Daytona Beach International Airport
Master Plan Update

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EXECUTIVE SUMMARY

This Master Plan Update outlines opportunities for improving both the airfield and other facilities in order for the Daytona Beach International Airport to meet the aviation and transportation needs for the East Central Florida Region. The Airport's air service region includes portions of 9 counties with Volusia and Flagler being the principal regions served.

The intent of this update is to evaluate the Airport's existing facilities, conditions, and activity, project future activity over the 20-year planning period, and recommend methods of accommodating this demand.

1.0 INVENTORY

The Daytona Beach International Airport is located in east central Florida in Volusia County. The Airport is situated approximately three miles southwest of downtown Daytona Beach. The Airport serves the needs of commercial passengers, general aviation (GA) users, charter passengers, and other airport tenants.

The airfield configuration consists of three active runways. Runway 7L-25R serves as the Airport's primary runway and is 10,500 feet long and 150 feet wide. Runway 16-34 serves as the crosswind runway and measures 6,000 feet long and 150 feet wide. Runway 7R-25L accommodates smaller GA traffic at the Airport and measures 3,200 feet long and 100 feet wide.

The landside facilities at the Airport include a 175,000 square foot Domestic Passenger Terminal building, located north of Runway 7L-25R, a 60,000 square foot International Passenger Terminal building and multiple fixed base operators (FBOs). There are also several hangars for both GA and corporate aircraft use. Aircraft Rescue and Fire Fighting (ARFF), fuel storage, and airport maintenance facilities are also located at the Airport.

Automobile access to the Airport is obtained via Interstate 95 and Interstate 4 to the west and Highway 92 to the north. Multiple other local roadways provide access to all developed areas of the Airport. A total of 1,013 public parking spaces are located north of, and adjacent to the terminal buildings.

The Airport lies within Class C airspace, which has an outer area extending out 10 nautical miles from the Airport. This airspace is controlled by Daytona Beach's Air Traffic Control Tower (ATCT) and Terminal Radar Approach Control (TRACON) facility located at the Airport.

The Airport is served by a number of navigational and landing aids designed to assist pilots. The Airport is equipped with a Category I Instrument Landing System (ILS) approach to Runway 7L and Precision Approach Path Indicator (PAPI) lights on all of the runways.

2.0 AVIATION ACTIVITY FORECASTS

Aviation activity forecasts are a vital component of developing a logical airport improvement plan. A thorough understanding of historical demands, growth trends, and factors affecting growth is required to develop reasonable projections. This information was used to determine the recommended development plan for the Airport.

2.1 Socioeconomic Background

Total personal income for the East Central Florida Region, has increased by 30.7% from 1992 to 1997. These figures are shown in **Table 1**, as well as the figures of other Florida counties. The population of Volusia County grew by an average of 1.4% annually from 1990 to 2000.

2.2 Historical Airport Activity

Historical airport activity is required to accurately determine future facility requirements at the Airport. Annual enplanements at Daytona Beach totaled 260,598 in 2001. The based aircraft fleet increased from 148 in 1985 to 188 in 2001.

2.3 Daytona Beach Forecasts

Two cases have been developed for Daytona Beach, a base and high case scenario. These cases represent the range of forecast activity expected at the Airport during the 20-year planning period. The FAA has approved the base case forecast and thus facility requirements and development concepts were determined based on these numbers.

By 2020, total passenger enplanements are projected to reach 400,000 in the base case scenario, depicted in **Table 2**. Total aircraft operations at the Daytona Beach International Airport are expected to increase to 436,569 in 2020. These figures are shown in **Table 3**.

The number of general aviation based aircraft is projected to increase from 188 in 2000 to 211 by 2020, as depicted in **Table 4**. General aviation operations are projected to increase to 424,110 operations in 2020. Table 3 shows the projected general aviation operations at the Airport. Peaking characteristics of total enplanements and operations are shown in **Table 5**.

Based on the continual growth of operations and activity at the Airport, it is believed that the future level of aviation activity will fall between the base and high case forecasts. Enplaned passenger forecasts are illustrated in **Figure 1** and aircraft operations forecasts are illustrated in **Figure 2**.

3.0 FACILITY REQUIREMENTS

The next step in the planning process, once the projections of future demand have been developed, is to consider the ability of the Airport's existing facilities to accommodate this demand. This section also details the facilities that will be required in order to meet this future demand. These facility requirements were developed for years 2005, 2010,

Table 1

DAYTONA BEACH INTERNATIONAL AIRPORT

Personal Income Trends by County/Region in Florida - 1997 vs 1992

County/ Region	Personal Income ($M) 1997	1992	Change
Brevard	10,342	8,182	26.4%
Indian River	3,423	2,514	36.2%
Okeechobee	559	432	29.5%
St. Lucie	3,475	2,538	36.9%
Volusia	**8,518**	**6,464**	**31.8%**
Central East	**26,318**	**20,130**	**30.7%**
Hardee	362	306	18.2%
Highlands	1,535	1,189	29.1%
Lake	4,046	2,859	41.5%
Marion	4,652	3,341	39.2%
Orange	18,733	13,681	36.9%
Osceola	2,462	1,794	37.2%
Polk	9,207	6,819	35.0%
Seminole	8,953	6,211	44.2%
Sumter	623	438	42.3%
Central	**50,574**	**36,638**	**38.0%**
Citrus	2,060	1,559	32.1%
De Soto	470	388	21.1%
Hernando	2,456	1,738	41.3%
Hillsborough	21,559	15,936	35.3%
Manatee	6,313	4,620	36.6%
Pasco	6,570	4,620	42.2%
Pinellas	24,771	18,812	31.7%
Sarasota	10,707	8,058	32.9%
Central West	**74,906**	**55,731**	**34.4%**

County/ Region	Personal Income ($M) 1997	1992	Change
Alachua	4,313	3,277	31.6%
Baker	341	257	32.7%
Bradford	391	290	34.8%
Clay	2,887	2,013	43.4%
Columbia	905	628	44.2%
Duval	17,770	13,369	32.9%
Flagler	823	510	61.4%
Nassau	2,407	1,785	34.9%
Putnam	1,119	886	26.3%
St. Johns	3,509	2,191	60.2%
Union	137	105	30.1%
Northeast	**34,604**	**25,311**	**36.7%**
Broward	40,743	30,259	34.6%
Dade	46,174	34,125	35.3%
Glades	121	101	20.3%
Hendry	533	476	12.0%
Martin	4,132	3,153	31.0%
Monroe	2,407	1,785	34.9%
Palm Beach	39,269	28,702	36.8%
Southeast	**133,380**	**98,601**	**35.3%**
Charlotte	2,895	2,157	34.2%
Collier	6,969	4,868	43.2%
Lee	9,863	7,282	35.4%
Southwest	**19,727**	**14,307**	**37.9%**

County/ Region	Personal Income ($M) 1997	1992	Change
Bay	2,985	2,202	35.6%
Calhoun	174	132	32.0%
Dixie	169	121	39.6%
Escambia	5,589	4,416	26.6%
Franklin	173	129	33.8%
Gadsden	699	552	26.5%
Gilchrist	182	134	36.0%
Gulf	222	163	35.9%
Hamilton	162	130	24.7%
Holmes	254	193	31.6%
Jackson	696	585	19.0%
Jefferson	226	169	33.6%
Lafayette	90	72	25.7%
Leon	5,031	3,665	37.3%
Levy	488	361	35.1%
Liberty	94	70	33.7%
Madison	257	201	28.0%
Okaloosa	3,736	2,713	37.7%
Santa Rosa	2,214	1,499	47.7%
Suwanee	561	420	33.5%
Taylor	308	243	26.6%
Wakulla	374	225	66.1%
Walton	596	394	51.4%
Washington	304	222	36.8%
Northwest	**25,581**	**19,011**	**34.6%**
Florida	**363,980**	**268,828**	**35.4%**
USA Total	**6,770,650**	**5,239,364**	**29.2%**

Sources: US Department of Commerce, Bureau of Economic Analysis: Regional Economic Information System for Personal Income;
VISIT FLORIDA (official tourism marketing agency for state of Florida) for Seven Regions

Volusia County experienced a growth in personal income of 31.8 percent from 1992 to 1997, which is slightly lower than the statewide growth of 35.4 percent in Florida overall.

Table 2

DAYTONA BEACH INTERNATIONAL AIRPORT

Passenger Aircraft Departures Forecasts by Aircraft Type - Base Case

Year	Annual Passenger Enplanements				Passenger Aircraft Departures				Average Enplanements per Departure			
	Air Carrier Jets	Regional Jets	Regional Turboprops	All Aircraft Types	Air Carrier Jets	Regional Jets	Regional Turboprops	All Aircraft Types	Air Carrier Jets	Regional Jets	Regional Turboprops	All Aircraft Types
					Historical							
09/99-08/00	212,579	51,312	-	263,891	2,042	1,098	-	3,140	104.1	46.7	0.0	84.0
					Forecasted							
2005	217,500	72,500	-	290,000	2,190	1,825	-	4,015	99.3	39.7	0.0	72.2
2010	231,000	99,000	-	330,000	2,190	2,555	-	4,745	105.5	38.7	0.0	69.5
2020	260,000	140,000	-	400,000	2,190	3,650	-	5,840	118.7	38.4	0.0	68.5

Source: Tables 3.8 and 3.19, and HNTB Analysis

Table 3

DAYTONA BEACH INTERNATIONAL AIRPORT

Summary of Projected Enplanements and Aircraft Operations - Base Case

		Aircraft Operations				
		Passenger Carriers				
Year	Annual Enplanements	Air Carrier Jets	Regional Jets	General Aviation	Military	Total
2000	268,082	4,084	2,196	355,353	779	362,412
2005	290,000	4,380	3,650	372,480	779	381,289
2010	330,000	4,380	5,110	390,000	779	400,269
2020	400,000	4,380	7,300	424,110	779	436,569
		Average Annual Growth Rates				
2000-2005	1.6%	1.4%	10.7%	0.9%	0.0%	1.0%
2005-2010	2.6%	0.0%	7.0%	0.9%	0.0%	1.0%
2010-2020	1.9%	0.0%	3.6%	0.8%	0.0%	0.9%
2000-2020	2.0%	0.4%	6.2%	0.9%	0.0%	0.9%

Note: Military Operations projected to remain constant at 09/99-08/00 levels

Sources: Tables 3.19, 3.20 and 3.31

Table 4

DAYTONA BEACH INTERNATIONAL AIRPORT

Based General Aviation Aircraft Trends and Forecast at Daytona Beach International

	Total Airport Based General Aviation Aircraft					Embry Riddle Based Aircraft					All Other Based Aircraft				
Year	Single Engine	Multi Engine	Jet Engine	Helicopters	Total	Single Engine	Multi Engine	Jet Engine	Helicopters	Total	Single Engine	Multi Engine	Jet Engine	Helicopters	Total
1985	118	23	2	5	148	N/A	N/A	-	-	N/A	N/A	N/A	2	5	N/A
1986	100	47	3	3	153	N/A	N/A	-	-	N/A	N/A	N/A	3	3	N/A
1987	100	47	7	6	160	N/A	N/A	-	-	N/A	N/A	N/A	7	6	N/A
1988	103	49	7	6	165	N/A	N/A	-	-	N/A	N/A	N/A	7	6	N/A
1989	148	36	5	3	192	N/A	N/A	-	-	N/A	N/A	N/A	5	3	N/A
1990	148	36	5	3	192	N/A	N/A	-	-	N/A	N/A	N/A	5	3	N/A
1991	148	36	5	3	192	N/A	N/A	-	-	N/A	N/A	N/A	5	3	N/A
1992	146	27	5	3	181	N/A	N/A	-	-	N/A	N/A	N/A	5	3	N/A
1993	146	27	5	3	181	N/A	N/A	-	-	N/A	N/A	N/A	5	3	N/A
1994	148	31	7	4	190	N/A	N/A	-	-	N/A	N/A	N/A	7	4	N/A
1995	131	30	9	5	175	N/A	N/A	-	-	N/A	N/A	N/A	9	5	N/A
1996	131	30	9	3	173	62	7	-	-	69	69	23	9	3	104
1997	127	30	9	3	169	55	8	-	-	63	72	22	9	3	106
1998E	131	32	9	3	175	64	7	-	-	71	67	25	9	3	104
1999E	138	34	10	4	186	76	6	-	-	82	62	28	10	4	104
2000	134	40	10	4	188	77	8	-	-	85	57	32	10	4	103
						Forecast									
2005	136	41	13	4	194	77	8	-	-	85	59	33	13	4	109
2010	138	41	16	5	200	77	8	-	-	85	61	33	16	5	115
2020	142	42	22	5	211	77	8	-	-	85	65	34	22	5	126
						Average Annual Growth Rates									
2000-2005	0.3%	0.3%	5.5%	1.5%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.4%	5.5%	1.5%	1.2%
2005-2010	0.3%	0.2%	4.1%	1.3%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.3%	4.1%	1.3%	1.0%
2010-2020	0.3%	0.2%	3.2%	1.1%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.2%	3.2%	1.1%	0.9%
2000-2020	0.3%	0.2%	4.0%	1.3%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.3%	4.0%	1.3%	1.0%

Note: Embry Riddle Based Aircraft Projected to Remain Constant per Embry Riddle Plans; Other Aircraft Projected to Grow at Similar Rates as FAA National Projected Rates per FAA Aerospace Forecasts FY 2000-2011 (March 2000), FAA Long Range Aerospace Forecasts FY 2015, 2020, and 2025 (June 2000)

Sources: FAA Aerospace Forecasts FY 2000-2011 (March 2000), FAA Long Range Aerospace Forecasts FY 2015, 2020, and 2025 (June 2000); Florida DOT and Embry Riddle websites; HNTB analysis

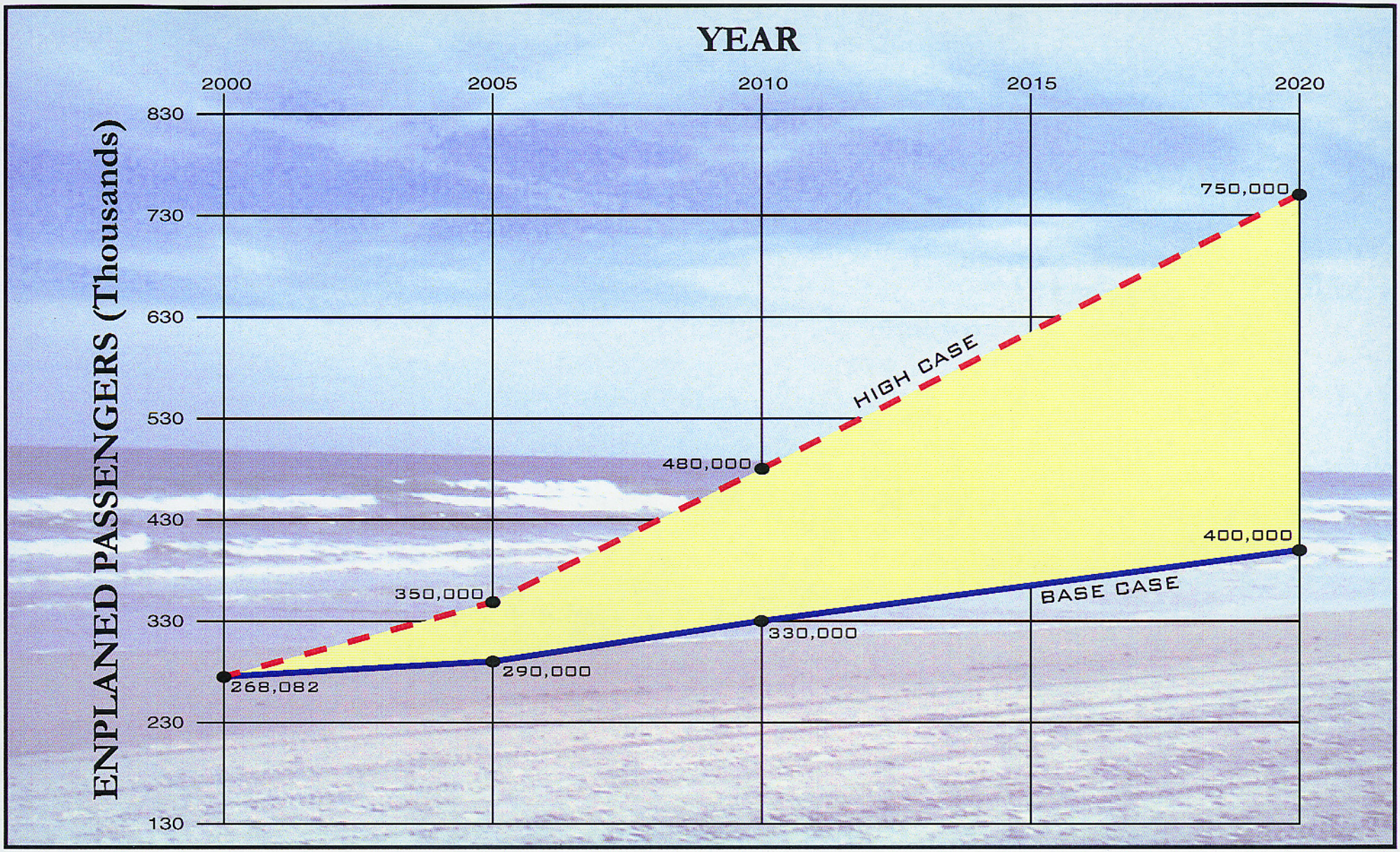
Table 5

DAYTONA BEACH INTERNATIONAL AIRPORT

Peaking Characteristics - Total Enplanements and Operations

	Base Case				High Case			
	2000	**2005**	**2010**	**2020**	**2000**	**2005**	**2010**	**2020**
Aircraft Departures								
Daily	595	625	656	715	595	630	661	727
Peak Hour	68	73	76	83	68	73	78	87
Aircraft Arrivals								
Daily	595	625	656	715	595	630	661	727
Peak Hour	68	73	76	83	68	73	78	87
Aircraft Operations								
Daily	1,190	1,250	1,312	1,430	1,190	1,260	1,322	1,454
Peak Hour	135	144	151	164	135	144	154	170
Passenger Enplanements								
Daily		936	1,064	1,291		1,129	1,548	2,420
Peak Hour		328	339	415		335	516	792
Passenger Deplanements								
Daily		936	1,064	1,291		1,129	1,548	2,420
Peak Hour		328	339	415		335	516	792
Total Passengers								
Daily		1,872	2,128	2,582		2,258	3,096	4,840
Peak Hour		491	555	645		503	860	1,210

Sources: Tables 3.22, 3.26, and 3.34



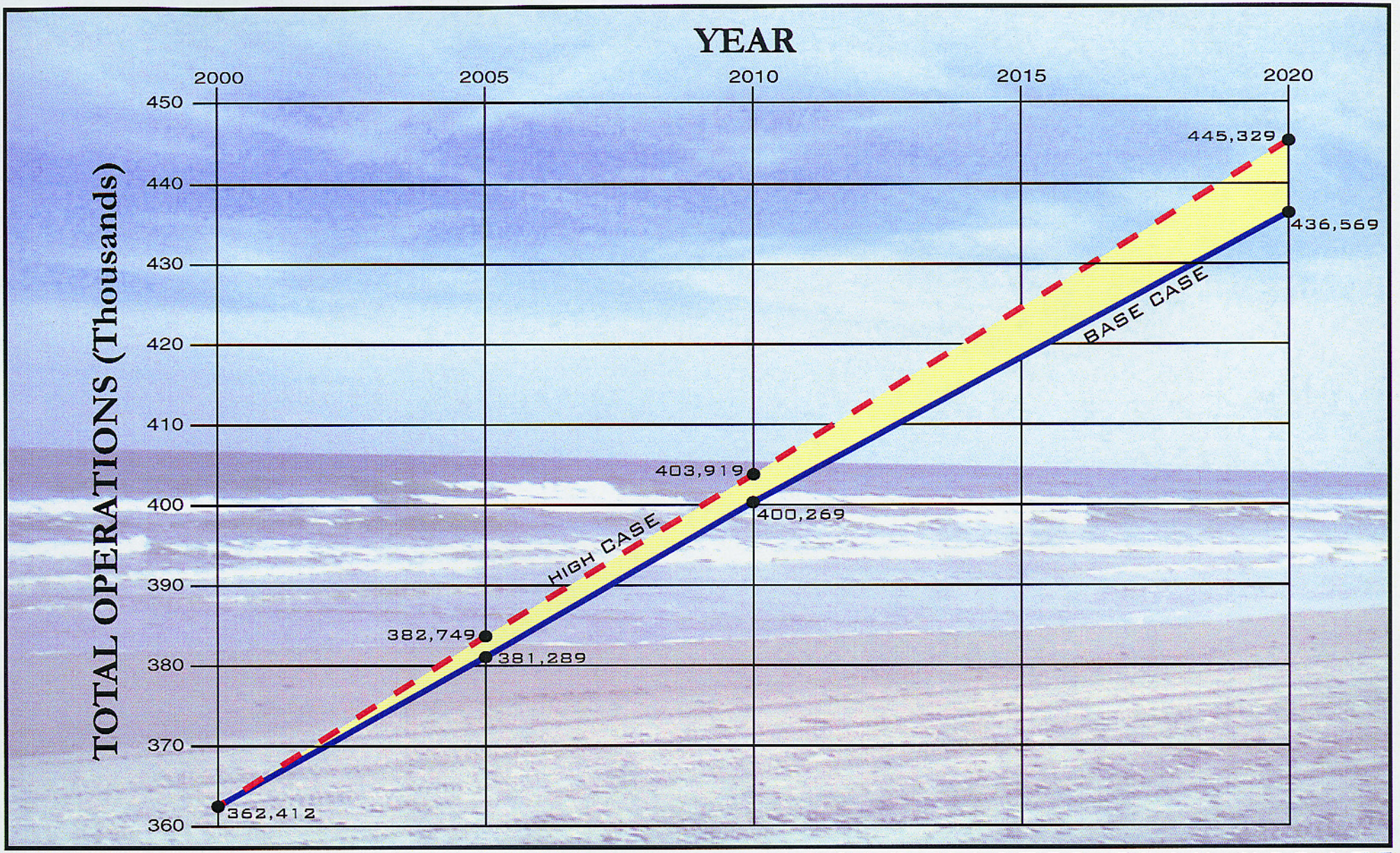
DAYTONA BEACH INTERNATIONAL AIRPORT MASTER PLAN UPDATE

DAYTONA BEACH INTERNATIONAL AIRPORT

FORECAST SUMMARY
ENPLANED PASSENGERS

HNTB

FIGURE 1



DAYTONA BEACH INTERNATIONAL AIRPORT MASTER PLAN UPDATE

DAYTONA BEACH INTERNATIONAL AIRPORT

FORECAST SUMMARY
TOTAL OPERATIONS

HNTB

FIGURE 2

and 2020. Facility requirements were determined by comparing the aviation demand projections presented in Chapter Three with the capacity of the various functional airport areas, including:

- Airspace Capacity
- Airfield Capacity and Delay
- Airfield Improvements
- Landside and Airside Buildings
- Air Cargo
- Support Facilities

Table 6 shows the future facility requirements for automobile parking at the Airport. Facility requirements for other areas of the Airport are described in detail in Chapter 4 of the Master Plan Update. Based on these facility requirements, development concepts were created to accommodate these future needs.

4.0 DEVELOPMENT CONCEPTS

Two future airport development and planning concepts were determined based on the forecasts for capacity and demand, and the future long-term goals of the Airport.

4.1 Development Concept One

To facilitate additional aircraft operations, a relocated Runway 7R-25L should be constructed. This runway will replace the existing 7R-25L Runway and will accommodate larger general aviation aircraft operations. Land located south of and adjacent to the Airport property should be purchased to accommodate this new runway.

Other development plans of concept one include reserving land for future automobile parking needs, terminal development, and aviation related development on the airfield such as hangars and aprons.

4.2 Development Concept Two

Development Concept Two is similar to Concept One but the existing Runway 7R-25L remains open, giving the Airport three parallel runways. This option gives the Airport more capacity for aircraft operations. The same areas of land will be reserved for future development as in Development Concept One.

4.3 Recommended Development Plan

Development Concept Two is the recommended development concept due to the increased capacity it provides the Airport. This Development Concept is illustrated in **Figure 3**.

The total initial cost for Concept Two is $41,761,100. This total represents order of magnitude costs.

5.0 AIRPORT PLANS

The Airport Plans Chapter describes the recommended development plan for the Daytona Beach International Airport. The recommended improvements are derived from the forecasts in Chapter Three.

5.1 Airport Implementation Plan

The long-term goal of the Daytona Beach International Airport is to

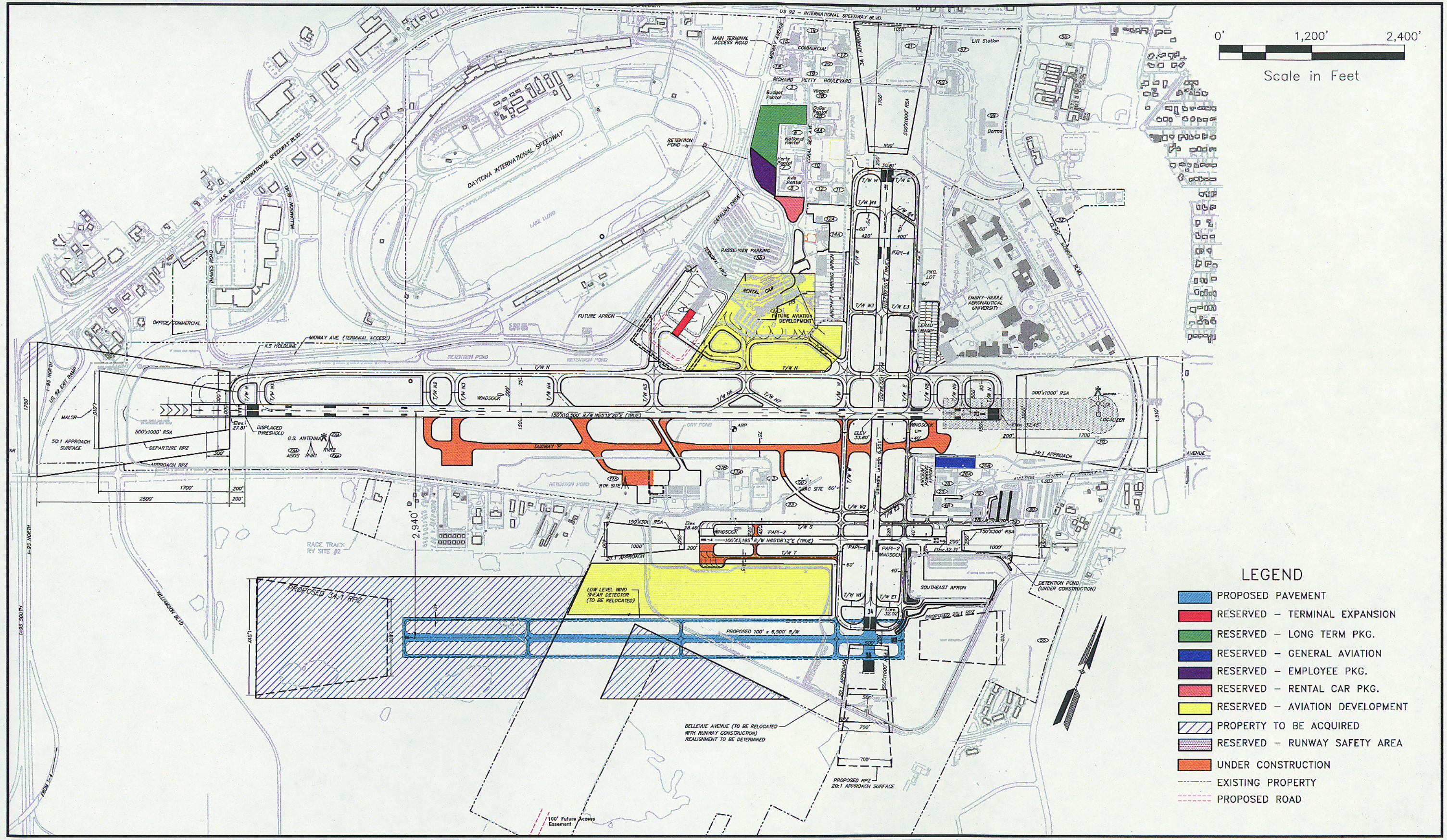
Table 6

DAYTONA BEACH INTERNATIONAL AIRPORT

Projected Parking Requirements

	Existing	2005		2010		2020	
	Spaces	**Base**	**High**	**Base**	**High**	**Base**	**High**
Long-Term							
General	624	328	396	373	546	438	841
Handicapped	24	10	12	12	17	14	26
Short-Term							
General	353	109	132	124	181	150	283
Handicapped	12	4	4	4	6	5	9
Rental	277	126	152	144	209	174	327
Employee							
General	156	87	106	100	145	120	226
Handicapped	6	3	3	3	4	4	7
Service	12	5	7	6	9	7	14
Ground Transportation	9	4	5	5	7	6	11
Bus Spaces	4	1	2	2	2	2	4
General Aviation	295	83	83	88	88	112	112
Total	**1,772**	**760**	**902**	**861**	**1,214**	**1,032**	**1,860**

Source: HNTB Analysis



DAYTONA BEACH INTERNATIONAL AIRPORT MASTER PLAN UPDATE

RECOMMENDED DEVELOPMENT PLAN

DAYTONA BEACH INTERNATIONAL AIRPORT

HNTB

FIGURE 3

maximize revenues and minimize expenses in a safe and efficient manner. The purchase of and eventual development of roughly 300 acres of land located south of and adjacent to the Airport property may increase revenue and help to offset expenses.

5.2 Obstruction Mitigation and Airspace Plan

The FAA sets forth guidelines for airspace obstructions in the Title 14 Code of Federal Regulations (14 CFR) Part 77 "Objects Affecting Navigable Airspace." This regulation states the exact dimensions required of the airspace surrounding airports. The Daytona Beach International Airport complies with FAA Part 77 surfaces for airspace.

The airspace plan is designed to accurately depict the Part 77 surfaces on the quadrangle (1" = 2,000') composite for the area around the Airport.

Obstructions to the Part 77 airspace surrounding the Daytona Beach International Airport are marked on the runway obstructions figures of the airport layout plan set.

Any and all non-necessary obstructions to the imaginary surfaces should be removed from the airport environment.

6.0 ENVIRONMENTAL OVERVIEW

The future environmental conditions must be closely examined when selecting potential development concepts. The environmental concerns that are most affected by airport development include noise, air quality, water quality, and wetland and wildlife habitat disturbances. These impacts are briefly described in the following sections. A total of 20 potential environmental impacts were studied for this Master Plan Update.

6.1 Noise

As part of the Environmental Overview, an analysis of the noise environment associated with flight operations under the current conditions (2000) and the 2020 Base-Case Forecast was completed using the Federal Aviation Administration's Integrated Noise Model (INM). Information such as the number of aircraft operations, types or aircraft, flight tracks, and runway utilization was used in developing noise contours, which illustrate the area of land most affected by aircraft operations and resultant noise.

The 2000 forecast noise contours show that the 65-db DNL noise contour extends to the northeast across Clyde Morris Boulevard. This is considered to be the threshold for tolerable noise exposure to surrounding communities. The Airport owns most of the area affected by these contours.

The 2020 base-case forecast noise contours show that the 65-dB DNL noise contour will extend farther to the northeast across Clyde Morris Boulevard than the 2000 contours. Figures 7-1 and 7-2 in the Master Plan document illustrate these noise contours.

6.2 Air Quality

The alternatives proposed in the Master Plan would have minimal impact on air quality. Prior to the development of any part of the Master Plan, environmental assessments will be conducted to determine if any new facilities or the projected future aircraft make-up will have a significant impact on air quality per State and Federal air quality guidelines.

6.3 Water Quality

With the increase in impervious ground area due to the new runway, taxiways, and buildings, stormwater discharge is the primary water quality issue with the changes proposed by the Master Plan. Considerable coordination will have to occur between local, state, and federal agencies to ensure that water quality standards are maintained and that the necessary permits are in place at the time of development.

6.4 Wetlands

There are several wetlands that will be impacted by the improvements proposed in the Airport Master Plan. These areas include mixtures of deciduous and evergreen growth. Wetlands identified within the effected development areas will be mitigated as needed.

6.5 Endangered and Threatened Species

As part of the 1996 Environmental Assessment, a review of the project site did not indicate the presence of any state or federal protected species other than some protected wading birds. However, the proposed improvements are not expected to have a significant impact on their habitat.

7.0 FINANCIAL PLAN

The Daytona Beach International Airport is considered an Enterprise Fund within Volusia County. This means that the Airport program operates independently from the County's general fund.

Table 7 shows historical and projected airport revenues and expenses through 2005. Total operating revenues are projected to reach $12,100,856 for fiscal year 2005 while total operating expenses are projected to reach $13,858,248 for 2005.

It should be noted that the total expense figures include depreciation that accounts for roughly $3 to $4 million in expenses each year. A substantial portion of depreciation expense results from amortization of assets acquired with Federal or State grant funding. Without including these expenses, net revenue totals $1 to $2 million annually.

Each new project recommended in this Master Plan was given a construction cost generated from the Development Concepts Chapter. The cost of these projects and other currently proposed capital improvement projects totals roughly $62.5 million**.** This includes land acquisition, runway and taxiway construction, and all other associated design and construction costs.

Table 7
DAYTONA BEACH INTERNATIONAL AIRPORT

Historical Revenues and Expenses vs. Enplanements

	Fiscal Year	Enplanements	Total Revenues	Revenues/Enplanements	Total Expenses	Expenses/Enplanements	Net Revenue
Actual	1997	392,939	$9,387,106	$23.89	$10,725,522	$27.30	($1,338,416)
	1998	313,121	$9,110,332	$29.10	$11,543,732	$36.87	($2,433,400)
	1999	284,123	$9,042,344	$31.83	$11,229,989	$39.53	($2,187,645)
	2000	268,082	$10,377,690	$38.71	$12,175,832	$45.42	($1,798,142)
	2001	260,598	$10,573,138	$40.57	$13,332,058	$51.16	($2,758,920)
Projected	2002	264,768	$11,141,711	$42.08	$13,479,175	$50.91	($2,337,464)
	2003	269,004	$11,179,347	$41.56	$13,595,051	$50.54	($2,415,704)
	2004	273,308	$11,614,898	$42.50	$13,721,264	$50.20	($2,106,366)
	2005	290,000	$12,100,856	$41.73	$13,858,248	$47.79	($1,757,392)

Source: County of Volusia, Daytona Beach International Airport Statement of Revenues & Expenses

Chapter One
Introduction, Goals, and Objectives

The purpose of this study is to update the 1995 Master Plan Update to reflect the changing conditions of Daytona Beach International Airport. They include changes in air carrier service, general aviation activity, changes in the aviation industry as well as the regional and global economies.

To ensure that the Master Plan Update becomes a working document that may be used to address the future issues facing the Airport, specific goals and objectives for the study have been designed by airport management. These goals, in no specific order, are:

1. GOAL
Provide a safe and reliable airport.

OBJECTIVES
- Ensure that all existing and future runway safety areas, runway protection zones, and runway approaches meet FAA-standards and will be protected from future incompatible development.

- Monitor and protect all navigable airspace in accordance with Federal Aviation Regulations Part 77.

- Adopt operating practices that minimize congestion and delay for the benefit of the air traveling public.

2. GOAL
Develop and manage the Airport in a manner that supports local and regional economic development and is responsive to beneficial economic development opportunities.

OBJECTIVE
- Utilize available census, demographic, and airline passenger traffic data to develop forecasts of future commercial and general aviation activity.

- Use forecasts as a primary source of data to plan future airport development.

3. GOAL
Create a Development Plan that fully considers national, state, regional, and local planning objectives.

OBJECTIVES
- Ensure that the Development Plan is compatible with the current National Plan of Integrated Airport Systems (NPIAS) and the Florida Aviation System Plan (FASP).

- Address the *Volusia County Comprehensive Plan for Growth Management* and its task to integrate all modes of transportation (rail, air, sea, and surface) within the county.

4. GOAL
Create a development plan that balances development needs of commercial airline service and general aviation.

OBJECTIVES
- Analyze projected general aviation growth and determine if further development of general aviation facilities is necessary to meet forecast demand levels.

- Segregate general aviation facilities from commercial aviation facilities.

- Ensure that development plans for general aviation do not adversely affect existing or projected commercial aviation traffic.

5. GOAL

Maintain convenient and uncongested highway access to the Airport.

OBJECTIVES

- Design and implement special event traffic plans to ensure convenient and consistent airport access.

- Analyze alternatives for the improvement of ground access, including the relocation of aviation facilities.

- Analyze commuter or light rail interface in cooperation with regional transportation planning efforts.

- Analyze cargo development potential to promote existing access advantages of Interstates 4 and 95.

6. GOAL

Promote the development of compatible land uses in undeveloped areas in the vicinity of the Airport.

OBJECTIVES

- Identify existing land-use and zoning regulations that affect the aeronautical development and development recommendations that promote future airport development needs.

- Analyze neighboring property and its impact on future development.

- Refine or adjust existing land acquisition plan to meet the needs of the development plan.

7. GOAL

Develop the Airport in an environmentally responsible manner.

OBJECTIVES

- Promote compatible land use as discussed above.

- Identify any areas negatively impacted by the Airport through airport noise and/or other environmental impacts.

- Develop recommendations for mitigating environmental impacts.

8. GOAL

Minimize airport operating costs and maximize airport revenues.

OBJECTIVE

- Develop a recommended Capital Improvement Program with anticipated levels of state, federal, and local funding.

9. GOAL

Build and maintain public confidence and support.

OBJECTIVES

- Address public concerns regarding airport financing through a financial analysis of the Airport's operation.

- Develop a financial plan for future airport funding.

This Master Plan Update will include chapters discussing the airport inventory, forecasts of aviation demand, demand versus facility requirements, development alternatives, environmental consequences, and financial analysis.

Chapter Two
Inventory

2.1 INTRODUCTION

This chapter documents existing conditions of the Daytona Beach International Airport as of December 2000. Information presented here was gathered through on-site inspections, interviews with airport management officials, and reviews of existing studies.

2.1.1 Airport Location and Property

Daytona Beach International Airport is located in east central Florida in Volusia County. The airport is approximately three miles southwest of downtown Daytona Beach at 29°10'47" North latitude and 81°03'29" West longitude. Airport property is expansive, encompassing 2,007 acres. The property has an elevation of 34 feet above Mean Sea Level (MSL). Approximately 50 miles southwest of the airport is the city of Orlando. Approximately 90 miles to the north is the city of Jacksonville. **Figure 2-1** illustrates the location of Daytona Beach.

International Speedway Boulevard to the north, Clyde Morris Boulevard to the east, Bellevue Avenue to the south, and Williamson Boulevard to the west generally border the airport property. **Figure 2-2** depicts the vicinity of the airport.

2.1.2 History of the Airport

Prior to 1930, the hard sand of Daytona Beach served as a landing strip for airmail aircraft. On May 15, 1930, Daytona Beach Airport began operations at its current site. In 1941, the airport constructed a paved runway and long-haul Douglas DC-3 flights between New York City and Daytona Beach began.

During World War II, civilian operations ceased and the airfield became a naval air training station. In 1946, the operation of the Airport reverted to the City of Daytona Beach. Commercial flights by carriers such as Eastern Airlines and National Airlines resumed. The Airport's first Air Traffic Control Tower was built in 1948 atop an existing hangar.

In 1965, Embry-Riddle Aeronautical Institute relocated from Miami to Daytona Beach. The Institute's flight training operations increased general aviation activity at the Airport. In 1966, jet service was introduced to Daytona Beach. Air carriers such as Eastern Airlines began operating long-haul flights from Daytona Beach to New York City. In 1969, Volusia County assumed ownership of the Airport, renaming it the Daytona Beach Regional Airport.

Large jets continued to serve the Airport throughout the 1970's and 1980's. Major airlines such as Eastern Airlines, Piedmont Airlines, American Airlines, Continental Airlines, National Airlines, and Delta Air Lines, served the Airport.

The Airport opened a new Domestic Passenger Terminal building in 1992. At this time, the Airport became known as the Daytona Beach International Airport. The primary runway was extended to

Source: MapArt, U.S. Terrain, Cartesia Software, 1996
Prepared by: HNTB

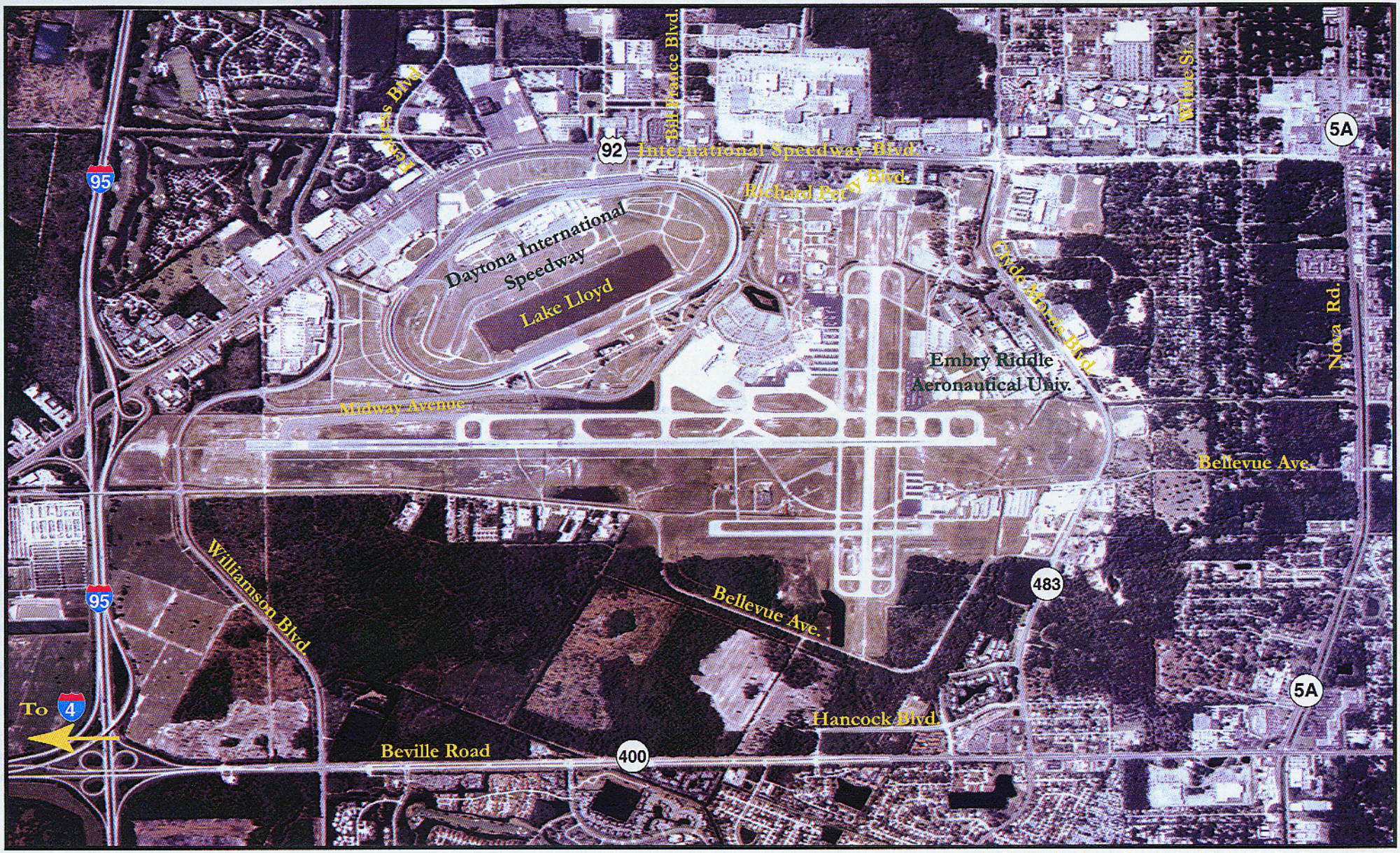
DAYTONA BEACH INTERNATIONAL AIRPORT MASTER PLAN UPDATE

DAYTONA BEACH INTERNATIONAL AIRPORT

LOCATION MAP

HNTB

FIGURE 2-1



DAYTONA BEACH INTERNATIONAL AIRPORT MASTER PLAN UPDATE

DAYTONA BEACH INTERNATIONAL AIRPORT

VICINITY MAP

HNTB

FIGURE 2-2

accommodate larger aircraft. In 1994, the old Domestic Passenger Terminal, adjacent to the new terminal building, became the International Passenger Terminal Building. The first commercial international flight arrived at this facility in 1995.

Currently, Delta Air Lines, Continental Airlines, and Vintage Props & Jets offer air carrier service. Continental Express Airlines and Atlantic Southeast Airlines offer commuter jet service.

Over 90% of airport operations are general aviation (GA) traffic. Recent growth in general aviation traffic is attributed to a national growth in recreational flying, as well as growth in corporate aviation and flight training activities.

2.1.3 Airport Management

Daytona Beach International Airport is owned and operated by Volusia County. The day-to-day operation of the Airport is the responsibility of the Director of Aviation. Departments within the Airport's organizational structure include Administration, Maintenance, Operations, Fire Department, Security, International Services, and Air Service Development/Marketing. The Airport's organizational chart is presented in **Figure 2-3**.

The Airport generates revenue from airline fees, concessions agreements, and aeronautical and non-aeronautical land leases. Many airport capital improvement projects are financed in part through Federal Aviation Administration's (FAA) Airport Improvement Program (AIP) and the Florida Department of Transportation (FDOT). Funding for these projects is also generated from bond issues. In accordance with FAA regulations, airport revenue is held in the *Enterprise Fund*, separate from the county's general fund. County tax dollars are not part of Daytona Beach International Airport funding.

The Airport's operating expenses are estimated at $2,203,556 for Fiscal Year (F.Y.) 2000-2001. These operating expenses are used to fund the seven different airport management departments shown in Figure 2-3. Capital improvement funds, less land acquisition fees, total $6,023,700 for (F.Y.) 2000-2001.

2.1.4 Significant On-Airport Activities

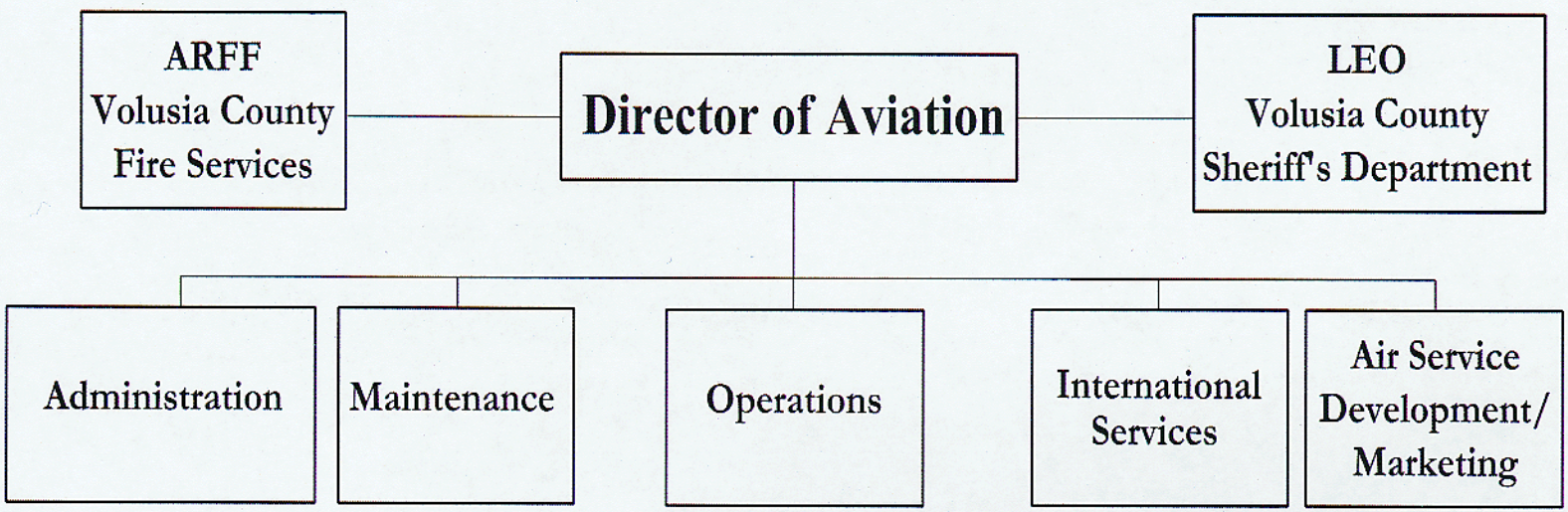
Daytona International Speedway

Daytona International Speedway, located on 480 acres of leased airport property, is owned and operated by the International Speedway Corporation. The racetrack was constructed on this site in 1959 and is home to one of the most famous motorsport events in the world, the Daytona 500. Also on the Speedway's leased properties is DAYTONA USA, a year-round attraction designed to educate and entertain race fans on the history of racing. The International Speedway Corporation, a publicly held company, generated over $300 million in revenue in 2000. The attractions at the Speedway help generate revenue for the Airport with the increased flight operations during these times.

Flight Training

The majority of traffic at Daytona Beach International Airport is flight training operations. Embry-Riddle Aeronautical University (ERAU) is Daytona Beach International Airport's largest flight training school and largest general aviation tenant.

Airport Services & Port Authority
County of Volusia, Florida



DAYTONA BEACH INTERNATIONAL AIRPORT

ORGANIZATIONAL CHART

HNTB

FIGURE 2-3

ERAU is an aviation college specializing in flight training with main campuses in Daytona Beach, Florida and Prescott, Arizona. The university currently has 77 single engine and 8 multiengine aircraft based at the Airport.

Embry-Riddle is currently undergoing a Master Plan Update and will be constructing many new facilities including a new flight operations building and aircraft maintenance hangar.

Future development of other flight training facilities includes the Phoenix East Aviation Flight Training Facility. This facility will be owned by Daytona Beach Jet Center and is designed to meet the needs of the growing general aviation demand at the Airport. The new facility, to be located just north of the Airport maintenance facility, will include three 100-foot by 100-foot hangars, a new apron, and an extension of Taxiway W.

Two new FBO facilities will also offer new or expanded flight training activities. The PhilAir General Aviation Plaza and Executive Flightline will offer flight training services. These new facilities will be discussed in detail in Section 2.1.9, General Aviation Facilities.

2.1.5 Relevant Zoning Regulations

On Airport Property

Daytona Beach International Airport lies within the city limits of Daytona Beach. Because the Airport is owned and operated by Volusia County, the agencies have inter-local agreement regarding the zoning of airport property. Volusia County holds the responsibility of creating their own planning, zoning, and building regulations for airport properties. The agreement allows for the City to review site plans and make recommendations, and to administer regulations regarding storm water, potable water, and sanitary sewer systems.

Off Airport Property

Most of the land surrounding the Airport is zoned by the city of Daytona Beach. This land varies from commercial to residential uses. Land on International Speedway Boulevard, adjacent to the Airport, is utilized by commercial enterprises such as restaurants and shopping centers. Residential land lies south, southeast, east, and north of airport property. Land to the west, northwest, and southwest of airport property is mainly undeveloped, although the Ladies Professional Golf Association (LPGA) and United States Tennis Association (USTA) have recently begun developments of residential communities, country clubs, golf courses, and tennis courts in this area.

To ensure that development of surrounding land does not impact airport operations, Daytona Beach City Codes contain Airport Impact Classifications. These classifications are used to regulate types of development and the heights of structures within the vicinity of the Airport.

Although the City of Daytona Beach has zoned most of the land surrounding the Airport, a small portion of land to the southwest of airport property falls under the jurisdiction of Volusia County Zoning. This land is mostly zoned industrial with the exception of one small agricultural plot and one small PUD (Planned Unit Development) area southwest of the Airport perimeter.

All airport property falls under Volusia County's "Airport Hazards" zoning

ordinances which govern development of the few plots of land surrounding the Airport. This regulation calls for height limitations as discussed in the Federal Aviation Regulations Part 77, *Objects Affecting Navigable Airspace*, as well as any variances mentioned in the Florida Statutes Chapter 333, *Airport Zoning*.

2.1.6 Previous Studies

The following studies regarding Daytona Beach International Airport provided background information for this inventory:

- *Daytona Beach International Airport Master Plan*, December 1995, HNTB Corporation.

- *National Plan of Integrated Airport Systems (1998-2002,)* March 1999, U.S. Department of Transportation.

- *Florida Airport Pavement Evaluation: Daytona Beach International Airport*, August 2000, Eckrose/Green Associates, Inc. for the Florida Department of Transportation Aviation Office.

2.2 AIRSIDE FACILITIES

This section details the airside components of the Airport as they existed in December 2000. Airside components include runways, taxiways, apron areas, imaginary surfaces, declared distances, lighting and signage, and other airport facilities directly relating to aircraft operations. These facilities, found to be in good to excellent condition, are depicted on the Airport Layout Plan in **Figure 2-4**.

Airside facilities used for air carrier traffic were designed to accommodate aircraft within Airplane Design Group IV. Aircraft that fall within this design group have a wingspan of 118 to 171 feet, and include aircraft such as the Boeing 757, Airbus A300, and the McDonnell Douglas MD-11. However, with certain limitations, the airfield and International Passenger Terminal area can accommodate large aircraft such as the Boeing 747 or Boeing 777.

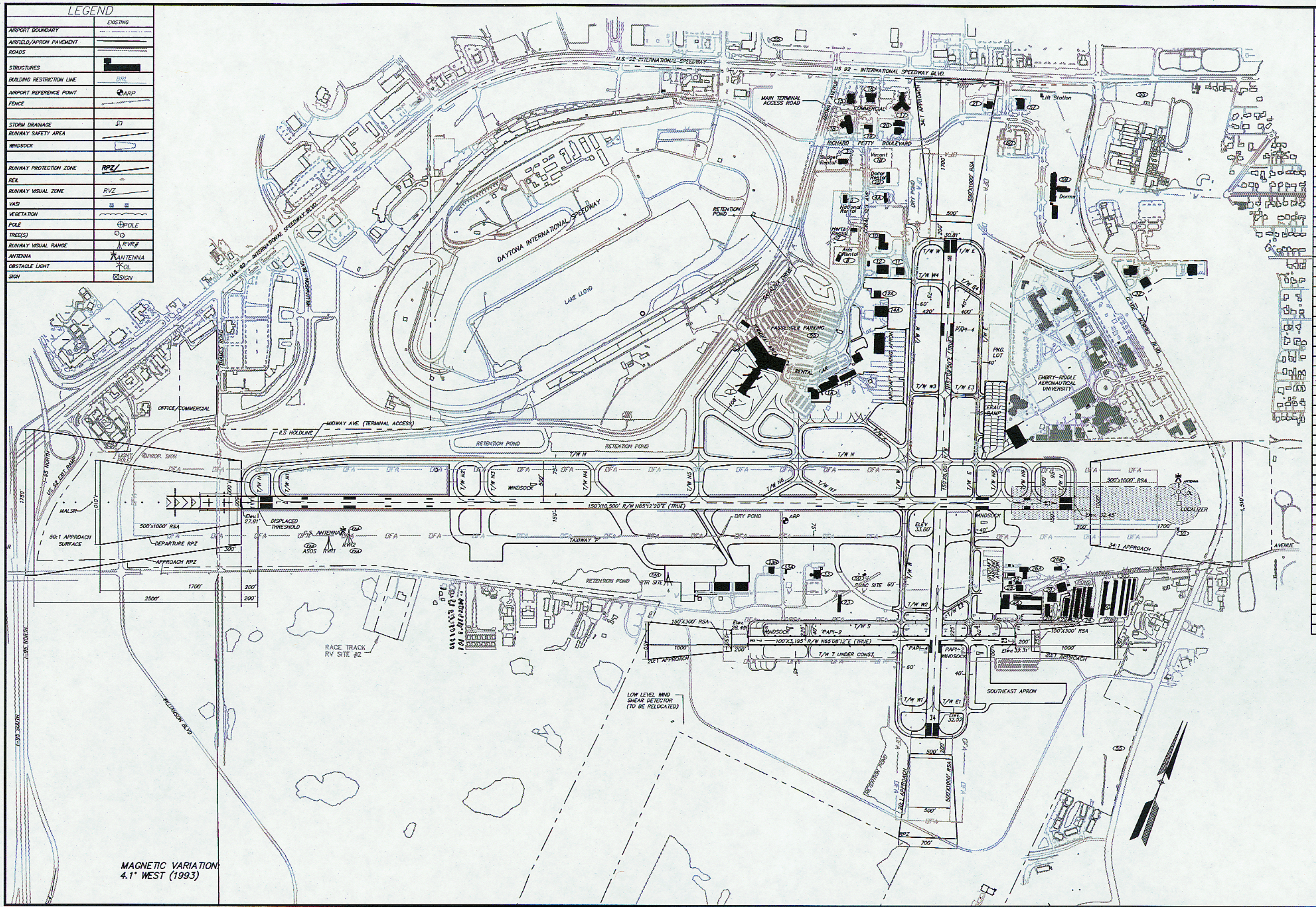
2.2.1 Runways and Taxiways

The Airport has two parallel runways and one crosswind runway. Runway 7L-25R, the primary runway, is 10,500 feet long and 150 feet wide. The west end of the runway has an elevation of 28.98 feet MSL while the east end is 33.62 feet MSL, giving the runway a 0.464 percent gradient.

Runway 7R-25L parallels the primary runway and is 3,195 feet long and 100 feet wide. Smaller general aviation aircraft primarily use this runway. The elevations for the runway ends are 29.63 feet for the west end and 33.48 feet for the east end, which yields to a gradient of 0.1204 percent.

Runway 16-34 is the Airport's crosswind runway. It is 6,001 feet long and 150 feet wide. The north end of the runway is at an elevation of 31.98 feet and the south end measures 33.69 feet, giving the runway a gradient of 0.0285 percent.

Both Runways 7L-25R and 7R-25L have full-length parallel taxiways. Taxiway N is located on the north side of Runway 7L-25R and is 75 feet wide. This taxiway connects to the runway at thirteen points. Taxiway N's centerline is located 500 feet from the Runway 7L-25R centerline, exceeding FAA runway-taxiway separation standards for an Airplane Design Group IV aircraft by 100 feet.



Building Table

LOCATION	TENANT	ELEV. (MSL) DATUM 1929 NVGD
15	Restaurant (Rio Bravo)	54.1
16	Restaurant (Olive Garden)	52.0
17	Hotel (Hampton Inn)	76.0
20	Car Rental Service (Alamo)	51.5
19	Halifax Clinical Research	50.9
18	Hilton Garden Inn (Embassy)	97.5
3	Budget Rental Car	56.3
9	Phoenix East Aviation (Vacant Parcel)	XXX
5	Race Track RV	XXX
6	National Car Rental	52.0
7	Hertz Car Rental	53.3
8	Avis Rental Car	53.0
12	Hangar (NASCAR)	61.0
11	Volusia Co. Sheriff's Dept Hangar	57.3
15	Dayt. Bch Int'l Airport Maintenance	68.2
10	Delta Air Cargo	68.2
18	Phoenix East Aviation (Vacant Parcel)	XXX
4	Fuel Farm	47.0
28	Dollar Rental Car	66.8
21	Regions Bank	46.9
57	Executive Offices	68.4
22	Lift Station	N/A
14	Daytona Beach Jet Center/ Hangar	54.3
14	Daytona Beach Jet Center	74.5
25	Rotating Beacon	39.2
1	Domestic Terminal Building	92.6
1A	International Terminal Building	58.3
59	Dorms	XXX
22	Yelvington Aviation Inc.	61.5
30	FAA Localizer Equipment Shelter	40.3
30	Non-Aviation Storage	50.7
30	Non-Aviation Storage	51.5
30	Non-Aviation Storage	50.6
30	Non-Aviation Storage	51.0
30	Non-Aviation Storage	56.7
29	Commonwealth Aviation T-Hangars	61.2
29	Commonwealth Aviation T-Hangars	49.7
29	Commonwealth Aviation T-Hangars	50.1
28	Condo Hangars	49.5
29	Commonwealth Aviation	49.5
41	FAA Airway Facilities	40.8
29	Commonwealth Aviation T-Hangars	59.5
27	FAA Airway Facilities	52.8
29	Commonwealth Aviation T-Hangars	59.5
26	Mosquito Control Storage	55.9
26	Mosquito Control	62.2
25	Civil Air Patrol Bldg	51.4
48	Vacant FBO Site Mid-Field Ramp	XXX
49	RCAG (FAA)	42.3
23	FBO (Willmon & Trans Florida Airlines)	45.1
33	FAA Tower	127.3
32	Health Department	XXX
53	Electrical Vault	39.9
54	ARFF	50.1
55	Low Level Wind Shear Detector	71.0
FAA	ASOS	53.0
FAA	Remote Transmitter	80.0
FAA	GS Antenna	XXX
FAA	RVR Antenna	XXX
60	Marriott Hotel	84.1

DAYTONA BEACH INTERNATIONAL AIRPORT MASTER PLAN UPDATE

DAYTONA BEACH INTERNATIONAL AIRPORT

EXISTING FACILITIES

HNTB

FIGURE 2-4

Taxiway S parallels the north side of Runway 7R-25L and is 40 feet wide. This taxiway connects to Runway 7R-25L in four places and has a centerline to centerline separation of 225 feet, meeting FAA Airplane Design Group I separation standards. This design Groups includes aircraft with a wingspan of up to but not including 49 feet in length.

Runway 16-34 is served by two full-length parallel taxiways located on either side of the runway. Taxiway W parallels the west side of Runway 16-34 and is 60 feet wide. This taxiway connects to Runway 16-34 in eight locations. The centerline to centerline separation between Taxiway W and Runway 16-34 is 420 feet. Taxiway E parallels the east side of Runway 16-34. The taxiway connects to the Runway in eight locations. It is 40 feet wide and has a separation distance from Runway 16-34 of 400 feet. Both Taxiway W and E meet the FAA's separation standards for an Airplane Design Group IV aircraft.

In addition to the primary taxiways discussed above, other secondary taxiways on the airfield connect the runways and taxiways to the terminals, aprons, and GA facilities. This network of taxiways permits safe and efficient movement of taxiing aircraft around the airfield.

2.2.2 Pavement Conditions

The 1998 Eckrose/Green Associates Airport Pavement Evaluation, evaluated all paved areas on the Airport and rated them from failed to excellent condition based on the Pavement Condition Index (PCI). Visual inspection confirms this evaluation.

The surface of Runway 7L-25R is grooved asphalt. The runway is in very good to excellent condition west of the intersection of Runway 16-34, and in good condition east of the intersection. Runway 7R-25L's surface is asphalt and in very good condition. The surface of Runway 16-34 is grooved asphalt and it is in excellent condition. Runway pavement strengths and dimensions are shown in **Table 2.1**.

Taxiway N, which parallels Runway 7L-25R, is in good condition. Taxiway S, which parallels Runway 7R-25L, is in poor condition west of the Runway 16-34 intersection. However, east of the intersection, the taxiway is in good condition. Taxiway W, located west of Runway 16-34, is in excellent condition. Taxiway E, east of Runway 16-34, is in good condition overall.

The Domestic Passenger Terminal apron is paved with Portland Cement Concrete (PCC) and is in excellent condition. The International Passenger Terminal apron is paved with asphalt over concrete and is in good condition.

The general aviation aprons vary in condition from excellent to poor.

2.2.3 Airspace Obstructions and Runway Protection Zones

Federal Aviation Regulation Part 77, *Objects Affecting Navigable Airspace*, outlines the airspace requirements and standards used to establish a safe environment for aircraft operating on and around an airport. Areas that surround runways need to be free from obstructions that might adversely affect aircraft operations. These areas are called imaginary surfaces.

Table 2.1
DAYTONA BEACH INTERNATIONAL AIRPORT

Runway Characteristics

Item	7L-25R	7R-25L	16-34
Length	10,500 feet	3,195 feet	6,001 feet
Width	150 feet	100 feet	150 feet
Displaced Thresholds	7L--690 feet	none	none
Runway Surface	Grooved Asphalt	Asphalt	Grooved Asphalt
Pavement Strength[1]			
Single Wheel	130,000 pounds	30,000 pounds	75,000 pounds
Dual Wheel	210,000 pounds		170,000 pounds
Dual Tandem	420,000 pounds		260,000 pounds
Double Dual Tandem	870,000 pounds		270,000 pounds

Source: Daytona Beach International Airport, Airport Layout Plan, November 2000

[1]These are the aircraft weights that should not be exceeded on a regular basis in order to ensure that the pavement maintains its 20-year design life. The wheel types refer to the main landing gear.

The flight approach assigned to each runway determines the geometry of the imaginary surfaces. Types of imaginary surfaces include the primary surface, horizontal surface, conical surface, transitional surface, and approach surface. Information on the dimensions of typical Part 77 surfaces is shown in **Figure 2-5**.

The Runway Protection Zone (RPZ) is a trapezoidal surface located at the ends of runways at the same elevation as the runway. It is designed to prohibit non-essential objects from adversely affecting aircraft approaching or departing the runway. The Object Free Area (OFA) is an area on the ground centered around a runway or taxiway. This area is free of objects that can cause obstructions to aircraft operations. **Table 2.2** shows the type of approach for each of Daytona Beach International Airport's runways, along with its corresponding RPZ dimensions and approach slope. **Figures 2-6**, **2-7**, and **2-8** illustrate the RPZs and obstructions to the runways. These obstructions are based on the Airport's most recent Obstruction Chart dated 1993.

2.2.4 Declared Distances

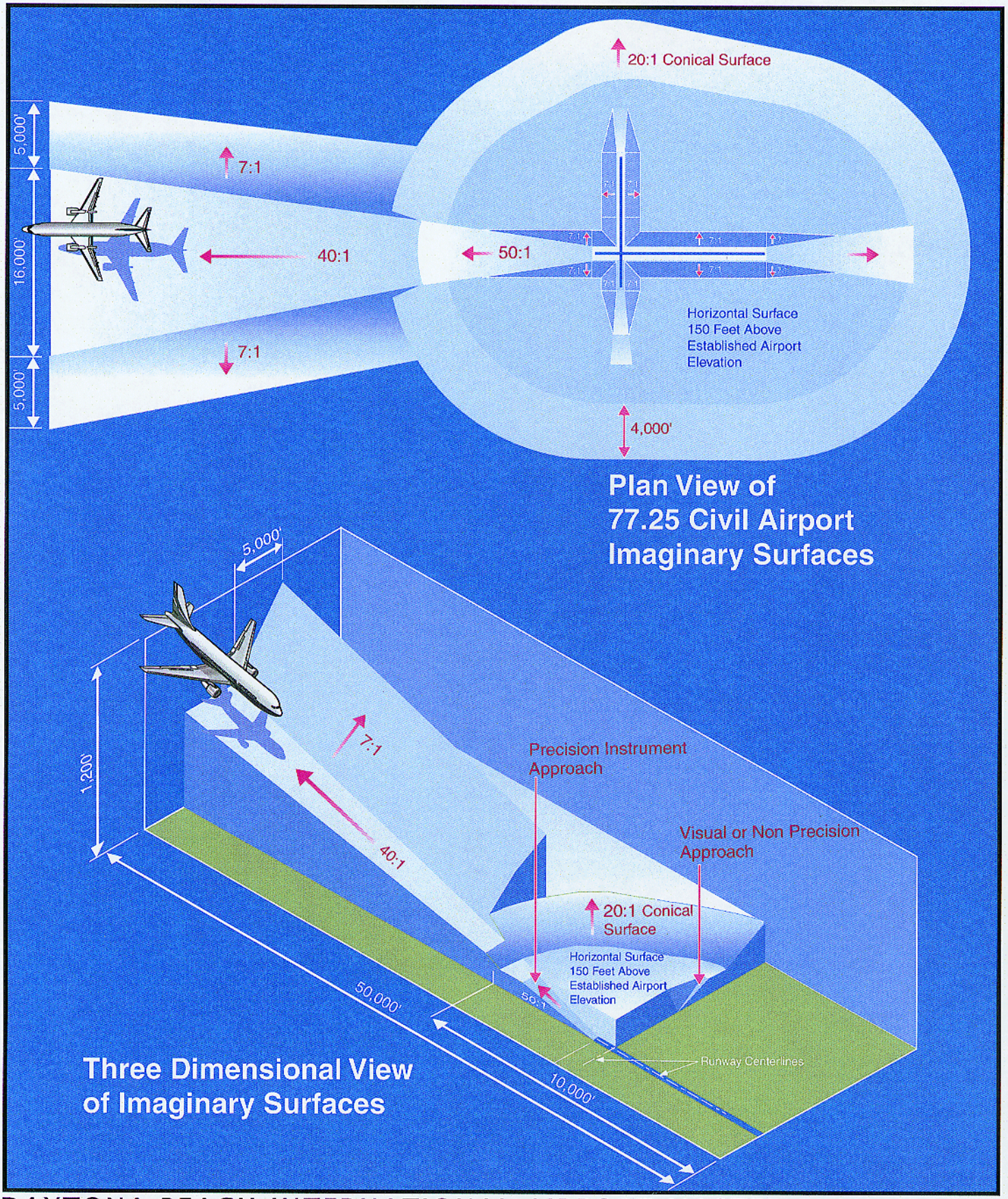
Obstructions to the approach surfaces of a runway can interfere with safe aircraft operations. To remove these obstructions from the approach surfaces, a runway's useful length may be altered. These new lengths, known as declared distances, are based on displaced thresholds, clearways, runway safety areas (RSAs), and object free areas (OFAs). The four declared distances are: takeoff run available (TORA), takeoff distance available (TODA), accelerate stop distance available (ASDA), and landing distance available (LDA). Runway 7L-25R uses declared distances due to the obstructions in the runway's approach surface. **Table 2.3** depicts the declared distances for Runway 7L-25R.

2.2.5 Airport Rescue and Fire Fighting (ARFF) Facilities and Equipment

The ARFF building is located between Runways 7L-25R and 7R-25L, west of Runway 16-34. This facility, which was recently renovated, can house up to eight vehicles in four separate bays. The facility is equipped with on-site refueling for ARFF equipment and an emergency generator. Living and sleeping quarters adequately accommodate the three Fire Lieutenants and nine Firefighters currently stationed at the Airport. The central location of the ARFF building allows for quick and easy access to all areas of the Airport. The midpoint of the air carrier runways, 7L-25R and 16-34, can be reached by all ARFF vehicles within the FAA required time of four minutes from this facility.

The Airport has a mutual aid agreement with the Daytona Beach Fire Department and Emergency Medical Services for first response emergencies. All surrounding municipalities and the Volusia County Fire Services Department provide additional mutual aid services.

Federal Aviation Regulation Part 139 requires different levels of rescue service depending on the length of aircraft serving the Airport. Indexes lettered A through E are assigned based on the length of the longest aircraft that serves that airport. Daytona Beach International Airport has Index C ARFF services. Index C is required for airports served by 5 or more daily operations of aircraft measuring 126 feet long up to, but not including, 159 feet long.



DAYTONA BEACH INTERNATIONAL AIRPORT MASTER PLAN UPDATE

DAYTONA BEACH INTERNATIONAL AIRPORT

TYPICAL PART 77 SURFACES

HNTB

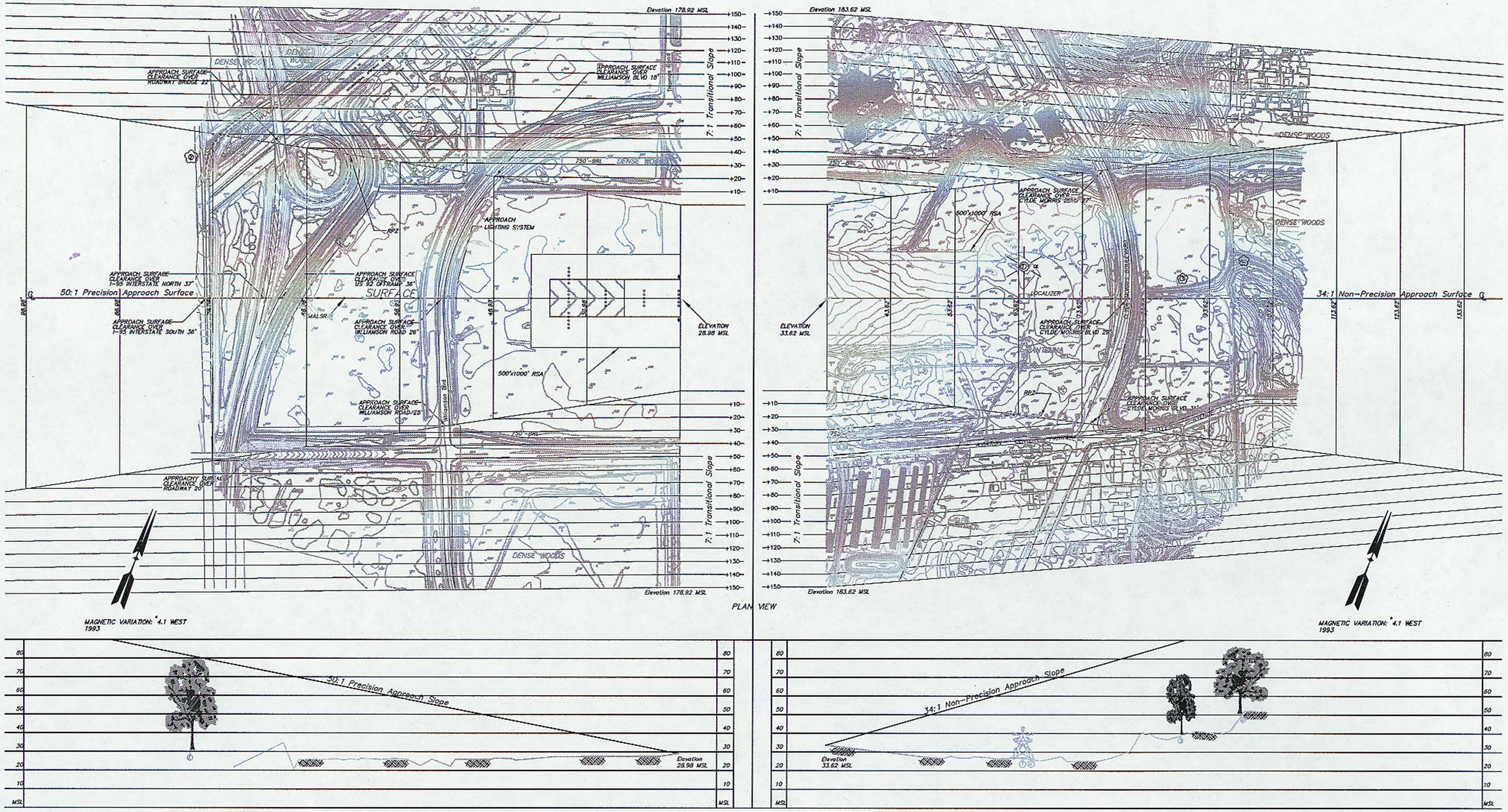
FIGURE 2-5

Table 2.2
DAYTONA BEACH INTERNATIONAL AIRPORT

Runway Approaches and Protection Zones

Runway End	Approach	Slope	RPZ Dimension
7L	Precision Instrument	50 to 1	1,000 feet inside 1,750 feet outside 2,500 foot length
25R	Non-precision Instrument	34 to 1	1,000 feet inside 1,425 feet outside 1,700 feet length
7R	Visual	20 to 1	250 feet inside 450 feet outside 1,000 length
25L	Visual	20 to 1	250 foot inside 450 feet outside 1,000 foot length
16	Non-precision Instrument	34 to 1	500 feet inside 1,010 feet outside 1,700 foot length
34	Visual	20 to 1	500 feet inside 700 feet outside 1,000 foot length

Source: Daytona Beach International Airport, Airport Layout Plan, November 2000



LEGEND

OL ON LOC	
TREE	
ANT ON BLDG	

Obstructions Runway 07L

No.	Description	Elev.	Obstruction			Remarks
			Approach Slope	Trans. Slope		
1	TREE	80	✓			

Obstructions Runway 25R

No.	Description	Elev.	Obstruction			Remarks
			Approach Slope	Trans. Slope		
1	OL ON LOC	36	✓			
2	ANT ON BLDG	44	✓			
3	TREE	71	✓			
4	TREE	85	✓			

0' 600' 1,200'

Scale in Feet

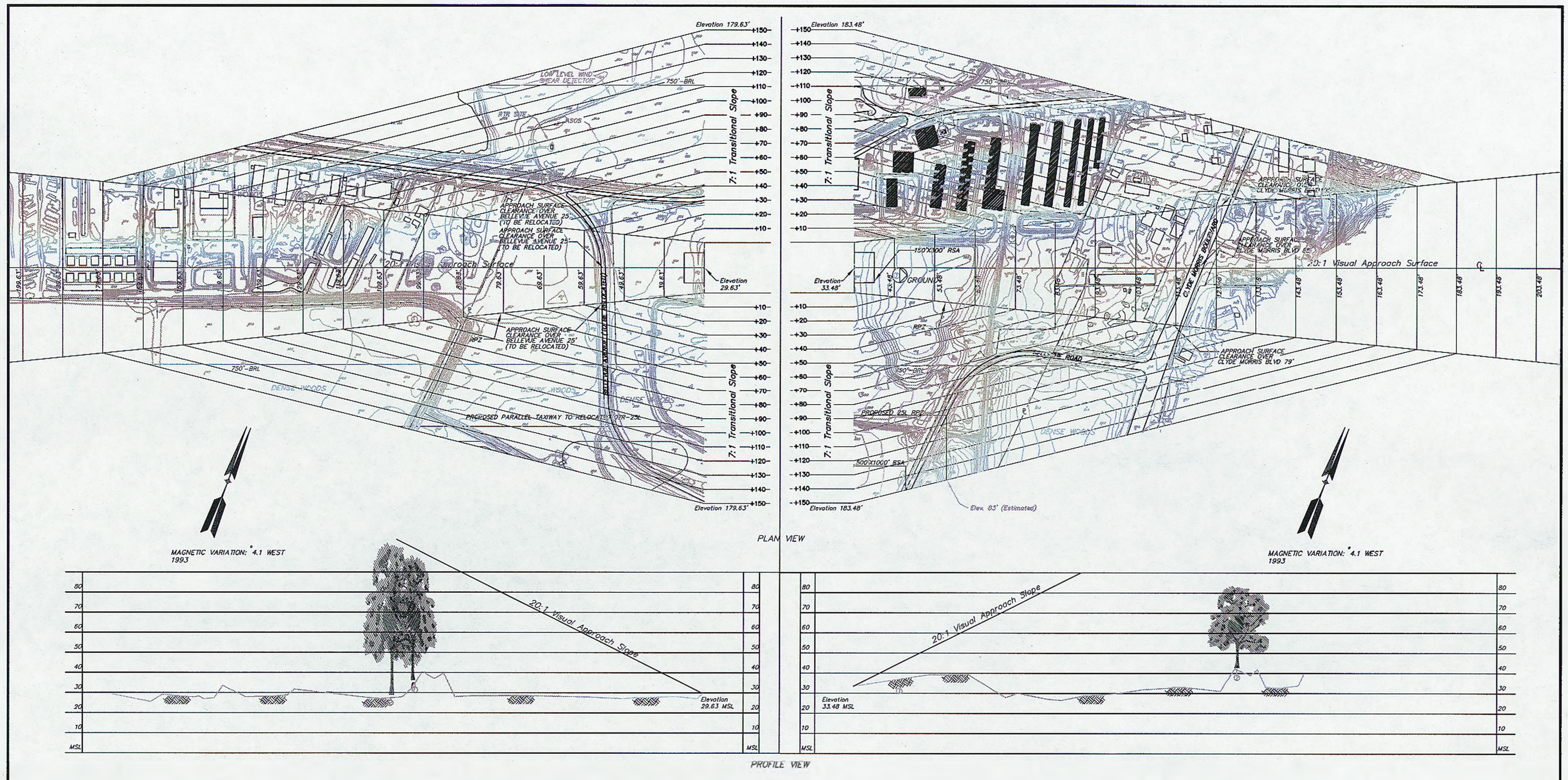
DAYTONA BEACH INTERNATIONAL AIRPORT MASTER PLAN UPDATE

DAYTONA BEACH INTERNATIONAL AIRPORT

RUNWAY PROTECTION ZONE
07L - 25R (Obstructions Noted)

HNTB

FIGURE 2-6



LEGEND

GROUND	
TREE	

Note: All elevations given in height Above Mean Sea Level (MSL)

Obstructions Runway 07R

No.	Description	Elev.	Obstruction		Remarks
			Approach Slope	Trans. Slope	
1	TREE	96	√		
2	TREE	103	√		

Obstructions Runway 25L

No.	Description	Elev.	Obstruction		Remarks
			Approach Slope	Trans. Slope	
1	GROUND	38	√		
2	TREE	82	√		

0' 500' 1,000'

Scale in Feet

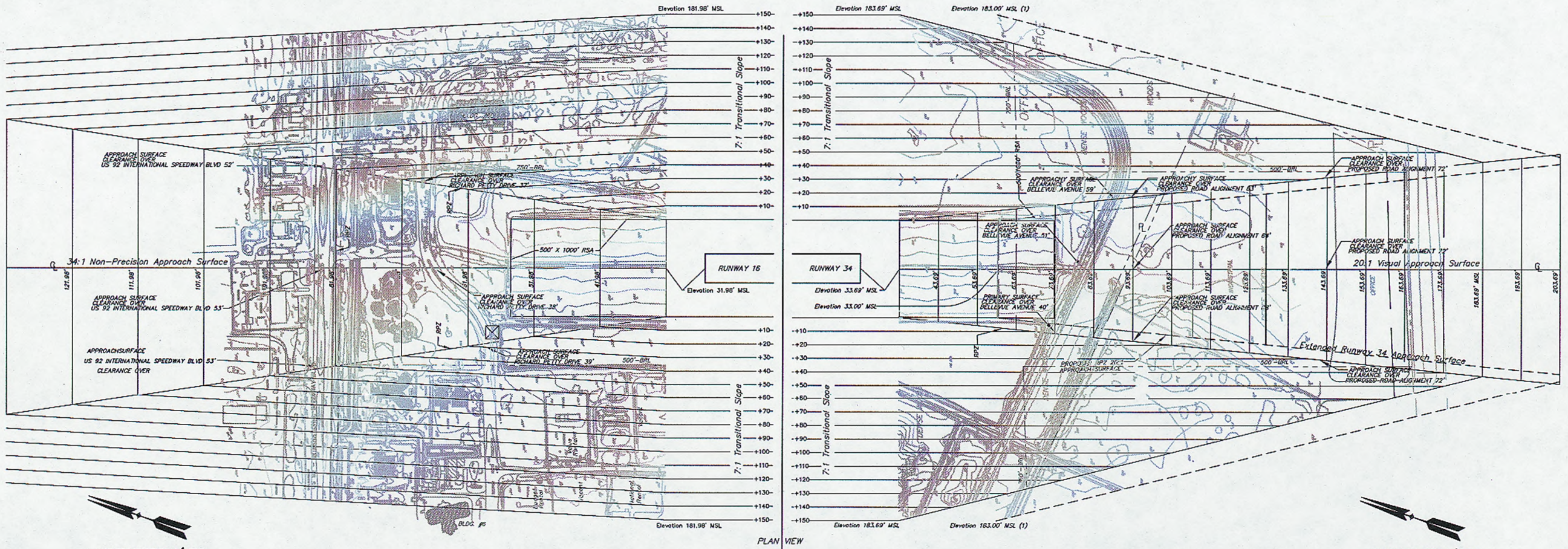
DAYTONA BEACH INTERNATIONAL AIRPORT MASTER PLAN UPDATE

DAYTONA BEACH INTERNATIONAL AIRPORT

RUNWAY PROTECTION ZONE
07R - 25L (Obstructions Noted)

HNTB

FIGURE 2-7



Obstructions Runway 16					
No.	Description	Elev.	Penetration Approach Slope	Penetration Trans. Slope	Remarks
1	TREE	73	/		TO BE TRIMMED

Obstructions Runway 34					
No.	Description	Elev	Penetration Approach Slope	Penetration Trans. Slope	Remarks
1	TREE	96	/		TO BE TRIMMED

LEGEND

GROUND

TREE

SIGN

SIGN

Note: All elevations given in height Above Mean Sea Level (MSL)

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CONSULTING ENGINEERS AND PLANNERS
6671 GATEWAY BLVD. SUITE 100
SARASOTA, FLORIDA 34233
PHONE: 941 342-8321
FAX NO.: 941 379-8474

0' 600' 1,200'

Scale in Feet

DAYTONA BEACH INTERNATIONAL AIRPORT MASTER PLAN UPDATE

DAYTONA BEACH INTERNATIONAL AIRPORT

RUNWAY PROTECTION ZONE
16-34 (Obstructions Noted)

HNTB

FIGURE 2-8

Table 2.3
DAYTONA BEACH INTERNATIONAL AIRPORT

Declared Distances

Declared Distance Measurement	7L	25R
Take-Off Run Available (TORA)	10,500	9,800
Take-Off Distance Available (TODA)	10,500	10,500
Accelerate-Stop Distance Available (ASDA)	10,500	10,300
Landing Distance Available (LDA)	9,800	10,300

Source: Daytona Beach International Airport Management

The Airport currently has four ARFF vehicles, three crash trucks and one rapid intervention vehicle. **Table 2.4** shows the ARFF equipment.

2.2.6 Airport and Airfield Maintenance

There are fifteen full-time maintenance positions at the Airport. These employees provide airport and airfield maintenance services. The maintenance facility is located approximately 700 feet west of the approach end to Runway 16. The facility provides the necessary storage and workspace needed for the repair of airport equipment. This facility can be reached from both the public and secured areas of the Airport. The building measures 7,500 square feet. This facility is in good condition.

There is an additional maintenance facility located in the southwest corner of the domestic terminal building. This area consists of 870 square feet of office and storage space.

2.2.7 Air Cargo Facilities

The airport-owned air cargo facility is located adjacent to the approach end of Runway 16. The 3,104 square-foot facility is attached to the north end of the Airport maintenance building. Delta Air Cargo leases this bonded freight facility for storing and preparing airfreight.

Trans Florida Airlines, located at the Airport, operates non-scheduled Convair 240 cargo service. The airline utilizes a 32,514 square-yard apron located between Runways 7L-25R and 7R-25L. Trans Florida Airlines also has a 200-foot by 50-foot hangar at this location which is in poor condition.

2.2.8 Airport Flight Kitchen

The airport-owned 13,568 square-foot flight kitchen is attached to the west side of the International Passenger Terminal. This facility provides all catering needs for domestic and international air carrier operations. This facility is in excellent condition.

2.2.9 General Aviation Facilities

Most aviation activity at Daytona Beach International Airport consists of general aviation operations. The following sections discuss the many facilities directly relating to general aviation activity at the Airport.

Fixed Base Operators (FBOs)

Fixed Base Operators provide fuel, aircraft tie-downs, aircraft maintenance, hangar space, and pilot information and products. The Airport has two FBOs, Daytona Beach Jet Center and Yelvington Jet Aviation.

The Daytona Beach Jet Center is a full-service FBO. The facility is located on Coral Sea Avenue, north of the International Passenger Terminal, along Taxiway W.

Yelvington Jet Aviation, located between Runways 7L- 25R and 7R-25L, is also considered a full-service FBO.

Future FBO service is expected from PhilAir and Executive Flightline.

The PhilAir General Aviation Plaza will be located on the southeast apron. The aircraft parking apron and automobile parking lot for this facility have been completed. The FBO terminal facilities will be constructed by the summer of 2001.

Table 2.4
DAYTONA BEACH INTERNATIONAL AIRPORT

ARFF Equipment

Quantity	Equipment Type	Model	Year	Capabilities
1	Crash Truck (HPR High Performance)	E-1	1997	1,500 Gal. H_20 195 Gal. AFFF 500 lbs. PK
1	Crash Truck (HPR High Performance)	U-2	1994	1,500 Gal. H_2O 200 Gal. AFFF
1	Crash Truck	U-3	1994	1,500 Gal. H_2O 200 Gal. AFFF
1	Rapid Intervention Vehicle	U-1	1991	1,000 Gal. H_2O 150 Gal. AFFF 500 lbs. PK

H_2O: Water
AFFF: Aqueous Film Forming Foam
PK: "Purple K" Potassium-Base Chemical

Source: Daytona Beach International Airport Management

Executive Flightline has signed a lease, effective January 2001, for a full-service FBO operation. This FBO will be located on the midfield apron. Products and services expected to be offered by this new FBO include fuel service, flight training, aircraft rentals, FAA-computer testing, pilot supplies, aircraft charters, rental and courtesy cars, and aircraft tie-down and hangar parking.

Dedicated Aircraft Maintenance Facilities

Embry-Riddle Aeronautical University conducts aircraft maintenance within their 100-foot by 120-foot maintenance hangar on the Embry-Riddle apron. The hangar is in excellent condition and is for Embry-Riddle Aeronautical University use only. A new aircraft maintenance facility has been outlined in Embry-Riddle's Master Plan. This facility will replace the existing maintenance hangar. Specific dimensions have not yet been determined for this facility.

On-airport tenants such as the Daytona Beach Jet Center, Cloud Dancer Aviation, Phil Air Flight Center, and Wrightway Aviation also perform aircraft maintenance. However, these tenants do not have facilities that are exclusively used for maintenance.

Aircraft Parking

The Daytona Beach Jet Center has a 49,978 square-yard apron with 82 general aviation/corporate aircraft parking positions. These positions are equipped with tie-downs.

NASCAR utilizes an 18,956 square yard apron located between their two hangars and in front of the Volusia County Sheriff's Department hangar.

Embry-Riddle Aeronautical University's aircraft parking apron is located directly in front of the University, east of Runway 16-34 and north of Runway 7L-25R. This 28,267 square-yard parking area is equipped with 93 tie-down parking positions and is used exclusively by the University. This area and the land for the new dormitories, located north of the campus, is leased from the Airport.

Yelvington Jet Aviation provides 13,444 square yards of apron for aircraft parking. There are no tie-down positions on this apron due to the lack of smaller general aviation aircraft in this area of the Airport.

Future development of aircraft parking includes the southeast apron, located east of Runway 16-34 and south of Runway 7R-25L. A 35,511 square-yard apron has been constructed for this area. The apron is expected to have 166 aircraft parking positions for PhilAir's General Aviation Plaza.

The midfield apron is located south of Runway 7L-25R and north of Runway 7R-25L, adjacent to Taxiway E. The area has a 32,514 square-yard apron. The apron has 84 aircraft parking positions equipped with tie-downs. This area will be used by Executive Flightline.

Details regarding the general aviation parking areas are depicted in **Table 2.5.**

Hangars

- Hangars are utilized for aircraft storage, maintenance, and office space. The Daytona Beach Jet Center has three hangars: one 125-foot by 250-foot hangar in fair condition; one 100-foot by 100-foot hangar in fair condition;

Table 2.5
DAYTONA BEACH INTERNATIONAL AIRPORT

Aircraft Parking

Location	Apron Size (Square Yards)	Tie-Down Positions
Existing		
Yelvington Jet Aviation	13,444	0
Embry-Riddle Aeronautical University	28,267	93
Daytona Beach Jet Center	49,978	82
NASCAR	18,956	N/A
Future Development		
Executive Flightline	32,514	84
PhilAir General Aviation Plaza	35,511	166
Total	**178,670**	**425**

Source: Daytona Beach International Airport Management

and one 100-foot by 100-foot hangar in excellent condition.

Yelvington Jet Aviation has one hangar measuring 100 feet by 140 feet that is in excellent condition. Yelvington has proposed the construction of a second hangar that would measure 100 feet by 180 feet.

Aerojet Management Corporation has one 100-foot by 120-foot hangar adjacent to the Yelvington facilities. This facility is in excellent condition.

NASCAR, located north of the Jet Center, operates two corporate hangars. One hangar measures 150 feet by 100 feet and houses aircraft as well as company offices. This hangar is in good condition. The second hangar is 100 feet by 100 feet and is in excellent condition.

Commonwealth Aviation has 19 T-hangars, all of which can accommodate light twin engine aircraft. These hangars are in good condition. Commonwealth also has three 100-foot by 100-foot hangars that are in good condition.

The Volusia County Sheriff's Department has one 100-foot by 100-foot hangar with offices located next to the NASCAR hangar along taxiway W. This hangar is in good condition.

The Airport owns one 50-foot by 150-foot hangar containing five T-hangars. The facility is in fair condition.

Proposed future development of hangars at the Airport includes:

- PhilAir – one 200-foot by 80-foot hangar
- PhilAir – twenty-four nested T-hangars
- PhilAir – ten 40-foot by 40-foot
- Executive Flightline – unknown
- Phoenix East Aviation – three 100-foot by 100-foot hangars

Table 2.6 summarizes all available information on the airport hangar facilities.

Fuel Storage

The Daytona Beach Jet Center fuels the majority of the general aviation, transient, and corporate traffic, as well as and all commercial aircraft. Embry-Riddle Aeronautical University and Phoenix East Aviation obtain their aviation fuel from this facility. The facility offers 100LL, Jet A, and auto fuel from six tanks, with a total capacity of 40,000 gallons of 100LL and 120,000 gallons of Jet A. This facility offers Bonded Jet Fuel and is an authorized Department of Defense fueling facility.

Yelvington Jet Aviation offers both full-service and self-service 100LL fuel, as well as full-service Jet A fuel. The facility has a total capacity of 13,000 gallons of 100LL and 24,000 gallons of Jet A.

Both the Volusia County Sheriff's Department and NASCAR own private Jet-A storage facilities. Current and proposed airport fuel storage capacities are shown in **Table 2.7**.

2.3 LANDSIDE FACILITIES

2.3.1 Domestic Passenger Terminal

The Domestic Passenger Terminal building is located north of Runway 7L-25R, west of Runway 16-34. The 175,000-square foot facility was completed in 1992 and is in excellent condition. The three-level building is illustrated in **Figure 2-9**.

Table 2.6
DAYTONA BEACH INTERNATIONAL AIRPORT

Hangar Facilities

Type of Hangar Owner	Size or Number	Condition
Hangars		
Daytona Beach Jet Center	125 ft. X 250 ft.	Good
Daytona Beach Jet Center	100 ft. X 100 ft.	Good
Daytona Beach Jet Center	100 ft. X 100 ft.	Excellent
Yelvington Jet Aviation	100 ft. X 140 ft.	Excellent
Aerojet Management Corporation	100 ft. X 140 ft.	Excellent
NASCAR	150 ft. X 100 ft.	Good
NASCAR	100 ft. X 100 ft.	Excellent
Embry-Riddle Aeronautical University	100 ft. X 120 ft.	Excellent
Commonwealth Aviation	100 ft. X 100 ft.	Good
Commonwealth Aviation	100 ft. X 100 ft.	Good
Commonwealth Aviation	100 ft. X 100 ft.	Good
Volusia County Sheriff's Department	100 ft. X 100 ft.	Good
T-Hangar Units		
Commonwealth Aviation	19 Units	Good
Daytona Beach International Airport	5 Units	Fair
Proposed Development		
Yelvington Jet Aviation	100 ft. X 180 ft.	
Executive Flightline	unknown	
PhilAir General Aviation Plaza	200 ft. X 80 ft.	
PhilAir General Aviation Plaza	(10) 40 ft. X 40 ft.	
PhilAir General Aviation Plaza	24 T-hangar Units	
Phoenix East Aviation	(3) 100 ft. X 100 ft.	

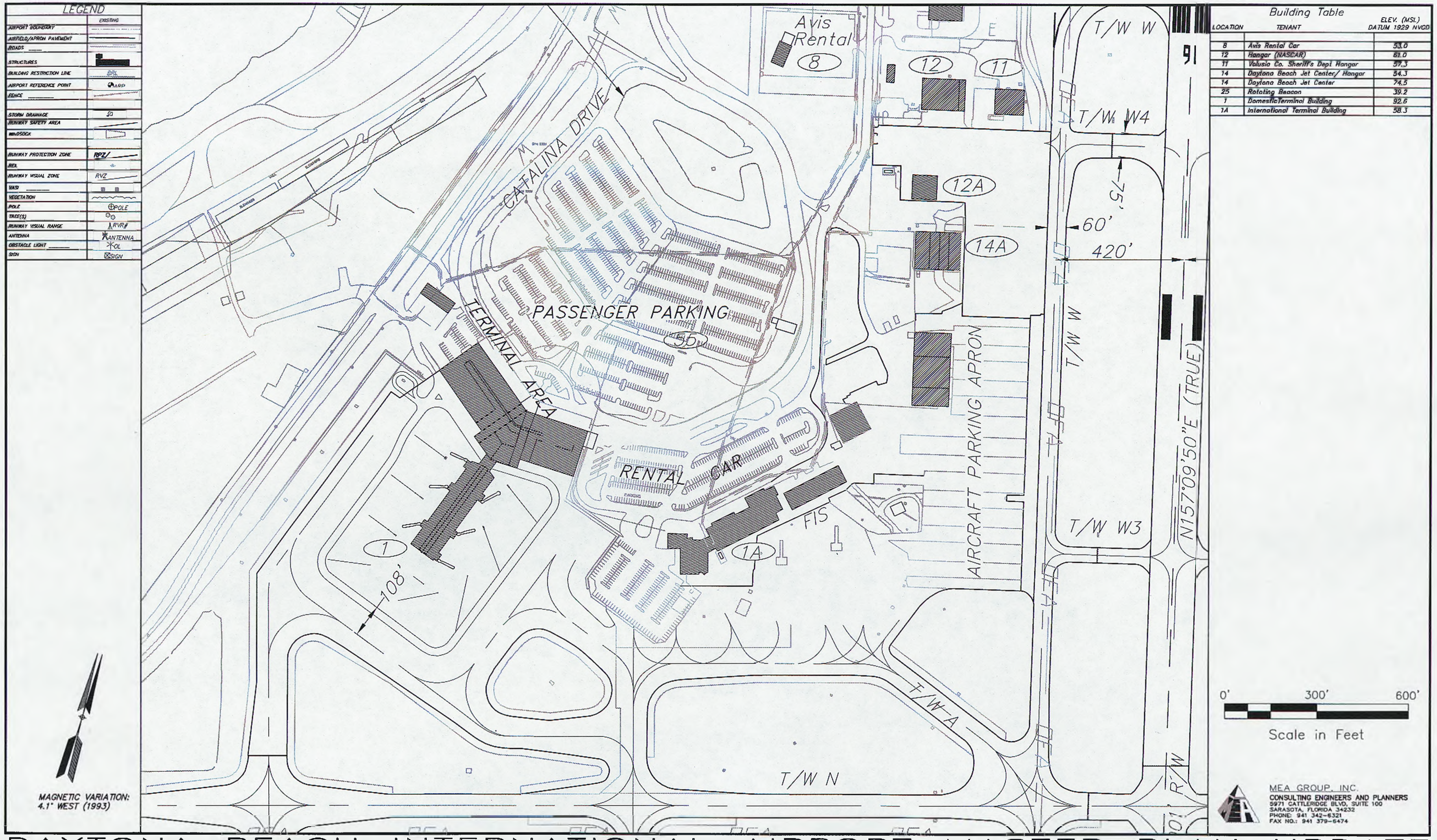
Source: Daytona Beach International Airport Management/HNTB

Table 2.7
DAYTONA BEACH INTERNATIONAL AIRPORT

Fuel Storage Capabilities

Location	100LL Capacity (Gallons)	Jet A Capacity (Gallons)
Existing		
Jet Center	40,000	120,000
NASCAR	N/A	15,000
Volusia County Sheriff's Department	N/A	12,000
Yelvington Jet Aviation	13,000	24,000
Proposed		
Executive Flightline	12,000	12,000
PhilAir General Aviation Plaza	12,000	12,000
Total (Existing and Proposed)	**77,000**	**195,000**

Source: Daytona Beach International Airport Management



Building Table

LOCATION	TENANT	ELEV. (MSL) DATUM 1929 NVGD
8	Avis Rental Car	53.0
12	Hangar (NASCAR)	61.0
11	Volusia Co. Sheriff's Dept Hangar	57.3
14	Daytona Beach Jet Center/ Hangar	54.3
14	Daytona Beach Jet Center	74.5
25	Rotating Beacon	39.2
1	Domestic Terminal Building	92.6
1A	International Terminal Building	58.3

DAYTONA BEACH INTERNATIONAL AIRPORT MASTER PLAN UPDATE

DAYTONA BEACH INTERNATIONAL AIRPORT

TERMINAL AREA PLAN

HNTB

FIGURE 2-9

Table 2.8 details the space usage of the Domestic Passenger Terminal.

The Domestic Passenger Terminal apron totals 88,111 square yards and offers six aircraft parking positions reserved for large commercial aircraft.

Level one houses the airline ticketing counters, baggage claim area, baggage service offices, and car rental service desks. The two baggage belts can accommodate one wide body aircraft each. Also on level one is the airport information desk and the elevator, escalator, and stairways leading up to level two. Airline operations, airport operations, and the police offices are also located on level one, under the terminal concourse.

Level two has six gates with jet bridges capable of handling narrow-bodied or regional jet aircraft. Four of these jet bridges can also accommodate wide-bodied aircraft. Also on Level 2 is the airport restaurant, two gift/merchandise shops, two bars, a snack shop, and cafe.

Level three houses airport administration offices. The elevator or stairwell from the first or second level accesses this area.

2.3.2 International Passenger Terminal

The International Passenger Terminal building, adjacent to the Domestic Passenger Terminal building, measures 60,000 square feet, and includes the Federal Inspection Service (FIS) facilities, international in-transit hold rooms, and departure areas. Passenger screening is conducted through the use of magnetometers and a baggage x-ray machine.

The International Passenger Terminal apron measures 43,444 square yards and can accommodate one large wide-body aircraft.

The International Passenger Terminal has one passenger departure holdroom and one in-transit holdroom. Each of the passenger holding areas is served by a jet bridge capable of accommodating wide-body aircraft.

Complete office and administrative facilities are provided for U.S. Customs, the U.S. Department of Immigration and Naturalization, and the Department of Agriculture.

The Federal Inspection Station, located in the International Passenger Terminal building, is staffed fulltime. This area has ten Immigrations booths, three Customs counters, holding rooms, and the baggage claim area. This facility was designed to process 450 passengers per hour. Activity in this area is monitored through the use of several security cameras.

2.3.3 Airport and Airline Security

Federal Aviation Regulation Part 107 requires the Airport to control access to the Air Operations Area (AOA), or the area of the Airport designed and used for the taxiing, take-off, or landing of aircraft. The Daytona Beach International Airport controls AOA access through a new computerized access control system. Additionally, airport security is maintained through a staff of sworn law enforcement officers. The security staff is responsible for enforcing all elements of FAA Part 107.

Table 2.8
DAYTONA BEACH INTERNATIONAL AIRPORT

Domestic Terminal Usage

Classification	Square Feet
Airline Space	67,000
Public Space	48,000
Concessions	16,000
Mechanical/Support	32,500
Other	11,500
Total	**175,000**

Source: Daytona Beach International Airport Master Plan Update, December 1995

Airline security is regulated through Federal Aviation Regulation Part 108. Airlines are required to protect persons and possessions aboard passenger aircraft. At Daytona Beach International Airport, Delta Air Lines manages the task of passenger screening. The airline has contracted with Globe Security to operate two magnetometers, two x-ray machines, trace detection equipment, and one hand wand metal detector to screen departing passengers. The equipment is regularly checked for accuracy and is frequently updated with new technologies.

2.4 AUTOMOBILE ACCESS AND PARKING

2.4.1 Access Roads

Major highway access to Daytona Beach International Airport is offered through Interstate 95 (north-south) as well as Interstate 4 (east-west). Williamson Boulevard, Highway 92 (International Speedway Boulevard), State Road 483 (Clyde Morris Boulevard), and State Road 400 (Beville Road,) are local roadways in the vicinity of the Airport. Bellevue Avenue Extension, Midway Avenue, Richard Petty Boulevard, and Aviation Center Parkway offer local access to airport property. Terminal access is provided through Catalina Drive. **Figure 2-10** illustrates the local roadway network in relation to airport property.

2.4.2 Parking Areas

Parking areas on the Airport include short and long-term parking, employee parking, rental car parking, and bus/taxi parking. **Table 2.9** depicts the airport parking areas and their capacities.

2.5 AIRSPACE AND AIR TRAFFIC CONTROL

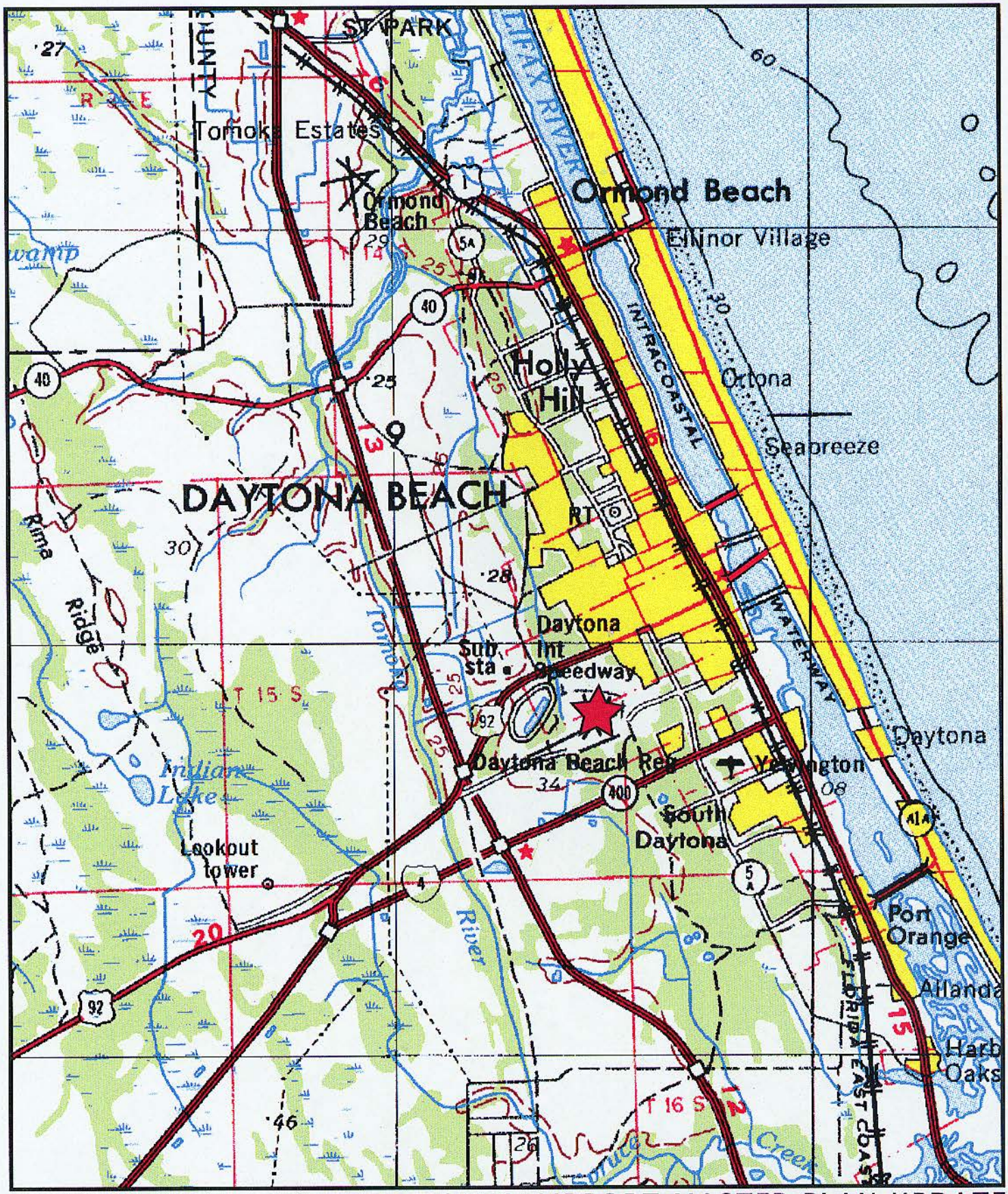
The airspace system at Daytona Beach International Airport is controlled and operated by the Federal Aviation Administration (FAA). This administration was established in 1958 through the Federal Aviation Act. The FAA established the National Airspace System (NAS) which protects people and property on the ground and establishes a safe airspace environment for civil, commercial, and military aviation. The NAS is the common network of airspace, airports, navigation aids, and air traffic control equipment across the United States.

2.5.1 Regional Airspace

The airspace structure in the United States has been broken down into six different classes, A, B, C, D, E, and G. Class C airspace surrounds Daytona Beach International Airport.

There are two layers of Class C airspace centered around the Airport. The inner core area is five nautical miles in diameter and extends from airport elevation (34 feet MSL) to 4,000 feet AGL (Above Ground Level). The outer area has a diameter of 10 nautical miles and extends from 1,200 feet AGL to 4,000 feet AGL.

An Air Traffic Control Tower (ATCT) and a Terminal Radar Approach Control (TRACON) facility are located at Daytona Beach International Airport. Aircraft in the Airport's Class C airspace and on the ground at the Airport are controlled from the ATCT. The ATCT operates as an ATC-10 facility and handled 320,000 operations in 2000. **Figures 2-11**, **2-12**, and **2-13**



DAYTONA BEACH INTERNATIONAL AIRPORT MASTER PLAN UPDATE

DAYTONA BEACH INTERNATIONAL AIRPORT

LOCAL ROADWAY NETWORK

HNTB

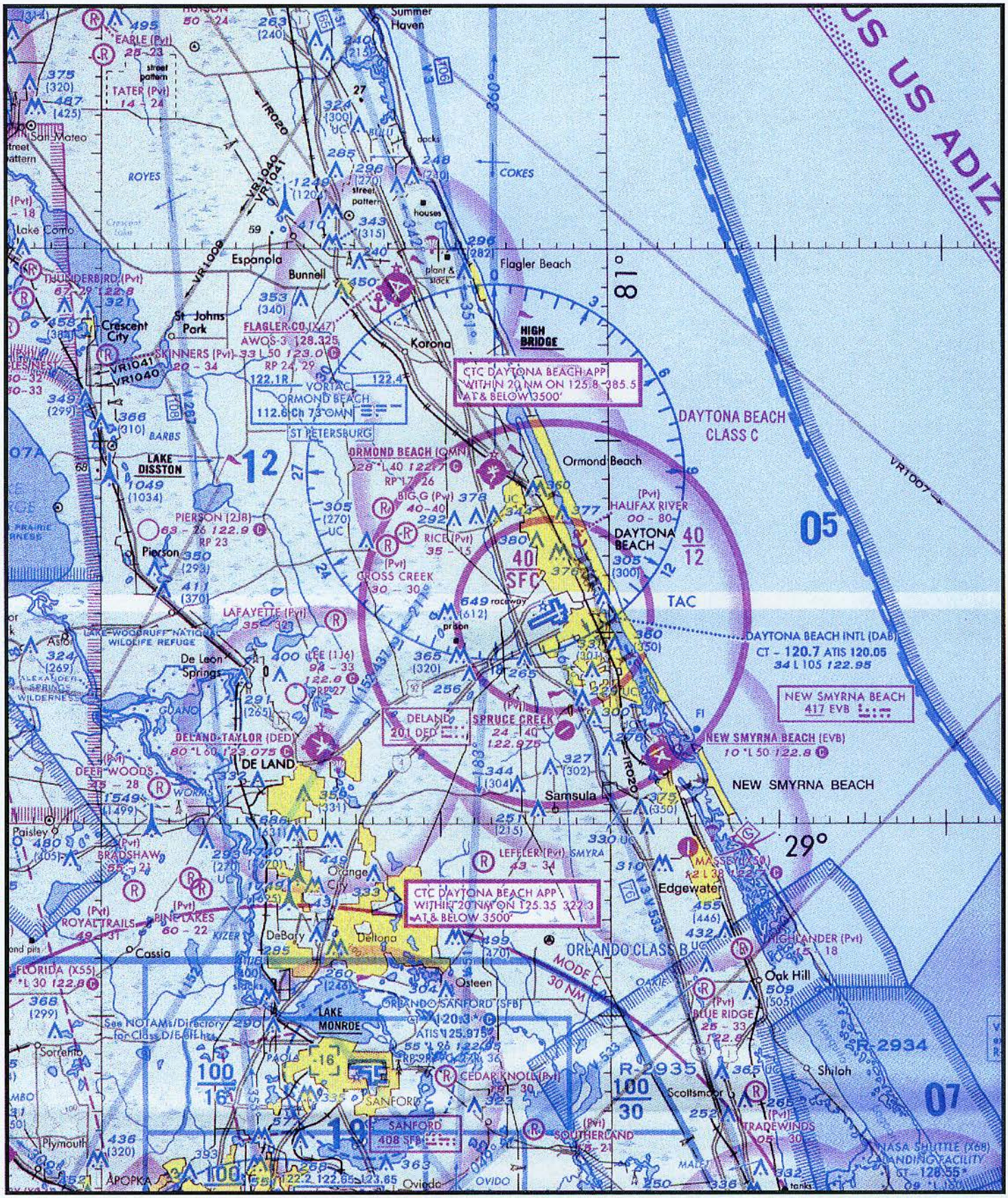
FIGURE 2-10

Table 2.9
DAYTONA BEACH INTERNATIONAL AIRPORT

Auto Parking Facilities

Location	Number of Spaces
Long-Term Spaces	
General	624
Handicapped-Accessible	24
Total Long-Term	648
Short-Term Spaces	
General	353
Handicapped-Accessible	12
Total Short-Term	365
Rental Car Spaces	277
Employee Spaces East lot	
General	132
Handicapped-Accessible	5
Total Employee	137
Employee Spaces West lot	
General	24
Handicapped-Accessible	1
Total Airport Staff	25
Service Building Spaces	
General	12
Ground Transportation Spaces	9
Bus Spaces	4
General Aviation	295
Total	1,772

Source: Daytona Beach International Airport Management



DAYTONA BEACH INTERNATIONAL AIRPORT MASTER PLAN UPDATE

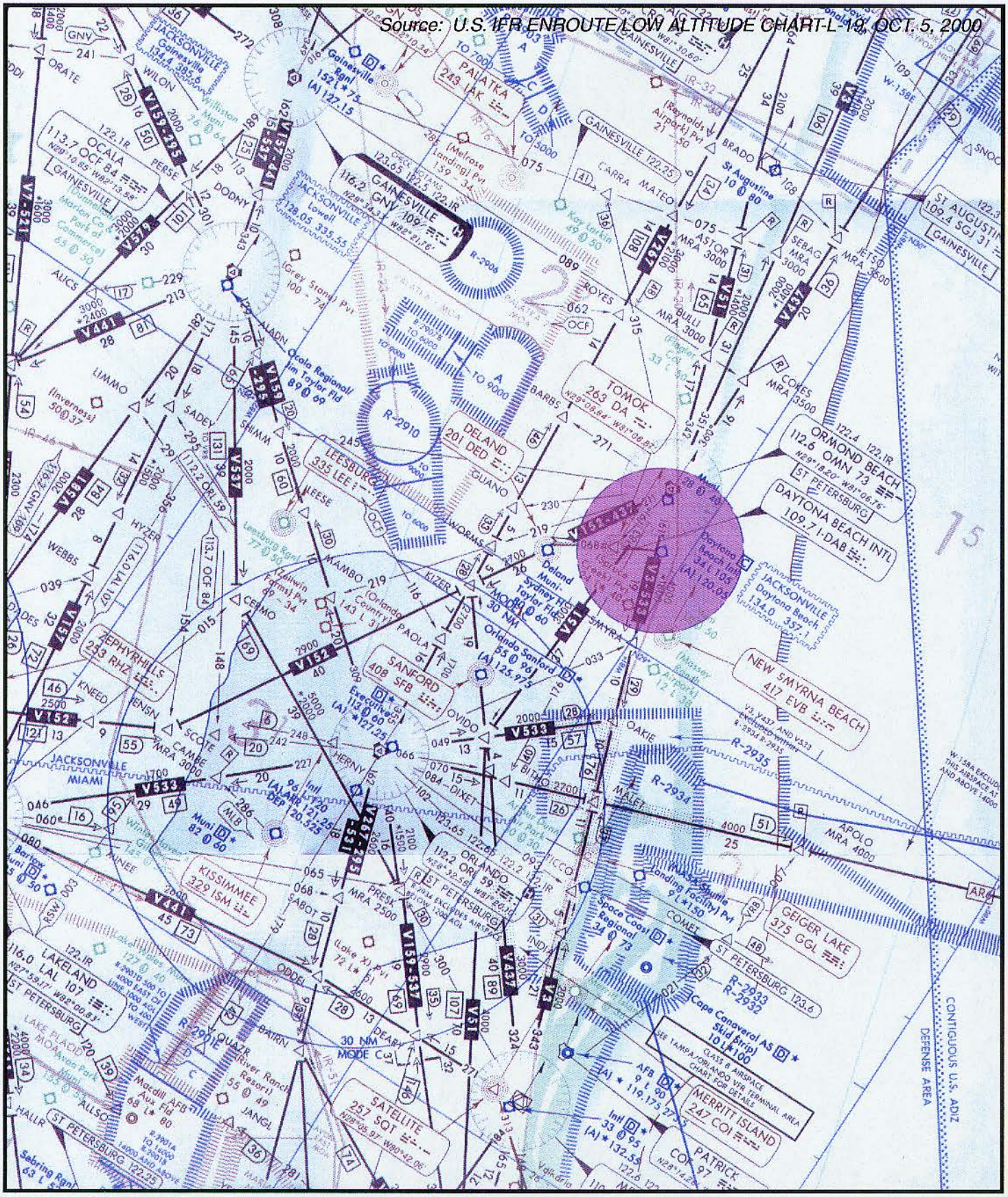
DAYTONA BEACH INTERNATIONAL AIRPORT

VFR AIRSPACE STRUCTURE

HNTB

FIGURE 2-11

Source: Jacksonville Sectional Aeronautical Chart, Sept. 07, 2000



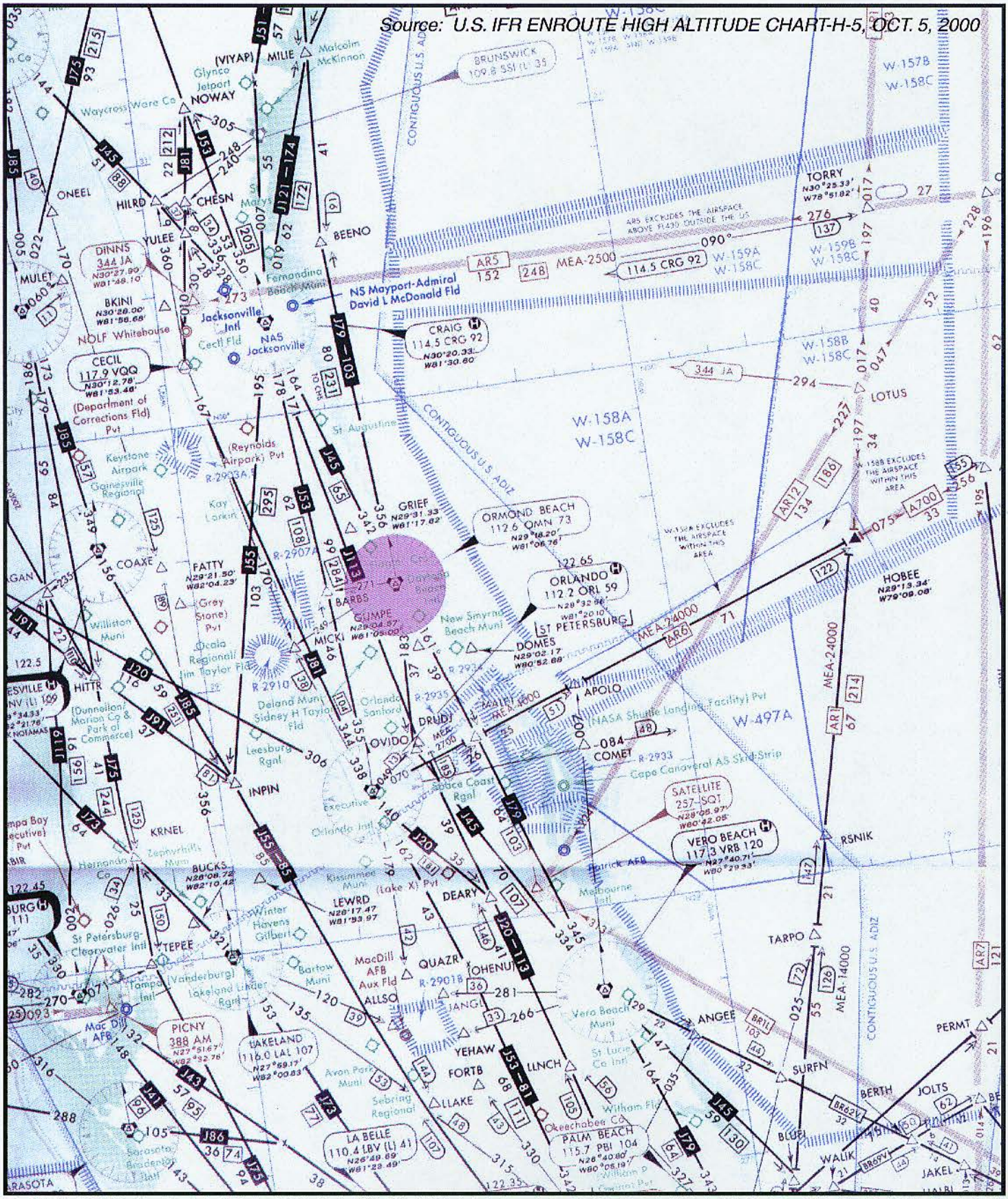
DAYTONA BEACH INTERNATIONAL AIRPORT MASTER PLAN UPDATE

DAYTONA BEACH INTERNATIONAL AIRPORT

LOW ALTITUDE AIRSPACE

HNTB

FIGURE 2-12



DAYTONA BEACH INTERNATIONAL AIRPORT MASTER PLAN UPDATE

DAYTONA BEACH INTERNATIONAL AIRPORT

HIGH ALTITUDE AIRSPACE

HNTB

FIGURE 2-13

illustrate the airspace in the vicinity of Daytona Beach.

The TRACON maintains radar traffic control over all aircraft within Class C airspace not under direct control of the ATCT. TRACON controllers maintain efficient airspace use and provide separation between aircraft in the Daytona Beach airspace. Controllers at the TRACON also handle IFR (Instrument Flight Rules) arrivals and departures for other airports within the terminal area, such as Deland, New Smyrna, Ormond Beach, Flagler/Bunnell County, Spruce Creek, and Massey Ranch. Instrument Approach Procedures for the Daytona Beach International Airport are depicted in **Figures 2-14 through 2-17**.

In 1999, the airspace around Patrick Air Force Base was incorporated into Daytona's TRACON area of control. This area is located roughly 70 miles south of Daytona and doubled the geographic responsibility of Daytona's TRACON. This acquisition added 400 operations each day to Daytona's TRACON traffic count. **Figure 2-18** illustrates the Daytona Beach TRACON area of control.

2.5.2 Air Route Traffic Control Centers (ARTCCs)

The FAA operates 21 Air Route Traffic Control Centers (ARTCCs) in the United States. These centers separate aircraft traveling between or around airports. The area surrounding Daytona Beach International Airport is controlled by the Jacksonville Center.

The Jacksonville Center controls the airspace of northern Florida, the southeast portion of Georgia, the southeast half of South Carolina, and small adjacent portions of both North Carolina and Alabama.

A letter of agreement is on file between Jacksonville Center and the Daytona Beach TRACON to coordinate transfer separation from the Center to the TRACON. The agreement also details the boundaries of each facility's area of responsibility and the procedures that should be used when an aircraft crosses from one facility's airspace to another.

2.5.3 Air Traffic Control Tower Facility

The Air Traffic Control Tower (ATCT) is located between Runways 7L-25R and 7R-25L and west of Runway 16-34. The Airport's TRACON facility is located at the base of the ATCT.

The ATCT and TRACON facility was constructed in 1986 and originally designed for a staff of 40 employees. There are currently 89 air traffic controllers working here. There are 14 Airways Facilities employees that work in this location also. However, these 14 employees will soon move to the new FAA Airways Facilities Building located on the east side of Runway 16-34 and south of Runway 7L-25R.

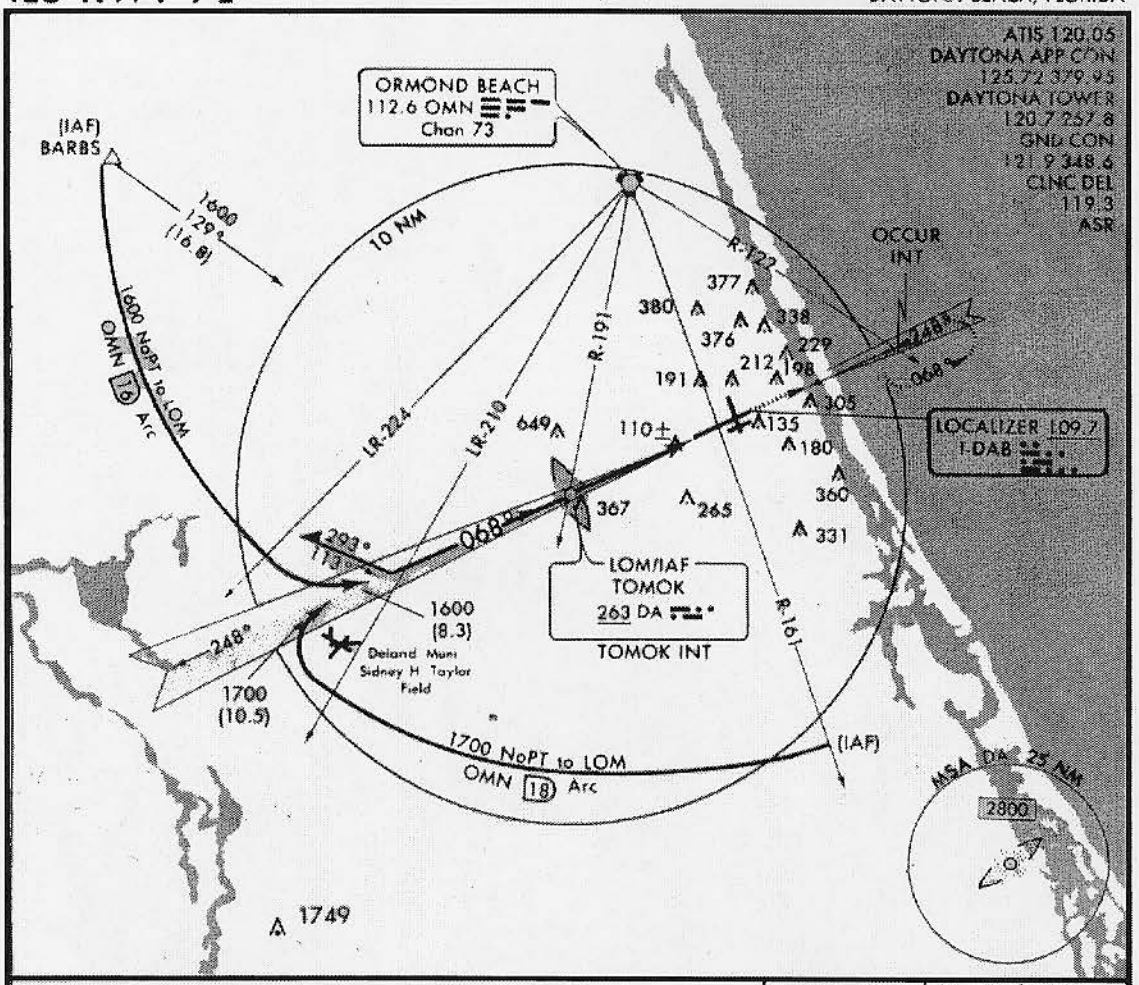
The visibility from the ATCT is mostly unimpaired. All areas of the runways and taxiways can be seen from the tower, as well as all approach and departure paths. However, the ATCT will have an obstructed view of the north end of Taxiway W once it is extended. This extension will be declared a non-movement area. Aircraft operating in this area will be expected to see and avoid obstacles.

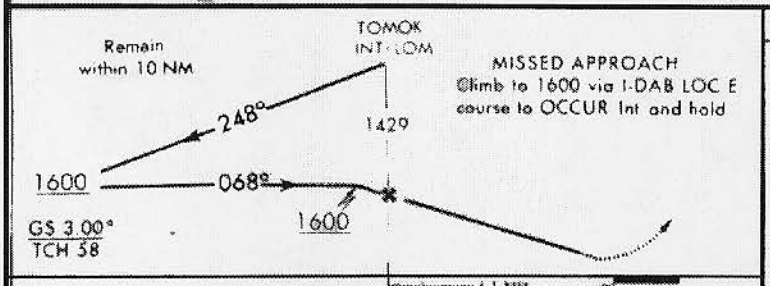
Amdt 28 00167

ILS RWY 7L

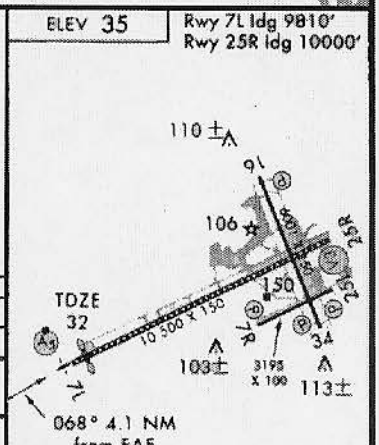
AL-110 (FAA)

DAYTONA BEACH INTL (DAB)
DAYTONA BEACH, FLORIDA





CATEGORY	A	B	C	D
S-ILS 7L	232/24 200 (200-½)			
S-LOC 7L	420/24 388 (400-½)			420/40 388 (400-¾)
CIRCLING	520-1 485 (500-1)		520-1½ 485 (500-1½)	620-2 585 (600-2)



FAF to MAP 4.1 NM					
Knots	60	90	120	150	180
Min:Sec	4:06	2:44	2:03	1:38	1:22

Source: U.S. Terminal Procedures, Nov. 30, 2000

SE-3, 5 OCT 2000

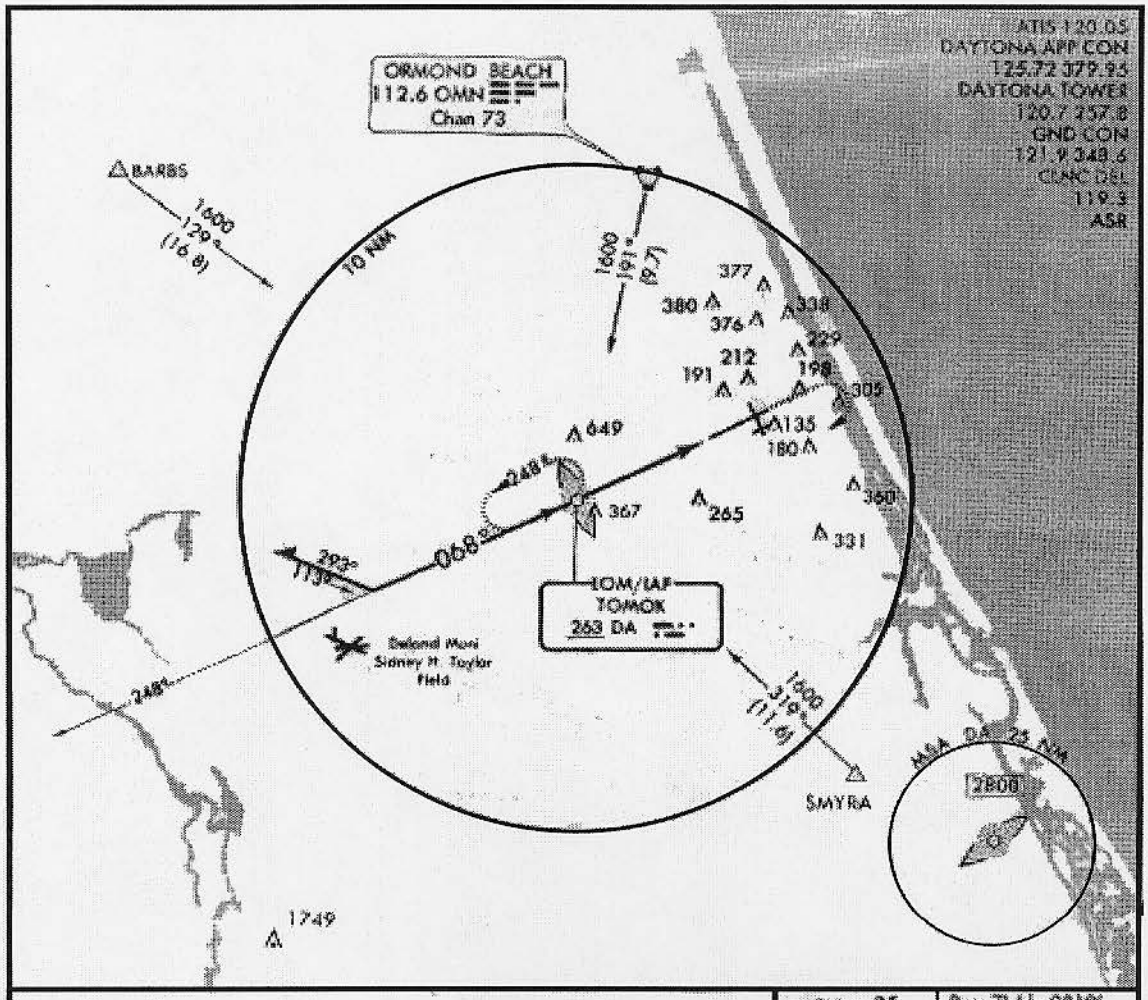
DAYTONA BEACH INTERNATIONAL AIRPORT

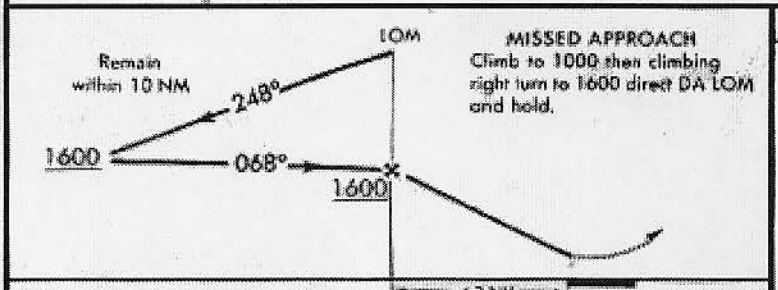
Instrument Approach Procedure
ILS RWY 7L

HNTB

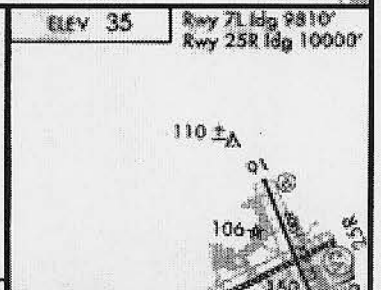
FIGURE 2-14

NDB or GPS RWY 7L



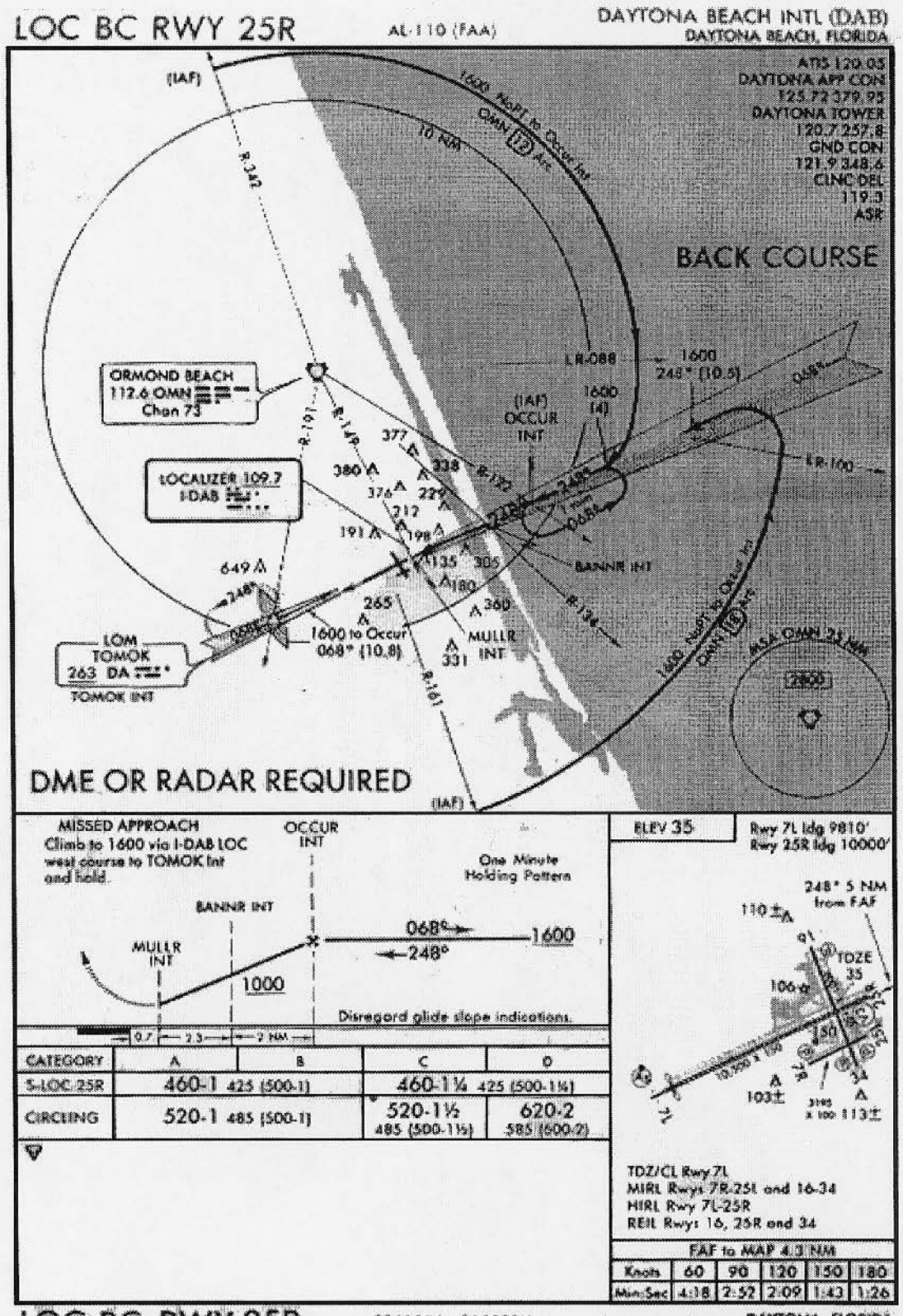


CATEGORY	A	B	C	D
S-7L	540/40 508 (600-¾)		540/50 508 (600-1)	540/60 508 (600-1¼)
CIRCLING	540-1 505 (600-1)		540-1½ 505 (600-1½)	620-2 585 (600-2)



FAF to MAP 4.2 NM					
Knots	60	90	120	150	180
Min:Sec	4:12	2:48	2:06	1:41	1:24

Source: U.S. Terminal Procedures, Nov. 30, 2000



Source: U.S. Terminal Procedures, Nov. 30, 2000

DAYTONA BEACH INTERNATIONAL AIRPORT MASTER PLAN UPDATE

DAYTONA BEACH INTERNATIONAL AIRPORT

Instrument Approach Procedure
LOC BC RWY 25R

HNTB

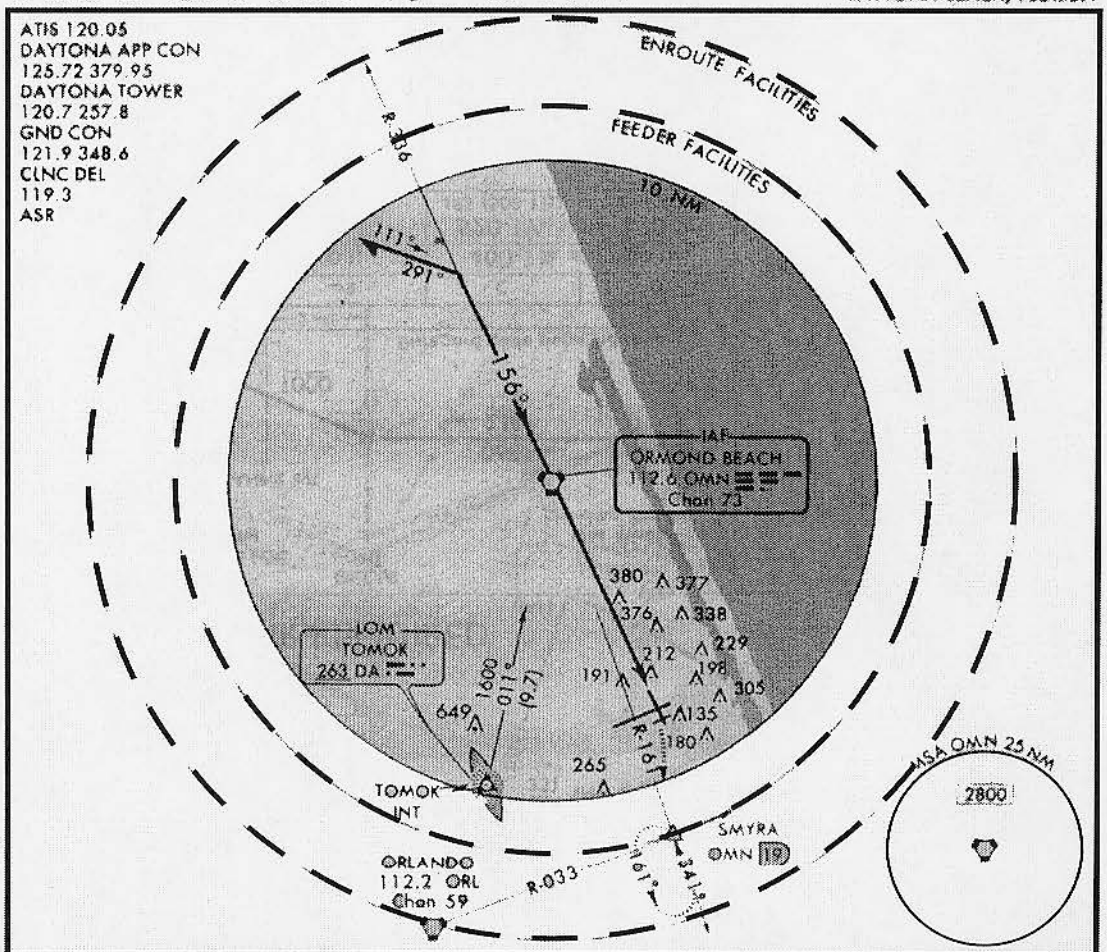
FIGURE 2-16

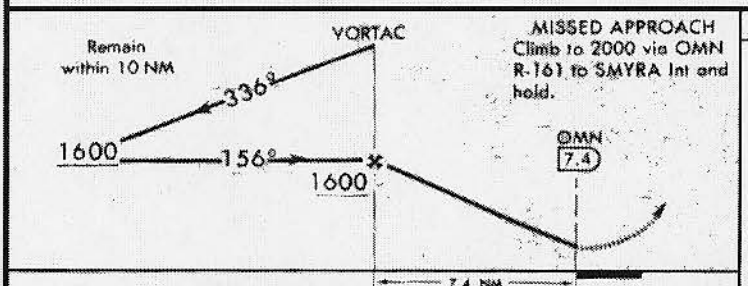
Amdt 17A 00167

VOR or GPS RWY 16

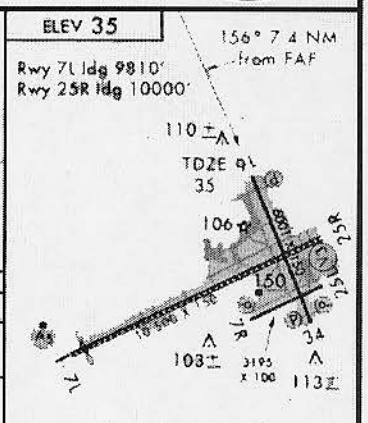
AL-110 (FAA)

DAYTONA BEACH INTL (DAB)
DAYTONA BEACH, FLORIDA



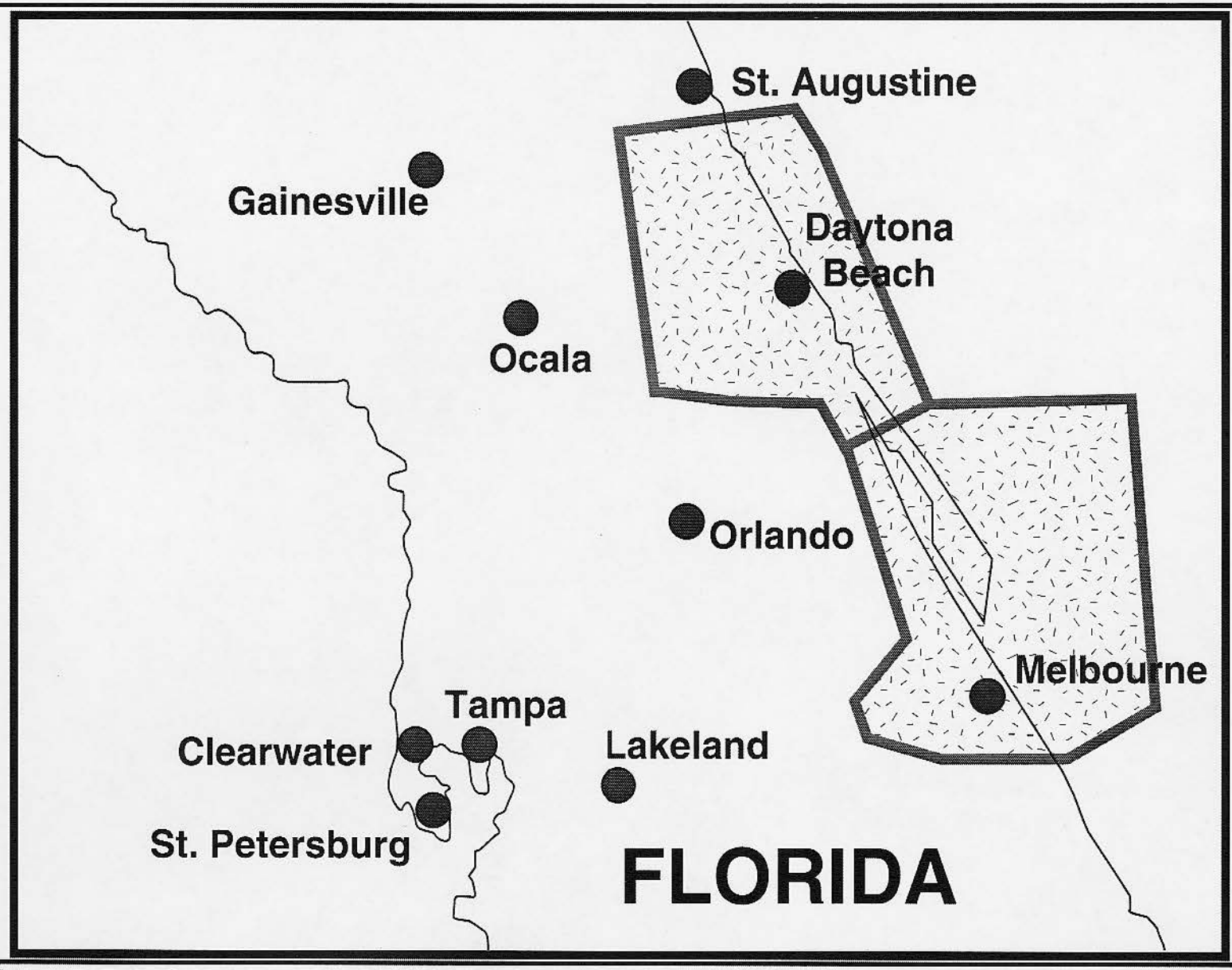


CATEGORY	A	B	C	D
S-16	700-1 665 (700-1)		700-1¾ 665 (700-1¾)	700-2 665 (700-2)
CIRCLING	700-1 665 (700-1)		700-1¾ 665 (700-1¾)	700-2 665 (700-2)



FAF to MAP 7.4 NM					
Knots	60	90	120	150	180
Min:Sec	7:24	4:56	3:42	2:58	2:28

Source: U.S. Terminal Procedures, Nov. 30, 2000



DAYTONA BEACH INTERNATIONAL AIRPORT MASTER PLAN UPDATE

DAYTONA BEACH INTERNATIONAL AIRPORT

AIRSPACE CONTROLLED BY DAB TRACON

HNTB

FIGURE 2-18

2.6 NAVIGATIONAL AIDS AND AIRPORT LIGHTING AIDS

2.6.1 Navigational Aids

Navigational Aids (NAVAIDS) are designed to aid pilots and air traffic controllers in maximizing the safe and efficient operation of the Airport under all meteorological conditions. NAVAIDS refer to any electronic device used to aid pilots in air navigation. These NAVAIDS include enroute navigational aids and terminal area navigational aids and landing aids.

Enroute Navigational Aids

Enroute navigational aids are designed to aid pilots in navigating between airports. These NAVAIDS consist of ground-based transmission facilities and receiving instrumentation located on the aircraft.

A Very High Frequency Omnidirectional Range (VOR) station is one of the most utilized NAVAIDS in the United States. The VOR is a ground based NAVAID which transmits high frequency radio signals 360 degrees in azimuth from the station. These radio signals enable a pilot to change course at that VOR or fly along one of the 360-degree radials to or from the station. Some VOR stations are equipped with Distance Measuring Equipment (DME) or Tactical Air navigation (TACAN). These devices emit signals enabling pilots to determine their line of site distance from the station. The TACAN also provides azimuth information for military aircraft. The Ormond Beach VORTAC (VOR and TACAN) is routinely used by pilots flying to and from Daytona Beach. This NAVAID is located roughly 7.9 nautical miles north of the Airport.

Another commonly used ground based NAVAID is the Non-Directional Beacon (NDB). This NAVAID consists of a low frequency radio beacon that pilots use to determine a bearing to or from an NDB station. Two NDB stations serve local navigational needs. The New Smyrna Beach NDB is located 9.7 nautical miles southeast of the Airport and the Deland NDB is located 13.2 nautical miles southwest of the Airport.

The Global Positioning System (GPS) is also used for aeronautical navigation. Pilots can navigate using position and speed indications provided by satellites orbiting the earth and instrumentation onboard the aircraft.

Terminal Area Navigation Aids and Landing Aids

Terminal Area Navigation and Landing Aids are used to assist pilots during aircraft landings and take-offs. Terminal Area NAVAIDs and landing aids at the Airport include VASIs, PAPIs, and an ILS.

A Visual Slope Approach Indicator (VASI) uses a system of lights to indicate an aircraft's position in relation to the correct approach slope of the runway. Runway 25R is equipped with a VASI-6, meaning 6 lights are used by this device. This VASI-6 is scheduled to be converted to a PAPI-4.

Precision Approach Path Indicators (PAPIs) are similar to VASIs. PAPIs also use a system of lights to guide pilots to the correct approach slope for a runway. Runways 7R and 25L are both equipped with PAPI-2 systems. Runways 16 and 34 are equipped with PAPI-4 systems.

Aircraft on final approach to a runway may use an Instrument Landing System (ILS). An ILS provides an approach path for aircraft by indicating the precise alignment and decent necessary to land. An ILS system has three parts: guidance information, range information, and visual information.

Runway 7L is equipped with a Category I Instrument Landing System (CAT I ILS). The equipment used for this system includes a localizer, outer marker, and glide slope.

A localizer provides course guidance to the runway centerline. The outer marker indicates that a pilot is on course to the runway. Daytona Beach International Airport has a compass locator as well. A glide slope transmitter provides decent information.

2.6.2 Airport Lighting Aids

Lighting aids assist pilots in the identification of an airport facility, on approaches and landings, and with taxiing on the airfield. Lighting aids of Daytona Beach International Airport include a rotating beacon, approach lights, touchdown zone lights, and runway and taxiway edge lights.

Rotating Beacon

A rotating beacon helps pilots identify lighted airports. Beacons which alternate flashes of green and white light identify civilian use land airports. Rotating beacons are generally in use from dusk to dawn, and when weather conditions deteriorate to a ceiling of less than 1,000 feet and visibility less than three miles.

Daytona Beach International Airport is equipped with a rotating beacon located adjacent to the International Passenger Terminal building.

Approach Lighting

Approach lighting systems (ALS) are used in the vicinity of runway thresholds as visual guidance for pilots landing on ALS equipped runways. The ALS provides the pilot with visual cues regarding aircraft alignment, roll, height, and position relative to the runway threshold. Medium intensity Approach Lights with Runway alignment indicator lights (MALSR) are used for the Category I (Cat-I) approach to Runway 7L. The ALS for Runway 25R consists of Runway End Identifier Lights (REIL) which mark the threshold of the runway. REIL lights are also located on Runways 16 and 34.

Airfield Lighting

Airfield lighting offers guidance to taxiing aircraft during nighttime operations or periods of low visibility. Airfield lighting may include runway or taxiway edge lights, centerline lights, and touchdown zone lights.

Runways 7L and 25R are equipped with High Intensity Runway Lights. Runways 7R, 25L, 16, and 34 are equipped with Medium Intensity Runway Lights. In addition, Runway 7L is equipped with centerline lights and touch down zone lights to aid in CAT I ILS landings.

2.7 METEOROLOGICAL DATA

Airport planning and development can be greatly impacted by climatic conditions. Temperatures can affect runway length requirements of aircraft. Wind speed and

direction determines runway orientation. Reduced visibility due to fog or heavy rains determines the need for navigational aids and airfield lighting.

Weather conditions at Daytona Beach are typical of East-Central Florida. Sunshine prevails on most days, although strong thunderstorms are common on summer afternoons. Temperatures are generally mild to warm, with an average annual temperature of 70.4° F. The average annual high temperature is 79.8°, and the average annual low temperature is 61°. The mean maximum temperature of the hottest month is 90° in the month of July. Average monthly rainfall totals vary from a low of 2.2 inches in April to 6.3 inches in September. The average annual precipitation totals 47.9 inches.

The winds at Daytona Beach are predominantly calm or out of the northeast, favoring the northeast-southwest runway layout. The crosswind runway favors the occasional northwest-southeast winds. **Figures 2-19, 2-20, and 2-21** illustrate the IFR, VFR, and All-Weather Windroses for the Airport. The runway layout of the Airport offers the FAA-recommended 95% wind coverage.

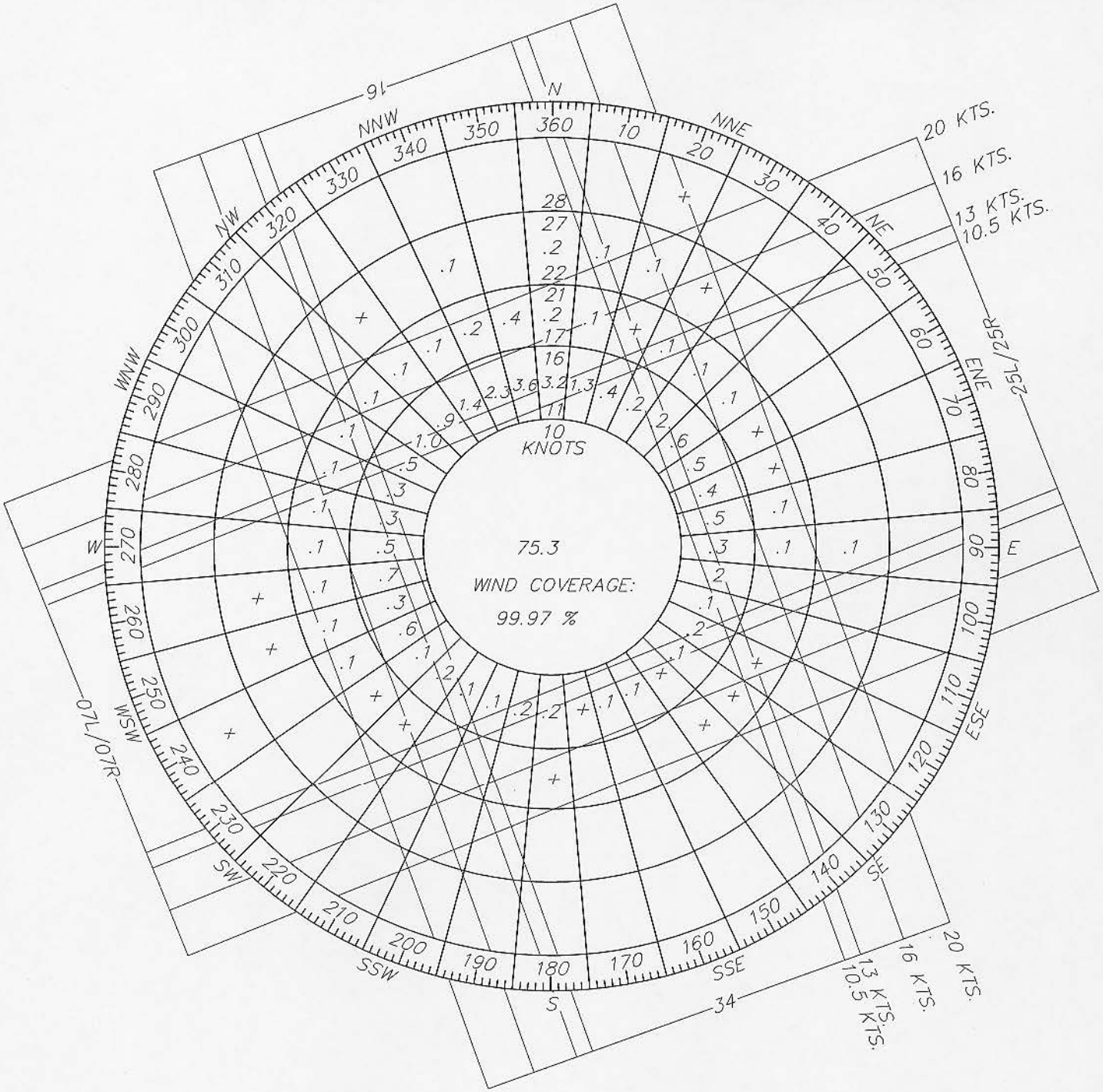
Advanced weather systems at the Airport include a Low-Level Wind Shear Alert System (LLWAS) and an automated Surface Observation Station (ASOS). This equipment is located just north of the approach end of Runway 7R.

2.8 UTILITIES

Supply and return lines provide water, sewer, electricity, gas, and telephone utility service to Daytona Beach International Airport. A summary of the utilities available and the suppliers is shown in **Table 2.10**.

2.9 SUMMARY

Chapter 2 of the Master Plan Update has detailed the existing facilities of the Daytona Beach International Airport. Chapter 3 will discuss the forecasting of future aviation demand for the Airport. Chapters 2 and 3 will serve as the basis for the formulation of development alternatives for the Airport.



IFR

Runway Crosswind Component

07L–25R 20, 16, 13, 10.5 Knots
07R–25L 13, 10.5 Knots
16–34 20, 16, 13, 10.5 Knots

Source: National Oceanic and Atmospheric Administration–National Climatic Data Center
Station Number: 12834–Daytona Beach, Florida. Period of Record: 1983–1992
Number of Observations: 87,670

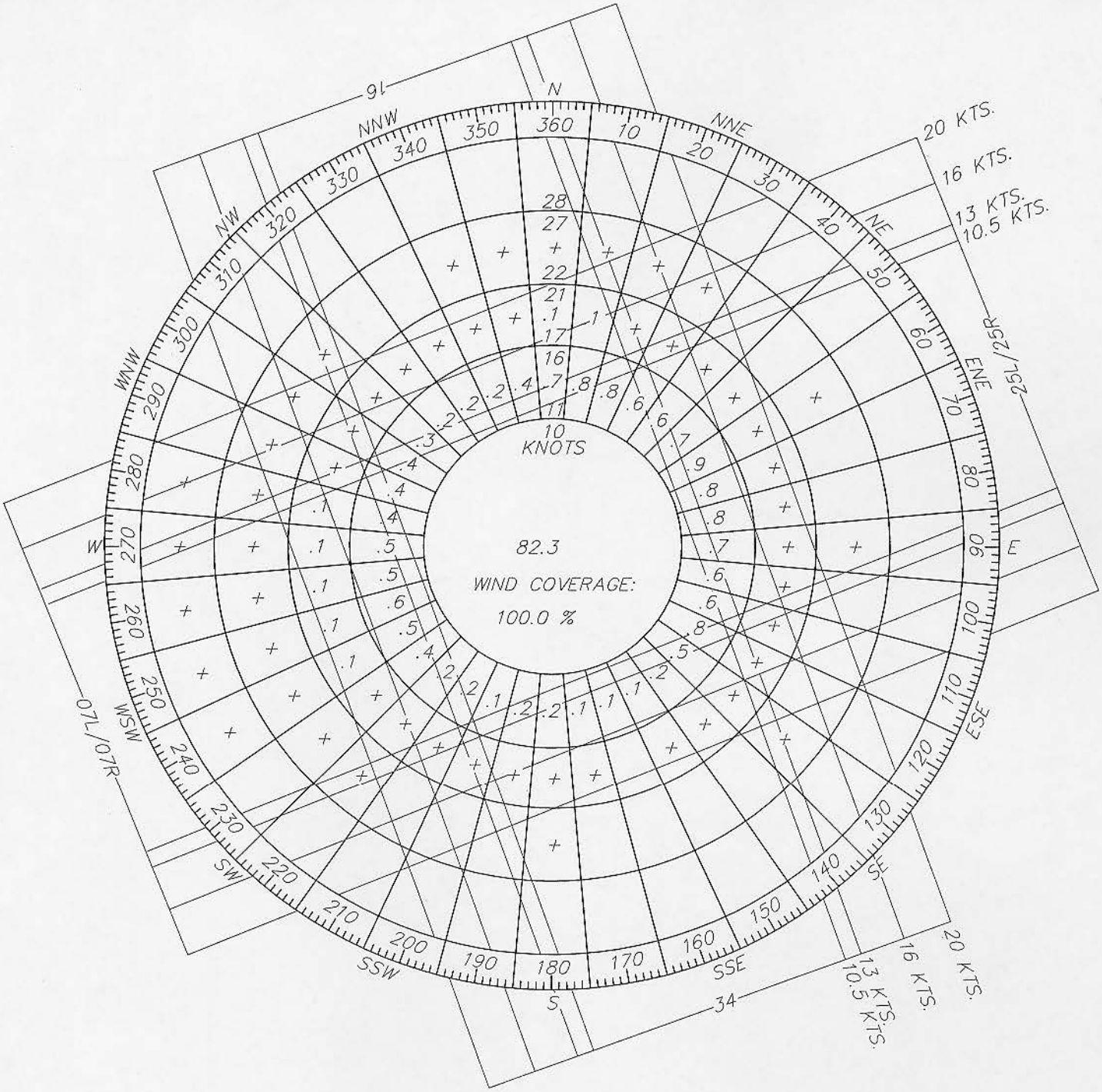
DAYTONA BEACH INTERNATIONAL AIRPORT MASTER PLAN UPDATE

DAYTONA BEACH INTERNATIONAL AIRPORT

IFR WINDROSE

HNTB

FIGURE 2-19



VFR

Runway Crosswind Component

07L–25R 20, 16, 13, 10.5 Knots
07R–25L 13, 10.5 Knots
16–34 20, 16, 13, 10.5 Knots

Source: National Oceanic and Atmospheric Administration–National Climatic Data Center
Station Number: 12834–Daytona Beach, Florida. Period of Record: 1983–1992
Number of Observations: 87,670

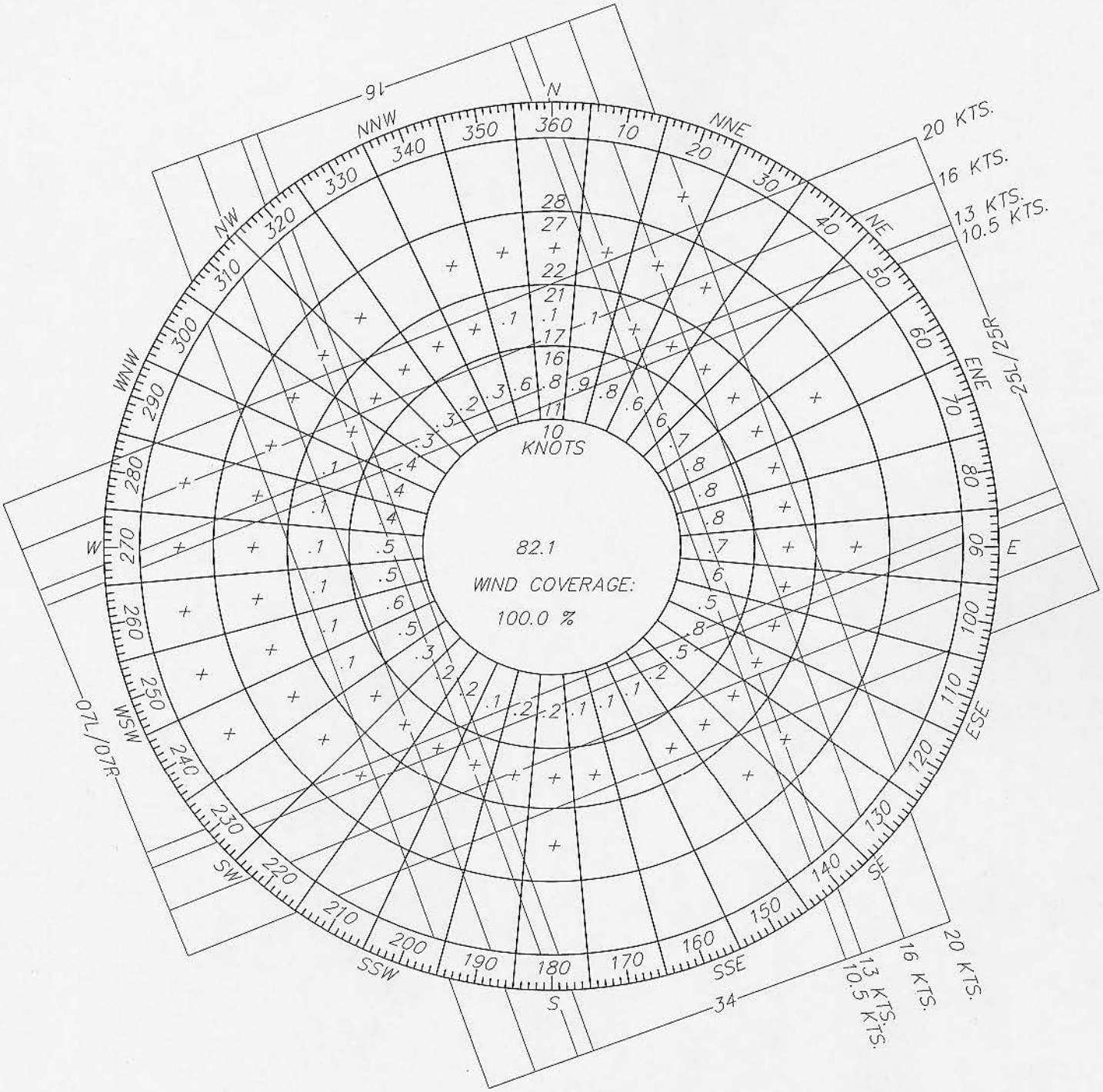
DAYTONA BEACH INTERNATIONAL AIRPORT MASTER PLAN UPDATE

DAYTONA BEACH INTERNATIONAL AIRPORT

VFR WINDROSE

HNTB

FIGURE 2-20



All–Weather

Runway Crosswind Component

07L–25R 20, 16, 13, 10.5 Knots
07R–25L 13, 10.5 Knots
16–34 20, 16, 13, 10.5 Knots

Source: National Oceanic and Atmospheric Administration–National Climatic Data Center
Station Number: 12834–Daytona Beach, Florida. Period of Record: 1983–1992
Number of Observations: 87,670

DAYTONA BEACH INTERNATIONAL AIRPORT MASTER PLAN UPDATE

DAYTONA BEACH INTERNATIONAL AIRPORT

HNTB

ALL WEATHER WINDROSE

FIGURE 2-21

Table 2.10
DAYTONA BEACH INTERNATIONAL AIRPORT

Airport Utilities

Utility	Supplier
Electricity	Florida Power and Light
Natural Gas	People's Gas
Cable Television	Time Warner Communications
Water and Sewer	City of Daytona Beach
Telephone	KMC Telecom
Misc.	Epik Communications
Misc.	Williams One Call Services (Fiber Optics)

Source: Sunshine State One-Call of Florida

Chapter Three
Aviation Activity Forecasts

This chapter provides the annual and derivative activity forecasts for Daytona Beach International Airport. The forecasts are intended for use in subsequent facility requirements analyses for the airside and landside area development. The recent upturn in passenger traffic is assumed to continue, and the forecasts are provided to determine whether or not additional facilities and infrastructure are required in the future. A credible and usable forecast is critical to ensure that the type and size of the planned facilities are appropriate for future conditions. The forecasts have been developed for the years 2005, 2010, and 2020. They correspond to short-, mid-, and long-range planning horizons. Two cases, a base case and a high case, were developed for the commercial passenger service forecasts, and a single base case was developed for all other aviation activity. All forecasts assumed that there were no constraints on growth in the future.

The base case forecasts will be used in the creation of the airport development plan. The high case forecast would only be reached if Daytona Beach recaptures much of the share of statewide traffic it once had in Florida. This high passenger traffic will only occur if significant marketing efforts are made by the airport and business community in Volusia County and if Orlando International and Orlando Sanford cannot fully retain existing traffic as well as attract the vast majority of growing traffic volumes generated by the visitors coming to the Orlando area. Under the high case forecast, resort and convention space development in the Daytona Beach area would attract additional air travelers to the airport, and the growing business community along the I-4 corridor would also provide Daytona Beach with potential business travelers.

In deriving the forecasts for both the base and high cases, comparisons with growth rates experienced at similar airports having large percentages of non-resident traffic were made. A review of US Census Bureau Economic Census data on lodging receipts was performed in order to establish the size of the overnight non-resident traffic base for various jurisdictions. Ratios of lodging receipts generated in other Florida regions to local airline enplanements served as guides for the potential traffic demand for Daytona Beach.

The assumptions inherent in the following calculations are based on input from airline and airport officials, previous studies, relevant literature, and professional experience. Forecasting, however, is not an exact science. Variances in forecast levels in the local and national economy and in the airline business environment may have a significant effect on the projections made in this chapter. These uncertainties increase toward the end of the forecast period when new technologies and changes in work and recreational practices may have an unpredictable impact on aviation activity. For these reasons, the forecasts should be periodically compared with actual Daytona Beach activity levels, and the airport plans and policies should be adjusted accordingly.

3.1 SOCIOECONOMIC BACKGROUND

The Daytona Beach area has roughly eight million annual visitors, and the Daytona Beach metropolitan area (Volusia & Flagler Counties) has an estimated population of over 475,000 people. Daytona Beach International Airport serves both residents and visitors flying to and from the area, but many travelers originating from or destined to the Daytona Beach area also use Orlando International Airport, which is located one to two hours drive away, depending on the time of day. With a wide variety of markets served nonstop and the greater availability of low fares in Orlando, the commercial aviation activity at Daytona Beach has been impacted over the years. In addition to serving the residents and visitors to Volusia and Flagler Counties, Daytona Beach also serves travelers to and from four surrounding counties in the area.

3.1.1 Visitor and Resident Socioeconomic Bases in Daytona Beach

Table 3.1 provides details on the visitor and resident socioeconomic bases by individual county and region in Florida. Since the total number of visitors to any area includes people driving in for a short day trip, lodging receipts were reviewed in order to provide a better approximation of the overnight visitor base. Volusia County, the primary service area for Daytona Beach, generated 2.2 percent of Florida's lodging receipts and earned 2.3 percent of Florida's personal income in 1997.

The growth trend in overnight visitors to the Daytona Beach service area is not as strong as in the rest of Florida. Lodging receipts in 1997 were only 0.2 percent greater than in 1992. As noted in **Table 3.2**, this increase is much smaller than the overall increase of 41.1 percent for the state of Florida during this same period. **Table 3.3** shows that the trend in personal income for the Daytona Beach service area is much more positive, as personal income rose 31.8 percent in 1997 over 1992. This increase in personal income was slightly greater than for the United States overall and slightly below the rate for Florida overall.

3.1.2 Passenger Air Traffic and Socioeconomic Trends in Daytona Beach

Volusia County generated $196 million in lodging receipts in 1997, while Daytona Beach enplaned 259,498 non-resident travelers in this fiscal year. There were about 1.33 non-resident enplanements for every $1,000 in lodging receipts in Daytona Beach during 1997, and this ratio has fallen with the decline in passenger traffic at Daytona Beach from 1997 to 2000. In comparison to other areas in Florida, as well as the U.S. overall, this ratio of non-resident enplanements to the lodging industry base was very low. Florida had about 3.31 non-resident passenger originations (excluding enplanements derived from connecting passengers in Miami, Tampa, and Orlando) for every $1,000 in lodging receipts, and the U.S. had roughly 2.76 non-resident originations (excluding all connecting passengers) for every $1,000 in lodging

Table 3.1

DAYTONA BEACH INTERNATIONAL AIRPORT

Lodging Receipts and Personal Income by County/Region in Florida - 1997

County/ Region	Lodging Receipts ($1,000)	Percent Florida Total	Personal Income ($M)	Percent Florida Total	County/ Region	Lodging Receipts ($1,000)	Percent Florida Total	Personal Income ($M)	Percent Florida Total	County/ Region	Lodging Receipts ($1,000)	Percent Florida Total	Personal Income ($M)	Percent Florida Total
Brevard	97,246	1.1%	10,342	2.8%	Alachua	46,655	0.5%	4,313	1.2%	Bay	133,425	1.5%	2,985	0.8%
Indian River	16,639	0.2%	3,423	0.9%	Baker		0.0%	341	0.1%	Calhoun	177	0.0%	174	0.0%
Okeechobee	4,581	0.1%	559	0.2%	Bradford	2,844	0.0%	391	0.1%	Dixie		0.0%	169	0.0%
St. Lucie	36,093	0.4%	3,475	1.0%	Clay	3,537	0.0%	2,887	0.8%	Escambia	43,831	0.5%	5,589	1.5%
Volusia	**195,599**	**2.2%**	**8,518**	**2.3%**	Columbia	13,418	0.2%	905	0.2%	Franklin	6,618	0.1%	173	0.0%
Central East	**350,158**	**4.0%**	**26,318**	**7.2%**	Duval	149,716	1.7%	17,770	4.9%	Gadsden	1,455	0.0%	699	0.2%
					Flagler	13,006	0.1%	823	0.2%	Gilchrist		0.0%	182	0.1%
Hardee	623	0.0%	362	0.1%	Nassau	103,441	1.2%	2,407	0.7%	Gulf		0.0%	222	0.1%
Highlands	5,183	0.1%	1,535	0.4%	Putnam	5,044	0.1%	1,119	0.3%	Hamilton	1,648	0.0%	162	0.0%
Lake	39,275	0.4%	4,046	1.1%	St. Johns	136,995	1.6%	3,509	1.0%	Holmes	1,317	0.0%	254	0.1%
Marion	28,517	0.3%	4,652	1.3%	Union	-	0.0%	137	0.0%	Jackson	3,524	0.0%	696	0.2%
Orange	2,651,522	30.1%	18,733	5.1%	**Northeast**	**474,656**	**5.4%**	**34,604**	**9.5%**	Jefferson	514	0.0%	226	0.1%
Osceola	495,586	5.6%	2,462	0.7%						Lafayette		0.0%	90	0.0%
Polk	80,853	0.9%	9,207	2.5%	Broward	745,520	8.5%	40,743	11.2%	Leon	49,594	0.6%	5,031	1.4%
Seminole	52,485	0.6%	8,953	2.5%	Dade	1,077,407	12.2%	46,174	12.7%	Levy	2,486	0.0%	488	0.1%
Sumter	5,115	0.1%	623	0.2%	Glades	1,999	0.0%	121	0.0%	Liberty	-	0.0%	94	0.0%
Central	**3,359,159**	**38.1%**	**50,574**	**13.9%**	Hendry	2,274	0.0%	533	0.1%	Madison	3,153	0.0%	257	0.1%
					Martin	41,891	0.5%	4,132	1.1%	Okaloosa	49,909	0.6%	3,736	1.0%
Citrus	14,700	0.2%	2,060	0.6%	Monroe	335,888	3.8%	2,407	0.7%	Santa Rosa	5,518	0.1%	2,214	0.6%
De Soto	2,423	0.0%	470	0.1%	Palm Beach	438,988	5.0%	39,269	10.8%	Suwanee	1,241	0.0%	561	0.2%
Hernando	5,806	0.1%	2,456	0.7%	**Southeast**	**2,643,967**	**30.0%**	**133,380**	**36.6%**	Taylor	2,141	0.0%	308	0.1%
Hillsborough	296,165	3.4%	21,559	5.9%						Wakulla	2,119	0.0%	374	0.1%
Manatee	43,708	0.5%	6,313	1.7%	Charlotte	20,963	0.2%	2,895	0.8%	Walton	68,580	0.8%	596	0.2%
Pasco	59,007	0.7%	6,570	1.8%	Collier	265,472	3.0%	6,969	1.9%	Washington	464	0.0%	304	0.1%
Pinellas	468,961	5.3%	24,771	6.8%	Lee	282,398	3.2%	9,863	2.7%	**Northwest**	**377,714**	**4.3%**	**25,581**	**7.0%**
Sarasota	137,272	1.6%	10,707	2.9%	**Southwest**	**568,833**	**6.5%**	**19,727**	**5.4%**					
Central West	**1,028,042**	**11.7%**	**74,906**	**20.6%**										
										Florida	**8,810,470**	**100.0%**	**363,980**	**100.0%**

Sources: US Department of Commerce, Census Bureau, Census of Service Industries-Geographic Area Series for Lodging Receipts; US Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System for Personal Income; VISIT FLORIDA (official tourism marketing agency for state of Florida) for Seven Regions

Volusia County, the prirmary service area for Daytona Beach International Airport, generated 2.2 percent of Florida's lodging receipts and earned 2.3 percent of Florida's personal income in 1997.

Table 3.2

DAYTONA BEACH INTERNATIONAL AIRPORT

Lodging Industry Trends by County/Region in Florida - 1997 vs 1992

County/ Region	Lodging Receipts ($1,000) 1997	1992	Change	County/ Region	Lodging Receipts ($1,000) 1997	1992	Change	County/ Region	Lodging Receipts ($1,000) 1997	1992	Change
Brevard	97,246	80,853	20.3%	Alachua	46,655	22,508	107.3%	Bay	133,425	100,180	33.2%
Indian River	16,639	11,187	48.7%	Baker				Calhoun			
Okeechobee	4,581	4,441	3.2%	Bradford	2,844	1,945	46.2%	Dixie			
St. Lucie	36,093	9,494	280.2%	Clay	3,537	2,198	60.9%	Escambia	43,831	37,740	16.1%
Volusia	**195,599**	**195,270**	**0.2%**	Columbia	13,418	12,994	3.3%	Franklin	6,618	4,021	64.6%
Central East	**350,158**	**301,245**	16.2%	Duval	149,716	107,845	38.8%	Gadsden	1,455	625	132.8%
				Flagler	13,006	1,377	844.5%	Gilchrist			
Hardee	623	509	22.4%	Nassau	103,441	41,993	146.3%	Gulf			
Highlands	5,183	14,676	-64.7%	Putnam	5,044	2,001	152.1%	Hamilton	1,648	2,035	-19.0%
Lake	39,275	32,946	19.2%	St. Johns	136,995	84,328	62.5%	Holmes	1,317	1,245	5.8%
Marion	28,517	31,959	-10.8%	Union				Jackson	3,524	3,396	3.8%
Orange	2,651,522	1,681,547	57.7%	**Northeast**	**474,656**	**277,189**	**71.2%**	Jefferson			
Osceola	495,586	294,385	68.3%					Lafayette			
Polk	80,853	73,701	9.7%	Broward	745,520	378,115	97.2%	Leon	49,594	40,993	21.0%
Seminole	52,485	39,761	32.0%	Dade	1,077,407	890,097	21.0%	Levy	2,486	1,587	56.6%
Sumter	5,115	5,680	-9.9%	Glades	1,999	980	104.0%	Liberty			
Central	**3,359,159**	**2,175,164**	54.4%	Hendry	2,274	2,431	-6.5%	Madison	3,153	1,019	209.4%
				Martin				Okaloosa	49,909	55,149	-9.5%
Citrus	14,700	13,865	6.0%	Monroe	335,888	277,665	21.0%	Santa Rosa	5,518	7,873	-29.9%
De Soto	2,423	1,549	56.4%	Palm Beach	438,988	419,033	4.8%	Suwanee	1,241	1,550	-19.9%
Hernando	5,806	4,739	22.5%	**Southeast**	**2,602,076**	**1,968,321**	**32.2%**	Taylor	2,141	1,784	20.0%
Hillsborough	296,165	189,295	56.5%					Wakulla			
Manatee	43,708	55,884	-21.8%	Charlotte	20,963	9,904	111.7%	Walton	68,580	43,553	57.5%
Pasco	59,007	31,298	88.5%	Collier	265,472	213,725	24.2%	Washington	464	577	-19.6%
Pinellas	468,961	329,260	42.4%	Lee	282,398	206,221	36.9%	**Northwest**	**374,904**	**303,327**	**23.6%**
Sarasota	137,272	103,160	33.1%	**Southwest**	**568,833**	**429,850**	**32.3%**				
Central West	**1,028,042**	**729,050**	41.0%								
								Florida	**8,810,470**	**6,244,943**	**41.1%**
								USA Total (a)	**86,454,861**	**58,586,837**	**47.6%**

Note: Only counties where data for both 1992 and 1997 were available are included in this table

(a) Total Lodging Receipts of $98,454,861,000 in 1997 included $20,652,442,000 in receipts at casino hotels. Gaming receipts of $12 billion in 1997 and $8.6 billion in 1992 excluded.

Sources: US Department of Commerce, Census Bureau, Census of Service Industries-Geographic Area Series for Lodging Receipts;
VISIT FLORIDA (official tourism marketing agency for state of Florida) for Seven Regions

Volusia County has not experienced any significant growth in lodging receipts from 1992 to 1997, while Florida's lodging receipts increased by 41.1 percent in these five years.

Table 3.3

DAYTONA BEACH INTERNATIONAL AIRPORT

Personal Income Trends by County/Region in Florida - 1997 vs 1992

County/ Region	Personal Income ($M) 1997	1992	Change
Brevard	10,342	8,182	26.4%
Indian River	3,423	2,514	36.2%
Okeechobee	559	432	29.5%
St. Lucie	3,475	2,538	36.9%
Volusia	**8,518**	**6,464**	**31.8%**
Central East	**26,318**	**20,130**	**30.7%**
Hardee	362	306	18.2%
Highlands	1,535	1,189	29.1%
Lake	4,046	2,859	41.5%
Marion	4,652	3,341	39.2%
Orange	18,733	13,681	36.9%
Osceola	2,462	1,794	37.2%
Polk	9,207	6,819	35.0%
Seminole	8,953	6,211	44.2%
Sumter	623	438	42.3%
Central	**50,574**	**36,638**	**38.0%**
Citrus	2,060	1,559	32.1%
De Soto	470	388	21.1%
Hernando	2,456	1,738	41.3%
Hillsborough	21,559	15,936	35.3%
Manatee	6,313	4,620	36.6%
Pasco	6,570	4,620	42.2%
Pinellas	24,771	18,812	31.7%
Sarasota	10,707	8,058	32.9%
Central West	**74,906**	**55,731**	**34.4%**

County/ Region	Personal Income ($M) 1997	1992	Change
Alachua	4,313	3,277	31.6%
Baker	341	257	32.7%
Bradford	391	290	34.8%
Clay	2,887	2,013	43.4%
Columbia	905	628	44.2%
Duval	17,770	13,369	32.9%
Flagler	823	510	61.4%
Nassau	2,407	1,785	34.9%
Putnam	1,119	886	26.3%
St. Johns	3,509	2,191	60.2%
Union	137	105	30.1%
Northeast	**34,604**	**25,311**	**36.7%**
Broward	40,743	30,259	34.6%
Dade	46,174	34,125	35.3%
Glades	121	101	20.3%
Hendry	533	476	12.0%
Martin	4,132	3,153	31.0%
Monroe	2,407	1,785	34.9%
Palm Beach	39,269	28,702	36.8%
Southeast	**133,380**	**98,601**	**35.3%**
Charlotte	2,895	2,157	34.2%
Collier	6,969	4,868	43.2%
Lee	9,863	7,282	35.4%
Southwest	**19,727**	**14,307**	**37.9%**

County/ Region	Personal Income ($M) 1997	1992	Change
Bay	2,985	2,202	35.6%
Calhoun	174	132	32.0%
Dixie	169	121	39.6%
Escambia	5,589	4,416	26.6%
Franklin	173	129	33.8%
Gadsden	699	552	26.5%
Gilchrist	182	134	36.0%
Gulf	222	163	35.9%
Hamilton	162	130	24.7%
Holmes	254	193	31.6%
Jackson	696	585	19.0%
Jefferson	226	169	33.6%
Lafayette	90	72	25.7%
Leon	5,031	3,665	37.3%
Levy	488	361	35.1%
Liberty	94	70	33.7%
Madison	257	201	28.0%
Okaloosa	3,736	2,713	37.7%
Santa Rosa	2,214	1,499	47.7%
Suwanee	561	420	33.5%
Taylor	308	243	26.6%
Wakulla	374	225	66.1%
Walton	596	394	51.4%
Washington	304	222	36.8%
Northwest	**25,581**	**19,011**	**34.6%**
Florida	**363,980**	**268,828**	**35.4%**
USA Total	**6,770,650**	**5,239,364**	**29.2%**

Sources: US Department of Commerce, Bureau of Economic Analysis: Regional Economic Information System for Personal Income;
VISIT FLORIDA (official tourism marketing agency for state of Florida) for Seven Regions

Volusia County experienced a growth in personal income of 31.8 percent from 1992 to 1997, which is slightly lower than the statewide growth of 35.4 percent in Florida overall.

receipts. Orlando, with its greater levels of air service, generated more than double the non-resident origination to lodging receipt ratio of Daytona Beach with 2.73 non-resident originations per $1,000 in lodging receipts. A complete analysis of the relationship between non-resident passenger originations and lodging industry receipts is provided in **Table 3.4**. This table shows the existing relationship between non-resident originations and lodging industry receipts and does not include the traffic leakage, which is at least 50 percent, that is occurring in the area.

Just as non-resident air travel in Daytona Beach is low relative to its overnight visitor base, there is also a relatively low level of resident originations at Daytona Beach as well. Volusia County generated $8.5 billion in personal income in 1997, while Daytona Beach enplaned 142,824 resident travelers in this fiscal year. There were roughly 16.77 resident enplanements for every million dollars in personal income during 1997. The state of Florida generated 41.57 resident originations (excluding connecting traffic in Miami, Tampa, and Orlando) for every million dollars in personal income earned by its residents, and the U.S. generated 35.27 resident originations for every million dollars in personal income earned by its residents in 1997. A complete analysis of the relationship between resident passenger originations and personal income earned by residents of various areas in Florida is provided in **Table 3.5**. This analysis indicates the potential for additional Daytona Beach air service, given its resident socioeconomic base. Just as with the non-resident data, this table does not include the traffic leakage, which is at least 50 percent, that is occurring in the area.

Air traffic levels depend primarily on socioeconomic performance, air service, and air fares. The domestic Origin & Destination (O&D) passenger traffic, revenue, and average fare trends for every commercial airport in Florida for each of the past three fiscal years (FY 1998 – FY 2000) are provided in **Table 3.6**. While domestic fares averaged $149 in Daytona Beach during FY 2000, the average domestic fares in Orlando and Jacksonville were only $122 and $130 respectively. As these airfare differentials indicate, there is greater availability of lower fares in Orlando and Jacksonville than in Daytona Beach. These airfare differentials have been increasing over the past couple years, as in FY 1998, the average domestic fare in Daytona Beach was only $134, while it was $119 in Orlando and $133 in Jacksonville. In just two years, the average domestic fare increased $15 in Daytona Beach while it only increased $3 in Orlando and dropped $3 in Jacksonville. As a result of both the availability of nonstop service to many destinations and the lower fares in Orlando and Jacksonville, significant numbers of potential Daytona Beach passengers are diverting to both of these other airports.

In a longer term review of domestic O&D passenger traffic trends at commercial airports in Florida, **Table 3.7** shows this history from Calendar Year 1990 through Fiscal Year 2000. Daytona Beach has experienced a decline in domestic O&D traffic from 960,690 passengers in 1990 to 488,520 passengers in FY 2000, which represents an average annual decline of 6.7 percent. During this same period, overall domestic O&D traffic for all Florida airports increased from 57.2 million passengers to

Table 3.4

DAYTONA BEACH INTERNATIONAL AIRPORT

Non-Resident Passenger Originations and Lodging Industry Receipts in Florida and United States - 1997

Airport/Region	Total Receipts for Lodging Industry ($1,000)	Non-Resident Originations at Commercial Airports FY1997					Non-Resident Originations Per $1,000 in Lodging Receipts
		Commercial Airport Enplanements	Estimated Percentage of Connecting Passengers	Estimated Local Originating Passengers	Non-Residents as Percent of Originations	Estimated Non-Resident Originations	
Daytona Beach	**195,599**	**402,322**	**0%**	**402,322**	**64.5%**	**259,498**	**1.33**
Melbourne	154,559	306,163	0%	306,163	56.5%	172,982	1.12
Central East	**350,158**	**708,485**	**0%**	**708,485**	**61.0%**	**432,480**	**1.24**
Sanford		335,525	10%	301,973	75.9%	229,197	
Orlando		13,077,471	10%	11,769,724	75.9%	8,933,220	
Central	**3,359,159**	**13,412,996**	**10%**	**12,071,696**	**75.9%**	**9,162,418**	**2.73**
St.Petersburg		417,192	0%	417,192	70.7%	294,955	
Sarasota		820,574	0%	820,574	65.0%	533,373	
Tampa		6,584,743	5%	6,255,506	58.8%	3,678,237	
Central West	**1,028,042**	**7,822,509**	**4%**	**7,493,272**	**60.1%**	**4,506,565**	**4.38**
Panama City		155,948	0%	155,948	61.2%	95,437	
Ft. Walton Beach		252,771	0%	252,771	60.4%	152,564	
Pensacola		564,901	0%	564,901	55.7%	314,907	
Tallahassee		466,741	0%	466,741	43.0%	200,795	
Northwest	**377,714**	**1,440,361**	**0%**	**1,440,361**	**53.0%**	**763,703**	**2.02**
Gainesville		179,753	0%	179,753	46.4%	83,405	
Jacksonville		2,036,849	0%	2,036,849	55.1%	1,122,304	
Northeast	**474,656**	**2,216,602**	**0%**	**2,216,602**	**54.4%**	**1,205,709**	**2.54**
Fort Myers		2,179,338	0%	2,179,338	74.1%	1,614,889	
Naples		64,931	0%	64,931	69.2%	44,932	
Southwest	**568,833**	**2,244,269**	**0%**	**2,244,269**	**74.0%**	**1,659,822**	**2.92**
Ft. Lauderdale		6,427,268	0%	6,427,268	61.7%	3,965,624	
Key West		268,816	0%	268,816	73.5%	197,580	
Marathon		36,728	0%	36,728	74.2%	27,252	
Miami		16,983,098	50%	8,491,549	64.3%	5,460,066	
West Palm Beach		2,938,031	0%	2,938,031	62.1%	1,824,517	
Southeast	**2,643,967**	**26,653,941**	**32%**	**18,162,392**	**63.2%**	**11,475,040**	**4.34**
Florida Total	**8,810,470**	**54,499,163**	**19%**	**44,337,077**	**65.9%**	**29,205,736**	**3.31**
US Total (a)	**86,454,861**	**636,769,629**	**25%**	**477,577,222**	**50.0%**	**238,788,611**	**2.76**

(a) Total Lodging Receipts for US of $98,454,861,000 included $20,652,442,000 in receipts at casino hotels. Gaming receipts estimated at $12 billion ($8.6 billion in 1992).

Sources: US Bureau of the Census, Census of Service Industries - Geographic Area Series, 1997 Census, for lodging data;
FAA TAF Forecast, December 1999, for Enplanements, and US DOT O&D Passenger Survey results for 1994 via Data Base Products for Non-Resident Percentages

Daytona Beach's primary service area generated nearly $200 million in lodging industry receipts in 1997, while Daytona Beach International enplaned 259,498 non-resident travelers in this fiscal year. There were about 1.33 non-resident enplanements for every $1,000 in lodging receipts for Daytona Beach during 1997. In comparison to nearly all other areas of Florida, as well as the US overall, this ratio of non-resident enplanements to the lodging industry base was very low. Many visitors are driving to the area, and some are using other airports with better air service and greater availability of lower fares.

Table 3.5

DAYTONA BEACH INTERNATIONAL AIRPORT

Resident Passenger Originations and Personal Income in Florida and United States - 1997

Airport/Region	Total Personal Income ($M)	Resident Originations at Commercial Airports FY1997					Estimated Resident Originations Per $M in Personal Income
		Commercial Airport Enplanements	Estimated Percentage of Connecting Passengers	Estimated Local Originating Passengers	Residents as Percent of Originations	Estimated Resident Originations	
Daytona Beach	**8,518**	**402,322**	**0%**	**402,322**	**35.5%**	**142,824**	**16.77**
Melbourne	17,800	306,163	0%	306,163	43.5%	133,181	7.48
Central East	**26,318**	**708,485**	**0%**	**708,485**	**39.0%**	**276,005**	**10.49**
Sanford		335,525	10%	301,973	24.1%	72,775	
Orlando		13,077,471	10%	11,769,724	24.1%	2,836,503	
Central	**50,574**	**13,412,996**	**10%**	**12,071,696**	**24.1%**	**2,909,279**	**57.53**
St.Petersburg		417,192	0%	417,192	29.3%	122,237	
Sarasota		820,574	0%	820,574	35.0%	287,201	
Tampa		6,584,743	5%	6,255,506	41.2%	2,577,268	
Central West	**74,906**	**7,822,509**	**4%**	**7,493,272**	**39.9%**	**2,986,707**	**39.87**
Panama City		155,948	0%	155,948	38.8%	60,511	
Ft. Walton Beach		252,771	0%	252,771	39.6%	100,207	
Pensacola		564,901	0%	564,901	44.3%	249,994	
Tallahassee		466,741	0%	466,741	57.0%	265,946	
Northwest	**25,581**	**1,440,361**	**0%**	**1,440,361**	**47.0%**	**676,658**	**26.45**
Gainesville		179,753	0%	179,753	53.6%	96,348	
Jacksonville		2,036,849	0%	2,036,849	44.9%	914,545	
Northeast	**34,604**	**2,216,602**	**0%**	**2,216,602**	**45.6%**	**1,010,893**	**29.21**
Fort Myers		2,179,338	0%	2,179,338	25.9%	564,449	
Naples		64,931	0%	64,931	30.8%	19,999	
Southwest	**19,727**	**2,244,269**	**0%**	**2,244,269**	**26.0%**	**584,447**	**29.63**
Ft. Lauderdale		6,427,268	0%	6,427,268	38.3%	2,461,644	
Key West		268,816	0%	268,816	26.5%	71,236	
Marathon		36,728	0%	36,728	25.8%	9,476	
Miami		16,983,098	50%	8,491,549	35.7%	3,031,483	
West Palm Beach		2,938,031	0%	2,938,031	37.9%	1,113,514	
Southeast	**133,380**	**26,653,941**	**32%**	**18,162,392**	**36.8%**	**6,687,352**	**50.14**
Florida Total	**363,980**	**54,499,163**	**19%**	**44,337,077**	**34.1%**	**15,131,341**	**41.57**
US Total	**6,770,650**	**636,769,629**	**25%**	**477,577,222**	**50.0%**	**238,788,611**	**35.27**

Sources: US Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System for Personal Income;
FAA TAF Forecast, December 1999, for Enplanements, and US DOT O&D Passenger Survey results for 1994 via Data Base Products for Non-Resident Percentages

Daytona Beach's primary service area generated $8.5 billion in personal income in 1997, while the Daytona Beach International Airport enplaned 142,824 resident travelers in this fiscal year. There were about 16.77 resident enplanements for every $M in personal income in Daytona Beach during 1997. In comparison to other areas in Florida, as well as the US overall, this ratio of resident enplanements to its personal income base was rather low. Many residents are driving to other airports in the area, for reasons similar to those that non residents use other airports - better air service and greater availability of low fares.

Table 3.6

DAYTONA BEACH INTERNATIONAL AIRPORT

Domestic O&D Passenger Traffic, Revenue, and Average Fares for Commercial Airports in Florida FY 1998 - FY 2000

Airport	Total Domestic O&D Passengers			Domestic O&D Passenger Revenue ($000)			Average Domestic Fare ($)		
	FY 1998	FY 1999	FY 2000	FY 1998	FY 1999	FY 2000	FY 1998	FY 1999	FY 2000
Orlando	20,607,490	21,590,810	23,184,670	2,443,200	2,556,440	2,830,200	119	118	122
Tampa	11,635,310	12,746,510	13,759,170	1,441,900	1,561,510	1,732,840	124	123	126
Fort Lauderdale	10,248,070	11,544,270	13,087,360	1,269,730	1,387,590	1,625,060	124	120	124
Miami	9,411,740	9,728,210	9,357,360	1,440,550	1,460,230	1,539,970	153	150	165
West Palm Beach	5,512,620	5,383,970	5,546,700	734,550	723,930	775,270	133	134	140
Jacksonville	4,208,640	4,516,340	4,840,810	558,240	586,900	629,420	133	130	130
Fort Myers	4,054,970	4,271,770	4,539,750	526,580	546,490	608,440	130	128	134
Sarasota	1,415,550	1,358,130	1,391,490	181,480	175,230	186,200	128	129	134
Pensacola	1,061,160	1,003,030	956,820	164,470	163,400	165,790	155	163	173
Tallahassee	881,190	845,050	843,550	138,610	137,310	138,290	157	162	164
Fort Walton Beach	513,210	643,210	742,970	77,950	93,940	109,570	152	146	147
Key West	525,850	518,080	524,880	69,200	68,910	73,170	132	133	139
Melbourne	482,030	535,480	506,170	70,490	75,000	77,090	146	140	152
Daytona Beach	**583,740**	**526,710**	**488,520**	**78,360**	**75,300**	**72,620**	**134**	**143**	**149**
St. Petersburg	488,060	367,170	380,570	49,630	39,670	39,780	102	108	105
Panama City	320,250	304,980	320,040	51,690	52,370	56,100	161	172	175
Gainesville	279,700	277,910	275,700	45,670	47,410	49,740	163	171	180
Naples	102,810	100,070	99,260	14,080	13,470	14,150	137	135	143
Sanford	5,300	-	48,710	210	-	4,840	40		99
Marathon	53,320	38,750	25,190	7,490	5,840	3,940	140	151	156
Florida Total	72,391,010	76,300,450	80,919,690	9,364,080	9,770,940	10,732,480	129	128	133

Source: DOT 10% Domestic O&D Survey via Data Base Products

Table 3.7

DAYTONA BEACH INTERNATIONAL AIRPORT

Domestic O&D Passenger Traffic Trends for Commercial Airports in Florida CY 1990 - FY 2000

Airport	1990	1991	1992	1993	1994	1995	1996	1997	FY 1998	FY 1999	FY 2000	Average Annual Percent Change CY 1990-CY 1995	CY 1995-FY 2000	CY 1990-FY 2000
Orlando	13,103,290	12,110,050	12,689,550	13,268,960	14,635,250	15,837,260	18,961,450	20,528,260	20,607,490	21,590,810	23,184,670	3.9%	8.4%	6.0%
Tampa	8,642,840	7,647,370	7,696,030	8,179,560	9,699,290	9,308,540	10,962,670	11,288,790	11,635,310	12,746,510	13,759,170	1.5%	8.6%	4.9%
Fort Lauderdale	7,231,490	6,321,540	6,334,080	7,072,410	8,532,130	7,863,870	9,072,230	10,163,260	10,248,070	11,544,270	13,087,360	1.7%	11.3%	6.3%
Miami	10,488,750	9,635,090	9,313,210	9,577,900	9,632,590	10,335,930	10,386,010	10,189,440	9,411,740	9,728,210	9,357,360	-0.3%	-2.1%	-1.2%
West Palm Beach	5,215,420	4,716,570	4,636,850	4,667,120	5,107,610	5,061,730	5,330,900	5,476,440	5,512,620	5,383,970	5,546,700	-0.6%	1.9%	0.6%
Jacksonville	2,487,400	2,311,710	2,408,760	2,549,710	3,353,830	3,265,940	3,356,730	3,926,040	4,208,640	4,516,340	4,840,810	5.6%	8.6%	7.1%
Fort Myers	3,341,490	3,068,780	3,039,000	3,186,700	3,471,480	3,624,660	3,806,650	3,971,090	4,054,970	4,271,770	4,539,750	1.6%	4.9%	3.2%
Sarasota	1,915,430	1,689,240	1,558,160	1,547,230	1,536,640	1,383,020	1,440,340	1,491,460	1,415,550	1,358,130	1,391,490	-6.3%	0.1%	-3.2%
Pensacola	820,670	840,170	844,600	808,190	1,004,880	993,460	1,018,110	1,065,910	1,061,160	1,003,030	956,820	3.9%	-0.8%	1.6%
Tallahassee	831,150	760,130	796,020	799,450	851,900	980,770	845,100	893,970	881,190	845,050	843,550	3.4%	-3.1%	0.2%
Fort Walton Beach	308,430	295,910	342,750	341,550	340,060	338,560	414,670	508,410	513,210	643,210	742,970	1.9%	18.0%	9.4%
Key West	378,350	363,570	380,720	412,920	386,800	465,840	535,200	523,300	525,850	518,080	524,880	4.2%	2.5%	3.4%
Melbourne	731,190	635,990	649,350	603,660	621,190	552,680	610,970	559,970	482,030	535,480	506,170	-5.4%	-1.8%	-3.7%
Daytona Beach	**960,690**	**817,080**	**818,200**	**754,740**	**740,760**	**651,970**	**729,150**	**711,860**	**583,740**	**526,710**	**488,520**	**-7.5%**	**-5.9%**	**-6.7%**
St. Petersburg	-	25,390	53,900	135,840	262,960	473,410	362,090	414,030	488,060	367,170	380,570			
Panama City	177,160	193,210	259,100	298,340	268,300	287,450	288,130	327,410	320,250	304,980	320,040	10.2%	2.3%	6.3%
Gainesville	406,090	328,980	366,200	342,030	339,420	330,030	306,230	338,060	279,700	277,910	275,700	-4.1%	-3.7%	-3.9%
Naples	111,420	107,200	96,020	114,550	115,800	157,210	146,260	113,090	102,810	100,070	99,260	7.1%	-9.2%	-1.2%
Sanford	-	250	-	-	-	-	-	30,120	5,300	-	48,710			
Marathon	43,440	37,180	40,820	56,000	57,050	73,080	78,090	71,750	53,320	38,750	25,190	11.0%	-20.1%	-5.4%
Total	57,194,700	51,905,410	52,323,320	54,716,860	60,957,940	61,985,410	68,650,980	72,592,660	72,391,010	76,300,450	80,919,690	1.6%	5.8%	3.6%
Markets with Major Presence by Low Fare Carriers (Ft. Lauderdale, Ft. Myers, Ft. Walton Beach, Jacksonville, Orlando, and Tampa) by FY 2000														
Subtotal	35,114,940	31,755,360	32,510,170	34,598,890	40,032,040	40,238,830	46,574,400	50,385,850	51,267,690	55,312,910	60,154,730	2.8%	8.8%	5.7%
Markets without Major Presence by Low Fare Carriers (markets other than Ft. Lauderdale, Ft. Myers, Ft. Walton Beach, Jacksonville, Orlando, and Tampa) by FY 2000														
Subtotal	22,079,760	20,150,050	19,813,150	20,117,970	20,925,900	21,746,580	22,076,580	22,206,810	21,123,320	20,987,540	20,764,960	-0.3%	-1.0%	-0.6%

Note: Low Fare Carriers include Southwest Airlines, AirTran, Delta Express, and Metrojet (US Airways)

Source: US DOT 10 % O&D Survey via Data Base Products

80.9 million passengers, which represents an average annual increase of 3.6 percent.

Certain airports have grown quite rapidly, while others have either grown quite slowly or even experienced lower traffic volumes just as Daytona Beach has. In grouping these airports into two separate categories, those having and those not having a major presence of low fare carriers by FY 2000, a clear trend can be seen. The combined domestic O&D passenger traffic for those airports with a major presence of low fare carriers – Ft. Lauderdale, Ft. Myers, Ft. Walton Beach, Jacksonville, Orlando, and Tampa – grew from 35.1 million passengers in 1990 to 60.2 million passengers in FY 2000. These airports experienced an average annual increase of 5.7 percent during this period. For the first five years, from 1990 to 1995, these airports grew 2.8 percent annually, and after the arrival of Southwest Airlines at the four largest airports in this group, these airports grew 8.8 percent annually from 1995 through FY 2000.

The remaining airports in Florida, those without a major presence of low fare carriers, have experienced a drop in domestic O&D passengers during this same period, from 22.1 million passengers in 1990 to only 20.8 million passengers in FY 2000. Traffic declined at a low 0.3 percent annual rate from 1990 to 1995, but with the increased diversion to the other airports in the latter half of the 1990s, traffic declined 1.0 percent annually from 1995 to FY 2000.

Table 3.8 shows the market share trends of domestic O&D passengers at each commercial airport in Florida from 1990 to FY 2000. Daytona Beach had 1.7 percent of all domestic O&D passengers in Florida in 1990, but by FY 2000, this share had dropped to 0.6 percent. The market share of domestic O&D passenger traffic that the airports with a major presence of low fare carriers grew from a collective 61.4 percent in 1990 to 64.9 percent in 1995 and 74.3 percent in FY 2000.

The historical and FAA forecasted fiscal year passenger enplanements in Daytona Beach, Orlando, Jacksonville, Florida, and the United States are provided in **Table 3.9**. Over the last 20 years, annual enplanements at Daytona Beach have ranged from a low of 238,521 (FY 1985) to a high of 507,060 (FY 1990). After growing at an average annual rate of 2.6 percent from FY 1980 to FY 1990, Daytona Beach enplanements declined at an average annual rate of –6.3 percent from FY 1990 to FY 1999. This recent history is in great contrast to the overall trend at all airports in Florida, where passenger traffic grew at an average rate of 4.7 percent from FY 1980 to FY 1990 and at an average annual rate of 3.8 percent from FY 1990 to FY 1999. Orlando International grew at an average annual rate of 10.3 percent from FY 1980 to FY 1990 and averaged 5.3 percent growth from FY 1990 to FY 1999.

All the airports that individually have less than 0.05 percent of national enplanements (categorized as non-hubs by the Federal Aviation Administration (FAA)) were nearly flat in enplanements from 1990 to 1999 with only an average annual increase of 0.7 percent. However, these non-hubs can be divided into two distinct groups based on their distribution of resident and non-resident enplanements. In reviewing the growth rates of those non-hubs where

Table 3.8

DAYTONA BEACH INTERNATIONAL AIRPORT

Market Shares of Domestic O&D Passenger Traffic Trends for Commercial Airports in Florida CY 1990 - FY 2000

												Point Change in Market Share		
Airport	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**FY 1998**	**FY 1999**	**FY 2000**	**CY 1990-CY 1995**	**CY 1995-FY 2000**	**CY 1990-FY 2000**
Orlando	22.9%	23.3%	24.3%	24.3%	24.0%	25.5%	27.6%	28.3%	28.5%	28.3%	28.7%	2.6%	3.1%	5.7%
Tampa	15.1%	14.7%	14.7%	14.9%	15.9%	15.0%	16.0%	15.6%	16.1%	16.7%	17.0%	-0.1%	2.0%	1.9%
Fort Lauderdale	12.6%	12.2%	12.1%	12.9%	14.0%	12.7%	13.2%	14.0%	14.2%	15.1%	16.2%	0.0%	3.5%	3.5%
Miami	18.3%	18.6%	17.8%	17.5%	15.8%	16.7%	15.1%	14.0%	13.0%	12.7%	11.6%	-1.7%	-5.1%	-6.8%
West Palm Beach	9.1%	9.1%	8.9%	8.5%	8.4%	8.2%	7.8%	7.5%	7.6%	7.1%	6.9%	-1.0%	-1.3%	-2.3%
Jacksonville	4.3%	4.5%	4.6%	4.7%	5.5%	5.3%	4.9%	5.4%	5.8%	5.9%	6.0%	0.9%	0.7%	1.6%
Fort Myers	5.8%	5.9%	5.8%	5.8%	5.7%	5.8%	5.5%	5.5%	5.6%	5.6%	5.6%	0.0%	-0.2%	-0.2%
Sarasota	3.3%	3.3%	3.0%	2.8%	2.5%	2.2%	2.1%	2.1%	2.0%	1.8%	1.7%	-1.1%	-0.5%	-1.6%
Pensacola	1.4%	1.6%	1.6%	1.5%	1.6%	1.6%	1.5%	1.5%	1.5%	1.3%	1.2%	0.2%	-0.4%	-0.3%
Tallahassee	1.5%	1.5%	1.5%	1.5%	1.4%	1.6%	1.2%	1.2%	1.2%	1.1%	1.0%	0.1%	-0.5%	-0.4%
Fort Walton Beach	0.5%	0.6%	0.7%	0.6%	0.6%	0.5%	0.6%	0.7%	0.7%	0.8%	0.9%	0.0%	0.4%	0.4%
Key West	0.7%	0.7%	0.7%	0.8%	0.6%	0.8%	0.8%	0.7%	0.7%	0.7%	0.6%	0.1%	-0.1%	0.0%
Melbourne	1.3%	1.2%	1.2%	1.1%	1.0%	0.9%	0.9%	0.8%	0.7%	0.7%	0.6%	-0.4%	-0.3%	-0.7%
Daytona Beach	**1.7%**	**1.6%**	**1.6%**	**1.4%**	**1.2%**	**1.1%**	**1.1%**	**1.0%**	**0.8%**	**0.7%**	**0.6%**	**-0.6%**	**-0.4%**	**-1.1%**
St. Petersburg	0.0%	0.0%	0.1%	0.2%	0.4%	0.8%	0.5%	0.6%	0.7%	0.5%	0.5%	0.8%	-0.3%	0.5%
Panama City	0.3%	0.4%	0.5%	0.5%	0.4%	0.5%	0.4%	0.5%	0.4%	0.4%	0.4%	0.2%	-0.1%	0.1%
Gainesville	0.7%	0.6%	0.7%	0.6%	0.6%	0.5%	0.4%	0.5%	0.4%	0.4%	0.3%	-0.2%	-0.2%	-0.4%
Naples	0.2%	0.2%	0.2%	0.2%	0.2%	0.3%	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	-0.1%	-0.1%
Sanford	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%	0.1%
Marathon	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.0%	0.0%	-0.1%	0.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%	0.0%	0.0%
						Markets with Major Presence by Low Fare Carriers (Ft. Lauderdale, Ft. Myers, Ft. Walton Beach, Jacksonville, Orlando, and Tampa) by FY 2000								
Subtotal	61.4%	61.2%	62.1%	63.2%	65.7%	64.9%	67.8%	69.4%	70.8%	72.5%	74.3%	3.5%	9.4%	12.9%
						Markets without Major Presence by Low Fare Carriers (markets other than Ft. Lauderdale, Ft. Myers, Ft. Walton Beach, Jacksonville, Orlando, and Tampa) by FY 2000								
Subtotal	38.6%	38.8%	37.9%	36.8%	34.3%	35.1%	32.2%	30.6%	29.2%	27.5%	25.7%	-3.5%	-9.4%	-12.9%

Note: Low Fare Carriers include Southwest Airlines, AirTran, Delta Express, and Metrojet (US Airways)

Source: US DOT 10 % O&D Survey via Data Base Products

Table 3.9

DAYTONA BEACH INTERNATIONAL AIRPORT

Historical and FAA Forecasted Passenger Enplanements in Florida and United States

Fiscal Year	Daytona Beach	Orlando Int'l	Jacksonville	Total Florida	All 31 Large Hubs (a)	High Density Large Hubs	Remaining Large Hubs	All 37 Medium Hubs (b)	All 72 Small Hubs (c)	All Non Hubs (d)	15 Select Leisure Non Hubs (e)	Other Non Hubs Less 15 Leisure Non Hubs	Total United States
1980	391,227	3,260,507	895,411	25,487,605	211,951,373	49,778,367	162,173,006	52,592,505	27,561,178	17,802,871	864,069	16,938,802	309,907,927
1985	238,521	4,926,227	1,179,597	28,911,784	279,831,153	55,028,696	224,802,457	69,552,842	34,173,072	16,003,299	897,270	15,106,029	399,560,366
1990	507,060	8,683,491	1,355,394	40,242,636	339,301,739	61,615,582	277,686,157	93,549,140	41,835,250	20,713,389	1,496,146	19,217,243	495,399,518
1991	448,409	8,712,084	1,283,668	39,375,707	333,567,928	57,788,755	275,779,173	93,279,530	41,208,990	21,098,338	1,554,653	19,543,685	489,154,786
1992	444,797	9,758,004	1,317,327	40,124,335	350,124,126	60,357,616	289,766,510	96,862,089	41,811,110	21,800,772	1,682,183	20,118,589	510,598,097
1993	407,785	10,280,218	1,324,950	42,209,599	356,959,099	60,878,568	296,080,531	100,051,933	41,265,822	21,761,304	1,763,525	19,997,779	520,038,158
1994	407,502	10,453,014	1,886,666	46,275,799	385,472,949	62,719,766	322,753,183	109,680,394	45,192,308	21,713,542	1,834,540	19,879,002	562,059,193
1995	365,659	10,584,116	1,816,518	47,045,163	401,384,820	63,711,106	337,673,714	113,843,031	45,805,695	21,009,007	1,696,883	19,312,124	582,042,553
1996	387,600	11,860,090	1,826,619	51,303,275	425,167,897	64,879,072	360,288,825	117,898,384	48,940,094	21,631,027	1,851,713	19,779,314	613,637,402
1997	402,322	13,077,471	2,036,849	54,509,683	443,842,151	66,467,951	377,374,200	121,660,633	49,982,631	22,012,260	2,005,868	20,006,392	637,497,675
1998	308,505	13,128,323	2,252,287	53,931,954	454,760,908	68,346,458	386,414,450	123,182,966	49,443,608	21,738,136	1,987,741	19,750,395	649,125,618
1999	282,265	13,780,567	2,408,602	56,366,081	471,683,640	68,709,730	402,973,910	129,103,936	51,291,696	22,060,441	2,147,353	19,913,088	674,139,713
Forecast													
2000	282,265	14,466,852	2,538,763	59,330,713	494,595,566	71,290,171	423,305,395	135,563,514	53,425,265	22,521,917	2,276,673	20,245,244	706,106,262
2005	282,265	19,621,480	3,189,571	75,429,692	613,126,335	86,424,512	526,701,823	165,643,338	62,109,828	25,362,671	2,696,500	22,666,171	866,242,172
2010	282,265	24,776,109	3,840,378	91,382,106	728,552,174	98,739,477	629,812,697	194,623,866	70,803,540	28,162,944	3,116,327	25,046,617	1,022,142,524
2015	282,265	29,930,739	4,491,186	107,334,537	843,622,084	110,698,480	732,923,604	223,609,912	79,505,310	30,969,849	3,536,164	27,433,685	1,177,707,155
Actual Average Annual Growth Rates													
1980-1999	-1.7%	7.9%	5.3%	4.3%	4.3%	1.7%	4.9%	4.8%	3.3%	1.1%	4.9%	0.9%	4.2%
1980-1990	2.6%	10.3%	4.2%	4.7%	4.8%	2.2%	5.5%	5.9%	4.3%	1.5%	5.6%	1.3%	4.8%
1990-1999	-6.3%	5.3%	6.6%	3.8%	3.7%	1.2%	4.2%	3.6%	2.3%	0.7%	4.1%	0.4%	3.5%
Forecasted Average Annual Growth Rates													
1999-2005	0.0%	6.1%	4.8%	5.0%	4.5%	3.9%	4.6%	4.2%	3.2%	2.4%	3.9%	2.2%	4.3%
2005-2010	0.0%	4.8%	3.8%	3.9%	3.5%	2.7%	3.6%	3.3%	2.7%	2.1%	2.9%	2.0%	3.4%
2010-2015	0.0%	3.9%	3.2%	3.3%	3.0%	2.3%	3.1%	2.8%	2.3%	1.9%	2.6%	1.8%	2.9%

(a) Of 31 airports categorized as Large Hubs by the FAA in 2000, 30 of them are in the continental USA. Effective April 2001, Southwest Airlines serves 13 of these airports.
(b) Of 37 airports categorized as Medium Hubs by the FAA in 2000, 34 of them are in the continental USA. Southwest Airlines serves 31 of these airports.
(c) Of 71 airports categorized as Small Hubs by the FAA in 2000, 63 of them are in the continental USA. Southwest Airlines serves 14 of these airports.
(d) Southwest Airlines did not serve any of the airports categorized as Non Hubs by the FAA in 2000.
(e) Aspen, Bozeman, Durango, Elko, Gulfport, Gunnison, Jackson Hole, Key West, Marathon, Monterey, Redding, Steamboat Springs, Sun Valley, Vail, and Telluride are non hubs with over 60 percent non-resident traffic.

Source: FAA TAF Forecast December 2000

residents comprised over 40 percent of all enplanements, there was an average annual increase of 0.4 percent from 1990 to 1999. By contrast, those non-hubs in the continental U.S. where non-residents comprised over 60 percent of all enplanements and are not located within an hour's drive of a medium or large hub grew at an average annual rate of 4.1 percent. From 1980 to 1999, this group of 15 non-hubs grew at an average rate of 4.9 percent annually. Among this group of airports are many sun and ski destinations, including Aspen, CO; Bozeman, MT; Durango, CO; Vail, CO; Elko, NV; Gulfport, MS; Gunnison, CO; Steamboat Springs, CO; Jackson Hole, WY; Key West, FL; Marathon, FL; Monterey, CA; Redding, CA; Sun Valley, ID; and Telluride, CO. These non-hubs are primarily destinations for leisure travelers. They are growing even faster than the national average for all airports and, in most cases, low fare carriers have not even entered these markets. Larger airports where non-residents comprise over 60 percent of all enplanements are also among the fastest growing airports in the country. Among these airports are Las Vegas, Orlando, Reno, Palm Springs, New Orleans, Myrtle Beach, Fort Myers, Miami, Ft. Lauderdale, and West Palm Beach.

3.2 AVIATION ACTIVITY FORECASTS

This aviation activity forecast covers the following major categories of aviation: passenger service (subdivided between air carriers and regional carriers), general aviation (GA), and military. Air taxi operations are included with the general aviation forecasts. No all-cargo operations were forecasted, based on a review of cargo opportunities at Daytona Beach. Cargo is projected to be limited to belly cargo on air carrier operations and some air taxi operations. The bottom-up approach to the passenger forecast provides forecasts for 2005, 2010, and 2020. Due to the long-term nature of the forecast, two cases provide forecasts based on different assumptions.

3.2.1 Air Passenger Traffic Forecasts

To review the historical trend in passenger traffic at Daytona Beach, calendar year data from the airport records are provided in **Table 3.10**. As with the fiscal year totals, annual enplanements have fluctuated greatly over the past 20 years. The lowest annual volume occurred in 1982 with 241,053 total enplanements, and the peak year occurred in 1990 with 530,895 total enplanements. There were 272,105 total enplanements in 2000. Annual enplanements have hit a recent low for the 12 months ending June 2000, but traffic has been increasing since this low point. Delta Connection carrier Atlantic Southeast regional jets replaced some of the mainline Delta flights in mid 1999, and this has contributed towards the recent decline in passengers at Daytona Beach. However, both Continental and Continental Express have increased capacity in late 2000 and JetBlue is also considering serving Daytona Beach from its hub at New York-Kennedy. Comair has also scheduled new weekend operations for Daytona Beach for the summer of 2001.

As Delta is currently and is expected to remain the largest carrier at Daytona Beach, a review of Delta's fleet, its current aircraft and orders for new aircraft, is in order. **Table 3.11** shows that Delta has many additional regional jets on order. Out of a

Table 3.10

DAYTONA BEACH INTERNATIONAL AIRPORT

Historical Passenger Enplanements by Aircraft Type in Daytona Beach

Calendar Year	Annual Passenger Enplanements				Percent Distribution of Annual Enplanements			
	Air Carrier Jets	Regional Jets	Regional Turboprops	All Aircraft Types	Air Carrier Jets	Regional Jets	Regional Turboprops	All Aircraft Types
1980	379,472	-	-	379,472	100.0%	0.0%	0.0%	100.0%
1981	286,946	-	511	287,457	99.8%	0.0%	0.2%	100.0%
1982	233,400	-	7,653	241,053	96.8%	0.0%	3.2%	100.0%
1983	245,442	-	10,897	256,339	95.7%	0.0%	4.3%	100.0%
1984	236,512	-	8,810	245,322	96.4%	0.0%	3.6%	100.0%
1985	238,664	-	3,292	241,956	98.6%	0.0%	1.4%	100.0%
1986	294,882	-	11,137	306,019	96.4%	0.0%	3.6%	100.0%
1987	366,407	-	749	367,156	99.8%	0.0%	0.2%	100.0%
1988	420,212	-	6,644	426,856	98.4%	0.0%	1.6%	100.0%
1989	423,740	-	4,584	428,324	98.9%	0.0%	1.1%	100.0%
1990	518,022	-	12,873	530,895	97.6%	0.0%	2.4%	100.0%
1991	421,773	-	38,560	460,333	91.6%	0.0%	8.4%	100.0%
1992	447,981	-	28,764	476,745	94.0%	0.0%	6.0%	100.0%
1993	413,135	-	29,111	442,246	93.4%	0.0%	6.6%	100.0%
1994	409,233	-	19,908	429,141	95.4%	0.0%	4.6%	100.0%
1995	366,903	-	12,583	379,486	96.7%	0.0%	3.3%	100.0%
1996	400,193	-	2,070	402,263	99.5%	0.0%	0.5%	100.0%
1997	392,939	-	-	392,939	100.0%	0.0%	0.0%	100.0%
1998	313,121	-	-	313,121	100.0%	0.0%	0.0%	100.0%
1999	253,995	26,892	3,236	284,123	89.4%	9.5%	1.1%	100.0%
2000	216,582	51,500	4,023	272,105	79.6%	18.9%	1.5%	100.0%

Source: Daytona Beach International Airport & HNTB Analysis

Table 3.11

DAYTONA BEACH INTERNATIONAL AIRPORT

Delta Aircraft Fleet as of December 31, 2000 and Future Delivery Schedule and Options

Aircraft Type	In Fleet on Dec. 31, 2000	Total Firm Orders	Total Options
Boeing 727-200	95	-	-
Boeing 737-200	54	-	-
Boeing 737-300	26	-	-
Boeing 737-600/700/800	40	92	60
Boeing 757-200	118	3	20
Boeing 767-200	15	-	-
Boeing 767-300	28	-	-
Boeing 767-300ER	57	2	11
Boeing 767-400	12	9	24
Boeing 777-200	7	6	20
Lockheed L1011	15	-	-
McDonnell Douglas MD-11	15	-	-
McDonnell Douglas MD-88	120	-	-
McDonnell Douglas MD-90	16	-	-
Embraer EMB-120	62	-	-
Aerospatiale ATR-72	19	-	-
Canadair CRJ-100/200	140	147	231
Canadair CRJ-700	-	57	165
Total	839	316	531

Source: Delta website on 4/17/01

total of 809 aircraft in the Delta fleet as of June 30, 1999, there were a total of 132 Canadair Regional Jets (CRJs). Delta has firm orders for an additional 160 CRJs and 146 mainline jets as of June 30, 1999. In addition, there are options for an additional 396 CRJs and 135 mainline jets. As these orders and options indicate, Delta plans to acquire many new regional jets in the future. Based on both these orders and the scheduling trends noted previously, it is very likely that Delta will continue to add regional jets in Daytona Beach and other comparable markets.

Other noticeable trends in airline fleets include the declining role of 19 seat turboprops in Florida and throughout the nation. Daytona Beach has had turboprop commuter service in the past, and there has been some interest by carriers flying these aircraft to potentially serve the airport. Based on the recent trends, though, this service is not likely to be in existence in 2005 and later. **Table 3.12** shows that the popular 19 seat turboprops Beechcraft 1900s, Jetstream 31s, and Swearingen Metros have experienced a decline in annual aircraft departures throughout the nation from 1.8 million in 1994 to only 0.8 million in 2000. **Table 3.13** shows that annual aircraft departures in Florida by these 3 aircraft have dropped from 104,136 departures in 1994 to 80,169 departures in 2000. Intrastate departures within Florida have declined from 95,331 departures in 1994 to only 66,176 departures in 2000. **Table 3.14** provides the trend of 19 seat turboprop departures by individual airport in Florida. Daytona Beach, Melbourne, Sarasota, and St. Petersburg have all lost service by these aircraft over the past six years, and many other airports have seen declines as well. An increase in departures from Florida airports to the Bahamas has partially offset some of the decline in intrastate service, but as competitive pressures increase on the 19 seat operators, it is forecast that their declining presence will continue into the future.

Intrastate air service in Florida changed dramatically during the 1990s. As shown in **Table 3.15**, combined American and American Eagle intra-Florida service has increased from 2.2 million scheduled seat departures in 1994 to 2.6 million scheduled seat departures in 2000. However, combined Delta and Delta Connection intra-Florida service declined dramatically from 4.2 million scheduled seat departures in 1994 to only 1.5 million scheduled seat departures in 2000. The April 2001 decision by Comair to retire its Embraer 120 fleet will impact the Orlando hub operation entirely, as the Cincinnati hub is now all regional jet.

Similarly, US Airways and US Airways Express have also reduced their scheduled seat departures in intra-Florida service from 4.4 million in 1994 to only 1.7 million in 2000. Continental and Continental Express/Connection have dropped their intra-Florida service from 2.8 million seat departures in 1994 to 0.9 million seat departures in 2000. Southwest Airlines has been primarily responsible for causing these dramatic reductions in intra-Florida service by the Delta, Continental, and US Airways carrier groups. After entering Florida in 1996, Southwest has increased its intra-Florida service to 2.4 million scheduled seat departures in 2000. With West Palm Beach service that began in January 2001, as well as other additions to its intrastate service, Southwest will overtake American/American

Table 3.12

DAYTONA BEACH INTERNATIONAL AIRPORT

Annual Scheduled Aircraft Departures by Popular 19 Seat Turboprop Commuter Aircraft by US Region 1994-2000

	1994	1995	1996	1997	1998	1999	2000
Scheduled Beechcraft 1900 Aircraft Departures by US Region							
Northeast (CT, ME, MA, NH, NJ, NY, PA, RI, VT)	220,056	269,259	264,001	234,121	221,297	184,984	154,091
South Atlantic (DC, FL, GA, MD, NC, SC, VA, WV)	71,074	117,210	154,993	135,073	144,387	149,466	121,241
South Central (AL, AR, KY, LA, MS, OK, TN, TX)	28,062	31,976	39,898	46,917	49,734	40,102	25,087
Midwest (IL, IN, IA, KS, MI, MN, NE, ND, OH, SD, WI)	275,832	250,895	231,883	219,911	213,561	201,525	173,762
West (AZ, CA, CO, ID, MT, NV, NM, OR, UT, WA, WY)	218,322	211,548	201,895	191,452	125,822	106,757	110,998
Total in Continental USA	813,346	880,888	892,670	827,474	754,801	682,834	585,179
Scheduled Jetstream 31 Aircraft Departures by US Region							
Northeast (CT, ME, MA, NH, NJ, NY, PA, RI, VT)	74,823	58,421	44,296	43,391	41,072	34,768	18,661
South Atlantic (DC, FL, GA, MD, NC, SC, VA, WV)	121,478	95,537	85,381	91,598	113,138	112,725	94,829
South Central (AL, AR, KY, LA, MS, OK, TN, TX)	72,146	63,750	34,684	30,619	16,545	6,247	4,570
Midwest (IL, IN, IA, KS, MI, MN, NE, ND, OH, SD, WI)	139,773	130,223	122,035	119,684	97,004	91,194	42,641
West (AZ, CA, CO, ID, MT, NV, NM, OR, UT, WA, WY)	211,550	192,897	144,385	110,330	59,805	37,392	11,629
Total in Continental USA	619,770	540,828	430,781	395,622	327,564	282,326	172,330
Scheduled Swearingen Metro Aircraft Departures by US Region							
Northeast (CT, ME, MA, NH, NJ, NY, PA, RI, VT)	27,247	1,496	1,300	70	-	-	-
South Atlantic (DC, FL, GA, MD, NC, SC, VA, WV)	25,345	19,020	6,669	-	-	-	-
South Central (AL, AR, KY, LA, MS, OK, TN, TX)	51,601	39,953	35,840	27,912	24,495	18,229	20,437
Midwest (IL, IN, IA, KS, MI, MN, NE, ND, OH, SD, WI)	93,524	82,513	60,869	10,619	714	1,062	939
West (AZ, CA, CO, ID, MT, NV, NM, OR, UT, WA, WY)	203,408	174,625	101,460	39,499	18,034	19,623	21,859
Total in Continental USA	401,125	317,607	206,138	78,100	43,243	38,914	43,235
Scheduled Beechcraft 1900, Jetstream 31, and Swearingen Metro Aircraft Departures by US Region							
Northeast (CT, ME, MA, NH, NJ, NY, PA, RI, VT)	322,126	329,176	309,597	277,582	262,369	219,752	172,752
South Atlantic (DC, FL, GA, MD, NC, SC, VA, WV)	217,897	231,767	247,043	226,671	257,525	262,191	216,070
South Central (AL, AR, KY, LA, MS, OK, TN, TX)	151,809	135,679	110,422	105,448	90,774	64,578	50,094
Midwest (IL, IN, IA, KS, MI, MN, NE, ND, OH, SD, WI)	509,129	463,631	414,787	350,214	311,279	293,781	217,342
West (AZ, CA, CO, ID, MT, NV, NM, OR, UT, WA, WY)	633,280	579,070	447,740	341,281	203,661	163,772	144,486
Total in Continental USA	1,834,241	1,739,323	1,529,589	1,301,196	1,125,608	1,004,074	800,744

Source: Official Airline Guide via BACK Information Services

Table 3.13

DAYTONA BEACH INTERNATIONAL AIRPORT

Annual Scheduled Aircraft Departures from Florida by Popular 19 Seat Turboprop Commuter Aircraft 1994-2000

	1994	1995	1996	1997	1998	1999	2000
Scheduled Beechcraft 1900 Aircraft Departures from Florida							
from Florida to another airport in Florida	49,884	67,763	83,630	81,815	100,705	92,392	66,176
from Florida to another state (GA, NC, SC, AL, TN, LA)	2,843	2,876	4,405	2,694	1,220	981	981
from Florida to Bahamas	1,929	3,545	7,125	8,916	14,558	13,757	13,012
Total Departures from Florida	54,656	74,184	95,160	93,425	116,483	107,130	80,169
Scheduled Jetstream 31 Aircraft Departures from Florida							
from Florida to another airport in Florida	26,698	283	-	-	-	-	-
from Florida to another state (GA, NC, SC, AL, TN, LA)	13	550	-	539	7	-	-
from Florida to Bahamas	3,400	385	-	-	-	-	-
Total Departures from Florida	30,111	1,218	-	539	7	-	-
Scheduled Swearingen Metro Aircraft Departures from Florida							
from Florida to another airport in Florida	18,749	17,817	5,679	-	-	-	-
from Florida to another state (GA, NC, SC, AL, TN, LA)	27	-	-	-	-	-	-
from Florida to Bahamas	593	522	325	-	-	-	-
Total Departures from Florida	19,369	18,339	6,004	-	-	-	-
Scheduled Beechcraft 1900, Jetstream 31, and Swearingen Metro Aircraft Departures from Florida							
from Florida to another airport in Florida	95,331	85,863	89,309	81,815	100,705	92,392	66,176
from Florida to another state (GA, NC, SC, AL, TN, LA)	2,883	3,426	4,405	3,233	1,227	981	981
from Florida to Bahamas	5,922	4,452	7,450	8,916	14,558	13,757	13,012
Total Departures from Florida	104,136	93,741	101,164	93,964	116,490	107,130	80,169

Source: Official Airline Guide via BACK Information Services

Table 3.14

DAYTONA BEACH INTERNATIONAL AIRPORT

Annual Scheduled Aircraft Departures from Individual Florida Airports by Popular 19 Seat Turboprop Commuter Aircraft 1994-2000

	1994	1995	1996	1997	1998	1999	2000
Scheduled Beechcraft 1900, Jetstream 31, and Swearingen Metro Aircraft Departures from Florida							
Daytona Beach	2,215	2,050	510	-	-	-	-
Fort Myers	4,515	3,091	3,045	985	2,057	2,206	2,051
Fort Walton Beach	2,341	2,540	2,106	2,078	2,049	2,288	2,532
Ft. Lauderdale	2,293	3,081	8,007	8,154	11,021	9,631	11,033
Gainesville	1,479	2,251	1,797	2,228	2,368	1,346	648
Jacksonville	5,500	5,218	9,290	6,760	3,356	2,129	2,028
Key West	3,469	3,101	4,142	6,470	11,422	11,840	7,098
Marathon	2,390	987	1,813	1,660	119	-	16
Melbourne	4,087	2,300	827	77	-	-	-
Miami	15,092	10,744	10,470	16,750	27,634	24,600	14,320
Naples	4,583	4,027	3,859	1,670	1,660	1,734	1,606
Orlando	27,784	22,449	14,176	12,109	14,423	11,605	7,461
Panama City	5,172	4,780	4,509	4,521	3,706	2,527	2,529
Pensacola	3,403	4,001	3,759	3,163	2,069	1,962	1,962
Sarasota	3,278	1,892	1,046	-	-	-	-
St. Petersburg	1,059	1,091	-	-	-	-	-
Tallahassee	2,879	3,248	4,632	4,261	3,840	4,599	4,141
Tampa	8,218	11,721	19,192	16,337	23,322	23,701	17,472
West Palm Beach	4,379	5,169	7,984	6,741	7,444	6,962	5,272
Florida Total	104,136	93,741	101,164	93,964	116,490	107,130	80,169

Source: Official Airline Guide via BACK Information Services

Table 3.15

DAYTONA BEACH INTERNATIONAL AIRPORT

Annual Scheduled Seat Departures in Intra-Florida Markets by Major Intra-Florida Carriers 1994-2000

Scheduled Seat Departures By Carrier

	1994	1995	1996	1997	1998	1999	2000
American Airlines	610,498	552,118	620,248	500,938	475,969	610,053	982,968
American Eagle	1,609,634	2,245,391	1,828,974	1,703,176	1,854,242	1,783,988	1,587,504
American total	2,220,132	2,797,509	2,449,222	2,204,114	2,330,211	2,394,041	2,570,472
Continental Airlines	2,563,860	895,468	65,796	58,962	89,743	92,098	23,673
Continental Express/Connection	244,260	431,109	262,770	585,699	847,438	942,604	853,758
Continental total	2,808,120	1,326,577	328,566	644,661	937,181	1,034,702	877,431
Delta Air Lines/Delta Express	2,796,933	1,598,734	1,085,254	1,260,403	1,181,902	727,937	314,160
Delta Connection	1,379,711	1,603,433	1,418,091	1,111,860	1,096,310	1,110,410	1,216,490
Delta total	4,176,644	3,202,167	2,503,345	2,372,263	2,278,212	1,838,347	1,530,650
US Airways	2,089,873	501,778	-	-	-		-
US Airways Express	2,319,128	2,723,110	2,706,797	2,518,641	2,072,924	1,671,726	1,694,633
US Airways total	4,409,001	3,224,888	2,706,797	2,518,641	2,072,924	1,671,726	1,694,633
Southwest Airlines	-	-	1,208,574	2,115,267	2,167,906	2,270,954	2,434,486
Total Major Intra-Florida Carriers	13,613,897	10,551,141	9,196,504	9,854,946	9,786,434	9,209,770	9,107,672

Source: Official Airline Guide via BACK Information Services

Eagle as the largest intra-Florida carrier in 2001. Based on these intra-Florida trends, there will most likely be no potential growth in intra-Florida service by the Continental, Delta or US Airways carrier groups. In fact, further declines in their intra-Florida service will probably occur as Southwest increases its route network in Florida. Small commuter aircraft have higher unit costs per seat mile than Southwest's Boeing 737s, and it is difficult for these commuter airlines to compete effectively on routes where the majority of traffic is flying on low fares.

In forecasting passenger enplanements for 2005, 2010, and 2020 using a bottom-up method, the nearby hubs of various carriers were reviewed. American's Miami hub has remained fairly steady in combined scheduled seat departures for American and American Eagle from 1995 to 2000, with 12.9 million seat departures scheduled in 1995 growing to 13.1 million seat departures scheduled in 2000. Scheduled aircraft departures have declined from 106,394 in 1995 to 94,399 in 2000, as average aircraft size has increased from 121.1 seats per aircraft departure in 1995 to 138.8 seats per aircraft departure in 2000. Based on the forecasted growth in this hub in the future and the increasing numbers of Embraer 145 regional jets in the American Eagle fleet, there is a strong chance that, as this hub grows, more intra-Florida service will result. **Table 3.16** provides details on American's Miami hub.

Delta's Atlanta hub has grown significantly over the past few years, which has helped Atlanta become the world's busiest airport. Total combined Delta and Delta Connection scheduled seat departures grew from 32.2 million in 1994 to 44.1 million in 2000. Scheduled aircraft departures have increased as well, from 245,888 in 1994 to 301,891 in 2000. Similar to American's Miami hub, average aircraft size has increased from 131.1 seats per aircraft departure in 1994 to 146.0 seats per aircraft departure in 2000. Based on the forecasted growth at this hub in the future and the increasing numbers of Canadair Regional Jets (CRJs) in the fleet of Delta Connection carriers, there is a strong chance that, as this hub grows, there will be many more regional jet flights at the Atlanta hub. **Table 3.17** provides complete details on trends at Delta's Atlanta hub from 1994 to 2000.

US Airways has a major hub in Charlotte, and scheduled seat departures have increased from 16.3 million in 1994 to 17.0 million in 2000. This hub has provided service to Daytona Beach in the past, and it could also potentially serve Daytona Beach once again in the future. **Table 3.18** provides complete details on trends at the Charlotte hub of US Airways. There has been an introduction of regional jets in Charlotte, but the current pending merger with United will probably delay consideration of new route developments until the business strategy can be fully developed and implemented.

The passenger enplanement forecast for Daytona Beach depends not only on the developments in air service at the airport, but also on developments in air service at neighboring airports, especially those at Orlando International, the closest and largest competitor.

Base Case Forecast

The following assumptions were used for the base case forecast:

Table 3.16

DAYTONA BEACH INTERNATIONAL AIRPORT

American Airlines and American Eagle Annual Scheduled Seat and Aircraft Departures by Equipment Type in Miami 1994-2000

Equipment Type	Annual Scheduled Seat Departures							Seats per Aircraft	Annual Scheduled Aircraft Departures						
	1994	1995	1996	1997	1998	1999	2000		1994	1995	1996	1997	1998	1999	2000
Aerospatiale ATR	271,676	600,944	346,932	465,842	116,334	140,760	653,568	46	5,906	13,064	7,542	10,127	2,529	3,060	14,208
Aerospatiale ATR 72	-	-	-	23,256	570,744	666,216	579,496	72	-	-	-	323	7,927	9,253	8,049
Airbus A300	1,732,800	1,969,920	1,971,840	1,782,720	1,940,736	1,694,016	269,952	192	9,025	10,260	10,270	9,285	10,108	8,823	1,406
Airbus A330	-	-	-	-	-	21,440	-	268	-	-	-	-	-	80	-
Airbus A330-600	-	-	-	-	-	-	1,552,960	230							6,752
Airbus A340	-	-	-	-	-	9,756	-	271	-	-	-	-	-	36	-
Boeing 727-200	3,671,550	4,119,300	4,014,450	3,725,100	4,062,900	3,972,150	3,443,850	150	24,477	27,462	26,763	24,834	27,086	26,481	22,959
Boeing 737	-	-	-	16,400	3,000	-		100	-	-	-	164	30	-	-
Boeing 737-800	-	-	-	-	-	-	587,212	146							4,022
Boeing 747	-	-	-	-	5,434	-	4,896	408	-	-	-	-	13	-	12
Boeing 747-400	-	-	3,696	-	-	-	-	462	-	-	8	-	-	-	-
Boeing 757	1,868,156	2,202,044	3,084,140	2,888,996	2,703,064	3,290,376	3,180,584	188	9,937	11,713	16,405	15,367	14,378	17,502	16,918
Boeing 767-200	340,560	270,728	102,340	215,000	155,316	184,556	-	172	1,980	1,574	595	1,250	903	1,073	-
Boeing 767-200	-	-	-	-	-	-	64,845	165							393
Boeing 767-300	805,230	768,177	953,028	785,979	864,639	934,591	1,020,510	207	3,890	3,711	4,604	3,797	4,177	4,515	4,930
Boeing 777	-	-	-	-	-	-	232,023	237	-	-	-	-	-	-	979
British Aerospace Jetstream 31	189,145	3,287	-	-	-	-	-	19	9,955	173	-	-	-	-	-
Embraer 145	-	-	-	-	600	6,800	19,700	50	-	-	-	-	12	136	394
McDonnell Douglas DC10	451,968	388,080	308,352	112,464	99,792	8,448	4,496	264	1,712	1,470	1,168	426	378	32	17
McDonnell Douglas MD11	458,235	465,120	374,595	372,555	214,965	294,525	174,280	255	1,797	1,824	1,469	1,461	843	1,155	683
McDonnell Douglas MD80	973,695	1,177,469	733,086	1,181,917	1,286,028	1,027,766	1,166,349	139	7,005	8,471	5,274	8,503	9,252	7,394	8,391
Saab Fairchild 340	603,194	609,144	812,158	787,576	760,512	590,920	145,724	34	17,741	17,916	23,887	23,164	22,368	17,380	4,286
Short Bros. 360	72,864	315,216	128,592	-	-	-	-	36	2,024	8,756	3,572	-	-	-	-
Total	11,439,073	12,889,429	12,833,209	12,357,805	12,784,064	12,842,320	13,100,445		95,449	106,394	101,557	98,701	100,004	96,920	94,399
Average Seats per Departure	119.8	121.1	126.4	125.2	127.8	132.5	138.8								

Source: Official Airline Guide via BACK Associates

Table 3.17

DAYTONA BEACH INTERNATIONAL AIRPORT

Delta Air Lines and Delta Connection Annual Scheduled Seat and Aircraft Departures by Equipment Type in Atlanta 1994-2000

Equipment Type	Annual Scheduled Seat Departures							Seats per Aircraft	Annual Scheduled Aircraft Departures						
	1994	1995	1996	1997	1998	1999	2000		1994	1995	1996	1997	1998	1999	2000
Aerospatiale ATR 72	192,984	353,562	594,726	1,007,358	1,092,696	1,108,404	1,544,862	66	2,924	5,357	9,011	15,263	16,556	16,794	23,407
Airbus A310	42,525	19,075	-	-	-	-	-	175	243	109	-	-	-	-	-
Boeing 727-200	4,012,488	4,776,180	4,658,052	6,152,178	7,183,590	6,304,116	5,444,311	138	29,076	34,610	33,754	44,581	52,055	45,682	39,452
Boeing 737-200	2,671,469	2,610,265	2,208,373	1,290,206	1,010,615	356,203	311,049	107	24,967	24,395	20,639	12,058	9,445	3,329	2,907
Boeing 737-300	128	128	-	-	326,912	1,174,912	1,131,776	128	1	1	-	-	2,554	9,179	8,842
Boeing 737-800	-	-	-	-	98,280	998,100	1,328,404	180	-	-	-	-	546	5,545	7,380
Boeing 747 Combi	265	-	-	-	-	-	-	265	1	-	-	-	-	-	-
Boeing 757	5,020,380	5,544,540	6,685,920	7,284,060	6,872,760	7,808,940	9,394,020	180	27,891	30,803	37,144	40,467	38,182	43,383	52,189
Boeing 767	1,160,352	1,033,464	1,470,024	1,415,964	1,369,656	1,487,160	1,388,832	204	5,688	5,066	7,206	6,941	6,714	7,290	6,808
Boeing 767-300	2,885,448	2,661,780	2,635,838	3,006,656	3,658,040	4,677,844	4,630,665	218	13,236	12,210	12,091	13,792	16,780	21,458	21,242
Boeing 767-400	-	-	-	-	-	-	195,730								
Boeing 777	-	-	-	-	-	199,424	628,120	304	-	-	-	-	-	656	2,066
British Aerospace 146	-	48,535	666,145	566,440	22,610	-	-	85	-	571	7,837	6,664	266	-	-
Canadair Regional Jet	-	-	-	42,700	721,500	1,494,650	1,724,550	50	-	-	-	854	14,430	29,893	34,491
De Havilland Dash 7	56,000	-	-	-	-	-	-	50	1,120	-	-	-	-	-	-
Embraer 120 Brasilia	1,685,820	1,656,120	1,474,530	1,330,590	1,175,700	1,003,380	855,510	30	56,194	55,204	49,151	44,353	39,190	33,446	28,517
Lockheed L1011	3,287,874	3,787,684	3,526,454	4,549,328	5,005,348	4,293,232	2,400,296	302	10,887	12,542	11,677	15,064	16,574	14,216	7,948
Lockheed L1011-500 TriStar	897,288	900,340	1,002,582	482,652	213,422	-	-	218	4,116	4,130	4,599	2,214	979	-	-
McDonnell Douglas MD11	103,168	176,824	347,448	496,496	631,904	579,576	727,376	248	416	713	1,401	2,002	2,548	2,337	2,933
McDonnell Douglas MD80	10,231,384	10,073,054	11,058,818	11,460,394	11,383,998	11,657,348	12,370,614	142	72,052	70,937	77,879	80,707	80,169	82,094	87,117
McDonnell Douglas MD90	-	48,900	450	150	150	150	-	150	-	326	3	1	1	1	-
Total	32,247,573	33,690,451	36,329,360	39,085,172	40,767,181	43,143,439	44,076,115		245,888	251,617	263,381	269,698	280,433	298,509	301,891
Average Seats per Departure	131.1	133.9	137.9	144.9	145.4	144.5	146.0								

Source: Official Airline Guide via BACK Associates

Table 3.18

DAYTONA BEACH INTERNATIONAL AIRPORT

US Airways and US Airways Express Annual Scheduled Seat and Aircraft Departures by Equipment Type in Charlotte 1994-2000

	Annual Scheduled Seat Departures							Seats per	Annual Scheduled Aircraft Departures						
Equipment Type	1994	1995	1996	1997	1998	1999	2000	Aircraft	1994	1995	1996	1997	1998	1999	2000
Airbus A319	-	-	-	-	57,000	501,720	1,413,840	120	-	-	-	-	475	4,181	11,782
Airbus A320	-	-	-	-	-	104,112	441,762	144	-	-	-	-	-	723	3,068
Boeing 727-200	473,838	261,381	-	-	-	-	-	151	3,138	1,731	-	-	-	-	-
Boeing 737-200	2,371,820	1,035,650	1,149,170	2,209,790	2,411,090	1,304,380	1,308,120	110	21,562	9,415	10,447	20,089	21,919	11,858	11,892
Boeing 737-300	2,737,098	2,853,396	2,701,818	3,184,272	3,409,812	3,207,960	3,371,256	126	21,723	22,646	21,443	25,272	27,062	25,460	26,756
Boeing 737-400	2,247,984	2,370,672	2,625,840	2,610,144	3,030,048	2,659,824	2,874,096	144	15,611	16,463	18,235	18,126	21,042	18,471	19,959
Boeing 757	775,684	1,368,458	1,485,120	1,335,880	1,016,834	1,187,186	1,620,346	182	4,262	7,519	8,160	7,340	5,587	6,523	8,903
Boeing 767	292,523	251,517	248,675	204,015	117,131	115,304	251,517	203	1,441	1,239	1,225	1,005	577	568	1,239
British Aerospace Jetstream J31	261,364	242,440	245,442	269,952	381,406	314,925	268,223	19	13,756	12,760	12,918	14,208	20,074	16,575	14,117
Canadair Regional Jet	-	-	-	-	99,550	122,450	89,300	50	-	-	-	-	1,991	2,449	1,786
De Havilland Dash 8	904,280	812,335	814,296	915,861	1,112,183	1,235,578	1,300,498	37	24,440	21,955	22,008	24,753	30,059	33,394	35,149
Dornier 328	-	30,537	45,008	44,950	42,398	47,705	51,475	29	-	1,053	1,552	1,550	1,462	1,645	1,775
Embraer 120 Brasilia	20,130	44,100	40,440	40,470	23,520	-	-	30	671	1,470	1,348	1,349	784	-	-
Fokker F100	1,887,426	1,637,457	1,473,042	1,849,014	1,869,578	2,652,756	2,432,081	97	19,458	16,881	15,186	19,062	19,274	27,348	25,073
Fokker F28	791,588	847,008	917,524	292,332	-	-	-	68	11,641	12,456	13,493	4,299	-	-	-
McDonnell Douglas DC9-30/40/50	2,158,262	2,790,579	2,228,199	1,345,489	824,927	699,885	474,624	103	20,954	27,093	21,633	13,063	8,009	6,795	4,608
McDonnell Douglas MD80	932,230	1,356,952	1,800,986	1,569,668	1,581,596	1,242,358	1,088,998	142	6,565	9,556	12,683	11,054	11,138	8,749	7,669
Short Bros. 360	459,288	448,164	425,520	302,760	3,852	-	-	36	12,758	12,449	11,820	8,410	107	-	-
Total	16,313,515	16,350,646	16,201,080	16,174,597	15,980,925	15,396,143	16,986,136		177,980	174,686	172,151	169,580	169,560	164,739	173,775
Average Seats per Departure	91.7	93.6	94.1	95.4	94.2	93.5	97.7								

Source: Official Airline Guide via BACK Associates

There are no constraints on any operations or traffic volumes.

1) Regional jets will continue to increase their market share of Daytona Beach traffic.
2) Orlando International will remain unconstrained and continue to grow its air service as airlines continue to compete vigorously on airfares at this neighboring airport.
3) Jacksonville will remain unconstrained and continue to grow its air service as airlines compete on airfares at this airport as well.

Table 3.19 provides the details on the base case passenger forecast for Daytona Beach. As enplanements have increased for the last half of 2000 and Continental has added capacity, the trend at Daytona Beach has recently been positive after a long period of decline. This positive trend is expected to continue, and passenger traffic is projected to grow to roughly 400,000 annual enplanements by 2020. This level of enplanements was most recently exceeded as recently as 1996 when there were 402,263 enplanements at the airport. Annual passenger traffic volumes of 290,000 enplanements in 2005 and 330,000 enplanements in 2010 are projected as traffic gradually grows to the 400,000 enplanements forecast for 2020. While the total enplanement level is projected to grow once again, though, the share of total Florida enplanements generated in Daytona Beach will decline. In 1980, the 379,472 Daytona Beach enplanements represented 1.49 percent of the Florida total. By 1995, the 379,486 Daytona Beach enplanements represented a significantly smaller 0.81 percent of the Florida total. In 2000, the 268,082 enplanements represented about 0.45 percent of the Florida total. The enplanement forecasts for 2005, 2010, and 2020 represent about 0.38 percent, 0.36 percent, and 0.32 percent of the Florida totals for each of these years respectively.

With the increasing numbers of regional jets in the carrier fleets, especially the Delta fleet, it is also projected that there will be increasing levels of regional jet operations in Daytona Beach. Daytona Beach has a market size that is well suited to Delta Connection regional jets. In addition to Delta Connection regional jet service, Daytona Beach has also recently attracted regional jet service from Continental Express. Comair has also announced new regional jet service to Daytona Beach that is scheduled to begin in the summer of 2001. Based on both the local and national trends, regional jets are projected to enplane 25 percent of the airport's travelers in 2005, 30 percent of passengers in 2010, and 35 percent of travelers in 2020. The specific routes will consist of flights to the hubs of various carriers. The remaining passengers will continue to be served with air carrier jets, and it is not anticipated that turboprops will reappear at the airport.

Table 3.20 provides the average enplanements per departure by aircraft type for the base case. From a base of 104.1 average enplanements per air carrier jet departure for the 12 months ending August 2000, air carrier jet departures are projected to average 99.3 enplanements in 2005, 105.5 enplanements in 2010, and 118.7 enplanements in 2020. From a base of 46.7 average enplanements per regional jet departures for the 12 months ending August 2000, regional jet departures are projected to average 39.7 enplanements in 2005, 38.7

Table 3.19

DAYTONA BEACH INTERNATIONAL AIRPORT

Passenger Enplanement Forecasts by Aircraft Type - Base Case

Calendar Year	Annual Passenger Enplanements in Daytona Beach: Air Carrier Jets	Regional Jets	Regional Turboprops	All Aircraft Types	Total Annual Passenger Enplanements in Florida (a)	Daytona Beach Enplanements as Percent of Florida Total (b)		Percent Distribution of Daytona Beach Enplanements: Air Carrier Jets	Regional Jets	Regional Turboprops	All Aircraft Types
Historical Enplanements											
1980	379,472	-	-	379,472	25,487,605	1.49%		100.0%	0.0%	0.0%	100.0%
1985	238,664	-	3,292	241,956	28,911,784	0.84%		98.6%	0.0%	1.4%	100.0%
1990	518,022	-	12,873	530,895	40,242,636	1.32%		97.6%	0.0%	2.4%	100.0%
1995	366,903	-	12,583	379,486	47,045,163	0.81%		96.7%	0.0%	3.3%	100.0%
2000	216,582	51,500	-	268,082	59,330,713	0.45%		80.8%	19.2%	0.0%	100.0%
Forecasted Enplanements											
2005	217,500	72,500	-	290,000	75,429,692	0.38%		75.0%	25.0%	0.0%	100.0%
2010	231,000	99,000	-	330,000	91,382,106	0.36%		70.0%	30.0%	0.0%	100.0%
2020	260,000	140,000	-	400,000	126,000,000	0.32%		65.0%	35.0%	0.0%	100.0%

(a) FAA Terminal Area Forecast of December 2000 for 2005 and 2010 is provided (TAF for 2015 is 107.3 million, HNTB estimate for 2020).

(b) FAA Terminal Area Forecast of December 2000 projects 282,265 annual enplanements from 1999 to 2015. Base case assumes that total annual enplanements will decline to 0.38 percent of total Florida in 2005, 0.36 percent in 2010 and 0.32 percent in 2020. Daytona Beach enplanements as percent of total Florida enplanements have ranged between 0.45 percent currently to 1.49 percent in 1980, so these projected market shares are well below historical shares.

Source: Table 3.8 and HNTB Analysis

Table 3.20

DAYTONA BEACH INTERNATIONAL AIRPORT

Passenger Aircraft Departures Forecasts by Aircraft Type - Base Case

Year	Annual Passenger Enplanements				Passenger Aircraft Departures				Average Enplanements per Departure			
	Air Carrier Jets	Regional Jets	Regional Turboprops	All Aircraft Types	Air Carrier Jets	Regional Jets	Regional Turboprops	All Aircraft Types	Air Carrier Jets	Regional Jets	Regional Turboprops	All Aircraft Types
Historical												
09/99-08/00	212,579	51,312	-	263,891	2,042	1,098	-	3,140	104.1	46.7	0.0	84.0
Forecasted												
2005	217,500	72,500	-	290,000	2,190	1,825	-	4,015	99.3	39.7	0.0	72.2
2010	231,000	99,000	-	330,000	2,190	2,555	-	4,745	105.5	38.7	0.0	69.5
2020	260,000	140,000	-	400,000	2,190	3,650	-	5,840	118.7	38.4	0.0	68.5

Source: Tables 3.8 and 3.19, and HNTB Analysis

enplanements in 2010, and 38.4 enplanements in 2020.

Table 3.21 provides the fleet mix forecast for the base case. Air carrier jet departures are projected to average six daily departures for 2005, 2010, and 2020. The growth in traffic will be absorbed by increases in average air carrier aircraft size and numbers of regional jet departures. Regional jet departures are projected to increase to five daily departures in 2005, seven daily departures in 2010, and ten daily departures in 2020.

The peaking characteristics for the base case are presented in **Table 3.22**. Air carrier departures are projected to peak at two per peak hour for 2005, 2010, and2020, while regional jet departures are projected to peak at two per peak hour in 2005 and 2010, and three in 2020. Peak hour operations for air carrier jets will stay steady at three per peak hour, and there will be three, four, and five regional jet operations during the peak hour in 2005, 2010, and 2020 respectively.

Peak hour enplanements on air carrier jets are projected to increase from 234 enplanements in 2005 to 248 enplanements in 2010 and 280 enplanements in 2020. Peak hour total passengers on air carrier jets are projected to increase from 351 passengers in 2005 to 373 passengers in 2010 and 419 passengers in 2020. Peak hour enplanements on regional jets are projected to be 94 enplanements in 2005, 91 enplanements in 2010, and 135 enplanements in 2020. Peak hour total passengers on regional jets are projected to grow from 140 in 2005 to 182 in 2010 and 226 in 2020.

High Case Forecast

The following assumptions were used for the high case forecast:

1) There are no constraints on any operations or traffic volumes.
2) Daytona Beach will reverse its course in share of Florida traffic, and by 2020 it will have 0.60 percent of total enplanements. This share is lower than the 0.84 percent share in 1985 and 0.81 percent share in 1995 and significantly lower than the shares of 1.49 percent in 1980 and 1.32 in 1990.
3) The Daytona Beach market will grow as a result of both increases in business and leisure traffic. Business traffic will grow as the I-4 corridor builds and ground transportation to Orlando International gets more and more congested. Leisure traffic will grow as Volusia County targets a more affluent tourist base and more visitors travel by air to vacation at new planned resort developments.
4) There will be added financial incentives to airlines to serve Daytona Beach from various sources, including the airport itself.

Table 3.23 provides the details on the high case passenger forecast for Daytona Beach. As enplanements have risen during the latter half of 2000 and capacity has been added by Continental and Continental Express in late 2000, the trend at Daytona Beach has recently been positive after a long period of decline. This positive trend is expected to continue, and passenger traffic is projected to grow to roughly 350,000

Table 3.21

DAYTONA BEACH INTERNATIONAL AIRPORT

Fleet Mix Forecast - Base Case

Aircraft Type	Seats per Aircraft	Annual Scheduled Departures 10/00-09/01	2005	2010	2020	Percent Distribution 10/00-09/01	2005	2010	2020
Air Carrier Jets									
Aircraft Departures									
Boeing 737-500 (Continental)	104	163	125	120	-	5.2%	3.1%	2.5%	0.0%
Boeing 737-300 (Continental)	124	26	-	-	-	0.8%	0.0%	0.0%	0.0%
MD-80 (Continental)	141	176	-	-	-	5.6%	0.0%	0.0%	0.0%
Boeing 737-800 (Continental)	155	-	240	610	730	0.0%	6.0%	12.9%	12.5%
MD-80 (Delta)	142	1,671	1,460	-	-	53.2%	36.4%	0.0%	0.0%
Boeing 727-200 (Delta)	149	3	-	-	-	0.1%	0.0%	0.0%	0.0%
Boeing 737-800 (Delta)	154	-	365	1,460	1,460	0.0%	9.1%	30.8%	25.0%
Boeing 757-200 (Delta)	182	3	-	-	-	0.1%	0.0%	0.0%	0.0%
Subtotal - Aircraft Departures		2,042	2,190	2,190	2,190	65.0%	54.5%	46.2%	37.5%
Seat Departures									
Total Scheduled Seat Departures		283,267	313,730	331,870	337,990				
Average Seats per Aircraft Departure		138.7	143.3	151.5	154.3				
Passenger Forecast			217,500	231,000	260,000				
Projected Load Factor			69.3%	69.6%	76.9%				
Regional Jets									
Aircraft Departures									
Canadair/Embraer Regional Jets	50	1,098	1,825	2,555	3,650	35.0%	45.5%	53.8%	62.5%
Subtotal - Aircraft Departures		1,098	1,825	2,555	3,650	35.0%	45.5%	53.8%	62.5%
Seat Departures									
Total Scheduled Seat Departures		54,900	91,250	127,750	182,500				
Average Seats per Aircraft Departure		50.0	50.0	50.0	50.0				
Passenger Forecast			72,500	99,000	140,000				
Projected Load Factor			79.5%	77.5%	76.7%				
All Passenger Aircraft									
Aircraft Departures									
Total Aircraft Departures		3,140	4,015	4,745	5,840	100.0%	100.0%	100.0%	100.0%
Seat Departures									
Total Scheduled Seat Departures		338,167	404,980	459,620	520,490				
Average Seats per Aircraft Departure		107.7	100.9	96.9	89.1				
Passenger Forecast			290,000	330,000	400,000				
Projected Load Factor			71.6%	71.8%	76.9%				

Source: Tables 3.8 and 3.20, and HNTB Analysis

Table 3.22

DAYTONA BEACH INTERNATIONAL AIRPORT

Peaking Characteristics - Base Case

	Air Carrier Operations				Regional Carrier Operations			
	10/00-09/01	**2005**	**2010**	**2020**	**10/00-09/01**	**2005**	**2010**	**2020**
Aircraft Departures								
Daily (a)	6	6	6	6	3	5	7	10
Peak Hour (b)	2	2	2	2	1	2	2	3
Aircraft Arrivals								
Daily (a)	6	6	6	6	3	5	7	10
Peak Hour (b)	2	2	2	2	1	2	2	3
Aircraft Operations								
Daily (a)	12	12	12	12	6	10	14	20
Peak Hour (b)	3	3	3	3	2	3	4	5
Passenger Enplanements								
Annual (c)		217,500	231,000	260,000		72,500	99,000	140,000
Peak Month (d)		21,750	23,100	26,000		7,250	9,900	14,000
Average Day Peak Month (e)		702	745	839		234	319	452
Peak Hour (f)		234	248	280		94	91	135
Passenger Deplanements								
Annual (c)		217,500	231,000	260,000		72,500	99,000	140,000
Peak Month (d)		21,750	23,100	26,000		7,250	9,900	14,000
Average Day Peak Month (e)		702	745	839		234	319	452
Peak Hour (f)		234	248	280		94	91	135
Total Passengers								
Annual (g)		435,000	462,000	520,000		145,000	198,000	280,000
Peak Month (g)		43,500	46,200	52,000		14,500	19,800	28,000
Average Day Peak Month (g)		1,403	1,490	1,677		468	639	903
Peak Hour (f)		351	373	419		140	182	226

(a) Table 3.20
(b) Peak Hour forecast to have one flight to each hub
(c) Table 3.20
(d) Peak Month forecast to have 10 percent of annual traffic (based on 09/99-08/00 traffic)
(e) Peak Month divided by 31
(f) Average Day Peak Month multiplied by ratio of peak hour to daily aircraft operations.
(g) Enplanements plus deplanements

Sources: As noted and HNTB analysis

Table 3.23

DAYTONA BEACH INTERNATIONAL AIRPORT

Passenger Enplanement Forecasts by Aircraft Type - High Case

Calendar Year	Annual Passenger Enplanements in Daytona Beach: Air Carrier Jets	Regional Jets	Regional Turboprops	All Aircraft Types	Total Annual Passenger Enplanements in Florida (a)	Daytona Beach Enplanements as Percent of Florida Total (b)		Percent Distribution of Daytona Beach Enplanements: Air Carrier Jets	Regional Jets	Regional Turboprops	All Aircraft Types
Historical Enplanements											
1980	379,472	-	-	379,472	25,487,605	1.49%		100.0%	0.0%	0.0%	100.0%
1985	238,664	-	3,292	241,956	28,911,784	0.84%		98.6%	0.0%	1.4%	100.0%
1990	518,022	-	12,873	530,895	40,242,636	1.32%		97.6%	0.0%	2.4%	100.0%
1995	366,903	-	12,583	379,486	47,045,163	0.81%		96.7%	0.0%	3.3%	100.0%
2000	216,582	51,500	-	268,082	59,330,713	0.45%		80.8%	19.2%	0.0%	100.0%
Forecasted Enplanements											
2005	269,500	80,500	-	350,000	75,429,692	0.46%		77.0%	23.0%	0.0%	100.0%
2010	360,000	120,000	-	480,000	91,382,106	0.53%		75.0%	25.0%	0.0%	100.0%
2020	525,000	225,000	-	750,000	126,000,000	0.60%		70.0%	30.0%	0.0%	100.0%

(a) FAA Terminal Area Forecast of December 1999 for 2005 and 2010 is provided (TAF for 2015 is 105.2 million, HNTB estimate for 2020).

(b) HNTB projects that for high case, Daytona Beach will increase its share of total Florida enplanements to 0.46 percent of the total in 2005, 0.53 percent of the total in 2010, and 0.60 percent of the total in 2020. The 0.60 percent share for 2020 is between the 0.81 percent share in 1995 and 0.44 percent share in 2000.

Source: Table 3.8, FAA Terminal Area Forecast of December 2000, and HNTB Analysis

enplanements by 2005, 480,000 enplanements by 2010, and 750,000 enplanements by 2020 in the high case. The peak enplanement level experienced by Daytona Beach in 1990 was 530,895 enplanements, so the potential 750,000 enplanements in 2020 represents a 42 percent increase in traffic over this 30 year period. Based on comparable markets, this growth is quite conservative, especially considering that this is a high case forecast.

The share of total Florida enplanements generated in Daytona Beach will increase over the 20 years in the high case. In 1980, the 379,472 enplanements represented 1.49 percent of the Florida total. By 1995, the 379,486 enplanements represented a significantly smaller 0.81 percent of the Florida total. For 2000, Daytona Beach generated about 0.44 percent of the Florida total. The enplanements projected for 2005, 2010, and 2020 represent about 0.46 percent, 0.53 percent, and 0.60 percent of the Florida totals for each of these years respectively. The 0.60 percent share forecast for 2020 is much lower than the 0.81 percent of enplanements Daytona Beach had in 1995.

With the higher traffic growth projections in the high case, air carriers will be using a mix of air carrier jets and regional jets to serve Daytona Beach. Based on both the local and national trends, regional jets are projected to enplane 23 percent of Daytona Beach travelers in 2005, 25 percent in 2010, and 30 percent in 2020. Just as in the base case, it is not anticipated that turboprops will reappear in the high case.

Table 3.24 provides the average enplanements per departure by aircraft type for the high case. From a base of 104.1 average enplanements per air carrier jet departure for the 12 months ending August 2000, Daytona Beach air carrier jet departures are projected to average 105.5 enplanements in 2005, 109.6 enplanements in 2010, and 119.9 enplanements in 2020. From a base of 46.7 average enplanements per regional jet departures for the 12 months ending August 2000, the airport's regional jet departures are projected to average 36.8 enplanements in 2005, 36.5 enplanements in 2010, and 38.5 enplanements in 2020.

Table 3.25 provides the fleet mix forecast for the high case. Air carrier jet departures are projected to increase to seven daily departures in 2005, nine daily departures in 2010, and 12 daily departures in 2020. Regional jet departures are projected to increase to six daily departures in 2005, nine daily departures in 2010, and 16 daily departures in 2020.

The peaking characteristics for the high case are presented in **Table 3.26**. Air carrier departures are projected to increase at two per peak hour for 2005, three per peak hour for 2010, and four per peak hour for 2020. Regional jet departures are projected to increase at two per peak hour in 2005, three per peak hour in 2010, and five per peak hour in 2020. Peak hour operations for air carrier jets will increase from three in 2005 to five in 2010 to six in 2020, and three regional jet operations in the peak hour during 2005 will grow to five operations in 2010 and to eight operations in 2020.

Peak hour enplanements on air carrier jets are projected to increase from 248 enplanements in 2005 to 387 enplanements in 2010 to 565 enplanements in 2020. Peak

Table 3.24

DAYTONA BEACH INTERNATIONAL AIRPORT

Passenger Aircraft Departures Forecasts by Aircraft Type - High Case

Year	Annual Passenger Enplanements				Passenger Aircraft Departures				Average Enplanements per Departure			
	Air Carrier Jets	Regional Jets	Regional Turboprops	All Aircraft Types	Air Carrier Jets	Regional Jets	Regional Turboprops	All Aircraft Types	Air Carrier Jets	Regional Jets	Regional Turboprops	All Aircraft Types
Historical												
09/99-08/00	212,579	51,312	-	263,891	2,042	1,098	-	3,140	104.1	46.7	0.0	84.0
Forecasted												
2005	269,500	80,500	-	350,000	2,555	2,190	-	4,745	105.5	36.8	0.0	73.8
2010	360,000	120,000	-	480,000	3,285	3,285	-	6,570	109.6	36.5	0.0	73.1
2020	525,000	225,000	-	750,000	4,380	5,840	-	10,220	119.9	38.5	0.0	73.4

Source: Tables 3.8 and 3.23, and HNTB Analysis

Table 3.25

DAYTONA BEACH INTERNATIONAL AIRPORT

Fleet Mix Forecast - High Case

Aircraft Type	Seats per Aircraft	Annual Scheduled Departures				Percent Distribution			
		10/00-09/01	2005	2010	2020	10/00-09/01	2005	2010	2020
Air Carrier Jets									
Aircraft Departures									
Boeing 737-500 (Continental)	104	163	125	125	-	5.2%	2.1%	1.6%	0.0%
Boeing 737-300 (Continental)	124	26	-	-	-	0.8%	0.0%	0.0%	0.0%
MD-80 (Continental)	141	176	-	-	-	5.6%	0.0%	0.0%	0.0%
Boeing 737-800 (Continental)	155	-	240	970	1,460	0.0%	4.1%	12.1%	14.8%
Boeing 737-800 (American)	146	-	-	730	730	0.0%	0.0%	9.1%	7.4%
MD-80 (Delta)	142	1,671	1,455	-	-	53.2%	24.9%	0.0%	0.0%
Boeing 727-200 (Delta)	149	3	-	-	-	0.1%	0.0%	0.0%	0.0%
Boeing 737-800 (Delta)	154	-	730	1,454	2,183	0.0%	12.5%	18.1%	22.2%
Boeing 757-200 (Delta)	182	3	5	6	7	0.1%	0.1%	0.1%	0.1%
Subtotal - Aircraft Departures		2,042	2,555	3,285	4,380	65.0%	43.8%	40.9%	44.4%
Seat Departures									
Total Scheduled Seat Departures		283,267	370,140	494,938	670,336				
Average Seats per Aircraft Departure		138.7	144.9	150.7	153.0				
Passenger Forecast			269,500	360,000	525,000				
Projected Load Factor			72.8%	72.7%	78.3%				
Regional Jets									
Aircraft Departures									
Canadair/Embraer Regional Jets	50	1,098	3,285	4,745	5,475	35.0%	56.3%	59.1%	55.6%
Subtotal - Aircraft Departures		1,098	3,285	4,745	5,475	35.0%	56.3%	59.1%	55.6%
Seat Departures									
Total Scheduled Seat Departures		54,900	164,250	237,250	273,750				
Average Seats per Aircraft Departure		50.0	50.0	50.0	50.0				
Passenger Forecast			130,000	192,000	225,000				
Projected Load Factor			79.1%	80.9%	82.2%				
All Passenger Aircraft									
Aircraft Departures									
Total Aircraft Departures		3,140	5,840	8,030	9,855	100.0%	100.0%	100.0%	100.0%
Seat Departures									
Total Scheduled Seat Departures		338,167	534,390	732,188	944,086				
Average Seats per Aircraft Departure		107.7	91.5	91.2	95.8				
Passenger Forecast			399,500	552,000	750,000				
Projected Load Factor			74.8%	75.4%	79.4%				

Source: Tables 3.8 and 3.24, and HNTB Analysis

Table 3.26

DAYTONA BEACH INTERNATIONAL AIRPORT

Peaking Characteristics - High Case

	Air Carrier Operations				Regional Carrier Operations			
	10/00-09/01	**2005**	**2010**	**2020**	**10/00-09/01**	**2005**	**2010**	**2020**
Aircraft Departures								
Daily (a)	6	7	9	12	3	6	9	16
Peak Hour (b)	2	2	3	4	1	2	3	5
Aircraft Arrivals								
Daily (a)	6	7	9	12	3	6	9	16
Peak Hour (b)	2	2	3	4	1	2	3	5
Aircraft Operations								
Daily (a)	12	14	18	24	6	12	18	32
Peak Hour (b)	3	3	5	6	2	3	5	8
Passenger Enplanements								
Annual (c)		269,500	360,000	525,000		80,500	120,000	225,000
Peak Month (d)		26,950	36,000	52,500		8,050	12,000	22,500
Average Day Peak Month (e)		869	1,161	1,694		260	387	726
Peak Hour (f)		248	387	565		87	129	227
Passenger Deplanements								
Annual (c)		269,500	360,000	525,000		80,500	120,000	225,000
Peak Month (d)		26,950	36,000	52,500		8,050	12,000	22,500
Average Day Peak Month (e)		869	1,161	1,694		260	387	726
Peak Hour (f)		248	387	565		87	129	227
Total Passengers								
Annual (g)		539,000	720,000	1,050,000		161,000	240,000	450,000
Peak Month (g)		53,900	72,000	105,000		16,100	24,000	45,000
Average Day Peak Month (g)		1,739	2,323	3,387		519	774	1,452
Peak Hour (f)		373	645	847		130	215	363

(a) Table 3.24
(b) Peak Hour forecast to have one flight to each hub
(c) Table 3.24
(d) Peak Month forecast to have 10 percent of annual traffic (based on 09/99-08/00 traffic)
(e) Peak Month divided by 31
(f) Average Day Peak Month multiplied by ratio of peak hour to daily aircraft operations.
(g) Enplanements plus deplanements

Sources: As noted and HNTB analysis

hour total passengers on air carrier jets are projected to grow from 373 passengers in 2005 to 645 passengers in 2010 to 847 passengers in 2020. Peak hour enplanements on regional jets are projected to grow from 87 enplanements in 2005 to 129 enplanements in 2010 and 227 enplanements in 2020. Peak hour total passengers on regional jets are projected to grow from 130 in 2005 to 215 in 2010 and 363 in 2020.

3.2.2 Air Cargo Traffic Forecast

With most of its air cargo being flown in the bellies of passenger aircraft, Daytona Beach has experienced a decline in air cargo activity in recent years as the passenger aircraft have reduced their service and available capacity for air cargo has declined. Annual enplaned air cargo has dropped from 1.5 million pounds in 1991 to 0.4 million pounds during the 12 months ending August 2000. **Table 3.27** has the historical trends in enplaned air cargo by category, and the dominance of airfreight over both air express and airmail shipments has continued over the past 10 years.

In comparing the annual air cargo volume with the scheduled mainline jet departures over the past 10 years, enplaned air cargo has averaged roughly 222 pounds per departure. Of this total, 212 pounds have been airfreight, eight pounds have been air express and airmail only averaged two pounds per departure. For the 12 months ending August 2000, airfreight has averaged 207.3 pounds per scheduled mainline jet departure, while air express averaged 11.5 pounds and airmail averaged 0.6 pounds.

Using the most recent average air cargo volumes per scheduled mainline jet departure as the base for the air cargo forecast, these values were multiplied by the mainline jet departures as forecasted in the passenger service forecasts. **Table 3.28** provides the air cargo forecasts for both the base and high cases. With the presence of Orlando International a short ride away from Daytona Beach, there is ample capacity for air cargo shipments via this alternative airport.

The forecasted change in annual enplaned air cargo in the base case from the 447,912 pounds enplaned in the 12 months ending August 2000 to 480,376 pounds in 2005, 2010, and 2020 reflects the forecasted steady state in mainline passenger jet service. With the growth in mainline jet passenger service projected in the high case, enplaned air cargo is forecasted to grow to 560,438 pounds in 2005, 720,564 pounds in 2010, and 960,751 pounds in 2020.

3.2.3 General Aviation Forecasts

This section presents forecasts of general aviation activity for Daytona Beach through 2020. The general aviation based aircraft and operations forecasts include air taxi planes and flights. As with all other facets of aviation demand, these forecasts form the basis for developing facility requirements and are therefore critical elements of this planning process.

General aviation activity has experienced a number of major transformations in the last two decades, including periods of significant growth as well as a prolonged period of decline. The reasons for the period of decline include rising operating costs (fuel, liability

Table 3.27

DAYTONA BEACH INTERNATIONAL AIRPORT

Annual Enplaned Air Freight/Air Express/Air Mail Traffic 1990-Year Ending 08/00

	Annual Enplaned Air Cargo Volume (pounds)				Scheduled Mainline Jet	Air Cargo (pounds) per Scheduled Mainline Jet Dept			
Year	Air Freight	Air Express	Air Mail (1)	Total	Departures	Air Freight	Air Express	Air Mail (1)	Total
1990	1,292,832	36,790	4,137	1,333,759	7,522	171.9	4.9	0.5	177.3
1991	1,407,183	40,878	9,888	1,457,949	6,217	226.3	6.6	1.6	234.5
1992	1,348,685	78,936	7,469	1,435,090	6,585	204.8	12.0	1.1	217.9
1993	1,206,637	46,644	17,621	1,270,902	5,334	226.2	8.7	3.3	238.3
1994	1,074,873	43,248	16,733	1,134,854	4,681	229.6	9.2	3.6	242.4
1995	1,035,886	24,821	6,908	1,067,615	4,373	236.9	5.7	1.6	244.1
1996	1,034,695	25,556	8,768	1,069,019	4,065	254.5	6.3	2.2	263.0
1997	596,043	37,949	11,616	645,608	3,627	164.3	10.5	3.2	178.0
1998	506,325	24,654	188,083	719,062	2,954	171.4	8.3	63.7	243.4
1999	402,189	21,371	206,653	630,213	2,369	169.8	9.0	87.2	266.0
YE 08/00	423,331	23,404	1,177	447,912	2,042	207.3	11.5	0.6	219.3
Total/Average	10,328,679	404,251	479,053	11,211,983	49,769	207.5	8.1	9.6	225.3
Total/Average excluding 98/99	9,420,165	358,226	84,317	9,862,708	44,446	211.9	8.1	1.9	221.9

(1) The extraordinarily high volume of mail recorded from December 1998 to March 1999 was due to runway construction in Jacksonville. This runway construction at Jacksonville resulted in air mail being diverted to other airports, including Daytona Beach. As the postal service has no plans to discontinue the current trucking operation for distribution of air mail to the Jacksonville center, these high air mail volumes are not expected to return.

Sources: Daytona Beach International Airport Files for air cargo volumes and Official Airline Guide via BACK Associates for Mainline Jet Departures

Table 3.28

DAYTONA BEACH INTERNATIONAL AIRPORT

Annual Enplaned Air Freight/Air Express/Air Mail Traffic Forecast - Base and High Cases

	Average Air Cargo (pounds) per Scheduled Mainline Jet Departure				Scheduled Mainline Jet	Annual Enplaned Air Cargo (pounds)			
Year	**Air Freight**	**Air Express**	**Air Mail**	**Total**	**Departures**	**Air Freight**	**Air Express**	**Air Mail**	**Total**
YE 08/00	207.3	11.5	0.6	219.3	2,042	423,331	23,404	1,177	447,912
Base Case Forecast									
2005	207.3	11.5	0.6	219.3	2,190	454,013	25,100	1,262	480,376
2010	207.3	11.5	0.6	219.3	2,190	454,013	25,100	1,262	480,376
2020	207.3	11.5	0.6	219.3	2,190	454,013	25,100	1,262	480,376
High Case Forecast									
2005	207.3	11.5	0.6	219.3	2,555	529,682	29,284	1,473	560,438
2010	207.3	11.5	0.6	219.3	3,285	681,020	37,650	1,893	720,564
2020	207.3	11.5	0.6	219.3	4,380	908,026	50,201	2,525	960,751

Sources: Tables 3.20, 3.24, and 3.27

insurance, others), a decreasing pilot population that formerly consisted of a large number of pilots trained during or shortly after periods of war, and the retirement of older aircraft that outpaced new aircraft shipments. The recent GA industry trends can be summarized as follows:

- In the late 1970s, annual aircraft shipments soared, primarily due to changes in the G.I. Bill that paid for flight training for veterans. This resulted in literally tens of thousands of new aircraft entering the industry, with a pilot base whose flying patterns were unknown.

- In the early 1980s, demand plummeted, due primarily to economic factors such as dramatically increased fuel costs. Interest rates were high in the 1980s, which made loans for new and used aircraft expensive.
- In the mid- and late-1980s, a variety of factors depressed the GA market:

  → Limited Demand – Aircraft manufactured in the 1950s and 1960s had a useful life that was much longer than anticipated. Instead of brisk new aircraft sales to replace retiring aircraft, new sales lagged as older aircraft continued flying.

  → Decline in Pilots – In the 1980s, the number of active pilots declined significantly. At one point in the mid-1980s, the pilot-to-aircraft ratio declined from 7.0 to 3.5. Student pilot certificates totaled 101,000 in 1995; however, this figure was as high as 200,000 in 1977.

  → Marketing – At a time when prospective pilots became interested in newer, high-tech equipment and aircraft, kit plane manufacturers and experimental aircraft became more appealing. As a result, these smaller industries flourished, while sales of more traditional aircraft declined.

- In the late 1980s and early 1990s, GA experienced some growth in turboprop, jet, and other high-performance categories.

- Due to an effective lobby, Congress passed the General Aviation Revitalization Act (GARA) in 1994. In the years preceding, many industry experts concluded that soaring aircraft liability costs had impacted GA operating costs to the point that many Americans could no longer afford to fly recreationally. Its intent was to limit that liability, thereby lowering the operating cost for the typical user.

- Since the passage of the GARA, aircraft shipments have increased dramatically. However, the reason for this increase may not be directly related to the GARA. Proponents of the GARA suggested that the GARA would reduce liability costs, thereby reducing new aircraft prices and making them more affordable to the typical buyer. Since 1994, though, new aircraft prices have increased. These aircraft are sold with much more high-tech equipment than similar aircraft sold 5, 10, or 20 years ago. Therefore, it is unclear how much the GARA has helped turn around the GA industry.

- Currently, new aircraft shipments and new pilots are forecast to increase at moderate rates through 2010. Part of this increase is attributable to the anticipated health of the U.S. economy, while the remainder is attributable to the improvement in industry-wide marketing campaigns designed to invigorate the industry by attracting new pilots.

Daytona Beach is home to Embry-Riddle Aeronautical University, the world's largest aeronautical university and the largest general aviation user at the airport. In assessing the growth potential for general aviation in Daytona Beach, a special breakout of Embry-Riddle's future plans was made.

Table 3.29 presents the population by municipality in comparison with the based aircraft totals by airport from 1990 to 2000 for Volusia County. The based aircraft totals do not include those of Embry-Riddle as their fleet does not follow regional demographic trends, but rather are dependent on the plans of the school. Total based aircraft less Embry-Riddle aircraft grew at an average annual rate of 1.4 percent from 1990 to 2000 in Volusia County, the same rate as the overall population of the county grew during this period. Airports in higher growth areas of the county experienced higher growth rates in based aircraft, while Daytona Beach actually experienced a slight decline in based aircraft while the population in its immediate area continued to grow.

Table 3.30 presents the based aircraft trends and forecast at Daytona Beach for both Embry-Riddle and all other general aviation users. Embry-Riddle officials provided insights into their future plans through 2020, which consisted of maintaining the levels of both based aircraft and student enrollees in its aeronautical science program that were present in 2000. Based on this information, it is projected that Embry- Riddle will maintain its based aircraft fleet of 77 single engine piston and eight multi engine piston aircraft at Daytona Beach from 2000 through 2020.

When subtracting the Embry-Riddle based aircraft from the Daytona Beach totals, there has been a fairly stable number of based aircraft from other users over the past five years. There were 103 based aircraft of other users in 2000, representing a minor decline from the 104 based aircraft from other users that were in Daytona Beach over three of the four previous years.

The set of based aircraft that does not include the Embry-Riddle aircraft is assumed to follow the national growth rates for each aircraft type as forecasted by the FAA for the duration of the forecast period. As previously indicated, this forecast assumes that there will not be any constraints on future growth.

The FAA national growth rates that are used in this forecast for the non Embry-Riddle aircraft are used due to the lack of any other overriding better predictor for this set of aircraft. The US Census Bureau projects that Florida's population will continue to grow much faster than the overall national rate over the next 20 years. However, the demographic projections for Volusia County according to the Office of Economic and Demographic Research from the Florida Legislature forecast that Volusia County will grow at a slightly lower rate than the

Table 3.29

DAYTONA BEACH INTERNATIONAL AIRPORT

Population by Municipality 1990-2000 in Comparison with Based Aircraft by Airport 1990-2000 for Volusia County

Municipality	Closest Airports	Population 1990	Population 1995	Population 2000 Forecast	Population Avg Annual Change 2000/90	Total Based Aircraft less Embry Riddle 1990 (1)	Total Based Aircraft less Embry Riddle 2000	Total Based Aircraft less Embry Riddle Avg Annual Change 2000/90
Daytona Beach	Daytona Beach	61,921	63,306	88,700	3.7%			
Daytona Beach Shores	Daytona Beach	2,335	2,680	3,440	4.0%			
Holly Hill	Daytona Beach	11,141	11,539	12,868	1.5%			
Ponce Inlet	Daytona Beach	1,704	2,120	2,870	5.4%			
Port Orange	Daytona Beach	35,399	39,750	50,300	3.6%			
South Daytona	Daytona Beach	12,482	12,889	13,264	0.6%			
Subtotal	Daytona Beach	124,982	132,284	171,442	3.2%	122	103	-1.7%
DeBary	Deland & Bob Lee	7,176	11,336	14,145	7.0%			
Deland	Deland & Bob Lee	16,491	17,973	20,759	2.3%			
Deltona	Deland & Bob Lee	50,828	56,148	73,815	3.8%			
Lake Helen	Deland & Bob Lee	2,344	2,438	4,145	5.9%			
Orange City	Deland & Bob Lee	5,347	6,117	9,813	6.3%			
Deleon Springs	Deland & Bob Lee	1,481	1,723	2,364	4.8%			
Subtotal	Deland & Bob Lee	83,667	95,735	125,041	4.1%	108	181	5.3%
Edgewater	New Smyrna Beach & Massey Ranch	15,337	17,484	19,424	2.4%			
New Smryna Beach	New Smyrna Beach & Massey Ranch	16,543	18,393	24,249	3.9%			
Oak Hill	New Smyrna Beach & Massey Ranch	963	1,070	1,670	5.7%			
Subtotal	New Smyrna Beach & Massey Ranch	32,843	36,947	45,343	3.3%	196	178	-1.0%
Ormond Beach	Ormond Beach	29,721	31,539	35,045	1.7%			
Ormond By-The-Sea	Ormond Beach	8,157	12,226	15,886	6.9%			
Subtotal	Ormond Beach	37,878	43,765	50,931	3.0%	70	108	4.4%
Pierson	Pierson	1,148	1,436	1,733	4.2%	4	7	5.8%
Total Volusia County including unincorporated areas (2)		373,909	406,609	430,600	1.4%	500	577	1.4%
Total Florida		13,018,365	14,185,403	15,317,023	1.6%	12,530	13,464	0.7%
Total USA		249,464,396	262,803,276	275,155,704	1.0%	203,330	208,570	0.3%

(1) Daytona Beach had a total of 192 based aircraft in 1990. Embry Riddle is estimated to have had 70 of these aircraft (69 in 1996, 63 in 1997, 71 in 1998, 82 in 1999, and 85 in 2000)
(2) US Census Estimates for Volusia County for 1998 and 1999 were 420,668 and 425,601. HNTB estimates population of 430,600 for 2000.

Source: Bureau of Economic and Business Research, Florida Population Studies, July 1996, for municipality populations; US Census Bureau 2000 for county populations;
Florida DOT for 1990 Based Aircraft; airnav.com for 2000 Based Aircraft; HNTB Analysis

Table 3.30

DAYTONA BEACH INTERNATIONAL AIRPORT

Based General Aviation Aircraft Trends and Forecast at Daytona Beach International

	Total Airport Based General Aviation Aircraft					Embry Riddle Based Aircraft					All Other Based Aircraft				
Year	Single Engine	Multi Engine	Jet Engine	Helicopters	Total	Single Engine	Multi Engine	Jet Engine	Helicopters	Total	Single Engine	Multi Engine	Jet Engine	Helicopters	Total
1985	118	23	2	5	148	N/A	N/A	-	-	N/A	N/A	N/A	2	5	N/A
1986	100	47	3	3	153	N/A	N/A	-	-	N/A	N/A	N/A	3	3	N/A
1987	100	47	7	6	160	N/A	N/A	-	-	N/A	N/A	N/A	7	6	N/A
1988	103	49	7	6	165	N/A	N/A	-	-	N/A	N/A	N/A	7	6	N/A
1989	148	36	5	3	192	N/A	N/A	-	-	N/A	N/A	N/A	5	3	N/A
1990	148	36	5	3	192	N/A	N/A	-	-	N/A	N/A	N/A	5	3	N/A
1991	148	36	5	3	192	N/A	N/A	-	-	N/A	N/A	N/A	5	3	N/A
1992	146	27	5	3	181	N/A	N/A	-	-	N/A	N/A	N/A	5	3	N/A
1993	146	27	5	3	181	N/A	N/A	-	-	N/A	N/A	N/A	5	3	N/A
1994	148	31	7	4	190	N/A	N/A	-	-	N/A	N/A	N/A	7	4	N/A
1995	131	30	9	5	175	N/A	N/A	-	-	N/A	N/A	N/A	9	5	N/A
1996	131	30	9	3	173	62	7	-	-	69	69	23	9	3	104
1997	127	30	9	3	169	55	8	-	-	63	72	22	9	3	106
1998E	131	32	9	3	175	64	7	-	-	71	67	25	9	3	104
1999E	138	34	10	4	186	76	6	-	-	82	62	28	10	4	104
2000	134	40	10	4	188	77	8	-	-	85	57	32	10	4	103
Forecast															
2005	136	41	13	4	194	77	8	-	-	85	59	33	13	4	109
2010	138	41	16	5	200	77	8	-	-	85	61	33	16	5	115
2020	142	42	22	5	211	77	8	-	-	85	65	34	22	5	126
Average Annual Growth Rates															
2000-2005	0.3%	0.3%	5.5%	1.5%	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.4%	5.5%	1.5%	1.2%
2005-2010	0.3%	0.2%	4.1%	1.3%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.3%	4.1%	1.3%	1.0%
2010-2020	0.3%	0.2%	3.2%	1.1%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.2%	3.2%	1.1%	0.9%
2000-2020	0.3%	0.2%	4.0%	1.3%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.3%	4.0%	1.3%	1.0%

Note: Embry Riddle Based Aircraft Projected to Remain Constant per Embry Riddle Plans; Other Aircraft Projected to Grow at Similar Rates as FAA National Projected Rates per FAA Aerospace Forecasts FY 2000-2011 (March 2000), FAA Long Range Aerospace Forecasts FY 2015, 2020, and 2025 (June 2000)

Sources: FAA Aerospace Forecasts FY 2000-2011 (March 2000), FAA Long Range Aerospace Forecasts FY 2015, 2020, and 2025 (June 2000); Florida DOT and Embry Riddle websites; HNTB analysis

state of Florida overall over the next 15 years.

Using these FAA national growth rates, the other single engine based aircraft in Daytona Beach should grow from 57 aircraft in 2000 to 59 aircraft in 2005, 61 in 2010, and 65 in 2020. Multi engine aircraft should grow from 32 aircraft in 2000 to 33 aircraft in 2005 and 2010 and 34 aircraft in 2020. Jet aircraft should increase at a more rapid rate from 10 aircraft in 2000 to 13 aircraft in 2005, 16 aircraft in 2010, and 22 aircraft in 2020. Helicopters are projected to grow from four aircraft in 2000 and 2005 to five aircraft in 2010 and 2020.

The combined forecast for both Embry-Riddle and all other based aircraft projects that there will be 142 single engine, 42 multi engine, 22 jet engine, and five helicopters at Daytona Beach in 2020. Summing these individual aircraft categories, there are 211 total based aircraft forecasted for 2020. This forecast is lower than the FAA Terminal Area Forecast (TAF) published December 2000, which projects that by 2015, Daytona Beach will have 234 total based aircraft. Based on the 217 aircraft projected for 2010 in the TAF, and the growth of 17 aircraft in the five years between 2010 and 2015, the interpolated TAF forecast would be about 251 total based aircraft at Daytona Beach in 2020. It is probable that the TAF forecast does not separate out the growth in based aircraft between Embry-Riddle and the other user groups. With this forecast based partially on the latest plans from Embry-Riddle for no growth in its fleet of aircraft, the differences between these two forecasts are readily explained.

Table 3.31 shows the annual general aviation operations trends and forecasts. With a growing number of general aviation operations per based aircraft occurring over the past six years, it is projected that there will be a continuation of this trend in the future. This assumption also follows the FAA TAF national forecast for towered airports where the 480 operations per based aircraft in 2000 is projected to climb to 495 operations per based aircraft in 2010. There were an estimated 1,890 general aviation operations per based aircraft at Daytona Beach in 2000, and this ratio is expected to climb to 1,920 operations per based aircraft in 2005, 1,950 operations per based aircraft in 2010, and 2,010 general aviation operations per based aircraft in 2020. The estimated operations by aircraft type are based on the percentages of based aircraft types.

With these assumptions on general aviation operations, the estimated distribution of general aviation operations at the airport in 2000 was 253,284 single engine operations, 75,607 multi engine operations, 18,902 jet operations, and 7,561 helicopter operations. The projection for 2020 is that there will be 285,420 single engine operations, 84,420 multi engine operations, 44,220 jet operations, and 10,050 helicopter operations. Total general aviation operations are projected to grow from 355,353 operations in 2000 to 424,110 operations in 2020.

Daytona Beach has had a consistent peak month of general aviation operations for the past three years. **Table 3.32** shows that the month of March has averaged 10.2 percent of total general aviation operations in Daytona Beach. March averaged 33,850

Table 3.31

DAYTONA BEACH INTERNATIONAL AIRPORT

Annual General Aviation Operations Trends and Forecast at Daytona Beach International

	Total Airport Based General Aviation Aircraft					Estimated General Aviation Operations by Aircraft Type (1)					Estimated General Aviation Operations per Based Aircraft (2)				
Year	Single Engine	Multi Engine	Jet Engine	Helicopters	Total	Single Engine	Multi Engine	Jet Engine	Helicopters	Total	Single Engine	Multi Engine	Jet Engine	Helicopters	Total
1990	148	36	5	3	192	242,884	59,080	8,206	4,923	315,093	1,641	1,641	1,641	1,641	1,641
1991	148	36	5	3	192	247,041	60,091	8,346	5,008	320,485	1,669	1,669	1,669	1,669	1,669
1992	146	27	5	3	181	210,592	38,945	7,212	4,327	261,076	1,442	1,442	1,442	1,442	1,442
1993	146	27	5	3	181	208,417	38,543	7,138	4,283	258,380	1,428	1,428	1,428	1,428	1,428
1994	148	31	7	4	190	180,452	37,797	8,535	4,877	231,661	1,219	1,219	1,219	1,219	1,219
1995	131	30	9	5	175	183,289	41,975	12,592	6,996	244,852	1,399	1,399	1,399	1,399	1,399
1996	131	30	9	3	173	197,851	45,309	13,593	4,531	261,284	1,510	1,510	1,510	1,510	1,510
1997	127	30	9	3	169	201,315	47,555	14,266	4,755	267,891	1,585	1,585	1,585	1,585	1,585
1998	131	32	9	3	175	223,295	54,545	15,341	5,114	298,295	1,705	1,705	1,705	1,705	1,705
1999	138	34	10	4	186	263,817	64,998	19,117	7,647	355,580	1,912	1,912	1,912	1,912	1,912
2000 (3)	134	40	10	4	188	253,284	75,607	18,902	7,561	355,353	1,890	1,890	1,890	1,890	1,890
						Forecast									
2005	136	41	13	4	194	261,120	78,720	24,960	7,680	372,480	1,920	1,920	1,920	1,920	1,920
2010	138	41	16	5	200	269,100	79,950	31,200	9,750	390,000	1,950	1,950	1,950	1,950	1,950
2020	142	42	22	5	211	285,420	84,420	44,220	10,050	424,110	2,010	2,010	2,010	2,010	2,010
						Average Annual Growth Rates									
2000-2005	0.3%	0.5%	5.4%	0.0%	0.6%	0.6%	0.8%	5.7%	0.3%	0.9%	0.3%	0.3%	0.3%	0.3%	0.3%
2005-2010	0.3%	0.0%	4.2%	4.6%	0.6%	0.6%	0.3%	4.6%	4.9%	0.9%	0.3%	0.3%	0.3%	0.3%	0.3%
2010-2020	0.3%	0.2%	3.2%	0.0%	0.5%	0.6%	0.5%	3.5%	0.3%	0.8%	0.3%	0.3%	0.3%	0.3%	0.3%
2000-2020	0.3%	0.2%	4.0%	1.1%	0.6%	0.6%	0.6%	4.3%	1.4%	0.9%	0.3%	0.3%	0.3%	0.3%	0.3%

(1) Distribution of Itinerant Operations by Non Based General Aviation Aircraft among aircraft types estimated to approximate the percentages of based aircraft types at Daytona Beach.

(2) General Aviation Operations per Based Aircraft projected to increase in the future (based on similar national trend as projected by Terminal Area Forecast for Towered Airports- 480 in 2000, 486 in 2005 and 495 in 2010)

(3) Annual General Aviation Operations for 2000 based on 12 month total from September 1999 - August 2000.

Sources: Daytona Beach International Operations Activity Records, Table 2.30, and HNTB analysis

Table 3.32

DAYTONA BEACH INTERNATIONAL AIRPORT

Peaking Characteristics of General Aviation Operations by Month - September 1997-August 2000

Month	1997/98	1998/99	1999/2000	Average	Percent of Total
September	24,046	20,690	22,029	22,255	6.7%
October	26,507	35,774	30,284	30,855	9.3%
November	23,557	34,373	29,106	29,012	8.7%
December	15,801	24,108	21,587	20,499	6.2%
January	22,614	28,929	23,786	25,110	7.6%
February	22,815	33,136	34,729	30,227	9.1%
March	28,622	37,008	35,920	33,850	10.2%
April	26,116	35,792	32,630	31,513	9.5%
May	25,005	32,806	35,249	31,020	9.3%
June	18,762	29,860	31,968	26,863	8.1%
July	18,145	29,064	28,951	25,387	7.6%
August	21,271	25,979	29,114	25,455	7.7%
Total	273,261	367,519	355,353	332,044	100.0%
Peak Month as Percent of Total	10.5%	10.1%	10.1%	10.2%	

Note: Outlined Months indicate Peak Months of Activity

Sources: Daytona Beach International Airport Files

monthly general aviation operations over the last three years, and there has been an average of 332,044 general aviation operations over the three years ending August 2000. As **Table 3.33** also shows, during the first four weeks of March 2000, the peak hour of operations comprised 11.2 percent of total operations. There was an average of 1,188 daily operations during this period, and there was an average of 133 operations during the peak hour.

Based on the annual general aviation forecasts and the peaking characteristics of Daytona Beach, **Table 3.34** provides the peaking characteristics of general aviation operations in 2000, 2005, 2010, and 2020. The projected peak hour general aviation activity includes 138 general aviation operations during the peak hour in 2005, 144 general aviation operations during the peak hour in 2010, and 156 general aviation operations during the peak hour in 2020.

3.2.4 Summary of Projected Enplanements and Total Aircraft Operations

Using the numbers previously forecast for each category of aircraft operations—passenger air carrier, passenger regional carrier, and general aviation—and adding military operations to these subtotals, **Tables 3.35 and 3.36** provide summaries of projected enplanements and aircraft operations for the base and high cases. **Table 3.37** provides the peaking characteristics for total enplanements and operations for both the base and high cases.

Although passenger carrier enplanements and operations differ in the base and high cases, general aviation and military operations are consistent in both cases. In the base case, there are 4,380 passenger air carrier jets operations, 3,650 regional jet operations, 372,480 general aviation operations, and 779 military operations forecasted for 2005. Forecast military operations are based on the same number of military operations as recorded for the 12 months ending August 2000, and as with the FAA's national forecasts of military operations, it is assumed that military operations will remain constant over the next 20 years. There are a total of 381,289 operations and 290,000 enplanements forecast for 2005. Total operations are forecast to grow to 400,269 operations in 2010 and 436,569 operations in 2020, while total enplanements are forecast to grow to 330,000 enplanements in 2010 and 400,000 enplanements in 2020.

In the high case, there are 382,749 total operations projected for 2005, 403,919 total operations forecast for 2010, and 445,329 operations forecast for 2020. Enplanements are projected to increase to 350,000 enplanements in 2005, 480,000 enplanements in 2010, and 750,000 enplanements in 2020.

Peak hour total aircraft operations in the base case are projected to climb to 144 operations in 2005, 151 operations in 2010, and 164 operations in 2020. Total aircraft operations in the high case are only slightly greater than the base case since most operations are due to general aviation activity where there are no differences between these two cases. Peak hour total aircraft operations in the high case are projected to climb to 144 operations in 2005, 154 operations in 2010, and 170 operations in 2020.

Table 3.33

DAYTONA BEACH INTERNATIONAL AIRPORT

Peaking Characteristics of Total Aircraft Operations by Day - March 1-28, 2000

Hour	1-Mar	2-Mar	3-Mar	4-Mar	5-Mar	6-Mar	7-Mar	8-Mar	9-Mar	10-Mar	11-Mar	12-Mar	13-Mar	14-Mar	15-Mar	16-Mar	17-Mar	18-Mar	19-Mar	20-Mar	21-Mar	22-Mar	23-Mar	24-Mar	25-Mar	26-Mar	27-Mar	28-Mar	Average
													Total																
0000-0100	3	4	4	3	3	4	8	4	14	13	3	2	6	7	8	3	3	2	4	2	8	9	4	5	5	3	5	3	5
0100-0200	2	2	5	1	3	-	-	-	-	1	3	3	1	-	-	2	4	4	4	1	1	8	2	-	3	-	-	1	2
0200-0300	-	-	1	-	2	1	2	1	2	-	2	-	-	-	-	1	-	1	2	3	3	13	4	-	2	2	1	-	2
0300-0400	-	-	1	-	2	-	-	2	-	1	-	-	-	-	2	2	2	4	3	-	1	-	4	1	-	-	-	-	1
0400-0500	-	2	1	-	-	-	2	-	-	1	-	-	2	-	-	-	-	1	1	-	2	-	6	-	2	2	-	3	1
0500-0600	1	2	1	-	-	-	-	2	-	-	-	-	2	1	-	-	-	2	-	-	2	-	1	-	-	5	-	-	1
0600-0700	-	17	1	15	2	14	10	54	18	15	23	9	-	3	5	8	1	5	7	14	11	36	17	2	4	2	22	16	12
0700-0800	57	76	-	25	16	53	33	73	45	59	30	27	22	19	37	19	37	3	11	11	47	70	94	28	11	12	47	74	37
0800-0900	49	93	6	54	46	72	89	85	84	66	33	20	67	81	83	34	55	53	40	20	40	71	56	22	20	36	76	111	56
0900-1000	104	87	12	81	55	103	105	103	111	117	61	46	136	93	106	57	99	97	69	28	51	143	75	28	107	57	92	86	82
1000-1100	127	96	99	71	86	93	89	92	123	135	67	61	105	68	101	44	68	58	41	48	11	108	63	66	86	93	54	84	80
1100-1200	116	112	137	119	110	139	153	159	125	143	99	92	109	128	128	38	143	85	59	91	16	86	49	84	106	97	63	116	104
1200-1300	84	70	101	39	148	131	95	136	135	134	126	106	100	88	88	36	62	93	52	86	55	103	36	91	131	141	119	95	96
1300-1400	93	103	107	92	175	135	106	119	104	113	81	110	118	110	84	54	111	100	42	129	75	99	25	108	135	121	112	109	103
1400-1500	146	84	112	79	111	130	136	115	138	174	83	88	96	108	48	40	80	40	15	81	50	75	25	75	109	108	66	90	89
1500-1600	102	101	131	50	128	178	140	132	130	138	90	86	128	88	75	74	127	34	49	107	117	117	26	63	127	51	47	106	98
1600-1700	93	82	109	21	134	113	100	141	129	153	91	112	119	75	80	46	77	30	53	93	118	81	26	75	87	48	23	76	85
1700-1800	103	92	132	28	184	199	93	132	151	148	99	76	118	76	75	58	99	37	27	118	172	124	26	113	119	101	41	120	102
1800-1900	69	70	77	18	59	112	100	100	81	80	63	41	100	71	52	8	64	19	15	66	57	49	19	59	56	67	36	86	61
1900-2000	52	74	43	18	70	96	59	66	67	52	26	48	35	48	61	3	45	23	15	65	86	52	27	108	52	76	11	87	52
2000-2100	80	99	43	24	93	149	105	66	51	51	65	39	71	31	75	10	27	48	8	52	72	55	32	87	81	13	17	98	59
2100-2200	42	82	22	22	44	59	77	28	33	27	7	26	33	23	45	1	34	19	7	65	53	49	11	66	62	8	13	66	37
2200-2300	26	18	15	11	30	53	35	24	39	12	3	8	16	27	15	2	5	-	12	21	27	10	7	50	3	11	3	22	18
2300-2400	5	5	6	7	3	27	7	16	10	4	-	1	-	4	3	1	8	4	1	8	6	37	14	11	11	7	-	-	7
Daily Total	1,354	1,371	1,166	778	1,504	1,861	1,544	1,650	1,590	1,637	1,055	1,001	1,384	1,149	1,171	541	1,151	762	537	1,109	1,081	1,395	649	1,142	1,319	1,061	848	1,449	1,188
Peak Hour	146	112	137	119	184	199	153	159	151	174	126	112	136	128	128	74	143	100	69	129	172	143	94	113	135	141	119	120	133
Peak Hour Percentage	10.8%	8.2%	11.7%	15.3%	12.2%	10.7%	9.9%	9.6%	9.5%	10.6%	11.9%	11.2%	9.8%	11.1%	10.9%	13.7%	12.4%	13.1%	12.8%	11.6%	15.9%	10.3%	14.5%	9.9%	10.2%	13.3%	14.0%	8.3%	11.2%

Source: Hourly Airport Operations Counts from Daytona Beach International Airport Tower

Table 3.34

DAYTONA BEACH INTERNATIONAL AIRPORT

Peaking Characteristics - General Aviation Operations

	General Aviation Operations			
	2000	**2005**	**2010**	**2020**
Aircraft Departures				
Annual (a)	177,677	186,240	195,000	212,055
Peak Month (b)	18,123	18,996	19,890	21,630
ADPM (c)	585	613	642	698
Peak Hour (d)	65	69	72	78
Aircraft Arrivals				
Annual (a)	177,677	186,240	195,000	212,055
Peak Month (b)	18,123	18,996	19,890	21,630
ADPM (c)	585	613	642	698
Peak Hour (d)	65	69	72	78
Aircraft Operations				
Annual (a)	355,354	372,480	390,000	424,110
Peak Month (b)	36,246	37,992	39,780	43,260
ADPM (c)	1,170	1,226	1,284	1,396
Peak Hour (d)	130	138	144	156

(a) Table 3.31
(b) Peak Month projected to have 10.2 percent of all operations (Table 3.32)
(c) Average Day Peak Month (Peak Month divided by 31)
(d) Peak Hour projected to have 11.2 percent of daily operations (Table 3.33)

Sources: As noted and HNTB analysis

Table 3.35

DAYTONA BEACH INTERNATIONAL AIRPORT

Summary of Projected Enplanements and Aircraft Operations - Base Case

		Aircraft Operations				
		Passenger Carriers				
Year	Annual Enplanements	Air Carrier Jets	Regional Jets	General Aviation	Military	Total
2000	268,082	4,084	2,196	355,353	779	362,412
2005	290,000	4,380	3,650	372,480	779	381,289
2010	330,000	4,380	5,110	390,000	779	400,269
2020	400,000	4,380	7,300	424,110	779	436,569
		Average Annual Growth Rates				
2000-2005	1.6%	1.4%	10.7%	0.9%	0.0%	1.0%
2005-2010	2.6%	0.0%	7.0%	0.9%	0.0%	1.0%
2010-2020	1.9%	0.0%	3.6%	0.8%	0.0%	0.9%
2000-2020	2.0%	0.4%	6.2%	0.9%	0.0%	0.9%

Note: Military Operations projected to remain constant at 09/99-08/00 levels

Sources: Tables 3.19, 3.20 and 3.31

Table 3.36

DAYTONA BEACH INTERNATIONAL AIRPORT

Summary of Projected Enplanements and Aircraft Operations - High Case

		Aircraft Operations				
		Passenger Carriers				
Year	Annual Enplanements	Air Carrier Jets	Regional Jets	General Aviation	Military	Total
2000	263,891	4,084	2,196	355,353	779	362,412
2005	350,000	5,110	4,380	372,480	779	382,749
2010	480,000	6,570	6,570	390,000	779	403,919
2020	750,000	8,760	11,680	424,110	779	445,329
		Average Annual Growth Rates				
2000-2005	5.8%	4.6%	14.8%	0.9%	0.0%	1.1%
2005-2010	6.5%	5.2%	8.4%	0.9%	0.0%	1.1%
2010-2020	4.6%	2.9%	5.9%	0.8%	0.0%	1.0%
2000-2020	5.4%	3.9%	8.7%	0.9%	0.0%	1.0%

Note: Military Operations projected to remain constant at 09/99-08/00 levels

Sources: Tables 3.23, 3.24, and 3.31

Table 3.37

DAYTONA BEACH INTERNATIONAL AIRPORT

Peaking Characteristics - Total Enplanements and Operations

	Base Case				High Case			
	2000	**2005**	**2010**	**2020**	**2000**	**2005**	**2010**	**2020**
Aircraft Departures								
Daily	595	625	656	715	595	630	661	727
Peak Hour	68	73	76	83	68	73	78	87
Aircraft Arrivals								
Daily	595	625	656	715	595	630	661	727
Peak Hour	68	73	76	83	68	73	78	87
Aircraft Operations								
Daily	1,190	1,250	1,312	1,430	1,190	1,260	1,322	1,454
Peak Hour	135	144	151	164	135	144	154	170
Passenger Enplanements								
Daily		936	1,064	1,291		1,129	1,548	2,420
Peak Hour		328	339	415		335	516	792
Passenger Deplanements								
Daily		936	1,064	1,291		1,129	1,548	2,420
Peak Hour		328	339	415		335	516	792
Total Passengers								
Daily		1,872	2,128	2,582		2,258	3,096	4,840
Peak Hour		491	555	645		503	860	1,210

Sources: Tables 3.22, 3.26, and 3.34

Peak hour total passengers, including both enplanements and deplanements, in the base case are projected to rise to 491 passengers in 2005, 555 passengers in 2010, and 645 passengers in 2020. Peak hour total passengers in the high case are forecast to grow to 503 passengers in 2005, 860 passengers in 2010, and 1,210 passengers in 2020.

The base and high cases represent two possible futures. They represent the most likely and most optimistic perspectives. However, there are many potential outcomes that may fall in between the levels of activity forecast in each case. Especially in cases where undeserved regional airports are in very close proximity to major hub airports, such as the situation Daytona Beach International is in relative to Orlando International, the range of potential aviation activity varies a great deal depending on the assumptions used. Daytona Beach is such an example, and the major focus of these two different cases is to provide a basis from which planning concepts to accommodate these opportunities can be developed.

Chapter Four
Facility Requirements

This chapter describes the facilities required to accommodate the forecast demand at Daytona Beach International Airport over the course of the planning period (through 2020). Facility requirements were determined by comparing the aviation demand projections presented in Chapter Three with the capacity of the various functional airport areas, including:

- Airspace Capacity
- Airfield Capacity and Delay
- Airfield Improvements
- Landside and Airside Buildings
- Air Cargo
- Support Facilities

Facility requirements are presented in phases corresponding to horizon years 2005, 2010, and 2020 to ensure a logical future development sequence.

The facility requirements were developed at an airport master plan level of detail, not the level of detail suitable for an architectural or engineering design study. Specific facility needs are discussed in this chapter, while alternative methods of meeting these requirements are evaluated in subsequent chapters.

4.1 AIRFIELD CAPACITY AND DELAY

Aircraft delay is directly related to airfield capacity. It is therefore essential to evaluate airfield capacity and resultant aircraft delays. This analysis is used to determine the airfield's capability to serve existing and future air traffic demand. This section details the relationship between airfield capacity and aircraft delay, and the factors that influence the ultimate capacity of an airfield.

4.1.1 Airfield Capacity Factors

Airfield capacity is the total number of aircraft that can operate from an airfield, during a given amount of time, when there is a continuous demand for service (i.e., when there is always at least one delayed aircraft waiting to depart or land.) Capacity is often measured in 1-hour increments, known as hourly capacity. Capacity can also be measured on an annual basis, known as Annual Service Volume (ASV). In this section, airfield capacity and delay were calculated using Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5060-5, Airport Capacity and Delay Manual, and the FAA Annual Delay Model. The FAA Airport Design v4.2D software was also used to determine VFR and IFR hourly capacity for aircraft operations.

The capacity of an airfield is influenced and determined by a number of factors, including aircraft separation, airspace limitations, weather, aircraft fleet mix, and runway and taxiway configuration and use.

Aircraft Separation

Separation between individual aircraft has a significant impact on the capacity of both an airfield and the airspace serving the airfield.

Generally, reduced separation will increase the capacity of an airfield since closer spacing means that more aircraft can use an airport during a specified time interval. Increased separation will reduce capacity. Several factors determine the required minimum separation between aircraft, including prevailing weather conditions, flight rules, and the type of aircraft.

Flight Rules and Weather Conditions

The flight rules under which aircraft operate have a direct impact on separation and, therefore, on airfield and airspace capacity.

Aircraft operate under two distinct categories of operational flight rules: visual flight rules (VFR) and instrument flight rules (IFR). These flight rules are closely related to the two categories of weather conditions: visual meteorological conditions (VMC) and instrument meteorological conditions (IMC). VMC exists during generally fair to good weather, and IMC exists during times of rain, low clouds, or reduced visibility. IMC exists whenever visibility falls below 3 statute miles or the ceiling drops below 1,000 feet above ground level (AGL).

During VMC, aircraft may operate under VFR, and the pilot is primarily responsible for seeing other aircraft and maintaining safe separation. Aircraft operating under VFR typically navigate by orientation to geographic and other visual references. Additionally, aircraft separation is reduced, and airspace and airfield capacity is increased compared to IFR.

During IMC, aircraft operate under IFR, and Air Traffic Control (ATC) is primarily responsible for separation of aircraft and exercises positive control over aircraft. Aircraft operating under IFR must meet certain minimum equipment requirements. Pilots must also be specially certified and meet proficiency requirements. IFR aircraft fly assigned routes and altitudes, and use a combination of radio navigation aids and vectors from ATC to navigate. Additionally, aircraft separation is increased, and airspace and airfield capacity is reduced as a result.

The majority of commercial air traffic, regardless of weather, operates under IFR. In an effort to increase capacity in both the airspace and the airports in the area, ATC will allow IFR aircraft to maintain visual separation when weather permits. Visual approaches can typically be conducted by IFR aircraft whenever the ceiling is 2,100 feet or greater and the visibility is 3 miles or greater. Conversely, IFR separation is maintained whenever the ceiling is less than 2,100 feet AGL or visibility is less than 3 miles. Using this criteria, VFR conditions occur approximately 92 percent of the time and IFR conditions exist approximately 8 percent of the time on average at Daytona Beach International Airport.

Fleet Mix

Fleet mix affects airborne aircraft separation requirements and, therefore, has a significant impact on airfield capacity. Where possible, ATC uses different runways, arrival/departure routes, and altitudes to separate aircraft. Separation for successive aircraft on the same runway and/or arrival/departure route considers two factors. First, separation between heavy, large, and small traffic is maintained to avoid wake turbulence from turbojet traffic. Wake turbulence is two counter-rotating cylindrical air masses created when aircraft wings produce lift. The velocity of the wind within these cylindrical air masses can be hazardous to other aircraft that encounter

them during flight, especially when a light aircraft follows a heavy aircraft. Minimum IFR separation between two aircraft is 3 nautical miles, but this separation is increased when wake turbulence is a factor. As an example, small aircraft are separated from heavy aircraft, such as a Boeing (B) 747, by 6 nautical miles. Small aircraft are separated from B757 aircraft by 5 nautical miles. **Table 4.1** shows the minimum separation standards between aircraft.

Second, faster aircraft must be separated from slower aircraft in order to maintain minimum separation standards. ATC will typically assign different arrival and departure routes and/or altitudes to segregate faster turbojet traffic from slower propeller-driven traffic.

Fleet mix must be calculated in order to determine airfield capacity at Daytona Beach International Airport. As shown in **Table 4.2**, aircraft are assigned to one of four categories for this capacity analysis. The fleet mix is refined into a Mix Index (MI), which is a weighted percentage of aircraft using an airport with a maximum takeoff weight greater than 41,000 pounds. The MI is derived using the following equation:

$$MI = C + 3D$$

In the formula, 'C' is the percentage of category C aircraft using an airport, and 'D' is the percentage of category D aircraft using an airport. The MI increases as the percentage of large and heavy aircraft using an airport increases. In general, airfield capacity decreases as the MI increases.

Table 4.1

DAYTONA BEACH INTERNATIONAL AIRPORT

Minimum Separation Standards

	Trailing A/C			
Leading A/C	**Heavy**	**B757**	**Large**	**Small**
Heavy	4nm	5nm	5nm	6nm
B757	3nm	3nm	4nm	5nm
Large	3nm	3nm	3nm	4nm
Small	3nm	3nm	3nm	3nm

Source: FAA Order N7110.157.

Table 4.2

DAYTONA BEACH INTERNATIONAL AIRPORT

Aircraft Classification

Aircraft Classification	Takeoff Weight (pounds)	Type of Aircraft	Average Approach Speed (knots)
A	41,000 or less	Small single engine propeller aircraft, such as C-172, C-207, PA-28	95
B	41,000 or less	Small twin-engine aircraft, including propeller-driven and some business jets, such as PA-31, C-310, Cessna Citation	120
C	41,000 pounds – 255,000 pounds	Large aircraft, such as MD-80, B737, A320, CRJ 200, ERJ 135/145	130
D	255,000 pounds or greater	Heavy aircraft, such as B-747, B-767, B-757, B-777	150

Sources: FAA Advisory Circular 150/5060-5, Airport Capacity and Delay (with changes), and HNTB analysis.

The MI was developed from the fleet mix data contained in Chapter 3, the Forecast chapter. The 2000 fleet mix has 7.8 percent category C aircraft, and 0 percent category D aircraft, which translates into a MI of 7.8. In the base case forecast, the MI is forecast to increase to 9 in 2005, and remain at 9 in 2010 and 2020. In the high forecast, the MI is forecast to increase to 9.2 in 2005, 9.7 in 2010, and 10.6 in 2020.

Runway Use

Runway use is determined by a number of factors at Daytona Beach International Airport, including prevailing winds, airfield layout, and runway length. There are three active runways at the airport: a primary east-west runway (7L-25R), a parallel runway used primarily for small general aviation (GA) aircraft operations (7R-25L), and a north-south crosswind runway (16-34).

Aircraft operating from an airport generally need to take off and land into the wind (known as a headwind) in order to reduce takeoff and landing ground roll length. Aircraft can also operate in a crosswind (i.e., when the wind is not blowing directly down the runway.) Use of any runway operating configuration is ultimately limited by the maximum crosswind or tailwind that aircraft can safely handle. Winds beyond these limits force an aircraft to use a different runway or not operate at all. Runway 7L-25R at Daytona Beach International Airport, serves as the primary runway for all aircraft operations. Light GA aircraft use Runway 7R-25L, and Runway 16-34 is used in crosswind conditions.

4.1.2 Runway Capacity

The FAA's Annual Delay Model (ADM) and FAA AC 150/5060-5, Airport Capacity and Delay, were used to estimate runway capacity at Daytona Beach International Airport under VFR and IFR conditions. It is important to note that the capacities provided in this section are theoretical and do not consider the impact of airspace interactions with other airports, such as Orlando International Airport.

Annual Service Volume

Annual Service Volume (ASV) is an FAA capacity measure that provides a reasonable estimate of the capacity of an airport on an annual basis and is useful for long-range planning. FAA AC 150/5060-5, Airport Capacity and Delay, as well as Airport Design v4.2D, was used to estimate the airport's ASV. Aircraft operations can exceed the theoretical ASV, sometimes by significant amounts, with corresponding increases in delay. In contrast, hourly capacities are physical capacities that generally cannot be exceeded. ASV is calculated based on hourly capacity results and historical demand patterns. As total annual operations approach the ASV of an airfield, average annual delays increase rapidly with relatively small increases in aircraft operations.

ASV is a function of the Mix Index (MI); as the MI of aircraft using the airport increases, and required aircraft separation increases as a result, ASV will decrease. The ASV for the existing airfield at Daytona Beach International Airport was calculated to be 485,000 operations. This number was generated by multiplying the weighted hourly capacity (181 operations), based on the runway layout and percentage of IFR/VFR operations, by the ratio of annual demand to daily demand and by the ratio of daily demand to peak hour demand. This value applies for a MI of 0 to 20. The MI is forecast to change only gradually in the base case forecast and, as a result, the ASV in 2020 would remain constant at 485,000 operations. The MI in the high forecast changes only slightly, causing the ASV to remain constant at 485,000 annual operations. In general, delays increase as the annual demand approaches and exceeds the ASV. High annual demand in 2020 is forecast to be 445,329 operations, indicating that the current airfield configuration of two parallel runways and one crosswind runway will possess adequate annual capacity.

One area of concern for airport users, however, is the airport's ability to accommodate instrument operations. The heavy student traffic at the airport often practices instrument approaches on the only instrumented runway, 7L-25R. These practice approaches often interfere with the commercial and business aircraft traffic.

The 1995 Master Plan Update recommended the relocation of Runway 7R-25L to increase the separation of the parallel runways, allowing for simultaneous instrument operations. Due to the desire of airport operators to accommodate both commercial/business aviation and flight training, this relocation is still recommended.

Peak-Hour Demand vs. Capacity

The FAA Annual Delay Model determines annual delay based on an analysis of hourly delay in representative hours of the year. The following demand profiles must be provided to calculate aircraft delay:

- Annual demand
- Monthly distribution of annual demand
- Daily distribution of weekly demand
- Hourly distribution of daily demand

Average hourly aircraft demand was developed using the above referenced monthly, daily, and hourly distribution of demand. Peak-hour demand versus capacity is shown in **Table 4.3**. Note that the hourly capacity of the airfield varies with the MI forecast for a particular year. In the base case, VFR airfield capacity is forecast to exceed hourly demand throughout the planning period. IFR capacity currently exceeds hourly demand and will continue to exceed hourly demand throughout the

planning period. Assuming the high forecast is realized, hourly demand during VFR conditions will remain below hourly capacity. Forecast hourly demand for the high case will exceed the IFR capacity of the airfield through 2020. This indicates a possible deficiency in the long-term hourly IFR capacity of the airfield if demand exceeds the base case forecast. Depending upon the needs of the airport operators, additional instrument runway capacity may be required.

4.1.3 Annual Delay and Delay Costs

ASV is a good indicator of potential long-range capacity issues, but average annual aircraft delay, expressed in minutes of delay per aircraft operation, is a better measure of an airport's ability to accommodate projected aircraft demand on a daily basis. Average annual delay is based on the frequency of good and poor weather conditions, demand variations, and runway capacity. If delay costs exceed the costs of providing new capacity, additional capacity is warranted.

Average Aircraft Delay

The FAA Annual Delay Model was used to estimate runway delays at Daytona Beach International Airport. The average aircraft delay in 2000 was estimated to be approximately 1.2 minutes per operation. Airfield capacity is typically reached when airfield delay reaches 4.0 minutes of delay per aircraft operation. However, these numbers reflect average delay; peak hour delays may be significantly higher.

A majority of operations at the airport consist of flight training. The effect of

Table 4.3

DAYTONA BEACH INTERNATIONAL AIRPORT

Hourly Demand vs. Capacity

	2000	2005	2010	2020
Base Forecast				
Total Demand	135	145	152	165
VFR Demand	124	133	140	152
IFR Demand	11	12	12	13
VFR Capacity	197	197	197	197
IFR Capacity	59	59	59	59
High Forecast				
Total Demand	135	146	153	168
VFR Demand	124	134	141	155
IFR Demand	11	12	12	13
VFR Capacity	197	197	197	197
IFR Capacity	59	59	59	59

Source: FAA Advisory Circular 150/5060-5, Airport Capacity and Delay (with changes), and HNTB analysis.

delays on these operations might not be realized due to the additional time needed to prepare the aircraft for flight. Flight delays are minimal for commercial aircraft at the airport as they are given priority over the smaller flight training aircraft.

Delay Costs

Aircraft delay can also be measured financially. Average operating costs per aircraft per hour are determined by the type and operational count of aircraft expected to use the airport. These costs include fuel, oil, maintenance, and crew.

Delay costs are minimal at Daytona Beach International Airport due to the number of general aviation operations at the airport. Commercial jet operations account for the majority of delay costs. Since commercial operations at the airport experience minimal or no delay, the associated delay costs are not significant.

Potential Capacity Improvements

Aircraft delays and delay costs will increase throughout the planning period. IFR airfield capacity exceeds demand for the base and high case forecast traffic level throughout the planning period as shown in section 4.1.1. Additional growth beyond the planning period will exceed airfield capacity. The airport is currently operating at 74 percent of their capacity. Planning for additional capacity improvements usually starts at 60 percent capacity and construction begins at 80 percent capacity. For this reason, the airport should preserve the option for one additional instrument runway to replace an existing runway for long-range capacity enhancement.

4.2 AIRFIELD REQUIREMENTS

4.2.1 Design Criteria

The FAA specifies that a critical aircraft or class of aircraft must be established for an airport. The critical aircraft determines the specific separation standards that should be applied to airport facility designs, such as runway/taxiway separation, runway/taxiway widths, building setbacks, etc. The critical aircraft is determined by identifying the most demanding aircraft or group of aircraft that uses the airport on a regular basis. To qualify as the critical aircraft, a threshold of 500 annual itinerant operations or 250 annual departures must be performed or be forecast for that aircraft or class of aircraft.

The critical aircraft is used to establish the appropriate Airport Reference Code (ARC) for an airport. The ARC is comprised of two components: (1) the *aircraft approach category*, which represents the approach speed of the aircraft and (2) the *aircraft design group*, which is based on the wingspan of the aircraft. FAA design criteria are categorized by ARC, which takes into account both the aircraft's approach speed and wingspan.

Aircraft Approach Category. The FAA has grouped aircraft based on their approach speed and maximum certificated landing weight. Approach speed equals 1.3 Vso, where Vso is aircraft stall speed. The stall speed and maximum certificated landing weight are established by the certificating authority of the Country of Registry. The aircraft approach categories are shown in **Table 4.4**.

Table 4.4

DAYTONA BEACH INTERNATIONAL AIRPORT

Aircraft Approach Categories

Approach Category	Approach Speed
A	less than 91 knots
B	91 knots or more, but less than 121 knots
C	121 knots or more, but less than 141 knots
D	141 knots or more, but less than 166 knots
E	166 knots or more

Source: AC 150/5300-13 (with changes).

Aircraft Design Group. The FAA establishes Aircraft Design Groups based on the physical characteristics of aircraft. Design Groups link airport dimensional standards and separation criteria to aircraft wingspans. The specific aircraft design groups are shown in **Table 4.5**.

Table 4.5

DAYTONA BEACH INTERNATIONAL AIRPORT

Aircraft Design Groups

Design Group	Wingspan Criteria
Group I	up to but not including 49'
Group II	49' up to but not including 79'
Group III	79' up to but not including 118'
Group IV	118' up to but including 171'
Group V	171' up to but not including 214'
Group VI	214' up to but not including 262'

Source: AC 150/5300-13 (with changes).

The ARC for Daytona Beach International Airport is D-IV, based on the current, approved Airport Layout Plan (ALP). Design Group D includes aircraft as large as the MD-11 or B767. The existing critical aircraft at the airport is the MD-80. An aircraft qualifies as the critical aircraft when 250 annual departures are performed, as previously noted. In the base case forecast, the critical aircraft will change in 2010 to the B737-800, and remain the B737-800 through 2020. The same is true of the high forecast. Runway 7R-25L is intended for use by light general aviation aircraft and meets ARC B-I standards. Aircraft utilize Runway 16-34 during crosswind conditions that restrict their use of Runway 7L-25R. Runway 16 has a non-precision approach, and Runway 34 has a visual approach. Runway 16-34 is designed to meet ARC D-IV standards.

4.2.2 Wind Coverage

The 10.5 to 20 knot crosswind components represent the full range of crosswind capacities for evaluation of all aircraft operating at Daytona Beach International Airport. The coverages are calculated from the wind roses shown in Chapter 2, Figures 2-19 through 2-21. The wind coverage of the airfield for a 20-knot crosswind component is greater than 99 percent for all-weather conditions and IFR conditions. The wind coverage for a 16-knot crosswind component is approximately 100 percent for all-weather and IFR conditions.

The analysis indicates the existing runway system exceeds FAA guidelines requiring at least 95 percent wind coverage. Additional runways are not required at the airport for wind coverage purposes.

4.2.3 Runway Length

Runway length requirements were determined based on the current and forecast fleet of aircraft expected to regularly serve the airport. Runway 7L-25R is 10,500 feet long, Runway 7R-25L is 3,195 feet long, and Runway 16-34 is 6,001 feet long.

Utilizing FAA planning manuals and Airport Design software (v4.2D), a recommended length of 8,310 feet was calculated to

accommodate 100 percent of large airplanes weighing 60,000 pounds or less at a 90 percent useful load. A recommended length of approximately 7,620 feet was calculated to accommodate large aircraft weighing over 60,000 pounds. These calculations were based on the mean maximum temperature during the hottest month of the year (90º F), the airport's elevation of 34 feet mean sea level, a projected trip length of 1,000 nautical miles, wet and slippery runways, and an effective runway gradient of 0.464 percent (representing the maximum percent at the airport.)

Table 4.6 represents takeoff distances for several aircraft at 90% Maximum Gross Takeoff Weight. Landing distances with 90% payload plus reserve fuel on a wet runway using full flaps are also shown. These distances were calculated using the performance tables for each aircraft.

Table 4.6

DAYTONA BEACH INTERNATIONAL AIRPORT

Runway Length Analysis

Aircraft	Engine	Takeoff Runway Length Maximum Takeoff Weight	Landing Runway Length Maximum Landing Weight
B727-200	JT8D-9A	9,500'	5,700'
B737-300	CFM56-3B-2	7,000'	5,500'
B737-500	CFM56-3B-1	8,200'	5,300'
B737-800	CFM56-7B26	7,300'	6,500'
B757-200	PW 2037	5,000'	4,700'
MD-82/88	JT8D-217A	7,000'	5,400'
ERJ-135/145	AE 3007C	5,600'	4,200'
CRJ-50-100	CF34-3B1	6,000'	5,500'

Source: Aircraft Planning Manuals and HNTB analysis.

The existing runway length is capable of accommodating the B737-800 and other C-III aircraft however, there can be a number of different runway lengths required to accommodate the same aircraft model. The required runway length for a given aircraft on a given day is determined by a combination of factors, including specific aircraft variant type, temperature, engine type, and takeoff weight. As shown in Table 4.6, the existing runway length is adequate to support both the base and high-case forecast aircraft operations.

4.2.4 Runway Widths

Runways 7L-25R and 16-34 are 150 feet wide, meeting FAA Airplane Design Group IV standards. Runway 7R-25L is 100 feet wide and meets and exceeds Airplane Design Group I standards. These runway widths are expected to adequately serve all current and forecast aircraft at Daytona Beach International Airport through the planning period.

4.2.5 Runway Clearances

Dimensional standards pertaining to runways and runway-related separations are essential

to provide adequate clearance from potential hazards that could impact the routine movement of aircraft at the airport. These standards relate to runway safety areas (RSAs) and object free areas (OFAs). Also addressed are the dimensional criteria for shoulders and blast pads.

RSAs enhance safety by providing cleared areas for airplanes that undershoot, over-run, or veer off the runway. They also provide improved accessibility for fire-fighting and rescue equipment during emergencies. RSAs should be graded and free of any structures, traverse ways, roads, railroads, and parking areas. Navigational Aids (NAVAIDs) with frangible mounts are permitted due to their essential functions.

The RSA for runways serving ARC D-IV aircraft is 500 feet wide along the entire runway length, and extends 1,000 feet beyond each runway end. Both Runways 7L-25R and 16-34 meet this design standard.

The RSA for runways serving ARC B-I aircraft is 120 feet wide along the entire runway length, and extends 240 feet beyond each runway end. Runway 7R-25L meets this design standard.

A *runway object free area* is an area on the ground that is centered on the runway centerline. The OFA enhances aircraft operational safety by being clear of objects, except those needed to be located in the OFA for air navigation or aircraft ground-maneuvering purposes.

The standard runway OFA for ARC D-IV is 800 feet wide along the entire runway length, and 1,000 feet beyond each runway end. Runway 7L-25R and Runway 16-34 meet this standard.

The standard runway OFA for ARC B-I is 400 feet wide along the entire runway length, and extends 500 feet beyond each runway end. Runway 7R-25L meets this design standard.

All current RSAs and OFAs are adequate to accommodate forecast increase in traffic at the Airport.

Aircraft parking limit lines establish the minimum distance an aircraft can be to a runway centerline based on Federal Aviation Regulation (F.A.R.) Part 77 criteria. Aircraft parking limit lines are particularly useful in developing airport terminal concepts. A 500-foot limit line from the runway centerline for B757 and smaller aircraft is typically used for planning aircraft parking positions and gate locations. The parking positions immediately in front of the Daytona Beach International Airport terminals meet this standard.

Blast pads are located at each end of a runway to provide ground erosion protection from jet blasts during aircraft takeoff. Standard blast pad dimensions for ARC D-IV are a width of 200 feet and a length of 200 feet. For ARC B-I, standard dimensions are a width of 120 feet and a length of 100 feet. A 600 foot by 150 foot blast pad is located at the approach end of Runway 7L and a 200 foot by 150 foot blast pad is located at the approach end of Runway 25R. The majority of commercial aircraft will continue to utilize this runway. The expansion of current blast pads or construction of additional blast pads is not necessary.

Runway shoulders minimize aircraft blast erosion and support use by airport maintenance and emergency equipment. Runway shoulders can also support aircraft that veer off the runway. Shoulders are

designed to improve safety, enhance drainage, and provide blast protection. Standard shoulder width is 25 feet for ARC D-IV and 10 feet for ARC B-I. The runway shoulders at the airport meet these standards and do not need to be enhanced to meet future forecast requirements.

Another important dimensional criteria is the *Building Restriction Line (BRL)*. BRLs provide the necessary clearance between the runway centerline and buildings or other fixed objects. The FAA recommends that BRLs encompass the runway protection zones (RPZs), the runway OFA, NAVAID critical areas, areas required for terminal instrument procedures, and the ATC tower line-of-sight. Daytona Beach International Airport currently has a 750 foot BRL in place around Runway 7L-25R and a 500 foot BRL around Runway 16-34. A 300 foot BRL encompasses runway 7R-25L. An extension of this BRL is recommended for any future runways equipped with instrument approaches.

4.2.6 Taxiway Requirements

Dimensional standards relating to taxiways and taxiway separations are necessary to ensure safe separation between aircraft operating on an airport and other aircraft or fixed or movable objects. Dimensional standards for the taxiways serving Runways 7L-25R and 16-34 are determined by ARC D-IV, while standards for the taxiways serving Runway 7R-25L are determined by ARC B-I. **Table 4.7** provides a summary of the separation standards for ARC D-IV and B-I.

Table 4.7

DAYTONA BEACH INTERNATIONAL AIRPORT

Taxiway Separation Standards

Standard	ARC D-IV	ARC B-I
Width	75’	25’
Runway Centerline to Taxiway Centerline Separation	400’	225’
Edge Safety Margin	15’	5’
Shoulder Width	25’	10’
Safety Area Width	171’	49’
OFA Width	259’	89’
Taxiway Centerline to Fixed or Movable Object	112.5’	44.5’

Source: AC 150/5300-13 (with changes).

The taxiway system at Daytona Beach International Airport provides adequate capacity and efficient flow for aircraft operations. The full-length parallel taxiways provide sufficient access for all runways. The taxiways also meet or exceed minimum width, safety area, and OFA design standards. An additional taxiway which is currently being constructed on the south side of and will connect to Runway 7L-25R, will enhance the safety and capacity of the airfield.

4.2.7 Pavement Strengths

Pavement strengths for Runways 7L-25R, 7R-25L, and 16-34 are provided in **Table 4.8**. Existing pavement strength is adequate for forecast aircraft operations at the airport.

Table 4.8

DAYTONA BEACH INTERNATIONAL AIRPORT

Pavement Strengths

Landing Gear Configuration	Pavement Strength (pounds)		
	Runway 7L-25R	Runway 7R-25L	Runway 16-34
Single Wheel	130,000	30,000	75,000
Dual Wheel	210,000	N/A	170,000
Dual Tandem Wheel	420,000	N/A	260,000
Double Dual Tandem Wheel	870,000	N/A	270,000

Source: Phase I Master Plan, February 1994.

4.2.8 Navigational Aids

The airport's existing complement of navigational and visual landing aids, described in the Master Plan Inventory, provide adequate air navigation capabilities to all aircraft in the short-term. However, as operations continue to increase, additional navigational and visual landing aids may be necessary to enhance the all-weather capabilities of the airport.

Current airport users have expressed a desire to have a precision instrument approach to Runway 7R, in order to increase the utility of the airport during times of heavy flight training.

4.3 PASSENGER TERMINAL

Terminal facility requirements for the airport were determined through the analysis of existing terminal plans, local service characteristics, forecasts, the consultant's planning data, and industry planning guidelines. Facility requirements were projected for the years 2005, 2010, and 2020 under the base case and high forecast scenarios. The forecasts for both of the scenarios are presented in Chapter Three. The ultimate 20-year annual passenger enplanement levels for the high scenario are forecast to be 750,000, compared to the base case forecast of 400,000 annual enplanements.

This section begins with a brief discussion of the existing facility, which forms the basis of the need for expanded facilities. Next, existing and forecast passenger demand levels and Daytona Beach-specific proposed planning factors are described to create the framework used in assessing the capacity of the existing terminal building, and in developing future facility requirements for the planning period.

The existing terminal building is a three-level structure which houses airline ticket counter and related airline office space, a passenger waiting area, a baggage claim area, a concessions area, airport administrative offices and board room, and a building mechanical area. The terminal and all related areas encompass approximately 175,000 square feet. The terminal is served by a single-level roadway with public, surface parking lots located to the north of the terminal building.

4.3.1 Demand Levels and Planning Factors

Demand levels are "units of demand," such as peak hour passengers or total square feet

of building, that place a demand on the terminal and its associated building systems. Planning factors are "units of facility" necessary to adequately serve a "unit of demand," such as a passenger. Planning factors are developed and used to assess the capacity of existing facilities, as well as to determine the required size of future facilities.

Demand Levels

The passenger demand levels directly affecting terminal building functions at the airport are as follows:

- Peak Hour Enplaning Passengers (PHEP)- the greatest number of passengers departing on both air carrier and regional carrier aircraft in a specific 60-minute time period.

- Peak Hour Deplaning Passengers (PHDP)- the greatest number of arriving passengers from both air carriers and regional carriers in a specific 60-minute time period.

- Peak Hour Passengers (PHP)- the largest number of both arriving and departing passengers from both air carriers and regional carriers in a specific 60-minute time period.

- Annual Enplaning Passengers (ANNEP)- the total number of passengers boarding air carrier or regional carrier aircraft during a specified year.

Additionally, the building total area is typically used as a demand to apply to a set percentage. This percentage is used as a factor to determine total square foot requirements for areas such as mechanical, electrical, and building systems, maintenance, and miscellaneous areas that occur throughout the terminal building.

As previously mentioned, the base case and high case forecast demand levels are presented in Chapter Three. A summary of the base case and high case forecast annual enplanements and the peak hour passenger levels are presented in **Tables 4.9 and 4.10**, respectively. At Daytona Beach International Airport, there is no significant transfer passenger activity. Therefore, the ratio of passenger originations and terminations as related to the PHEP and PHDP levels is not required. Additionally, annual aircraft and peak hour aircraft operations were derived from the forecasted annual enplanement levels to generate the aircraft parking position requirements.

Functional components of the terminal building must respond to the above demand levels. For example, ticket counters and outbound baggage facilities primarily serve PHEP, whereas baggage claim facilities serve PHDP. Concession areas serve all passengers but are usually evaluated in terms of ANNEP rather than PHP since their economic viability is typically based on a total annual volume of patronage and anticipated revenue dollars per passenger as well as possible earnings per square foot of concession space.

Planning Factors

The existing terminal building functional areas and existing size factors were analyzed together with existing and proposed sizing factors at comparable origination and destination (O&D) airports. This analysis was used to arrive at proposed planning factors for assessing the capacity of the existing terminals and for projecting future facility requirements.

Table 4.9

DAYTONA BEACH INTERNATIONAL AIRPORT

Base Case Forecast - Passenger & Aircraft Activity

	2000	2005	2010	2020
Enplanements				
Annual (ANNEP)	268,082	290,000	330,000	400,000
Peak Hour Enplanements (PHEP)		328	339	415
Peak Hour Originations (PHOP)		328	339	415
Deplanements				
Annual (ANNDP)		290,000	330,000	400,000
Peak Hour Deplanements (PHDP)		328	339	415
Peak Hour Terminations (PHTP)		328	339	415
Peak Hour Deplanements - International (PHDP Intl.)		N/A	N/A	N/A
Total Passengers				
Annual		580,000	660,000	800,000
Peak Hour Passengers (PHP)		480	538	615
Aircraft Operations				
Annual Operations (air carrier & commuter carriers only)	6,280	8,030	9,490	11,680
Peak Hour Operations	5	6	7	8
Peak Hour Arrivals	3	4	4	5
Peak Hour Departures	3	4	4	5
GATE REQUIREMENTS(a)	**5**	**5**	**5**	**6**

(a) Requirements assume 1 jet position = 1 departure lounge.

Table 4.10

DAYTONA BEACH INTERNATIONAL AIRPORT

High Case Forecast - Passenger & Aircraft Activity

	2000	2005	2010	2020
Enplanements				
Annual (ANNEP)	263,891	350,000	480,000	750,000
Peak Hour Enplanements (PHEP)		335	516	792
Peak Hour Originations (PHOP)		335	516	792
Deplanements				
Annual (ANNDP)		350,000	480,000	750,000
Peak Hour Deplanements (PHDP)		335	516	792
Peak Hour Terminations (PHTP)		335	516	792
Peak Hour Deplanements - International (PHDP Intl.)		N/A	N/A	N/A
Total Passengers				
Annual		700,000	960,000	1,500,000
Peak Hour Passengers (PHP)		574	703	1,016
Aircraft Operations				
Annual Operations (air carrier & commuter carriers only)	6,280	9,490	13,140	20,440
Peak Hour Operations	5	6	10	14
Peak Hour Arrivals	3	4	6	9
Peak Hour Departures	3	4	6	9
GATE REQUIREMENTS(a)	**5**	**6**	**8**	**13**

(a) Requirements assume 1 commuter position = 1 departure lounge and 1 jet position = 1 departure lounge.

The proposed factors, presented in **Table 4.11**, are those required to provide adequate levels of service through the planning period. Additionally, the proposed factors are used as a means for developing a capacity analysis of the existing terminal facility. "Capacity," in this instance, is considered to be the demand level at which the terminal's level of service degrades.

4.3.2 Passenger Terminal Facility Requirements

Facility requirements for the airport were derived by applying the forecast demand levels to the selected planning factors. Facility requirements were projected for the planning years indicated for the base case and high case forecast scenarios, as shown in **Tables 4.12** through **4.17**. A summary of facility requirements for each of the forecast scenarios is presented in **Tables 4.18** and **4.19**. A comparison of the existing areas to the proposed facility requirements indicates that the current facility is adequate throughout the base case planning period.

Terminal Building

The terminal building houses a wide range of functions and spaces. These functions and spaces are divided into five main categories: Airline Space, Concessions Space, Public Space, Mechanical/Support, and Other. For the purpose of discussion, the existing terminal area is referenced as a basis to relate projected facility requirements. Where the forecast airline functional spaces are compared to existing airline functional spaces, the forecast areas are compared to all airline tenant spaces, including vacant counters, ticket offices, and operations areas. A detailed discussion of each category follows.

Airline Space

This category includes ticket counters, ticket counter queuing, airline ticket offices (ATOs), departure lounges/ gates, baggage claim, outbound and inbound baggage areas, and airline operation areas.

All airline functional areas relating specifically to enplaning (departing) passengers were projected based on PHEP demand levels. These areas include ticket counters, ticket counter queuing, ATOs, and outbound baggage areas.

Currently, Daytona Beach International Airport has approximately 212 linear feet of ticket counter frontage. Assuming a fairly generous processing time per passenger of about 3 minutes and an average 5 linear feet per agent position (6.5-foot to 7-foot counter and a 3-foot baggage well for two agents), the existing linear frontage of ticket counters compared to the projected requirements yields a deficiency in ticket counter frontage under the 2020 high case forecasts. The existing ticket counter frontage is expected to meet the base case demand throughout the planning period. Under the high case forecast demand scenario, demand would require approximately 65 linear feet of additional ticket counter space.

Directly related to the ticket counter frontage, and proportional to the projected demands is the ticketing queue space. The ticketing queue space is 15- to 20-feet deep times the ticket counter length. Both areas would increase as the need for additional ticket counter frontage increases The existing ticket counter queuing at the airport is estimated to be 10,000 square feet. The ticket area and queue space is projected to be sufficient under the base and high case forecast demand.

Table 4.11

DAYTONA BEACH INTERNATIONAL AIRPORT

Passenger Terminal Building - Planning Factors

Space	Factor (a)		Remarks
Airline Functions			
Ticket Counter - SF	3.59	SF/PHEP	10.25 feet deep (Industry standard = 10.5' deep)
Ticket Counter - LF	0.35	LF/PHEP	Avg 3.0 minute process time per pax; 5.0 to 5.4 linear feet per agent position
Ticket Counter Queuing	7.00	SF/PHEP	20 feet deep, 5-foot circulation with 15-foot queue depth, uniqueue
Airline Ticket Office	7.00	SF/PHEP	20 feet deep; similar to comparable airports.
Departure Lounge	1,210	SF/GATE	Weighted average based on forecast fleet mix, load factor
Baggage Claim (SF)	23.85	SF/PHDP	15 feet around baggage claim devices
Baggage Claim (LF)	1.07	LF/PHDP	Display 75% of bags, average bags per passenger = 2.0
Baggage Service	1.50	SF/PHDP	Comparable airports
Outbound Baggage	15.75	SF/PHEP	45 feet deep (existing approx. 35 to 40 feet deep)
Inbound Baggage	19.61	SF/PHDP	Existing factor
Operations/Maintenance/Storage	0.0200	SF/ANNEP	Comparable airports
Concessions Space			
Food/Beverage	0.0100	SF/ANNEP	Comparable airports
News/Gift/Sundry	0.0030	SF/ANNEP	Comparable airports
Rental Car	0.0020	SF/ANNEP	Comparable airports
Other Revenue	0.0020	SF/ANNEP	Comparable airports
Secure Public Area			
Security	480	SF/Chkpt	Processes approximately 400 to 600 people/hr/chkpt
Circulation	1,400	SF/Gate	Comparable airports
Restrooms	3.00	SF/PHP	Comparable airports
Non-Secure Public Area			
Circulation - Ticketing	7.00	SF/PHEP	20 feet deep x ticket counter length
Circulation - Baggage Claim	15.47	SF/PHDP	Comparable airports
Circulation - General	0.0300	SF/ANNEP	Comparable airports
Restrooms	3.00	SF/PHP	Comparable airports
Other	0.0050	SF/ANNEP	Comparable airports
Non-Public Area			
FAA		As Required	
Airport Administration		As Required	
Maintenance	1.00%	Of Total SF	Comparable airports
Mechanical/Electrical/Bldg. Systems	13.00%	Of Total SF	Comparable airports
Miscellaneous	1.00%	Of Total SF	Comparable airports

Source: HNTB analysis, April 2001.

Table 4.12

DAYTONA BEACH INTERNATIONAL AIRPORT

Passenger Terminal Building - Facility Requirements 2005 (Base Case)

Space	Demand Level		Planning Factor		LF	SF	Percent of Total
Airline Functions							
Ticket Counter (SF)	328	PHEP	3.59	SF/PHEP		1,178	1.40%
Ticket Counter (LF)	328	PHEP	0.35	LF/PHEP	115		
Ticket Counter Queuing	328	PHEP	7.00	SF/PHEP		2,296	2.73%
Airline Ticket Office	328	PHEP	7.00	SF/PHEP		2,296	2.73%
Departure Lounge	5	Gates	1,210	SF/Gate		6,050	7.19%
Baggage Claim (SF)	328	PHDP	23.85	SF/PHDP		7,823	9.30%
Baggage Claim (LF)	328	PHDP	1.07	LF/PHDP	351		
Baggage Service	328	PHDP	1.50	SF/PHDP		492	0.58%
Outbound Baggage	328	PHEP	15.75	SF/PHEP		5,166	6.14%
Inbound Baggage	328	PHDP	19.61	SF/PHDP		6,432	7.65%
Operations/Maintenance/Storage	290,000	ANNEP	0.01	SF/ANNEP		2,900	3.45%
Subtotal Airline Functions						**34,632**	**41.17%**
Concessions Space							
Food/Beverage	290,000	ANNEP	0.0100	SF/ANNEP		2,900	3.45%
News/Gift/Sundry	290,000	ANNEP	0.0030	SF/ANNEP		870	1.03%
Rental Car	290,000	ANNEP	0.0020	SF/ANNEP		580	0.69%
Other Revenue	290,000	ANNEP	0.0020	SF/ANNEP		580	0.69%
Subtotal Concessions Space						**4,930**	**5.86%**
Secure Public Area							
Security	2	Chkpt	480	SF/Chkpt		960	1.14%
Circulation	5	Gates	1,400	SF/Gate		7,000	8.32%
Restrooms	480	PHP	3.00	SF/PHP		1,440	1.71%
Subtotal Secure Public Area						**9,400**	**11.17%**
Non-Secure Public Area							
Circulation - Ticketing	328	PHEP	7.00	SF/PHEP		2,296	2.73%
Circulation - Baggage Claim	328	PHDP	15.47	SF/PHDP		5,074	6.03%
Circulation - General	290,000	ANNEP	0.0300	SF/ANNEP		8,700	10.34%
Restrooms	480	PHP	3.00	SF/PHP		1,440	1.71%
Other	290,000	ANNEP	0.0050	SF/ANNEP		1,450	1.72%
Subtotal Non-Secure Public Area						**18,960**	**22.54%**
Non-Public Area							
Airport Administration	As Required		6,016	*(Aprox. Existing SF)*		6,016	7.15%
Maintenance	Total SF		1.00%	Of Total SF		679	0.81%
Mechanical/Electrical/Bldg. Systems	Total SF		13.00%	Of Total SF		8,830	10.50%
Miscellaneous	Total SF		1.00%	Of Total SF		679	0.81%
Subtotal Non-Public Area						**16,204**	**19.26%**
Total All Areas						**84,127**	**100%**

Source: HNTB analysis.

Table 4.13

DAYTONA BEACH INTERNATIONAL AIRPORT

Passenger Terminal Building - Facility Requirements 2010 (Base Case)

Space	Demand Level		Planning Factor		LF	SF	Percent of Total
Airline Functions							
Ticket Counter (SF)	339	PHEP	3.59	SF/PHEP		1,217	1.37%
Ticket Counter (LF)	339	PHEP	0.35	LF/PHEP	119		
Ticket Counter Queuing	339	PHEP	7.00	SF/PHEP		2,373	2.68%
Airline Ticket Office	339	PHEP	7.00	SF/PHEP		2,373	2.68%
Departure Lounge	5	Gates	1,210	SF/Gate		6,050	6.82%
Baggage Claim (SF)	339	PHDP	23.85	SF/PHDP		8,085	9.12%
Baggage Claim (LF)	339	PHDP	1.07	LF/PHDP	363		
Baggage Service	339	PHDP	1.50	SF/PHDP		509	0.57%
Outbound Baggage	339	PHEP	15.75	SF/PHEP		5,339	6.02%
Inbound Baggage	339	PHDP	19.61	SF/PHDP		6,648	7.50%
Operations/Maintenance/Storage	330,000	ANNEP	0.01	SF/ANNEP		3,300	3.72%
Subtotal Airline Functions						**35,894**	**40.49%**
Concessions Space							
Food/Beverage	330,000	ANNEP	0.0100	SF/ANNEP		3,300	3.72%
News/Gift/Sundry	330,000	ANNEP	0.0030	SF/ANNEP		990	1.12%
Rental Car	330,000	ANNEP	0.0020	SF/ANNEP		660	0.74%
Other Revenue	330,000	ANNEP	0.0020	SF/ANNEP		660	0.74%
Subtotal Concessions Space						**5,610**	**6.33%**
Secure Public Area							
Security	2	Chkpt	480	SF/Chkpt		960	1.08%
Circulation	5	Gates	1,400	SF/Gate		7,000	7.90%
Restrooms	538	PHP	3.00	SF/PHP		1,614	1.82%
Subtotal Secure Public Area						**9,574**	**10.80%**
Non-Secure Public Area							
Circulation - Ticketing	339	PHEP	7.00	SF/PHEP		2,373	2.68%
Circulation - Baggage Claim	339	PHDP	15.47	SF/PHDP		5,244	5.92%
Circulation - General	330,000	ANNEP	0.0300	SF/ANNEP		9,900	11.17%
Restrooms	538	PHP	3.00	SF/PHP		1,614	1.82%
Other	330,000	ANNEP	0.0050	SF/ANNEP		1,650	1.86%
Subtotal Non-Secure Public Area						**20,781**	**23.44%**
Non-Public Area							
Airport Administration	As Required		6,016	*(Aprox. Existing SF)*		6,016	6.79%
Maintenance	Total SF		1.00%	Of Total SF		719	0.81%
Mechanical/Electrical/Bldg. Systems	Total SF		13.00%	Of Total SF		9,342	10.54%
Miscellaneous	Total SF		1.00%	Of Total SF		719	0.81%
Subtotal Non-Public Area						**16,795**	**18.94%**
Total All Areas						**88,654**	**100%**

Source: HNTB analysis.

Table 4.14

DAYTONA BEACH INTERNATIONAL AIRPORT

Passenger Terminal Building - Facility Requirements 2020 (Base Case)

Space	Demand Level		Planning Factor		LF	SF	Percent of Total
Airline Functions							
Ticket Counter (SF)	415	PHEP	3.59	SF/PHEP		1,490	1.41%
Ticket Counter (LF)	415	PHEP	0.35	LF/PHEP	145		
Ticket Counter Queuing	415	PHEP	7.00	SF/PHEP		2,905	2.74%
Airline Ticket Office	415	PHEP	7.00	SF/PHEP		2,905	2.74%
Departure Lounge	6	Gates	1,210	SF/Gate		7,260	6.85%
Baggage Claim (SF)	415	PHDP	23.85	SF/PHDP		9,898	9.34%
Baggage Claim (LF)	415	PHDP	1.07	LF/PHDP	444		
Baggage Service	415	PHDP	1.50	SF/PHDP		623	0.59%
Outbound Baggage	415	PHEP	15.75	SF/PHEP		6,536	6.17%
Inbound Baggage	415	PHDP	19.61	SF/PHDP		8,138	7.68%
Operations/Maintenance/Storage	400,000	ANNEP	0.01	SF/ANNEP		4,000	3.77%
Subtotal Airline Functions						**43,755**	**41.28%**
Concessions Space							
Food/Beverage	400,000	ANNEP	0.0100	SF/ANNEP		4,000	3.77%
News/Gift/Sundry	400,000	ANNEP	0.0030	SF/ANNEP		1,200	1.13%
Rental Car	400,000	ANNEP	0.0020	SF/ANNEP		800	0.75%
Other Revenue	400,000	ANNEP	0.0020	SF/ANNEP		800	0.75%
Subtotal Concessions Space						**6,800**	**6.42%**
Secure Public Area							
Security	2	Chkpt	480	SF/Chkpt		960	0.91%
Circulation	6	Gates	1,400	SF/Gate		8,400	7.93%
Restrooms	615	PHP	3.00	SF/PHP		1,845	1.74%
Subtotal Secure Public Area						**11,205**	**10.57%**
Non-Secure Public Area							
Circulation - Ticketing	415	PHEP	7.00	SF/PHEP		2,905	2.74%
Circulation - Baggage Claim	415	PHDP	15.47	SF/PHDP		6,420	6.06%
Circulation - General	400,000	ANNEP	0.0300	SF/ANNEP		12,000	11.32%
Restrooms	615	PHP	3.00	SF/PHP		1,845	1.74%
Other	400,000	ANNEP	0.0050	SF/ANNEP		2,000	1.89%
Subtotal Non-Secure Public Area						**25,170**	**23.75%**
Non-Public Area							
Airport Administration	As Required		6,016	*(Aprox. Existing SF)*		6,016	5.68%
Maintenance	Total SF		1.00%	Of Total SF		869	0.82%
Mechanical/Electrical/Bldg. Systems	Total SF		13.00%	Of Total SF		11,301	10.66%
Miscellaneous	Total SF		1.00%	Of Total SF		869	0.82%
Subtotal Non-Public Area						**19,055**	**17.98%**
Total All Areas						**105,985**	**100%**

Source: HNTB analysis.

Table 4.15

DAYTONA BEACH INTERNATIONAL AIRPORT

Passenger Terminal Building - Facility Requirements 2005 (High Case)

Space	Demand Level		Planning Factor		LF	SF	Percent of Total
Airline Functions							
Ticket Counter (SF)	335	PHEP	3.59	SF/PHEP		1,203	1.28%
Ticket Counter (LF)	335	PHEP	0.35	LF/PHEP	117		
Ticket Counter Queuing	335	PHEP	7.00	SF/PHEP		2,345	2.50%
Airline Ticket Office	335	PHEP	7.00	SF/PHEP		2,345	2.25%
Departure Lounge	6	Gates	1,210	SF/Gate		7,260	7.74%
Baggage Claim (SF)	335	PHDP	23.85	SF/PHDP		7,990	8.52%
Baggage Claim (LF)	335	PHDP	1.07	LF/PHDP	358		
Baggage Service	335	PHDP	1.50	SF/PHDP		503	0.54%
Outbound Baggage	335	PHEP	15.75	SF/PHEP		5,276	5.63%
Inbound Baggage	335	PHDP	19.61	SF/PHDP		6,569	7.01%
Operations/Maintenance/Storage	350,000	ANNEP	0.01	SF/ANNEP		3,500	3.73%
Subtotal Airline Functions						**36,991**	**39.20%**
Concessions Space							
Food/Beverage	350,000	ANNEP	0.0100	SF/ANNEP		3,500	3.73%
News/Gift/Sundry	350,000	ANNEP	0.0030	SF/ANNEP		1,050	1.12%
Rental Car	350,000	ANNEP	0.0020	SF/ANNEP		700	0.75%
Other Revenue	350,000	ANNEP	0.0020	SF/ANNEP		700	0.75%
Subtotal Concessions Space						**5,950**	**6.35%**
Secure Public Area							
Security	2	Chkpt	480	SF/Chkpt		960	1.02%
Circulation	6	Gates	1,400	SF/Gate		8,400	8.96%
Restrooms	574	PHP	3.00	SF/PHP		1,722	1.84%
Subtotal Secure Public Area						**11,082**	**11.82%**
Non-Secure Public Area							
Circulation - Ticketing	335	PHEP	7.00	SF/PHEP		2,345	2.50%
Circulation - Baggage Claim	335	PHDP	15.47	SF/PHDP		5,182	5.53%
Circulation - General	350,000	ANNEP	0.0300	SF/ANNEP		10,500	11.20%
Restrooms	574	PHP	3.00	SF/PHP		1,722	1.84%
Other	350,000	ANNEP	0.0050	SF/ANNEP		1,750	1.87%
Subtotal Non-Secure Public Area						**21,499**	**22.93%**
Non-Public Area							
Airport Administration	As Required		6,016	*(Aprox. Existing SF)*		6,016	6.42%
Maintenance	Total SF		1.00%	Of Total SF		815	0.87%
Mechanical/Electrical/Bldg. Systems	Total SF		13.00%	Of Total SF		10,600	11.30%
Miscellaneous	Total SF		1.00%	Of Total SF		815	0.87%
Subtotal Non-Public Area						**18,247**	**19.46%**
Total All Areas						**93,769**	**100%**

Source: HNTB analysis.

Table 4.16

DAYTONA BEACH INTERNATIONAL AIRPORT

Passenger Terminal Building - Facility Requirements 2010 (High Case)

Space	Demand Level		Planning Factor		LF	SF	Percent of Total
Airline Functions							
Ticket Counter (SF)	516	PHEP	3.59	SF/PHEP		1,852	1.42%
Ticket Counter (LF)	516	PHEP	0.35	LF/PHEP	181		
Ticket Counter Queuing	516	PHEP	7.00	SF/PHEP		3,612	2.76%
Airline Ticket Office	516	PHEP	7.00	SF/PHEP		3,612	2.76%
Departure Lounge	8	Gates	1,210	SF/Gate		9,680	7.39%
Baggage Claim (SF)	516	PHDP	23.85	SF/PHDP		12,307	9.40%
Baggage Claim (LF)	516	PHDP	1.07	LF/PHDP	552		
Baggage Service	516	PHDP	1.50	SF/PHDP		774	0.59%
Outbound Baggage	516	PHEP	15.75	SF/PHEP		8,127	6.21%
Inbound Baggage	516	PHDP	19.61	SF/PHDP		10,119	7.73%
Operations/Maintenance/Storage	480,000	ANNEP	0.01	SF/ANNEP		4,800	3.67%
Subtotal Airline Functions						**54,883**	**41.93%**
Concessions Space							
Food/Beverage	480,000	ANNEP	0.0100	SF/ANNEP		4,800	3.67%
News/Gift/Sundry	480,000	ANNEP	0.0030	SF/ANNEP		1,440	1.10%
Rental Car	480,000	ANNEP	0.0020	SF/ANNEP		960	0.73%
Other Revenue	480,000	ANNEP	0.0020	SF/ANNEP		960	0.73%
Subtotal Concessions Space						**8,160**	**6.23%**
Secure Public Area							
Security	2	Chkpt	480	SF/Chkpt		960	0.73%
Circulation	8	Gates	1,400	SF/Gate		11,200	8.56%
Restrooms	703	PHP	3.00	SF/PHP		2,109	1.61%
Subtotal Secure Public Area						**14,269**	**10.90%**
Non-Secure Public Area							
Circulation - Ticketing	516	PHEP	7.00	SF/PHEP		3,612	2.76%
Circulation - Baggage Claim	516	PHDP	15.47	SF/PHDP		7,983	6.10%
Circulation - General	480,000	ANNEP	0.0300	SF/ANNEP		14,400	11.00%
Restrooms	703	PHP	3.00	SF/PHP		2,109	1.61%
Other	480,000	ANNEP	0.0050	SF/ANNEP		2,400	1.83%
Subtotal Non-Secure Public Area						**30,504**	**23.30%**
Non-Public Area							
Airport Administration	As Required		6,016	*(Aprox. Existing SF)*		6,016	4.60%
Maintenance	Total SF		1.00%	Of Total SF		1,138	0.87%
Mechanical/Electrical/Bldg. Systems	Total SF		13.00%	Of Total SF		14,798	11.30%
Miscellaneous	Total SF		1.00%	Of Total SF		1,138	0.87%
Subtotal Non-Public Area						**23,091**	**17.64%**
Total All Areas						**130,906**	**100%**

Source: HNTB analysis.

Table 4.17

DAYTONA BEACH INTERNATIONAL AIRPORT

Passenger Terminal Building - Facility Requirements 2020 (High Case)

Space	Demand Level		Planning Factor		LF	SF	Percent of Total
Airline Functions							
Ticket Counter (SF)	792	PHEP	3.59	SF/PHEP		2,843	1.43%
Ticket Counter (LF)	792	PHEP	0.35	LF/PHEP	277		
Ticket Counter Queuing	792	PHEP	7.00	SF/PHEP		5,544	2.78%
Airline Ticket Office	792	PHEP	7.00	SF/PHEP		5,544	2.78%
Departure Lounge	13	Gates	1,210	SF/Gate		15,730	7.89%
Baggage Claim (SF)	792	PHDP	23.85	SF/PHDP		18,889	9.48%
Baggage Claim (LF)	792	PHDP	1.07	LF/PHDP	847		
Baggage Service	792	PHDP	1.50	SF/PHDP		1,188	0.60%
Outbound Baggage	792	PHEP	15.75	SF/PHEP		12,474	6.26%
Inbound Baggage	792	PHDP	19.61	SF/PHDP		15,531	7.79%
Operations/Maintenance/Storage	750,000	ANNEP	0.01	SF/ANNEP		7,500	3.76%
Subtotal Airline Functions						**85,244**	**42.77%**
Concessions Space							
Food/Beverage	750,000	ANNEP	0.0100	SF/ANNEP		7,500	3.76%
News/Gift/Sundry	750,000	ANNEP	0.0030	SF/ANNEP		2,250	1.13%
Rental Car	750,000	ANNEP	0.0020	SF/ANNEP		1,500	0.75%
Other Revenue	750,000	ANNEP	0.0020	SF/ANNEP		1,500	0.75%
Subtotal Concessions Space						**12,750**	**6.40%**
Secure Public Area							
Security	2	Chkpt	480	SF/Chkpt		960	0.48%
Circulation	13	Gates	1,400	SF/Gate		18,200	9.13%
Restrooms	1,016	PHP	3.00	SF/PHP		3,048	1.53%
Subtotal Secure Public Area						**22,208**	**11.14%**
Non-Secure Public Area							
Circulation - Ticketing	792	PHEP	7.00	SF/PHEP		5,544	2.78%
Circulation - Baggage Claim	792	PHDP	15.47	SF/PHDP		12,252	6.15%
Circulation - General	750,000	ANNEP	0.0300	SF/ANNEP		22,500	11.29%
Restrooms	1,016	PHP	3.00	SF/PHP		3,048	1.53%
Other	750,000	ANNEP	0.0050	SF/ANNEP		3,750	1.88%
Subtotal Non-Secure Public Area						**47,094**	**23.63%**
Non-Public Area							
Airport Administration	As Required		6,016	*(Aprox. Existing SF)*		6,016	3.02%
Maintenance	Total SF		1.00%	Of Total SF		1,733	0.87%
Mechanical/Electrical/Bldg. Systems	Total SF		13.00%	Of Total SF		22,531	11.30%
Miscellaneous	Total SF		1.00%	Of Total SF		1,733	0.87%
Subtotal Non-Public Area						**32,013**	**16.06%**
Total All Areas						**199,309**	**100%**

Source: HNTB analysis.
Table 3.37

Table 4.18

DAYTONA BEACH INTERNATIONAL AIRPORT

Passenger Terminal Building - Facility Requirements Summary (Base Case)

Space	2005		2010		2020	
	LF	**SF**	**LF**	**SF**	**LF**	**SF**
Airline Functions						
Ticket Counter (SF)		1,178		1,217		1,490
Ticket Counter (LF)	115		119		145	
Ticket Counter Queuing		2,296		2,373		2,905
Airline Ticket Office		2,296		2,373		2,905
Departure Lounge		6,050		6,050		7,260
Baggage Claim (SF)		7,823		8,085		9,898
Baggage Claim (LF)	351		363		444	
Baggage Service		492		509		623
Outbound Baggage		5,166		5,339		6,536
Inbound Baggage		6,432		6,648		8,138
Operations/Maintenance/Storage		2,900		3,300		4,000
Subtotal Airline Functions		**34,632**		**35,894**		**43,755**
Concessions Space						
Food/Beverage		2,900		3,300		4,000
News/Gift/Sundry		870		990		1,200
Rental Car		580		660		800
Other Revenue		580		660		800
Subtotal Concessions Space		**4,930**		**5,610**		**6,800**
Secure Public Area						
Security		960		960		960
Circulation		7,000		7,000		8,400
Restrooms		1,440		1,614		1,845
Subtotal Secure Public Area		**9,400**		**9,574**		**11,205**
Non-Secure Public Area						
Circulation - Ticketing		2,296		2,373		2,905
Circulation - Baggage Claim		5,074		5,244		6,420
Circulation - General		8,700		9,900		12,000
Restrooms		1,440		1,614		1,845
Other		1,450		1,650		2,000
Subtotal Non-Secure Public Area		**18,960**		**20,781**		**25,170**
Non-Public Area						
Airport Administration		6,016		6,016		6,016
Maintenance		679		719		869
Mechanical/Electrical/Building Systems		8,830		9,342		11,301
Miscellaneous		679		719		869
Subtotal Non-Public Area		**16,204**		**16,795**		**19,055**
Total All Areas		**84,127**		**88,654**		**105,985**

(a) Existing Airline Ticket Office includes Operations and Outbound Baggage; Existing Circulation includes Ticketing, Baggage, and G Existing News/Gift/Sundry combined with Food/Beverage.

Source: HNTB analysis.

Table 4.19

DAYTONA BEACH INTERNATIONAL AIRPORT

Passenger Terminal Building - Facility Requirements Summary (High Case)

Space	2005		2010		2020	
	LF	**SF**	**LF**	**SF**	**LF**	**SF**
Airline Functions						
Ticket Counter (SF)		1,203		1,852		2,843
Ticket Counter (LF)	117		181		277	
Ticket Counter Queuing		2,345		3,612		5,544
Airline Ticket Office		2,345		3,612		5,544
Departure Lounge		7,260		9,680		15,730
Baggage Claim (SF)		7,990		12,307		18,889
Baggage Claim (LF)	358		552		847	
Baggage Service		503		774		1,188
Outbound Baggage		5,276		8,127		12,474
Inbound Baggage		6,569		10,119		15,531
Operations/Maintenance/Storage		3,500		4,800		7,500
Subtotal Airline Functions		**36,991**		**54,883**		**85,244**
Concessions Space						
Food/Beverage		3,500		4,800		7,500
News/Gift/Sundry		1,050		1,440		2,250
Rental Car		700		960		1,500
Other Revenue		700		960		1,500
Subtotal Concessions Space		**5,950**		**8,160**		**12,750**
Secure Public Area						
Security		960		960		960
Circulation		8,400		11,200		18,200
Restrooms		1,722		2,109		3,048
Subtotal Secure Public Area		**11,082**		**14,269**		**22,208**
Non-Secure Public Area						
Circulation - Ticketing		2,345		3,612		5,544
Circulation - Baggage Claim		5,182		7,983		12,252
Circulation - General		10,500		14,400		22,500
Restrooms		1,722		2,109		3,048
Other		1,750		2,400		3,750
Subtotal Non-Secure Public Area		**21,499**		**30,504**		**47,094**
Non-Public Area						
Airport Administration		6,016		6,016		6,016
Maintenance		815		1,138		1,733
Mechanical/Electrical/Building Systems		10,600		14,798		22,531
Miscellaneous		815		1,138		1,733
Subtotal Non-Public Area		**18,247**		**23,091**		**32,013**
Total All Areas		**93,769**		**130,906**		**199,309**

(a) Existing Airline Ticket Office includes Operations and Outbound Baggage; Existing Circulation includes Ticketing, Baggage, and C
Existing News/Gift/Sundry combined with Food/Beverage.

Source: HNTB analysis.

Airline Ticketing Area and the associated Ticket Offices are generally located behind the ticket counter. These areas are used for support, operations space, and, in some cases, outbound baggage makeup. The facility requirements for the Ticketing Area and ATO space are also directly related to the linear feet of ticket counter. The ticketing area is 10.5-feet deep times the linear feet of ticket counter. Typically, ATO space is approximately 20-feet deep and located behind the airline tenants ticket counters. Currently the Ticket Area and ATO facilities measure approximately 11,000 square feet. Based on the proposed factors and the projected passenger demand levels, the Ticketing Area and Ticket Offices meet the requirements for the base and high case planning period.

Facility requirements for aircraft gates and departure lounges were calculated as a function of forecast fleet mix, gate requirements, and required square feet per passenger. The passenger terminal currently houses 6 aircraft gates/departure lounges. Under the base case forecast, this number of gates and lounges will be sufficient to meet the forecast demand. It is forecast that 6, 8, and 13 air carrier gates will be required by the end of the planning period for the high forecast. Based on the tables presented in Chapter Three, the air carrier fleet mix varies from the Boeing 737-500 and –800 series and the McDonnell-Douglas MD-80 to occasional operations of the Boeing 727-200 and 757-200. The commuter/regional carrier fleet mix includes both the Embraer and Canadair Regional Jets. With the projected demand for additional gates/parking positions, comes an increase in departure lounge area. Approximately 10,000 square feet of departure lounge area exists at the airport. These facilities are expected to meet the base case demand. Under the high case, approximately 15,700 square feet of departure lounge area is forecast to be necessary to meet the projected 2020 demand, meaning that the facility will have a deficiency of nearly 5,700 square feet.

PHDP demand levels were used to calculate facility requirements for baggage claim and baggage make-up areas. The existing terminal has approximately 24,000 square feet for these uses. These facilities are expected to be sufficient in serving the base and high case forecast demand however, additional inbound and outbound baggage areas might be necessary for long range planning purposes in the high forecast.

Concession Space

Concession space includes food and beverage establishments, news/gift/sundry stands and shops, rental car counters and offices, and other revenue-generating space, such as telephones, advertisement kiosks, and ground transportation service areas. Facility requirements for these areas were projected based on ANNEP since a concessionaire's economic viability is determined by anticipated dollars per passenger that can reasonably be expected in a given year. Projected facility requirements for all concession spaces are projected to increase from over 4,930 square feet for the base case 2005 forecast to 12,750 square feet for the 2020 high forecast. The existing terminal's nearly 19,000 square feet of concessions space is projected to meet this demand.

Secure Public Area

The secure public areas include the security checkpoints, secure circulation, and restrooms located beyond the security checkpoint on the secure side.

The facility requirements for security checkpoints were based on a processing rate of 400 to 600 passengers per hour per station (a security screening station consists of an x-ray device and a magnetometer.) Currently, the airport has two security checkpoint stations. Proposed planning factors call for approximately 480 square feet of security space per checkpoint. Based on these factors, the base and high forecast demand levels do not indicate a need for additional security checkpoints through the planning period.

Secure circulation area requirements were based on the average square feet of concourse circulation needed for each departure lounge/gate. The factor used for secure circulation includes areas not directly adjacent to the departure lounge, to account for circulation at the restroom cores, and concession areas that occur along the concourse. The requirements for this functional area is expected to grow from nearly 7,000 square feet for the 2005 base case demand to 18,200 square feet for the 2020 high case demand. The 2020 base case will require 8,400 square feet of area. The current facility offers nearly 10,000 square feet of secure circulation. Therefore, if the high forecast demand levels are met, roughly 8,200 square feet of additional secure circulation space is recommended.

Currently, there is one set of restrooms located on the secure side, measuring approximately 1,300 square feet. Requirements based on projected PHP under the base forecast reflect a need for nearly 500 additional square feet by 2020. Under the high case, an additional 2,700 square feet of secure restrooms are projected to be necessary to meet the increased demand.

Non-Secure Public Area

This category includes circulation in the ticketing lobby, baggage claim lobby, and general circulation, including entry/exit vestibules and stairs. Also included in this category are non-secure public restrooms and other public areas, such as seating alcoves and miscellaneous areas accessible to the public.

Facility requirements for ticketing lobby circulation are a direct function of the amount of ticket counter required, and are based on PHEP. Ticketing lobby circulation is considered to be that circulation area which occurs in front of the ticket counter, not including passenger queuing space. Average ticket lobby circulation corridors range from 20-feet wide to approximately 35-feet wide. Existing general circulation is approximately 13,500 square feet. Under the 2005 base forecast, approximately 8,700 square feet will be necessary to meet the demands of forecasted general circulation levels. Under the 2020 high forecast, this number is expected to exceed 18,200 square feet. Therefore, additional general circulation area of approximately 5,000 may be necessary to meet the high case forecast demand.

The need for other non-secure areas, such as seating areas, is also expected to increase over the course of the planning period under the high-case forecast.

Non-Public Areas

Non-public areas include airport administration offices; loading dock areas; maintenance rooms; space for mechanical, electrical, and building systems; and miscellaneous areas.

Miscellaneous and maintenance areas, as well as mechanical, electrical, and buildings systems, are calculated as a percentage of total building area. Daytona Beach International Airport currently has roughly 20,000 square feet of mechanical/electrical/building system space. The base case 2020 forecast demand calls for nearly 11,300 square feet of mechanical/ electrical/building system space, while over 2,500 square feet of additional space will be required under the 2020 high forecast to meet the 22,500 forecast requirement. The airport's existing maintenance space of nearly 2,600 square feet is expected to be sufficient throughout the planning period for the base and high case requirement.

Passenger Terminal Summary

An analysis of the existing capacity and future facility requirements for Daytona Beach International Airport indicates an acceptable terminal area for the base case. However, there is a need for an additional aggregate total area of approximately 25,000 square feet of terminal and 7 additional aircraft gates to meet the 2020 high case scenario.

4.4 SURFACE TRANSPORTATION AND PARKING REQUIREMENTS

The Daytona Beach International Airport (DBIA) is served by I-4 to the west and I-95 to the north and south. Locally, the airport can be accessed via Beville Road, Williamson Boulevard, Bellevue Avenue Extension, Richard Petty Boulevard, and International Speedway Boulevard (ISB). All routes lead to the main access point at the intersection of Midway Avenue and Catalina Drive. All roadways leading to and from the airport have a minimum of two lanes in each direction; posted speed limits range from 40-55 miles per hour (mph) on local roads and 55-70 mph on interstates.

Catalina Drive is the main access road to the airport and leads to the domestic and international terminals, all classes of parking, and the rental car drop-off area. It is a two-lane roadway leading to and from the terminal areas. Catalina Drive varies in width throughout the airport from two lanes at the entrance and exit, to four lanes immediately in front of the terminal building. A secondary two-lane route is located off of Richard Petty Boulevard at Coral Sea Avenue that is used primarily for rental car return, terminal, cargo, and maintenance support

For those passengers utilizing public transportation, the airport is serviced by a variety of local taxi, shuttle, and limousine companies. Public bussing is also provided by VOTRAN, with one route serving the airport continuously throughout the day, Monday through Saturday.

Ground transportation is located outside the east entrance to the airport with sufficient curb space to accommodate approximately four vehicles. The primary entrance to the main terminal building is located along the north side of the building with approximately 600 feet of curb for passenger drop-off and pick-up.

Airport Access Requirements

Based on all future condition forecasts and the intersection level of service analyses, no additional lanes are recommended for the airport internal roadway network. The existing roadway network is underutilized during the PM peak-hour and any future

traffic will have minimal impact on the capacity of the roadway.

There is currently 414 feet of available curb space adjacent to the airport terminal. The future year curb space requirements were estimated based on peak hour passenger enplaning and deplaning projections, using procedures recommended by the Transportation Research Board.[1] The resulting requirements are shown in **Tables 4.20 and 4.21**. Under the base growth case, the existing curb space will be adequate to serve the needs of terminal users in the years 2005 and 2010. In 2020, the base case forecast numbers call for a terminal curb on 426 feet. However, due to the small deficiency, the existing curb is thought to be adequate to meet this demand.

Under the high growth case, the existing curb space will quickly become inadequate. By 2020, as much as 773 linear feet of total curb space may be required to serve enplaning and deplaning passengers in the high growth case.

4.4.1 Data Collection

Historical Traffic Counts

Historical traffic counts and peak season factors were obtained through the Florida Department of Transportation's (FDOT) Florida Traffic Information program. These counts were used in the Network Simulation (NETSIM) analysis software to interpolate traffic flow between studied intersections and to determine growth rates for future background traffic.

Crash Data

Crash data for the past two years was collected from Volusia County Traffic Engineering to determine the presence of any high hazard areas. **Figure 4-1** shows the number of crashes within the past two years in the study area.

Twenty-Four Hour Counts

Twenty-four hour counts were taken to determine the peaking conditions in the vicinity of the Daytona Beach International Airport. Counts were taken at the following locations:

- Beville Road between Woodcrest Avenue and Clyde Morris Boulevard
- Beville Road between Clyde Morris Boulevard and Cambridge Avenue
- Bellevue Avenue Extension between Williamson Boulevard and Clyde Morris Blvd.
- Catalina Boulevard east of Midway Avenue (DBIA Main Entrance)
- Clyde Morris Boulevard between Bellevue Avenue Extension and Richard Petty Blvd.
- ISB east of I-95
- ISB between Hagen Terrace and Clyde Morris Boulevard
- Midway Avenue between ISB and Richard Petty Drive
- Midway Avenue between Williamson Boulevard and Catalina Drive
- Richard Petty Boulevard between Corsair Drive and Clyde Morris Boulevard

[1] Transportation Research Board, National Research Council. (1987). *Special Report 215: Measuring Airport Landside Capacity*. Washington, D.C.

Table 4.20

DAYTONA BEACH INTERNATIONAL AIRPORT

Terminal Curb Length Requirements
Base Case

Year	Peak Hour Passengers (a)		Required Curb Length (b)			
	Enplaning	Deplaning	Enplaning	Deplaning	Total	Rounded (c)
2005	328	328	131	164	295	369
2010	339	339	136	170	305	381
2020	415	415	166	208	374	467

(a) Table 3.37
(b) TRB Special Report 215.
(c) 25% added to total length to account for variations in vehicle mix, occupancy and dwell times.

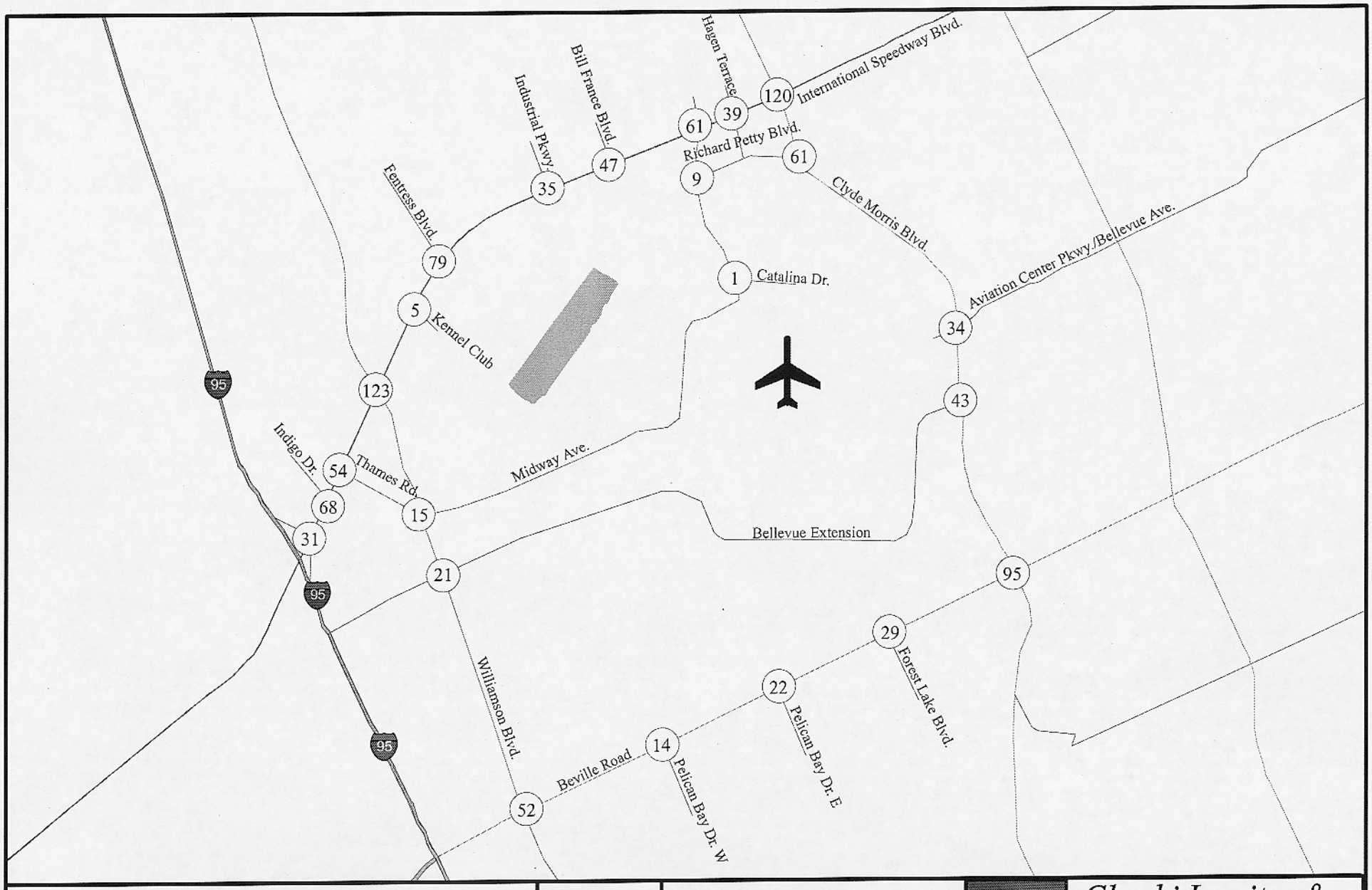
Table 4.21

DAYTONA BEACH INTERNATIONAL AIRPORT

Terminal Curb Length Requirements
High Case

Year	Peak Hour Passengers (a)		Required Curb Length (b)			
	Enplaning	Deplaning	Enplaning	Deplaning	Total	Rounded (c)
2005	335	335	134	168	302	377
2010	516	516	206	258	464	581
2020	792	792	317	396	713	891

(a) Table 3.37
(b) TRB Special Report 215.
(c) 25% added to total length to account for variations in vehicle mix, occupancy and dwell times.



Daytona Beach International Airport Master Plan

N

Two Year Crash History

PROJECT NUMBER: 2381.01

FIGURE: 4.4.1

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Turning Movement Counts

Eight-hour turning movement counts were taken to determine operational levels of service (LOS) for major intersections accessing the airport. The turning movement counts include two hours during the AM peak-period (7:00 am to 9:00 am), two hours during the Midday peak-period (11:00 am to1:00 pm), and two hours during the PM peak-period (5:00 pm to 7:00 pm). Turning movement counts were taken at the following major intersections:

- Beville Road and Williamson Boulevard
- Beville Road and Clyde Morris Boulevard
- Bellevue Avenue Extension and Williamson Boulevard
- Bellevue Avenue Extension and Clyde Morris Boulevard
- Catalina Drive and Midway Avenue
- ISB and I-95 Northbound Off-Ramp
- ISB and Williamson Boulevard
- ISB and Midway Avenue
- ISB and Clyde Morris Avenue
- Midway Avenue and Williamson Boulevard
- Richard Petty Boulevard and Midway Avenue
- Richard Petty Drive and Clyde Morris Boulevard

Turn-Lane Requirements

NETSIM was used to determine the maximum queue length for all approaches to the major intersections within the study area. The recommendations for storage space shown in **Table 4.22** are based on a 25-foot per vehicle requirement, which includes the vehicle and space between other vehicles.

Traffic Signal Timing

Traffic signal timing and phasing information for the major intersections was obtained from the Traffic Engineering Departments of the City of Daytona Beach and Volusia County. In addition, signal timing information was obtained during field visits for all other signalized intersections within the study area for the purpose of a NETSIM roadway network simulation.

Six levels of service have been established as standards by which to gauge intersection performance, designated by the letters A through F. The level of service categories are defined as follows:

Level of Service A: Control delays ≤ 10 seconds/vehicle. Progression is favorable and most vehicles arrive during a green cycle and do not have to stop.

Level of Service B: Control delays 10-20 seconds/vehicle. Good progression, more vehicle stops.

Level of Service C: Control delays 20-35 seconds/vehicle. Fair progression, significant vehicle stoppage.

Level of Service D: Control delays 35-55 seconds/vehicle. Unfavorable progression, noticeable congestion.

Level of Service E: Control delays 55-80 seconds/vehicle. Poor progression, significant congestion.

Level of Service F: Control delays > 80 seconds/vehicle. Considered unacceptable to most drivers. Very poor progression and vehicles may need more than one signal cycle to get through the intersection.

Table 4.22

DAYTONA BEACH INTERNATIONAL AIRPROT

Recommended Turn-Lane Lengths

Intersection	Movement	Existing Length (ft.)	2005	2010	2020
Beville Rd. & Williamson Blvd.	EBLT/EBRT	282D/306	NC	NC	NC
	WBLT/WBRT	290D/291	NC	NC	NC
	SBLT/SBRT	371D/339	NC	NC	NC
	NBLT/NBRT	233D/Shared	NC	NC	NC
Beville Rd. & Clyde Morris Blvd.	EBLT/EBRT	276D/176	NC	NC	NC
	WBLT/WBRT	275D/182	NC	NC	NC
	SBLT/SBRT	265D/Shared	NC	NC	NC
	NBLT/NBRT	183D/Shared	**200D/NC**	**250D/NC**	**250D/NC**
Bellevue Avenue Extension & Williamson Blvd.	EBLT/EBRT	104/104	NC	NC	NC
	WBLT/WBRT	175/Shared	NC	NC	NC
	SBLT/SBRT	282/282	NC	NC	NC
	NBLT/NBRT	359/359	NC	NC	NC
Bellevue Avenue Extension & Clyde Morris Blvd.	EBLT/EBRT	188/Shared	NC	NC	NC
	WBLT/WBRT	Shared	NC	NC	NC
	SBLT/SBRT	64/72	NC	NC	NC
	NBLT/NBRT	Shared/Shared	NC	NC	NC
Catalina Dr. & Midway Ave.	EBLT/EBRT	N/A	N/A	N/A	N/A
	WBLT/WBRT	30/30	**50/NC**	**75/NC**	**75/NC**
	SBLT/SBRT	287/ N/A	NC	NC	NC
	NBLT/NBRT	N/A /182	NC	NC	NC
ISB & I-95 NB Off-Ramp	EBLT/EBRT	N/A	N/A	N/A	NC
	WBLT/WBRT	N/A /Cont.	NC	NC	NC
	SBLT/SBRT	N/A	N/A	N/A	NC
	NBLT/NBRT	Cont./Cont.	NC	NC	NC
ISB & Williamson Blvd.	EBLT/EBRT	268D/Cont.	**NC/NC**	**275D/NC**	**275D/NC**
	WBLT/WBRT	180D/Cont.	**225D/NC**	**225D/NC**	**225D/NC**
	SBLT/SBRT	175/261	**225/NC**	**225/NC**	**225/NC**
	NBLT/NBRT	155/175	**175/NC**	**175/200**	**200/200**

Table 4.22 continued

ISB & Midway Ave.	EBLT/EBRT	341D/Cont.	NC	NC	NC
	WBLT/WBRT	341D/Cont.	NC	NC	NC
	SBLT/SBRT	81/Shared	**125/NC**	**125/NC**	**125/NC**
	NBLT/NBRT	116D/289	**175/NC**	**175D/NC**	**175D/NC**
ISB & Clyde Morris Blvd.[1]	EBLT/EBRT	318D/Cont.	NC	NC	NC
	WBLT/WBRT	393D/325	NC	NC	NC
	SBLT/SBRT	307D/327	**425/NC**	**425/NC**	**425/NC**
	NBLT/NBRT	354D/354	NC	NC	**375/NC**
Midway Ave. & Williamson Blvd.	EBLT/EBRT	191/191	NC	NC	NC
	WBLT/WBRT	154/Shared	NC	NC	NC
	SBLT/SBRT	82/Shared	NC	NC	NC
	NBLT/NBRT	134/290	NC	NC	NC
Richard Petty Blvd. & Midway Ave.	EBLT/EBRT	Shared	NC	NC	NC
	WBLT/WBRT	98/216	NC	NC	NC
	SBLT/SBRT	132/Shared	**175/NC**	**175/NC**	**175/NC**
	NBLT/NBRT	86/117	NC	NC	NC
Richard Petty Blvd. & Clyde Morris Blvd.	EBLT/EBRT	728/Shared	NC	**NC/NC**	**NC/NC**
	WBLT/WBRT	237/Shared	**325/NC**	**325/NC**	**325/NC**
	SBLT/SBRT	107/Shared	NC	NC	NC
	NBLT/NBRT	119/199	**175/NC**	**175/NC**	**175/NC**

D- Dual turn-lane
Cont.- Continuous turn-lane
Shared- Movement shares a lane with one or more approaches to the intersection
NC- No changes required to existing geometry
Bold terms indicate recommended changes to geometry
1- The deficiencies in level of service at this intersection shown in Tables 4.4.1 and 4.5.3 are a result of the high volume of through movements rather than left- or right-turning vehicle

The Highway Capacity Software (HCS) was used to determine signal timings that would allow the major intersections to operate at an acceptable level of service. **Table 4.23** shows the existing and proposed levels of service and corresponding signal cycle length. Bold entries indicate that a satisfactory level of service is not attainable with existing geometry. For those intersections that are currently or will be failing, the cycle length shown is that which minimizes the vehicle delay. The base and high case forecasts were not differentiated here because the variances between the forecasts would be most notable at the intersection of Midway Avenue and Catalina Drive, where there is minimal delay in all forecast conditions. The increase in airport traffic is represented in the other intersections as background traffic growth. It is important to note that those segments shown as failing are likely to be deficient with or without the projected growth from the airport.

Special Events

Due to the variety of special events within the Daytona Beach area, traffic tends to be concentrated in certain areas, based on the event (i.e. Spring Break at the beach, racing events at the Daytona International Speedway, Bike Week at both the beach and the Speedway, etc.). In addition, the peak times and traffic flows vary significantly for each event and throughout the course of an individual event. In part because of the varied nature of these events, the City of Daytona Beach and Volusia County do not currently have any specialized signalization or signage plans in place for special events. Video cameras and various detection devices are monitored during special events and signal timings are adjusted on an as needed, real-time basis. Programmable signboards supplied by the City of Daytona Beach and Volusia County are used to direct visitors to attractions and parking sites.

Because there are no specialized signalization plans in place, NETSIM was configured using standard signal timing and phasing. The turning movement counts taken in November 2000 were factored up by 1.04 to represent peak-season (March/April) conditions. The twenty-four hour counts indicated that peak usage of five of the major intersections is between 11:00am and 1:00pm, while the other seven intersections peak during the PM period-5:00pm to 7:00pm, therefore the NETSIM analysis was performed for the PM peak-period.

NETSIM was used to look at the roadway network within the study area as a whole to determine if there were any intersections or segments that experience an excessive level of delay or congestion during the peak-season peak-hour. The level of service at a signalized intersection is based on the average stop delay per vehicle for the various movements within the intersection.

Intersection level of service describes the operating condition determined from the number of vehicles approaching a given intersection during a specified time period. It is a qualitative measure of control delay as a measure of driver discomfort, frustration, fuel consumption, and travel time.

The existing operating conditions at the signalized intersections were evaluated using the Highway Capacity Software 3.2 (HCS). This software utilizes the methodology outlined in Chapter 9 of the *Highway Capacity Manual, Special Report 209*. **Table 4.24** shows the estimated PM peak-hour peak-season levels of service.

Table 4.23

DAYTONA BEACH INTERNATIONAL AIRPORT

Signal Timing Recommendations for Peak-Season PM Peak-Hour

Intersection	Existing Cycle Length (sec.)	Existing LOS	2005 Cycle Length (sec.)	2005 LOS	2010 Cycle Length (sec.)	2010 LOS	2020 Cycle Length (sec.)	2020 LOS
Beville Rd. & Williamson Blvd.	116	D	110	D	120	E	**180**	**F**
Beville Rd. & Clyde Morris Blvd.	214	E	95	D	95	D	150	D
Bellevue Ave. Extension & Williamson Blvd.	87	B	87	B	87	B	87	B
Bellevue Ave. Extension & Clyde Morris Blvd.	91	A	91	A	91	A	**116**	**F**
Catalina Dr. & Midway Ave.	69	B	69	B	69	B	69	B
ISB & I-95 NB Off-Ramp	60	A	60	A	60	A	60	A
ISB & Williamson Blvd.	156	D	**165**	**F**	**165**	**F**	**299**	**F**
ISB & Midway Ave.	149	D	**150**	**F**	**143**	**F**	**159**	**F**
ISB & Clyde Morris Blvd.	**195**	**F**	**172**	**F**	**190**	**F**	**230**	**F**
Midway Ave. & Williamson Blvd.	60	B	60	B	60	B	60	B
Richard Petty Blvd. & Midway Avenue	90	B	90	B	90	B	90	B
Richard Petty Dr. & Clyde Morris Blvd.	122	E	**145**	**F**	**171**	**F**	**184**	**F**

Table 4.24

DAYTONA BEACH INTERNATIONAL AIRPROT

PM Peak-Hour Peak-Season Levels of Service at Signalized Intersections

Intersection	Delay (Seconds)	Level of Service
Beville Road and Williamson Boulevard	46.7	D
Beville Road and Clyde Morris Boulevard	67.9	D
Bellevue Avenue Extension and Williamson Boulevard	17.9	B
Bellevue Avenue Extension and Clyde Morris Boulevard	5.4	A
Catalina Drive and Midway Avenue	9.3	A
ISB and I-95 NB Off-Ramp	8.6	A
ISB and Williamson Boulevard	53.5	D
ISB and Midway Avenue	53.1	D
ISB and Clyde Morris Boulevard	156.7	F
Midway Avenue and Williamson Boulevard	13.1	A
Richard Petty Boulevard and Midway Avenue	14.4	B
Richard Petty Drive and Clyde Morris Boulevard	63.3	E

The NETSIM and HCS analyses showed excessive vehicle delay surrounding the intersection of ISB and Clyde Morris Boulevard. However, because special event signalization is performed on an as-needed basis, actual levels of service may vary somewhat depending on the situational demand.

4.4.2 Signage

Signage for the airport falls into three categories- off-site directional, on-site directional, and entrance signs. Green and white off-site directional signs are located along roadways within the vicinity of the airport and serve to direct traffic to the airport via alternating arrows.

On-site directional signs serve to direct traffic around and off of the airport property, to the local attractions. This signage is limited to airport property and directs travelers to local roads and interstates. Ground-level signs directing visitors to various parts of the airport accompany overhead signage.

Drivers unfamiliar with the area are at a disadvantage when leaving or returning to the Daytona Beach International Airport. For those drivers leaving the airport property, there is adequate signage to guide them to major roadways in the area and to the beaches. However, for that traffic bound for the Daytona International Speedway, there are no directional signs to the Speedway or available parking from the airport. This can be especially troublesome when certain roads are closed off or made one-way as sometimes happens during the course of special events. Drivers returning to the airport are provided with adequate directional signage.

The first step in improving visitor accessibility is to make certain that they are aware of the current state of the roads and any obstacles (blocked or temporary one-way roads) that may lie between them and their destination. This can be done through informational services at the airport via an information desk or real-time changeable signage. Information and rental car staff can provide leaflets reviewing conditions that pertain specifically to the current special event along with area maps. Similar information can be supplied by the local motels and hotels to ensure that once visitors are here, they can safely navigate Daytona Beach and return to the airport at the end of their stay. Information staff must also be aware of parking accessibility for Speedway events. Because visitors to the area are often spread out from Flagler County south to New Smyrna Beach, it is also important to cooperate with lodging facilities in these areas for information distribution.

The implementation of signage plans would assist in ensuring that visitors can move around the area with minimal frustration, creating a safer atmosphere for other visitors and local residents. Two signage plans are proposed here, one for the period at the beginning of a special event and one for the period at the end of a special event. Both programs are based on the use of mobile, programmable signage that can be modified as necessary to work with a particular event.

The use of these signing plans may need to be overlapped where events back up to each other, such as the overlap during Spring Break weeks. The need for signage is also event specific, so cooperation between local governments and the airport is necessary for the safe and efficient flow of traffic. The local Chambers of Commerce can also be helpful in making drivers aware of road

conditions before coming to or while in the area.

Plan 1- Start of Special Events

Upon leaving the airport, once on Midway Avenue, there should be clear signs in place to direct drivers to the beaches and/or the Speedway, using arrows, mileage, and text. For visitors going to the Speedway, signs using text and arrows should be present before reaching Midway Avenue to direct drivers to available parking. The airport, Volusia County, and Daytona Beach Traffic Engineering Departments should work together to see that sign placement is set up such that visitors turning onto ISB will have ample notice to access Speedway entrances and parking.

Plan 2- Close of Special Events

Drivers returning to the airport must be given adequate notice of where to turn to access the airport. Portable signs indicating mileage and direction to the airport would assist visitors coming from the beaches. Permanent, easily recognizable signs at Midway Avenue, Hagen Terrace, Williamson Boulevard, and Thames Road should be installed to mark the entrances to the airport from ISB. There are currently permanent signs in place on ISB to indicate what cross street is at the next signal. Similar signs could be installed so drivers can anticipate the airport entrance and make any necessary lane changes.

4.4.3 Airport Parking Requirements

Based on the base and high case forecasts, and assuming the percentages allotted for each type of parking remain constant, **Table 4.25** shows the future parking recommendations for each forecast category. Additional automobile parking spaces will be needed to meet the 2020 high case forecast automobile traffic.

The number of general aviation automobile parking spaces is currently sufficient for the airport however, these spaces are unevenly distributed among the many flight schools and general aviation facilities at the airport. Additional parking spaces are needed around the midfield ramp at Commonwealth Aviation.

4.5 CARGO FACILITIES

This section describes the capacity of existing cargo facilities and the projected requirements through 2020. Facility requirements, which include cargo building space and apron area, were determined for the airport's freight operators.

As shown in **Table 4.26,** the current cargo base for Daytona Beach International Airport is expected to be 40 tons by the year 2020. This is a reduction in the current total of 224 annual cargo tons. No additional cargo space is required throughout the planning period at the airport. The majority of the tonnage presented in this table is carried on air carrier aircraft.

The airport currently has 3,104 square feet of cargo building and office space. This facility has not been utilized to its full potential. The measure used to define the capacity of freight facilities is the building utilization rate. Building utilization rates are expressed as square feet per annual ton of freight.

A survey of 75 airports concluded that the average building utilization rate for U.S. airports is 1.5 square feet per ton of cargo. In addition, the survey indicated that the average range of adequacy for an airport on average is

Table 4.25

DAYTONA BEACH INTERNATIONAL AIRPORT

Projected Parking Requirements

	Existing Spaces	2005		2010		2020	
		Base	**High**	**Base**	**High**	**Base**	**High**
Long-Term							
General	624	328	396	373	546	438	841
Handicapped	24	10	12	12	17	14	26
Short-Term							
General	353	109	132	124	181	150	283
Handicapped	12	4	4	4	6	5	9
Rental	277	126	152	144	209	174	327
Employee							
General	156	87	106	100	145	120	226
Handicapped	6	3	3	3	4	4	7
Service	12	5	7	6	9	7	14
Ground Transportation	9	4	5	5	7	6	11
Bus Spaces	4	1	2	2	2	2	4
General Aviation	295	83	83	88	88	112	112
Total	**1,772**	**760**	**902**	**861**	**1,214**	**1,032**	**1,860**

Table 4.26

DAYTONA BEACH INTERNATIONAL AIRPORT

Integrated (All-Cargo) Carrier Building and Apron Requirements
Base and High Case Forecast

Year	All Cargo Carrier Cargo (tons)	Existing Building (SF)	Future Requirements Building (SF)(a)	Future Requirements Deficiency	Existing Apron (SY)	Future Requirements Apron (SY) (b)	Future Requirements Deficiency
Current							
2000	224	3,104	336	-	32,514	9,714	-
Base Case							
2005	120	3,104	180	-			
2010	80	3,104	120	-			
2020	40	3,104	60	-			
High Case							
2005	280	3,104	420	-			
2010	440	3,104	661	-			
2020	761	3,104	1,141	-			

(a) Based on national average utilization rate of 1.5 SF per annual ton of freight.
(b) Based on 6 Convair 240s initiating cargo service at DAB and equal to approx. 1,619sq. Yds. Each

Source: HNTB analysis.

between 1.0 and 2.5 square feet per ton. A building utilization rate of 1.0 square foot per ton typically implies that the facilities are well-utilized and some near-term expansion is required. A utilization rate of 2.5 square feet per ton implies that either the existing tenants have ample space for existing operation with some expansion capability, or there are a number of cargo-related tenants such as freight forwarders, truckers, and handling agents which occupy space at the airport.

Using the utilization rate of 1.5 square feet per ton of cargo, as discussed above, Table 4.52 presents the base and high forecast for the integrated (all-cargo) carrier building requirements. Building requirements are expected to drop in the base case forecast. There will not be a deficiency in cargo building space within the
20-year planning period.

Air cargo ramp sizes can vary considerably based on aircraft size and tenant requirements, and are often a function of available land and airport layout. Presently, the airport has approximately 32,514 square yards of apron space associated with cargo operations. This area is currently leased by Trans Florida Airlines for the storage and maintenance of their six cargo aircraft. Cargo flights are not initiated from the airport however, adequate facilities and apron space permit future cargo operations.

All-cargo apron requirements have been determined by aircraft type and peak hour frequency during the forecast period. Based on the forecasts presented in Chapter Three and discussions with airport personnel, integrated (all-cargo) carriers would be expected to serve Daytona Beach International Airport with aircraft similar in size to the Convair 240. An average area was determined for the Convair by multiplying the aircraft's length by its wingspan and adding a general planning factor of 50 feet to the wingspan and 25 feet to the length to account for the ground support equipment. Using the assumptions presented in Table 3.28 for each of the planning years, the required apron space was calculated. The results of the air cargo apron analysis are presented in Table 4.26. These calculations are based on Trans Florida Airlines initiating cargo flights to and from the airport with all six of their cargo aircraft**.**

4.6 GENERAL AVIATION FACILITIES

GA facility requirements are identified based on the projections of GA demand presented in Chapter Three. GA users and existing on-airport operators have expressed the need for expanded GA facilities in the future as demand increases. The concept phase of the Master Plan will identify any facilities which should be replaced, and determine if existing facilities are in the appropriate location or if they should be relocated for better utilization of the area. This section identifies GA facilities needs to satisfy 2020 requirements.

4.6.1 Hangar Requirements

Demand for hangar space is typically related to the local climate and the type of based aircraft. Areas with more severe weather conditions have a higher demand for hangar storage facilities. The large investments in jet and turboprop aircraft also increase the demand for hangar storage of these categories of aircraft. As discussed in Chapter Two, there are several hangars for both GA and corporate aircraft on the airport. There are three T-hangar buildings, with a capacity of 24 aircraft. Other

conventional hangars include those used by the Daytona Beach Jet Center, Yelvington Jet Aviation, Commonwealth Aviation the Volusia County Sheriff's Department, NASCAR, and Aerojet Management Corporation. **Table 4.27** presents the distribution of aircraft by storage category.

T-Hangar Requirements

Based on discussions with airport and FBO personnel and planning factors for similar airports, 40 percent of single engine aircraft and 30 percent of multi-engine piston aircraft should be provided with T-hangars. **Table 4.28** presents the T-hangar requirements based on this planning factor. An additional 24 T-hangar units are currently being constructed for the PhilAir General Aviation Plaza. This brings the total number of T-hangar units to 48 by 2005. This will meet the current and forecast requirement for T-hangars however, the construction of additional T-hangars should be considered, as it will draw additional based aircraft to the airport.

Conventional Hangars

Existing conventional hangar space at the airport totals 140,250 square feet. Daytona Beach Jet Center operates two 10,000 square foot hangars and one 31,250 square foot hangar. NASCAR operates one 15,000 square foot hangar and one 10,000 square foot hangar. Commonwealth Aviation operates three hangars, each measuring 10,000 square feet.

The demand for additional conventional hangar space is based on discussions with the FBOs and industry standards which state that 50 percent of the based light, multi-engine aircraft, 100 percent of the based turboprop and jet aircraft, and 100 percent of the helicopters prefer conventional hangar space. An additional 15 percent of the space is typically planned for maintenance areas.

For planning purposes, the following aircraft space requirements were used to determine total conventional hangar needs:

- Single Engine - 1,500 square feet
- Twin-Engine - 1,800 square feet
- Turbojet - 2,900 square feet
- Helicopter - 1,500 square feet

Based on these planning factors, the existing conventional hangars have sufficient space to accommodate the projected aircraft levels beyond the year 2020. **Table 4.29** presents the conventional hangar space requirements for 2005, 2010, and 2020. Yelvington Jet Aviation, Executive Flightline, PhilAir General Aviation Plaza, and Phoenix East Aviation are all planning to construct new hangars within the five-year planning period. The exact size of these facilities has not yet been determined. These planned hangars, along with the current hangars, meet the current and forecast demand levels.

4.6.2 General Aviation Apron Requirements

Parking for based and itinerant general aviation aircraft is available at three locations on the airport: the Daytona Beach Jet Center, the Phil Air General Aviation Plaza, and Yelvington Jet Aviation. NASCAR and Embry-Riddle Aeronautical University have private apron areas. **Table 4.30** depicts the general aviation aircraft parking apron requirements.

Future development of general aviation apron areas includes the Executive Flightline, apron area that was formerly used by the Phil Air FBO. The total existing apron area, including maneuvering space, is

Table 4.27

DAYTONA BEACH INTERNATIONAL AIRPORT

Summary of Based Aircraft and Mix of Based Aircraft Storage Requirements

	Based Aircraft Summary			
	2000	**2005**	**2010**	**2020**
Single Engine	134	136	138	142
Multi-Engine (Piston & Turbopro	40	41	41	42
Jet	10	13	16	22
Helicopter	4	4	5	5
TOTAL	**188**	**194**	**200**	**211**

Mix of Based Aircraft Storage Requirements

	Aircraft Type			
Type of Based Aircraft Storage	**Single Engine**	**Multi-Engine**	**Jet**	**Helicopter**
Conventional Hangar	0%	30%	100%	100%
T-Hangar	40%	60%	0%	0%
Tie-Down	60%	10%	0%	0%
TOTAL	**100%**	**100%**	**100%**	**100%**

Source: HNTB analysis.

Table 4.28

DAYTONA BEACH INTERNATIONAL AIRPORT

T-Hangar Requirements (units) (a)

	Actual 2000	Requirement 2005	2010	2020
Existing Units	24	48	48	48
Required Units	32	34	34	36

Note: Boxed numbers indicate deficiency.

(a) Assumes 40 percent of single engine (non-Embry-Riddle) aircraft and 30 percent of multi-engine aircraft.

Note: Additional T-Hangars may be warrented to increase the based aircraft at the airport.

Source: HNTB analysis.

Table 4.29

DAYTONA BEACH INTERNATIONAL AIRPORT

Conventional Hangar Requirements (a)

	Actual 2000	Requirement 2005	Requirement 2010	Requirement 2020
Required Storage Area (SF) (b)		81,500	91,700	109,100
15% Maintenance Area (SF)		12,225	13,755	16,365
Total Requirement (SF)	140,250	93,725	105,455	125,465
Net Requirement (SF)	-	-	-	-

(a) Includes 100 percent of turbojet and turboprop aircraft, 50 percent of multi-engine aircraft, and 100 percent of helicopters.
(b) Based on aircraft space requirements provided in text.

Source: HNTB analysis.

Table 4.30

DAYTONA BEACH INTERNATIONAL AIRPORT

General Aviation Aircraft Parking Apron Requirements

Aircraft Classifications	**2000**	**2005**	**2010**	**2020**
Daily Transient Aircraft (a)				
Single Engine	174	182	191	208
Multi-Engine	50	52	55	59
Jets	17	18	19	21
Helicopters	7	8	8	9
TOTAL	249	261	273	297
Based Aircraft				
Single Engine (60%)	80	82	83	85
Multi-Engine (0%)	4	4	4	4
Jets (0%)	0	0	0	0
Helicopters (0%)	0	0	0	0
TOTAL UNHANGARED (Tie-down)	84	86	87	89
Apron Area Requirements (SY)				
Single Engine (b)	76,331	79,190	82,139	87,857
Multi-Engine (c)	32,235	33,663	35,142	37,998
Jets (d)	23,495	24,620	25,784	28,033
Helicopters(e)	3,356	3,517	3,683	4,005
TOTAL REQUIREMENTS (SY)	135,418	140,990	146,748	157,893
EXISTING SPACE (SY)	178,670	178,670	178,670	178,670
DEFICIENCY	--	--	--	--

(a) 50 percent of daily transient aircraft; AC 150/5300-13 App. 15
(b) Single Engine - 300 (SY)/aircraft
(c) Multi-Engine - 600 (SY)/aircraft
(d) Jets - 1350 (SY)/aircraft
(e) Helicopters - 450 (SY)/aircraft

Source: HNTB analysis.

estimated to be approximately 179,000 square yards.

Transient Aircraft

Transient aircraft parking requirements are based on assumptions that are applied to itinerant operations performed by transient aircraft on the average day of the peak month. The percent of average daily transient aircraft activity has been determined by conversations with the FBO. The following are assumptions used to determine transient aircraft parking requirements:

- The majority of transient aircraft will arrive and depart on the same day; therefore, it is assumed that the actual number of aircraft utilizing the parking apron is one-half (50 percent) of the transient operations being performed on the average day of the peak month

- During this planning period, 50 percent of the transient aircraft will be on the ground at any given time; therefore, 50 percent of the transient activity occurring on the average day of the peak month will need parking space.

- Single engine aircraft require 300 square yards of apron space, multi-engine aircraft need 600 square yards, helicopters require approximately 450 square yards, and jets require 1,350 square yards of apron space for parking and maneuvering.

Based Aircraft

In order to determine apron requirements for based aircraft, the sizing criteria is based on projected transient aircraft, in addition to the assumptions shown in Table 4.30, which are based on industry standards. Table 4.30 provides space requirements for paved GA parking area to meet the needs throughout the planning period. This table also indicates that the current apron space will be sufficient throughout the planning period.

For planning purposes, it is assumed that 60 percent of single engine and 20 percent of multi-engine aircraft will require tie-downs at the airport. Local/tie-down ramp area requirements are based on a planning ratio of 300 square yards per single engine aircraft and 600 square yards per twin-engine aircraft. For planning purposes, it is assumed that all tie-downs at the airport are paved. As shown in **Table 4.31**, the tie-down requirements through the year 2020 are met by the current supply of tie-downs.

4.6.3 General Aviation Terminal Requirements

GA terminal/administration building requirements are derived from FAA planning ratios that include space allocations for the following areas:

- Waiting area/pilot lounge
- Management/operations
- Public restrooms
- Concessions
- Circulation and utilities

Daytona Beach Jet Center occupies the 14,000 square feet of GA terminal space at Daytona Beach International Airport.

The formula for GA terminal facilities is based on annual GA itinerant operations. As shown in **Table 4.32**, the existing facility does not currently meet the GA terminal demand. Additional general aviation terminal space will be constructed with the new facilities proposed by PhilAir General Aviation Plaza, Executive Flightline, and Phoenix East Aviation. The exact sizes of

these new general aviation terminals is not known, but this construction will help alleviate the need for additional GA terminal space.

4.7 SUPPORT FACILITIES

4.7.1 Airport Maintenance

The Daytona Beach International Airport maintenance facilities are currently located in a 7,500-square foot, 2-story building west of the approach end of Runway 16. The requirements for future facilities are based on staff size, material, and equipment, to maintain existing and future facilities. The current facility is sufficient for future needs.

Table 4.31

DAYTONA BEACH INTERNATIONAL AIRPORT

Tie-Down Requirements

	Requirement			
	2000	**2005**	**2010**	**2020**
Existing	175	425	425	425
Required	122	124	125	127
Deficiency	-	-	-	-

Source: HNTB analysis.

Table 4.32

DAYTONA BEACH INTERNATIONAL AIRPORT

General Aviation Terminal Requirements (square feet) (a)

	Requirement			
	2000	**2005**	**2010**	**2020**
Existing (b)	20,000	20,000	20,000	20,000
Required	23,166	24,904	26,686	30,138
Deficiency	(3,166)	(4,904)	(6,686)	(10,138)

(a) Based on .14 SF/annual itinerant GA operations.
(b) Includes office space, pilot lounge, concessions, etc.

4.7.2 Aircraft Rescue and Fire Fighting Requirements

Airports certified under FAR Part 139 (Certification and Operations: Land Airports Serving Certain Air Carriers) must comply with specific Airport Rescue and Fire Fighting (ARFF) operational requirements. The two primary considerations in determining compliance are response time requirements and equipment and agent requirements. This criteria was developed

through research conducted by the FAA and the ICAO Rescue and Firefighting Panel. Five airport classes, referred to as indexes, and their corresponding ARFF equipment requirements were identified in this research. The applicable airport index is determined by the length of the longest aircraft operated by an air carrier performing an average of five scheduled departures per day (computed on an annual basis), as shown in **Table 4.33**.

Daytona Beach International Airport currently meets the requirements for classification as an ARFF Index C airport. Index C includes airports having five or more daily departures by aircraft with a fuselage length of at least 126 feet up to, but not including, 159 feet. To meet Index C requirements, airports must have at least two ARFF vehicles with the combined capacity of 3,000 gallons of water and 500 pounds of dry chemicals.

The airport currently has four vehicles to met Index C capacities. According to the forecast, the airport will not be served by any aircraft that will change its current ARFF Index in the planning period.

ARFF Response Time

According to FAR Part 139, response time requirements for ARFF vehicles specify that at least one ARFF vehicle at its assigned post shall be able to reach the midpoint of the farthest runway serving air carrier aircraft within 3 minutes from the time of the alarm to the time of initial agent application. All other required vehicles shall reach this same point from their assigned posts within 4 minutes from the time of alarm to the time of initial agent application. The ARFF facilities at the airport are located in the ARFF Building, between Runways 7L-25R and 7R-25L. Runway 16-34 is the furthest runway from this facility.

HNTB has conducted ARFF response analyses using manual calculations at other airports around the country. Based on typical accelerations and velocities for first response vehicles, a distance of less than 9,800 feet represents a response time of less than 3 minutes. In addition, 400 feet is added to the calculation for each 90-degree turn.

Using existing pavement (ARFF access road, Runway 7L-25R, and Runway 16-34,) the distance to the center of Runway 16-34 for ARFF response distance is approximately 4,200 feet, which is corrected by 1,200 feet since it involves three turns. Since this is less than the 9,800-foot maximum, no auxiliary ARFF facilities are recommended for the airport.

4.7.3 Aviation Fuel Storage Facilities

There are currently four aviation fuel storage facilities at Daytona Beach International Airport, consisting of one 40,000 gallon tank and one 13,000 gallon 100LL fuel tank. Jet A fuel is stored in one 120,000 gallon tank, one 15,000 gallon tank, one 12,000 gallon tank, and one 24,000 gallon tank. These facilities currently meet the needs of aviation operations at the airport. Proposed fueling facilities include two additional 12,000 gallon 100LL tanks and two 12,000 Jet A tanks. These additional facilities will meet future forecast demands for aviation fuel.

Table 4.33

DAYTONA BEACH INTERNATIONAL AIRPORT

ARFF Index Classifications

Airport Index	Required No. of Vehicles	Aircraft Length	Scheduled Departures (a)	Agent + Water for Foam
A	1	<90’	> 1	500 lbs. DC or HALON 1211 or 450 lbs. DC + 100 Gal H_2O.
B	1 or 2	≥ 90’, < 126’ ≥ 126’, <159’	< 5	Index A + 1,500 Gel H_2O
C	2 or 3	≥ 126’, < 159’ ≥159’, <200’	≥ 5 < 5	Index A + 3,000 Gel H_2O
D	3	≥159’, <200’ >200’	≥ 5 < 5	Index A + 4,000 Gel H_2O
E	3	≥ 200’	≥ 5	Index A + 6,000 Gel H_2O

(a) daily departures

4.8 SUMMARY OF FACILITY REQUIREMENTS

This chapter has outlined the facility requirements for the major components of the Daytona Beach International Airport. Concepts for the arrangement of future facilities will be based on these requirements, and are presented in the next chapter.

Chapter Five
Airport Development Concepts

This chapter presents two concepts for future airport development at Daytona Beach International Airport. These concepts were developed with consideration for the airport facility, the forecasts for capacity and demand (particularly the 2020 high case forecast scenario,) and the strategic long-term goals of the Airport. Both concepts are similar. They differ only in the use of the existing 7R-25L Runway.

Both concepts were analyzed considering the following factors:

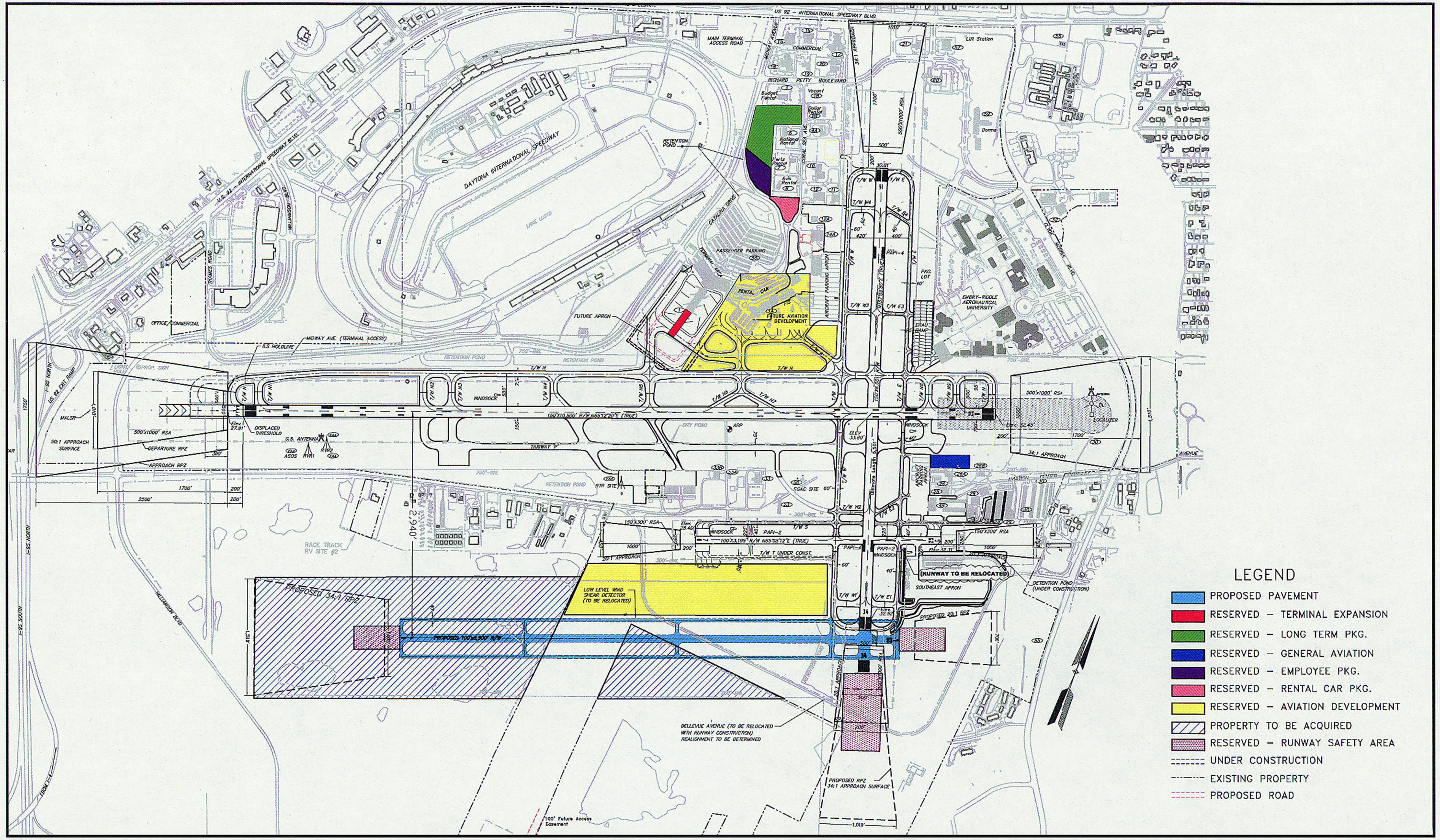
- construction and operating costs
- spatial organization
- economic impact to the community
- architectural/community image
- flexibility to accommodate future demand fluctuations in the terminal area
- technological changes and changes in airline operations
- comfort and convenience of passengers in the terminal area (e.g., walking distances, space, surface transportation systems)
- public parking availability and location
- ground access system support
- driving distances and times
- construction impacts, including ease of phasing and construction
- level of concessions to maximize revenues
- opportunities for aviation-related and non-aviation-related, revenue-producing developments on and near airport property
- airfield delays and other operational factors
- environmental impacts

5.1 DEVELOPMENT CONCEPT ONE

Development Concept One represents an alternative similar to the desired Development Concept in the 1995 Daytona Beach International Airport Master Plan. This concept is shown in **Figure 5-1**.

5.1.1 Airfield Development

The components of the Airfield Development Plan were modeled with regard to the Airport's goals of enhancing capacity and maintaining operational efficiency, while considering airspace/air traffic, environmental, and construction/ phasing issues, as well as maintaining the facility's flexibility for future expansion. To facilitate additional aircraft operations, a relocated Runway 7R-25L should be constructed. This runway will replace the existing 7R-25L Runway.



DAYTONA BEACH INTERNATIONAL AIRPORT MASTER PLAN UPDATE

DAYTONA BEACH INTERNATIONAL AIRPORT

DEVELOPMENT CONCEPT ONE

0' 1,200' 2,400'

Scale in Feet

HNTB

FIGURE 5-1

The new runway will accommodate B-II category aircraft including single and multi-engine general aviation aircraft and small corporate jets. The relocated runway will measure 6,500 feet long and 100 feet wide. This runway will have a full length taxiway on the north and south side measuring 40 feet wide. The centerline of the taxiways will be located 240 feet out from the centerline of the runway, complying with category B-II separation standards.

The relocated runway will be placed 2,940 feet south of Runway 7L-25R and will intersect Runway 16-34 near the approach end to Runway 34. To avoid an overlap of runway markings, the approach end of Runway 34 will be extended 565 feet south from its current location, giving Runway 16-34 a 6,566 foot length.

A non-precision instrument approach will be utilized on the 7R end of the runway and a visual approach will be used on the 25L end. Land surrounding this new runway should be purchased to provide a clear runway safety area and runway protection zone. This land is represented by the shaded area surrounding the new runway in Figure 5-1.

The existing runway 7R-25L will be closed and marked as such. The runway pavement will not be removed. With the runway remaining in place, the Airport has the option of using it for aircraft parking.

Land should also be reserved for general aviation facilities on the north side of the midfield ramp area. This apron area will be accessible from Aviation Center Parkway and will accommodate the general aviation requirements of the various FBOs located in this area.

Property Acquisition

To facilitate the runway 7R-25L relocation, the Airport would need to continue its land acquisition program. This land is located on the southwest side of the airport property and is currently undeveloped. All other property reserved for future development is currently owned by the Airport.

5.1.2 Reserved Land

In addition to the expansion projects listed above, each concept addresses land that should be reserved for specific airport development needs. The location and size of this land is the same in both concepts. These reserved areas of land include general recommendations for the use of that land. For example, land marked for future aviation development may be required for hangars, terminal facilities, storage, or fuel facilities. The significance of the land reservation is to preserve that area for the future needs of the airport.

Terminal Expansion

Land reserved for terminal expansion may be used to increase the existing terminal building and apron area around the terminal. This area reserved for the terminal expansion lies to the southwest of the current terminal building and is an extension of the current facility. The Facility Requirements chapter of this Master Plan calls for 7 additional aircraft gates by the year 2020 if the high case forecast is reached.

Future Aviation Development

There are two separate locations on the airfield which should be reserved for future aviation development. This area is situated next to the current terminal facility. A

possible use for this land includes a future domestic and/or international terminal building as well as a future cargo facility. This area could also be used for concession space, apron areas, or automobile parking facilities.

The other area reserved for future aviation development is located between the current Runway 7R-25L and the future Runway 7R-25L. This area extends west from Taxiway W to the property line. Future uses for this area include T-Hangars, Condo hangars, apron space, and other general aviation facilities.

Automobile Parking

The Facility Requirements chapter sites a need for an additional 217 regular and 2 handicapped long-term parking spaces under the 2020 high case forecast. There will also be a need for 70 regular and 1 additional handicapped space for employee parking and 50 additional spaces for rental car parking. Land should be reserved for these future automobile parking areas at the Airport.

This reserved land is located north of the current automobile parking facilities at the Airport, and is adjacent to Midway Avenue. Three separate lots should be constructed for long term parking, employee parking, and rental car parking. This land can be divided among the three separate lots to best suit the future needs of the Airport.

5.2 DEVELOPMENT CONCEPT TWO

Development Concept Two is similar to Concept One but Runway 7R-25L remains open, giving the Airport three parallel runways. This option gives the Airport more capacity for aircraft operations. This concept is shown in **Figure 5-2.**

5.2.1 Airfield Development

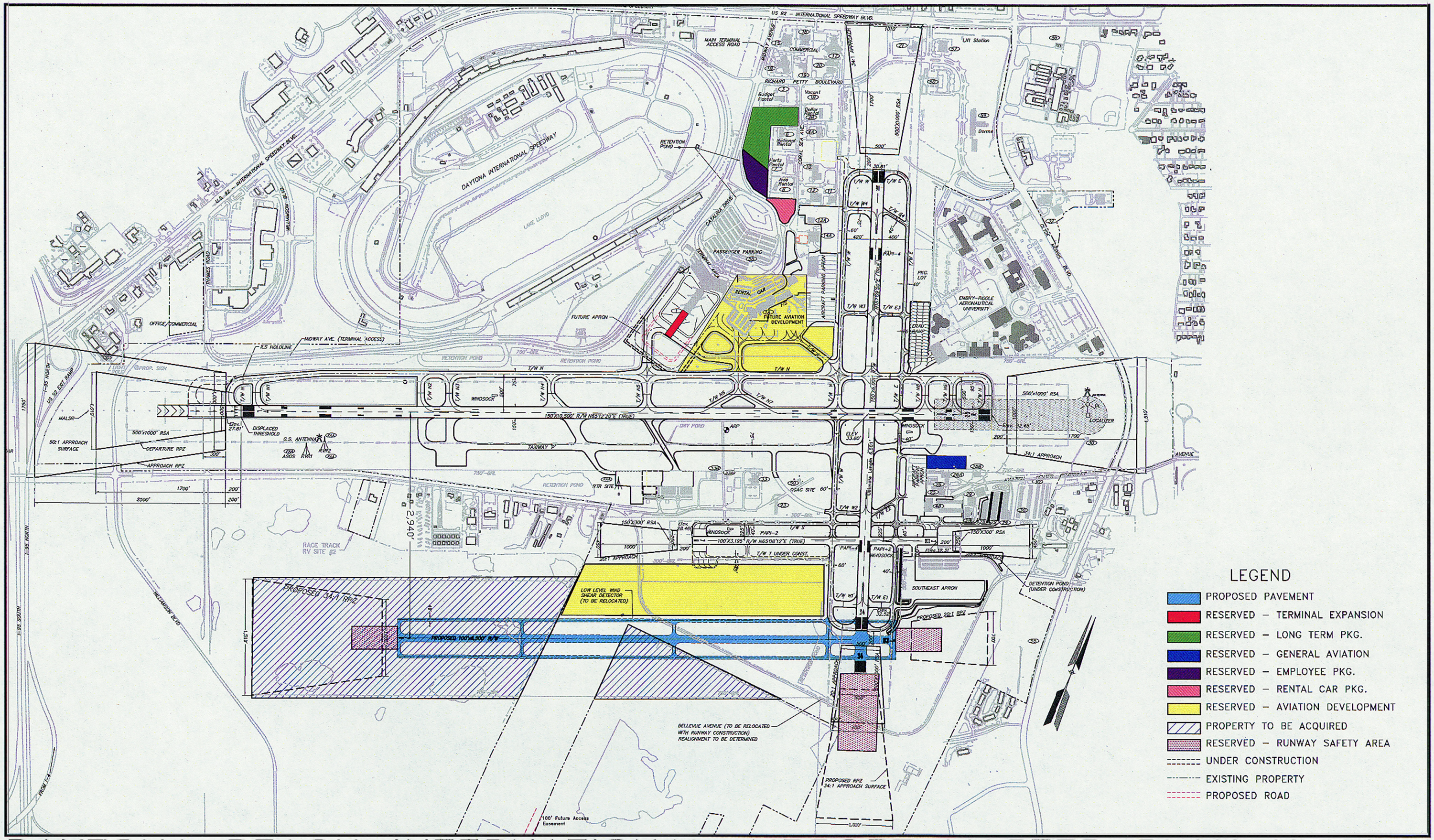
As stated earlier, this concept proposes the construction of a new Runway 7R-25L but keeps the existing Runway 7R-25L open and renames it 7C-25C. The details of the new Runway 7R-25L were discussed under Concept One and are the same for Concept Two.

The components of the Airfield Development Plan were modeled with regard to the Airport's goals of enhancing capacity and maintaining operational efficiency, while considering airspace/air traffic, environmental, and construction/ phasing issues, as well as maintaining the facility's flexibility for future expansion.

To facilitate additional aircraft operations, a relocated Runway 7R-25L should be constructed. This runway will replace the existing 7R-25L Runway.

The new runway will accommodate B-II category aircraft including single and multi-engine general aviation aircraft and small corporate jets. The relocated runway will measure 6,500 feet long and 100 feet wide.

This runway will have a full length taxiway on the north and south side measuring 40 feet wide. The centerline of the taxiways will be located 240 feet out from the centerline of the runway, complying with category B-II separation standards. The relocated runway will be placed 2,940 feet south of Runway 7L-25R and will intersect Runway 16-34 near the approach end to Runway 34. To avoid an overlap of runway markings, the approach end of Runway 34 will be extended 565 feet south from its current location, giving Runway 16-34 a 6,566 foot length.



DAYTONA BEACH INTERNATIONAL AIRPORT MASTER PLAN UPDATE

DAYTONA BEACH INTERNATIONAL AIRPORT

DEVELOPMENT CONCEPT TWO

0' 1,200' 2,400'

Scale in Feet

HNTB

FIGURE 5-2

A non-precision instrument approach will be utilized on the 7R end of the runway and a visual approach will be used on the 25L end. Land surrounding this new runway should be purchased to provide a clear runway safety area and runway protection zone. This land is represented by the shaded area surrounding the new runway in Figure 5-2.

The existing runway 7R-25L will be closed and marked as such. This runway will not be removed. With the runway remaining in place, the Airport has the option of using it for aircraft parking during peak operations such as the Daytona 500.

Land should also be reserved for general aviation facilities on the north side of the midfield ramp area. This apron area will be accessible from Aviation Center Parkway and will accommodate the general aviation requirements of the various FBOs located in this area.

Property Acquisition

To facilitate the runway 7R-25L relocation, the Airport would need to continue its land acquisition program. This land is located on the southwest side of the airport property and is currently undeveloped. All other property reserved for future development is owned by the Airport.

5.2.2 Reserved Land

The recommended reserved land for Concept Two is the same as it is for Concept One and is reiterated in this section.

Terminal Expansion

Land reserved for terminal expansion may be used to increase the existing terminal building and apron area around the terminal. This area reserved for the terminal expansion lies to the southwest of the current terminal building and is an extension of the current facility. The Facility Requirements chapter of this Master Plan calls for 7 additional aircraft gates by the year 2020 if the high case forecast is reached.

Future Aviation Development

There are two separate locations on the airfield which should be reserved for future aviation development. This area is situated next to the current terminal facility. A possible use for this land includes a future domestic and/or international terminal building as well as a future cargo facility. This area could also be used for concession space, apron areas, or automobile parking facilities.

The other area reserved for future aviation development is located between the current Runway 7R-25L and the future Runway 7R-25L. This area extends west from Taxiway W to the property line. Future uses for this area include T-Hangars, Condo hangars, apron space, and other general aviation facilities.

Automobile Parking

The Facility Requirements chapter sites a need for an additional 225 regular and 11 handicapped long-term parking spaces under the 2020 high case forecast. There will also be a need for 70 regular and 1 additional handicapped space for employee parking and 50 additional spaces for rental car parking. Land should be reserved for these future automobile parking areas at the Airport.

This reserved land is located north of the current automobile parking facilities at the Airport, and is adjacent to Midway Avenue.

Three separate lots should be constructed for long term parking, employee parking, and rental car parking. This land can be divided among the three separate lots to best suit the future needs of the Airport.

5.3 COSTS

The development costs generated for Concepts One and Two are estimates only. They are provided to give a general idea of the costs that might be incurred with the implementation of either of the Development Concepts.

5.3.1 Concept One

The primary costs associated with Development Concept One include the site preparation and construction of the relocated runway and taxiways, as well as the removal of the marking from the old Runway 7R-25L. This amount totals $41,785,475. The cost sheet for Concept One is shown in **Table 5.1** and represents order of magnitude costs.

5.3.2 Concept Two

The costs for implementing Concept Two are similar to that of Concept One. The only difference is the runway marking for 7C-25C will remain in place and only change minimally to reflect the center designation. This gives Concept Two a slightly lower cost than Concept One. The total cost for Concept Two is $41,761,100. The cost sheet for Concept Two is shown in **Table 5.2** and represents order of magnitude costs.

5.4 RECCOMENDED CONCEPT

The most significant difference between Development Concept One and Two is the future capacity requirements for Daytona Beach International Airport. The current Annual Service Volume (ASV) is 485,000 operations at the Airport. This was discussed in detail in Chapter 4.

With Development Concept One, the airport will only marginally improve its ASV. This is due to the closing of the existing Runway 7R-25L. The new Runway 7R-25L will be longer and thus able to accommodate more aircraft however, there will only be two runways in operation at one time and thus the ASV will be limited to slightly more than 500,000 operations.

With Development Concept Two, the Airport retains the existing Runway 7R-25L and gains another parallel runway altogether. This will increase the ASV of the airport to roughly 700,000 operations per year.

Based on forecast operations for Daytona Beach International airport, it is recommended that the airport adopt Concept Two. This Concept gives the Airport the ability to accommodate more aircraft operations due to the use of three parallel runways and one crosswind runway. This layout will meet the operational needs in the high case forecast for the Airport.

The cost difference between Concept One and Two is minimal because the new 7R-25L runway will be constructed in either case. Concept Two will cost slightly less due to the remarking of the old Runway 7R-25L in Concept One.

5.4.1 Phasing

It is neither necessary nor feasible to complete the development projects at once. The Airport does not have over $40 million of available capital, nor does current demand require the immediate completion of the development projects. Therefore, the

Table 5.1

DAYTONA BEACH INTERNATIONAL AIRPORT

Cost Estimate - New Runway 7R-25L

Item	Quanity	Unit	Unit Price	Total
Common Excavation	59,400	CY	$4.00	$237,600.00
Pavement				
Asphalt	397,000	Tons	$35.00	$13,895,000.00
Limerock (8")	152,700	SY	$7.00	$1,068,900.00
Compacted Subgrade	158,800	SY	$2.00	$317,600.00
Tack Coat	14,900	Gallons	$1.00	$14,900.00
Prime Coat	37,100	Gallons	$1.00	$37,100.00
Marking	320,000	SF	$0.75	$240,000.00
Lighting				
Base MountedEdge Lights	425	EA	$500.00	$212,500.00
Cable in Conduit	70,000	LF	$1.50	$105,000.00
Trenching	50,000	LF	$3.00	$150,000.00
Counterpoise	50,000	LF	$0.50	$25,000.00
REILs	4	EA	$10,000.00	$40,000.00
4-way duct bank	1,800	LF	$50.00	$90,000.00
Guidance signs				
one module sign	70	EA	$3,000.00	$210,000.00
two module sign	25	EA	$3,500.00	$87,500.00
Sodding	331,000	SY	$1.50	$496,500.00
Drainage	1	LS	$100,000.00	$100,000.00
Maintenance of Traffic	1	LS	$25,000.00	$25,000.00
TOTAL CONSTRUCTION COST				**$17,352,600.00**
Engineering Design/construction (20% construction cost)	1	LS		$3,470,520.00
Mobilization (10% construction cost)	1	LS		$1,735,260.00
Environmental Assessment	1	LS	$350,000.00	$350,000.00
Land Acquisition (aprox.)	300	AC	$35,000.00	$10,500,000.00
Survey	1	LS	$20,000.00	$20,000.00
TOTAL COST				**$33,428,380.00**
Contingencies (25% total cost)	1	LS		$8,357,095.00
TOTAL COST INCL. CONTINGENCIES				**$41,785,475.00**

Source: HNTB Analysis

Table 5.2

DAYTONA BEACH INTERNATIONAL AIRPORT

Cost Estimate - New Runway 7R-25L

Item	Quanity	Unit	Unit Price	Total
Common Excavation	59,400	CY	$4.00	$237,600.00
Pavement				
Asphalt	397,000	Tons	$35.00	$13,895,000.00
Limerock (8")	152,700	SY	$7.00	$1,068,900.00
Compacted Subgrade	158,800	SY	$2.00	$317,600.00
Tack Coat	14,900	Gallons	$1.00	$14,900.00
Prime Coat	37,100	Gallons	$1.00	$37,100.00
Marking	300,000	SF	$0.75	$225,000.00
Lighting				
Base MountedEdge Lights	425	EA	$500.00	$212,500.00
Cable in Conduit	70,000	LF	$1.50	$105,000.00
Trenching	50,000	LF	$3.00	$150,000.00
Counterpoise	50,000	LF	$0.50	$25,000.00
REILs	4	EA	$10,000.00	$40,000.00
4-way duct bank	1,800	LF	$50.00	$90,000.00
Guidance signs				
one module sign	70	EA	$3,000.00	$210,000.00
two module sign	25	EA	$3,500.00	$87,500.00
Sodding	331,000	SY	$1.50	$496,500.00
Drainage	1	LS	$100,000.00	$100,000.00
Maintenance of Traffic	1	LS	$25,000.00	$25,000.00
TOTAL CONSTRUCTION COST				**$17,337,600.00**
Engineering Design/construction (20% construction cost)	1	LS		$3,467,520.00
Mobilization (10% construction cost)	1	LS		$1,733,760.00
Environmental Assessment	1	LS	$350,000.00	$350,000.00
Land Acquisition (aprox.)	300	AC	$35,000.00	$10,500,000.00
Survey	1	LS	$20,000.00	$20,000.00
TOTAL COST				**$33,408,880.00**
Contingencies (25% total cost)	1	LS		$8,352,220.00
TOTAL COST INCL. CONTINGENCIES				**$41,761,100.00**

Source: HNTB Analysis

work should be completed in phases, as described below.

Phase I (2000 to 2005)

Phase I would include the purchase of additional acreage south of the Airport to accommodate the future Runway 7R-25L. This land is represented as a hatched area around the new runway on Figure 5-2.

Phase II (2006 to 2010)

Phase II would include all mid-term development projects with construction years between 2006 and 2010. Included in this time frame would be the construction of the new runway in 2006. A parallel taxiway would also be constructed at this time on the north side of the new runway.

Phase III (2011 to 2020)

Phase III would include all long-term development projects with construction years between 2011 and 2020. Included in this time frame would be the construction of a parallel taxiway on the south side of the new Runway 7R-25L.

Chapter Six
Airport Plans

This chapter describes the recommended development plan for the Daytona Beach International Airport. The recommended improvements are derived from the forecasts in Chapter Three. Three separate plans are discussed in this chapter. They include:

- Airport Implementation Plan
- Obstruction Mitigation and Airspace Plan
- Airport Layout Plan

6.1 AIRPORT IMPLEMENTATION PLAN

The mission statement of the Daytona Beach International Airport is: to ensure Daytona Beach International Airport provides and promotes safe, efficient, convenient and economically self-sustaining air transportation facilities responsive to airline and community needs while supporting and promoting the area's economic growth and development. The Airport provides commercial service flights, which are vital to the residents of and around Daytona Beach, Florida. Other services offered at the Airport include flight training, aircraft rental, aircraft maintenance, and aircraft storage. The specific goals and objectives of the airport and this Master Plan Update are listed in Chapter One.

Historical airport activity demonstrates a need for commercial service to and from the Daytona Beach area. A steady increase of enplaned passengers is forecast through 2020. An increase in general aviation operations is also forecast along with an increase in the number of based aircraft at the Airport. If current practices are maintained, it is not anticipated that the current functions of the Airport will change within the 20-year planning period.

Airport Goal and Action Items

The long-term goal of the Daytona Beach International Airport is to maximize revenues and minimize expenses in a safe and efficient manner.

Various action items for achieving this goal include:

- Attract additional commercial service flights to the Airport.
- Purchase land directly south of the Airport for future aviation-related development.
- Construct additional hangars and other aviation facilities to attract and increase the number of service companies and aircraft.
- Construct a new parallel runway to accommodate increasing aircraft operations.

Any single action item or all of these action items together will increase business at the Airport and thus increase revenues while minimizing increases in expenses.

Implementation Plan

An Implementation Plan has been developed for each of the action items derived to meet the Airport's goal. A large step forward for increasing revenues at the Airport involves the purchase of roughly 300 acres of land

located south of and adjacent to the Airport property. This land is currently privately owned. Because this land would be used for airport expansion and development, the Airport may request for funding assistance from the Federal Government and Florida Department of Transportation. The Federal Government can contribute up to 90 percent of the land acquisition cost leaving FDOT with five percent and five percent coming from the local share. Once this funding is secured, the Airport may initiate the purchase of this land.

Once this land has been acquired, planning and construction can begin on the new parallel runway and taxiway. The County of Volusia will approve the construction of the runway and taxiway.

The construction of the new parallel runway is eligible for financial funding from the Federal Government and FDOT. The Federal Government will fund up to 90 percent of the construction cost while FDOT and local share funding will constitute 5 percent each. Once all permits have been obtained and financial resources made available, construction of the new runway can commence.

Already established within the capital improvement program for the Daytona Beach International Airport is the construction of a general aviation hangar on the southeast area of the Airport. A detailed design of this facility must first be developed along with the its exact location on the Airport. Construction can begin once all required permits have been acquired. Other aviation related facilities that can be constructed on the airport property include Fixed Base Operators, T-hangars, and increased apron areas.

An ongoing goal for increasing revenues is to attract and maintain more commercial service airlines at the Airport. Various incentives can be offered to airlines in order to attract their business. These incentives include reduced landing fees and terminal rental rates. Other incentives include written support from local citizens directed at various airlines for adding additional flights at the Airport.

Schedule

The development projects have been categorized into separate phases for their construction or addition to the Daytona Beach International Airport.

Phase I

Land acquisition for airport development and noise mitigation, general aviation development, and hangar construction.

Phase II

Construction of new runway and parallel taxiway.

Phase III

Construction of additional south parallel taxiway along new Runway 7R-25L.

6.2 OBSTRUCTION MITIGATION AND AIRSPACE PLAN

The primary goal of the Federal Aviation Administration (FAA) is to provide safe operating conditions and environments for aircraft. This goal includes the regulation of airspace surrounding airports to ensure that there are no objects or obstructions that may interfere with aircraft operations. The FAA sets forth guidelines for airspace obstructions in the Title 14 Code of Federal

Regulations (14 CFR) Part 77 "Objects Affecting Navigable Airspace." This regulation states the exact dimensions required of the airspace surrounding airports. The Daytona Beach International Airport complies with the FAA and the Part 77 surfaces for airspace.

Part 77 Surfaces

The Part 77 surfaces, also known as the imaginary surfaces, are determined by the type of airport and the runways at that airport. The category of each runway, based on the existing and proposed approaches, determines the exact size of that runway's Part 77 surfaces. The dimensions and slope of the part 77 surfaces are determined by the most precise approach that is existing or proposed for that runway end. The Part 77 surface is comprised of five separate imaginary surfaces. They include:

1. Primary Surface – The primary surface is a rectangular area that surrounds the runway and extends 200 feet beyond each runway end. Its elevation is the same as the runway and its width can be as low as 250 feet and as high as 1,000 feet depending on the category of runway.

2. Horizontal Surface – The horizontal surface is an oval shaped area encompassing the runway, located 150 above the airport elevation. Its width will vary from 5,000 feet to 10,000 feet depending on the runway service category.

3. Conical Surface – The conical surface extends upward at a slope of 20:1 (horizontal:vertical) and outward for 4,000 feet from the edge of the horizontal surface. Its shape is the same as the horizontal surface.

4. Transitional Surface – The transitional surface consists of a sloping area which begins at the edge of the primary surface and slopes upward at 7:1 (horizontal:vertical) until it intersects the horizontal surface.

5. Approach Surfaces – The approach surfaces begin at the end of the primary surface (200 feet beyond the runway end) and slopes upward at a predetermined ratio while flaring outward horizontally. The width and elevation of the approach surfaces conforms to that of the primary surface; while the slope, length, and width of the outer ends is determined by the runway service category and existing or proposed instrument approach procedures.

Height Restrictions

Any proposed development projects around an airport should be reviewed in accordance with 14 CFR Part 77 regulations to ensure that there will be no conflicts between the new construction and the Part 77 surfaces. No object should penetrate the Part 77 surfaces. If an object does penetrate the Part 77 surfaces, the FAA can determine if the object needs to be modified or if the approach to that runway needs to be modified to comply with the Part 77 regulation. The FAA must be notified of all new construction around an airport with a 7460-1 form. This notification applies to any construction or alteration (a) of more than 200 feet in height above the ground level at this site, and/or (b) of greater height than an imaginary surface extending outward and upward at 100:1 for a

horizontal distance of 20,000 feet from the nearest point of the nearest runway.

Part 77 Airspace Plan

The airspace plan is designed to accurately depict the Part 77 surfaces on the quadrangle (1" = 2,000') composite for the area around the Airport.

Runway 7L at Daytona Beach International Airport is currently classified as a precision approach runway with a 50:1 approach slope. Runways 25R and 16 are non-precision runways and have a 34:1 approach slope. Runways 7R, 25L and 34 are visual approach runways and have a 20:1 approach slope. The proposed new runway 7R and 25L will be a non-precision runway with 7R and 25L having a 34:1 approach slope. The new Runway 7C-25C (existing 7R-25L) will have a 20:1 visual approach to each end.

Obstructions to the Part 77 airspace surrounding the Daytona Beach International Airport are marked on the runway obstructions figures of the airport layout plan set. An Obstruction Disposition Table can also be found on this figure which lists known obstructions with the surfaces that each one penetrates as well as the amount of penetration in feet.

There are other structures located on the Airport, which penetrate the Part 77 surfaces. These structures include the Visual Approach Slope Indicator (VASI,) the Automated surface Weather Observing System (AWOS,) and the windsock. These structures are lighted and are necessary for the safe navigation of aircraft. These structures are also frangible and will give way if struck by an aircraft.

No objects, besides those necessary for safe navigation, are permitted to penetrate the Part 77 surfaces. Every effort should be made to ensure that the airport environment remains obstruction-free.

General Conclusions

Any and all non-necessary obstructions to the imaginary surfaces should be removed from the airport environment. Numerous factors including excessive relocation costs often complicate the process of creating an obstruction-free airspace. Obstructions, which cannot be removed, should be equipped with hazard beacons so they can be clearly seen during all hours of the day. Every effort should be made to clear all obstructions from the approach areas of the busiest runways.

There is no clearly defined point at which an obstruction will render one or all of the runways at an airport unusable. There are many factors that influence the severity of the obstruction such as the height, location, and type of obstruction. Volusia County should continue to prohibit construction that will interfere with the imaginary surfaces and coordinate possible conflicting alterations or construction projects with the FAA and local and State Government planning agencies.

The Volusia County Code of Ordinances states that: "All aeronautical activities at this airport and all flying or aircraft departing from or arriving in the airspace above this airport shall be conducted in conformity with the current pertinent regulations and directives of the Federal Aviation Agency and Civil Aeronautics Board." This ordinance thus covers all FAA regulations regarding Part 77 surfaces.

To regulate the construction of new towers that may interfere with the Airport's airspace, the Ordinance states that: "All

communication towers and antennas or modifications thereof must meet or exceed current standards and regulation of the FAA, the FCC, and any other agency of the federal government with the authority to regulate communication towers and antennas."

It may be necessary to add a new section to the Airport Chapter 18 of the Volusia County Code of Ordinances that addresses the importance and need to keep all Part 77 surfaces clear of obstructions when possible. Any and all references to the Federal Aviation Agency should be changed to the Federal Aviation Administration and any references to the Civil Aeronautics Board should be eliminated due to the termination of this organization.

6.3 AIRPORT LAYOUT PLAN

The Airport Layout Plan (ALP) is a group of drawings that serve as the primary tool for the guidance of growth at the Daytona Beach International Airport. The various drawings depict the recommendations contained within this Master Plan Update. The ALP set was reduced from its working size of 24" x 36" in order to be incorporated in the Master Plan Update document for easy reference. This reduced size ALP set is located in the appendix. The eight separate drawing which constitute the ALP set include:

- Sheet 1 – Title Sheet
- Sheet 2 – Data Sheet
- Sheet 3 – Airport Layout Plan
- Sheet 4 – Terminal Area Plan
- Sheet 5 – Airspace Plan (Part 77-Full)
- Sheet 6 – Airspace Plan (Part 77-Conical)
- Sheet 7 – Runway 16-34 Plan and Profile
- Sheet 8 – Runway 7L-25R Plan and Profile
- Sheet 9 – Runway 7C-25C Plan and Profile
- Sheet 10 – Future Runway 7R-25L Plan and Profile
- Sheet 11 – On Airport Land Use Plan
- Sheet 12 – Exhibit "A" Property Map
- Sheet 13 – Vicinity Plan w/2020 DNL Noise Contours

6.3.1 Title Sheet

The Title Sheet of the ALP set serves as a cover sheet and provides information such as the airport name, owner, location, and company that prepared the ALP set. An index of drawings, graphic representations of the airport location (scale 1" = 500,000' or sectional aeronautical chart), and the airport vicinity (scale 1" = 24,000' or U.S.G.S. 7 minute quadrangle map) is also presented on the title sheet.

6.3.2 Data Sheet

The Data Sheet of the ALP set displays wind rose information, basic airport and runway data, and runway protection zone data. The wind rose data includes all-weather, IFR, and VFR information. The information presented in the Airport and Runway Data blocks covers the existing, future, and proposed conditions of the Airport.

6.3.3 Airport Layout Plan

The Airport Layout Plan is the graphical representation, to scale, of the existing and proposed airport facilities. It serves as a bird's eye view of the Airport and shows clearance and dimensional information required for conformance with applicable FAA standards. The Airport Layout Plan establishes the ultimate configuration of all runways, taxiways, and apron areas at this point in time. In addition, areas are shown which should be reserved for development,

and areas that should be acquired to allow the expansion of aviation-related and non-aviation-related commercial revenue producing facilities.

6.3.4 Terminal Area Plan

The Terminal Area Plan shows a close up view of the terminal and surrounding areas of the Airport. All existing and proposed terminal related facilities are included on this drawing. Also shown are all terminal related roadways. This Plan allows airport managers to see what specific airport improvements are proposed for the terminal area.

6.3.5 Airspace Plan

The current and future airspace surrounding the Airport is shown on the Airspace Plan. This sheet incorporates a graphical representation of the Imaginary Surfaces as described within FAR Part 77. The imaginary surfaces are established in relation to the airport elevation and to each runway end. The size of each imaginary surface is based on the runway category and type of planned approach.

6.3.6 Runway Plan and Profile

The Runway Approach and RPZ Plans are used to determine if any obstructions are present within the approach areas or runway protection zones of the runways. One sheet was developed for each Runway, which depicts the RPZ for that runway.

6.3.7 Airport Land Use Plan

The Airport Land Use Plan is a graphic representation indicating general development guidelines for all existing on-airport property and ultimate proposed acquisition areas. The purpose of this plan is to provide overall developmental guidance for the Airport and immediately adjacent areas influenced by airport operations, if applicable. The Land Use Plan shows all areas of the Airport categorized by specific use.

6.3.8 Airport Property Map

The Airport Property Map depicts the boundary of the Airport as well as all surrounding parcels and deed metes and bounds. Airspace and avigation easements are also shown on this exhibit. All leased areas are shown with the acreage of each parcel and the name of the lessee

6.3.9 Airport Vicinity Plan

The Airport Vicinity Map defines both graphically and in tabular form how various tracts of land within the airport boundary are distributed. Also depicted on this drawing are the projected 2020 noise contours.

The purpose of this drawing is to provide information necessary for analyzing the current and future aeronautical uses of the land. All groups or organizations currently leasing land from the Airport are depicted on this drawing.

Chapter Seven
Environmental Overview

7.1 ENVIRONMENTAL OVERVIEW

The future environmental conditions must be closely examined when selecting potential development concepts. The environmental concerns that are most affected by airport development include noise, air quality, light, and wetland and wildlife habitat disturbances. This analysis serves as an overview of environmental needs that may have to be examined with future development. It is not an Environmental Assessment, rather an overview of projected considerations that will need to be assessed in conjunction with future construction and planning projects.

7.2 SITE DESCRIPTION

Daytona Beach International Airport (DAB) is located approximately 2.7 miles from the center of the City of Daytona Beach, Florida at 34 feet above mean sea level (MSL). The airport site and surrounding area are level terrain. The Airport is located approximately 2.9 miles from the western edge of the Halifax River/ Intercoastal Waterway and 3.8 miles from the Atlantic Ocean coastline.

The Daytona Beach International Airport is bound to the north by International Speedway Boulevard/US 92. Land use north of the airport consists of a mix of commercial, industrial, and institutional facilities. The area south and east of the airport is primarily made up of single- and multi-family residential housing, with some commercial and government property as well. The area west of the airport, extending west of I-95, consists of mostly vacant land with some small commercial parcels.

7.3 ALTERNATIVES

Several airport construction alternatives are being evaluated as options to meet the future aeronautical need of the Airport. Alternatives include the expansion of the passenger terminal, the addition of long-term, employee, and rental car parking, the relocation of Bellevue Avenue to accommodate the proposed changes to Runway 7R-25L, and the construction of additional facilities to house general and corporate aviation activities.

The build alternatives are based on the construction of a new Runway 7R-25L to the south of the existing Runway 7R-25L, increasing the centerline-to-centerline distance between the existing Runway 7L-25R and the new 7R-25L from 1,650 feet to 2,940 feet. In addition, the new runway will be longer than the existing Runway 7R-25L, to accommodate a wider range of aircraft. Both build alternatives include the construction of 40-foot wide parallel taxiways north and south of the new Runway 7R-25L. The runway variations between the alternatives are shown in **Table 7.1** on page 2.

Table 7.1
DAYTONA BEACH INTERNATIONAL AIRPORT

Proposed Design Alternatives

Alternative	Size	Centerline Distance	Existing Runway 7R-25L to Remain Open?
No-Build (Existing)	3,195 ft. x 100 ft.	1,650 ft.	Yes
1	6,500 ft. x 100 ft.	2,940 ft.	No
2	6,500 ft. x 100 ft.	2,940 ft.	Yes

Source: HNTB Analysis

There are several environmental considerations that must be looked at in evaluating alternatives as outlined in FAA Order 5050.4A, *Airport Environmental Handbook*.

7.4 NOISE

7.4.1 Introduction

As part of the Environmental Overview, an analysis of the noise environment associated with flight operations under the current conditions (2000) and the 2020 Base-Case Forecast was completed using the Federal Aviation Administration's (FAA) Integrated Noise Model (INM) Version 6.0b, the most current version of the program. INM is the standard tool for assessing aircraft noise impacts in the vicinity of airports within the United States. All noise contours presented in this document are shown in terms of the Day-Night Average Sound Level (DNL), which is the time-averaged sound level associated with all aviation related activities around an airport during an average day. Through research conducted by several public and private organizations, the DNL noise metric has been found to provide the greatest measure of community reaction to aircraft noise over a long period of time. It is the measure accepted by the FAA for use in the majority of noise analyses conducted at airports in the United States.

7.4.2 Annual Aircraft Operations

Annual aircraft operations for each of the three analyzed scenarios at Daytona Beach International Airport were obtained from the forecasts presented in Chapter Three of the Master Plan Update. Annual operations for 2000 and the 2020 Base-Case forecast scenarios are presented in **Table 7.2** on page 4. In order to model the annual operations in INM, the operations were further divided among specific aircraft types within each category. Ten different aircraft were used in INM to depict all operations at the Airport. Many aircraft can be substituted for one aircraft in the program. For example: all single-engine fixed pitch piston aircraft are modeled using one aircraft in INM. It is assumed that 50 percent of operations are arrivals and 50 percent are departures.

7.4.3 Modeled Runway Utilization

Table 7.3 on page 5 presents the modeled runway utilization percentages used in this analysis for the 2000 and 2020 noise contours. These utilization percentages are based on input received from the Air Traffic Control Tower (ATCT) personnel at Daytona Beach International Airport. Commercial operations are categorized as those operations involving commercial airlines at the Airport. General Aviation operations account for all other operations at the Airport.

The 2020 runway utilization shows a shift in General Aviation aircraft from 7C-25C to the new 7R-25L Runway. Runway 7C-25C will still be used by General Aviation aircraft but on a reduced basis.

7.4.4 Modeled Flight Tracks and Utilization

Flight tracks for the current (2000) situation at the Airport consist of arrival and departure tracks to each of the runways. Aircraft entering or leaving the area primarily fly in a north-south direction. This is depicted in the arrival tracks to Runways 7L and 7R in 2000 and 2020. The arrival tracks for all other runways are shown as straight-in approaches. Departure tracks from Runways 25L, 25R, and 7R turn roughly forty degrees north and forty

Table 7.2
DAYTONA BEACH INTERNATIONAL AIRPORT

Summary of Projected Enplanements and Aircraft Operations - Base Case

		Aircraft Operations				
Year	**Annual Enplanements**	**Passenger Carriers**		**General Aviation**	**Military**	**Total**
		Air Carrier Jets	**Regional Jets**			
2000	268,082	4,084	2,196	355,353	779	362,412
2005	290,000	4,380	3,650	372,480	779	381,289
2010	330,000	4,380	5,110	390,000	779	400,269
2020	400,000	4,380	7,300	424,110	779	436,569

Source: HNTB Analysis

Table 7.3
DAYTONA BEACH INTERNATIONAL AIRPORT

Runway Usage Percentages for 2000

Runway	Commercial	General Aviation
7L	65	55
7R	N/A	20
25L	N/A	9
25R	21	4
16	5	9
34	9	3
Total	100	100

Runway Usage Percentages for 2020

Runway	Commercial	General Aviation
7L	63	50
7R	2	15
7C	N/A	5
25L	2	9
25R	19	6
25C	N/A	3
16	5	9
34	9	3
Total	100	100

Source: DAB ATCT

degrees south after departure. There are three departure tracks from Runway 16. Two of them head south and one turns 180 degrees to the left and heads north. All other departure tracks are straight-out departures.

7.4.5 Additional Modeling Parameters

The current version of INM, Version 6.0b, allows the user to input weather data into the model to more accurately predict the effects of temperature and relative humidity on the propagation of sound around the airport. As such, annual weather data for calendar year 2000 was obtained for Daytona Beach International Airport in order to estimate the average temperature and relative humidity at the Airport. Based on this data, an average temperature of 70.3 °F and an average relative humidity of 75 percent were used in the noise model. An average barometric pressure of 30.06 in-Hg was also used.

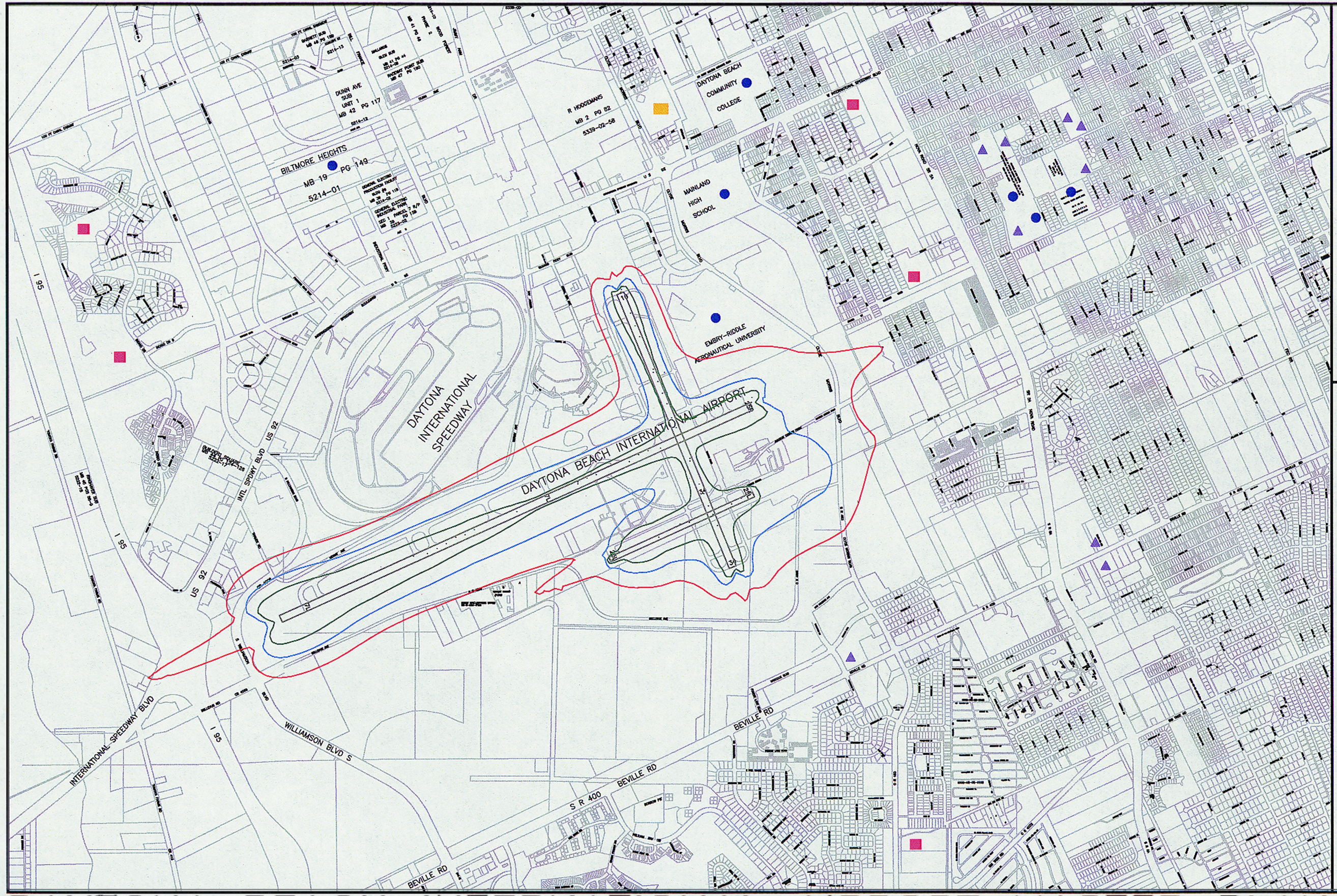
7.4.6 Resultant Noise Exposure

Figures 7-1 and **7-2,** located on pages 7 and 8 respectively, present the 65- through 75-dB DNL contours for 2000 and the 2020 Base-Case forecast scenarios, respectively. These contours were overlaid on a current Volusia County zoning map. These contours were calculated based on the data presented and discussed above using INM 6.0b.

Although the majority of the existing land uses in the general vicinity of the airport are primarily business and undeveloped land, there are residential areas located to the south and east of the airport as well. Parks, hospitals, churches, and schools are also labeled on the map. None of these landmarks were found to be adversely impacted by the resultant noise. Figures 7-1 and 7-2 illustrate the extent of the contours for each of the scenarios into the surrounding communities.

The 2000 forecast noise contours presented in Figure 7-1 show that the 65-db DNL contour extends to the northeast across Clyde Morris Boulevard. Most of the area affected by these contours is owned by the Airport. The area that is not owned is comprised of undeveloped land. The 65-db DNL contour also extends across part of the Embry-Riddle Aeronautical University campus. A small portion of industrial zoned area is located within the 65-db DNL contour to the southwest of Runway 7R-25L. Likewise, a small portion of the 70-db DNL contour covers Williamson Boulevard north of the approach end to Runway 7L. The FAA prefers that land use within the 70+dB DNL noise contours be limited to on-airport property or vacant areas. This is the case with Daytona Beach International Airport.

The 2020 base-case forecast noise contours presented in Figure 7-2 show that the 65 dB DNL contour will extend farther to the northeast across Clyde Morris Boulevard than the 2000 contours presented in Figure 7-1. This area covers airport property and undeveloped land. The most significant change in contours in the 2020 base-case is the utilization of the new Runway 7R-25L and extension of Runway 16-34. The 65-db DNL noise contours will remain north of Beville Road and west of Clyde Morris Boulevard. This land is currently undeveloped. Portions of the area affected by the 65-db DNL noise contours are owned by the Airport. The Airport has plans to acquire all of the land affected by the noise for construction of the New 7R-25L Runway. An increased area of land west of Runway 7C-25C, currently used for industrial purposes will be affected by the noise. Due to the nature of activity in this



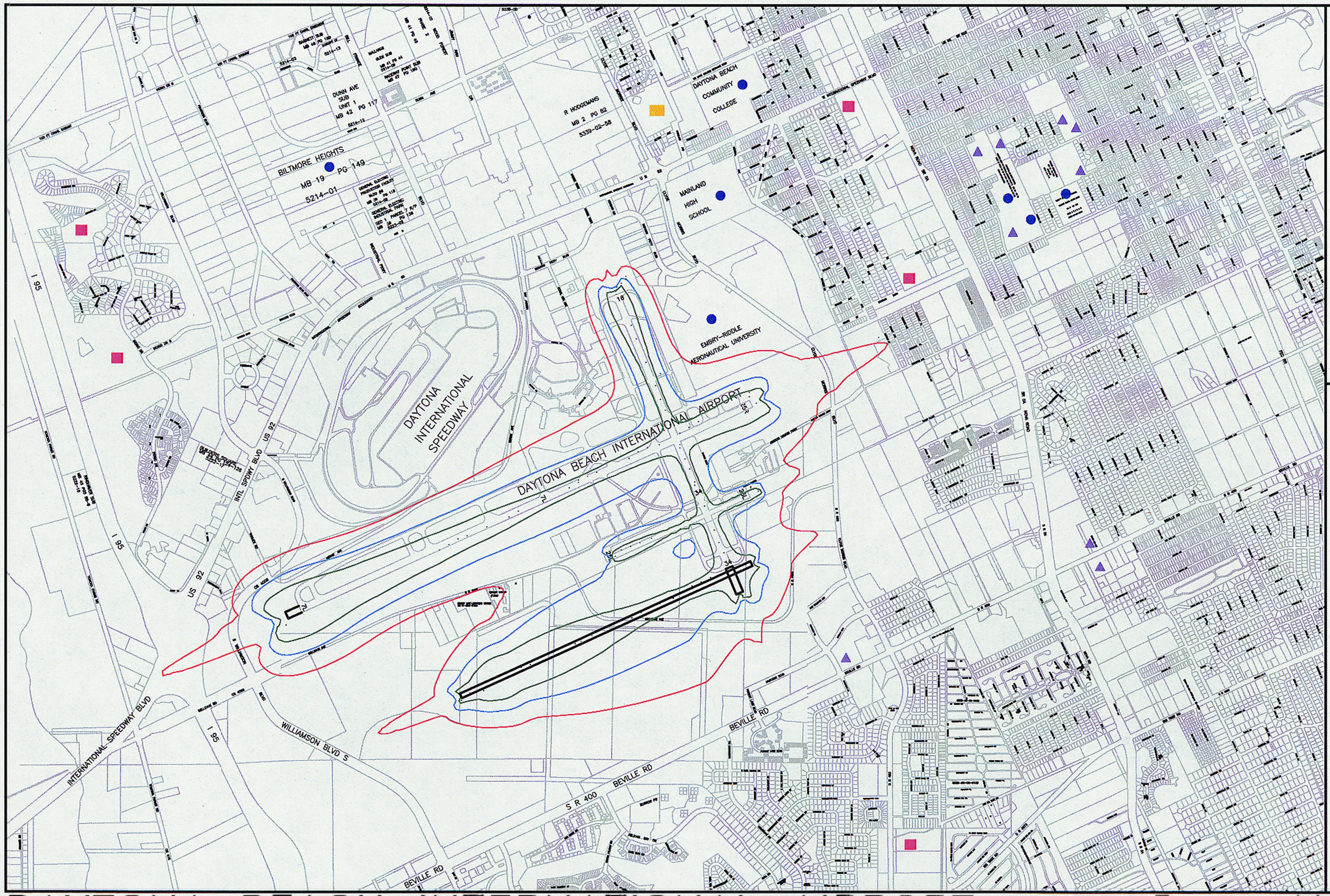
DAYTONA BEACH INTERNATIONAL AIRPORT MASTER PLAN UPDATE

DAYTONA BEACH INTERNATIONAL AIRPORT

2000 NOISE CONTOURS

HNTB

FIGURE 7-1



LEGEND

NOISE CONTOURS

- 65 Ldn
- 70 Ldn
- 75 Ldn

NOISE SENSITIVE USES

- Parks/Recreation & Cultural Facilities
- Hospitals
- Churches
- Schools

N

SCALE: 1" = 1,000'

DAYTONA BEACH INTERNATIONAL AIRPORT MASTER PLAN UPDATE

DAYTONA BEACH INTERNATIONAL AIRPORT

2020 NOISE CONTOURS

HNTB

FIGURE 7-2

area, the increased noise will not adversely impact the daily operations of these businesses.

7.5 COMPATIBLE LAND USES

The areas of land affected by the noise generated at the Daytona Beach International Airport are primarily comprised of airport property and undeveloped land. Every effort should be made to minimize current and future noise impacts on surrounding residential areas.

Land affected by the noise should be used for industrial/commercial purposes or airport related activities. An area of land has been set aside for future aviation development between Runways 7C-25C and 7R-25L. This land will be used for aviation related activities such as hangars, FBOs, and apron space. Because of this, the 70 and 65-db DNL noise levels will not affect these activities.

Roughly 1,500 to 2,000 feet of land east and west of Runway 7R-25L should remain either undeveloped or used for industrial/commercial development due to the concentration of noise levels in these areas.

7.6 SOCIAL IMPACTS

Both build alternatives require the acquisition of approximately 300 acres of undeveloped land adjacent to the existing southern airport boundary. None of this land is currently occupied, so there will be no need to displace residences or businesses.

Driver utilization of Bellevue Road is not expected to experience a significant change after the roadway relocation. The increase in vehicular traffic as a result of increased flight operations and on-site employment is not expected to have a significant affect on the surrounding roadway network.

7.7 INDUCED SOCIO-ECONOMIC IMPACTS

The addition of a new runway will help in meeting the commercial and general aviation demand in Volusia County. Aviation and non-aviation related facilities, proposed as part of the Airport development, would attract new business to the area, creating more local employment. The projected increase in aviation activity will bring new airlines, Fixed Based Operators (FBOs), and flight training schools to the area as well.

7.8 ENVIRONMENTAL JUSTICE

Executive Order 12898- Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations requires that Federal agencies make every effort to ensure that adverse impacts to low-income and minority populations as a result of the project are not disproportionately high. Adverse impacts can include those that are environmental, social, economical, and geographical in nature. Particular attention must be paid in instances where project development can be detrimental to the cohesiveness and economic vitality of a low-income or minority community.

The proposed improvements for the Airport are not anticipated to have any adverse affects on local low-income or minority communities. Therefore, no environmental justice impacts are expected as a result of the proposed development.

7.9 AIR QUALITY

There are six primary air pollutants associated with an airport. **Table 7.4**

Table 7.4
DAYTONA BEACH INTERNATIONAL AIRPORT

Pollutants Associated with Airport Operations

Pollutant	Source	
	Aviation Related	**Non-aviation Related**
Ozone (O_3)	Aircraft idle, takeoff, and climb out	Gas powered ground vehicles
Carbon Monoxide (CO)	Incomplete combustion during taxi and idle	Incomplete combustion in ground vehicles
Particulates (PM-10)	Incomplete combustion	Incomplete combustion
Sulfur Dioxide (SO_2)	Minimal by-product of fuel burn	By-product of fuel burn
Nitrogen Oxides (NO_x)	High temperature combustion during takeoff	High temperature combustion in ground vehicles, boilers
Lead (Pb)	Leaded gasoline used in piston-driven aircraft	Ground vehicles operating with leaded gasoline

Source: Ghyabi Lassiter and Associates, Inc.

shows the principal sources for each of the emissions as related to airport operations.

Volusia County and Daytona Beach do not currently exceed national air quality standards. The alternatives proposed in the master plan would have minimal impact on air quality. Prior to the development of any part of the Master Plan, environmental assessments will be conducted to determine if any new facilities or the projected future aircraft make-up will have a significant impact on air quality per State and Federal air quality guidelines.

7.10 WATER QUALITY

With the increase in impervious ground area due to the new runway, taxiways, and buildings, stormwater discharge is the primary water quality issue with the changes proposed by the Master Plan. There are three issues to be addressed in dealing with stormwater management:

- ◊ Pollutants and sediment created as a result of construction
- ◊ Spilled fuel, oil, and other industry related contaminants
- ◊ Higher rates of stormwater discharge can increase soil erosion and sediment transport

Temporary measures, including sediment barriers and silt fences, will be installed during construction to minimize construction-related water management problems. Skimmers will be installed to separate contaminants before the discharge reaches the stormwater management system. The anticipated addition to the Airport will increase the amount of impervious ground area, increasing the amount of stormwater run-off to be treated. The existing stormwater management system consists of swales and underground pipes that lead to a treatment area before the water is released into the offsite drainage system. Treated stormwater leaves the property via the B-19 canal to Spruce Creek to the Atlantic Ocean or via a ditch system to the Tomoka River. Spruce Creek and the Tomoka River are currently classified as Outstanding Florida Waters with no adverse water quality issues.

Considerable coordination will have to occur between local, state, and federal agencies to ensure that water quality standards are maintained and that the necessary permits are in place at the time of development. There are not expected to be any adverse affects on water quality with the developments proposed in the Airport Master Plan. Measures will be incorporated, in accordance with FAA AC 150/5370-10A, Standards for Specifying Construction of Airports, and Item P-165, Temporary Air and Water Pollution, Soil Erosion and Siltation Control, to minimize adverse water quality affects, including control of water pollution during construction.

7.11 DEPARTMENT OF TRANSPORTATION ACT, SECTION 4(f)

The Daytona Beach International Airport expansion will not affect any publicly or privately owned land including parks, recreation areas, wildlife refuges, or historic sites. Therefore the project is not expected to have any impact on Section 4(f) properties.

7.12 HISTORICAL, ARCHITECTURAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

The State Historic Preservation Officer and the Director of the Florida Master Site Files have been consulted in prior projects at the

Airport and no significant sites have been identified. If, during excavation and construction, there appears any indication of a historical, architectural, archeological, or culturally significant finding, the appropriate agencies will be consulted.

7.13 BIOTIC COMMUNITIES

The Daytona Beach International Airport property covers a diverse mix of environmental areas including wetlands, pastures, and forests. The upland areas are made up primarily of:

- ◊ cabbage palm (Sabal palmetto)
- ◊ laurel oak (Quercus laurifolia)
- ◊ live oak (Quercus virginiana)
- ◊ magnolia (Serenoa repens)
- ◊ red bay (Persea borboni)
- ◊ red maple (Acer rubrum)
- ◊ slash pine (Pinus elliottii)
- ◊ sawpalmetto (Serenoa repens)
- ◊ sweetbay (Magnolia virginiana)
- ◊ sweetgum (Liquidambar styraciflua)
- ◊ water oak (Quercus nigra)
- ◊ waxmyrtle (Myrica cerifera)

In addition, there are large expanses of open pasture with planted grasses. There are also some areas of mixed hardwood that will have to be removed. Coordination with the U.S. Army Corps of Engineers and St. John's River Water Management District will ensure that any adverse impacts will be compensated for by the creation of new natural areas on- or off-site.

7.14 ENDANGERED AND THREATENED SPECIES

As part of the 1996 Environmental Assessment, a review of the project site did not indicate the presence of any state or federal protected species other than some protected wading birds. However, the proposed improvements are not expected to have a significant impact on their habitat. No evidence of federal or state protected flora or fauna have been found on the site. Any disruption to non-protected species of wildlife, flora, or fauna will be offset by proposed habitat enhancement.

7.15 WETLANDS

The Clean Water Act defines wetlands as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas."

There are several wetlands that will be impacted by the improvements proposed in the Airport Master Plan. These areas include mixtures of deciduous and evergreen growth. All disturbed wetland areas will be re-established if necessary. There is not anticipated to be any net loss of wetlands. Much of the area was historically wetlands, so the area is favorable for the creation of new wetlands. In many instances, newly created wetlands can be developed such that they tie into existing wetlands, either directly adjacent to, or through the existing ditch system. Because of the nature of the existing wetlands- forested rather than herbaceous- there will be little impact on birds that inhabit the area.

The U.S. Army Corps of Engineers and the St. John's River Water Management District

performed jurisdictional determination of the wetlands on the Airport property for the 1996 Environmental Assessment. A jurisdictional map was also developed as part of the assessment in 1995 to delineate the wetlands that would be impacted by the construction of a third runway. A new determination and map will be required as part of the environmental assessment that will be performed prior to the start of any new construction. At that time, a detailed assessment of all affected wetlands as well as plant and wildlife will be developed.

7.16 FLOODPLAINS

A review of FEMA's most recent Flood Insurance Rate Map (FIRM), dated June 4, 1990, shows that the site, primarily along the eastern side of the proposed runway and taxiways, falls within the 100-year floodplain. Portions of the proposed expansion area have a base flood elevation of 27 and 28 feet MSL. Because the new runway and taxiways will be built at approximately 30 feet MSL, there will be a loss of floodplain storage. Any loss of flood storage will be compensated through an equal amount of storage being developed elsewhere on the site. The relocation of Bellevue Avenue can be designed to minimize floodplain impacts; in addition, the relocated road can relieve some of the impacts that were a result of the original roadway design.

The volume of compensatory storage required will be determined by the area of fill needed for the runway, taxiways, and relocated roadway up to an elevation of 27 or 28 feet MSL, where applicable. Compensatory storage can be provided in two ways. Regrading the site can supply compensatory storage. Also, by excavating an equal volume within the same project area down to the mean wet-season groundwater table, storage can be achieved. The excavated material will then be placed on an existing area that is above the 100-year floodplain, or it may be used as fill for the proposed improvements. Regardless of the method selected to provide compensatory storage, there will be no net loss in floodplain storage.

7.17 COASTAL ZONE MANAGEMENT AND COASTAL BARRIERS

The Daytona Beach International Airport does fall within the Coastal Zone Management Areas of the City of Daytona Beach, Volusia County, and the State of Florida; however, the proposed improvements are not expected to have any adverse impacts on the Coastal Zone Management programs. In addition, no coastal barriers, or wild or scenic rivers are expected to be affected by the proposed development.

7.18 FARMLAND

Prime farmland is described as land that has the qualities that promote the growth of crops producing marketable goods including food, feed, and fiber. There is limited livestock grazing within the study area; however, no prime farmland has been found within the study area; therefore the proposed development is not expected to have an impact on farmland.

7.19 ENERGY SUPPLY AND NATURAL RESOURCES

The proposed development can be expected to have a higher demand for energy and natural resources for both the ground facilities and aircraft. The ground facilities, including runways, taxiways, and buildings, will increase the electrical energy

consumption of the Airport. Ground vehicles will produce a minor increase in fuel consumption as travel patterns may be modified and travel distances will likely increase to service a larger area. Aircraft fuel consumption will also experience an increase as taxi distances and times will increase. Runup times and flight patterns are not expected to change.

No known natural resource deposits exist within the vicinity of the airport. Overall, there will be no significant affects on energy supply or natural resources as a result of the proposed development.

7.20 LIGHT EMISSIONS

There is not expected to be a significant impact on surrounding areas due to light emissions. If impacts do occur, they will be mitigated by shielding. The positioning of existing and proposed runway and taxiway lights, Vertical Approach Slope Indicators (VASIs), and Runway End Identifier Lights (REILs) are not expected to infringe on any light-sensitive areas.

7.21 SOLID WASTE

A significant amount of solid waste will be produced during construction; however, all waste will be properly disposed of in Volusia County facilities. Once operational, the proposed development is not expected to significantly increase the amount of solid waste currently produced by the Airport. The Tomoka Landfill is the closest solid waste disposal facility and is located approximately 15,000 feet southwest of the airport.

This facility attracts numerous birds from the shoreline. These birds transverse the airspace around the Daytona Beach International Airport, conflicting with the aircraft operations at and around the Airport. Measures are already in place to deter these birds from congregating near the airport runways.

7.22 HAZARDOUS WASTE

The most common potential hazardous waste sources associated with an airport are the storage and disposal of fuel (for aircraft and surface vehicles), aircraft de-icing fluid, and other materials required for the maintenance of aircraft and support vehicles. The proposed improvements do not include any actions that would contribute to hazardous waste issues- primarily the addition and/or removal of storage tanks. The wastewater treatment facilities described previously in this analysis will minimize the affect of hazardous waste on the environment. Due to the preventative measures and ongoing monitoring that will take place, there is not expected to be any adverse impact on the site or surrounding area due to hazardous waste.

7.23 CONSTRUCTION IMPACTS

FAA regulations require that no construction activity may take place within 200 feet of the centerline of an active runway; however, this may be modified on a case-by-case basis. Because the proposed construction will tie in with the southern end of the existing Runway 16-34, the existing runway may have to be closed for periods during construction. Limiting constructon to off-peak and evening or night hours may minimize construction affecting the existing runway. In addition, because Runway 16-34 is a crosswind, or secondary runway, and not used as frequently as Runway 7L-25R, prevailing weather conditions may allow for limited construction during other times.

FAA Advisory Circular 150/5370-2C ("Operational Safety on Airports During Construction") contains specific guidelines on areas that need to be addressed in the consideration of active construction at an operational airport. Appendix 1 of AC 150/5370-2C also contains special safety requirements including the permissible proximity to navigational aids and taxiways and limits on what kind of construction may be performed at the site.

Prior to, and during the construction phase of development, all airport users including the FAA, commercial service operators, fixed base operators, and airport management will be made aware of schedules, construction vehicle travel routes, waste disposal, and other pertinent information related to construction and airport operations.

Potential construction impacts such as noise, dust generation, traffic disruptions, and air and water quality impacts will be temporary and will be minimized by the use of appropriate controls. Construction will be accomplished in accordance with provisions of FAA AC 150/5370-10A, Standards for Specifying Construction of Airports, and Item P-165, Temporary Air and Water Pollution, Soil Erosion and Siltation Control. All required state and local permits will be obtained prior to the start of construction.

All applicable local, state, and federal guidelines will be followed. Therefore there is not expected to be any adverse affects as a result of the proposed construction.

7.24 CONCLUSION

Several environmental factors have been reviewed as they relate to the proposed development of the Daytona Beach International Airport. This analysis has not found that any environmental factors will prohibit the improvements to the Airport as proposed in the Master Plan Update. As required by FAA Order 5050.4A, an Environmental Assessment will be completed, which will include a more detailed analysis of the study area. Cooperation and compliance with all applicable local, state, and federal agencies and regulations will ensure that the Daytona Beach International Airport Master Plan is carried out in full, with minimal impact on the surrounding environment.

Chapter Eight
Financial Plan

The purpose of this chapter is to illustrate the current and future financial situation of the Daytona Beach International Airport as well as list potential sources of funding for developing the recommended airport development projects. These projects were derived in the Developments Concepts Chapter of the Master Plan Update. Recommendations are made in this chapter to strengthen the Airport's financial position throughout the 20-year planning period.

8.1 EXISTING AIRPORT FINANCIAL STRUCTURE

The purpose of this section is to summarize and analyze the Daytona Beach International Airport financial statements. These financial statements include balance sheets, combined income statements, and cash flow statements from the previous five years of operations at the Airport.

Volusia County's 12-month fiscal year begins on October 1st and ends on September 30th of each year. Information from the most recent fiscal year (FY) 2001 was used in generating this financial plan.

8.1.1 Enterprise Fund

The Daytona Beach International Airport is considered an Enterprise Fund within Volusia County. This means that the Airport program operates independently from the County's general fund. Five separate funds are included in the Volusia County Enterprise Fund and are listed below.

- **Airport**
- **Refuse Disposal**
- **Volusia Transportation Authority**
- **Garbage Collection**
- **Utilities**

8.1.2 Cost Centers

Cost centers are areas of functional activities of an airport. These centers are designed to account for expenditures generated by Operations & Maintenance (O&M) through investment services. The Daytona Beach International Airport is divided into four cost centers: Terminal, Terminal Area, Airfield Area, and Other Areas.

8.1.3 Operating Revenues

Airport operating revenues are generated from various sources including airline and concession rental fees, landing and fuel flowage fees, and other airport services.

For the past five fiscal years, the operating revenues at the Airport ranged from a low of $7,302,609 in 1998 to a high of $8,229,619 in 2001. These amounts are shown in **Table 8.1**.

8.1.4 Non-Operating Revenues

Activities that contribute to the Airport Fund but are not related to the daily operation of the Airport are considered non-operating revenues. These revenues include operating grants, passenger facility charges (PFCs), and interest revenues.

Operating grants totaled $149,952 while interest revenues from the debt service reserve fund and the operating fund totaled approximately $870,000 for fiscal year

Table 8.1
DAYTONA BEACH INTERNATIONAL AIRPORT

Operating Revenues

	Actual					Projected			
Item	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Terminal-Airlines	2,817,908	2,797,741	2,835,762	2,869,369	2,858,353	2,851,774	1,014,290	1,014,290	1,014,290
Terminal-Concession	2,638,016	2,276,731	2,190,956	2,108,819	2,693,528	2,585,857	2,392,250	2,376,250	2,376,250
Airfield	986,482	803,550	895,708	858,963	896,578	774,243	832,000	832,000	832,000
Commercial Area	866,444	1,023,201	1,191,924	1,291,470	1,385,742	1,770,209	1,770,209	1,770,209	1,770,209
Other Operating Revenues	415,210	401,386	415,960	575,091	395,418	481,179	257,149	257,149	257,149
Total	**$7,724,060**	**$7,302,609**	**$7,530,310**	**$7,703,712**	**$8,229,619**	**$8,463,262**	**$6,265,898**	**$6,249,898**	**$6,249,898**

Non-Operating Revenues

	Actual					Projected			
Item	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Operating Grants/Payment in Lieu of Taxes	0	0	0	112,030	149,952	0	0	0	0
Capital Grant - Federal Appropriation	0	0	0	0	1,314,415	2,268,449	2,268,449	0	0
Net Gain on Disposal of Fixed Assets	735	0	0	0	1,696	0	0	0	0
Passenger Facility Charges	1,079,668	1,079,668	1,079,668	1,079,668	0	0	2,250,000	2,500,000	500,000
Debt Service Reserve Utilization	0	0	0	0	0	0	0	2,000,000	1,795,958
Gain from Forward Delivery	0	0	90,000	795,900	0	0	0	600,000	3,380,000
Interest Revenue (Debt Service Reserve Fund)	199,288	199,288	192,614	236,221	549,274	210,000	200,000	90,000	0
Interest Revenue (Operating Fund)	383,355	528,767	149,752	450,159	328,182	200,000	195,000	175,000	175,000
Total	**$1,663,046**	**$1,807,723**	**$1,512,034**	**$2,673,978**	**$2,343,519**	**$2,678,449**	**$4,913,449**	**$5,365,000**	**$5,850,958**
Total Airport Revenues	**$9,387,106**	**$9,110,332**	**$9,042,344**	**$10,377,690**	**$10,573,138**	**$11,141,711**	**$11,179,347**	**$11,614,898**	**$12,100,856**

Source: County of Volusia, Daytona Beach International Airport Statement of Revenues & Expenses

2001. The Airport received a capital grant of $1,314,415 from federal appropriation in 2001.

8.1.5 Operating Expenses

Depreciation and Personal Services form two of the largest operating expenses at the Airport. . Operating expenses ranged from a low of $7,566,918 in 1997 to a high of $10,381,987 in 2001.

Personal services totaled $2,863,035 for the fiscal year ending September 30, 2001. This amount represents airport administration and staff compensation expenses.

Depreciation includes all assets which lose value over the useful life of the asset. Depreciation at the Airport totaled $3,869,844 for the fiscal year 2001.

Other major operating expense categories include utilities and contractual services.

Contracted services increased to $1,690,461 for the fiscal year 2001, up from $774,707 for the previous year. The Airport restaurant's operations and increased law enforcement, accounted for the largest portions of this increase. **Table 8.2** shows the Airport's Operating Expenses.

8.1.6 Non-Operating Expenses

Non-operating expenses include interest expenses and bond issuance costs from debt service and the port authority loan. These expenses are also shown in Table 8.2.

Table 8.3 shows historical and projected airport revenues and expenses through 2005. Total operating revenues are projected to reach $12,100,856 for fiscal year 2005 while total operating expenses are projected to reach $13,858,248 for 2005.

8.1.7 Airport Cost of Providing Passenger Service

The information in Table 8.3 also shows the Airport's revenues per enplanement and expenses per enplanement. These numbers were calculated using the total revenues and total expenses from Tables 3.1 and 3.2 as well as the base case forecast enplanements.

In 2001, the Airport generated approximately $40.57 in revenues for every enplaned passenger. However, the Airport paid $51.16 in expenses for providing airline facilities with a net loss of $10.59 per passenger. Projections show that this gap will decrease as revenues per passenger increase to $41.73 by 2005 and costs remain relatively constant at $47.79 per enplaned passenger. This results in a projected net loss of $6.06 per passenger. This highlights the Airport's trend toward increased revenues and stabilized expenses. This trend should positively affect the Airport Enterprise Fund's borrowing power for capital improvements.

Implementation of the capital improvement program described in other portions of this master plan will help develop a diversity of new revenue streams to continue the Airport's trend of increasing net income while decreasing net loss. In addition to vigorous public/private development on suitable airport lands, targeted initiatives to decrease the costs of providing passenger service will enhance the Airport's ability to attract and maintain new scheduled airline operators.

Table 8.2
DAYTONA BEACH INTERNATIONAL AIRPORT

Operating Expenses

	Actual					Projected			
Item	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Personal Services	2,628,987	2,462,318	2,497,391	2,552,903	2,863,035	3,066,187	3,219,496	3,380,471	3,549,494
Contractual Services	490,660	693,836	710,172	774,707	1,690,461	1,732,723	1,776,041	1,820,442	1,865,953
Supplies and Materials	204,788	206,360	315,009	344,650	678,997	695,972	713,371	731,206	749,486
Repairs and Maintenance	174,262	159,023	181,128	170,152	202,605	207,670	212,862	218,183	223,638
Utilities	720,209	666,665	608,112	708,055	812,699	833,016	853,842	875,188	897,068
Other Services and Charges	219,242	204,097	223,243	208,474	264,346	270,955	277,729	284,672	291,789
Depreciation	3,128,770	4,044,891	3,550,878	3,678,818	3,869,844	3,811,796	3,754,619	3,698,300	3,642,826
Bad Debt Expense	0	0	0	0	0	0	0	0	0
Total Operating Expenses	**$7,566,918**	**$8,437,190**	**$8,085,933**	**$8,437,759**	**$10,381,987**	**$10,618,319**	**$10,807,960**	**$11,008,462**	**$11,220,254**

Non-Operating Expenses

	Actual					Projected			
Item	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Interest Expense (Debt-Service)	2,974,175	2,930,023	2,883,253	2,780,207	2,775,845	2,715,958	2,651,083	2,581,838	2,507,030
Bond Issuance Costs (Debt-Service & Bond Premium)	135,780	134,227	224,227	929,384	150,875	131,828	131,302	130,964	130,964
Interest Expense (Port Authority Loan)	48,649	42,292	36,576	28,482	23,351	13,070	4,706	0	0
Total Non-Operating Expenses	**$3,158,604**	**$3,106,542**	**$3,144,056**	**$3,738,073**	**$2,950,071**	**$2,860,856**	**$2,787,091**	**$2,712,802**	**$2,637,994**
Total Airport Expenses	**$10,725,522**	**$11,543,732**	**$11,229,989**	**$12,175,832**	**$13,332,058**	**$13,479,175**	**$13,595,051**	**$13,721,264**	**$13,858,248**

* (Debt-Service & Bond Premium)

Source: County of Volusia, Daytona Beach International Airport Statement of Revenues & Expenses

Table 8.3

DAYTONA BEACH INTERNATIONAL AIRPORT

Historical Revenues and Expenses vs. Enplanements

	Fiscal Year	Enplanements	Total Revenues	Revenues/Enplanements	Total Expenses	Expenses/Enplanements	Net Revenue
Actual	1997	392,939	$9,387,106	$23.89	$10,725,522	$27.30	($1,338,416)
	1998	313,121	$9,110,332	$29.10	$11,543,732	$36.87	($2,433,400)
	1999	284,123	$9,042,344	$31.83	$11,229,989	$39.53	($2,187,645)
	2000	268,082	$10,377,690	$38.71	$12,175,832	$45.42	($1,798,142)
	2001	260,598	$10,573,138	$40.57	$13,332,058	$51.16	($2,758,920)
Projected	2002	264,768	$11,141,711	$42.08	$13,479,175	$50.91	($2,337,464)
	2003	269,004	$11,179,347	$41.56	$13,595,051	$50.54	($2,415,704)
	2004	273,308	$11,614,898	$42.50	$13,721,264	$50.20	($2,106,366)
	2005	290,000	$12,100,856	$41.73	$13,858,248	$47.79	($1,757,392)

Source: County of Volusia, Daytona Beach International Airport Statement of Revenues & Expenses

8.2 AVAILABLE FUNDING SOURCES

The Daytona Beach International Airport has five primary sources of funding available for capital projects. They include:

- Passenger Facility Charges
- Airport Improvement Program Funds
- Florida Department of Transportation Grants and Loans
- Third-Party Sources
- Airport Revenues

8.2.1 Passenger Facility Charges

Passenger Facility Charges (PFCs) are among the most advantageous sources of capital funding for airports. The FAA authorizes the collection of up to $4.50 per passenger enplanement to fund certain approved projects. Eligible projects include those which:

- Preserve or enhance safety, security, or capacity.
- Reduce or mitigate noise.
- Enhance competition among air carriers.

The current Passenger Facility Charge at the Airport is $3.00 per enplaned passenger, however, the airlines retain $.08 per enplanement as a handling fee. This results in a $2.92 PFC allotted to the Airport per enplaned passenger.

PFCs expected to be collected for FY 2002 total $808,049. If PFCs at the Airport were increased to $4.50, the Airport would collect $1,223,142 in 2002. **Table 8.4** shows the difference between charging the current $3.00 and possible future $4.50 PFC.

8.2.2 Airport Improvement Program Funds

The FAA also awards Airport Improvement Program (AIP) funds to airports. These funds are divided into two classes: discretionary funds and entitlement funds. Discretionary Funds are awarded at the discretion of the FAA to airports, based on certain eligibility criteria, while Entitlement Funds are awarded to airports based on the following formula:

- $7.80 for each of the first 50,000 enplanements
- $5.20 for each of the next 50,000 enplanements
- $2.60 for each of the next 400,000 enplanements
- $0.65 for each of the next 500,000 enplanements
- $0.50 for each enplanement over 1,000,000

Total capital contributions to the Airport in 2001 totaled $3,411,671.

The FAA can also fund Facilities & Equipment (F&E) projects at airports. These funds are used for Federal facilities such as air traffic control towers and runway instrumentation. The FAA can fund the entire project without any requirements for local matching funds.

8.2.3 Florida Department of Transportation Grants and Loans

The Florida Department of Transportation (FDOT) also provides funding for airport capital improvement projects. The State will match half of the local contribution of AIP-funded projects. FDOT funding is primarily used to assist with federally funded projects. The State also offers a

Table 8.4
DAYTONA BEACH INTERNATIONAL AIRPORT

Projected PFC Revenue

Year	Enplanements	PFC $3.00/pax ($2.92 collected)	PFC $4.50/pax ($4.42 collected)	Increased Revenues
2002	276,729	$808,049	$1,223,142	$415,093
2003	281,157	$820,978	$1,242,714	$421,736
2004	285,655	$834,113	$1,262,595	$428,482
2005	290,000	$846,800	$1,281,800	$435,000
Total	**1,133,541**	**$3,309,940**	**$5,010,251**	**$1,700,311**

Source: HNTB Analysis

program to fund up to 75 percent of land acquisition costs with an interest-free loan. FDOT is projected to cover over $84 million in project costs in Florida through 2020.

8.2.4 Third-Party Sources

Private airport development is funded by third-party sources. These funds are used for the construction of FBOs, private hangars, private fueling facilities, and car rental facilities. No Federal, State, or local funds will be used for construction of these facilities.

8.2.5 Airport Revenues

Historically, the Airport has passed on remaining capital improvement costs to the airlines. Thus, airport revenues are used to fund the remaining costs of capital improvement projects. Total airport revenues for FY 2001 totaled $10,573,138.

8.3 PROPOSED CAPITAL PROGRAM

Each new project recommended in this Master Plan was given a construction cost generated from the Development Concepts Chapter. The total cost of the projects is roughly $62.5 million. This includes land acquisition, runway and taxiway construction, and all other associated design and construction costs. Other recommended projects include reserving land for future aviation uses. A cost value has not been given to these projects because the land to be reserved is already owned by the Airport.

Included in the total cost of the capital improvement projects are capital projects that were not generated from this master plan update. These projects include hangar construction, land acquisition for noise mitigation, and development of general aviation areas on the northwest and southwest areas of the Airport. All of these projects are considered short-term and located within phase I of the capital program. **Table 8.5** shows each recommended project along with the cost and percentage of that project to be paid by Federal, State, and Local funds.

Approval of the projects and award of funds are subject to the approval by the FAA for AIP funds and FDOT for State grants and loans. Federal and State funds would account for 95 percent of the cost of land acquisition, general aviation development, and runway and taxiway construction. Hangar construction, utility installation, and land acquisition for non-noise issues, would be covered by 50 percent FDOT funding and 50 percent local funding. The total local share for these capital projects totals roughly $7,713,442.

8.4 REVENUE PROJECTIONS

It is important to review the revenue projections for the Airport to determine the future revenues to be accumulated and used towards the capital projects. Table 8.1 depicts a breakdown of the Airport's revenue projections. These revenue projections are broken down into the following categories:

- Terminal-Airlines
- Terminal-Concession
- Airfield
- Hangar Area
- Passenger Facility Charge
- Special Events
- Investment Income
- Land Rental
- Air-Cargo Building Rental
- Apron Rent

Table 8.5

DAYTONA BEACH INTERNATIONAL AIRPORT

Capital Improvement Projects

Phase	Item	Est. Cost	FAA Funding		FDOT Funding		Local Share	
			%	Amount	%	Amount	%	Amount
I	Construct Taxiway "P" and "T" Phase II	$5,341,080	90	$4,806,972	5	$267,054	5	$267,054
I	New Taxiway "S" Design	250,000	90	225,000	5	12,500	5	12,500
I	Construct New Taxiway "S"	5,000,000	90	4,500,000	5	250,000	5	250,000
I	Construct GA Runup Area/Itinerant Parking	622,222	-	-	50	311,111	50	311,111
I	Land Acquisition - Noise	4,944,444	-	-	50	2,472,222	50	2,472,222
I	Addition & Upgrade to Power Vault & Equipment	225,000	-	-	50	112,500	50	112,500
I	Construct Air Cargo Apron	4,400,000	-	-	50	2,200,000	50	2,200,000
I	Land Acquisition	10,500,000	90	9,450,000	5	525,000	5	525,000
II	Construct New 7R-25L Runway	23,445,825	90	21,101,243	5	1,172,291	5	1,172,291
III	Construct New 7R-25L South Parallel Taxiway	7,815,275	90	7,033,748	5	390,764	5	390,764
	Total	**$62,543,846**		**$47,116,962**		**$7,713,442**		**$7,713,442**

Source: Daytona Beach International Airport Management and FDOT Work Program 2002-2006

- Other Contributions and Donations

Terminal-Airlines

Terminal rental space accounts for a large percentage of revenue received from the airlines. These revenues are based on Signatory Lease agreements and are broken down into aircraft loading bridges, airline space rental, airline utilities, airport security, charter fees, and public announcement system. Revenue collected from the rental of these facilities totaled $2,858,353 for FY 2001. The revenue estimate for FY 2002 totals $2,851,774. **Table 8.6** shows the current airline lease rates at the Daytona Beach International Airport.

Airline Cost Index

An important performance measure for the Airport is the cost of doing business for the airlines. This benchmark can be calculated as the ratio of total airline costs per enplaned passenger. Airline costs at Daytona Beach International Airport were totaled from the signatory agreements and spread over all the airlines conducting operations. The costs were divided by the total number of existing and projected enplanements.

This analysis yielded a cost to the airlines of approximately $9.05 per enplaning passenger in the base year 2000. By 2005, assuming a 10 percent increase in rates and charges to the airlines, the cost per passenger was estimated to be $9.06 for the base forecast scenario. This cost could possibly decrease to $7.51 per passenger if the high forecast scenario is realized, since costs decrease when they can be spread over a larger number of passengers. These figures are shown in **Table 8.7**.

In order to attract new airline service, it is an important strategic planning goal to lower the cost of providing airline facilities as much as possible. Lower airline costs also improve the Airport's bargaining position for negotiating bond issues for future capital development projects.

For benchmark comparison purposes, the airline cost index at certain hub airports in 2000-2001 is generally targeted at an approximate $4 to $5 per enplaning passenger. While it is difficult for a non-hub airport to achieve this level of efficiency, a $7 to $10 cost per passenger to the airlines is reasonable for strategic planning purposes, airport operational efficiency, and to help attract new scheduled operators.

Terminal-Concession

Terminal-concession rental space accounts for the second largest revenue generating source for the Airport. Some examples of terminal-concession rental include gift shop concession, ground transportation permits, pay telephones, and rental car concessions. These sources generated $2,693,528 in revenue in FY 2001 while projected revenue for FY 2002 totals $2,585,857.

Landing & Fuel Flowage Fees

Landing and fuel flowage fees obtained in FY 2001 totaled $527,090. Revenues from these sources are projected to reach roughly $390,000 in 2002.

Hangar Area

Various tenants at the Airport rent land for hangar use. The total revenue generated from airfield land rental for hangars totaled $282,625 for FY 2001. The estimated

Table 8.6
DAYTONA BEACH INTERNATIONAL AIRPORT

Current Airline Lease Rates

Item	Rate
Exclusive Use	
Ticket Counter/baggage	$43.25 per sq. ft.
Baggage Service	$43.25 per sq. ft.
Operations Area	$43.25 per sq. ft.
Curbside Baggage	$43.25 per sq. ft.
Preferential Use	
Holdroom	$43.25 per sq. ft.
Loading Bridge (each)	$48,896 annually
Apron Rent (each gate apron**)**	$74,420 annually
Joint Use	
20% split, 80% based on enplanements	$43.25 per sq. ft.
Security	$277.20 per day
Landing Fees	$1.19 per 1,000 lbs.
Passenger Facility Charge	
(per enplaned passenger)	$2.92
Microphones	$5.00 per unit

Source: Daytona Beach International Airport Management

Table 8.7
DAYTONA BEACH INTERNATIONAL AIRPORT

Airline Operating Costs

Annual Costs (in Base Year 2000)

Space/Rent	Gates 2 & 4 **Delta**	Gate 1 **Continental**	***Total***
1. Exclusive Use			
Ticket Counter/Baggage	$189,759.38	$135,362.00	$325,121.38
Baggage Service	10,596.25	9,644.75	20,241.00
Operations Area	217,115.00	119,499.75	336,614.75
Curbside Baggage	6,747.00	8,044.50	14,791.50
Group Room	64,875.00		64,875.00
2. Preferential	251,650.13	121,792.00	373,442.13
(Holdroom)			
3. Loading Bridge	97,792.00	48,896.00	146,688.00
4. Apron	148,840.00	74,420.00	223,260.00
5. Joint Use			444,783.00
(20-80 Split)			
6. Security			101,178.00
7. Landing Fees (est.)			337,803.00
$1.19/1000 lbs.			
9. Microphones	300.00	240.00	540.00
$5/unit			
		Total	**$2,389,337.76**

Source: DAB Airport Management Records, 2000

Annual Enplanements

2000 Base	2000 High	2005 Base	2005 High
263,891	263,891	290,000	350,000

Source: HNTB Analysis

Average Airline Costs per Enplanement

2000 Base	2000 High	2005* Base	2005* High
$9.05	$9.05	$9.06	$7.51

Source: HNTB Analysis

* Note: Fee projections assume 10% increase in airline costs

Estimate of Landing Fees

Annual Operations
Typical Aircraft Types by Weight

Fleet Mix	Weight (Max Ldg. Wt.)	Total Ops BASE 2000	Total Ops BASE 2005	Landings 2000	Landings 2005	Total Ops HIGH 2000	Total Ops HIGH 2005	Landings 2000	Landings 2005
Airliners									
McDonnell Douglas MD-88	130,000	4,084	4,380	**2,042**	**2,190**	4,084	5,110	**2,042**	**2,555**
Regional Carriers									
Beech 1900D	16,765	2,196	3,650	**1,098**	**1,825**	2,196	4,380	**1,098**	**2,190**
Total Landed Weight in lbs.				283,867,970	315,296,125			283,867,970	368,865,350
Collectible Fees at 1.19 per 1,000 lbs.				**$337,803**	**$375,202**			**$337,803**	**$438,950**

Source: HNTB Analysis

Note 1: Fee projections are in Year 2000 dollars

Note 2: Fleet mix and weights are assumed for typical aircraft.

Note 3: Fees estimates are order-of-magnitude for planning purposes only. Actual fees may vary significantly.

revenue for FY 2002 is $312,000. This increase is due in part to the new Executive Flightline and Parcel 61 development. These FBOs have new hangars, fueling facilities, and apron areas from which the Airport will generate revenue.

Passenger Facility Charge

Passenger Facility Charges were discussed earlier in this chapter. The projected revenue from PFCs totals roughly $808,049 for FY 2002. PFCs collected for 2001 totaled $734,632.

Special Events

The Daytona Beach International Airport rents out airport property for special events held at the Airport as well as those held at the Daytona International Speedway, located adjacent to the Airport. A total of $86,744 was generated from these events in FY 2001. It is projected that roughly $72,243 will be generated in FY 2002 from these activities.

Investment Income

The interest earned on cash balances is considered a revenue source for the Airport. Currently, the Airport earns interest on the debt service reserve fund and the operating fund. The Airport earned a combined $877,456 in interest in FY 2001 from these two accounts. The expected interest to be earned in FY 2002 totals roughly $410,000.

Land Rental

Land rental refers to land that is owned by the Airport but located outside of the airfield perimeter fence. All rentals are comprised of commercial tenants. Revenue generated from this land rental totaled $1,217,729 in FY 2001. A total of $1,406,691 is projected for FY 2002 for land rental. This is an increase from the previous fiscal year due to new commercial development on airport owned land.

Air-Cargo Building Rental

Currently, the only tenants of the air-cargo facility at the Airport are Delta Air Lines and the Volusia County Sheriff's Office. Delta uses this facility for bulk cargo and mail services. Revenues generated from this rental totaled $27,113 for FY 2001. Expected revenue for FY 2002 totals $27,113.

Apron Rent

Apron areas are rented by signatory airlines serving the Airport. A total of $372,155 was collected form the airlines during FY 2001. The revenue estimate for FY 2002 also totals $372,155.

Other Contributions and Donations

Other contributions and donations include grants that will be paid for by tenants and land reserve fund money for capital improvement projects. A projected $79,309 will be collected during FY 2002.

8.5 T-HANGAR DEVELOPMENT

Airport owned T-hangars could provide the Airport with a steady revenue stream for the life of the hangars. Land is being reserved for future aviation development on the Airport. This development may include T-hangars or other general aviation facilities.

The T-hangar development is considered an airside capital improvement project and thus would be eligible for Florida Department of

Transportation funding. Projects eligible for FDOT funding are listed in the Florida Aviation Grant Program handbook.

The Florida Department of Transportation and local funding would cover the construction cost of additional T-hangars at the Daytona Beach International Airport. Fifty percent of the costs would be provided by each contributing group.

The American Association of Airport Executives (AAAE) developed a comprehensive list of rates and charges for airports throughout the United States in 2000. Based on this information, an average T-hangar monthly rental price was determined for each classification of airport.

Daytona Beach International Airport is considered a non-hub airport. The average monthly T-hangar charge for Florida non-hub airports was $310. This is roughly $50 lower than the average current T-hangar rates at the Airport.

A ten-unit T-hangar occupied to capacity throughout the year at $360 per month could generate revenues totaling $43,200. Ten such hangars could potentially generate over $430,000 for the Airport each fiscal year.

8.6 DEBT SERVICE REQUIREMENTS

To finance the construction of the domestic passenger terminal building, Airport System Revenue Bonds were issued in 1991. These 1991 series bonds were refinanced in 1993 and 2000 and covered the total terminal construction cost of $46,030,000. **Table 8.8** shows the detailed airport debt service requirements from FY 2000 through FY 2021.

In 2000, the Federal Government authorized the Airport to use Federal funds to pay down the Airport's debt service requirements. This program, AIR 21, greatly reduces the financial strain on the Airport and allows for the majority of revenue generated at the Airport to be used to cover total expenses.

8.7 ALTERNATIVE FUNDING SOURCES

Alternative sources of funding may be required to implement some or all of the Airport's Capital Improvement Projects as well as offset any debt incurred from operating expenses.

Special facility bonds can be issued to cover the initial development and construction expenses associated with the construction of a new airport facility.

Revenue bonds provide another source of funding for airport development. These bonds work like special facility bonds but the debt service is payable from the revenue generated by the facility that was constructed.

Because of the current debt service requirements of the Daytona Beach International Airport, it may not be possible to issue any additional bonds until the current debt service is reduced.

Developer financing is an option to eliminate development and construction costs of a certain facility at the Airport. Any facility financed this way would then be owned and operated by the developer or a third party. The Airport would still be able to collect land lease fees and fuel flowage fees from these private entities. The Airport would not be able to collect any hangar

Table 8.8
DAYTONA BEACH INTERNATIONAL AIRPORT

Debt Service Requirements
Combined 1993 & 2000 Debt

Fiscal Year	Principal Amount 1-Oct	Interest Payments Due		Annual Funding Requirements	Annual Expenses (Interest)	Balance Outstanding End of Year
		1-Apr	1-Oct			
2000	305,000	326,895.00	682,934.58	1,314,829.58	1,009,829.58	42,445,000
2001	1,020,000	1,387,922.50	1,387,922.50	3,795,845.00	2,775,845.00	41,425,000
2002	1,080,000	1,357,978.75	1,357,978.75	3,795,957.50	2,715,957.50	40,345,000
2003	1,140,000	1,325,541.25	1,325,541.25	3,791,082.50	2,651,082.50	39,205,000
2004	1,210,000	1,290,918.75	1,290,918.75	3,791,837.50	2,581,837.50	37,995,000
2005	1,285,000	1,253,515.00	1,253,515.00	3,792,030.00	2,507,030.00	36,710,000
2006	1,365,000	1,213,091.25	1,213,091.25	3,791,182.50	2,426,182.50	35,345,000
2007	1,450,000	1,169,681.25	1,169,681.25	3,789,362.50	2,339,362.50	33,895,000
2008	1,550,000	1,122,437.50	1,122,437.50	3,794,875.00	2,244,875.00	32,345,000
2009	1,650,000	1,071,787.50	1,071,787.50	3,793,575.00	2,143,575.00	30,695,000
2010	1,755,000	1,017,718.75	1,017,718.75	3,790,437.50	2,035,437.50	28,940,000
2011	1,875,000	960,006.25	960,006.25	3,795,012.50	1,920,012.50	27,065,000
2012	1,995,000	898,187.50	898,187.50	3,791,375.00	1,796,375.00	25,070,000
2013	2,125,000	832,178.13	832,178.13	3,789,356.26	1,664,356.26	22,945,000
2014	2,265,000	761,790.63	761,790.63	3,788,581.26	1,523,581.26	20,680,000
2015	2,415,000	686,743.75	686,743.75	3,788,487.50	1,373,487.50	18,265,000
2016	2,575,000	606,687.50	606,687.50	3,788,375.00	1,213,375.00	15,690,000
2017	2,750,000	521,271.88	521,271.88	3,792,543.76	1,042,543.76	12,940,000
2018	2,930,000	430,006.25	430,006.25	3,790,012.50	860,012.50	10,010,000
2019	3,125,000	332,715.63	332,715.63	3,790,431.26	665,431.26	6,885,000
2020	3,330,000	228,875.00	228,875.00	3,787,750.00	457,750.00	3,555,000
2021	3,555,000	118,203.13	118,203.13	3,791,406.26	236,406.26	0
Total	**$42,750,000**	**$18,914,153.15**	**$19,270,192.73**	**$80,934,345.88**	**$38,184,345.88**	-

Source: County of Volusia, Daytona Beach International Airport - Airport Revenue Bonds

rental or tie-down fees from this facility due to its private ownership.

The Airport also has the option of increasing the Passenger Facility Charge from $3.00 to the FAA maximum of $4.50 per enplaned passenger. The increased revenues can be seen in Table 8.4. This increase could be temporary and would have to be negotiated with the airlines serving the Airport because they are responsible for the PFC collection.

8.8 CONCLUSION

The Daytona Beach International Airport has seen a reduction in the number of airlines serving the Airport over the past few years. This has caused a decline in revenues and an increase in expenses for the Airport. The loss of lease revenues from American Airlines and US Airways will cause a significant reduction in FY 2003 operating revenues.

To counter-act this problem, it is recommended that the Airport continue with its land-acquisition program. This program includes a strategy of acquiring approximately 300 acres of land located south of the Airport.

The land will be used for the new Runway 7R-25L, if this project is developed, and for future aviation development. The advantages of adding this new runway are continuing to be evaluated.

This new runway may increase the capacity of the Airport and thus increase the number of flights that can be accommodated at the Airport. More general aviation and business flights can be moved to the new parallel runway, thus freeing up Runway 7L-25R, the main commercial runway, for increased airline use. Ultimately, these strategies will improve the revenue-generating capability of the Airport, and thereby, its financial position.

Future aviation/business development of that portion of land not occupied by the new runway includes aircraft parking aprons, hangars, Fixed Base Operators, or aviation related commercial development. All of these activities will contribute new revenue streams to the airport.

Land located in this area can also be used for non-aviation commercial and industrial development. The additional revenue generated from these aviation developments will supplement future operating revenue at Daytona Beach International Airport.

Overall, the capital improvement program outlined in this master plan, is feasible with a mix of public/private funding initiatives. Along with airport management initiatives to:

- reduce the Airport's cost of providing passenger service facilities;
- reduce the cost to the airlines of providing air passenger service;
- provide new opportunities for aviation and non-aviation business development.

The proposed improvements will help Daytona Beach International Airport develop diverse new revenue streams to secure an advantageous financial position. This in turn will help attract new scheduled and unscheduled operators to the Airport for a secure future.

APPENDIX A

REDUCED SIZE ALP SET

DAYTONA BEACH INTERNATIONAL AIRPORT

DAYTONA BEACH, FLORIDA

MASTER PLAN UPDATE STUDY

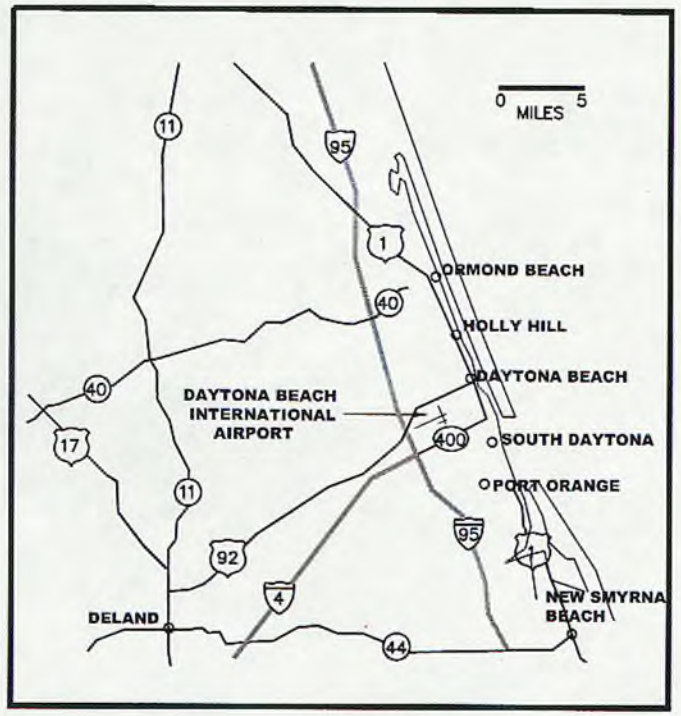
A.I.P. # 3-12-0017-3700
State Project # 408884-1-94-01

FAA APPROVAL LETTER

INDEX OF DRAWINGS

LOCATION MAP

VICINITY MAP



Prepared for
Daytona Beach International Airport

by

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

In association with:

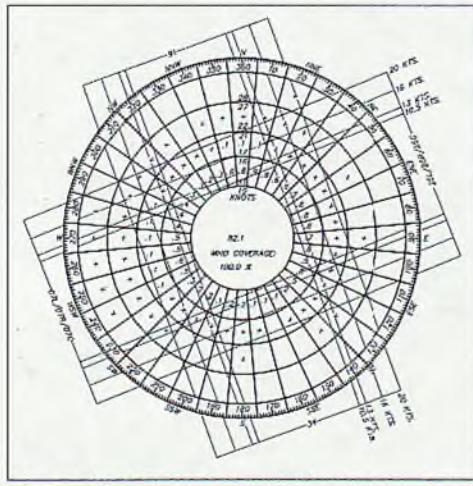
Ghyabi Lassiter & Associates, Inc.
Embry-Riddle Aeronautical University

DATE: June 2003

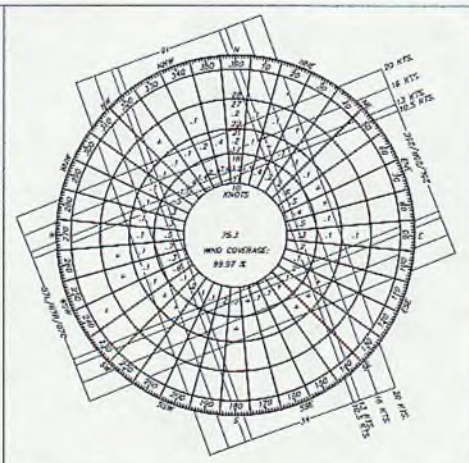
Funding Acknowledgment

The preparation of this document was financed in part through AIP grants and State and Local revenues. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of this report by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted therein nor does it indicate that the proposed development is environmentally accordant with appropriate public laws.

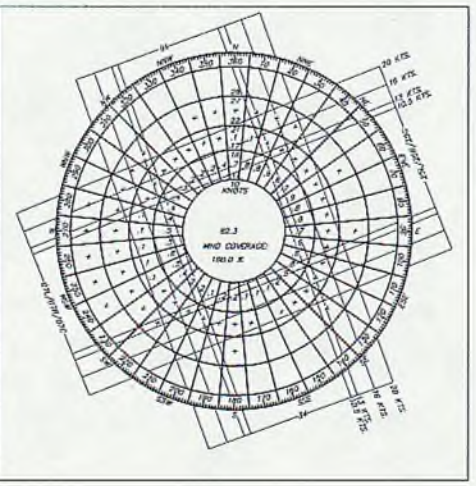
ALL WEATHER WINDROSE



IFR WINDROSE



VFR WINDROSE



SOURCE: NOAA NATIONAL CLIMATIC CENTER/NATIONAL CLIMATIC DATA CENTER STATION NUMBER: 12834 – DAYTONA BEACH, FLORIDA OBSERVATIONS: 87,676 OBSERVATIONS 1963–1992

WIND COVERAGE BY RUNWAY

RUNWAY	ALL WEATHER			
	10.5 K/15 MPH	13.0 K/15 MPH	16.0 KNOTS	20 KNOTS
16–34	95.2%	95.75%	99.55%	99.99%
7L–25R	95.85%	98.63%	99.98%	100%
7C–25C	95.85%	98.63%	99.98%	100%
7R–25L	95.85%	98.63%	99.98%	100%

Airport / Terminal NAVAIDS

Description
ILS, VOR, NDB, ATCT, ASR–9
LOM, VOT, LOC–BC, MALSR, ASOS
REIL, PAPI, GPS

RUNWAY DATA TABLE

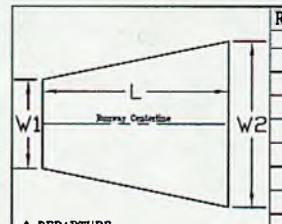
Runway	16 – 34				7 L – 25 R				7 R (C) – 25 L (C) *				FUTURE 7 R – 25 L			
ITEM	16		34		7 L		25 R		7 R (C)		25 L (C)		7 R		25 L	
	EXISTING	ULT.	EXISTING	ULT.	EXISTING	ULT.	EXISTING	ULT.	EXISTING	ULT.	EXISTING	ULT.	EX.	ULTIMATE	EX.	ULTIMATE
RUNWAY END ELEVATION	30.81' MSL	SAME	32.52' MSL	33.0'	27.81'	SAME	32.45'	SAME	28.46	SAME	32.31'	SAME	NONE	31.83'	NONE	31.83'
RUNWAY LENGTH	6,001'	6,566'	6,001'	6,566'	10,500	SAME	10,500	SAME	3,195'	SAME	3,195'	SAME	NONE	6,500'	NONE	6,500'
DISPLACED THRESHOLD	NONE	NONE	NONE	NONE	690'	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
RELOCATED THRESHOLD	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
EFFECTIVE GRADIENT	.0265%	SAME	.0265%	SAME	0.464%	SAME	0.464%	SAME	.1204%	SAME	.1204%	SAME	NONE		NONE	
RUNWAY WIDTH	150'	SAME	150'	SAME	150'	SAME	150'	SAME	100	SAME	100	SAME	NONE	100'	NONE	100'
SAFETY AREA WIDTH	500'	SAME	500'	SAME	500'	SAME	500'	584'	150	SAME	150	SAME	NONE	150'	NONE	150'
STABILIZED SHOULDER	25'	SAME	25'	SAME	25	SAME	25	SAME	NONE	SAME	NONE	SAME	NONE	10'	NONE	10'
PAVEMENT SURFACE	ASPH – G	SAME	ASPH – G	SAME	ASPH – G	SAME	ASPH – G	SAME	ASPH	SAME	ASPH	SAME	NONE	ASPH – G	NONE	ASPH – G
PAVEMENT STRENGTH	S–75	SAME	S–75	SAME	S–130	SAME	S–130	SAME	S–30	SAME	S–30	SAME	NONE	S–75	NONE	S–75
x1000	DW–170	SAME	DW–170	SAME	DW–210	SAME	DW–210	SAME		SAME		SAME	NONE		NONE	
	DTW–260	SAME	DTW–260	SAME	DTW–420	SAME	DTW–420	SAME		SAME		SAME	NONE		NONE	
	DDTW–260	SAME	DDTW–260	SAME	DDTW–870	SAME	DDTW–870	SAME		SAME		SAME	NONE		NONE	
RUNWAY LIGHTING	MIRL, REIL	SAME	MIRL, REIL	SAME	HIRL, TDZ, CL	SAME	HIRL, CL	SAME	MIRL	SAME	MIRL	SAME	NONE	MIRL, REIL	NONE	MIRL, REIL
RUNWAY MARKING	NPI – G	SAME	VISUAL	SAME	PRECISION	SAME	NONPRECISION	SAME	VISUAL	SAME	VISUAL	SAME	NONE	NONPRECISION	NONE	VISUAL
NAVIGATIONAL AID CATEGORY	NONPRECISION	SAME	VISUAL	SAME	CAT I–ILS	SAME	NONPRECISION	SAME	VISUAL	SAME	VISUAL	SAME	NONE	NONPRECISION	NONE	VISUAL
RUNWAY APPROACH SURFACE	34:1	SAME	20:1	SAME	50:1	SAME	34:1	SAME	20:1	SAME	20:1	SAME	NONE	34:1	NONE	20:1
ELECTRONIC NAVIGATIONAL AIDS	NONE	SAME	NONE	SAME	ILS, NDB	SAME	LOC–BC, REIL	SAME					NONE	NONE	NONE	NONE
					REIL, GS	SAME	VASI	SAME								
APPROACH LIGHTING SYSTEM					MALSR	SAME										
VISUAL NAVIGATIONAL AIDS	PAPI 4	SAME	PAPI 4	SAME			VASI–6	PAPI–4	PAPI–2		PAPI–2			PAPI–4	NONE	PAPI–4
AIRPLANE DESIGN GROUP	IV		IV		IV		IV		I		I		II		NONE	II
AIRCRAFT APPROACH CATEGORY	D		D		D		D		B		B		B		NONE	B
APPROACH VISIBILITY MINIMUMS	NP 2M	SAME	VISUAL	SAME	CAT 1 1/2 M	SAME	NP 1 3/4 M	SAME	VISUAL	SAME	VISUAL	SAME	NONE	NP 2M	NONE	VISUAL

* EXISTING RUNWAY 7R–25L TO BE RENAMED 7C – 25C

RUNWAY OBJECT FREE AREAS, ZONES, & SAFETY AREAS BEYOND THE RUNWAY ENDS

RUNWAY	REQUIRED			EXISTING			FUTURE		
	RSA	OFA	OFZ	RSA	OFA	OFZ	RSA	OFA	OFZ
16	500' x 1,000'	800' x 1,000'	400' x 200'	500' x 1,000'	800' x 1,000'	400' x 200'	490' x 200'	800' x 1,000'	400' x 200'
34	500' x 1,000'	800' x 1,000'	400' x 200'	500' x 1,000'	800' x 1,000'	400' x 200'	500' x 1,000'	800' x 1,000'	400' x 200'
7L	500' x 1,000'	800' x 1,000'	400' x 2,140'	500' x 1,000'	800' x 1,000'	400' x 2,140'	500' x 1,000'	800' x 1,000'	400' x 2,140'
25R	500' x 1,000'	800' x 1,000'	400' x 2,140'	500' x 1,000'	800' x 1,000'	400' x 2,140'	500' x 1,000'	800' x 1,000'	400' x 2,140'
7C	150' x 300'	500' x 300'	300' x 200'	150' x 300'	500' x 300'	300' x 200'	150' x 300'	500' x 300'	300' x 200'
25C	150' x 300'	500' x 300'	300' x 200'	150' x 300'	500' x 300'	300' x 200'	150' x 300'	500' x 300'	300' x 200'
7R	150' x 300'	500' x 300'	300' x 200'	150' x 300'	500' x 300'	300' x 200'	150' x 300'	500' x 300'	300' x 200'
25L	150' x 300'	500' x 300'	300' x 200'	150' x 300'	500' x 300'	300' x 200'	150' x 300'	500' x 300'	300' x 200'

RUNWAY PROTECTION ZONE DATA



* DEPARTURE

RUNWAY	EXISTING			FUTURE		
	W1	W2	L	W1	W2	L
16	500'	1,010'	1,700'	SAME	SAME	SAME
34	500'	700'	1,000'	500'	700'	1,000'
7L	1,000'	1,450'	2,500'	SAME	SAME	SAME
7L *	500'	1,010'	1,700'	SAME	SAME	SAME
25R	1,000'	1,425'	1,700'	1,000'	1,510'	1,700'
7R(C)	250'	450'	1,000'	SAME	SAME	SAME
25L(C)	250'	450'	1,000'	SAME	SAME	SAME
7R	NONE	NONE	NONE	1,000'	1,510'	1,700'
25L	NONE	NONE	NONE	500'	700'	1,000'

DECLARED DISTANCES

	EXISTING	
	RUNWAY 7L – 25R	
	7L	25R
TAKEOFF RUN AVAILABLE (TORA)	10,500'	9,800'
TAKEOFF DISTANCE AVAILABLE (TODA)	10,500'	10,500'
ACCELERATE–STOP DISTANCE AVAILABLE (ASDA)	10,500'	10,300'
LANDING DISTANCE AVAILABLE (LDA)	9,800'	10,300'

RUNWAY END LATITUDES AND LONGITUDES

	EXISTING		FUTURE	
	LATITUDE	LONGITUDE	LATITUDE	LONGITUDE
RUNWAY 16	29°10'33.67" N	81°02'51.63" W	SAME	SAME
RUNWAY 34	29°10'32.43" N	81°02'56.56" W	29°10'27.79" N	81°02'54.34" W
RUNWAY 7L	29°10'22" N	81°04'40" W	SAME	SAME
RUNWAY 7L Displaced Threshold	29°10'24.06" N	81°04'32.87" W	SAME	SAME
RUNWAY 25R	29°11'04.75" N	81°02'52.52" W	SAME	SAME
RUNWAY 7C	29°10'33.72" N	81°03'24.66 W	SAME	SAME
RUNWAY 25C	29°10'47.02" N	81°02'51.94 W	SAME	SAME
RUNWAY 7R	NONE	NONE	29°10'08.69" N	81°03'58.19" W
RUNWAY 25L	NONE	NONE	29°10'33.67" N	81°02'51.63" W

Construction Notice Requirement

To protect operational safety and future development, all proposed construction on the airport must be coordinated by the airport owner with the FAA Airports District Office prior to construction. FAA's review takes approximately 60 days.

AIRPORT DATA

		EXISTING	FUTURE
AIRPORT ELEVATION (M.S.L.)		32.83' M.S.L.	SAME
MEAN MAX. TEMP. OF HOTTEST MONTH		90° F	SAME
ENROUTE & TERMINAL NAVAIDS		ILS, VOR, LOC	SAME
AIRPORT REFERENCE POINT (NAD 83)	Lat.	N 29° 10' 47.70"	29° 10' 40.56"
	Long.	W 81° 03' 29.00"	81° 03' 27.29"
AIRPORT REFERENCE CODE		D – IV	SAME
MAGNETIC DECLINATION & YEAR		MAG. 4.1° W (1993)	SAME

NOTES :
①
②
③
④
⑤

NOTE:

All elevations (with the exception of the Airspace Plans) have been converted from NGVD29 to NAVD88. A conversion factor has been added to the Airspace Drawings.

Modifications to FAA Design Standards

Date of FAA Letter	Description

AUTH.	BY	REVISIONS	DATE

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Approved by:

FEDERAL AVIATION ADMINISTRATION

Name Title Date

FLORIDA DEPARTMENT OF TRANSPORTATION

Name Title Date

VOLUSIA COUNTY

Name Title Date

DAYTONA BEACH INTERNATIONAL AIRPORT
Daytona Beach, Florida

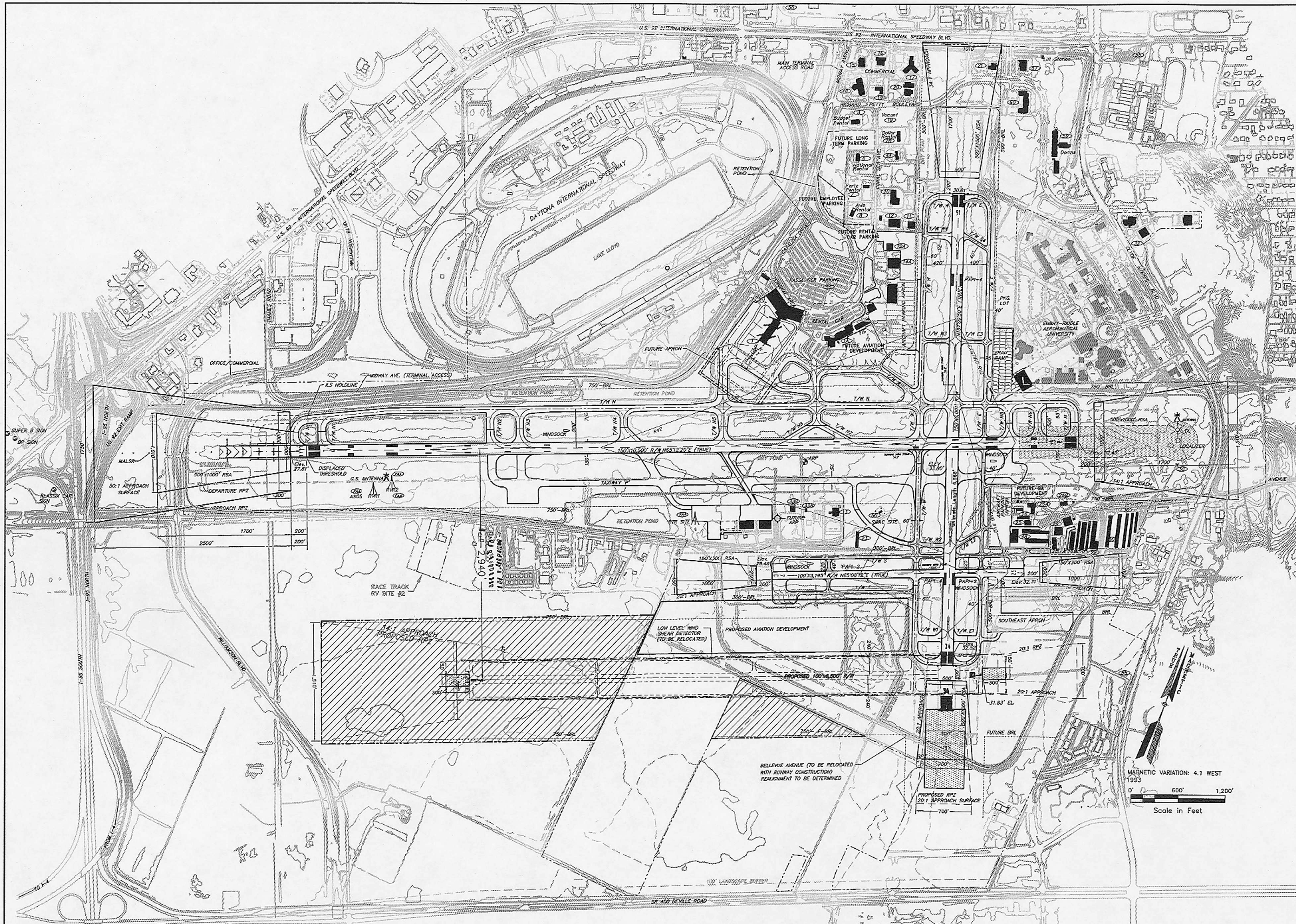
HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

PROJECT NAME: MASTER PLAN UPDATE STUDY

DRAWING TITLE: DATA SHEET

DATE: 06/07/2002

DRAWING NO. 2 of 13



Building Table

LOCATION	TENANT	ELEV. in FEET (MSL) DATUM 1988 NAVD
1	Domestic Terminal Building	91.43
1A	International Terminal Building	57.13
1B	Phoenix East Aviation (Vacant Parcel)	XXX
2B	Dollar Rental Car	65.63
3	Budget Rental Car	55.13
4	Fuel Farm	45.83
5	Race Track RV	XXX
6	National Car Rental	50.83
7	Hertz Car Rental	52.13
8	Avis Rental Car	51.83
10	Delta Air Cargo/Airport Maintenance	67.03
11	Volusia Co. Sheriff's Dept Hangar	56.13
12	Hangar (NASCAR)	59.83
14	Daytona Beach Jet Center/ Hangar	73.33
14A	Daytona Beach Jet Center	53.13
15	Restaurant (Rio Bravo)	52.93
16	Restaurant (Olive Garden)	50.83
17	Hotel (Hampton Inn)	74.83
18	Hilton Garden Inn (Embassy)	96.33
19	Halifax Clinical Research	49.73
20	Car Rental Service (Alamo)	50.33
21	Regions Bank	45.73
22	Lift Station	N/A
22	Yelvington Aviation Inc.	60.33
23	FBO (Willman & Trans Florida Airlines)	43.93
25	Civil Air Patrol Bldg	50.23
26A	Mosquito Control Storage	54.73
26B	Mosquito Control Storage	XXX
26	Mosquito Control	61.03
27	FAA Airway Facilities	51.63
28	Condo Hangars	48.33
29	Commonwealth Aviation T-Hangars	60.03
29	Commonwealth Aviation T-Hangars	48.53
29	Commonwealth Aviation T-Hangars	48.93
29	Commonwealth Aviation T-Hangars	58.33
29	Commonwealth Aviation	48.33
29	Commonwealth Aviation T-Hangars	58.33
30	FAA Localizer Equipment Shelter	31.13
30	Non-Aviation Storage	49.53
30	Non-Aviation Storage	50.33
30	Non-Aviation Storage	49.43
30	Non-Aviation Storage	49.83
30	Non-Aviation Storage	55.53
32	Health Department	XXX
33	FAA Tower	126.1
33A	Electrical Vault	38.73
33B	ARFF	48.93
41	FAA Airway Facilities	39.63
48	Executive Flight	XXX
50	RCAG (FAA)	41.13
55	Low Lever Wind Shear Detector	XXX
57	Executive Offices	67.23
59	Dorms	XXX
60	Marriott Hotel	82.93

LEGEND

ITEM	EXISTING	FUTURE
WINDSOCK		
RUNWAY PROTECTION ZONE		
AIRPORT BOUNDARY		
AIRFIELD/APRON PAVEMENT		
ROADS		
STRUCTURES		
AIRPORT REFERENCE POINT	ARP	
FENCE		
RUNWAY SAFETY AREA		
RUNWAY SAFETY AREA		
OBJECT FREE AREA	OFA	OFA
REIL		
VASI		
VEGETATION		N/A
POLE	POLE	
TREE(S)		
RUNWAY VISUAL RANGE	RVR	
ANTENNA	ANTENNA	
OBSTACLE LIGHT	OL	
SIGN	SIGN	

AUTH.	BY	REVISIONS	DATE

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DAYTONA BEACH INTERNATIONAL AIRPORT
Daytona Beach, Florida

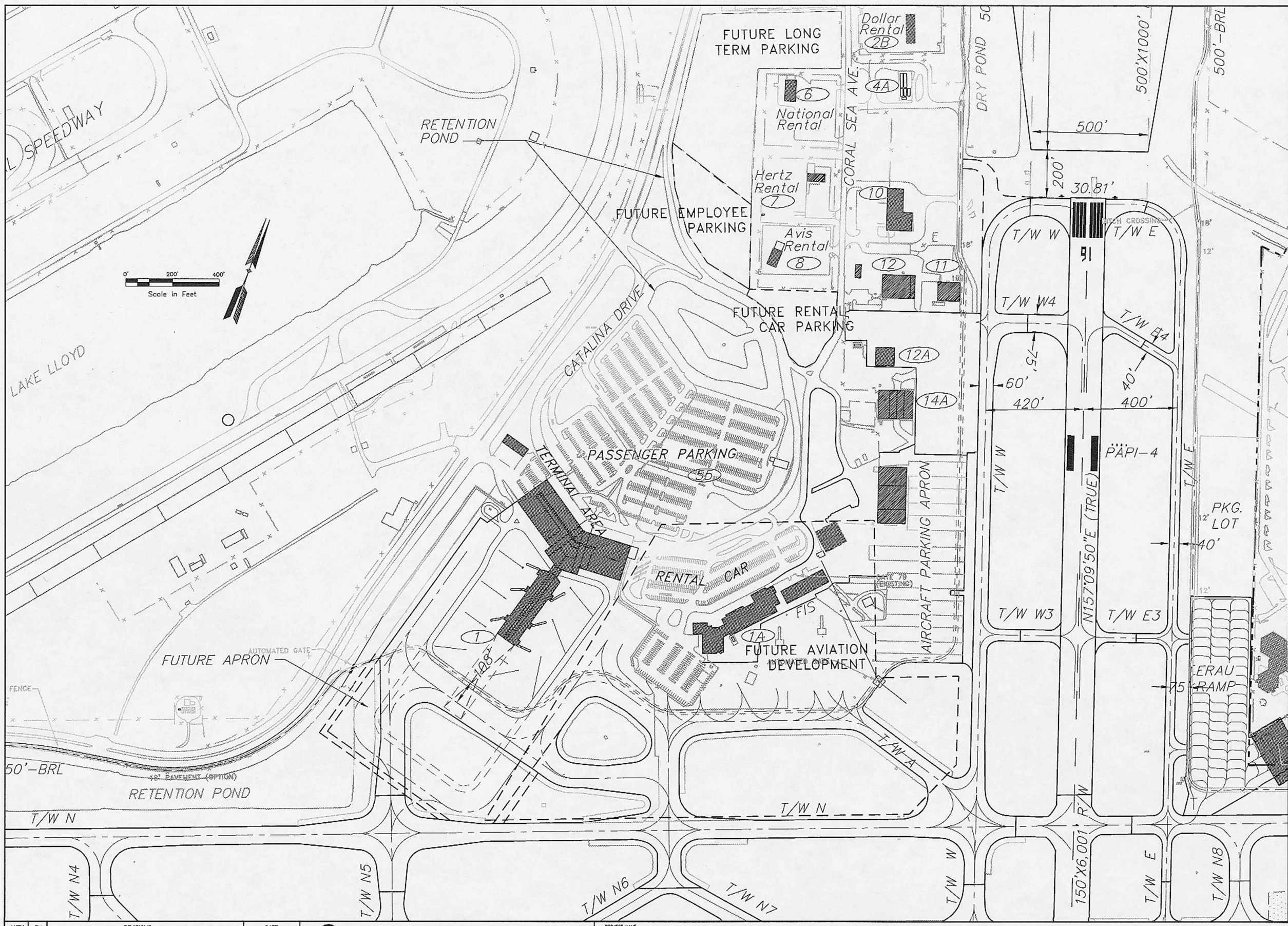
HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

PROJECT NAME: MASTER PLAN UPDATE STUDY

DRAWING TITLE: AIRPORT LAYOUT PLAN

DATE: 06/06/2002

DRAWING NO. 3 of 13



Building Table

LOCATION	TENANT	ELEV. in FEET (MSL) DATUM 1988 NAVD
1	Domestic Terminal Building	91.43
1A	International Terminal Building	57.13
1B	Phoenix East Aviation (Vacant Parcel)	XXX
2B	Dollar Rental Car	65.63
3	Budget Rental Car	55.13
4	Fuel Farm	45.83
5	Race Track RV	XXX
6	National Car Rental	50.83
7	Hertz Car Rental	52.13
8	Avis Rental Car	51.83
10	Delta Air Cargo/Airport Maintenance	67.03
11	Volusia Co. Sheriff's Dept Hangar	56.13
12	Hangar (NASCAR)	59.83
14	Daytona Beach Jet Center/ Hangar	73.33
14A	Daytona Beach Jet Center	53.13
15	Restaurant (Rio Bravo)	52.93
16	Restaurant (Olive Garden)	50.83
17	Hotel (Hampton Inn)	74.83
18	Hilton Garden Inn (Embassy)	96.33
19	Halifax Clinical Research	49.73
20	Car Rental Service (Alamo)	50.33
21	Regions Bank	45.73
22	Lift Station	N/A
22	Yelvington Aviation Inc.	60.33
23	FBO (Williman & Trans Florida Airlines)	43.93
25	Civil Air Patrol Bldg	50.23
26A	Mosquito Control Storage	54.73
26B	Mosquito Control Storage	XXX
26	Mosquito Control	61.03
27	FAA Airway Facilities	51.83
28	Condo Hangars	48.33
29	Commonwealth Aviation T-Hangars	60.03
29	Commonwealth Aviation T-Hangars	48.53
29	Commonwealth Aviation T-Hangars	48.93
29	Commonwealth Aviation T-Hangars	58.33
29	Commonwealth Aviation	48.33
29	Commonwealth Aviation T-Hangars	58.33
30	FAA Localizer Equipment Shelter	31.13
30	Non-Aviation Storage	49.53
30	Non-Aviation Storage	50.33
30	Non-Aviation Storage	49.43
30	Non-Aviation Storage	49.83
30	Non-Aviation Storage	55.53
32	Health Department	XXX
33	FAA Tower	126.1
33A	Electrical Vault	38.73
33B	ARFF	48.93
41	FAA Airway Facilities	39.63
48	Executive Flight	XXX
50	RCAG (FAA)	41.13
55	Low Level Wind Shear Detector	XXX
57	Executive Offices	67.23
59	Dorms	XXX
60	Marriott Hotel	82.93

LEGEND

ITEM	EXISTING	FUTURE
WINDSOCK		
RUNWAY PROTECTION ZONE		
AIRPORT BOUNDARY		
AIRFIELD/APRON PAVEMENT		
ROADS		
STRUCTURES		
AIRPORT REFERENCE POINT	ARP	
FENCE		
RUNWAY SAFETY AREA		
RUNWAY SAFETY AREA		
OBJECT FREE AREA	OFA	OFA
REIL		
VASI		
VEGETATION		N/A
POLE	POLE	
TREE(S)		
RUNWAY VISUAL RANGE	RVR#	
ANTENNA	ANTENNA	
OBSTACLE LIGHT	OL	
SIGN	SIGN	

AUTH.	BY	REVISIONS	DATE

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DAYTONA BEACH INTERNATIONAL AIRPORT
Daytona Beach, Florida

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

PROJECT NAME
MASTER PLAN UPDATE STUDY

DRAWING TITLE
TERMINAL AREA PLAN

DATE: 06/06/2002

DRAWING NO.
4 of 13

NOTE:
Base Map: USGS Quad Maps, Revised 1993.

The Datum used for the topography is NGVD29. The Datum shift (NAVD88 minus NGVD29) is −1.175. Subtract 1.175 from existing elevations to get NAVD88 elevations.

AIRPORT ELEVATION
34.0' MSL
HORIZONTAL SURFACE ELEVATION
184.0' MSL

TRANSITIONAL SURFACE 7:1
50:1 APPROACH SURFACE
40:1 APPROACH SURFACE
34:1 APPROACH SURFACE
20:1 APPROACH SURFACE

DAYTONA BEACH
PORT ORANGE
ATLANTIC OCEAN

AUTH.	BY	REVISIONS	DATE

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DAYTONA BEACH INTERNATIONAL AIRPORT
Daytona Beach, Florida

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

PROJECT NAME
MASTER PLAN UPDATE STUDY

DRAWING TITLE
AIRSPACE PLAN (PART 77-FULL)

0' 3,000' 6,000'
Scale in Feet

DATE: 06/06/2002

DRAWING NO.
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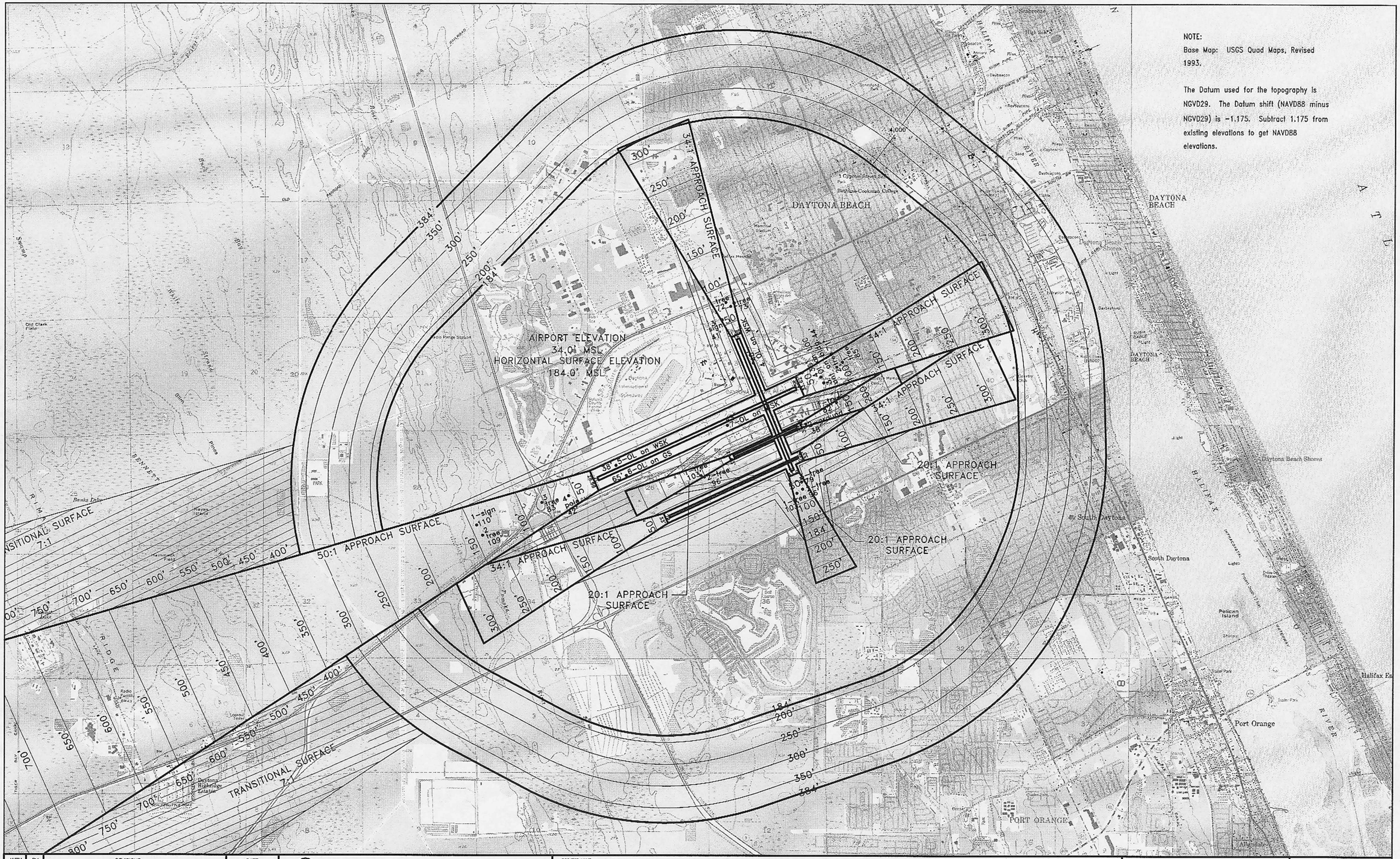

NOTE:
Base Map: USGS Quad Maps, Revised 1993.

The Datum used for the topography is NGVD29. The Datum shift (NAVD88 minus NGVD29) is -1.175. Subtract 1.175 from existing elevations to get NAVD88 elevations.

AUTH.	BY	REVISIONS	DATE

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DAYTONA BEACH INTERNATIONAL AIRPORT
Daytona Beach, Florida

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

PROJECT NAME
MASTER PLAN UPDATE STUDY

DRAWING TITLE
AIRSPACE PLAN (PART 77-CONICAL)

0' 2000' 4,000'
Scale in Feet

DATE: 06/06/2002

DRAWING NO.
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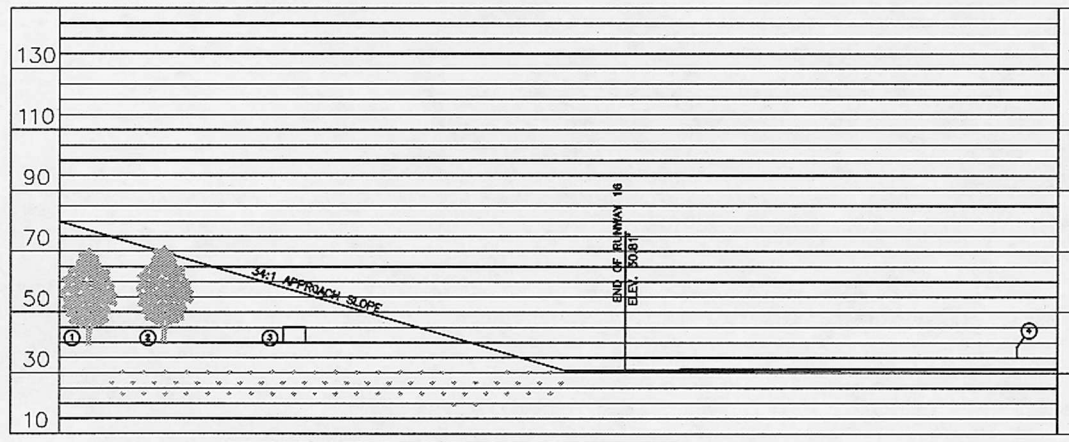

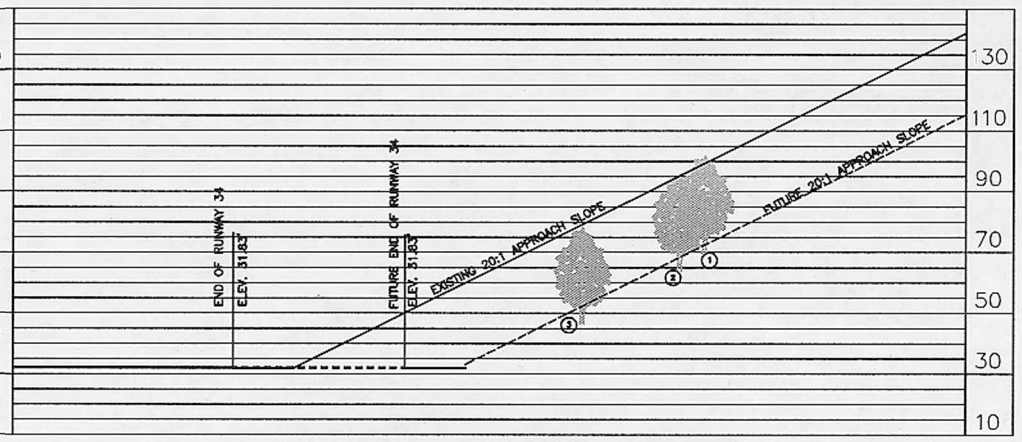

RUNWAY 16 OBSTRUCTION SUMMARY TABLE

ITEM NUMBER	OBJECT	OBJECT ELEVATION	DISTANCE FROM E.O.R.	PART 77 SURFACE	PART 77 EXCEEDS	DISPOSITION
				34:1		
1	TREE	70.83	1774	TRANSITIONAL	-8'	9' CLEAR
2	TREE	71.83	1551	APPROACH	2'	TOP OR REMOVE
3	SIGN	39.83	1095	TRANSITIONAL	-17'	17' CLEAR
4	OL ON LTD WSK	38.83	-1290	PRIMARY	8'	NONE

RUNWAY 34 OBSTRUCTION SUMMARY TABLE

ITEM NUMBER	OBJECT	OBJECT ELEVATION	DISTANCE FROM E.O.R.	PART 77 SURFACE	PART 77 EXCEEDS	DISPOSITION
				20:1		
1	TREE	101.83'	1,550'	APPROACH	2.5'	TOP OR REMOVE
2	TREE	94.83'	1,470'	APPROACH	-4.5'	NONE
3	TREE	79.83'	1,147'	APPROACH	-1.30'	NONE
4	OL ON LTD WSK	38.83'	-4,170'	APPROACH	8'	NONE

FUTURE RWY 34 OBSTRUCTION SUMMARY TABLE

ITEM NUMBER	OBJECT	OBJECT ELEVATION	DISTANCE FROM E.O.R.	PART 77 SURFACE	PART 77 EXCEEDS	DISPOSITION
				20:1		
1	TREE	101.83'	1,000'	APPROACH	27.5'	TOP OR REMOVE
2	TREE	94.83'	970'	APPROACH	24.5'	TOP OR REMOVE
3	TREE	79.83'	647'	APPROACH	23.6'	TOP OR REMOVE
4	OL ON LTD WSK	38.83'	-4,170'	APPROACH	8'	NONE

HORIZONTAL SCALE 1'=300'
VERTICAL SCALE 1'=30'

AUTH.	BY	REVISIONS	DATE

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DAYTONA BEACH INTERNATIONAL AIRPORT
Daytona Beach, Florida

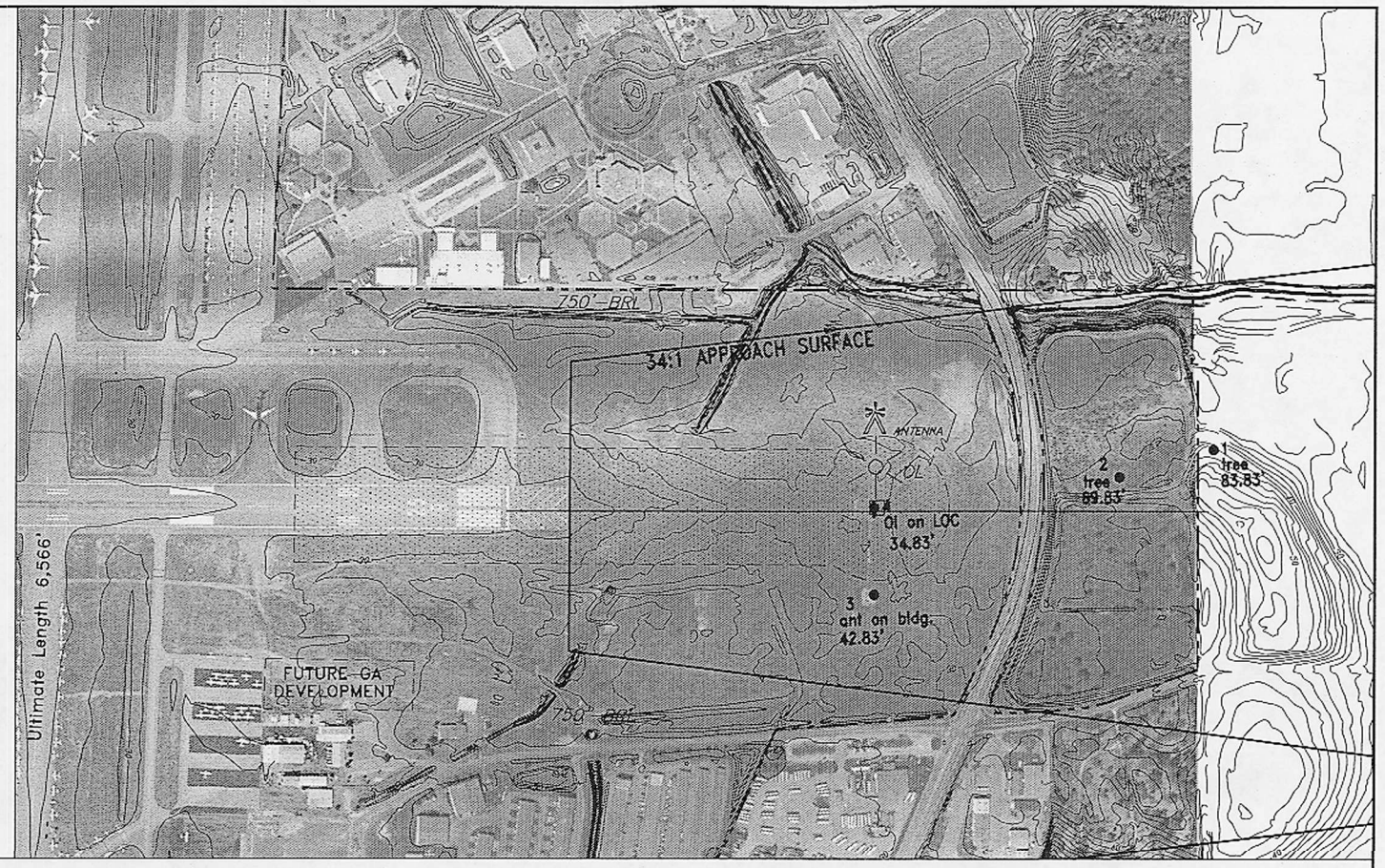
HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

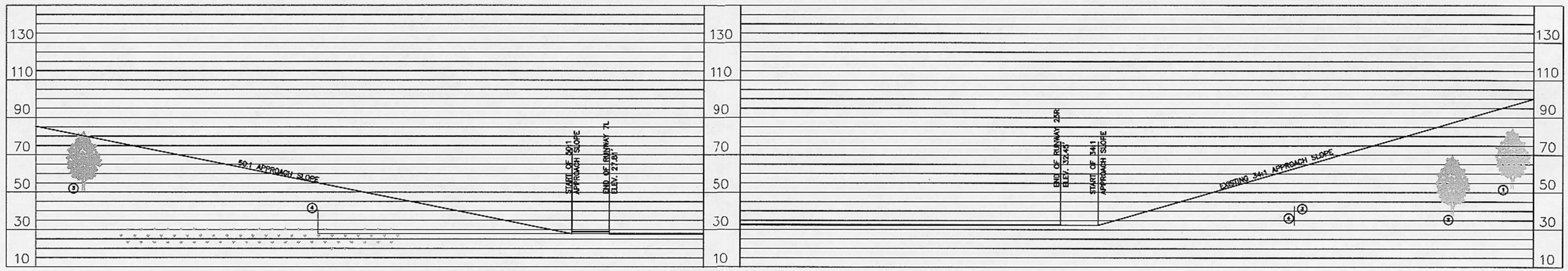
PROJECT NAME
MASTER PLAN UPDATE STUDY

DRAWING TITLE
RUNWAY 16-34 PLAN AND PROFILE

DATE: 06/07/02

DRAWING NO.
7 of 13





RUNWAY 7L OBSTRUCTION SUMMARY TABLE

ITEM NUMBER	OBJECT	OBJECT ELEVATION	DISTANCE FROM E.O.R.	PART 77 SURFACE	PART 77 EXCEEDS	DISPOSITION
				50:1		
1	SIGN	108.83'	5,992'	APPROACH	-37'	NONE
2	TREE	107.83'	5,819'	APPROACH	-38'	NONE
3	TREE	81.83'	2,817'	APPROACH	-1'	TOP OR REMOVE
4	POLE	40.83'	1,559'	APPROACH	-18'	NONE

HORIZONTAL SCALE 1'=300'
VERTICAL SCALE 1'=30'

RUNWAY 25R OBSTRUCTION SUMMARY TABLE

ITEM NUMBER	OBJECT	OBJECT ELEVATION	DISTANCE FROM E.O.R.	PART 77 SURFACE	PART 77 EXCEEDS	DISPOSITION
				34:1		
1	TREE	83.83'	2,422'	APPROACH	-14'	NONE
2	TREE	89.83'	2,095'	APPROACH	-19'	NONE
3	ANT. ON BLDG.	42.83'	1,350'	APPROACH	-20'	NONE
4	OL ON LOC.	34.83'	1,249'	PRIMARY	-28'	NONE

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DAYTONA BEACH INTERNATIONAL AIRPORT
Daytona Beach, Florida

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The HNTB Companies

PROJECT NAME
MASTER PLAN UPDATE STUDY

DRAWING TITLE
RUNWAY 7L-25R PLAN AND PROFILE

DATE: 06/07/02

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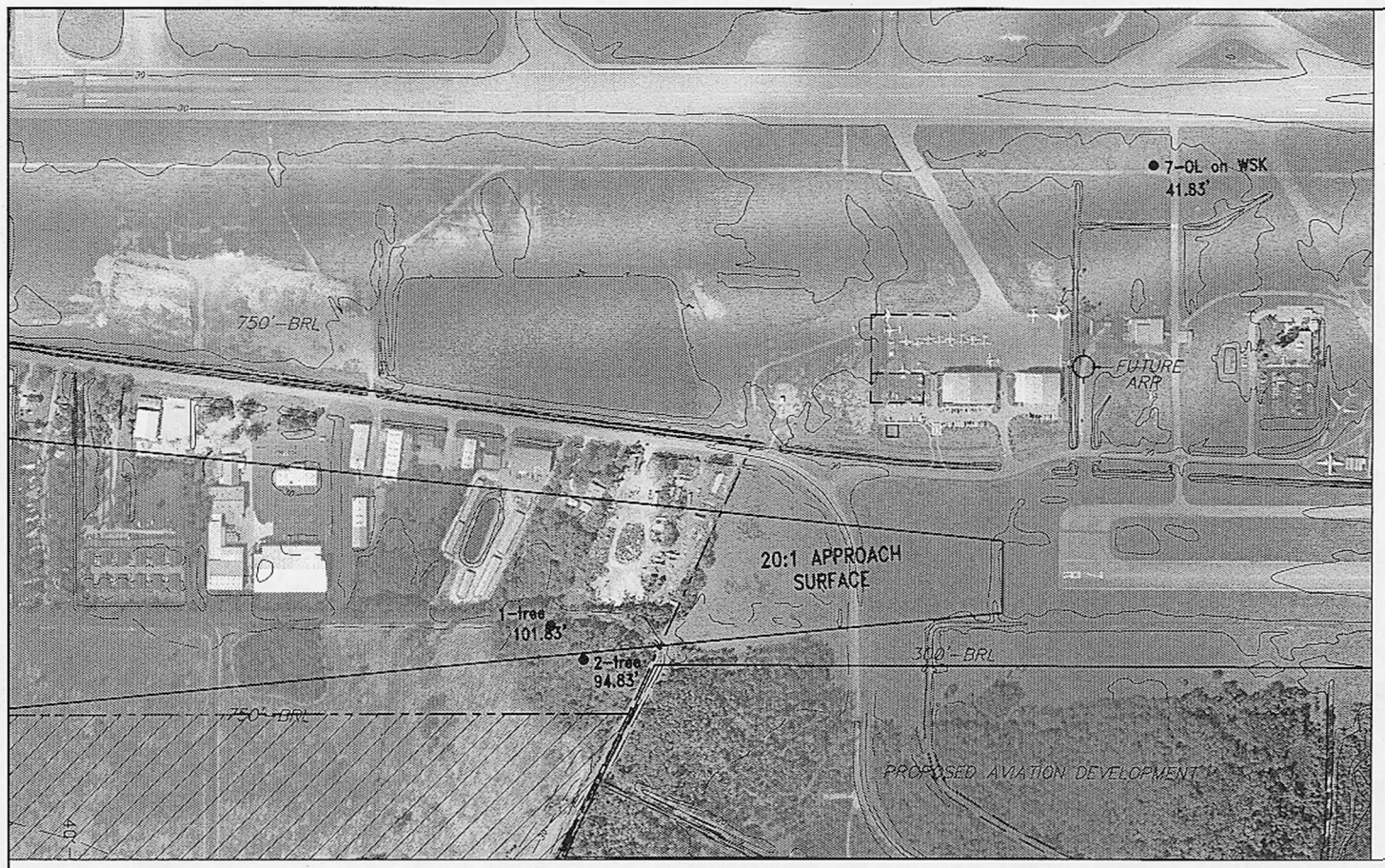

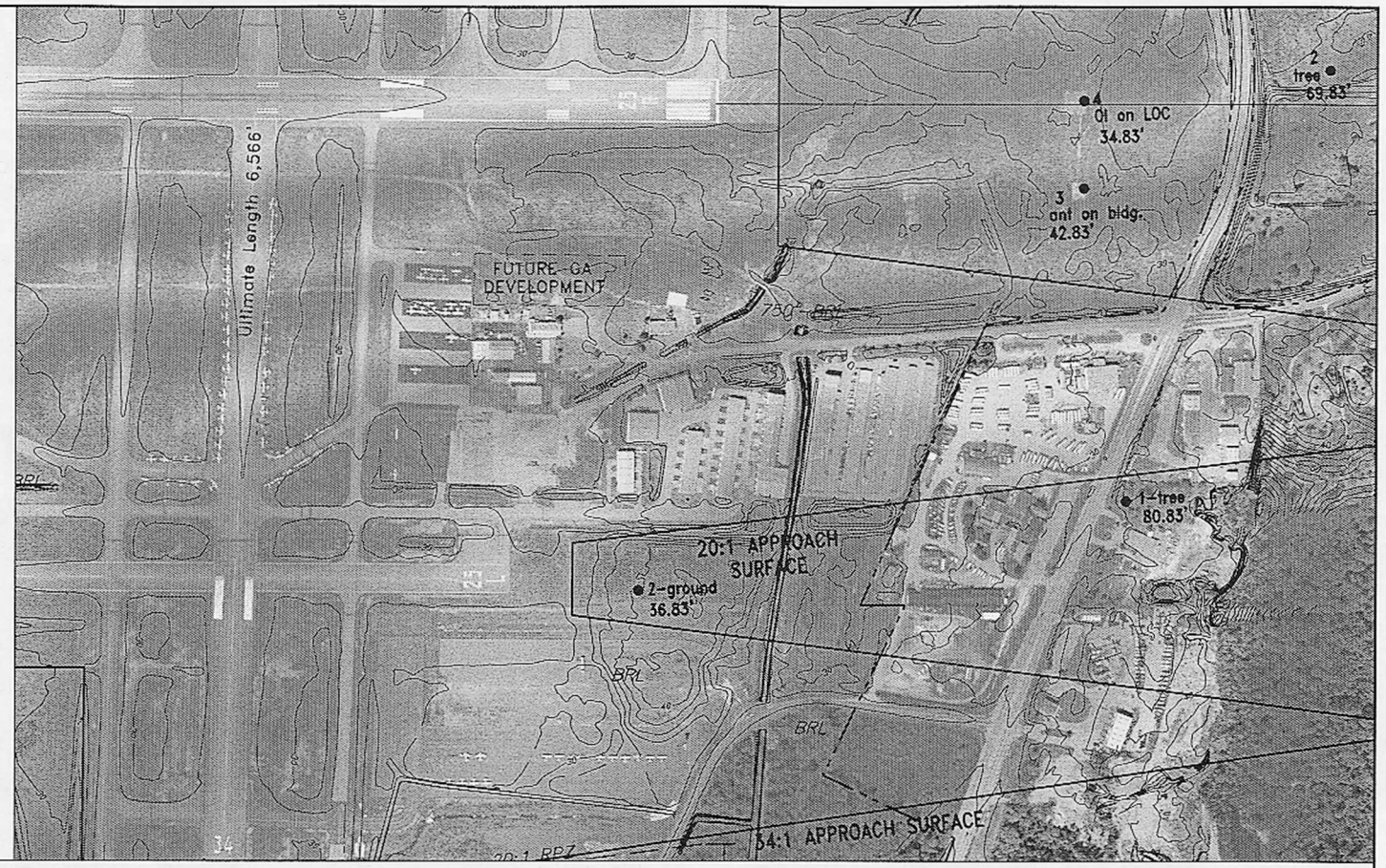

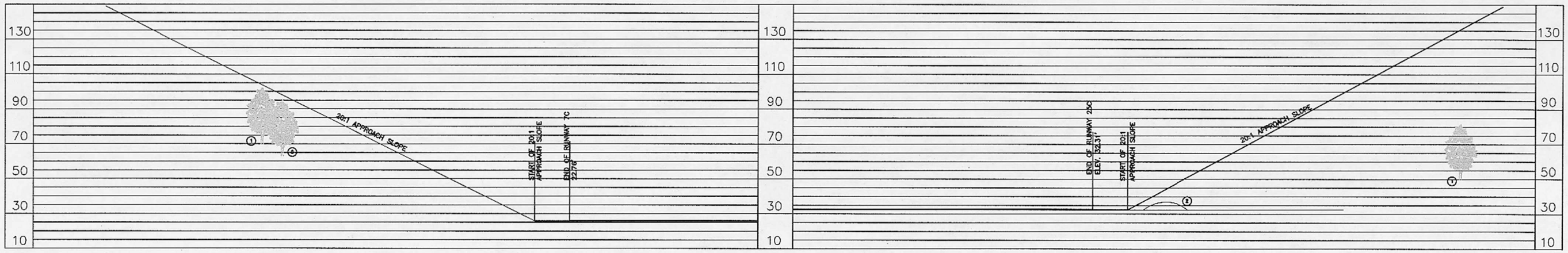

RUNWAY 7C OBSTRUCTION SUMMARY TABLE

ITEM NUMBER	OBJECT	OBJECT ELEVATION	DISTANCE FROM E.O.R.	PART 77 SURFACE	PART 77 EXCEEDS	DISPOSITION
				20:1		
1	TREE	101.83'	1,750'	APPROACH	-5'	NONE
2	TREE	94.83'	1,649'	TRANSITIONAL	-6'	NONE

HORIZONTAL SCALE 1'=300'
VERTICAL SCALE 1'=30'

RUNWAY 25R OBSTRUCTION SUMMARY TABLE

ITEM NUMBER	OBJECT	OBJECT ELEVATION	DISTANCE FROM E.O.R.	PART 77 SURFACE	PART 77 EXCEEDS	DISPOSITION
				20:1		
1	TREE	80.83'	2,107'	APPROACH	+47'	NONE
2	GROUND	36.83'	427'	APPROACH	-7'	NONE

NOTE: Existing Runway 7R – 25L will be renumbered to 7C –25C to accommodate future third parallel runway.

AUTH.	BY	REVISIONS	DATE

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DAYTONA BEACH INTERNATIONAL AIRPORT
Daytona Beach, Florida

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

PROJECT NAME
MASTER PLAN UPDATE STUDY

DRAWING TITLE
RUNWAY 7C–25C PLAN AND PROFILE

DATE: 06/07/02

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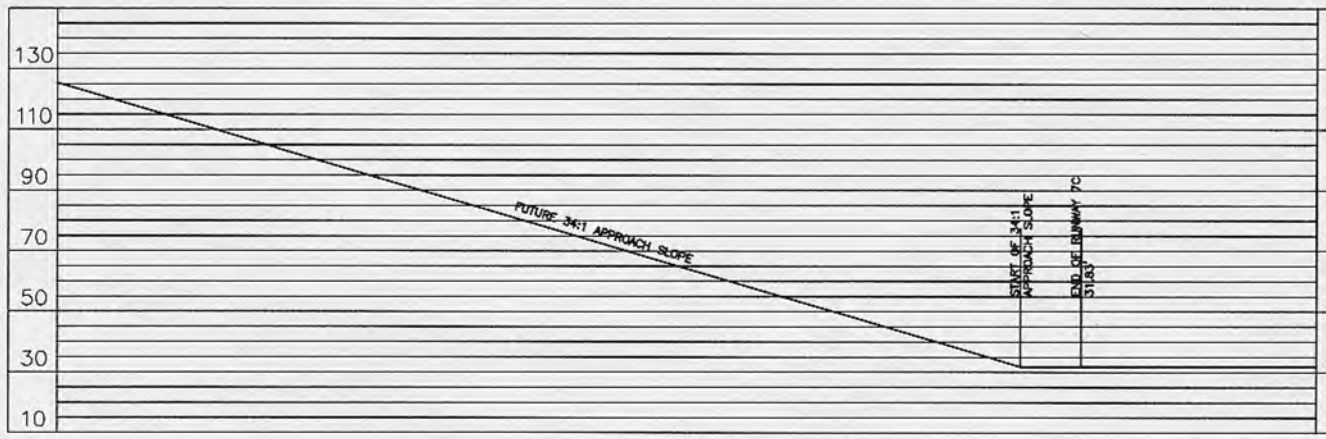

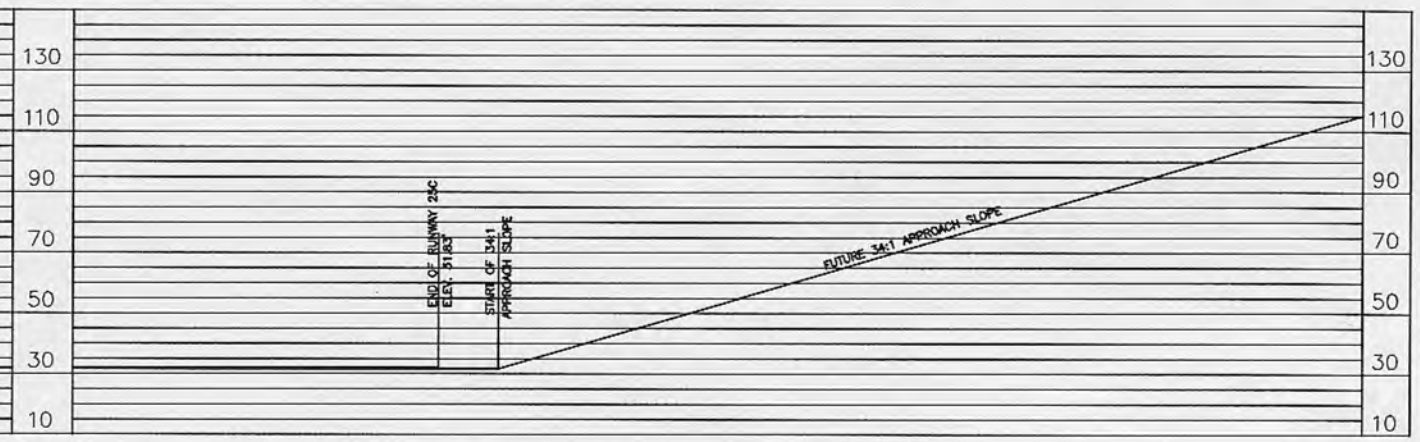

RUNWAY 7R OBSTRUCTION SUMMARY TABLE						
ITEM NUMBER	OBJECT	OBJECT ELEVATION	DISTANCE FROM E.O.R.	PART 77 SURFACE 34:1	PART 77 EXCEEDS	DISPOSITION

HORIZONTAL SCALE 1'=300'
VERTICAL SCALE 1'=30'

RUNWAY 25L OBSTRUCTION SUMMARY TABLE						
ITEM NUMBER	OBJECT	OBJECT ELEVATION	DISTANCE FROM E.O.R	PART 77 SURFACE 34:1	PART 77 EXCEEDS	DISPOSITION

NOTE: Any Obstruction will be cleared before Runway Construction begins.

AUTH.	BY	REVISIONS	DATE

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DAYTONA BEACH INTERNATIONAL AIRPORT
Daytona Beach, Florida

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

PROJECT NAME
MASTER PLAN UPDATE STUDY

DRAWING TITLE
FUTURE RUNWAY 7R-25L PLAN AND PROFILE

DATE: 06/07/02

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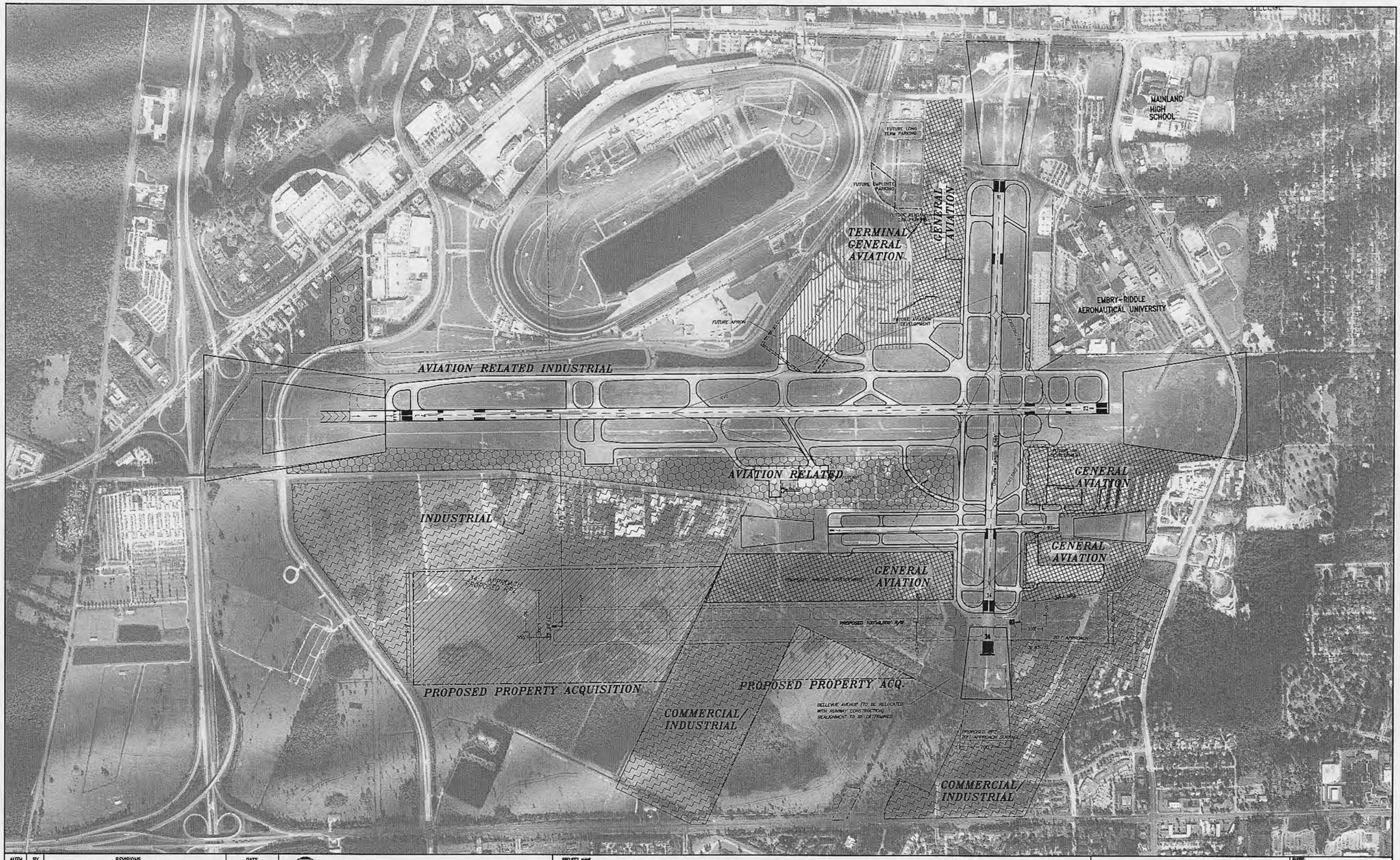

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DAYTONA BEACH INTERNATIONAL AIRPORT
Daytona Beach, Florida

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

PROJECT NAME
MASTER PLAN UPDATE STUDY

DRAWING TITLE
ON AIRPORT LAND USE PLAN

0' 600' 1,200'
Scale in Feet

DATE: 06/07/02

DRAWING NO.
11 of 13

LEGEND

- Lease Limits
- Airport Boundary
- (15) Leasee Number

#	LEASEE	AREA
1A	Domestic Terminal	NA
1B	International Terminal	NA
1B	Available	2.5 AC
2B	Dollar Rental Car	2.0 AC
3	Budget Rental Car	3.0 AC
4A	Fuel Farm (Jet Center)	0.2 AC
4B	Fuel Farm	0.11 AC
4C	Fuel Farm	0.11 AC
5	Race Track RV	11.73 AC
6	RAC Service Facility	2.265 AC
7	Hertz Car Rental	2.035 AC
8	Avis Rental Car	2.045 AC
9	Sheltair	4.04 AC
10	Air Cargo/Airport Maintenance	3.528 AC
11	Volusia Co. Sheriff's Dept Hangar	1.863 AC
12	Hangar (NASCAR)	4.386 AC
13	Embry-Riddle Ramp	15.31 AC
14	Jet Center/Sheltair	15.55 AC
15	Restaurant (Rio Brava)	1.889 AC
16	Restaurant (Olive Garden)	1.897 AC
17	Hotel (Hamaton Inn)	3.58 AC
18	Hilton Garden Inn (Embassy)	3.36 AC
19	Halifax Clinical Research	0.698 AC
20	Car Rental Service (Alamo)	2.484 AC
21	Regions Bank	1.890 AC
22	Yelvington Aviation Inc.	10.23 AC
23	FBO (Millman & Trans Florida Airlines)	5.290 AC
24	Executive Flight Line	8.12 AC
25	Civil Air Patrol Bldg.	0.71 AC
26	Volusia County Mosquito Control	2.74 AC
27	FAA Airway Facilities	0.83 AC
28	Conda Hangers	1.00 AC
29	Commonwealth Aviation T-Hangars	6.759 AC
30	Commonwealth Self-Storage	5.804 AC
31	FAA Facilities	0.10 AC
32	Health Department	2.300 AC
33	FAA Tower	3.80 AC
34	Wetland	3.60 AC
35	D.I.S. Use Agreement	4.41 AC
36	Reserved	
37	Rio Brava Restaurant	0.4 AC
38	D.I.S. Use Agreement	0.95 AC
39	Reserved	0.91 AC
40	Available	58.94 AC
41	Speedway Corporation	374 AC
42	Daytona Intl. Speedway	2.75 AC
44	Daytona Intl. Speedway Retention	6.86 AC
45	Available	16.48 AC
46	Spirit Life Harvest Church	5.12 AC
47	Available	3.74 AC
48	Available	20.34 AC
49	Available	5.73 AC
50	Available	1.58 AC
51	Available	1.42 AC
52	Available	5.54 AC
53	Available	2.00 AC
54	Available	80.00 AC
55	Race Track RV	4.84 AC
55A	Available	0.29 AC
56	Available	11.12 AC
57	Executcenter	1.423 AC
58	ERAU Development	10.84 AC
59	ERAU Dorms	13.85 AC
60	Oceanside One (Mariott)	4.34 AC
61	South East Apron	12.82 AC
62	SW General Aviation	54.96 AC
63	ERAU	3.04 AC
64	ERAU	4.43 AC
65	D.I.S. Use Agreement	2.00 AC

MAGNETIC VARIATION: 4.1 WEST 1993

0' 600' 1,200'

Scale in Feet

AUTH.	BY	REVISIONS	DATE

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DAYTONA BEACH INTERNATIONAL AIRPORT
Daytona Beach, Florida

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

PROJECT NAME
MASTER PLAN UPDATE STUDY

DRAWING TITLE
AIRPORT PROPERTY MAP

DATE: 06/07/02

DRAWING NO.
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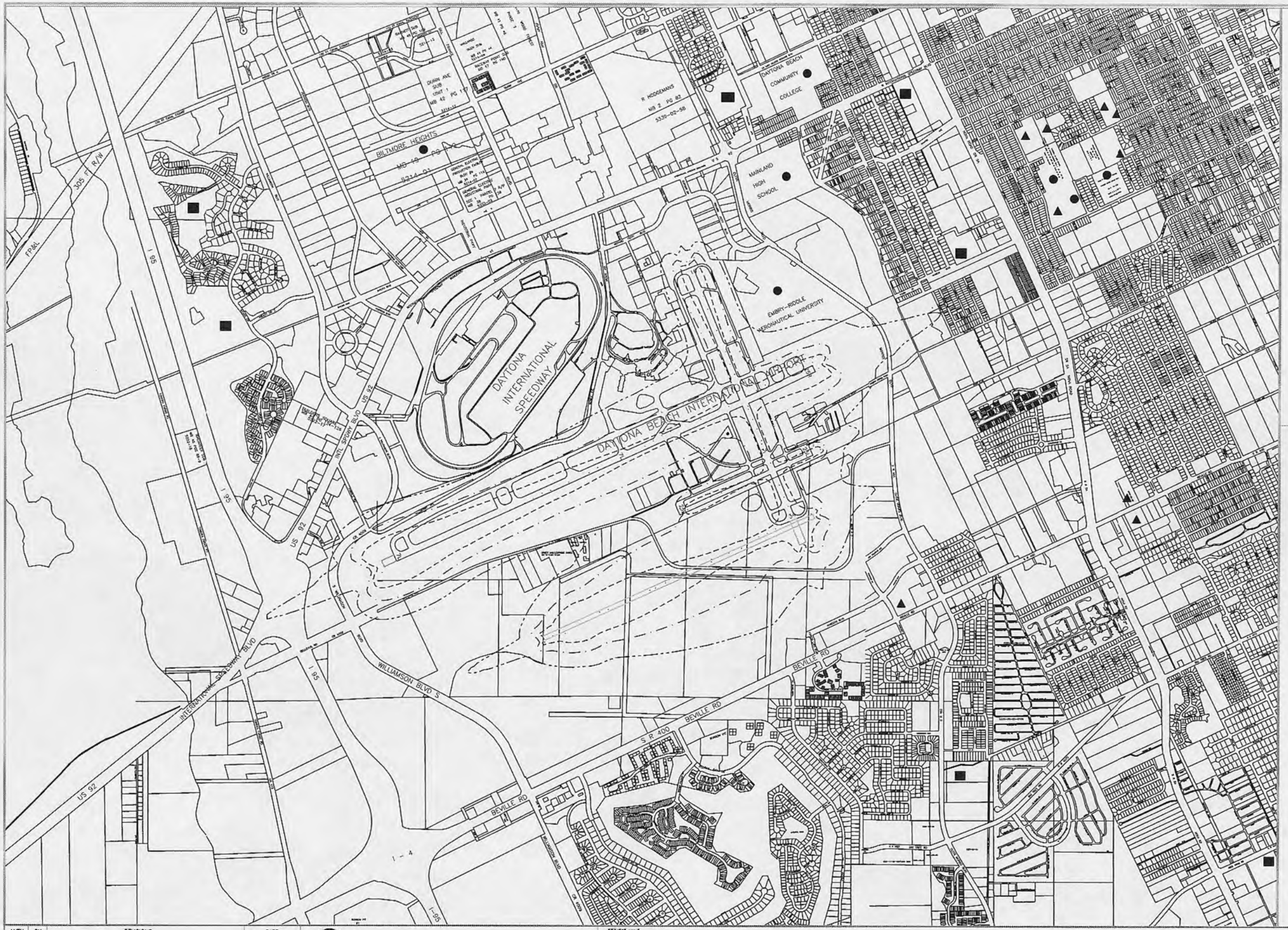

LEGEND

NOISE CONTOURS

- 65 Ldn
- 70 Ldn
- 75 Ldn

NOISE SENSITIVE USES

- Parks/Recreation & Cultural Facilities
- Hospitals
- Churches
- Schools

N

0' 1,000' 2,000'
Scale in Feet

AUTH.	BY	REVISIONS	DATE

DAYTONA BEACH INTERNATIONAL AIRPORT
Daytona Beach, Florida

HNTB *ARCHITECTS ENGINEERS PLANNERS*
The HNTB Companies

PROJECT NAME
MASTER PLAN UPDATE STUDY

DRAWING TITLE
VICINITY PLAN WITH 2020 DNL NOISE CONTOURS

DATE: 07/06/02

DRAWING NO.
13 of 13