PUBLIC

GREATER ORLANDO AVIATION AUTHORITY

MCO

ORLANDO INTERNATIONAL AIRPORT

Master Plan Update
Volume 1

Introduction
Inventory/Existing Conditions
Aviation Demand Forecasts
Demand - Capacity Analysis/Facility Requirements

2002-2022




August 2004

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MASTER PLAN UPDATE

ORLANDO INTERNATIONAL AIRPORT

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Prepared for:
GREATER ORLANDO AVIATION AUTHORITY

Prepared by:
The URS Team

August 2004

Preface

This Airport Master Plan Update was undertaken by the Greater Orlando Aviation Authority (GOAA) to document the operational capability, enhance safety and security, and identify capital improvements for Orlando International Airport (MCO). This document serves as a management tool to guide future airport development, taking into consideration changes that have occurred in the air transportation industry, the airport, and surrounding communities since completion of the previous Master Plan. In this study, the Airport Master Plan planning period for MCO extends twenty years through FY 2022. Where applicable, analyses have been updated to reflect the new runway and other airport capacity related facility improvements. The previous Airport Master Plan Study was completed in 1995.

This Master Plan Update Study began in 2000. As a result of the events of September 11, 2001 and other aviation industry related issues, the project was delayed until late 2003. Initial sections of the Airport Master Plan Update were written as a snapshot in time. For example, the Fourth Runway (Runway 17L/35R) was not operational when the Demand/Capacity and Facility Requirements analyses were conducted and completed.

Furthermore it would be noted that nearly all the Airport Master Plan Update related technical planning analyses were completed prior to Hurricanes Charley, Frances, and Jeanne impacting the Central Florida region during August and September 2004.

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MASTER PLAN UPDATE

ORLANDO INTERNATIONAL AIRPORT

SECTION 1.0

INTRODUCTION

Prepared for:
GREATER ORLANDO AVIATION AUTHORITY

Prepared by:
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SECTION 1.0

INTRODUCTION

This Airport Master Plan Update was undertaken by the Greater Orlando Aviation Authority (Authority) to document the operational capability, enhance safety, and identify capital improvements for Orlando International Airport (MCO). This document serves as a management tool to guide future airport development, taking into consideration changes that have occurred in the air transportation industry, the airport, and surrounding communities over the past ten years. The previous Airport Master Plan for MCO was completed in 1995.

1.1 Purpose of the Master Plan Update

The primary goals of this Airport Master Plan Update are to provide guidance for the future development of MCO, satisfy the aviation demand in a financially feasible and responsible manner, and address the aviation, environmental, and socioeconomic issues of the community. In support of these goals, the following objectives have been identified:

- Identify airside, landside, and airspace improvements or options to optimize the economic aspects of the airport while enhancing safety, security and operational capability.
- Establish an implementation phasing schedule for short-, intermediate-, and long-term improvements.
- Identify short-term requirements and recommend actions to optimize near-term funding opportunities.
- Ensure that short-term actions and recommendations do not preclude long-range planning options.
- Incorporate the interests of the public and government agencies into the planning process.
- Be sensitive to the overall environmental characteristics and needs of the City of Orlando, Orange County, and surrounding communities.
- Reflect current Comprehensive Plan land uses (on- and off- airport) and make recommendations as to compatible land uses and land acquisition, identify appropriate legal steps necessary to ensure proper zoning, and minimal noise impacts on the areas adjacent to the airport.

1.2 Airport Ownership and Management

In 1976, the Aviation Authority, chartered by the State of Florida, was established as an agency of the City of Orlando to operate and maintain both MCO and its primary general aviation reliever facility, Orlando Executive Airport (ORL).

MCO, managed by the Aviation Authority, consists of a seven-member board of directors. Five members are appointed by the Governor of the State of Florida, one from the Orlando City Council, and one representative from the Orange County Board of County Commission. The functions of the Board include the following:

- To exercise the powers of the Authority to make rules and regulations concerning its operations and facilities.
- To adopt resolutions, policies and procedures, and to approve the execution of legal contracts that obligate the Authority.
- To approve the Authority's annual operating budget and capital improvement expenditures.
- To serve as a public forum for citizens on aviation matters.

The Executive Director for both MCO and ORL reports to the Authority Board. The Executive Director and staff of nearly 700 full-time employees manage and maintain both airports. The Authority is responsible for daily operation, maintenance, planning, design, and construction of MCO and ORL.

1.3 Project Scope

Because of the opportunities for future development are available at MCO, the Authority identified the need to update the 1995 Airport Master Plan ALP and provide a visionary plan to accommodate the future aviation needs of the community.

The Master Plan Update will follow the guidelines established in the Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5070-6A, *Airport Master Plans*, dated June 1985. Specific tasks included in this study are:

Task A Coordination – This task reviewed and finalized the project scope, schedule, study team members, meeting locations and format, coordination procedures, and specific key issues.

Task B Inventory – This task included the collection of data pertinent to MCO and the area it serves and provides an inventory of existing airport related facilities.

Task C Aviation Demand Forecasts – This task examined historical and recent aviation activities for MCO and forecasted future activities based on anticipated growth in airport traffic activity.

Task D Airfield/Landside Demand/Capacity Analyses/Facility Requirements – This task calculated the hourly and annual capacities of the existing aviation facilities and the various alternative development plans to be examined. This task also identified those new or expanded facilities necessary to increase capacities to meet the projected aviation demands.

Task E Alternatives Analysis – This task identified and evaluated alternative means of meeting the requirements of forecast activities.

Task F Terminal Facilities – This task documented the existing North Terminal Complex improvements and planned South Terminal Complex facilities.

Task G Surface Transportation – In this task, existing and future operating conditions for the various intermodal facilities at MCO were analyzed. The analyses were conducted to identify current and projected deficiencies and to develop improvement concepts that address those deficiencies and accommodate future demand on airport's surface access network.

Task H Land Use Support Facilities – This task identified existing and future land uses on the airport.

Task I Environmental Considerations - This task included an overview and identification of those factors listed in FAA AC 150/5050-4A, Airport Environmental Handbook, likely to be affected by the recommended airport development.

Task J Implementation Plan - This task involved working with the Authority planning staff to incorporate the selected improvement projects into the long-range development plan. The FY 2004-2019 Capital Improvement Plan (CIP) prepared by the Authority is detailed and the beyond 2019 development is also identified.

Task K Airport Layout Plan (ALP) - This task involved updating and reformatting the ALP drawing sheet set.

Task L Executive Summary - This task involved the development of an Executive Summary document to present and summarize the findings and recommendations of the Master Plan Update.

Task M Economic Impact Analysis - This task involved the identification of the economic impact of MCO on the local business community and the travel- and tourism-related industry (see Appendix A).

1.4 Project Goals and Objectives

The main objective of this Master Plan Update is to create a guide for the development of MCO that reflects recent changes in the aviation industry and is compatible with the region's rapid growth and development. Emphasis is placed on the next study planning period FY 2002–FY 2022 in compliance with the FAA's definition and guidelines for conducting Airport Master Plan studies. However, attention is also directed towards ultimate airport capacity potential so that appropriate land use zoning can be implemented to protect the feasibility of the airport and realize its ultimate configuration. This Master Plan Update serves as a management tool that reflects the Authority's policies and goals. The plan was developed with close coordination with all appropriate Federal, state, regional, and local agencies to ensure feasibility.

This Master Plan Update provides a flexible and cost-effective guide for the future development of MCO through the year 2022 and beyond. Physical improvements needed to meet projected levels of passengers, aircraft operations, and air cargo tonnage during the 20-year planning process is identified. The goals and objectives of this Master Plan Update include:

- Update aviation demand forecasts through the 20-year planning period (2002-2022).
- Identify demand-driven, aviation-related facilities based on forecasted million annual passengers (MAP), annual air cargo activity levels, annual aircraft operations, and peak hour traffic activity.
- Identify alternatives, land development, and revenue-generating opportunities to meet the projected demand.
- Develop a CIP to accommodate projected annual demand and recommend a financial plan to implement this CIP.
- Update the ALP drawing set to address the recommended CIP and to comply with FAA airport planning and design criteria.
- Develop an Economic Impact Analysis to quantify the financial benefits of airport-related activity to the local business community and to the travel- and tourism-related industry.

1.5 Project Organization

This study was conducted according to the Professional Services Agreement for Orlando International Airport Master Plan Update dated in June 2000. The Authority's Planning Department was responsible for the administration of the study and reported directly to the Authority's Executive Director. URS Corporation was selected as the prime consultant for this Master Plan Update project. To assist URS, seven subconsultants performed various task assignments during the study period. These subconsultants included:

- Avid Neo Geo, Inc. – MCO Informational Video
- Cost Management, Inc. – Project cost estimates
- Fishkind & Associates, Inc. – Economic Impact Analysis (Appendix A) and forecasts
- HDR – Surface transportation and modeling
- John F. Brown Company, Inc. – Forecasts
- TransSolutions, LLC – Airfield & roadway simulation modeling and alternatives
- Turner Associates – Inventory

1.6 Project Coordination

Master Plan Update project progress/coordination meetings were periodically held. Over the course of the study, more than 30 committee meetings were held with representatives from the Authority senior staff, the Authority Planning staff, FAA, Florida Department of Transportation (FDOT), the Authority's consultants, and URS study team members. These meetings were held to coordinate the Master Plan Study task project deliverables, and time schedule.

The consultant team obtained relevant information including socioeconomic data, operational statistics, and mapping from numerous sources, including airport staff. Conclusions regarding existing and future aviation demand levels, facility capacities, and facility requirements were then drawn and reported to the airport staff for evaluation and feedback. Once concurrence was reached with airport staff, alternatives to satisfy the airfield, terminal building, and surface access requirements were developed and analyzed.

The final plan reflects the knowledge, insight, and opinions of numerous individuals that contributed to its creation. It includes features that were mutually accepted and is considered to be in the best interest of the community and the region's aviation system.

1.7 Document Organization

The MCO Master Plan Update is organized into three report volumes encompassing 11 sections:

Volume 1

Section 1.0: Introduction – Brief summary of the purpose of the Master Plan Update, ownership, scope of services, project objectives, coordination process, document organization, and community involvement program.

Section 2.0: Inventory/Existing Conditions – This section describes the overall setting of MCO. This includes a summary of the history and general information. From information provided by the Authority, City of Orlando, and other governmental agencies, this section presents an overview of existing physical facilities, operational characteristics, and recent and ongoing facility development.

Section 3.0: Aviation Demand Forecasts – This section provides an update of aviation activity forecasts for MCO through the year 2022. These forecasts were approved by FAA and FDOT and this data will eventually be incorporated into the FAA's National Plan of Integrated Airport Systems (NPIAS) and the FAA's Terminal Area Forecast (TAF).

Section 4.0: Demand-Capacity Analysis/Facility Requirements – This section describes the airside and landside demand/capacity analysis that determines the capability of existing airport facilities to accommodate existing and future aviation demands as quantified by the aviation forecasts.

Volume 2

Section 5.0: Airfield Plan – The airfield section describes the overall airfield plan along with key associated elements of the airfield. The plan discusses individual runway/navigational aid (NAVAID) system followed by discussions on taxiway improvements, air traffic control tower (ATCT)/aircraft rescue and firefighting (ARFF)/terminal NAVAIDs, the airport operations area (AOA) secure service road system, security fencing, and airspace.

Section 6.0: Terminal Facilities – The terminal facilities section describes the existing and future terminal complexes. The terminal complex at MCO includes the North Terminal Complex and future South Terminal Complex. The existing and future terminal support areas are considered part of these complexes.

Section 7.0: Surface Transportation Plan – The surface transportation section describes the overall surface transportation system. This includes the primary and secondary roads along with future high-speed rail (HSR), light rail transit (LRT), and Intermodal Transit System (ITS).

Section 8.0: Building Area Plans – The building areas section describes airport property available for future aviation and non-aviation-related development. These areas include the Tradeport area, Midfield/Heintzelman Boulevard area, the Gee Bee property, and the Poitras property.

Section 9.0: Land Use Plan – The land use section presents the existing and future on-airport Land Use Plan for the airport.

Section 10.0: Environmental Considerations – The environmental considerations section provides Federal, state, and local officials and the public with an understanding of the potential environmental impacts of the proposed airport development. The considerations presented in this section are modeled after the format of an Environmental Assessment (EA), described in FAA Order 5050.4A, *Airport Environmental Handbook.*

It should be emphasized that the information contained in this section is not a formal EA nor an Environmental Impact Statement (EIS) as referred to in the National Environmental Policy Act of 1969 (NEPA) or the Airport and Airway Improvement Act of 1982. The overview points out those areas that may have the potential to be impacted by the proposed airport development at MCO.

Volume 3

Section 11.0: Capital Improvement Plan – This section and supporting appendix describe the multi-year CIP by project category to serve short- and long-term aviation demand projections.

1.8 Public Information Program

In addition to conducting numerous meetings with the Authority's master planning update project subcommittee, two public information meetings were held to provide community citizens with an opportunity to contribute to the planning process. The first meeting was held on May 24, 2004, at the Authority Maintenance Shops building located at MCO. The second meeting was held on May 26, 2004, at the ORL Administrative Office. The public was invited to attend these meetings to express their views regarding the Draft MCO Master Plan Update study. Report exhibits were displayed and the Authority staff and URS consultant team members were available to discuss the planning project.

MASTER PLAN UPDATE

ORLANDO INTERNATIONAL AIRPORT

SECTION 2.0

INVENTORY

Prepared for:
GREATER ORLANDO AVIATION AUTHORITY

Prepared by:
The URS Team

August 2004

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SECTION 2.0

INVENTORY

2.1 Introduction

This section of the Master Plan Update outlines the airport history and provides data on the current site characteristics, airfield facilities, Landside facilities, ground transportation, fuel facilities, drainage, land use, airspace, and meteorology. This information will be used in later sections of the study to assist in formulating development recommendations and establishing the financial and operational effects of each recommendation. Existing studies were used to avoid redundancy and duplication of data collection efforts. In addition, Greater Orlando Aviation Authority (GOAA) staff provided the records necessary to establish the existing conditions of operations and facilities at Orlando International Airport (MCO). MCO is the FAA designation for Orlando International Airport.

2.2 Airport History

The history of aviation in Orlando began over 90 years ago with the first flight in Florida. In February 1910, Lincoln Beachey, using a Curtiss Biplane built by the Wright Brothers, was the only one of three aviators to keep his airplane aloft long enough to claim the prize money offered to anyone that could fly an airplane for 5 minutes. Since these early beginnings, aviation blossomed in the Orlando area. Flights moved from Buck Field west of Orlando to Beacon Hill Airport on the Cheney Highway. In 1928, the Municipal Airport near Lake Underhill became Orlando's center for aviation activity with the inauguration of airmail routes between Jacksonville and Miami. This airport had two runways and covered 50 acres north of South Street and east of Bumby Street. Today, this airport is known as Orlando Executive Airport (ORL).

As World War II dramatically changed world politics, so too did it change aviation in Orlando. The U.S. Army Air Corps took over the Municipal Airport in 1941. At this time, the City of Orlando purchased 1,240 acres of land southeast of Pine Castle in southeast Orange County for the development of a civilian aviation facility. The U.S. Army Air Corps also took over this land and acquired additional land in 1942 to build the Pine Castle Army Airfield to serve as a base for B-17 Flying Fortresses.

With the war's end, both airports were returned to the City. The Municipal Airport remained Orlando's commercial airport. Pine Castle Army Airfield was decommissioned and facilities were dismantled with the exception of two hangars and several small buildings. In 1948, the property was deeded back to the City of Orlando for a brief period ending in 1951, when the Pine Castle Army Airfield was reactivated during the Korean War to serve as a B-47 jet bomber training facility. The airfield became a combat facility under the Strategic Air Command (SAC) in 1954. Following a crash in 1957 that killed Wing Commander Colonel Michael M. McCoy, two crew members, and an officer of the British Royal Air Force, Pine Castle Army Airfield was renamed McCoy Air Force Base (AFB) to honor Colonel McCoy.

The arrival of the B-52 bomber in 1961 rendered the 5,500-foot runways at McCoy AFB inadequate and two parallel 12,000-foot runways were constructed by the military. In doing so, McCoy AFB became attractive to commercial jets needing longer runways than those available at the Municipal Airport. In 1962, a joint use agreement between the City of Orlando and the U.S. Air Force was signed allowing the development of 960 acres of land for civilian use known as "Phase I." The U.S.

Air Force allowed Runway 18L/36R to be used for the arrival and departure of civilian commercial aircraft operations. The City purchased 3,657 acres of additional land east and south of the terminal for civil aviation use and in 1969 completed the first Airport Master Plan that marked the beginning of a significant civil aviation development (Phase II).

On April 17, 1975, the U.S. Government transferred the airport in fee simple to the City of Orlando. The airport was renamed the Orlando Jetport. In 1976, the airport was granted international status and was officially named Orlando International Airport. The airport had a land area that totaled 6,120 acres. GOAA was established as an agency of the City of Orlando to control and manage both MCO and ORL. Under its direction, an Airport Master Plan and Airport Layout Plan (ALP) were prepared for MCO during 1977 and 1978 and described the Phase III development. The Master Plan called for the construction of a new terminal complex with up to 48 aircraft gates and the capability to accommodate 12 million passengers annually. The new $800 million Midfield Terminal Complex including Airsides 1 and 3 opened in 1981 serving 13 airlines and an original hangar/terminal was converted to an air cargo facility. During 1981, the new terminal processed over six million passengers. A 1,400-acre aviation park, the Orlando Tradeport, was launched in 1982. Construction of a new international concourse at Airside 1 began in 1983 and opened with full U.S. Customs and Immigration Services in 1984. Nonstop scheduled service to Europe was inaugurated that same year. In 1985, approval was given for the construction of a Third Runway (17R/35L) and Main Landside Terminal expansion. In 1986, activity reached 12 million passengers, four years ahead of forecast.

In 1986, $86 million in airport revenue bonds were issued for expansion improvements that included construction of two parking garages and expansion for food and beverage services in the Landside Terminal Building. Bonds were issued in 1988 for $430 million for the main terminal building, roadway, and tenant improvements. With the opening of the third parallel runway (17R/35L) in 1989, the airport's annual passenger activity reached 17.2 million. One year later, the third airside terminal (Airside 4) opened increasing the number of gates from 48 to 72 and expanding the airport's design capacity to 22.5 million annual passengers (MAP). The airport processed over 21.7 MAP in 1994.

Construction began on the fourth airside terminal (Airside 2) and the north crossfield taxiway (Taxiway J) in 1998. In September 2000, this taxiway and Airside 2 (Gates 100-129) were opened for service, bringing the total number of gates to 90 and passenger service capacity to between 36 and 40 MAP. The north crossfield taxiway opened in 2000. Design concepts and site preparation for the South Terminal Complex began in 1999. The Fourth Runway (17L/35R) was opened in December 2003 and was completed in March 2004.

jetBlue Airways started scheduled service and became a signatory airline in 2000. jetBlue Airways has plans for a major expansion in 2004, including JetBlue Airways' first flight training center and new maintenance hangar. A new regional Federal Express (FedEx) service facility opened on Tradeport in 2001. In 2002, a 345-foot airport traffic control tower (ATCT) opened at MCO, the tallest in North America. Flight Safety International opened a 52,000-square-foot pilot simulator training center in 2003. The Cessna Citation Service Center for private and corporate aircraft opened in 2004.

A chronological timeline of the events shaping MCO is presented in Appendix B.

2.3 Site Characteristics

2.3.1 General Location

MCO is located approximately 12 miles southeast of the City of Orlando in Orange County. MCO, which is managed by GOAA, is situated on 13,301.95 acres of property. The property is bounded by the Bee Line Expressway (State Road 528) to the north, Narcoossee Road to the east, Boggy Creek Road and State Road 417 (Central Florida GreeneWay) to the south, and Tradeport Drive to the west. The general location of MCO within the Orlando metropolitan area and in the central Florida region is shown on Figure 2-1.

2.3.2 Existing Airport

A color aerial photo of the existing airport is shown on Figure 2-2. This photo, taken in December 2003, depicts the completed Fourth Runway (17L/35R) project and associated taxiway system.

2.3.3 Topography

The topography around the airport can be described as flat, as ground elevations vary only slightly. Because of the low-lying characteristics of the airport property, the airport has an elaborate drainage system that incorporates retention ponds, canals, and drainage control structures. Located within the Boggy Creek Drainage basin, airport drainage generally flows to the south.

2.3.4 Airport Reference Point

Defined as the airport's midpoint, the Airport Reference Point (ARP) is Latitude 28°25'44.0"N and Longitude 81°18'57.7"W. The airport's official elevation, which is defined as the highest point on an airport's usable runway, is 96 feet above mean sea level (MSL).

2.3.5 Existing On-Airport Land Use

As part of the inventory documentation process, MCO's current on-airport land use areas were defined, as shown on Figure 2-3. Using standard land use classifications, the entire airport was defined by a current use category. Land that can be developed in the future is identified as undeveloped land on this land use diagram. From this diagram, it is estimated that approximately 3,600 acres of land is undeveloped.

Access to the airport is provided from the north via Airport Boulevard and from the south via the South Access Road. Both access roads feed a two-loop road system that serve the A and B sides of the Landside Terminal Building. The North Terminal Complex is situated midfield on 854 acres between the east and west runways and is generally composed of a Landside Building and four Airside Terminal Buildings, Airsides 1 through 4. The North Terminal Complex contains airline operations; retail, food, and beverage tenants; ground transportation service operations; GOAA office and operational space; and the Hyatt Regency Orlando International Airport Hotel.

2.3.6 Surrounding Land Use

As a general overview, land surrounding the airport is mixed and generally comprised of industrial, commercial, residential, agricultural, and conservation/natural uses. Commercial land use dominates the area immediately north of the airport, with industrial and forested/undeveloped uses as the predominant uses to the northeast. To the east and south, land use consists of agricultural and forested/undeveloped uses mixed with residential areas. Agricultural and forested/undeveloped uses are the dominant uses south of the airport. Land use west of the airport is mixed commercial, residential, and industrial with industrial and residential uses dominating. Figure 2-4 shows the general land use surrounding the airport.

The central Florida region is the focus of rapid growth and development. Areas surrounding the airport also experience rapid growth with development trends following the existing land use development. The most intense growth is expected to be in residential land uses.

2.3.7 EXISTING AIRLINE SERVICE

MCO served over 50 carriers in 2002 that included 37 scheduled, 11 charter, and 11 cargo carriers. MCO provides scheduled nonstop service to 70 destinations in the U.S. Scheduled nonstop service is available to 14 international cities; direct service is available to more than 100 locations worldwide. Table 2-1 lists the air carriers as of April 2004 that currently provide airline service from MCO.

TABLE 2-1
AIRLINE SERVICE AT MCO AND STATUS

Signatory	Non-Signatory Scheduled/Domestic	Non-Signatory Scheduled/Foreign
American Airlines ATA Airlines AirTran Airways British Airways Continental Delta Connection/Comair Delta Air Lines/Song JetBlue Airways Northwest Airlines Southwest Airlines Spirit Airlines United Airlines Virgin Atlantic Airways	Alaska Airlines America West Airlines Frontier Airlines Midwest Airlines US Airways	AeroMexico Air Canada Air Jamaica Air Transat Bahamasair Thomas Cook Powered by Condor Copa Airlines Icelandair LTU International Airways Martinair Holland Mexicana Airlines
Non-Signatory Charter/Domestic	**Non-Signatory Charter/Foreign**	**Non-Signatory Commuter**
Champion Air Falcon Air Express Miami Air International Planet Airways Ryan International Airlines Sun Country Airlines	Canjet Airlines Kelowna Flightcraft SkyService Zoom Airlines	Delta Connection - Chautauqua Airlines American Eagle Operated by Executive Air Gulfstream International Airlines US Airways Express Operated by AirMidwest Airlines/ Mesa Airlines Group

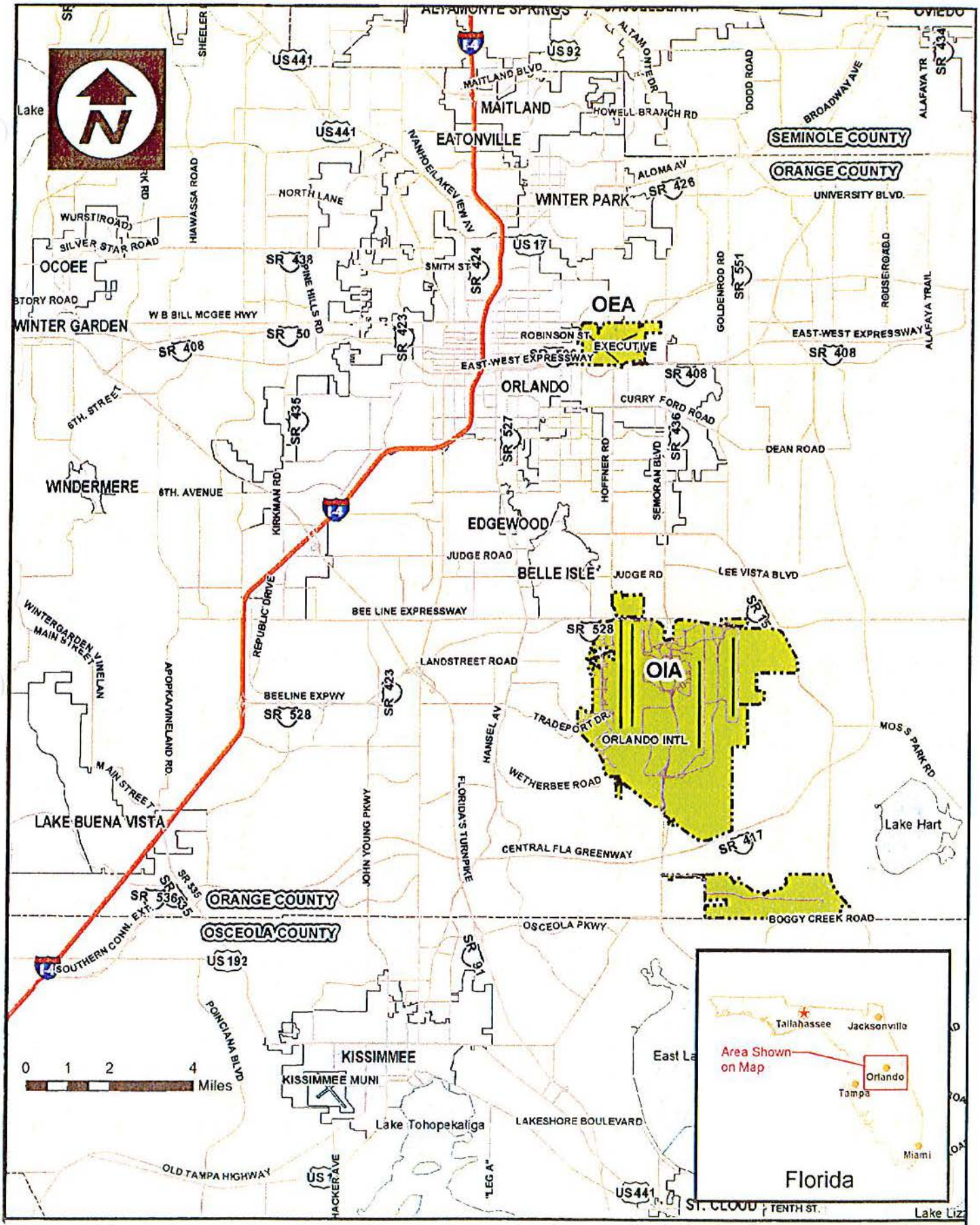
Source: GOAA Airline List, April 2004.

2.4 Facility Inventory

The facility inventory consists of documenting physical features of the airport. The inventory information that is presented in this section was provided by GOAA. The first element described is the existing airfield, which defines the runways, taxiways, aprons, etc. The existing building areas are broken down by sectors and each sector is defined. Existing ground transportation depicts both a regional roadway system and on-airport road system. Existing airport drainage maps were collected and documents the existing drainage conditions. Key airspace planning-related items and meteorology conditions were compiled. A general inventory of the fuel facilities and on-airport utility systems were collected and documented.

2.4.1 EXISTING AIRFIELD

Existing airfield pavement development occupies approximately 1,997 acres of airport property and includes ramp areas and a system of taxiways, which support four parallel runways in a north-south configuration. Many of the original airfield pavements were constructed during the 1940s as part of



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GREATER ORLANDO AVIATION AUTHORITY
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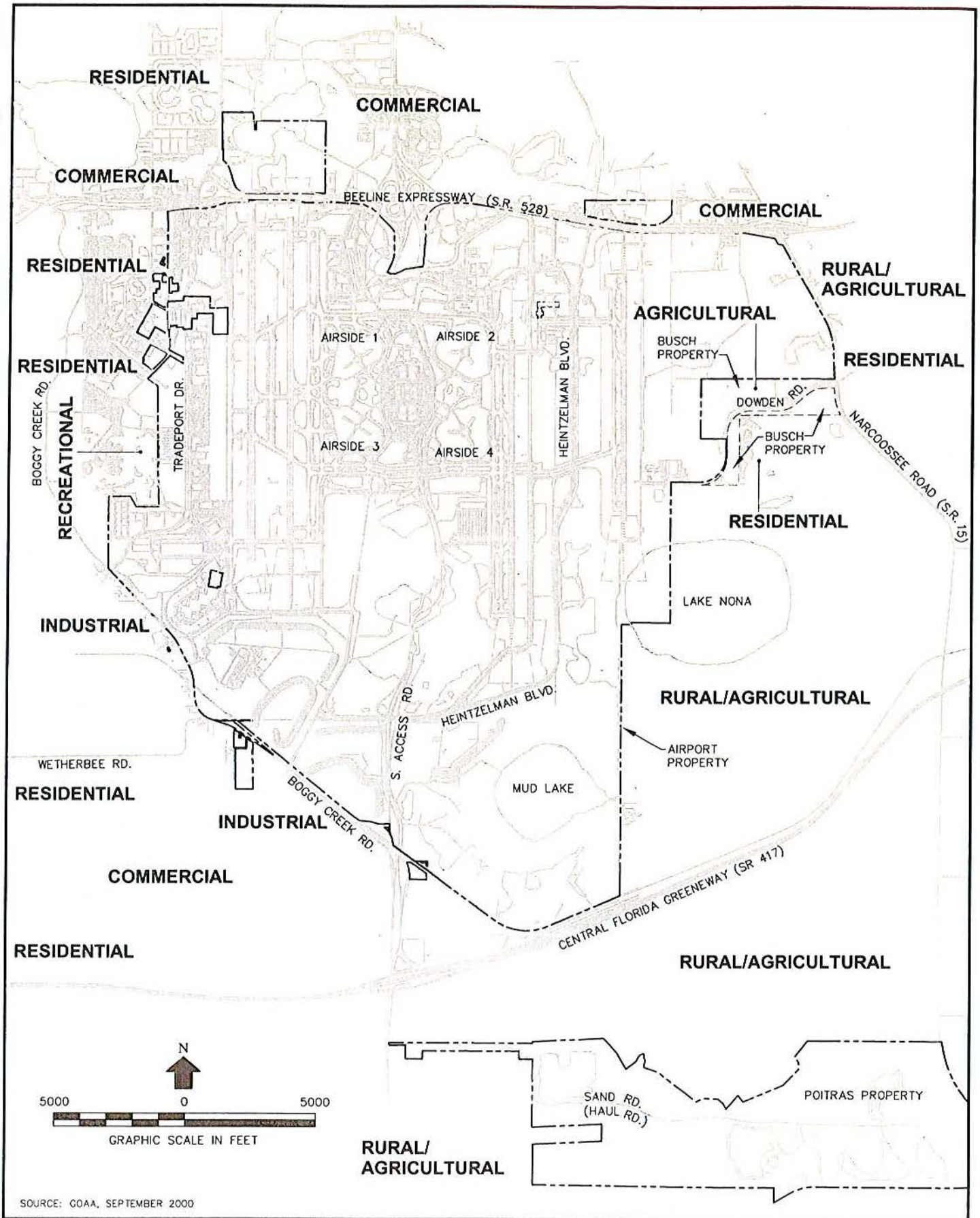
LOCATION MAP & VICINITY MAP

FIGURE: 2-1



SOURCE: GOAA, SEPTEMBER 2000

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EXISTING SURROUNDING LAND USE MAP

FIGURE: 2-4

the Pine Castle Army Airfield to accommodate B-17 aircraft. In February 2002, a 10-year pavement maintenance management plan was completed that evaluated the condition of airfield pavement surfaces. GOAA is currently implementing this plan that will involve the following activities:

- Review of historical pavement construction records and maintenance history to estimate present pavement condition,
- Develop a segmented and systematic airfield pavement inspection program, and
- Identify and quantify existing pavement distress in an objective, quantifiable manner using established pavement evaluation criteria.

2.4.1.1 Runways

MCO possesses four parallel runways (18R/36L, 18L/36R, 17R/35L, and 17L/35R) orientated in a north-south direction. This orientation is adequate to meet the FAA-recommended 95 percent wind coverage. The runway complex is capable of handling all existing commercial aircraft. Portions of the airfield will need upgrades to accommodate A380-800 aircraft. Runway 18L/36R was designed and constructed in 1953 for U.S. Air Force B-47 aircraft. The rehabilitation of Runway 18L/36R and associated taxiways was undertaken in 1995 and was completed in 1996. Runway 18R/36L was reconstructed in 1961 to accommodate B-52 aircraft and a major pavement rehabilitation was completed in 1989. Runway 17R/35L was completed in 1989 and is currently being rehabilitated. For capacity reasons, a fourth parallel runway (17L/35R) was constructed and its initial use will be for air carrier aircraft arrivals. Figure 2-5 depicts the existing runway layout at MCO (runways are depicted in blue).

Centerline-to-centerline spacing for Runways 18R/36L and 18L/36R is 1,500 feet. Because of this relatively close spacing, Air Traffic Control (ATC) must treat these runways as a single runway. This single runway treatment is because of aircraft wake turbulence and separation standards. Centerline-to-centerline spacing for Runways 18L/36R and 17R/35L is 8,450 feet. Because of this large spacing, Runway 17R/35L is considered an independent runway with regard to aircraft operations. This means that simultaneous operations can occur on Runway 17R/35L and the two west side runways during any weather condition. The Fourth Runway's (17L/35R) centerline is located 4,300 feet east of the Runway 17R/35L centerline. This runway separation provides triple "all weather" independent arrivals capability at MCO.

Tables 2-2 through 2-5 list the physical characteristics, lighting, and navigational aids (NAVAIDs) serving each runway at MCO. The following defines each data element found in these tables.

Dimensions - are the length and width of the runway in feet.

Pavement Surface - is the type of material used in the construction of the runway surface.

Pavement Friction Treatment - is the type of runway surface preparation that is intended to improve aircraft braking effectiveness under wet and slippery conditions.

Weight Bearing Capacity - is the aircraft landing gear configuration and published maximum weight, in pounds, that the runway is intended to support. Letters preceding the maximum aircraft weight indicate the landing gear configuration. SW means single wheel landing gear, such as a Cessna 172, DC-3, and F-15. DW means dual wheel landing gear, such as a DC-9, MD-80, Boeing 737, and Airbus A319/A320. DTW means dual tandem wheel landing gear, such as a Boeing 757 or 767.

Gradient - is the runway surface percent of slope. FAA requires Aircraft Approach Category (AAC) C and D runways to possess an overall slope of no greater than 1.5 percent, with the first and last

quarter of each runway possessing a slope no greater than 0.08 percent. This is to ensure that runways are constructed as flat as feasible.

Runway Markings - are the type of runway markings displayed on the runway surface. FAA has designated marking requirements for runways based on the type of flight procedures serving a particular runway and they include visual, non-precision, and precision markings. The minimum markings for a visual runway include the designation number and centerline markings. The minimum markings for a non-precision runway include the designation number, centerline markings, and threshold markings. Precision runway markings include all the minimum non-precision markings and an aiming point marking, touchdown zone markings, and side stripes.

Touchdown Zone Elevation (TDZE) - is the highest elevation measured in feet above MSL in the first 3,000 feet of each runway end. This 3,000-foot section of the runway is considered the touchdown zone.

Takeoff Run Available (TORA) - is the runway length declared available and suitable for the ground run of an airplane taking off.

Takeoff Distance Available (TODA) - is the TORA plus the length of any remaining runway or clearway beyond the far end of the TORA.

Accelerate-Stop Distance Available (ASDA) - is the runway plus stopway length declared available and suitable for the acceleration and deceleration of an airplane aborting a takeoff.

TABLE 2-2

EXISTING RUNWAY 18L/36R INFORMATION

Item		Runway 18L/36R	
Runway Length/Width/Shoulder Width		12,005'/200'/35'	
Airport Reference Code		D-V	
Critical Design Aircraft		B-747	
Effective Gradient (Percent)		0.01	
Percent Wind Coverage (20 kts/23 mph)		99.8%	
Runway Pavement	Strength (000 lbs.)	200 DG, 400 DT	
	Surface Type/Friction	Concrete/Asphalt/Grooved	
Maximum Runway Elevation (above MSL)		96.4'	
Runway Lighting		HIRL, CL TDZL - 36R end	
Runway Marking		Precision	
Item		**18L**	**36R**
End Elevations (MSL)		92.5'	91.1'
End Coordinates	Latitude	28°26'54.0028" N	28°24'55.1462" N
	Longitude	81°19'20.3023" W	81°19'19.350" W
Runway Protection Zone (RPZ)	Length	1,700'	2,500'
	Width - Inner/Outer	1,000'/1,425'	1,000'/1,750'
Approach Lighting		N/A	ALSF-2
Runway Touch Down Zone Elevations (MSL)		96'	92'
FAR Part 77 Imaginary Surfaces	Approach Category	Non-Precision	Precision, CAT IIIb
	Inner Approach Surface Slope	34:1	50:1
NAVAIDS	Electronic Navigation Aids	N/A	ILS, LOC, MM
	Visual Approach Aids	VASI-6	N/A
Approach Visibility Minimums (Cloud Ceiling/Visibility)	ILS CAT I	N/A	200'/1/2 MI.
	ILS CAT II	N/A	100'/1200' RVR
	ILS CAT IIIb	N/A	0'/600' RVR
	RNAV/GPS	384'/1 1/4 MI.	408'/ 1 MI.
	VOR/DME	444'/1 1/4 MI.	508'/1/2 MI.
	VOR	444'/1 MI.	N/A

Source: URS, May 2004.

TABLE 2-3
EXISTING RUNWAY 18R/36L INFORMATION

Item		Runway 18R/36L	
Runway Length/Width/Shoulder Width		12,004'/200'/35'	
Airport Reference Code		D-V	
Critical Design Aircraft		B-747	
Effective Gradient (Percent)		0.01	
Percent Wind Coverage (20 kts/23 mph)		99.8%	
Runway Pavement	Strength (000 lbs.)	200 DG, 400 DT	
	Surface Type/Friction	Concrete/Grooved	
Maximum Runway Elevation (above MSL)		94.0'	
Runway Lighting		HIRL/CL/TDZL	
Runway Marking		Precision	
Item		**18R**	**36L**
End Elevations (MSL)		92.5'	91.2'
End Coordinates	Latitude	28°26'53.8561" N	28°24'55.0089" N
	Longitude	81°19'37.1093" W	81°19'35.8333" W
Runway Protection Zone (RPZ)	Length	2,500'	1,700'
	Width - Inner/Outer	1,000'/1,750'	1,000'/1,425'
Approach Lighting		MALSR	N/A
Runway Touch Down Zone Elevations (MSL)		94'	88'
FAR Part 77 Imaginary Surfaces	Approach Category	Precision, CAT I	Non-Precision
	Inner Approach Surface Slope	50:1	34:1
NAVAIDS	Electronic Navigation Aids	ILS, LOC, MM	N/A
	Visual Approach Aids	N/A	REIL, VASI-6
Approach Visibility Minimums (Cloud Ceiling/Visibility)	ILS CAT I	200'/1,800' RVR	N/A
	ILS CAT II	N/A	N/A
	ILS CAT IIIb	N/A	N/A
	RNAV/GPS	406'/1 MI.	407'/11/2 MI.
	VOR/DME	446'/1/2 MI.	507'/1 MI.
	VOR	446'/1/2 MI.	N/A

Source: URS, May 2004.

TABLE 2-4
EXISTING RUNWAY 17R/35L INFORMATION

Item		Runway 17R/35L	
Runway Length/Width/Shoulder Width		10,000'/150'/35'	
Airport Reference Code		D-V	
Critical Design Aircraft		B-747-200	
Effective Gradient (Percent)		0.04	
Percent Wind Coverage (20 kts/23 mph)		99.8%	
Runway Pavement	Strength (000 lbs.)	210 DG, 400 DT	
	Surface Type/Friction	Concrete/Grooved	
Maximum Runway Elevation (above MSL)		90.2'	
Runway Lighting		HIRL/CL/TDZL	
Runway Marking		Precision	
Item		**17R**	**35L**
End Elevations (MSL)		90.2'	86.7'
End Coordinates	Latitude	28°26'08.2009" N	28°24'29.1966" N
	Longitude	81°17'45.1655" W	81°17'44.1317" W
Runway Protection Zone (RPZ)	Length	2,500'	2,500'
	Width - Inner/Outer	1,000'/1,750'	1,000'/1,750'
Approach Lighting		ALSF-2	ALSF-2
Runway Touch Down Zone Elevations (MSL)		90'	88'
FAR Part 77 Imaginary Surfaces	Approach Category	Precision, CAT II	Precision, CAT IIIb
	Inner Approach Surface Slope	50:1	50:1
NAVAIDS	Electronic Navigation Aids	ILS, LOC, MM	ILS, LOC, MM
	Visual Approach Aids	N/A	PAPI-4
Approach Visibility Minimums (Cloud Ceiling/Visibility)	ILS CAT I	200'/1/2 MI.	200'/1/2 MI.
	ILS CAT II	100'/1200' RVR	100'/1200' RVR
	ILS CAT IIIb	N/A	0'/600' RVR
	RNAV/GPS	470'/1 MI.	372'/3/4 MI.
	VOR/DME	N/A	N/A
	VOR	N/A	N/A

Source: URS, May 2004.

TABLE 2-5
EXISTING RUNWAY 17L/35R INFORMATION

Item		Runway 17L/35R	
Runway Length/Width/Shoulder Width		9,000'/150'/35'	
Airport Reference Code		D-V	
Critical Design Aircraft		B-747-400	
Effective Gradient (Percent)		0.00	
Percent Wind Coverage (20 kts/23 mph)		99.8%	
Runway Pavement	Strength (000 lbs.)	210 DG, 750 DT	
	Surface Type/Friction	Concrete/Grooved	
Maximum Runway Elevation (above MSL)		89.7'	
Runway Lighting		HIRL, CL, TDZL	
Runway Marking		Precision	
Item		**17L**	**35R**
End Elevations (MSL)		89.7'	89.7'
End Coordinates	Latitude	28°26'37.3071" N	28°25'08.1985" N
	Longitude	81°16'57.2920" W	81°16'56.3785" W
Runway Protection Zone (RPZ)	Length	2,500'	2,500'
	Width - Inner/Outer	1,000'/1,750'	1,000'/1,750'
Approach Lighting		ALSF-2	ALSF-2
Runway Touch Down Zone Elevations (MSL)		90'	90'
FAR Part 77 Imaginary Surfaces	Approach Category	Precision, CAT II	Precision, CAT II
	Inner Approach Surface Slope	50:1	50:1
Approach Aids	Electronic Navigation Aids	ILS, LOC, MM	ILS, LOC, MM
	Visual Approach Aids	PAPI-4	PAPI-4
Approach Visibility Minimums (Cloud Ceiling/Visibility)	ILS CAT I	200'/1/2 MI.	200'/1/2 MI.
	ILS CAT II	100'/1200' RVR	100'/1200' RVR
	ILS CAT IIIb	N/A	N/A
	RNAV/GPS	390'/3/4 MI.	450'/1 MI.
	VOR/DME	N/A	N/A
	VOR	N/A	N/A

Source: URS, May 2004.

- **Landing Distance Available (LDA)** - the runway length declared available and suitable for a landing airplane.
- **Lighting** - is the type of runway edge and in pavement lighting installed on the runway.
  - **HIRL** is high intensity runway edge lighting and they are installed the full length of the runway and parallel to the edge of useable pavement. HIRL is the highest intensity runway edge lights that can be installed on a runway. Other runway light options include MIRL and LIRL, medium intensity runway lights and low intensity runway lights, respectively.
  - **CL** is centerline lights, which are mounted in the pavement along the runway centerline and are spaced at 50-foot intervals. When viewed from the landing threshold, the runway centerline lights are white until the last 3,000 feet of the runway. The white lights begin to alternate with red for the next 2,000 feet, and for the last 1,000 feet of the runway, all centerline lights are red.
  - **TDZL** is touchdown zone lights, which consist of two rows of transverse light bars disposed symmetrically about the runway centerline. The system consists of steady-burning white lights that start 100 feet beyond the landing threshold and extend to 3,000 feet beyond the landing threshold or to the midpoint of the runway, whichever is less.

- **Approach Lighting System (ALS)** - are a configuration of signal lights starting at the landing threshold and extending into the approach area a distance of 2,400 to 3,000 feet for precision instrument runways and 1,400 to 1,500 feet for non-precision instrument runways. Some systems include sequenced flashing lights, which appear to the pilot as a ball of light traveling towards the runway at high speed (twice per second). The ALS assists the pilot to transition from instrument flight to visual flight for landing by aiding in the identification and alignment with the runway. Operational requirements dictate the sophistication and configuration of the approach light system for a particular runway. FAA recognizes four ALS configurations to meet visual requirements for precision and non-precision approaches as follows:
  - **ALSF-2** is a 2,400-foot (720-meter) high intensity ALS with sequenced flashing lights. It is required for Category II (CAT II) and Category III (CAT III) precision approaches.
  - **MALSR** is a 2,400-foot (720-meter) medium intensity ALS with runway alignment indicator lights (RAILs). It is an economy ALS system approved for Category I (CAT I) precision approaches. The MALS portion of the system is 1,400 feet (420 meters) in length. The RAIL portion extends outward an additional 1,000 feet (300 meters).
  - **MALS** is a 1,400-foot (420-meter) medium intensity ALS. It enhances non-precision instrument and night visual approaches.
  - **MALSF** is a medium intensity ALS identical to the MALS above except that sequenced flashing lights are added to the outer three light bars. The sequenced flashing lights improve pilot recognition of the ALS when there are distracting lights in the airport vicinity.
- **Navigational Aids (NAVAIDs)** - includes electronic and visual air NAVAIDs, lights, signs, and associated supporting equipment.
  - **ASR** is airport surveillance radar. An ASR is an approach control radar designed to provide relatively short-range coverage in the general vicinity of an airport and to serve as an expeditious means of handling terminal area traffic through observation of precise aircraft locations on a radarscope. The ASR can also be used as an instrument approach aid for a non-precision approach. ASR provides range and azimuth information only and does not provide elevation data. Coverage of the ASR can extend up to 60 miles. MCO has an ASR-9 model on-site.
  - **DME** is distance measuring equipment. DME can be collocated as part of a VHF omni-directional range (VOR) or localizer facility. As its name implies it provides distance to the specific facility in nautical miles (NM).
  - **GPS** is Global Positioning System. GPS is sometimes referred to as Global Positioning Satellite System or Global Navigation Satellite System because it is a navigation system based on the use of satellites. GPS is a U.S. satellite-based radio navigational, positioning, and time transfer system operated by the Department of Defense. It is based on a system of 24 satellites. GPS equipment determines an aircraft's position by triangulation computations referenced off the satellite system's positions and then computes a navigational track for the aircraft based on the pilot's equipment setup and selection of a desired route of flight. GPS can be used for navigation on all segments of a flight; departure, en-route, arrival, terminal, and approach, but not all GPS equipment is certified by FAA for

navigation on all segments. Typically, a GPS unit is equipped with an updateable database of airports, navigational fixes, and approach procedures, which the pilot can retrieve from the system to setup the GPS equipment for navigation. Some departure and arrival procedures may not be found in a GPS database. If the procedure cannot be retrieved from the equipment's database, it cannot be flown using GPS.

Standard GPS signals provide navigation positioning accuracy to within a range of 1 to 100 meters. The position accuracy of GPS can be improved with the assistance of some ground based reference receiver stations. These receiver stations check the accuracy of a GPS satellite's measurement information and broadcast a correction factor to appropriately equipped aircraft. This correction and augmentation of GPS signals is referred to as Differential GPS. FAA is planning to implement a network of these correction stations for Differential GPS utilization on a wide-area and local-area basis and subsequently named Wide Area Augmentation System and Local Area Augmentation System, respectively.

- **ILS** is an Instrument Landing System. The ILS is considered a precision instrument approach procedure (IAP), which provides both vertical and horizontal guidance. The ILS is designed to provide an approach path for exact alignment and descent of an aircraft on final approach to a runway. The ground equipment consists of two highly directional transmitting systems, known as the localizer and glideslope transmitters, and along the approach, three (or fewer) marker beacons (outer marker, middle marker, and inner marker). The marker beacons provide range information or distance from the runway information. When an aircraft passes over a beacon, the pilot will receive cockpit indications as passage occurs providing the pilot with distance from the landing runway. The ILS is certified for specific weather minimums and is so designated as a CAT I, CAT II, or CAT III approach. The lowest landing weather minimums for a CAT I approach are a 200-foot ceiling and 1,800-foot visibility, for a CAT II approach they are a 100-foot ceiling and 1,200-foot visibility, and for a CAT IIIb approach they can be as low as zero ceiling and zero visibility.

- **IM** is the inner marker beacon, normally referred to as the "inner marker." Marker beacons have a rated power output of 3 watts or less and an antenna array designed to produce an elliptical pattern with dimensions, at 1,000 feet above the antenna, of approximately 2,400 feet in width and 4,200 feet in length. The IM will indicate a point at which an aircraft is at a designated decision height (DH) on the glide path between the middle marker (MM) and landing threshold.

- **MM** is the middle marker beacon, normally referred to as the "middle marker." The MM indicates a position approximately 3,500 feet from the landing threshold. This is also the position where an aircraft on the glide path will be at an altitude of approximately 200 feet above the elevation of the touchdown zone.

- **OM** is the outer marker beacon, normally referred to as the "outer marker." The OM is located off-airport and indicates a position at which an aircraft at the appropriate altitude on the localizer course will intercept the ILS glide path. Runway 18R is served by an outer marker designated at the "Toffe" intersection.

- **PAPI** (Precision Approach Path Indicator) provides visual approach slope guidance. On runways not provided with electronic guidance, the light signals are

beneficial in aiding the pilot of an aircraft to determine the correct glide slope. The presence of objects in the approach area may present serious hazard if an aircraft descends below the normal approach path offered by the PAPI guidance. Runway 17L/35R is currently served by PAPIs at each end. Future PAPIs are planned for all other runways.

- **RVR** is runway visual range. The RVR transmissometer equipment that is installed adjacent to a runway and is capable of determining the visibility for a specific section of the runway, such as touchdown, midfield, and rollout portions of the runway. The determined visibility represents the horizontal distance a pilot in a moving aircraft should see looking down the runway. RVR is horizontal visual range, not slant visual range. RVR is used in lieu of prevailing visibility in determining weather minimums for a particular runway.

- **TDWR (Terminal Doppler Weather Radar)** is a specialized radar purposely built to serve the terminal area of the airport. Its mission is to detect windshear and microburst associated with convective storms, so as to enhance the safety of aircraft landing and taking off from MCO. The radar is strategically located off-airport so that it has a clear view of the approach and departure areas for each runway.

  The TDWR is specially designed to operate in a high clutter environment normally present in the vicinity of airports. It makes use of a variety of methods to minimize clutter and to eliminate the influence of such moving targets such as birds, aircraft, and automobiles. In this way, TDWR can accurately measure the radial wind speed and its fluctuation from which low level windshear can be computed. Equipped with sophisticated computer programs, TDWR is able to automatically detect thunderstorm-induced windshear phenomena.

- **VASI** is visual approach slope indicator. The VASI is a system of lights so arranged to provide visual descent guidance information during the approach to a runway. These lights are visible from 3 to 5 miles during the day and up to 20 miles or more at night. The visual glide path of the VASI provides safe obstruction clearance within plus or minus 10 degrees of the extended runway centerline and to 4 NM from the runway threshold. Descent using the VASI should not be initiated until the aircraft is visually aligned with the runway. Most VASI installations consist of 2 light bars, near and far, and may consist of 2, 4, or 12 light units. Some VASIs consist of 3 bars, near, middle, and far, which provide an additional visual glide path to accommodate high cockpit aircraft. The light bars emit a directional pattern of high intensity red and white focused light beams, which indicate via color combinations the position of the aircraft to the desired glide path (normally set at 3 degrees and coincidental with the ILS glide path). To a pilot, these beams appear to be one on top of the other and indicate the following: the aircraft is "on path" if the pilot sees red over white, "above path" if white over white, and "below path" if red over red. The 3-bar VASIs provide two visual glide paths to the same runway. The lower glide path is provided by the near and middle bars and is normally set at 3 degrees while the upper glide path, provided by the middle and far bars, is normally 0.25 degrees higher. This higher glide path is intended for use only by high cockpit aircraft to provide a sufficient threshold crossing height. Although normal glide path angles are 3 degrees, angles at some locations may be as high as 4.5 degrees to give proper obstacle clearance.

- **VOR** is VHF omni-directional range. The word "omni" means all, and an omni directional range is a VHF radio transmitting ground station that projects straight line courses (radials)

from the station in all directions. From a top view, it can be visualized as being similar to the spokes from the hub of a wheel. Appropriately equipped aircraft can fly selected radial courses to or from the VOR station. The VOR can be used as part of a non-precision IAP, where a selected radial is flown to a specific airport or runway. MCO is served by a VORTAC facility that has collated TACAN navigation equipment for exclusive use by the military. The VORTAC facility is located at ORL.

2.4.1.2 Taxiways

MCO has a series of parallel and connecting taxiways that provide access between the passenger terminal, Fixed Base Operators (FBOs), corporate hangars, cargo ramps, maintenance facilities, and each runway. Figure 2-5 depicts the existing taxiway layout at MCO (taxiways are depicted in dark green).

Taxiway A parallels Runway 18R/36L and is located 787 feet west of the runway (centerline-to-centerline). This taxiway provides access to the Tradeport North, Central, and alert area ramp areas on the west side of the airfield, which is home to the FBOs, cargo and general aviation maintenance facilities, and corporate hangars. Taxiways A1, A2, and A3 are connector taxiways off Taxiway A to Runway 18R/36L. Taxiway A has been scaled off the 1995 ALP at 50 feet in width, which meets Airplane Design Group (ADG) III standards as defined in FAA Advisory Circular (AC) 150/5300-13, Change 7.

Taxiway B has 11 taxiway connections. Taxiway B parallels Runway 18L/36R and is located 700 feet east of the runway, measured centerline to centerline. Taxiway B1 is a connector taxiway between Runway 18R and Runway 18L and parallel Taxiways B and C. Taxiway B2 is a connector and bypass taxiway between Runway 18L and parallel Taxiways B and C. Taxiways B4, B5, B6, and B7 are connector taxiways providing access to Airsides 1 and 3 from the parallel Taxiways B and C and Runway 18L/36R. Taxiways B6 and B7 provide high-speed exits for Runway 18L, which help reduce runway occupancy time for arrival aircraft and expedite taxi to the terminal areas. Likewise, Taxiway B5 is a high-speed exit for Runway 36R. Taxiway B9 is a bypass taxiway for Runway 36R. Taxiway B10 interconnects Runways 36L and 36R as well as functioning as a connector taxiway for Taxiway B.

Taxiway C is a parallel taxiway referred to as an "inner" taxiway since it is located closest to the Landside Terminal on the inside of Taxiway B. It is located 300 feet to the east of Taxiway B (centerline-to-centerline) for that portion of the taxiway located to the north of Taxiway J. To the south of Taxiway J, the taxiway spacing between Taxiways B and C increases to 500 feet. Taxiway C shares connector Taxiways B1, B2, B4, B5, B6, and B7 with Taxiway B, which provides access to Runways 18L/36R and 18R/36L and Airsides 1 and 3.

Taxiway E provides a south crossfield taxiway, connecting the east and west sides of the airfield. It provides a high-speed exit for Runways 18R and 18L with access to Airsides 3 and 4. It runs parallel and to the inside of Taxiway F. Spacing between the two taxiways is 300 feet, measured centerline to centerline. Connector taxiways E1, E2, and E3 provide access to Airside 3 and Taxiway F. Connector taxiways E4 and E5 provide access to Airside 4 and Taxiway F.

Taxiway F is part of the south crossfield taxiway system. It provides access to parallel Taxiways B and G and, by way of the connector taxiways of Taxiway E, access to Airsides 3 and 4.

Taxiways G and H are parallel taxiways for Runway 17R/35L. Taxiway G is considered the interim taxiway because it is closest to the airsides. Taxiway H is located 400 feet to the west of Runway 17R/35L and 300 feet to the east of Taxiway G, measured centerline-to-centerline. Connector taxiways G1, H1, and H2 provide access to Runway 17R/35L and Airside 2. Taxiway H2 also serves as a bypass taxiway for Runway 17R. Connector taxiways H3 and H4 provide access to

Airside 4. Connector taxiways H4 and H5 are considered high-speed exits for Runway 35L. Connector taxiways H6, H7, and H8 are considered high-speed exits for Runway 17R.

Taxiway J is the north crossfield taxiway that provides separation of aircraft flow and assists in the reduction of taxi times.

Taxiway K is located to the east of Runway 17R/35L. It provides access to Taxiway L and the Comair Airlines maintenance facility.

Taxiway Y is located between Runways 18R/36L and 18L/36R. Taxiway Y is used as an exit taxiway for Runway 18R/36L. An aircraft upon crossing Runway 18L/36R from Taxiway Y will have access to Taxiways B6 and B5, which provide access to Airsides 1 and 3. Taxiway Z bisects Taxiway Y. Taxiway Z provides aircraft access to Taxiways J or E, which permits the aircraft to utilize the north crossfield or south crossfield taxiway systems, respectively.

All taxiways, unless noted above, are a minimum of 75 feet wide (FAA AC150/5300-13/ADG IV and V) and lighted with Medium Intensity Taxiway Lights (MITL). Pending the implementation of the pavement maintenance management plan, information on the construction make up and composition of MCO taxiways can be found in the October 1995 Master Plan, Section II, Airfield Development.

2.4.1.3 Ramp Areas

There are nine aircraft ramp areas at MCO, as depicted on Figure 2-5 (areas in light green). Each airside has an associated ramp area for the parking of air carrier aircraft at specific gate locations. The Tradeport Apron (West Ramp) accommodates general aviation, cargo, and corporate/business aircraft. Rehabilitation of the West Ramp was completed in April 1995. The Alert Area Ramp is used by aircraft maintenance facilities and airport operations staff. The Northwest Terminal Support Area (NWTSA) ramp area is used primarily for cargo operations. There are also three other aircraft maintenance company related aprons at OIA. Information on the construction and composition of MCO ramp areas can be found in the October 1995 OIA Master Plan, Section II, Airfield Development and the February 2002 OIA Pavement Maintenance Management Plan.

2.4.1.4 Helipads

MCO has two designated helipads on the airport, as depicted on Figure 2-5. One helipad is located on the Tradeport side on the north end of the West Ramp and is 44 feet by 44 feet. The other helipad is a 40-foot by 40-foot pad located on the Terminal rooftop that is for special use. The terminal-top heliport is only available with prior approval from Airfield Operations. This approval is normally given to Federal, state, and local law enforcement and military operations.

2.4.2 EXISTING BUILDING FACILITIES

The following paragraphs are descriptive narratives of buildings located within the boundaries of MCO. An inventory of building facilities is presented in Table 2-6. See Figure 2-6 for locations of these facilities.

2.4.2.1 Existing North Terminal Complex Facilities

In total, the North Terminal Complex primarily consists of five buildings which contain approximately 4.4 million square feet of space. The North Terminal Complex is located on 854 acres of the 23-square-mile site owned by MCO. The 23-square-mile site gives MCO the third largest

State Road 417 (Central Florida GreeneWay) - State Road 417 is a four-lane limited access toll road that extends from I-4 on the south side of Orlando and terminates at I-4 in northern Seminole County. This toll facility serves as the beltway around the eastern side of the Orlando Metropolitan Statistical Area (MSA) and provides direct access to MCO through a full interchange at Boggy Creek Road south of the airport. Additional access is provided through an interchange at Narcoosee Road northeast of the airport. The segment of State Road 417 between Curry Ford Road and State Road 528 carried approximately 30,500 vpd in 2000. The segment of State Road 417 between State Road 528 and Narcoosee Road carried approximately 15,600 vpd in 2000.

Conway Road - Conway Road is a two-lane north-south arterial that begins at an interchange with State Road 408 (East-West Expressway) and extends to the State Road 528/Tradeport Drive interchange. Conway Road becomes Tradeport Drive south of State Road 528. AADT for Conway Road was obtained from the *Orange County Annual Traffic Count Report* (2001). The segment of Conway Road just north of State Road 528 between Judge Road and McCoy Road carried approximately 13,000 vpd in 2001.

State Road 436 (Semoran Boulevard) - State Road 436 is a four-lane north-south principal arterial located on the east side of the Orlando MSA. It serves as the primary access roadway for MCO, with a direct access interchange with State Road 528 and Airport Boulevard. State Road 436 provides access to numerous commercial, residential, and industrial developments in southeastern Orange County. State Road 436 is currently under construction to be widened to six lanes from Curry Ford Road south to State Road 528. This project is anticipated to be completed in 2005. The segment of State Road 436 just north of State Road 528 carried approximately 41,000 vpd in 2000.

State Road 551 (Goldenrod Road) - State Road 551 is a north-south four-lane divided arterial serving eastern Orange County. State Road 551 extends from Aloma Avenue (State Road 426) south, intersects with State Road 15, and continues to Heintzelman Boulevard on airport property. State Road 551 links with State Road 528 just north of the airport. The segment of State Road 551 just north of State Road 15 carried approximately 28,000 vpd in 2000.

2.4.3.2 On-Airport Roadway System

There is an extensive on-site roadway system serving MCO. The on-site system serves airport passenger traffic, service vehicles, air cargo facilities, the Hyatt Regency Hotel, and employees. The passenger traffic is further subdivided into various modes and types of trips such as rental cars, parking, curbside, and commercial vehicles. Figure 2-17 (also see Appendix C) illustrates the on-site roadway system serving the airport. The following summarizes the existing on-site roadway system and functions.

The latest traffic count data were obtained for the on-airport roadways described below. The available data consists of peak season average daily traffic volumes summarized in the *Orlando International Airport Easter 2000 Peak Season Daily Traffic Counts* (HDR, 2000).

Airport Boulevard - Passenger access to the terminals is supported by Airport Boulevard, a multi-lane one-way roadway that circles the North Terminal. Southbound Airport Boulevard provides one-way access between the State Road 528/State Road 436/Airport Boulevard interchange (north of the airport) and South Access Road (south of the North Terminal) with connections to Cargo Road and Terminals A and B. Northbound Airport Boulevard provides one-way access between South Access Road (south of the North Terminal) and the State Road 528/State Road 436/Airport Boulevard interchange (north of the airport) with connections to Terminals A and B and Cargo Road. The segment of Airport Boulevard immediately south of the State Road 528 interchange carried approximately 62,800 vpd in 2000.

Loop Circulation System/Curbside Roadways - The internal airport loop circulation system provides access to, from, and the return to the two sides of the Landside terminal (A and B). The terminal access is provided via ramps from Airport Boulevard to the terminal curbside roadways and the parking areas.

There are three curbside roadways along the front faces of Terminals A and B. The third level roadway serves departing (enplaning) passengers. This four-lane facility permits private vehicles to drop passengers at the curbside for check-in procedures. The second level roadway serves the arriving (deplaning) passengers. This four-lane facility provides for passenger pick up by private vehicles outside of the baggage claim area of the terminals. The lowest level is a commercial curb that accommodates commercial vehicles picking up passengers. The commercial curb provides for charter buses and rental car buses to pick up arriving passengers.

A fourth curbside serves both Terminals A and B from the same roadway. The fourth curb provides for taxi pick up of passengers exiting the terminal area. The fourth curb is temporarily closed for security restrictions. Taxicab operations were relocated to the commercial curb.

The roadway volumes on the curbside roadways vary widely by time of day. In addition, vehicles park temporarily on these roadways to discharge or pick up passengers. Therefore, the queue space for stopped vehicles is a critical component for the design of these roadways, rather than the actual volume using the roadway.

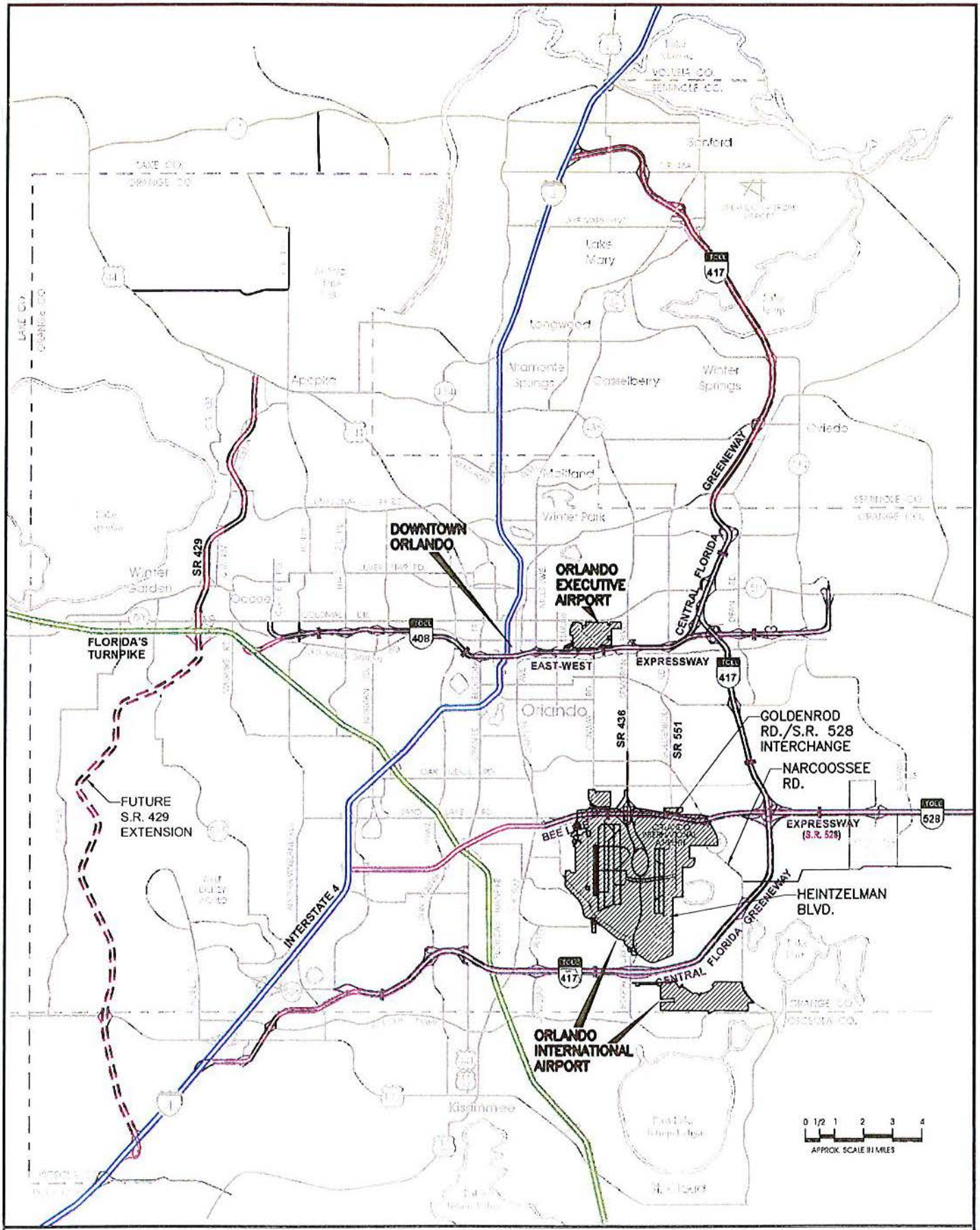
South Access Road - South Access Road is a two-lane undivided roadway that provides access from Airport Boulevard south of the existing terminal complex to the State Road 417/Boggy Creek Road interchange on the south side of the airport. South Access Road links with Heintzelman Boulevard south of the existing terminal. The segment of South Access Road between the North Terminal and Heintzelman Boulevard carried approximately 18,400 vpd in 2000.

Bear Road - This is an east-west two-lane collector roadway that extends from Tradeport Drive east of the Gold satellite parking lot and then eastward and south to Cargo Road. Bear Road provides access to support facilities located in the NWTSA area of the airport as well as an alternative access to the Blue Satellite Parking lot. In 2000, Bear Road carried approximately 6,800 vpd east of Tradeport Drive and 6,650 vpd north of Cargo Road near the Blue Satellite Parking area.

Cargo Road - Cargo Road is the major east-west roadway across the northern portion of the airport. It provides on-site circulation for trips within the airport property as well as an access route for the Blue Satellite Parking lot and the employee parking area. This four-lane divided roadway has full interchanges with northbound and southbound Airport Boulevard north of the existing terminal complex. In 2000, Cargo Road carried approximately 10,400 vpd near the Blue Satellite Parking lot, approximately 12,600 vpd near Airport Boulevard, and approximately 6,050 vpd east of the employee parking area.

Tradeport Drive - Tradeport Drive is a four-lane divided roadway that begins at an interchange with State Road 528 in the north, intersects with Boggy Creek Road in the southwest quadrant of airport property, and extends to Orange Avenue. Tradeport Drive provides access to service facilities located at the NWTSA to the west side of the airport. The segment of Tradeport Drive between State Road 528 and Bear Road carried approximately 22,400 vpd in 2000.

Heintzelman Boulevard - Heintzelman Boulevard (open to traffic in 2003) is a north-south roadway that extends from Goldenrod Road and runs southwest to its interchange with South Access Road. This four-lane divided roadway provides additional access from the east to the airport. The *Orlando International Airport Easter 2003 Peak Season Daily Traffic Counts* (HDR, 2003) showed that Heintzelman Boulevard carried approximately 3,900 vpd north of Cargo Road in 2003.



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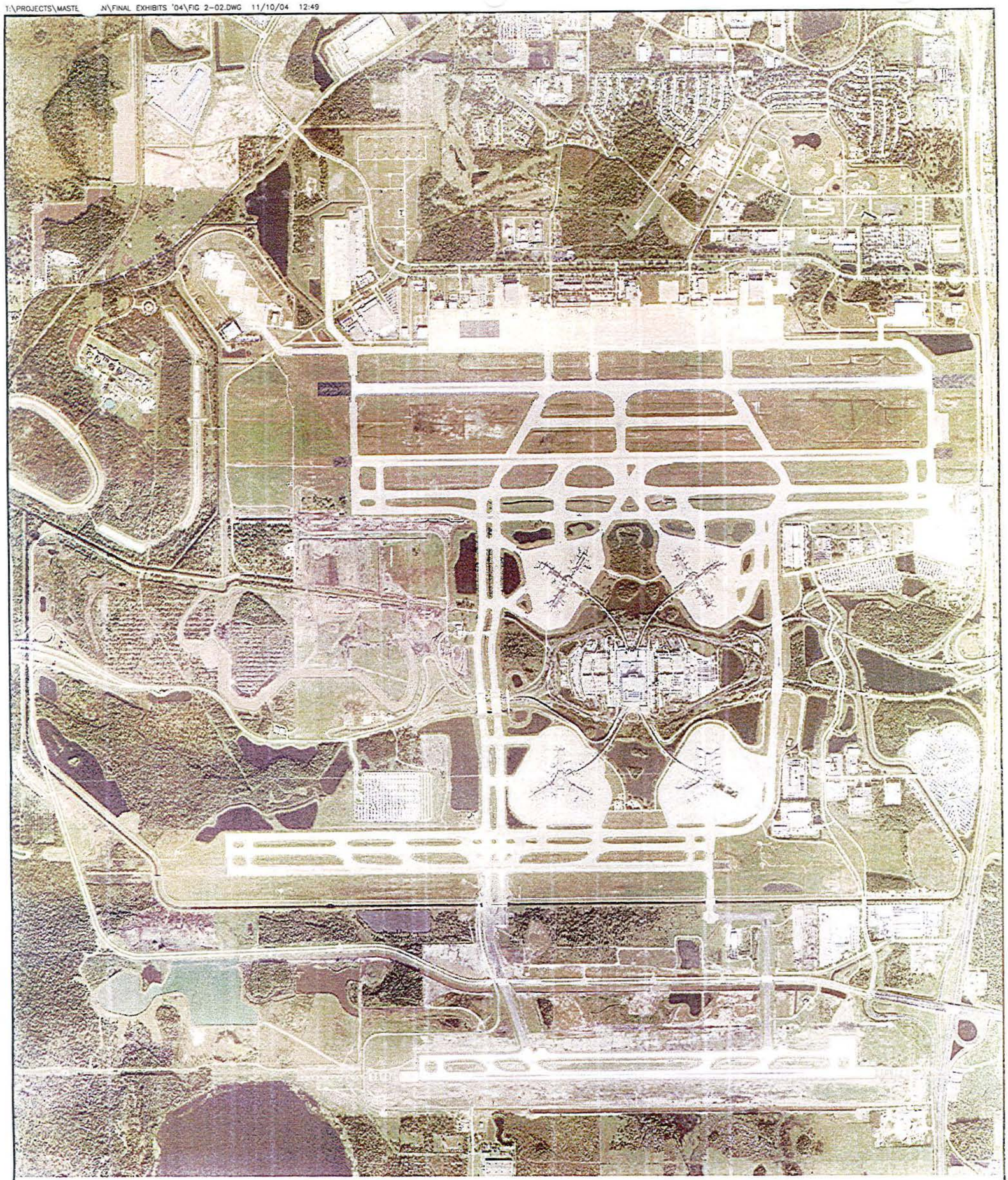
EXISTING REGIONAL ROADWAY SYSTEM

FIGURE: 2-16

T:\PROJECTS\MASTER FINAL EXHIBITS '04\FIG 2-16.DWG 12/10/04 08:50

T:\PROJECTS\MASTE .N\FINAL EXHIBITS '04\FIG 2-02.DWG 11/10/04 12:49



DATE OF AERIAL PHOTOGRAPH, JULY 03, 2004

2000 0 2000
GRAPHIC SCALE IN FEET

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FIGURE: 2-2

EXISTING AERIAL PHOTOGRAPH

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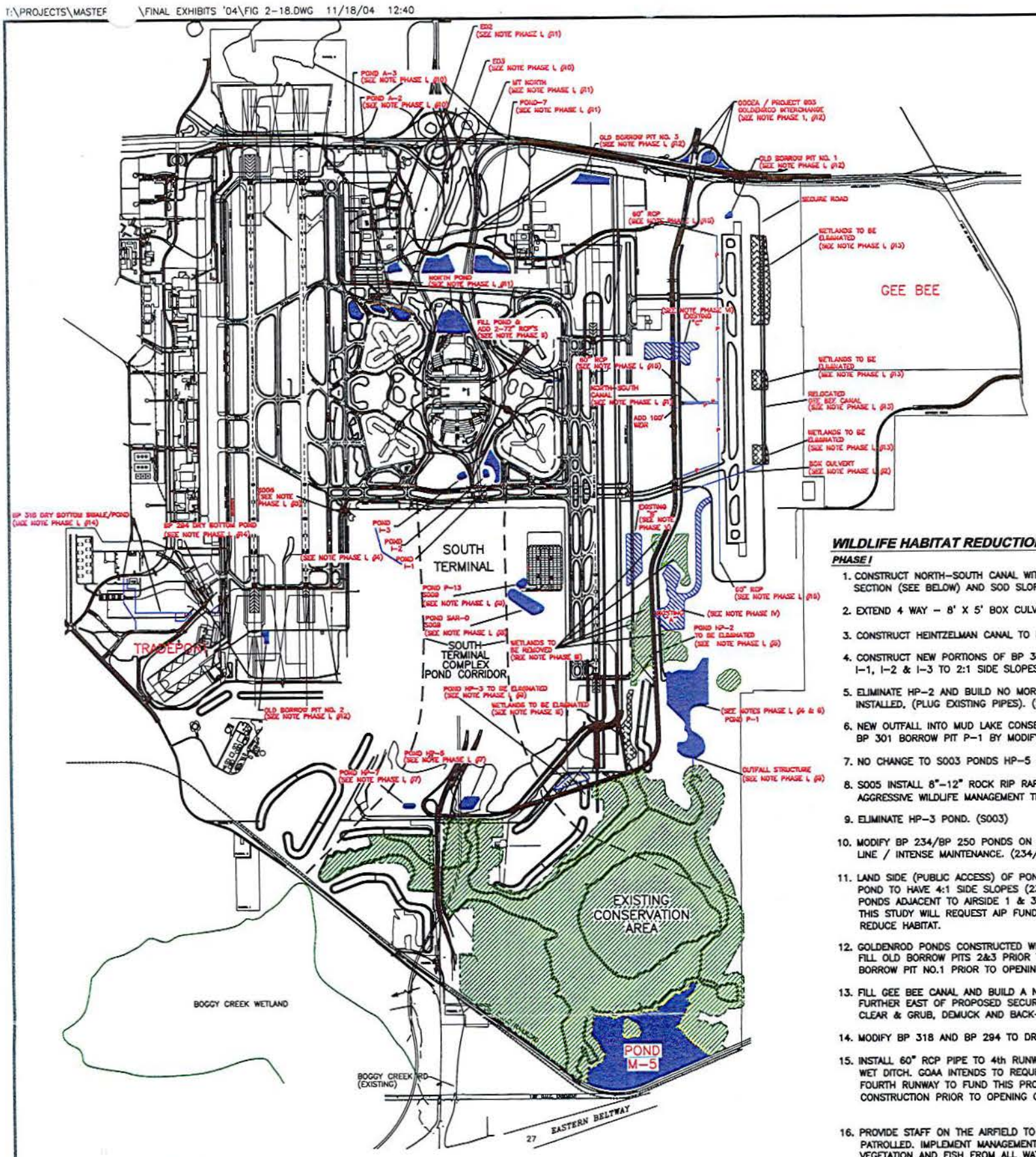
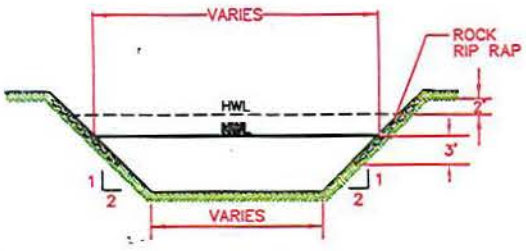
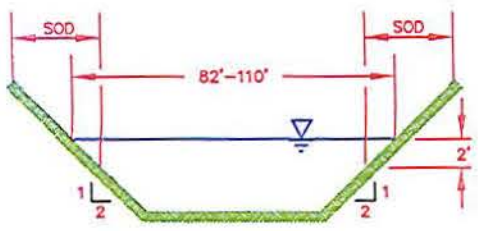
T:\PROJECTS\MASTEF \FINAL EXHIBITS '04\FIG 2-18.DWG 11/18/04 12:40





TYPICAL ROCK RIP RAP POND DESIGN
N.T.S.



NORTH-SOUTH/GEE BEE CANAL
N.T.S.

PROJECT REFERENCE TABLE

THE FOLLOWING NINE PROJECTS ARE COVERED BY THIS ALP APPROVAL

PROJECTS	APPLICABLE NOTES
1. FOURTH RUNWAY PROGRAM	2,4,6,13,15,16,17,18,19, NOTE: PHASES II – VI
2. HEINTZELMAN BOULEVARD	1,3,5,7,9,16,17, NOTE: PHASES II – VI
3. GOLDENROD ROAD EXTENSION AND INTERCHANGE	12,16
4. NORTH CROSSFIELD TAXIWAY	10,11,16,19
5. MID-CROSSFIELD TAXIWAYS BRIDGES AND RELATED IMPROVEMENTS	4,16,20
6. SOUTH TRADEPORT INFRASTRUCTURE (FEDERAL EXPRESS PROJECT)	14,16
7. TAXIWAY "C" EXTENSION	8,16,20
8. SATELLITE (RED) PARKING LOT	8,16
9. RCA QTA EXPANSION PARKING AREAS	16,17

WILDLIFE HABITAT REDUCTION / MITIGATION AGREEMENT:

PHASE I

1. CONSTRUCT NORTH-SOUTH CANAL WITH 2:1 SIDE SLOPES PER NEW CROSS SECTION (SEE BELOW) AND SOD SLOPES. (S003)
2. EXTEND 4 WAY – 8' X 5' BOX CULVERT (DESIGNED FOR AIRCRAFT LOADING). (301)
3. CONSTRUCT HEINTZELMAN CANAL TO POND P-1 TO CIRCUMVENT HP-2. (S003)
4. CONSTRUCT NEW PORTIONS OF BP 301 BORROW PIT P1 & BP S002 PONDS I-1, I-2 & I-3 TO 2:1 SIDE SLOPES AND SOD SLOPES. (301 & S002)
5. ELIMINATE HP-2 AND BUILD NO MORE CROSS DRAINS FOR 72" RCP; 2 OF 6 INSTALLED. (PLUG EXISTING PIPES). (S003)
6. NEW OUTFALL INTO MUD LAKE CONSERVATION AREA WILL BE OUT OF THE BP 301 BORROW PIT P-1 BY MODIFYING BP 301 OUTFALL STRUCTURE. (301)
7. NO CHANGE TO S003 PONDS HP-5 & HP-7. (S003)
8. S005 INSTALL 8"-12" ROCK RIP RAP TO SIDE SLOPES AND IMPLEMENT AGGRESSIVE WILDLIFE MANAGEMENT TECHNIQUES. S009 NO CHANGE.
9. ELIMINATE HP-3 POND. (S003)
10. MODIFY BP 234/BP 250 PONDS ON AOA SIDE SLOPES TO 2:1. SOD TO WATER LINE / INTENSE MAINTENANCE. (234/250 – PONDS A2, A3, & E03)
11. LAND SIDE (PUBLIC ACCESS) OF PONDS E02, MT NORTH, POND 7 AND NORTH POND TO HAVE 4:1 SIDE SLOPES (234/250). THE AUTHORITY WILL STUDY EXISTING PONDS ADJACENT TO AIRSIDE 1 & 3 AS MITIGATION AND BASED UPON THE RESULTS OF THIS STUDY WILL REQUEST AIP FUNDING TO IMPLEMENT RECOMMENDATIONS TO REDUCE HABITAT.
12. GOLDENROD PONDS CONSTRUCTED WITH 2:1 SIDE SLOPES WITH 8"-12" ROCK RIP RAP. FILL OLD BORROW PITS 2&3 PRIOR TO OPENING OF INTERCHANGE. FILL OLD BORROW PIT NO.1 PRIOR TO OPENING OF 4TH RUNWAY. (OOCEA 903)
13. FILL GEE BEE CANAL AND BUILD A NEW CANAL WITH 2:1 SIDE SLOPES (SOD) FURTHER EAST OF PROPOSED SECURE ROAD. MITIGATE LOSS OF WETLANDS, AND CLEAR & GRUB, DEMUCK AND BACK-FILL WITH SUITABLE MATERIAL. (316)
14. MODIFY BP 318 AND BP 294 TO DRY PONDS. (318/294 – TRADEPORT ALERT AREA)
15. INSTALL 60" RCP PIPE TO 4th RUNWAY DRAINAGE CANAL TO REPLACE BP-301 WET DITCH. GOAA INTENDS TO REQUEST AN AMENDMENT TO THE LOI FOR THE FOURTH RUNWAY TO FUND THIS PROJECT. GOAA INTENDS TO COMPLETE CONSTRUCTION PRIOR TO OPENING OF THE FOURTH RUNWAY.
16. PROVIDE STAFF ON THE AIRFIELD TO ENSURE WETLAND HABITAT IS ADEQUATELY PATROLLED. IMPLEMENT MANAGEMENT TECHNIQUES INCLUDING REMOVAL OF VEGETATION AND FISH FROM ALL WATER BODIES. AUTHORITY HAS ADDED WILDLIFE BIOLOGIST STAFF POSITION AS OF SEPTEMBER 2000. ALL FUTURE PONDS WITH NO RIP RAP WILL REQUIRE AGGRESSIVE WILDLIFE MANAGEMENT TECHNIQUES UP TO THE WATER EDGES.
17. DESIGN AND CONSTRUCT THE EAST AIRFIELD DRAINAGE SYSTEM TO ONLY TREAT DEVELOPMENT RUNOFF FROM THE 4th RUNWAY, HEINTZELMAN BOULEVARD AND THE AREA WHICH IS CURRENTLY DEVELOPED OR BEING NEGOTIATED FOR DEVELOPMENT IN THE MID FIELD AREA (i.e. AVIS, NATIONAL RENT-A-CAR) UNTIL SUCH TIME AS THE FDOT/FAA PILOT STUDY IS COMPLETED.
    - A. IF STUDY SHOWS ACCEPTABLE LEVEL OF QUALITY, MODIFY THE DESIGN/PERMITS TO TRANSFER THE WATER QUALITY TREATMENT TO THE MID FIELD AREA.
    - B. IF THE PILOT STUDY POLLUTANT LEVELS INDICATE ADDITIONAL NEEDED TREATMENT, MODIFY THE DESIGN/PERMITS TO ADD TREATMENT FOR FULL DEVELOPMENT WITHIN THE MID FIELD AREA IN POND P-1.
    - C. IF DEVELOPMENT WITHIN THE MID FIELD AREA OCCURS PRIOR TO COMPLETION OF THE PILOT STUDY, (i.e. RENTAL CAR FACILITIES) EACH SITE WILL HAVE TO PROVIDE ON-SITE WATER QUALITY TREATMENT FACILITIES IN ACCORDANCE WITH THE FAA ADVISORY CIRCULAR.
    - D. UTILIZE DESIGN CRITERIA, AS AUTHORIZED BY CHAPTER 62-40 F.A.C. TO (POND P-1). REDUCE AERIAL EXTENT OF WATER QUALITY TREATMENT FACILITIES. WATER QUALITY MASS BALANCE MODELS WILL BE UTILIZED TO DEMONSTRATE AT LEAST 80% REDUCTION OF THE AVERAGE ANNUAL LOAD OF POLLUTANTS THAT WOULD CAUSE OR CONTRIBUTE TO VIOLATIONS OF STATE WATER QUALITY STANDARDS.
18. REMOVE 3.2± ACRES WETLAND EAST OF POND P-1 AND SOUTH OF 4th RUNWAY.
19. UTILIZE BORROW PIT (M-5) TO PROVIDE FILL SOURCE FOR BACK-FILLING PONDS A & B, COMAIR POND AND AIRSIDE POND. (SEE PHASES II – VI BELOW)
20. IN CONCEPT, THE NEW PONDS LOCATED IN THE NORTH AND SOUTH TERMINAL CENTRAL CORE AREA WILL USE 2:1 SODDED SIDE SLOPES AND WILL REQUIRE INTENSIVE WILDLIFE MANAGEMENT TECHNIQUES. NEW PONDS IN THE SOUTH TERMINAL COMPLEX SHOULD BE LOCATED IN THE "POND CORRIDOR" AS SHOWN ON THE ALP. PONDS OUTSIDE THIS AREA AND NEAR OPERATIONAL AREAS AND APPROACHES, WILL BE 2:1 SLOPE WITH ROCK RIP RAP.

NOTE:

AS MITIGATION FOR THE HEINTZELMAN CANAL, GEE BEE CANAL AND POND P-1 CONSTRUCTION, THE FOLLOWING PROJECTS PHASES II – VI WILL BE ACCOMPLISHED AND FUNDING WILL BE REQUESTED THRU AIP AND PFC OVER NEXT 3 YEARS.

PHASE II

FILL CONVEYANCE POND BETWEEN A/S 2 AND 4 & ADD 72" RCP TO DRAIN.

PHASE III

REMOVE REMNANT WETLANDS (51.14 ACRES).

PHASE IV

FILL STILLING BASIN "A".

PHASE V

FILL 3rd RUNWAY BORROW PIT (B).

PHASE VI

FILL COMAIR POND (C).

THIS ALP CHANGE APPROVAL SATISFIES SPECIAL CONDITIONS OR DETERMINATIONS AS FOLLOWS:

1. DETERMINATION FOR PFC APPLICATION NO. 00-08-C-00-MCO, DATED JULY 19, 2000, (PAGE 6).

2. GRANT AGREEMENT DATED AUGUST 8, 2000, FOR PROJECT NUMBER 3-12-0057-6100.

SUBMITTED BY:	DATE:
SIGNATURE ON FILE	01/18/01
GOAA EXECUTIVE DIRECTOR	

ORLANDO INTERNATIONAL AIRPORT ALP SUPPLEMENT DEPICTING SPECIFIC DRAINAGE FACILITY LOCATION AND CONSTRUCTION, SUBJECT TO THE WILDLIFE HABITAT REDUCTION / MITIGATION AGREEMENT HERE IN:

APPROVED BY:	DATE:
SIGNATURE ON FILE	01/19/01
ORLANDO AIRPORT DISTRICT OFFICE (FEDERAL AVIATION ADMINISTRATION)	

FIGURE: 2-18

EXISTING ORLANDO INTERNATIONAL AIRPORT LAYOUT PLAN SUPPLEMENT (DRAINAGE)

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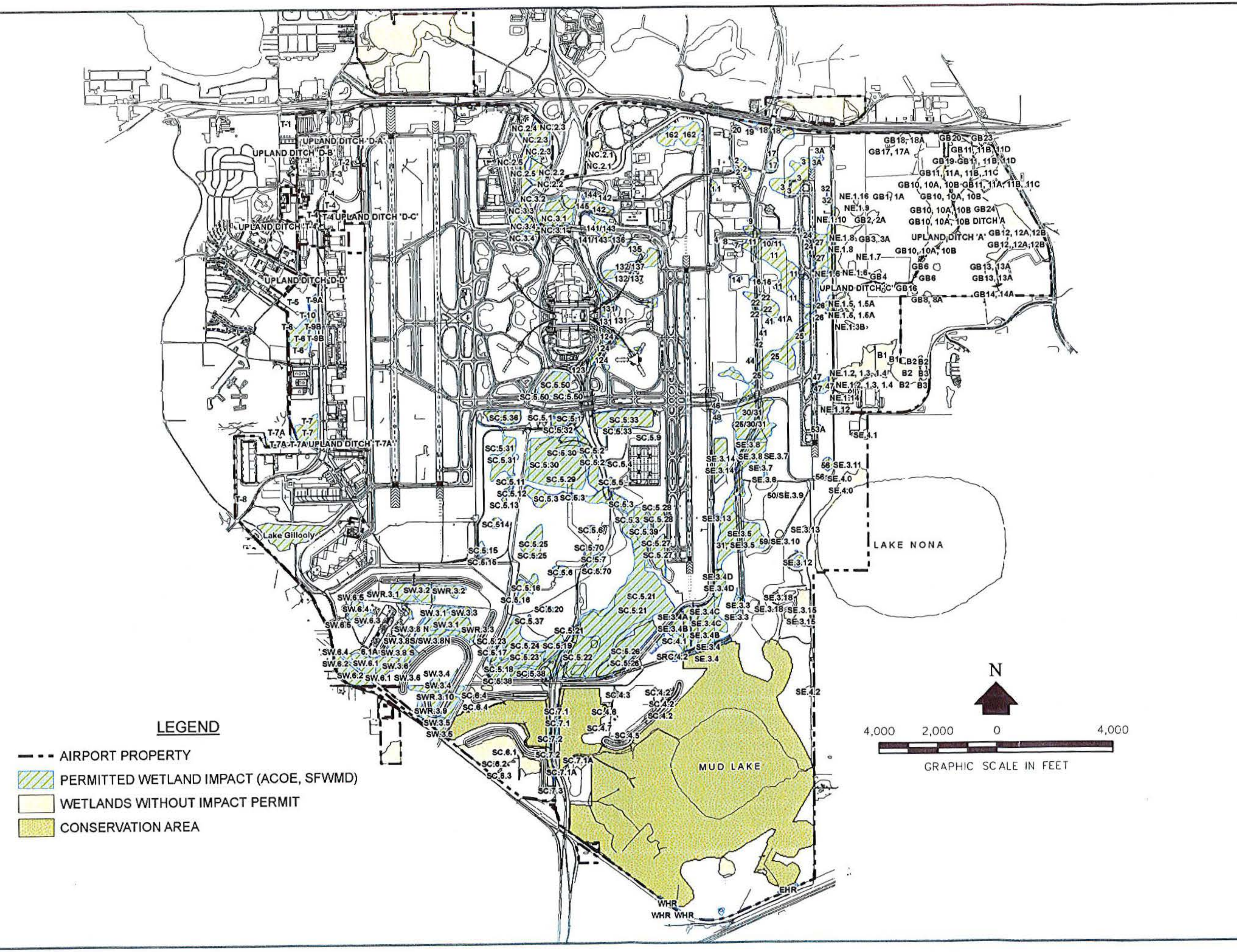

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WETLANDS & CONSERVATION AREAS

FIGURE: 2-19

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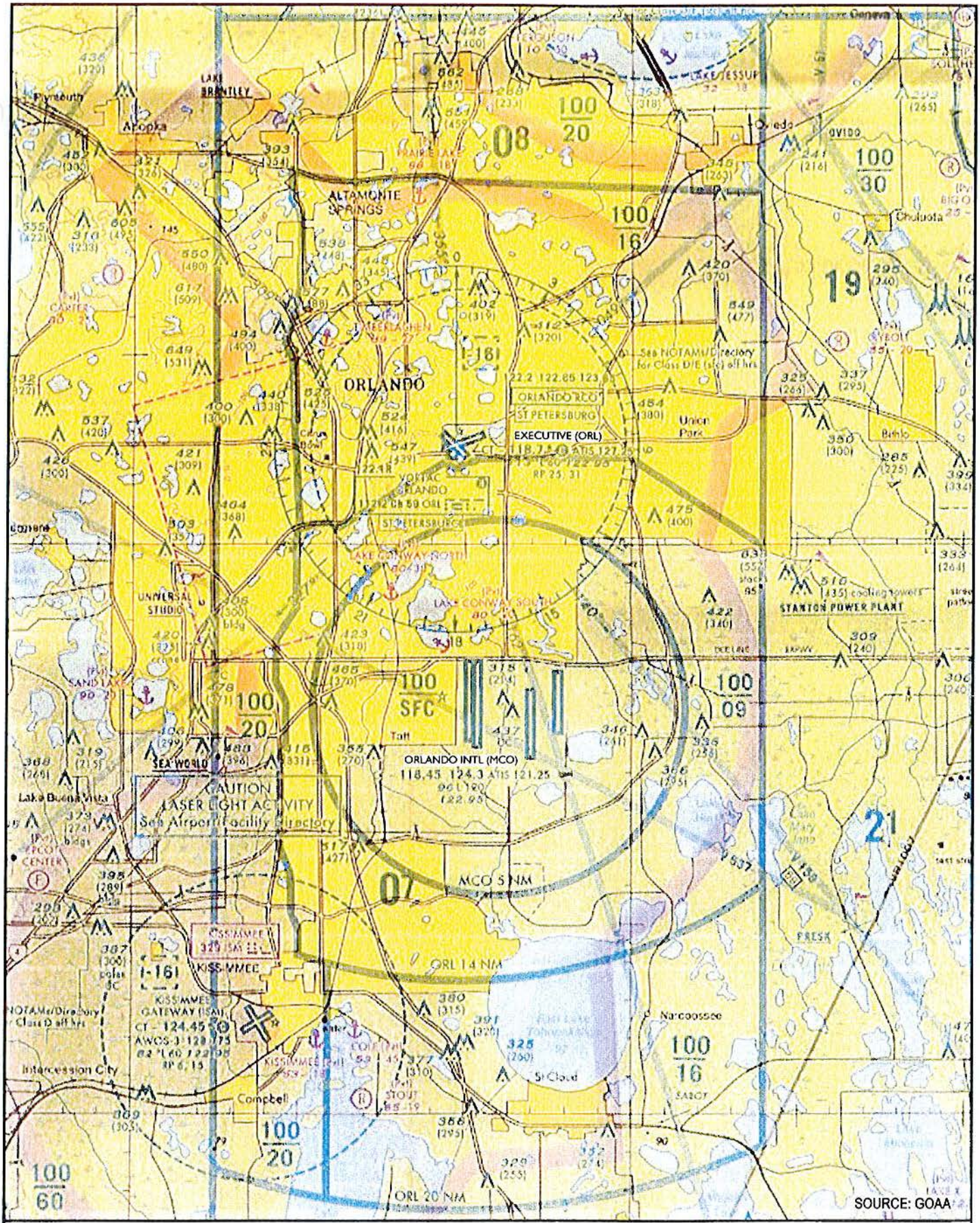

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ORLANDO AREA AIRSPACE (VFR TERMINAL AREA AERONAUTICAL CHART - AUGUST 2004)

FIGURE: 2-20

T:\PROJECTS\MASTER FINAL EXHIBITS '04\FIG 2-20.DWG 11/19/04 13:44

- Citrus Five
- Jaguar Three
- McCoy Nine
- Orlando Eight

The Citrus Five and Orlando Eight are "Vector" DPs, which means navigational assistance is provided by an air traffic controller utilizing radar and assigning headings for the pilot to fly until clearing the pilot to resume the flight under the aircraft's own navigational capabilities.

The Jaguar Three and McCoy Nine are considered "Pilot Nav" DPs. These DPs depict routings that the pilot can fly utilizing on-board navigational equipment.

Arrival Procedures - MCO has four standard terminal arrival routes (STARs). A STAR is published to simplify clearance delivery procedures and facilitate transition between enroute and instrument approach procedures. The STAR is published in graphical and text form to convey ATC information to pilots. The four STARs for MCO are:

- Bitho Seven
- Goofy Five
- Leese Nine
- Minee Three

These STARs utilize the FAA's network of navigational aids in Florida. The Bitho Seven STAR uses the Ormond Beach VORTAC (VHF Omni-directional range and tactical aircraft navigation station) for navigational guidance. The Goofy Four STAR uses the Pahokee VORTAC for navigational guidance. The Leese Nine STAR uses the Ocala VORTAC for navigational guidance. The Minee Three STAR uses the Lakeland VORTAC for navigational guidance.

An arriving aircraft's point of origin determines which STAR is used. For example, aircraft approaching MCO from the north may use the Leese Nine Arrival, aircraft arriving from the northeast could use the Bitho Seven Arrival, aircraft arriving from the southeast may use the Goofy Five Arrival, and aircraft arriving from the east can use the Minee Three Arrival.

Noise Abatement Procedures - In addition to the published DPs, MCO has noise abatement procedures that affect the routing of departures. The current MCO 7220.3F Tower Order consists of the following elements:

- Direct aircraft to approach from the south (Runways 35L and 36L/R) and depart to the south (Runways 17R and 18L/R) between 11:00 pm and 7:00 am whenever wind, weather, and field conditions permit. Offer Runway 18L intersection departures from Taxiway B2 when conditions permit during this time period as well.
- Direct departure aircraft on Runways 36L, 36R, and 35L to fly a heading that will ensure these aircraft do not fly over noise sensitive areas located to the east and west of the extended runway centerline.
- Do not approve right traffic patterns to Runway 18 or VFR closed traffic patterns to the west side of MCO with jet aircraft unless weather or safety conditions mandate such an operation.
- When wind, weather, or field conditions require a northerly departure, use Runway 35L for all departing turbojets and instruct turbojet departures to turn to a heading of 060 at the middle marker.
- Ensure aircraft flying the Orlando DP commence their right turn within one mile of the runway.

These procedures were designed to minimize aircraft overflight of residential areas in the vicinity of the airport.

Instrument Approach Procedures - IAPs are navigational procedures designed to provide horizontal and vertical navigational guidance to the approach ends of certain designated and equipped runways. All IAPs in the U.S. are based on joint civil and military criteria contained in the U.S. These procedures are based on criteria contained in TERPS, takes into account the interrelationship between airports, facilities, and the surrounding environment, terrain, obstacles, noise sensitivity, etc. Appropriate altitudes, courses, headings, distances, and other limitations are specified and, once approved, the procedures are published and distributed by government and commercial cartographers as instrument approach charts.

There are two general categories of IAPs: precision or non-precision. A precision IAP provides both horizontal and vertical navigation guidance, as well as range (distance) information. A non-precision approach provides only horizontal navigation guidance and some may provide range information. Range information may be provided in the form of marker beacons, DME, or from GPS equipment. Precision approaches include the ILS, the Transponder Landing System (TLS), the Microwave Landing System (MLS), Precision Approach Radar (PAR), and the GPS Landing System (GLS). The system-wide development and implementation of MLS and TLS has been abandoned by FAA for any wide-scale utilization. The PAR is used primarily by the military and will normally be found only in conjunction with military installations. Precision approaches are further grouped into three categories (CAT I through CAT III) based on the precision IAP's minimum visibility and cloud ceiling requirements. The lowest landing weather minimums for a CAT I precision approach at MCO is a 200-foot ceiling and a 1,800-foot RVR visibility. The lowest landing weather minimums for a CAT II approach at MCO is a 100-foot ceiling and 1,200-foot visibility. The lowest landing weather minimums for a CAT IIIb IAP at MCO is as low as a zero foot ceiling and a 600-foot RVR visibility. Published non-precision approaches are based on the following type of NAVAIDs: non-direction beacon (NDB), VOR, GPS, and Area Navigation (RNAV). The lowest landing weather minimums for a non-precision IAP at MCO is a ceiling of 372 feet and visibility of 4,000 feet RVR. Table 2-8 summarizes the IAPs available at MCO by runway end.

TABLE 2-8

LOWEST PUBLISHED INSTRUMENT APPROACH PROCEDURE MINIMUMS

Runway	IAP	DH or MDA (in feet)	Visibility (in feet RVR or statute miles)
18L	VOR/DME	444	5,000 feet
	VOR	444	5,000 feet
	RNAV/GPS	384	6,000 feet
18R	ILS (CAT I)	200	1,800 feet
	VOR/DME	446	2,400 feet
	VOR	446	2,400 feet
	RNAV/GPS	406	5,000 feet
17R	ILS (CAT I)	200	1,800 feet
	ILS (CAT II)	100	1,200 feet
	RNAV/GPS	470	5,000 feet
17L	ILS (CAT I)	200	1,800 feet
	ILS (CAT II)	100	1,200 feet
	RNAV/GPS	390	4,000 feet
35R	ILS (CAT I)	200	1,800 feet
	ILS (CAT II)	100	1,200 feet
	RNAV/GPS	390	5,000 feet
35L	ILS (CAT I)	200	1,800 feet
	ILS (CAT II)	100	1,200 feet
	ILS (CAT IIIb)	N/A	600 feet
	RNAV/GPS	372	4,000 feet
36R	ILS (CAT I)	200	1,800 feet
	ILS (CATII)	100	1,200 feet
	ILS (CAT IIIb)	N/A	600 feet
	VOR/DME	508	2,400 feet
	RNAV/GPS	408	5,000 feet
36L	VOR/DME	507	5,000 feet
	RNAV/GPS	407	1.5 miles

DH = Precision IAP decision height in feet above runway touchdown zone elevation.
MDA = Non-precision IAP minimum descent altitude in feet above runway touchdown zone elevation.
N/A = Not applicable.
RVR = Reported runway visual range.
Note: Minimums shown are for aircraft approach Category D (approach speeds 141 through 166 knots).

Source: U.S. Terminal Procedures, Southeast (SE); Volume 3 of 4; August 5, 2004.
URS Corporation, June 2004.

2.4.5.4 Airfield Operations

A description of airfield operations as it pertains to runway utilization, taxi routes, and taxiway utilization is presented in the following paragraphs.

Runway Utilization - Runway utilization depends on several factors which include wind conditions, runway length, aircraft type, and parking/gate location. Runway utilization means the percentage of time the runway end is used for arrivals and departures. In August 2000, a FAR Part 150 Noise Compatibility Study was completed for MCO. During this study, runway utilization data was gathered from MCO's Noise and Operations Monitoring System (NOMS) and ATC personnel interviews. Analysis of the data indicates that approximately 85 percent of the time, MCO is primarily operating in a south flow utilizing Runways 18L, 18R, and 17R. The remaining 15 percent of the time, MCO is operating in a north flow utilizing Runways 36L, 36R, and 35L. Table 2-9 summarizes runway utilization by runway end and type operation.

TABLE 2-9
2000 THREE RUNWAY UTILIZATION BREAKDOWN BY USER GROUP

Runway	Arrival Percentages			Departure Percentages		
	Air Carrier and Commuter	Cargo	General Aviation and Military	Air Carrier and Commuter	Cargo	General Aviation and Military
18L	17.0	25.0	25.0	34.0	50.0	50.0
18R	34.0	50.0	50.0	17.0	25.0	25.0
17R	34.0	9.0	9.0	34.0	9.0	9.0
South	**85.0**	**84.0**	**84.0**	**85.0**	**84.0**	**84.0**
36L	6.0	9.0	9.0	3.0	5.0	5.0
36R	3.0	5.0	5.0	6.0	9.0	9.0
35L	6.0	2.0	2.0	6.0	2.0	2.0
North	**15.0**	**16.0**	**16.0**	**15.0**	**16.0**	**16.0**
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: FAR Part 150 Noise Exposure Maps and Compatibility Plan, August 2000.
URS Corporation, January 2001.

The Fourth Runway (17L/35R) was completed and became operational in late 2003. This additional runway was constructed to increase airfield capacity at MCO. It is used predominantly by air carrier and commuter type aircraft. The estimated utilization rates for MCO runways with Runway 17L/35R operational are presented in Table 2-10.

Taxiway Utilization - Taxiway utilization and flows were determined by consultation with MCO ATCT personnel and reference to Tower Order MCO 7220.3F, dated July 1, 1999, and Tower Notice MCO N7110.673, dated October 7, 2000.

During IFR operations at MCO, aircraft are taxied for direction of flight. This means aircraft that will be flying a compass heading from 360 degrees through 179 degrees will be taxied to Runway 17R or 35L, depending on flow condition (north or south operation), and aircraft that will be flying compass headings from 180 degrees through 359 degrees will be taxied to Runways 18 or 36, dependent upon operational flow.

TABLE 2-10
PROJECTED FOUR RUNWAY UTILIZATION BREAKDOWN BY USER GROUP

Runway	Arrival Percentages			Departure Percentages		
	Air Carrier and Commuter	Cargo	General Aviation and Military	Air Carrier and Commuter	Cargo	General Aviation and Military
18L	17.0	25.5	25.5	34.0	51.0	50.0
18R	34.0	51.0	51.0	17.0	25.5	25.0
17R	25.5	8.5	8.5	30.0	8.5	8.5
17L	8.5	0.0	0.0	4.0	0.0	0.0
South	**85.0**	**85.0**	**85.0**	**85.0**	**85.0**	**84.0**
36L	6.0	9.0	9.0	3.0	4.5	4.5
36R	3.0	4.5	4.5	6.0	9.0	9.0
35L	4.5	1.5	1.5	5.0	1.5	1.5
35R	1.5	0.0	0.0	1.0	0.0	0.0
North	**15.0**	**15.0**	**15.0**	**15.0**	**15.0**	**15.0**
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: FAR Part 150 Noise Exposure Maps and Compatibility Plan, August 2000.
URS Corporation, January 2001.

If MCO is operating in VFR conditions, aircraft are taxied for convenience. This means that aircraft taxiing from Airsides 1, 2, or 4 are taxied to the nearest available runway and aircraft taxiing from Airside 3 are taxied for direction of flight.

As a general rule, the inner taxiways (Taxiways C and G) are used as much as practical to allow for uninterrupted use of the high-speed turnoffs from the runways, which will help to expedite arrivals to the gate areas. During south flow operations, Taxiway J is used to taxi aircraft westbound on the airfield between Taxiways J2 and J3. During north flow operations, Taxiway J is used to taxi aircraft eastbound on the airfield between Taxiways J2 and J3.

Taxiway utilization and flows are depicted on Figure 2-21.

Non-movement areas have been identified at MCO. These are areas not under the control of ATCT ground control. Typically, these areas are difficult for the ATCT personnel to see or clearly track aircraft and surface vehicle movements and, therefore, they are not able to safely provide traffic separation in these areas. Operations in these areas are at the pilot or operator's discretion and risk. Figure 2-22 depicts the location of non-movement areas at MCO. The red dots on Figure 2-22 indicate locations where control of traffic is assumed by the ATCT ground controller position. Aircraft and vehicle operators desiring to leave the non-movement areas (operate past the red dot locations depicted on Figure 2-22) and utilize any of the adjoining taxiways must communicate and request clearance prior to leaving the non-movement area and remain in contact with the ATCT during operations on those portions of the airfield considered to be movement areas. The movement areas are shown as the non-shaded paved areas on Figure 2-22.

2.4.6 METEOROLOGY

Weather conditions at MCO were analyzed using hourly observation data for the period of January 1990 through December 1999 from the publication *Monthly Station Normals of Temperature, Precipitation, and Heating and Cooling Degree Days 1961-1990,* and the Internet site www.weatherbase.com. The first two data sources were obtained from the National Climatic Data Center (NCDC) in Asheville, North Carolina. The last source (www.weatherbase.com) disseminates weather data from a variety of sources, including the NCDC.

Average air temperatures recorded at MCO are considered mild. The average maximum temperature is 82.6 degrees Fahrenheit (° F); the average minimum temperature is 62.0° F, with an overall average temperature of 72.3° F. The highest recorded temperature during the past 26 years has been 100° F, with the lowest recorded temperature of 20° F. The highest recorded temperature occurred in the months of May, June, and July. The lowest recorded temperature occurred in the month of December.

Precipitation in Orlando is usually found in one form only - rain - because of the generally warm climate. Normal annual precipitation is 48.11 inches; the most precipitation recorded is 68.7 inches, and the least precipitation recorded is 40.1 inches during the past 26 years. Between the months of June and September, MCO will typically receive the most rainfall. During the past 51 years, July has averaged as the rainiest month with an average of 17 days.

2.4.6.1 Ceiling and Visibility

According to data obtained from www.weatherbase.com, on average during the past 45 years, MCO experienced clear skies (less than 1/10th sky coverage) 90 days a year, partly cloudy skies (3/10th to 6/10th sky coverage) 147 days a year, and cloudy skies (7/10th or more coverage) 128 days a year. Furthermore, on average, MCO experienced 116 rainy days per year during the same period. Analysis of hourly observations obtained from the NCDC was used to determine how these general

weather conditions translated into specific weather conditions requiring compliance with certain flight rules and procedures.

Hourly observations for the period of January 1990 through December 1999 were used to determine the occurrence of specific ceiling and visibility conditions at MCO. These specific ceiling and visibility conditions were matched with operating rules (VFR or IFR) and procedures (non-precision, precision CAT I, precision CAT II, and precision CAT III). This matching resulted in the development of six queries. The queries represent ceiling and visibility requirements to conduct specific types of operations or procedures at MCO. The queries were forwarded to the NCDC for the retrieval of hourly report data from the NCDC's historical hourly weather database. After retrieval, the hourly report data was analyzed to develop the percentage of time that a specific type of operation would occur at MCO. The operation and procedure categories include: VFR, IFR-NP, IFR-CAT I, IFR-CAT II, IFR-CAT III, and IFR-Below CAT III. The occurrence of weather conditions that support each of these categories is presented in Table 2-11.

TABLE 2-11
CEILING AND VISIBILITY CONDITION OCCURRENCE

Type of Operation	Ceiling and Visibility Conditions	Percent of Occurrence
VFR	>= 1,000 feet and >= 3 miles	95.60
IFR-NP	< 1,000 feet and/or < 3 miles, but >= 500 feet and >= 1 mile	2.80
IFR-CAT I	< 1,000 feet and/or < 3 miles, but >= 200 feet and >= .5 mile	0.88
IFR-CAT II	< 1,000 feet and/or < 3 miles, but >= 100 feet and >= .13 mile	0.50
IFR-CAT III	< 100 feet and/or < .13 miles, but < 100 feet and >= .06 mile	0.11
IFR-Below CAT III	< 100 feet and < .06 mile	0.08
Total		**100.00**

Source: National Climatic Data Center, Weather Station 12815; Orlando, Florida, 1990-1999.
URS Corporation, January 2001.

2.4.6.2 Wind Analysis

The hourly observation data obtained from the NCDC was used to complete a cursory analysis of wind patterns in the vicinity of MCO. Winds at MCO are predominantly from the north, approximately 47 percent of the time. Southerly winds are experienced approximately 40 percent of the time. Direct crosswind conditions (90 degrees to runway heading) exist approximately 6 percent of the time. The average wind speed is 8 miles per hour. Calm winds prevail approximately 7 percent of the time. Analysis of meteorological conditions, specifically the origin of prevailing winds, is important in the determination of the required number and orientation of runways at an airport. Ideally, a runway should be aligned with the prevailing winds that, to varying degrees, have a direct effect on all aircraft takeoff and landing performance capabilities. Generally, the smaller the aircraft, the more affected it is by the wind, particularly crosswind components.

The runway wind coverage at MCO was determined using FAA's Standard Wind Analysis as part of the Airport Design Program Version 4.2D. For the purpose of runway wind analyses, a crosswind component can be defined as the wind that occurs at a right angle to the runway centerline. Crosswind components of 10.5, 13, 16, and 20 knots were used to analyze the runway system at MCO. The calculated all weather crosswind component coverage is 91.55 percent for 10.5 knots (12 miles per hour [mph]), 95.57 percent for 13 knots (15 mph), 99.13 percent for 16 knots (18 mph), and 99.80 for 29 knots (33 mph). Wind coverage crosswind data is presented in Table 2-12.

MASTER PLAN UPDATE

ORLANDO INTERNATIONAL AIRPORT

SECTION 3.0

AVIATION DEMAND FORECASTS

Prepared for:
GREATER ORLANDO AVIATION AUTHORITY

Developed by
JOHN F. BROWN COMPANY, INC.

November 2002

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SECTION 3.0

AVIATION DEMAND FORECASTS

3.1 INTRODUCTION

This section provides an update of the 20-year aviation demand forecasts that were prepared in December 1994 in conjunction with the 1995 Master Plan for Orlando International Airport (MCO).

The unique challenge in this forecasting assignment was to incorporate the effects on aviation activity from recent events, including a major downturn in the U.S. economy, the aftermath of the September 11 tragedy, and prospects of a significant restructuring of the domestic airline industry. These factors have had a dramatic impact on aviation activity over the past year, and they have implications as well for the industry's longer-term outlook.

The forecast results are organized into four sections.

- Section 3.2 contains a brief overview of the demographic and economic trends that will influence the growth of aviation activity at the airport over the next two decades.
- Section 3.3 presents highlights of the analysis of aviation activity, air service, and other aviation trends as they have unfolded over the past decade, with specific attention to aviation activity and service changes at MCO over the past year. Section
- Section 3.4 presents the primary forecasts of passenger enplanements, cargo tonnage, and flight operations at the airport through to fiscal year (FY) 2022. It describes the methodology that was used to develop the forecasts and it compares the forecasts with those developed by others. Section
- Section 3.5 presents further detailed forecasts that were derived from the primary forecasts. Specifically, it provides a breakdown of the operations forecast by aircraft type, for each of the categories of operations at MCO, namely, passenger flights, all-cargo flights, general aviation, and military operations. Section 3.5 also provides a number of forecasts, for both passengers and flight operations, which quantify peak-month and peak-hour flows.

NOTE: The aviation demand forecasts for MCO were developed in November 2002 and approved by FAA in January 2003. Through August 2004, the rolling twelve month total passenger activity was approximately 30.4 million.

3.2 ECONOMIC BASE FOR AIR TRANSPORTATION

3.2.1 OVERVIEW

The Orlando Metropolitan Statistical Area (MSA or the Orlando Area) provides a solid base of economic activity for the continued growth and development of air transportation. A consistently good economic performance over the past three decades bodes well for the sustained growth of the local economy throughout the forecast period. This is true even in light of the recent cyclical downturn in tourism. Among the key features of the economic base are:

- The Orlando area is one of the most important entertainment and hospitality centers in the world;
- Seven of the top 10 U.S. theme parks, based on attendance, are located in or near the Orlando MSA; and
- Orlando is situated in the center of Florida's most important high-tech corridor.

3.2.2 AIR TRADE AREA

The local air trade area of the airport is centered in the Orlando MSA (consisting of Lake, Orange, Osceola, and Seminole counties), in which Orlando is the primary city (Figure 3-1). The trade area also includes a large secondary trade area encompassing Brevard, Volusia, and Marion counties.

In terms of population, Florida is the fourth largest state in the nation. It has been, and is projected to continue to be, one of the fastest growing states. In the past four decades, Florida has been growing at a faster rate than the nation as a whole, at an annual average rate of 3.0 percent compared to 1.1 percent for the U.S. Since Orlando is located in the center of the state, the extended service area for the airport spans 20 counties with a population of about 6.1 million.

The Orlando MSA represents 10.3 percent of the state population, 9.8 percent of its income, and about 12.8 percent of its non-agricultural employment. Since 1960, the Orlando area's rate of population growth has averaged about 4.1 percent per year, almost four times the rate of national population growth.

3.2.3 DEMOGRAPHIC TRENDS

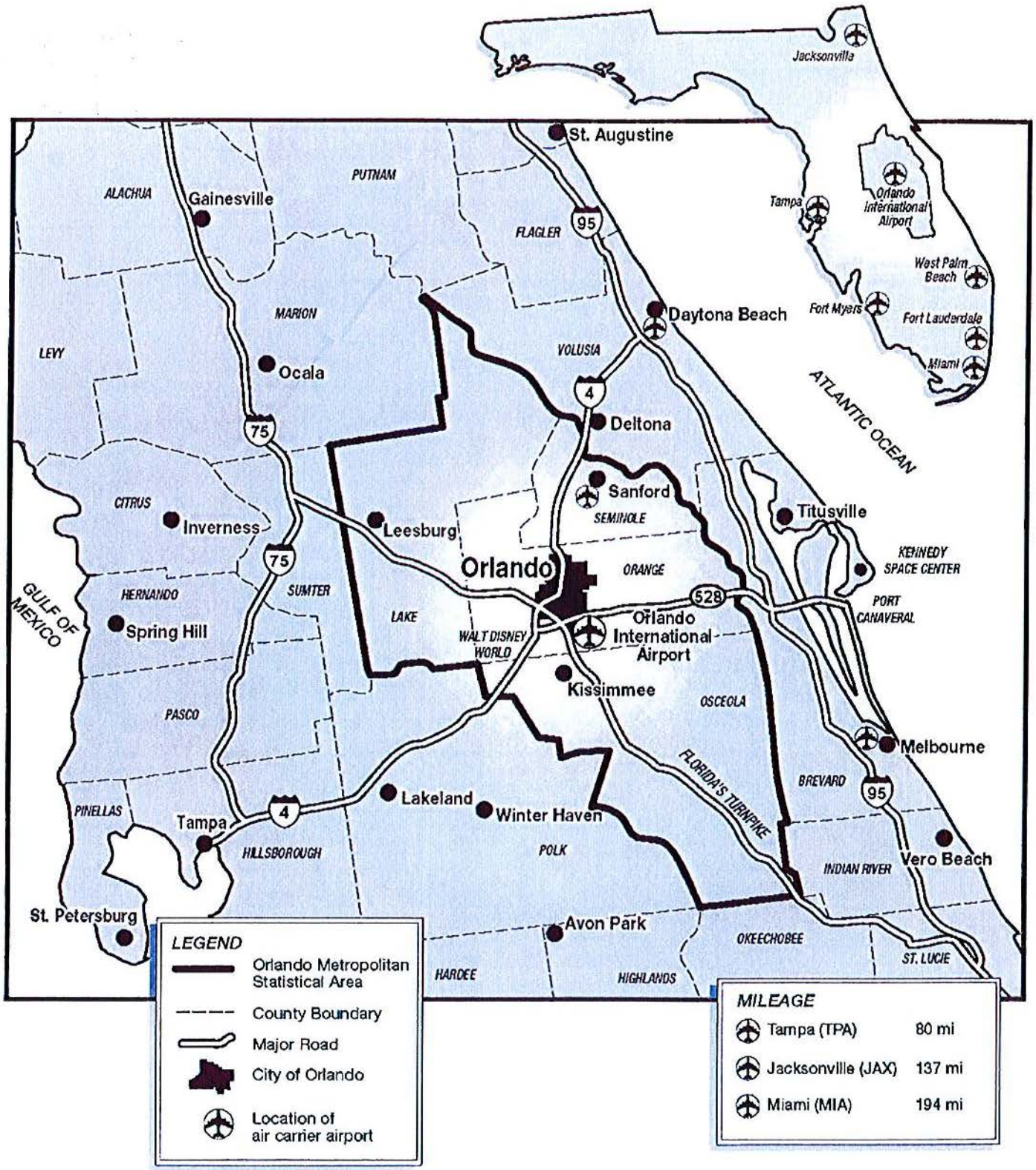
3.2.3.1 Population

Orlando, the third most populous MSA in the state, led the state in population growth through the 1990s and, according to the University of Florida, Bureau of Economic and Business Research, should maintain that leading position at least through 2010.

The Orlando Area population grew at nearly five times the rate of growth for the nation from 1970 to 1980 (an average of 5.9 percent per year for Orlando compared to 1.2 percent growth for the nation), at about four times the national rate from 1980 to 1990, and more than double the national rate during the 1990s (Table 3-1). In addition, the Orlando Area population grew at twice the rate of state population growth over the past 30 years.

The strong population growth of the Orlando MSA between 1970 and 2000 was driven primarily by net population inflows. New residents have been attracted by the development of huge theme parks and a promising high-tech industry cluster. The dynamic growth of these two industries has also contributed to the growth of other industries and service providers in the Orlando Area.

For the period through 2010, the University of Florida, Bureau of Economic and Business Research, projects that the Orlando MSA population will grow at about 2.3 percent per year, which is faster than the projected rate for the state as a whole and more than double the projected rate of national population growth.



Prepared by John F. Brown Company, Inc Cincinnati, Ohio 2003

GREATER ORLANDO AVIATION AUTHORITY
Orlando International Airport
Master Plan Update

ORLANDO-MSA VICINITY MAP

FIGURE: 3-1

TABLE 3-1
POPULATION TRENDS
(IN THOUSANDS)

Year(s)	U.S.	Florida	Orlando MSA	Orlando as a Percentage of the U.S.	Orlando as a Percentage of Florida
1960	179,979	4,952	338	0.19	6.8
1970	201,895	6,865	453	0.22	6.6
1980	227,225	9,840	805	0.35	8.9
1990	249,403	13,009	1,225	0.49	9.4
2000	282,125	16,087	1,662	0.59	10.3
2010F	306,615	18,967	2,062	0.67	10.9
Historical AACGR (Percent)					
1960-1970	1.2	3.3	3.0	---	---
1970-1980	1.2	3.7	5.9	---	---
1980-1990	0.9	2.8	4.3	---	---
1990-2000	1.2	2.2	3.1	---	---
Forecast AACGR (Percent)					
2000-2010	0.9	1.7	2.3	---	---

Sources: U.S. data - U.S. Department of Commerce, Bureau of Census, Orlando.
Florida data - University of Florida, Bureau of Economic and Business Research.
Data compiled by John F. Brown Company, Inc., 2002.
Notes: AACGR = Average annual compound growth rate.
F = Forecast.

The Orlando population is younger than the state population overall. Roughly two-thirds of Orlando area residents are under the age of 45 compared to about 60 percent for the state. In general, the age distribution in the Orlando MSA resembles the national age distribution much more closely than that of Florida, which tends to be more heavily weighted by senior citizens.

3.2.3.2 Income

Trends in the growth and distribution of income in the Orlando Area are a determining factor in locally originating demand for air transportation. Growth of income can be attributed to the expansion of economic activity, which consists of increased output from existing firms and the creation of new businesses. The growth in business activity generates demand for business air travel. The income generated by increased economic activity leads to greater discretionary income of individuals, which in turn is positively related to demand for air transportation associated with leisure travel.

The Orlando MSA ranks fifth in the state in total real personal income. Following the 2001-2002 national recession, personal income for the U.S., Florida, and the Orlando Area is projected to resume growth through 2010. The University of Florida, Bureau of Economic and Business Research, projects continued strong growth of personal income in the Orlando Area that will outperform both the state and the nation.

As shown in Table 3-2, the Orlando area's real personal income per capita in 2000 ($25,024) was 91 percent of the national average ($27,494) and 96 percent of the state average ($26,177). During the 1970s, the Orlando area's growth in per capita income lagged significantly behind that of the state and the nation. That situation changed in subsequent years as the entertainment and hospitality sectors began to expand.

TABLE 3-2
PER CAPITA PERSONAL INCOME TRENDS
(IN 1996 DOLLARS)

Year(s)	U.S.	Florida	Orlando MSA	Orlando as a Percentage of the U.S.	Orlando as a Percentage of Florida
1970	$14,880	$14,175	$15,885	106.8	112.1
1980	$18,524	$17,921	$17,357	93.7	96.9
1990	$22,959	$23,204	$21,829	95.1	94.1
2000	$27,494	$26,177	$25,024	91.0	95.6
2010F	$34,662	$33,405	$32,199	93.0	96.4
Historical AACGR (Percent)					
1970-1980	2.2	2.4	0.9	---	---
1980-1990	2.2	2.6	2.3	---	---
1990-2000	1.8	1.2	1.4	---	---
Forecast AACGR (Percent)					
2000-2010	2.3	2.5	2.6	---	---

Sources: U.S. data - U.S. Department of Commerce, Bureau of Economic Analysis; forecasts based on data from the U.S. Bureau of Labor Statistics.
Orlando and Florida data - University of Florida, Bureau of Economic and Business Research.
Data compiled by John F. Brown Company, Inc., 2002.

Notes: Forecasts for the U.S. are based on data from the Congressional Budget Office.
AACGR = Average annual compound growth rate.
F = Forecast.
Nominal figures adjusted by consumer spending deflator.

The Orlando Area's slower real per capita income growth during the period 1990-2000 corresponds to a similar national and statewide trend. The slower growth rate of real per capita income, compared to total personal income, can be attributed to the strong population growth. The slowdown observed during 1990-2000 also reflects a moderate decline in manufacturing employment in line with the state and the nation.

Projections for 2000-2010 show the Orlando Area's per capita personal income expanding at a slightly higher rate than the state and the nation. During this period, both Florida and Orlando return to their historical growth trend, after a dip during the previous decade. The University of Florida, Bureau of Economic and Business Research, projects stronger productivity growth during the 2000-2010 period as a determining factor in the higher growth of real per capita income.

3.2.4 ECONOMIC TRENDS

3.2.4.1 Economy

The national recession, which according to the National Bureau of Economic Research began in March 2001, and the events of September 11, 2001, which have taken a particularly heavy toll on the hospitality industry, have raised questions concerning possible negative long-term effects on visitor flow into the Orlando area.

The national economy has a considerable impact on the Orlando economy. The key sector of tourism is heavily reliant on U.S. visitors. The health of the U.S. economy is thus a major factor in the demand for Orlando's goods and services. Based on projections issued in August 2002 by the Congressional Budget Office (CBO), the outlook for the U.S. economy is favorable. The CBO projects that the economy will continue its modest recovery in 2002 and return to more robust growth

in 2003. For the period 2003-2010, the CBO projects that the U.S. economy will grow at an average rate of 3.2 percent per year, which is somewhat slower than the 3.6 percent rate during the expansion period 1992-2000.

Orlando Area hotel occupancy and visitors to the major theme parks have begun to recover from the lows experienced after September 11. More importantly, enhanced security measures imposed by the Federal government and complemented by similar actions by state and local government may provide the basis for greater confidence in air travel and increased attendance at the theme parks.

3.2.4.2 Employment

The economy of the Orlando MSA has expanded to create employment opportunities for its growing population. The Orlando area outpaced Florida and the nation in the creation of non-agricultural employment over the past 3 decades (Table 3-3). During that period, employment grew strongly (averaging about 6 percent per year) compared to the U.S. (about 2 percent) and Florida (about 4 percent).

TABLE 3-3
TOTAL NON-AGRICULTURAL EMPLOYMENT TRENDS
(ANNUAL AVERAGE, IN THOUSANDS OF JOBS)

Year(s)	U.S.	Florida	Orlando MSA	Orlando as a Percentage of the U.S.	Orlando as a Percentage of Florida
1970	70,880	2,152	164	0.23	7.6
1980	90,406	3,579	313	0.35	8.7
1990	109,403	5,387	611	0.56	11.3
2000	131,759	7,076	908	0.69	12.8
2010F	154,425	8,608	1,181	0.76	13.7
Historical AACGR (Percent)					
1970-1980	2.5	5.2	6.7	---	---
1980-1990	1.9	4.2	6.9	---	---
1990-2000	1.9	2.8	4.0	---	---
Forecast AACGR (Percent)					
2000-2010	1.6	2.0	2.7	---	---

Sources: U.S. data - Historical and Forecast - U.S. Department of Labor, Bureau of Labor Statistics.
Orlando and Florida data - University of Florida, Bureau of Economic and Business Research.
Data compiled by John F. Brown Company, Inc., 2002.

Notes: AACGR = Average annual compound growth rate.
F = Forecast.

The Orlando MSA is orientated principally to the services (hospitality, amusement, recreation, personal services, business services, and health care) and trade sectors which accounted for 43.5 percent and 24.1 percent, respectively, of the Orlando area's non-agricultural employment in 2000. Orlando's dynamic employment growth can be attributed largely to the development of several major theme parks starting in the 1970s. Employment in the Orlando Area's service industry grew 6.4 percent on average, between 1990 and 2000, compared with 5.2 percent and 3.8 percent at the state and national level, respectively.

The Orlando MSA is home to an emerging high-tech industry. Electronic equipment is the most important sub-sector of the Orlando Area's manufacturing industry. Situated at the center of Florida's most important high-tech corridor, with its proximity to the Kennedy Space Center, Orlando has attracted defense-related and high-tech firms such as Lockheed Martin, Siemens ICN, and Cirent Semiconductor.

According to the University of Florida, Bureau of Economic and Business Research, employment in the Orlando MSA will continue to outpace both the state and the nation through 2010.

According to the Economic Development Commission of Orlando, companies with corporate headquarters located in the Orlando MSA include the American Automobile Association (AAA), ChepUSA, Dixon Ticonderoga, and Tupperware International. Several of the largest foreign-owned companies in Florida are also located in the Orlando MSA: Hubbard Construction Company, Inc. (France); Grand Cypress Florida, Inc., operator of hotels and motels (Japan); Mivan Florida, Inc, general contractors (Northern Ireland); Siemens Westinghouse Power Corp., manufacturers of turbines and generators (Germany); Enviroworks, Inc., coated fabrics (Denmark); and Wet N' Wild Florida, amusement park (Canada).

3.2.4.3 Tourism - Leisure and Business

A total of 43.3 million visitors traveled to the Orlando MSA by all modes of transport in 2000, up 1.6 percent over the 1999 total (Table 3-4). During the 1995-2000 period, visitor trips to Orlando grew at nearly 6 percent per year. Domestic out-of-state visitors showed above-average growth, growing almost 8 percent per year, on average. International visitors grew at an annual average of 3 percent. In 2000, 8.6 percent of the total visitors hailed from outside the U.S.

Of the domestic out-of-state visitors in 2000, those traveling to Orlando for leisure reasons accounted for 77 percent of the total, with the remainder (23 percent) visiting for business.

International visitors to Orlando accounted for nearly 9 percent of total visitors in 2000, originating principally in the U.K. and Europe, followed by Canada and Latin America. Many visitors from Latin America enter the U.S. through Miami, and then either drive or use a connecting domestic flight to Orlando.

TABLE 3-4
VISITORS TO ORLANDO MSA
(IN THOUSANDS)

Sector/U.S. Origin/ Type of Visit	1992	1995	2000	Percent of Total		
				1992	1995	2000
Domestic	23,478	29,205	39,533	85.3	90.1	91.4
Intra-Florida	13,865	15,782	19,811	50.4	48.6	45.8
Leisure	10,956	11,715	15,484	39.8	36.1	35.8
Business	2,909	4,067	4,327	10.6	12.5	10.0
Out of State	9,613	13,458	19,722	34.9	41.5	45.6
Leisure	7,647	10,973	15,111	27.8	33.8	34.9
Business	1,966	2,485	4,611	7.1	7.7	10.7
International	4,052	3,202	3,730	14.7	9.9	8.6
Total	**27,530**	**32,407**	**43,263**	**100.0**	**100.0**	**100.0**

Sources: D.K. Shifflet & Associates; U.S. Department of Commerce, Tourism Industries; Orlando Convention and Visitors Bureau Research Department.
Data compiled by John F. Brown Company, Inc., 2002.

During the 1990s, particularly since 1995, the number of out-of-state visitors to the Orlando MSA has grown, in part due to the booming cruise industry. Port Canaveral, the world's second busiest cruise port, lies directly east of MCO and just outside the Orlando MSA. The number of cruise ship passengers at Port Canaveral grew from 900,000 in 1990 to 3.5 million in 2001. Many out-of-state cruise ship passengers arrive and depart Florida via MCO.

The wealth of convention and meeting space and the available diversions for families of convention attendees together keep Orlando on the shortlist of convention and meeting planners. The Orlando/Orange County Convention Bureau estimates that visitors to the Orlando Area, for purposes of conventions and meetings, grew 10 percent per year, on average, between 1995 and 2000, from 2.3 million to 3.7 million visitors.

3.3 AIRPORT ACTIVITY TRENDS

3.3.1 OVERVIEW

MCO ranked fifteenth in 2001 among U.S. airports in terms of total passengers and fifth in terms of origin-destination (O&D) passengers. The top two carriers at MCO in FY 2001 were Delta Air Lines and US Airways; the airport ranked fifth in Delta Air Lines' domestic system and eighth in US Airways' system. Southwest Airlines was the third-ranking carrier at MCO; Orlando is the only Florida "focus city"[1] in Southwest Airlines' system. A diverse group of airlines provide passenger service at the airport including, in FY 2001, 31 U.S. airlines and 27 foreign-flag carriers.

In the wake of the September 11 attacks, passenger activity declined further and faster than at any time in the history of the airline industry, which forced both U.S. and foreign-flag airlines to make numerous service changes at MCO. In the first 9 months of FY 2002, enplanements declined over 16 percent at MCO and airline capacity in August 2002 was still down 10.6 percent.

3.3.2 PASSENGER ENPLANEMENT TRENDS

Passenger activity at MCO grew at about 5 percent per year, on average, from FY 1991 to FY 2001 (Table 3-5). Enplanements showed particularly strong growth in FY 1992 (11.4%), as the nation recovered from the economic recession and Gulf War, and in FYs 1996 and 1997 (about 10% per year), when aviation activity was stimulated by the introduction of service by Southwest Airlines and other low-fare carriers. Aviation activity grew in each of the ten years except for a decline of 1.5 percent in FY 2001.

[1] Although Southwest Airlines is not a hub-and-spoke operation, it does tend to concentrate its flights at certain cities in its route system - these are often referred to as Southwest Airlines' "focus cities."

TABLE 3-5
ENPLANED PASSENGER TRENDS
(FOR THE 12 MONTHS ENDED SEPTEMBER 30)

Year(s)	Domestic		International		Total Enplaned Passengers	Percent Change Over Previous Year
	Enplaned Passengers	Percent of Total	Enplaned Passengers	Percent of Total		
1991	8,125,736	89.8	926,199	10.2	9,051,935	
1992	8,876,235	88.0	1,207,732	12.0	10,083,967	11.4
1993	9,329,191	87.6	1,315,710	12.4	10,644,901	5.6
1994	9,574,320	88.3	1,269,165	11.7	10,843,485	1.9
1995	9,934,768	89.5	1,164,228	10.5	11,098,996	2.4
1996	11,021,730	89.8	1,248,121	10.2	12,269,851	10.5
1997	12,340,561	92.0	1,070,568	8.0	13,411,129	9.3
1998	12,738,645	92.7	996,807	7.3	13,735,452	2.4
1999	13,214,826	92.2	1,110,479	7.8	14,325,305	4.3
2000	13,921,552	91.8	1,235,879	8.2	15,157,431	5.8
2001	13,820,942	92.5	1,113,876	7.5	14,934,818	-1.5
FYTD 2001	10,735,195	92.8	838,828	7.2	11,574,023	---
FYTD 2002	9,083,595	93.6	621,604	6.4	9,705,199	---
AACGR (PERCENT)						
1991-1996	6.3	---	6.1	---	6.3	---
1996-2001	4.6	---	-2.3	---	4.0	---
1991-2001	5.5	---	1.9	---	5.1	---
Year-Over-Year Change (Percent)						
FYTD 2001-2002	-15.4	---	-25.9	---	-16.1	---

Source: Greater Orlando Aviation Authority (GOAA).
Data compiled by John F. Brown Company, Inc., 2002.
Notes: FYTD = Fiscal year-to-date, October through June.
AACGR = Average annual compound growth rate.

In 1997, there was a slight shift in the composition of passenger activity at MCO. Prior to that year, domestic enplanements accounted for between 88 and 90 percent of the total. In FY 1997, that proportion grew to about 92 percent as domestic activity grew and some international charter operators moved to Orlando Sanford International Airport (SFB). Since that time, the composition of aviation activity at MCO has remained generally constant.

In the first nine months of FY 2002, MCO enplanements declined 16.1 percent from the same period of FY 2001. The drop in international activity (-25.9 percent) exceeded the decline in domestic activity (-15.4 percent).

During this period, 31 U.S. carriers accounted for 13.9 million (93.1 percent) of the 14.9 million passengers enplaned at MCO. The remaining 1.0 million passengers (6.9 percent) were enplaned on 27 foreign-flag carriers.

In FY 2001, nearly 82 percent of total enplanements at MCO were carried on the top 10 carriers at the airport (Table 3-6). Together, Delta Air Lines, US Airways, and Southwest Airlines (the airport's top three carriers) accounted for 49 percent of total enplanements. Consequently, the airport would be described as having a relatively low level of carrier concentration, especially when compared with many other large U.S. airline hub airports.

Both Delta Air Lines and US Airways enplanements have fallen sharply, down 22.5 percent and 32.6 percent, respectively, in the first 9 months of FY 2002. Since September, Southwest Airlines has become the second-ranked carrier at MCO. Enplanements on Southwest Airlines grew 9.9 percent in the first nine months of FY 2002 and its share of the Orlando market rose to 14.1 percent from 10.8 percent. Notably, enplanements on AirTran Airways, another low-fare operator, also grew 11.2 percent in the first 9 months of FY 2002.

Between 1980 and 2000, enplanements at MCO grew faster than at any of the major Florida airports selected for comparison (Table 3-7). Miami has ranked first in terms of enplanements over the past two decades. However, Miami's passenger base relies heavily on connecting passengers whereas at MCO, almost 95 percent of passengers are originating. Enplanements at MCO declined by a greater percentage during calendar year 2001 than at any of the selected airports. However, even with the decline in 2001, enplanements at MCO showed a four-fold increase from 1980 to 2001.

International passenger activity at MCO grew at 2.0 percent per year, on average, between FYs 1991 and 2001 (Table 3-8). Overall, international enplanements at MCO fluctuated within a relatively narrow range over the past decade and showed only modest growth. Foreign-flag carriers increased their activity at the airport while international activity carried by U.S. carriers declined. Over the same period, international activity on scheduled flights grew substantially at MCO while most of the charter activity shifted to SFB.

A major shift in the composition of the airport's international activity base occurred over the past decade (Table 3-8). Non-scheduled (more commonly known as charter) passenger boardings at MCO peaked in FY 1992 at just over 800,000, accounting for nearly 70 percent of all international enplanements. Charter activity declined sharply in the years that followed, however, and by FY 1995, about 575,000 passengers boarded international charter flights at MCO, representing 55 percent of total international enplanements at the airport.

TABLE 3-6
TOTAL ENPLANED PASSENGERS BY CARRIER
(RANKED ON FY 2001)

Rank	Carrier	For the 12 Months Ended September 30						AACGR 1996-2001 (Percent)	For the 9 Months Ended June 30		
		1996	1997	1998	1999	2000	2001		2001	2002	Percent Change
1	Delta Air Lines	2,736,864	3,833,100	3,931,447	4,056,389	3,956,805	3,600,609	5.6	2,762,905	2,057,196	-25.5
2	US Airways	1,904,959	1,933,080	1,775,190	1,933,711	1,966,210	2,092,596	1.9	1,635,298	1,102,513	-32.6
3	Southwest Airlines	260,476	753,561	913,922	1,063,098	1,350,960	1,633,456	44.4	1,245,903	1,369,522	9.9
4	American Airlines[1]	892,173	908,611	855,445	917,044	1,011,587	961,477	1.5	1,122,557	1,002,431	-10.7
5	Continental Airlines	813,305	812,759	861,630	917,708	941,247	943,958	3.0	740,816	627,366	-15.3
6	United Airlines	639,942	633,470	765,630	907,525	990,817	931,986	7.8	731,942	564,210	-22.9
7	Northwest Airlines	831,859	838,449	802,312	861,857	895,717	862,524	0.7	691,750	586,305	-15.2
8	ATA Airlines	487,084	376,377	441,245	450,192	468,762	414,558	-3.2	316,298	309,229	-2.2
9	AirTran Airways	664,536	662,464	586,840	346,380	395,237	386,438	-10.3	304,278	338,282	11.2
10	Virgin Atlantic Airways	188,790	237,023	246,934	325,852	372,078	339,754	12.5	246,366	226,048	-8.2
11	Spirit Airlines	83,481	65,687	102,598	149,021	236,255	326,841	31.4	235,790	224,419	-4.8
12	Comair/Delta Connection	466,776	331,377	377,004	425,931	462,029	279,553	-9.7	236,902	250,758	5.8
	All Others	2,299,606	2,025,171	2,075,255	1,970,597	2,109,727	2,160,858	-1.2	1,303,218	1,046,920	-19.7
	Total	12,269,851	13,411,129	13,735,452	14,325,305	15,157,431	14,934,818	4.0	11,574,023	9,705,199	-16.1
1	Delta Air Lines	22.3%	28.6%	28.6%	28.3%	26.1%	24.1%	—	23.9%	21.2%	—
2	US Airways	15.5%	14.4%	12.9%	13.5%	13.0%	14.0%	—	14.1%	11.4%	—
3	Southwest Airlines	2.1%	5.6%	6.7%	7.4%	8.9%	10.9%	—	10.8%	14.1%	—
4	American Airlines[1]	7.3%	6.8%	6.2%	6.4%	6.7%	6.4%	—	9.7%	10.3%	—
5	Continental Airlines	6.6%	6.1%	6.3%	6.4%	6.2%	6.3%	—	6.4%	6.5%	—
6	United Airlines	5.2%	4.7%	5.6%	6.3%	6.5%	6.2%	—	6.3%	5.8%	—
7	Northwest Airlines	6.8%	6.3%	5.8%	6.0%	5.9%	5.8%	—	6.0%	6.0%	—
8	ATA Airlines	4.0%	2.8%	3.2%	3.1%	3.1%	2.8%	—	2.7%	3.2%	—
9	AirTran Airways	5.4%	4.9%	4.3%	2.4%	2.6%	2.6%	—	2.6%	3.5%	—
10	Virgin Atlantic Airways	1.5%	1.8%	1.8%	2.3%	2.5%	2.3%	—	2.1%	2.3%	—
11	Spirit Airlines	0.7%	0.5%	0.7%	1.0%	1.6%	2.2%	—	2.0%	2.3%	—
12	Comair/Delta Connection	3.8%	2.5%	2.7%	3.0%	3.0%	1.9%	—	2.0%	2.6%	—
	All Others	18.7%	15.1%	15.1%	13.8%	13.9%	14.5%	—	11.3%	10.8%	—
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	—	100.0%	100.0%	—

Source: *GOAA. Data compiled by John F. Brown Company, Inc., 2002.*

Notes: [1] American Airlines began reporting TWA passengers with its own in December 2001.
Figures may not sum to totals due to rounding.
AACGR = Average annual compound growth rate.

TABLE 3-7
ENPLANED PASSENGERS AT SELECTED FLORIDA AIRPORTS
(FOR THE 12 MONTHS ENDED DECEMBER 31)

Airport	Passengers (in millions)				AACGR (percent)		
	1980	1990	2000	2001	1980-2000	1980-2001	2000-2001
Orlando	3.3	9.0	15.3	14.1	8.0	7.2	-7.8
Miami	10.3	12.9	16.8	15.9	2.5	2.1	-5.4
Tampa	3.8	5.3	8.0	8.0	3.8	3.6	0.0
Fort Lauderdale	3.0	4.6	7.9	8.2	5.0	4.9	3.8
Palm Beach	1.3	2.9	3.0	3.0	4.3	4.1	0.0
Fort Myers	0.6	1.9	2.6	2.7	7.6	7.4	3.8
Jacksonville	0.9	1.4	2.6	2.5	5.4	5.0	-3.8

Source: Airports Council International.
Data compiled by John F. Brown Company, Inc., 2002.
AACGR = Average annual compound growth rate.

TABLE 3-8
REGIONAL TRENDS IN INTERNATIONAL DEPARTING PASSENGERS[1] AT MCO AND SFB
(FOR THE 12 MONTHS ENDED SEPTEMBER 30)

Year(s)	MCO International Passengers					SFB International Charter Passengers	Total International Passengers (SFB+MCO)				
	Scheduled		Charter		MCO Total		Total Passengers	MCO Share (Percent)	SFB Share (Percent)	Charter Passengers	Charter Share (Percent)
	Passengers	Percent of MCO	Passengers	Percent of MCO							
	A	A/C	B	B/C	A+B=C	D	C+D=E	C/E	D/E	B+C=F	F/E
1991	216,551	24.6	664,552	75.4	881,103	---	881,103	100.0	0.0	664,552	75.4
1992	376,603	31.8	808,948	68.2	1,185,551	306	1,185,857	100.0	0.0	809,254	68.2
1993	533,742	40.8	773,529	59.2	1,307,271	---	1,307,271	100.0	0.0	773,529	59.2
1994	510,574	43.1	674,968	56.9	1,185,542	---	1,185,542	100.0	0.0	674,968	56.9
1995	469,757	44.9	577,203	55.1	1,046,960	---	1,046,960	100.0	0.0	577,203	55.1
1996	675,526	58.8	473,835	41.2	1,149,361	173,414	1,322,775	86.9	13.1	647,249	48.9
1997	740,703	73.0	274,430	27.0	1,015,133	439,396	1,454,529	69.8	30.2	713,826	49.1
1998	757,112	86.4	119,591	13.6	876,703	533,830	1,410,533	62.2	37.8	653,421	46.3
1999	836,869	81.8	186,279	18.2	1,023,148	476,451	1,499,599	68.2	31.8	662,730	44.2
2000	971,584	82.4	206,915	17.6	1,178,499	448,407	1,626,906	72.4	27.6	655,322	40.3
2001	931,284	86.5	144,750	13.5	1,076,034	473,665	1,549,699	69.4	30.6	618,415	39.9
AACGR (Percent)											
1991-1996	25.5	---	-6.5	---	5.5	na	8.5	---	---	-0.5	---
1996-1998	5.9	---	-49.8	---	-12.7	75.5	3.3	---	---	0.5	---
1998-2001	7.1	---	6.6	---	7.1	-3.9	3.2	---	---	-1.8	---
1991-2001	15.7	---	-14.1	---	2.0	na	5.8	---	---	-0.7	---

Source: U.S. Department of Transportation (DOT), Schedule T-100.
Data compiled by John F. Brown Company, Inc., 2002.

Notes: 1 Includes both enplaned and 'through' passengers. Excludes non-revenue passengers.
These data differ from the passenger enplanements statistics reported by the airlines to the airports.
AACGR = Average annual compound growth rate.
na = not applicable.

In FY 1996, a number of tour operators (mostly U.K.-based) moved their charter flight operations from MCO to SFB. This resulted in a further drop in international charter passenger activity at MCO; in FY 1998, only about 120,000 passengers were enplaned on international charter flights, accounting for less than 14 percent of all international enplanements at the airport.

Over the FY 1991-2001 period, international passenger activity on scheduled flights at MCO grew steadily from about 217,000 in FY 1991 to 931,000 in FY 2001. This change, from mostly charter to mostly scheduled activity, has resulted in growth in the number of business travelers using international flights at MCO. Virtually no scheduled international flights operated at SFB in 2002.

Europe, and the U.K. in particular, accounted for about half of the airport's international passenger activity over the past decade (Table 3-9). The intermediate years, FYs 1993 and 1998, represented the highs and lows, respectively, of international activity at MCO over the FY 1991-2001 period. Canadian activity grew at the airport following the liberalization of the U.S.-Canada air service agreement in 1995 and continues to comprise over 23 percent of international enplanements at MCO. Aviation activity between MCO and the Caribbean, Mexico, and Latin America represented roughly 15 percent of the airport's international total over the past 10 years.

TABLE 3-9

MAJOR INTERNATIONAL PASSENGER MARKETS

(FOR THE 12 MONTHS ENDED SEPTEMBER 30, PASSENGERS IN THOUSANDS)

International Market Area	1991	Percent of Total	1993	Percent of Total	1998	Percent of Total	2001	Percent of Total
U.K.	336	38.1	605	46.3	342	39.0	551	51.2
Europe (excluding U.K.)	87	9.9	158	12.1	95	10.8	73	6.8
Canada	189	21.4	183	14.0	261	29.8	249	23.2
Caribbean	87	9.9	99	7.6	46	5.3	73	6.8
Mexico	32	3.6	114	8.7	37	4.2	40	3.7
Central and South America	4	0.5	20	1.6	37	4.2	32	3.0
Unknown and Other	146	16.6	129	9.8	59	6.7	58	5.4
Total	**881**	**100.0**	**1,307**	**100.0**	**877**	**100.0**	**1,076**	**100.0**
AACGR (Percent)								
1991-1993	---	---	21.8	---	---	---	---	---
1993-1998	---	---	---	---	-7.7	---	---	---
1998-2001	---	---	---	---	---	---	7.1	---

Source: DOT, Schedule T-100.
Data compiled by John F. Brown Company, Inc., 2002.

Notes: Includes both O&D and connecting revenue passengers departing from MCO on scheduled and non-scheduled international flights.
These data differ from the passenger enplanement statistics reported by the airlines to the airport.
Figures may not sum to totals due to rounding.
AACGR = Average annual compound growth rate.

3.3.3 ORIGIN & DESTINATION PASSENGER TRENDS

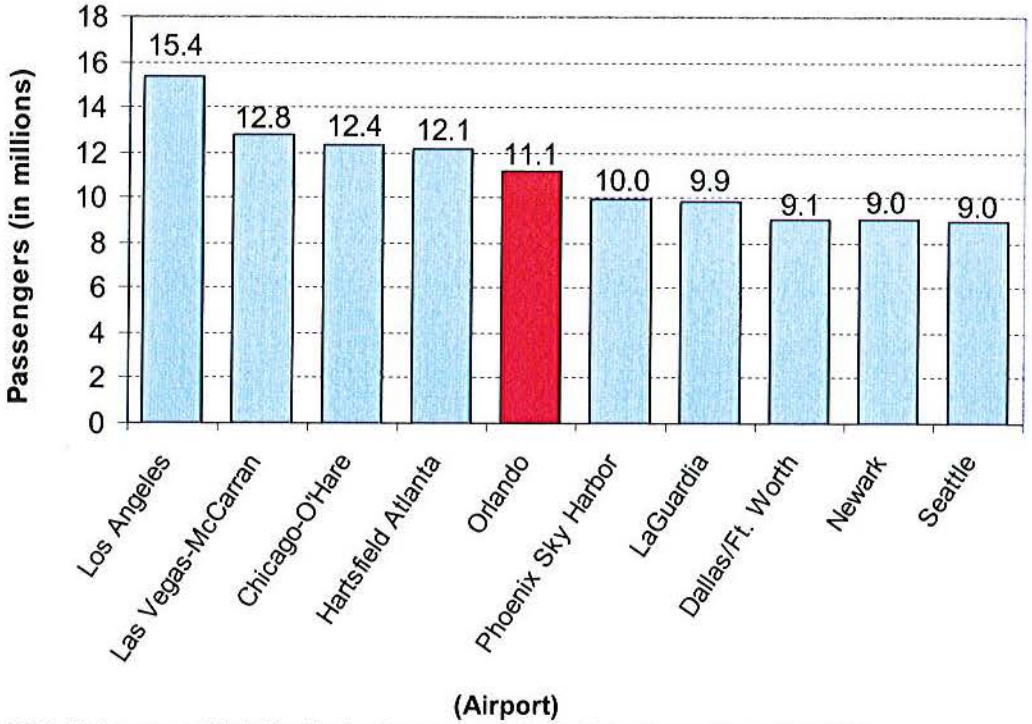
MCO ranked fifth in 2001 among U.S. airports in terms of O&D passengers, behind Los Angeles International Airport (LAX), Las Vegas McCarran International Airport (LAS), Chicago O'Hare International Airport (ORD), and The William B. Hartsfield International Airport (ATL) (Figure 3-2). Domestic scheduled O&D passengers, which represented nearly 85 percent of domestic enplanements in FY 2001, grew 6.8 percent per year between FYs 1991 and 2001, a much higher rate than the average annual growth experienced across the state (4.6 percent) and the nation (3.6 percent).

Domestic O&D aviation activity at MCO grew over the past decade in relative terms, as a percentage of both state and national activity (Table 3-10). As a proportion of total domestic O&D enplanements at all Florida airports combined, MCO grew from 23 percent in FY 1991 to 28 percent in FY 1997

and maintained that proportion thereafter. Domestic O&D activity at MCO in FY 2001 accounted for nearly 3 percent of the nationwide total, up from 2 percent 10 years before. In the latter part of the 1990s, growth in domestic O&D activity at MCO generally matched or exceeded the rate of growth in Florida and the U.S. as a whole.

For the first 6 months of FY 2002, post-September 11, MCO experienced a 17.1 percent decline in domestic O&D passengers, exceeding the declines experienced across the state (-12.1 percent) and the nation (-14.7 percent).

FIGURE 3-2
TOP-RANKING U.S. AIRPORTS
BY OUTBOUND DOMESTIC O&D PASSENGERS
(CALENDAR YEAR 2001)



Source: DOT, Air Passenger Origin-Destination Survey, reconciled to Schedules T-100 and 298C T-1. Data compiled by John F. Brown Company, Inc., 2002.

TABLE 3-10
DOMESTIC SCHEDULED O&D PASSENGER TRENDS
AT MCO, ALL FLORIDA AIRPORTS, AND ALL U.S. AIRPORTS
(FOR THE 12 MONTHS ENDED SEPTEMBER 30)

Year(s)	Outbound O&D Revenue Passengers			MCO as a Percent of Total	
	MCO	Florida Total[1]	U.S. Total[2]	Florida	U.S.
1991	6,081,080	26,596,560	285,691,200	22.9	2.1
1996	9,006,880	33,614,430	361,696,540	26.8	2.5
1997	10,145,990	36,011,320	376,073,230	28.2	2.7
1998	10,279,280	36,236,190	381,074,850	28.4	2.7
1999	10,802,510	38,218,060	394,964,860	28.3	2.7
2000	11,610,040	40,553,640	414,619,680	28.6	2.8
2001	11,748,410	41,578,290	406,828,920	28.3	2.9
FYTD 2001	6,050,520	21,708,190	208,839,040	27.9	2.9
FYTD 2002	5,017,690	19,071,130	178,130,230	26.3	2.8
AACGR (Percent)					
1991-1996	8.2	4.8	4.8	---	---
1996-2001	5.5	4.3	2.4	---	---
1991-2001	6.8	4.6	3.6	---	---
Year-Over-Year Change (Percent)					
FYTD 2000-2001	-17.1	-12.1	-14.7	---	---

Source: DOT, Air Passenger Origin-Destination Survey, reconciled to Schedules T-100 and 298C T-1. Data compiled by John F. Brown Company, Inc., 2002.

Notes: [1] Excludes purely domestic trips by international passengers while visiting in the U.S.
[2] Excludes airports outside the continental U.S., i.e., those in Puerto Rico, the U.S. Virgin Islands, Hawaii, and the islands of the U.S. Pacific Trust.
FYTD = Fiscal year-to-date, October through March.
AACGR = Average annual compound growth rate.

Nearly 60 percent of domestic O&D passengers at MCO in FY 2001 traveled in the top 20 city-pair markets (Table 3-11). Total O&D activity grew over FY 1996 at a higher rate in the top 20 domestic markets (6.2 percent per year, on average) than in the smaller-volume markets (4.5 percent). Based on data from the DOT, *Air Passenger Origin-Destination Survey,* over three-quarters of domestic O&D activity at MCO is generated by visitors. Despite a surge of resident travel growth in the mid-1990s, the proportion of visitors in FY 2001 (about 77 percent) was identical to the level 10 years before. The percentage of visitors traveling between the top 20 O&D city markets from MCO is also shown in Table 3-11.

In addition, Table 3-11 illustrates how O&D passenger activity between MCO and the top 20 city markets changed in the first 6 months of FY 2002. Each of the top 20 city-pairs experienced negative growth, and activity in markets such as New York, Boston, Atlanta, Washington D.C., and Hartford experienced declines in excess of 20 percent.

TABLE 3-11
TOP 20 DOMESTIC O&D CITY MARKETS
(FOR THE 12 MONTHS ENDED SEPTEMBER 30; RANKED ON 2001 PASSENGERS)

Rank[1]	City Market/ Airport	Domestic Outbound O&D Revenue Passengers		Visitors as a Percent of 2001 Passengers	AACGR (Percent) 1996-2001	Six Months Ended March 31		
		1996	2001			2001	2002	Percent Change
1	New York	1,055,160	1,496,480	80.6	7.2	705,770	552,340	-21.7
	Kennedy	*166,170*	*305,440*	*81.1*	*12.9*	*143,960*	*142,600*	*-0.9*
	Newark	*512,340*	*652,620*	*83.3*	*5.0*	*318,960*	*204,470*	*-35.9*
	LaGuardia	*376,650*	*538,420*	*77.6*	*7.4*	*242,850*	*205,270*	*-15.5*
2	Chicago[2]	483,630	613,170	81.8	4.9	302,900	279,560	-7.7
3	Boston	419,740	425,380	82.8	0.3	234,560	167,930	-28.4
4	Philadelphia	332,730	416,400	85.2	4.6	214,200	183,210	-14.5
5	Atlanta	349,170	363,840	65.4	0.8	195,920	139,250	-28.9
6	Washington D.C.[3]	277,410	351,270	75.1	4.8	179,830	135,190	-24.8
7	Detroit[4]	317,170	320,480	84.3	0.2	169,480	143,500	-15.3
8	Baltimore	185,070	317,550	81.1	11.4	160,330	131,600	-18.3
9	Los Angeles[5]	226,290	316,600	70.4	7.2	157,810	127,990	-18.9
10	Hartford	183,460	311,860	83.5	11.2	164,880	128,540	-22.0
11	Minneapolis-St. Paul	118,210	268,690	83.2	17.8	163,070	136,630	-16.2
12	San Juan	178,930	251,730	63.6	7.1	116,420	93,900	-19.3
13	Dallas/Ft. Worth[6]	201,950	239,290	75.9	3.5	120,870	102,730	-15.0
14	Indianapolis	155,180	208,690	81.1	6.1	108,890	96,370	-11.5
15	Providence	85,780	203,790	82.7	18.9	105,850	102,610	-3.1
16	San Francisco[7]	142,390	203,590	72.0	7.4	97,840	82,410	-15.8
17	Denver	121,890	191,320	71.5	9.4	104,330	91,440	-12.4
18	Pittsburgh	136,080	179,890	81.4	5.7	87,990	76,290	-13.3
19	Houston[8]	109,120	170,670	76.4	9.4	86,330	77,490	-10.2
20	Columbus	120,030	161,130	80.3	6.1	84,450	68,080	-16.4
	Top 20 Markets	5,199,390	7,011,820	---	6.2	3,558,720	2,916,520	-18.0
	Other Markets	3,807,490	4,736,590	---	4.5	2,419,800	2,101,170	-15.7
	Total - All Markets	**9,006,880**	**11,748,410**	**---**	**5.5**	**6,050,520**	**5,017,690**	**-17.1**

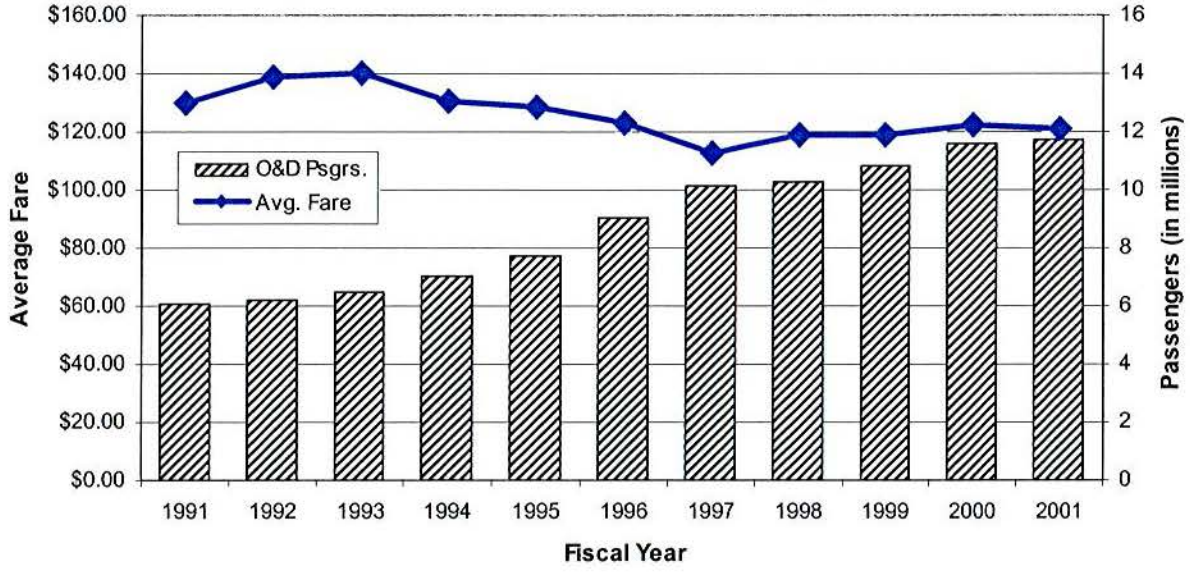
Source: DOT, Air Passenger Origin-Destination Survey, reconciled to Schedule T-100 and 298C T-1.
Data compiled by John F. Brown Company, Inc., 2002.

Notes:
[1] Ranked by domestic outbound O&D passengers for the 12 months ended September 30, 2001.
[2] Market includes O'Hare and Midway Airports.
[3] Market includes Dulles and Reagan Airports.
[4] Market includes Detroit Metro and City Airports.
[5] Market includes Los Angeles, Burbank, Long Beach, Ontario, and Orange County Airports.
[6] Market includes Dallas/Ft. Worth Airport and Love Field.
[7] Market includes San Francisco, San Jose, and Oakland Airports.
[8] Market includes Bush and Hobby Airports.
AACGR = Average annual compound growth rate.

3.3.4 AIR FARE TRENDS

The relationship between airfares and passenger activity at MCO is illustrated on Figure 3-3. Domestic O&D passenger enplanements showed strong growth (up 57 percent) in the FY 1993-1997 period, during which the average domestic one-way fare paid at the airport dropped by 20 percent. This period coincided with the introduction of low-fare service by Southwest Airlines and other low-fare carriers. In the years that followed, the average fare paid showed gradual growth and passenger activity grew at a more modest rate. It is important to note that the average one-way fare was lower in FY 2001 than in FY 1991 at MCO.

FIGURE 3-3
TRENDS IN AVERAGE FARE PAID AND DOMESTIC O&D PASSENGERS
(FISCAL YEARS 1991 THROUGH 2001)



Source: DOT, Air Passenger Origin-Destination Survey, reconciled to Schedules T-100 and 298C T-1. Data compiled by John F. Brown Company, Inc., 2002.
Note: Outbound passengers only.

Table 3-12 presents average fare, average length of haul, and average yield data for the top 10 U.S. domestic O&D airports. One way to evaluate the average fare paid by passengers at MCO is by drawing comparisons (Appendix E) with other airports whose passengers, on average, travel a similar distance. On that basis, with the exception of LAS, MCO had the lowest average fare paid, among airports of any length of haul within 10 to 15 percent of MCO.

TABLE 3-12

AVERAGE ONE-WAY FARE AT TOP 10 U.S. DOMESTIC O&D AIRPORTS

(CALENDAR YEAR 2001, LISTED BY DESCENDING LENGTH OF HAUL)

Airport	Average Fare (dollars)	Average Length of Haul (miles)	Yield (cents per mile)
Los Angeles	153.79	1,505	10.22
Seattle	146.33	1,419	10.31
Newark	190.30	1,309	14.54
Las Vegas-McCarran	106.78	1,186	9.00
Phoenix-Sky Harbor	120.09	1,123	10.69
Orlando	**117.10**	**1,120**	**10.46**
Dallas/Fort Worth	190.21	1,033	18.41
Chicago-O'Hare	167.65	1,001	16.74
New York-LaGuardia	154.22	916	16.83
Hartsfield Atlanta	148.81	838	17.75

Source: DOT, Air Passenger Origin-Destination Survey, reconciled to Schedules T-100 and 298C T-1. Data compiled by John F. Brown Company, Inc., 2002.

3.3.5 AIR SERVICE TRENDS

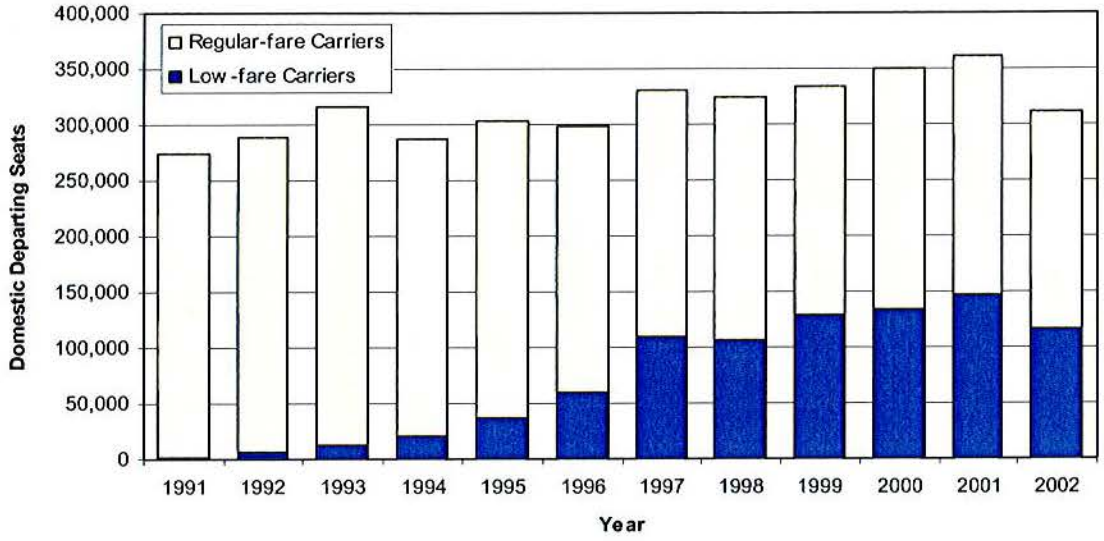
The nature of domestic air service at MCO underwent a significant shift over the past 10 years. In FY 1991, there were virtually no low-fare scheduled carriers serving the airport. Passengers seeking low fares were forced to rely on domestic charter flights and the often-elusive, capacity-controlled low fares offered by the major network airlines. Throughout the decade, however, the airport experienced service launches and subsequent service expansions by several low-fare carriers. As the low-fare carriers increased their presence at the airport, the regular-fare carriers tended to reduce their capacity at MCO.

The growth in low-fare seats over the 1991-2002 period is illustrated on Figure 3-4. In 1996, 20 percent of all domestic departing seats were operated by low-fare carriers; by 2001, over 40 percent were provided by low-fare carriers. Because of the shutdown of US Airways' MetroJet operation and the scaling back of Delta Express service following the September 11 attacks, the proportion of low-fare seats in 2002 declined to 37.6 percent.

MCO experienced considerable growth in domestic scheduled service in recent years; there were 10.3 percent more scheduled jet flights to domestic destinations in August 2001 than in August 1997. Most of this growth was in the form of nonstop service to the airport's top 20 O&D cities.

Between August 2001 and August 2002, however, primarily because of cutbacks by the airlines following September 11, the number of flight departures at the airport dropped more than 8 percent. Service declines in the top 20 markets accounted for virtually all of the reductions at MCO; flight reductions to 3 cities (i.e., New York, Boston, and Washington) alone accounted for half of the total cuts. The number of flights to New York-Kennedy, Philadelphia, and San Juan grew after September 11, and the level of service to several cities was either held constant or reduced by only one or two flights per week. The net result was that MCO was served by just one percent more domestic flights in August 2002 than 5 years before.

FIGURE 3-4
AVERAGE WEEKLY SEATS ON REGULAR AND LOW-FARE CARRIERS DEPARTING ON SCHEDULED DOMESTIC FLIGHTS



Source: *Official Airline Guide, for the month of February.*
Data compiled by John F. Brown Company, Inc., 2002.

Notes: The following carriers were categorized as "low-fare" carriers: AirTran Airways, America West Airlines, ATA Airlines, Carnival Airlines, Delta Express, Eastwind Airlines, Frontier Airlines, jetBlue Airways, US Airways/MetroJet, ProAir, Southwest Airlines, Spirit Airlines, Sun Country Airlines, Valujet, and Vanguard Airlines.

Not reflected in the figure are the "CAL Lite" low-fare seats operated by Continental Airlines in 1994 and 1995.

Table 3-13 presents the historical aircraft operations at the airport for FYs 1993 through 2001. Since 1993, aircraft operations at MCO have grown at 0.6 percent per year, on average; this compares to the average growth nationally of 1.1 percent per year over the same period. In any given year, air carrier and commuter operations accounted for approximately 90 percent of the aircraft operations at MCO. General aviation and military operations represent the remaining 10 percent. General aviation at MCO is primarily generated by itinerant corporate jets and the airport's based aircraft fleet.

3.3.6 CARGO ACTIVITY TRENDS

Total cargo tonnage handled at MCO has grown 3 percent per year on average between FYs 1993 and 2001 (Table 3-14). Based on data reported by the Air Transport Association (ATA)[2], total cargo tonnage handled nationally grew 4.8 percent per year over the same period. Cargo handled by all-cargo carriers has been the primary driver behind the growth at MCO. Integrated cargo carriers have experienced particularly strong growth, averaging 8.2 percent per year between FYs 1993 and 2001. In FY 2001, the integrated all-cargo carriers (FedEx, DHL, United Parcel Service [UPS], Emery Worldwide, and ABX Air, Inc.) accounted for almost 65 percent of all cargo tonnage handled at the airport.

[2] Data includes all services (scheduled and nonscheduled) for all ATA passenger members and its largest cargo members.

TABLE 3-13
AIRCRAFT OPERATIONS TRENDS
(FISCAL YEARS 1993 THROUGH 2001)

Year(s)	Air Carrier and Commuter				General Aviation	Military	Total Operations
	Passenger Carriers	All-Cargo Carriers	Other Commercial	Total			
1993	277,318	8,954	12,466	298,738	23,094	5,638	327,200
1994	287,874	10,218	10,846	308,938	28,290	6,986	344,214
1995	289,234	10,950	6,034	306,218	30,210	7,182	343,610
1996	289,174	10,092	6,450	305,716	30,448	5,778	341,942
1997	300,052	11,442	8,996	320,490	31,024	5,730	357,246
1998	303,770	13,058	6,166	322,994	34,876	5,414	363,284
1999	301,018	13,924	6,772	321,714	36,974	4,576	363,262
2000	306,344	14,198	9,126	329,668	33,112	4,586	367,368
2001	288,198	13,454	8,094	309,746	27,606	4,964	342,316
AACGR (Percent)							
1993-1997	2.0	6.3	-7.8	1.8	7.7	1.6	2.2
1997-2001	-1.0	4.1	-2.6	-0.8	-2.9	-3.5	-1.1
1993-2001	0.5	5.2	-5.3	0.5	2.3	-1.0	0.6

Sources: GOAA; FAA, Air Traffic Control (ATC).
Data compiled by John F. Brown Company, Inc., 2002.
Notes: AACGR = Average annual compound growth rate.
Figures may not sum to totals due to rounding.

TABLE 3-14
TRENDS IN TOTAL CARGO HANDLED
(FISCAL YEARS 1993 THROUGH 2001; IN TONS)

Year(s)	Passenger Carriers			All-Cargo Carriers			Total All-Carriers
	U.S.	Foreign-Flag	Total	Integrators	All Other	Total	
1993	87,363	15,679	103,042	88,685	13,020	101,706	204,747
1994	86,621	22,303	108,924	103,420	15,250	118,670	227,594
1995	83,444	24,925	108,369	115,465	16,561	132,026	240,395
1996	82,169	23,943	106,112	117,377	13,145	130,522	236,634
1997	78,714	22,673	101,387	117,882	21,479	139,361	240,748
1998	72,149	23,694	95,843	129,534	32,102	161,636	257,478
1999	71,921	27,853	99,774	146,078	35,597	181,675	281,449
2000	73,922	28,225	102,148	172,662	21,536	194,198	296,346
2001	53,949	24,287	78,236	166,598	14,811	181,409	259,645
AACGR (Percent)							
1993-1997	-2.6	9.7	-0.4	7.4	13.3	8.2	4.1
1997-2001	-9.0	1.7	-6.3	9.0	-8.9	6.8	1.9
1993-2001	-5.8	5.6	-3.4	8.2	1.6	7.5	3.0

Source: GOAA.
Data compiled by John F. Brown Company, Inc., 2002.
Notes: AACGR = Average annual compound growth rate.
Figures may not sum to totals due to rounding.

Passenger carriers have handled a declining share of total cargo at MCO over the past decade, falling from 50 percent of the total in FY 1993 to 30 percent by FY 2001. Cargo tonnage handled on passenger carriers declined 3.4 percent per year between FYs 1993 and 2001.

3.4 TRAFFIC FORECASTS

3.4.1 OVERVIEW

Forecasts of aviation activity at MCO through 2022 were developed through a review of the Orlando Area's demographic and economic base (described in Section 3.2), detailed analyses of activity trends (some of which are summarized in Section 3.3), interviews from several airline representatives, tourism industry trends, and knowledge of evolving industry trends. In the end, professional judgment was used to develop the aviation activity forecasts presented in this section.

In the course of preparing this forecast, the following sources of information were examined:

1. A regression and other analyses were conducted on several historical time series of activity measures. Although these analyses were useful in defining trends prior to the events of September 11, they were only indirectly helpful in charting long-term future aviation activity direction.

2. Carrier news releases and some short-term projections shared with the airport by certain carriers.

3. The most recent GOAA passenger interview survey that was deemed by airport staff to be reliable was conducted in the spring of 1998. Those findings helped to define the general nature of passengers using the airport.

4. Aviation activity forecasts prepared by others were reviewed including the original 1994 Master Plan forecasts, Draft Master Plan forecasts prepared for GOAA in the summer of 2001, projection estimates of visitor and resident travel produced by Fishkind and Associates, and the Terminal Area Forecast (TAF) prepared recently (and still in preliminary form) by the FAA.

The aviation activity forecasts for MCO were prepared in the early months of 2002 in support of an issuance of airport revenue bonds. Those projections were developed for financial planning purposes, with an intended high degree of likelihood that they will be exceeded over the forecast period. It is recognized that the aviation activity forecasts presented in this section will be employed largely for facility planning purposes. Consequently, these forecasts have been developed independently from the earlier activity forecasts, and with an intended lower degree of likelihood that they will be exceeded over the forecast period.

3.4.2 AIR PASSENGER ENPLANEMENTS

In this subsection, the methodology used and assumptions made in developing the projections of enplaned passengers through 2022 are described. The forecasts developed are also compared to those prepared by others. Finally, the planning activity levels and the timeframe ranges when those activity levels will be reached are presented.

3.4.2.1 Methodology

The methodology employed in developing these passenger forecasts was based on four key elements, namely, a) segmentation of activity by geographic sector and passenger type, b) accurate historical

and base-year data, c) monthly projections of short-term activity changes, and d) annual projections of longer-term activity growth. These elements are described below.

3.4.2.2 Passenger Activity Segmentation

Passenger activity was categorized along two dimensions. The first was the traditional breakdown by geographic sector, with some distinct differences from the usual simplistic domestic/international split, as follows:

1. Domestic (88 percent of FY 2002 projected enplanements)

   Passengers who boarded domestic flights at MCO and whose final destinations were in the U.S., including Alaska, Hawaii, Puerto Rico, and the U.S. Virgin Islands.

2. Domestic-Bound for International Destinations (about 5.5 percent)

   Passengers who boarded domestic flights at the airport but whose final destinations were outside of the U.S. Recorded as domestic enplanements at MCO, these passengers traveled to other U.S. gateway airports where they connected with international flights.

3. International (about 6.5 percent)

   Passengers who boarded international flights at MCO. Although all of these passengers follow the same boarding patterns on departure from the airport, there is a difference in the way they are handled upon arrival. Hence, they were categorized into two subgroups for forecast purposes: 1) those who arrived from certain airports in origin countries (i.e., Canada, Bahamas) where they pre-cleared U.S. Customs and Immigration and were treated upon arrival at MCO no differently than domestic passengers, and 2) those who were required to clear through Federal Inspection Services (FIS) upon arrival at MCO. GOAA does not maintain statistics regarding pre-cleared passenger counts; therefore, it was assumed that all passengers arriving on flights from Canada, Nassau, and Freeport arrived pre-cleared. It is recognized, however, that perhaps as much as 25 percent of arriving passenger activity from Canada requires FIS clearance.

Enplanements were also categorized by type of passengers. More specifically, the passengers were classified by the role that the airport played in their air journeys: as their air travel destination, as their originating airport, or as the place where they made flight connections, as follows:

1. Visitors (73 percent of FY 2002 projected enplanements)

   Passengers who reside outside of Orlando and its surrounding area, who were returning after a visit, or who were traveling to yet another destination before returning home. Air travel by these passengers is subject to demand-related factors, including the status of the economy in their part of the U.S. or their home country; the attraction of Orlando's theme parks and hospitality infrastructure, or of cruises departing from nearby Port Canaveral; business connections with Orlando firms; and conventions held at Orlando Area facilities. Visitor air travel is also subject to supply-related factors, namely, the level and quality of air service and the level and availability of airfares.

2. Area Residents (22 percent)

   Passengers who reside in Orlando and within driving distance of the airport, who originated their air journeys at MCO. Resident air travel is primarily influenced by demand-related factors, including local demographics (e.g., population growth, age distribution, personal income) and local economics (e.g., employment growth, new business creation, unemployment).

3. Connecting Passengers (5 percent)

   Passengers who made connections from one flight to another at the airport. Connecting air travel at MCO is primarily influenced by supply-side factors, including carrier hubbing activity, feeder service levels, carrier codesharing and alliance relationships, and air service at competing airports.

3.4.2.3 Base Year Data and Short-Term Projections

The quality of any aviation activity forecast is highly dependent on accurate historical and base-year activity data. Data obtained from both GOAA and DOT were used to develop an 11-year time series of enplanements at MCO, broken out in the various market segments described earlier (see domestic enplanements in Table 3-15 and international enplanements in Table 3-16).

Because aviation activity at MCO is still showing the effects of the downturn in air travel that began in early 2001 and the dramatic drop that followed the events of September 11, 2001, enplanements were projected at the airport on a monthly basis for the last 3 months of FY 2002. These projections were made using enplanement data by carrier grouping, due to the lack of current segmented data from DOT. Using these monthly projections, together with actual data for the earlier part of FY 2002, total FY 2002 activity was projected for each enplanement segment. Monthly enplanements were also projected through FY 2003 to serve as a guide for the annual forecast of segmented activity in that year. (See Figure 3-5 for an illustration of these near-term projections, summarized into 6 categories and expressed on a quarterly basis for both FYs 2002 and 2003.)

3.4.2.4 Longer-Term Growth Forecasts

Estimated annual growth factors were applied to each segment of enplanement activity, as shown in Table 3-17.

Domestic activity growth in FY 2003 was projected to be in excess of 10 percent, relative to the depressed activity levels in FY 2002, as the post-September 11th aviation activity recovery continues. The rate of domestic activity growth is expected to taper rapidly in subsequent years. Domestic visitor activity growth is assumed to decline over the forecast period, as the market matures and the addition of more theme parks has a diminishing effect on the rate of visitor growth. Domestic travel by area residents is expected to remain strong, supported both by continued growth in area businesses and the ongoing inflow of retirees with a relatively high propensity to travel by air.

TABLE 3-15
TRENDS IN DOMESTIC ENPLANED PASSENGERS, SEGMENTED FOR FORECASTING PURPOSES
(FOR THE 12 MONTHS ENDED SEPTEMBER 30)

	"Pure" Domestic Enplanements															
	Revenue Passengers on Scheduled Flights					Revenue Passengers on Charter Flights and All Domestic Non-Revenue Passengers (Assume All O&D)			"Pure" Domestic Summary				Domestic Enplanements By O&D Passengers Bound for International Destinations			Total Domestic Enplaned Passengers
	Originating Domestic O&D		Connections From		Total Scheduled				O&D Passengers							
Year(s)	Residents (1)	Visitors (2)	Domestic Flights (3)	Int'l Flights (4)	Revenue Passengers (5)	Residents (6)	Visitors (7)	Total (8)	Residents (9)	Visitors (10)	Connecting (11)	"Pure" Domestic Total (12)	Residents (13)	Visitors (14)	Total (15)	(16)
1991	1,358,534	4,739,596	1,020,895	42,890	7,161,915	111,704	446,817	558,521	1,470,239	5,186,412	1,063,785	7,720,436	92,854	312,446	405,300	8,125,736
1992	1,364,786	4,847,464	1,445,785	76,440	7,734,475	133,776	535,104	668,880	1,498,562	5,382,568	1,522,225	8,403,355	100,960	371,920	472,880	8,876,235
1993	1,448,462	5,017,928	1,508,585	104,490	8,079,465	150,069	600,277	750,346	1,598,531	5,618,205	1,613,075	8,829,811	104,420	394,960	499,380	9,329,191
1994	1,646,584	5,413,686	1,206,510	94,360	8,361,140	144,158	576,632	720,790	1,790,742	5,990,318	1,300,870	9,081,930	107,567	384,803	492,390	9,574,320
1995	1,825,279	5,936,671	957,660	69,960	8,789,570	122,270	489,078	611,348	1,947,549	6,425,749	1,027,620	9,400,918	120,757	413,093	533,850	9,934,768
1996	2,224,418	6,808,922	748,335	67,660	9,849,335	110,205	440,820	551,025	2,334,623	7,249,742	815,995	10,400,360	138,068	483,302	621,370	11,021,730
1997	2,612,017	7,563,043	870,645	48,520	11,094,225	104,875	419,501	524,376	2,716,892	7,982,544	919,165	11,618,601	152,967	568,233	721,200	12,339,801
1998	2,621,506	7,684,434	909,315	36,130	11,251,385	148,777	595,107	743,884	2,770,283	8,279,541	945,445	11,995,269	156,387	584,433	740,820	12,736,089
1999	2,582,133	8,244,407	822,165	36,960	11,685,665	146,866	587,465	734,332	2,729,000	8,831,872	859,125	12,419,997	165,928	624,582	790,510	13,210,507
2000	2,724,876	8,899,664	813,595	42,860	12,480,995	108,454	433,814	542,268	2,833,330	9,333,478	856,455	13,023,263	189,037	708,573	897,610	13,920,873
2001	2,730,330	9,032,100	701,425	36,540	12,500,395	87,720	350,880	438,600	2,818,051	9,382,980	737,965	12,938,995	201,138	678,732	879,870	13,818,865
2002P	2,494,700	8,112,000	590,000	29,000	11,225,700	40,300	161,000	201,300	2,535,000	8,273,000	619,000	11,427,000	191,500	501,500	693,000	12,120,000
FY 2001 1st Half	1,319,212	4,737,458	429,380	21,980	6,508,030	35,083	140,331	175,414	1,354,295	4,877,789	451,360	6,683,444	89,939	366,231	456,170	7,139,614
FY 2002 1st Half	1,119,721	3,902,209	314,930	14,040	5,350,900	15,243	60,971	76,214	1,134,964	3,963,180	328,970	5,427,114	80,037	238,923	318,960	5,746,074
AACGR (Percent)																
1991-1996	10.4	7.5	-6.0	9.5	6.6	-0.3	-0.3	-0.3	9.7	6.9	-5.2	6.1	8.3	9.1	8.9	6.3
1996-2001	4.2	5.8	-1.3	-11.6	4.9	-4.5	-4.5	-4.5	3.8	5.3	-2.0	4.5	7.8	7.0	7.2	4.6
1991-2001	7.2	6.7	-3.7	-1.6	5.7	-2.4	-2.4	-2.4	6.7	6.1	-3.6	5.3	8.0	8.1	8.1	5.5
Year-Over-Year Change (Percent)																
2001-2002P	-8.6	-10.2	-15.9	-20.6	-10.2	-54.1	-54.1	-54.1	-10.0	-11.8	-16.1	-11.7	-4.8	-26.1	-21.2	-12.3

Sources: *GOAA; DOT, Schedules T-3, T-100, 298C T-1, and Air Passenger Origin-Destination Survey, reconciled to Schedules T-100 and 298C T-1;*
U.S. Department of Commerce, Tourism Industries, U.S. International Air Travel Statistics, data reported by U.S. Immigration and Naturalization Service; John F. Brown Company, Inc., 2002.

Notes: P = Projection by John F. Brown Company, Inc.
AACGR = Average annual compound growth rate.

Description of Data:

Column:
1 Domestic O&D passengers who initiated their travel at MCO.
2 Domestic O&D passengers who departed MCO after a visit to the Orlando Area. Notes: Includes purely domestic trips by international travelers while visiting the U.S. Categorization of domestic O&D passengers into residents and visitors, in columns 1 and 2, was estimated on the basis of DOT O&D Survey data.
3 Domestic-to-domestic connections.
4 International-to-domestic connections. Note: Figures in columns 3 and 4 do not include connections made strictly between regional carriers, from foreign-flag airlines to regional carriers, or those made by connecting passengers traveling on separate tickets.
5 Sum of columns 1 through 4.
6, 7 Column 8 is split by an estimated 20 percent residents and 80 percent visitors.
8 Column 12 minus column 5. Includes revenue and non-revenue passengers traveling on scheduled flights and all passengers carried on domestic non-scheduled (i.e., charter) flights.
9 Sum of columns 1 and 6.
10 Sum of columns 2 and 7.
11 Sum of columns 3 and 4.
12 Column 16 minus column 1.
13 Passengers originating international trips at MCO who used domestic flights to other U.S. airport gateways, connecting there with flights to their international destinations.
14 Passengers returning from a visit in the Orlando area, who used domestic flights to other U.S. airport gateways, connecting there with international flights.
Note: Categorization of column 15 passengers into residents and visitors was estimated on the basis of DOT O&D Survey data.
15 DOT *O&D Survey.*
16 GOAA.

TABLE 3-16

TRENDS IN INTERNATIONAL AND TOTAL ENPLANED PASSENGERS, SEGMENTED FOR FORECASTING PURPOSES (FOR THE 12 MONTHS ENDED SEPTEMBER 30)

	International Enplanements															
	O&D Passengers								International Summary				Summary of Total Enplaned Passengers			
	By Carrier Flag				By Pre-Cleared vs. Requiring FIS											
	On U.S. Carriers		On Foreign-Flag Carriers		Pre-Cleared		Requiring FIS		O&D Passengers				O&D Passengers			
Year(s)	Residents (17)	Visitors (18)	Residents (19)	Visitors (20)	Residents (21)	Visitors (22)	Residents (23)	Visitors (24)	Residents (25)	Visitors (26)	Connecting (27)	Total International Enplaned Passengers (28)	Residents (29)	Visitors (30)	Connecting (31)	Total Enplaned Passengers (32)
1991	35,879	120,731	51,172	675,527	24,056	192,691	62,995	603,567	87,051	796,258	42,890	926,199	1,650,144	6,295,116	1,106,675	9,051,935
1992	50,826	187,234	57,444	835,788	31,910	226,077	76,360	796,945	108,270	1,023,022	76,440	1,207,732	1,707,792	6,777,510	1,598,665	10,083,967
1993	42,025	158,957	88,087	922,151	25,101	190,116	105,011	890,992	130,112	1,081,108	104,490	1,315,710	1,833,063	7,094,273	1,717,565	10,644,901
1994	61,172	218,793	81,741	813,099	19,512	149,508	123,401	882,384	142,913	1,031,892	94,360	1,269,165	2,041,243	7,407,012	1,395,230	10,843,485
1995	63,506	217,247	78,765	734,750	21,042	138,906	121,229	813,091	142,271	951,997	69,960	1,164,228	2,210,577	7,790,839	1,097,580	11,098,996
1996	65,566	229,512	97,250	788,133	33,640	206,728	129,176	810,917	162,816	1,017,645	67,660	1,248,121	2,635,508	8,750,688	883,655	12,269,851
1997	33,275	123,610	110,394	755,529	40,856	232,956	102,813	646,182	143,669	879,139	48,520	1,071,328	3,013,528	9,429,916	967,685	13,411,129
1998	17,792	66,492	142,631	736,318	44,208	217,026	116,216	585,783	160,424	802,809	36,130	999,363	3,087,093	9,666,784	981,575	13,735,452
1999	15,852	59,670	134,739	867,577	35,243	204,799	115,349	722,447	150,592	927,247	36,960	1,114,798	3,045,519	10,383,701	896,085	14,325,305
2000	20,062	75,198	139,799	958,639	41,517	249,290	118,343	784,548	159,861	1,033,837	42,860	1,236,558	3,182,227	11,075,889	899,315	15,157,431
2001	10,115	34,133	132,527	902,638	47,432	284,694	95,211	652,076	142,642	936,770	36,540	1,115,953	3,161,831	10,998,482	774,505	14,934,818
2002P	10,500	27,500	103,000	683,000	37,500	207,000	76,000	503,500	113,500	710,500	31,000	855,000	2,840,000	9,485,001	650,000	12,975,000
FY 2001 1st Half	5,103	21,327	69,015	442,801	n.e.	n.e.	n.e.	n.e.	74,118	464,128	21,980	560,226	1,518,352	5,708,148	473,340	7,699,840
FY 2002 1st Half	4,576	13,462	52,983	327,617	n.e.	n.e.	n.e.	n.e.	57,559	341,079	14,040	412,678	1,272,560	4,543,183	343,010	6,158,752
AACGR (Percent)																
1991-1996	12.8	13.7	13.7	3.1	6.9	1.4	15.4	6.1	13.3	5.0	9.5	6.1	9.8	6.8	-4.4	6.3
1996-2001	-31.2	-31.7	6.4	2.8	7.1	6.6	-5.9	-4.3	-2.6	-1.6	-11.6	-2.2	3.7	4.7	-2.6	4.0
1991-2001	-11.9	-11.9	10.0	2.9	7.0	4.0	4.2	0.8	5.1	1.6	-1.6	1.9	6.7	5.7	-3.5	5.1
Year-Over-Year Change (Percent)																
2001-2002P	3.8	-19.4	-22.3	-24.3	-20.9	-27.3	-20.2	-22.8	-20.4	-24.2	-15.2	-23.4	-10.2	-13.8	-16.1	-13.1

Sources: *GOAA; DOT, Schedules T-3, T-100, 298C T-1, and Air Passenger Origin-Destination Survey, reconciled to Schedules T-100 and 298C T-1;*
U.S. Department of Commerce, Tourism Industries, U.S. International Air Travel Statistics, data reported by U.S. Immigration and Naturalization Service; John F. Brown Company, Inc., 2002.

Notes: P = Projection by John F. Brown Company, Inc.; n.e. = not estimated.
AACGR = Average annual compound growth rate.

Description of Data:

Column 17 - 20 GOAA passenger enplanement statistics. Note: Includes revenue and non-revenue passengers.

17, 18 Passengers enplaned on both scheduled and non-scheduled (i.e., charter) international flights operated by U.S. carriers (airport data) minus column 4.
Note: Categorization of international passengers enplaned on U.S. carriers into residents and visitors in columns 17 and 18 was estimated on the basis of DOT *O&D Survey* data.

19, 20 Passengers enplaned on both scheduled and non-scheduled (i.e., charter) international flights operated by foreign-flag carriers.
Note: Categorization of international passengers enplaned on foreign-flag carriers into residents and visitors in columns 19 and 20 was estimated on the basis of DOT O&D Survey data.

21, 22 International onboard passengers departing for Nassau, Freeport, and Canada.

23, 24 International enplaned passengers as reported by the airport minus international onboard passengers departing for Nassau, Freeport, and Canada.
Note: Categorization of international passengers into residents and visitors in columns 21 through 24 was estimated on the basis of DOT *O&D Survey* data.

25 Sum of columns 17 and 19.

26 Sum of columns 18 and 20.

27 Set equal to column 4.

28 GOAA.

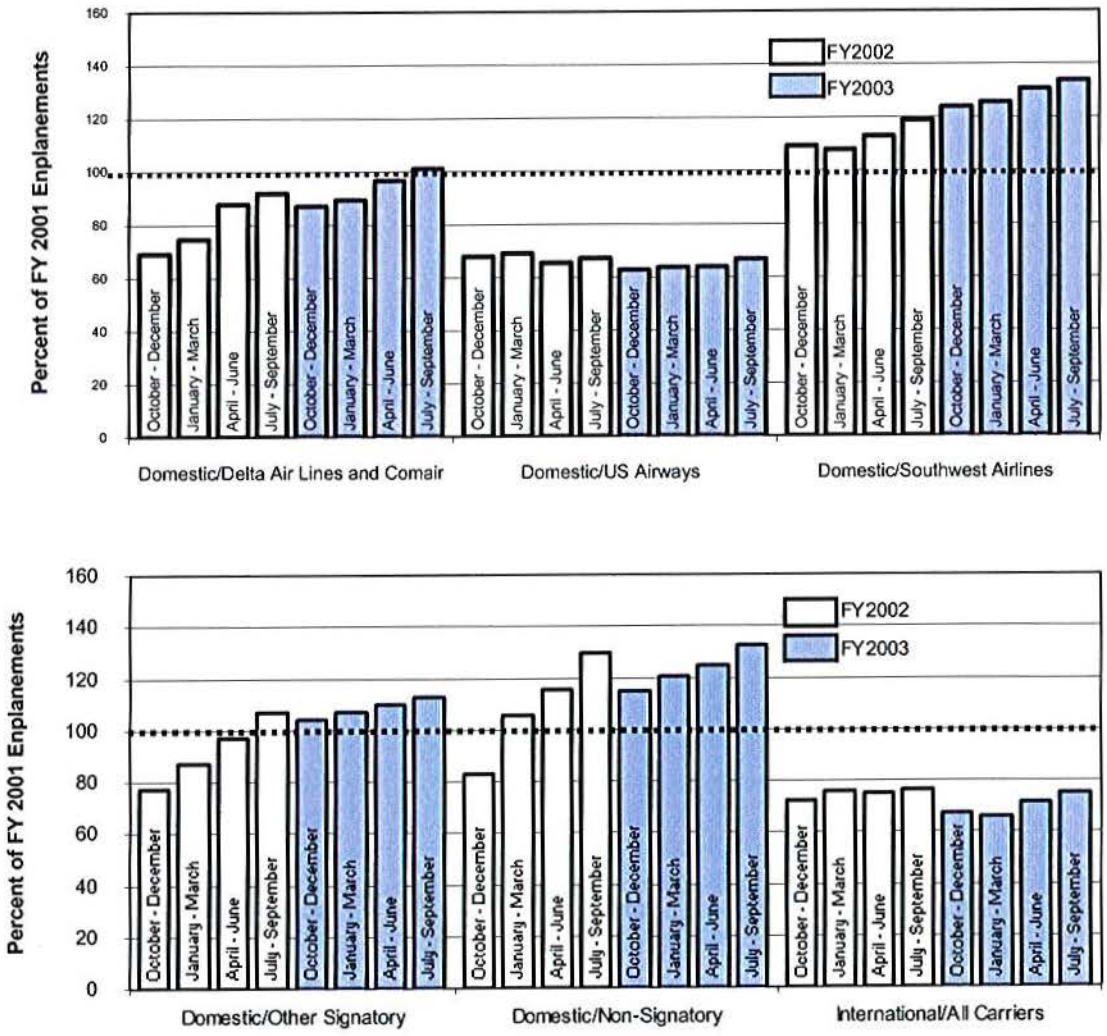
29 Sum of columns 9, 13, and 25.

30 Sum of columns 10, 14, and 26.

31 Sum of columns 11 and 27.

32 GOAA.

FIGURE 3-5
PROJECTION OF NEAR-TERM PASSENGER ENPLANEMENTS
(FISCAL YEAR 2002 AND 2003, BY QUARTER)



Sources: Historical data, October 2001 through June 2002 - GOAA;
Projections, July 2002 through June 2003 - John F. Brown Company, Inc., 2002.

TABLE 3-17
ENPLANED PASSENGER ANNUAL RATES OF CHANGE - BASE FORECAST
(FOR THE 12 MONTHS ENDED SEPTEMBER 30; IN PERCENT)

	Projected 2002	2003	2004	2005	2006	2007	2008-2012	2013-2017	2018-2022	AACGR 2001-2022
Total Enplanements	-13.1	12.8	5.0	4.3	3.9	3.7	3.5	3.0	2.7	2.9
Domestic	-11.7	13.7	4.5	3.9	3.6	3.4	3.2	2.8	2.6	2.8
O&D	-11.4	13.6	4.4	3.9	3.6	3.4	3.2	2.8	2.6	2.8
Resident	-10.0	12.5	5.0	4.3	4.0	4.0	4.0	3.8	3.5	3.6
Visitor	-11.8	14.0	4.3	3.8	3.5	3.3	3.0	2.5	2.3	2.6
Connecting	-16.1	14.5	6.0	4.5	3.5	3.0	2.5	2.3	2.0	2.2
Domestic-Bound for International Destinations	-21.2	24.8	10.1	7.7	6.4	6.0	5.1	4.0	3.0	4.2
O&D	-21.2	24.8	10.1	7.7	6.4	6.0	5.1	4.0	3.0	4.2
Resident	-4.8	11.0	7.0	6.5	6.3	6.0	5.0	4.0	3.0	4.4
Visitor	-26.1	30.0	11.0	8.0	6.5	6.0	5.0	4.0	3.0	4.1
International	-23.4	-8.8	6.9	6.1	6.1	5.8	5.7	5.0	4.2	2.9
O&D	-23.7	-9.3	6.7	5.9	5.8	5.5	5.6	4.9	4.1	2.8
Requiring FIS	-22.5	-8.9	7.4	6.5	6.5	6.4	6.5	5.4	4.5	3.4
Resident	-20.2	-8.0	7.0	6.0	6.0	6.0	6.0	5.0	4.5	3.4
Visitor	-22.8	-9.0	7.5	6.5	6.5	6.5	6.5	5.5	4.5	3.4
Precleared	-26.4	-10.4	5.0	4.3	4.2	3.2	2.8	3.0	2.9	0.8
Resident	-20.9	-8.0	5.3	4.5	4.0	3.5	3.3	3.0	3.0	1.4
Visitor	-27.3	-11.0	5.0	4.3	3.8	3.3	3.0	2.8	2.8	0.7
Connecting	-15.2	7.0	12.0	12.0	12.0	11.0	9.0	7.0	5.0	6.6

Data compiled by John F. Brown Company, Inc., 2002.
AACGR = Average annual compound growth rate.

The decline in international passenger activity is projected to continue into FY 2003, longer than for domestic activity, due in part to a continued decline in international activity in the first 6 months of 2002 relative to the corresponding months of 2000. Hence, it is expected that international activity at the airport will continue to decline into FY 2003 before it levels out and starts to show positive growth. However, it is also expected that international service will tend to grow faster than domestic service through the remainder of the forecast period, and that international enplanements will reflect that growth in service. Finally, it is expected that the component of international passenger activity that requires FIS clearance at MCO will grow at a greater rate than the precleared component, since Canada and the Bahamas represent relatively mature markets.

Until international air service develops further at MCO, more than half of the enplaning passengers bound for international destinations will use domestic flights to other U.S. gateway airports. Consequently, the growth of the Domestic-Bound for International Destinations segment is projected to exceed that of the international segment until later in this decade; over the longer-term, however, the international segment will likely show relatively stronger growth.

3.4.2.5 Base Passenger Forecast

The resulting enplaned passenger forecast, along with projected average rates of growth, is presented in Table 3-18. In the near term, the recovery of total enplanements to pre-September 11 levels by late 2003 and previous peak level (2000) by late 2004 is projected. In the long term, 27.15 million enplanements at MCO in FY 2022 is projected, more than double the passenger level that is projected for FY 2002.

Over the next 20 years, moderate changes in the composition of passenger activity are projected at MCO. Domestic passengers will make up a smaller proportion of the total (85 percent, down from 88 percent in FY 2002), while international passengers (both those boarding international flights and those using domestic flights to other U.S. gateways) will make up the remaining 15 percent (up from 12 percent). The number of international passengers requiring clearance through FIS upon arrival will nearly triple from the current number, while the number of precleared passengers will not even double over the forecast period.

The share of total passengers made up of area residents will grow significantly (24.4 percent, up from about 22 percent in FY 2002), while visitors will account for a reduced proportion (about 71 percent, down from 73 percent). Meanwhile, connecting passengers will continue to represent about 5 percent of total activity at MCO.

A comparison of the base passenger activity forecast to the original Master Plan forecast made in December 1994, and to the TAFs made by FAA both prior to and following September 11, 2001, is presented on Figure 3-6.[3]

[3] The FAA 2002 TAF is a preliminary forecast prepared in August 2002 and, hence, is subject to change before being officially released by FAA in January 2003.

TABLE 3-18
ENPLANED PASSENGERS - BASE FORECAST
(FOR THE 12 MONTHS ENDED SEPTEMBER 30; PASSENGERS IN THOUSANDS)

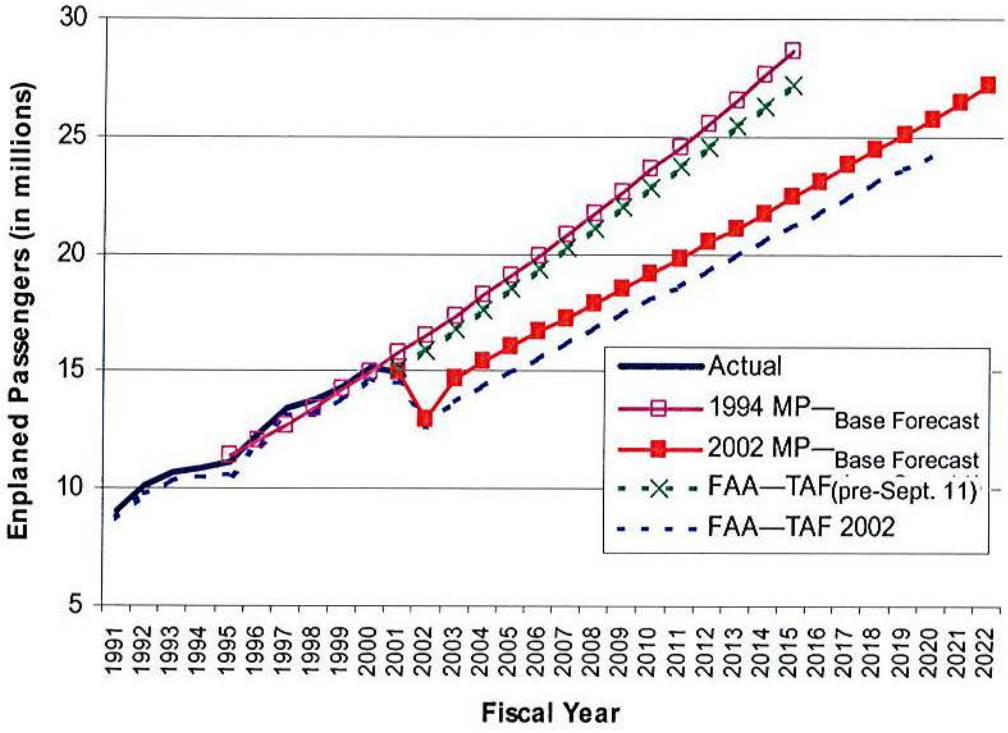
	Actual		Projected	Forecast												AACGR 2001-2022 (Percent)
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2017	2022	
Total Enplanements	**15,157**	**14,935**	**12,975**	**14,637**	**15,365**	**16,019**	**16,649**	**17,265**	**17,862**	**18,480**	**19,122**	**19,788**	**20,479**	**23,761**	**27,149**	**2.9**
Domestic	**13,023**	**12,939**	**11,427**	**12,992**	**13,579**	**14,109**	**14,619**	**15,116**	**15,599**	**16,097**	**16,612**	**17,144**	**17,693**	**20,296**	**23,016**	**2.8**
O&D	12,167	12,201	10,808	12,283	12,827	13,323	13,805	14,278	14,740	15,217	15,710	16,219	16,745	19,237	21,847	2.8
Resident	2,833	2,818	2,535	2,852	2,995	3,122	3,247	3,377	3,512	3,652	3,798	3,950	4,108	4,939	5,866	3.6
Visitor	9,333	9,383	8,273	9,431	9,832	10,201	10,558	10,901	11,228	11,565	11,912	12,269	12,637	14,298	15,981	2.6
Connecting	856	738	619	709	752	786	814	838	859	880	902	925	948	1,059	1,169	2.2
Domestic-Bound for International Destinations	**898**	**880**	**693**	**865**	**952**	**1,025**	**1,091**	**1,156**	**1,214**	**1,274**	**1,338**	**1,405**	**1,476**	**1,797**	**2,083**	**4.2**
O&D	898	880	693	865	952	1,025	1,091	1,156	1,214	1,274	1,338	1,405	1,476	1,797	2,083	4.2
Resident	189	201	192	213	228	243	258	273	287	301	316	332	349	425	493	4.4
Visitor	709	679	502	652	724	782	833	883	927	973	1,022	1,073	1,127	1,372	1,590	4.1
International	**1,237**	**1,116**	**855**	**780**	**834**	**885**	**939**	**993**	**1,049**	**1,109**	**1,172**	**1,239**	**1,310**	**1,668**	**2,050**	**2.9**
O&D	1,194	1,079	824	747	797	844	893	942	993	1,048	1,106	1,167	1,232	1,559	1,911	2.8
Requiring FIS	903	747	580	528	567	604	643	684	728	775	825	878	935	1,219	1,519	3.4
Resident	118	95	76	70	75	80	85	90	95	101	107	113	120	153	191	3.4
Visitor	785	652	504	458	492	524	558	594	633	674	718	765	815	1,066	1,328	3.4
Precleared	291	332	245	219	230	240	250	258	265	273	281	289	297	340	392	0.8
Resident	42	47	38	35	37	39	41	42	43	44	45	46	47	54	64	1.4
Visitor	249	285	207	184	193	201	209	216	222	229	236	243	250	286	328	0.7
Connecting	43	37	31	33	37	41	46	51	56	61	66	72	78	109	139	6.6
Residents	**3,182**	**3,162**	**2,840**	**3,170**	**3,335**	**3,484**	**3,631**	**3,782**	**3,937**	**4,098**	**4,266**	**4,441**	**4,624**	**5,571**	**6,614**	**3.6**
Domestic O&D	2,833	2,818	2,535	2,852	2,995	3,122	3,247	3,377	3,512	3,652	3,798	3,950	4,108	4,939	5,866	3.6
International O&D	160	143	114	105	112	119	126	132	138	145	152	159	167	207	255	2.8
Requiring FIS	118	95	76	70	75	80	85	90	95	101	107	113	120	153	191	3.4
Precleared	42	47	38	35	37	39	41	42	43	44	45	46	47	54	64	1.4
Dom.-Bound for Int'l. Dest.	189	201	192	213	228	243	258	273	287	301	316	332	349	425	493	4.4
Visitors	**11,076**	**10,998**	**9,485**	**10,725**	**11,241**	**11,708**	**12,158**	**12,594**	**13,010**	**13,441**	**13,888**	**14,350**	**14,829**	**17,022**	**19,227**	**2.7**
Domestic O&D	9,333	9,383	8,273	9,431	9,832	10,201	10,558	10,901	11,228	11,565	11,912	12,269	12,637	14,298	15,981	2.6
International O&D	1,034	937	711	642	685	725	767	810	855	903	954	1,008	1,065	1,352	1,656	2.8
Requiring FIS	785	652	504	458	492	524	558	594	633	674	718	765	815	1,066	1,328	3.4
Precleared	249	285	207	184	193	201	209	216	222	229	236	243	250	286	328	0.7
Dom.-Bound for Int'l. Dest.	709	679	502	652	724	782	833	883	927	973	1,022	1,073	1,127	1,372	1,590	4.1
Connecting	**899**	**775**	**650**	**742**	**789**	**827**	**860**	**889**	**915**	**941**	**968**	**997**	**1,026**	**1,168**	**1,308**	**2.5**
Domestic	856	738	619	709	752	786	814	838	859	880	902	925	948	1,059	1,169	2.2
International	43	37	31	33	37	41	46	51	56	61	66	72	78	109	139	6.6

Source: *GOAA. Data compiled by John F. Brown Company, Inc., 2002.*

Notes: AACGR = Average annual compound growth rate.

Figures may not sum to totals due to rounding.

FIGURE 3-6
COMPARISON OF ENPLANEMENT FORECASTS



Sources: GOAA; FAA; ZHA Inc.; John F. Brown Company, Inc., 2002.

Figure 3-6 shows two noteworthy differences between pre-September 11 and post-September 11 projections, namely, 1) the dip in activity in FY 2002, and 2) a somewhat slower longer-term rate of growth following the recovery period. The near-term effect of the current activity downturn is an expected 3- to 4-year deferral of aviation activity growth at MCO. In the longer term, the effect is more dramatic; the base projection of 27 million enplanements in FY 2022 was envisioned in the original Master Plan to occur in the FY 2013-2014 timeframe.

Although the planning horizon for the FAA's preliminary revised 2002 TAF for MCO is FY 2020, extrapolation yields a FY 2022 estimate of 25.0 million enplanements. It is important to note, however, that the FAA forecast represents only revenue passengers, while the FY 2022 forecast for MCO includes roughly a million non-revenue passengers.[4] On this basis, the FAA's preliminary projection is only about 1.2 million passengers, or less than 5 percent, lower than the FY 2022 forecast.

[4] Air carrier employees or others receiving air transportation against whom token service charges are levied are considered non-revenue. Passengers flying on frequent travel program reward tickets are classified as revenue passengers.

3.4.2.6 Range of Passenger Forecasts

In the current highly uncertain aviation activity forecasting environment, various factors could cause enplanements at MCO to be higher or lower than those presented in the base forecast. "High" and "Low" passenger projections were developed to bracket the base forecast, representing a likely range of variation in activity levels that could occur over the next 20 years.

A quicker recovery from the current aviation activity downturn and a more robust economic recovery than is currently expected form the basis for the "High" forecast. This scenario could also include one or more of the following events: a rapid rebuilding of service by Delta Air Lines, its new low-fare airline division, Song, and its connection partner carriers; the addition of substantial capacity and connecting activity by Southwest Airlines; a successful restructuring under Chapter 11 by US Airways; and aggressive additions of international flight capacity at the airport by both U.S. and foreign-flag airlines.

By contrast, the "Low" forecast is based on a projected activity downturn and a prolonged recovery of the U.S. economy. As was the case for the "High" forecast, this scenario could also include one or more of the following events: a sluggish rebuilding of service by Delta Air Lines and its connection partner carriers; slower additions of capacity by Southwest Airlines and less connecting activity; a drawn-out restructuring under Chapter 11 by US Airways with emergence as a smaller carrier; and slower-than-expected additions of international flight capacity at the airport by U.S. and foreign-flag airlines.

A summary of the base, "High," and "Low" projections is presented in Table 3-19. The "High" forecast projects 31.9 million enplanements in FY 2022, nearly 4.8 million more (17.5 percent higher) than the base forecast. By comparison, the "Low" forecast envisions nearly 23.7 million passengers in FY 2022, 3.5 million fewer (12.8 percent lower) than the base forecast.

The passenger forecast range is illustrated on Figure 3-7. The FAA's preliminary revised TAF, which lies between the base and "Low" forecasts, is included in the figure for comparison purposes. Additionally, Figure 3-7 presents a comparison of the Master Plan forecast, the MCO Bond Feasibility forecast issued in March 2002 (Appendix F), and the FAA's preliminary forecast prepared in August 2002.

3.4.2.7 Planning Activity Levels

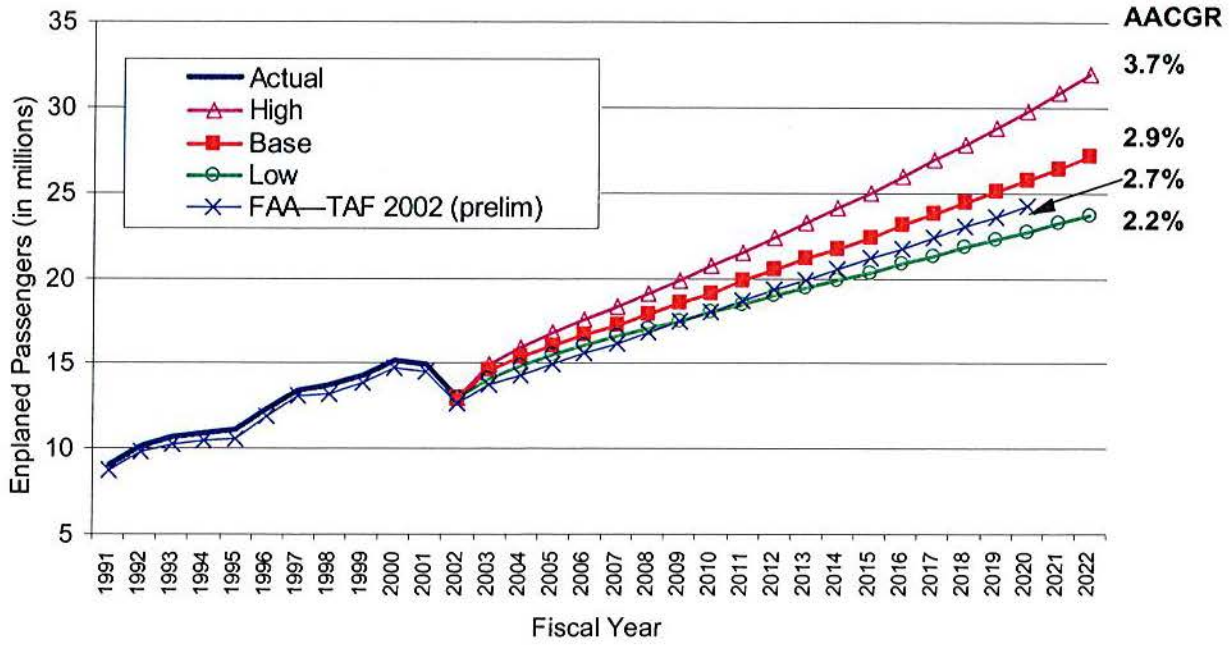
Given the high degree of uncertainty currently associated with aviation activity forecasts, it may be useful in the master planning process to know when certain passenger activity milestones may be reached at MCO. Table 3-20 presents the timeframes within which each of 7 planning activity levels between 35 and 65 million annual passengers (MAP - total enplaned and deplaned) are projected to occur. For example, it is expected that the airport will reach the 55 MAP level between FYs 2018 and 2030, with FY 2023 the most likely year.

TABLE 3-19
COMPARISON OF "HIGH," BASE, AND "LOW" ENPLANED PASSENGER FORECASTS (FOR THE 12 MONTHS ENDED SEPTEMBER 30; PASSENGERS IN THOUSANDS)

Year	TOTAL ENPLANED PASSENGERS			Period	Annual Growth Rate		
	High	Base	Low		High (Percent)	Base (Percent)	Low (Percent)
2000	15,157	15,157	15,157	---	---	---	---
2001A	14,935	14,935	14,935	2000-2001	-1.5	-1.5	-1.5
2002P	12,975	12,975	12,975	2001-2002	-13.1	-13.1	-13.1
2003F	14,929	14,637	14,098	2002-2003	15.1	12.8	8.7
2004	15,865	15,365	14,843	2003-2004	6.3	5.0	5.3
2005	16,738	16,019	15,484	2004-2005	5.5	4.3	4.3
2006	17,563	16,649	16,055	2005-2006	4.9	3.9	3.7
2007	18,350	17,265	16,585	2006-2007	4.5	3.7	3.3
2008	19,089	17,862	17,028	2007-2008	4.0	3.5	2.7
2009	19,859	18,480	17,484	2008-2009	4.0	3.5	2.7
2010	20,663	19,122	17,951	2009-2010	4.0	3.5	2.7
2011	21,503	19,788	18,431	2010-2011	4.1	3.5	2.7
2012	22,378	20,479	18,927	2011-2012	4.1	3.5	2.7
2017	26,917	23,761	21,309	2012-2017	3.8	3.0	2.4
2022	31,909	27,149	23,671	2017-2022	3.5	2.7	2.1
---	---	---	---	2001-2022	3.7	2.9	2.2

Data compiled by John F. Brown Company, Inc., 2002.
A = Actual, P = Projected, F = Forecast.

FIGURE 3-7
COMPARISON OF "HIGH," BASE, AND "LOW" ENPLANED PASSENGER FORECASTS (FISCAL YEARS 2002 THROUGH 2022)



Sources: GOAA; FAA; John F. Brown Company, Inc., 2002.
AACGR = Average annual compound growth rate.

TABLE 3-20
PLANNING ACTIVITY LEVELS

Planning Activity Level	Total Passengers (millions)	Fiscal Year When Total Passenger Threshold Levels are Forecast to be Reached		
		Early ("High" Range)	Expected (Base Forecast)	Late ("Low" Range)
35 MAP	35.0	2006	2008	2009
40 MAP	40.0	2010	2012	2015
45 MAP	45.0	2012	2015	2020
50 MAP	50.0	2016	2019	2025
55 MAP	55.0	2018	2023	2030
60 MAP	60.0	2021	2026	2034
65 MAP	65.0	2023	2030	2040

Data compiled by John F. Brown Company, Inc., 2002.

3.4.3 AIR CARGO

In this sub-section, the assumptions made in developing the forecast of air cargo tonnage (freight and mail) through 2022 are described.

Growth in air cargo activity at MCO will derive from business and industry growth in the Orlando Area and from growth in cargo lift capacity by both the passenger and all-cargo carriers. In the absence of any major new development by a cargo operator, it is assumed that the cargo trends described earlier will continue. In the event that major cargo developments are undertaken at the airport during the forecast period, the cargo projections presented herein will likely be exceeded.

The strongest growth in domestic cargo at MCO over the past decade was on the integrated carriers. These operators also suffered relatively less decline in cargo tonnage over the past year than either the passenger carriers or the other all-cargo carriers. Consequently, a fairly robust growth in cargo for the integrated carriers is projected: 10 percent per year in FY 2004, for example, declining gradually to 6 percent per year in the latter years of the forecast period. By contrast, a somewhat longer recovery timeframe for the passenger carriers and the other all-cargo carriers is projected, and much slower growth (between 1 and 3 percent per year) from FYs 2007 to 2022. Overall, domestic cargo is projected to grow at 5.7 percent per year between FYs 2001 and 2022 at MCO. In its current market outlook (2002-2021), Boeing projects that U.S. domestic cargo will grow at 3.5 percent per year, on average.

The majority (more than 90 percent) of international cargo at MCO in recent years was carried on passenger flights operated by foreign-flag carriers. As U.S. carriers reduced international service at the airport throughout the 1990s, the amount of cargo carried by them dwindled to negligible levels by FY 2000. The integrated carriers reported a much smaller and generally stable volume of *enplaned* international cargo at MCO in recent years but no *deplaned* international cargo. Accordingly, all of the growth in MCO international cargo (5 percent per year from FY 2005 to the end of the forecast period) was assigned to the foreign-flag passenger carriers.

The resulting projection of total cargo (i.e., domestic plus international, enplaned plus deplaned) is shown in Table 3-21. Total cargo tonnage activity at MCO is projected to grow 5.7 percent per year between FYs 2001 and 2022. The FAA[5] 2002 cargo forecasts call for 4.4 percent growth in total cargo between FYs 2003 and 2013. From a FY 2000 peak of nearly 297,000 tons, it is anticipated that MCO cargo activity will bottom out in FY 2002 at about 217,000 tons and not exceed the FY

[5] FAA forecasts are based on revenue ton miles for U.S. carriers only.

2000 level until FY 2005. Total cargo handled at the airport is projected to reach 495,000 tons by FY 2012 and, growing at between 5 and 6 percent annually, 838,000 tons by FY 2022. This represents nearly triple the cargo tonnage handled at MCO in FY 2000. It is expected that the relative proportions by sector (90 percent domestic, 10 percent international) and by directionality (56 percent deplaned, 44 percent enplaned) will remain roughly the same.

3.4.4 AIRCRAFT OPERATIONS

The development of aircraft operations projections through the forecast period is described in this sub-section.

3.4.4.1 Methodology

Passenger flight operations were derived from the base passenger forecast. In the current evolving industry environment, airlines will need to operate at relatively high load factors to deal with generally lower unit revenues; consequently, it is expected that, over the forecast period, the average passenger load factor (i.e., the percentage of scheduled airline seats occupied) will remain at 77 percent, the level reached in FY 2001 and projected for FY 2002. The average load factor estimate was used to calculate the number of seats that will be operated at MCO in each year through FY 2022.

It is anticipated that pressure to reduce unit costs will prompt the airlines to reverse the trend to smaller aircraft, as seen in the 1990s, and gradually shift to larger aircraft with their associated lower seat-mile costs. As a result, it is projected that the average seats per passenger flight will grow by about 0.5 percent per year, on average, from 134 in FY 2002 to 146 by FY 2022. Using the projected average seats per flight, the number of passenger flights that will be operated at MCO was calculated (Table 3-22).

All-cargo flight operations were derived from the projection of cargo tonnage at MCO. After analyzing the history of cargo tonnage carried by integrated operators and all-cargo carriers and the relationship of tonnage carried to the number of flights operated, the average cargo tonnage per flight for each type of operator was projected for each year until FY 2022. For the integrators, whose total tonnage per inbound/outbound operation grew 2 percent per year on average for the FY 1993-2001 period, an annual growth in tonnage per flight of about 2 percent was projected. For the other all-cargo operators, which showed negligible growth over the FY 1993-2001 period, no growth in tonnage per flight was projected. Using these projections, the annual number of all-cargo flights that will be operated at MCO in each year of the forecast period was calculated.

TABLE 3-21
SUMMARY OF AIR CARGO ACTIVITY
(FOR THE 12 MONTHS ENDED SEPTEMBER 30; CARGO IN THOUSANDS OF TONS)

Category	Actual		Projected	Forecast												AACGR 2001-2022 (Percent)
Carrier Type	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2017	2022	
Total Cargo	296	260	217	253	288	320	346	368	390	413	439	466	495	652	838	5.7
All-Cargo																
Integrators	173	167	150	165	181	199	215	232	251	271	293	316	341	478	639	6.6
Other All-Cargo	22	15	10	13	14	14	15	15	16	16	17	17	18	20	22	1.8
PASSENGER																
U.S.	74	54	28	42	57	69	77	79	80	81	82	83	83	88	92	2.6
Foreign-Flag	28	24	29	33	35	37	39	41	43	45	47	50	52	67	85	6.2
Domestic Cargo	267	234	187	219	252	282	306	326	346	367	390	415	441	584	752	5.7
All-Cargo	193	181	159	177	194	213	229	247	266	286	308	332	358	497	660	
Passenger	74	54	28	42	57	69	77	79	80	81	82	83	83	88	92	
International Cargo	29	25	30	34	36	38	40	42	44	46	48	51	53	68	86	6.0
All-Cargo	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Passenger	28	24	29	33	35	37	39	41	43	45	47	50	52	67	85	
Enplaned Cargo	132	116	95	111	127	141	153	162	172	182	193	205	217	285	365	5.6
All-Cargo	83	78	69	77	84	92	99	107	115	124	133	144	155	214	284	
Passenger	48	38	26	35	43	49	54	56	57	58	60	61	62	71	81	
Deplaned Cargo	165	144	122	141	161	179	193	206	218	231	246	261	278	367	473	5.8
All-Cargo	111	103	91	101	111	121	131	141	152	163	176	190	204	283	377	
Passenger	54	41	31	41	50	57	62	65	66	68	70	71	73	84	96	

Sources: GOAA; John F. Brown Company, Inc., 2002.

Notes: AACGR = Average annual compound growth rate.

Cargo figures may not sum to totals due to rounding.

TABLE 3-22
DERIVATION OF PASSENGER FLIGHT OPERATIONS
(FOR THE 12 MONTHS ENDED SEPTEMBER 30)

	Actual		PROJECTED	Forecast											
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2017	2022
Domestic Passenger Enplanements	13,921	13,819	12,120	13,857	14,531	15,134	15,710	16,272	16,813	17,371	17,950	18,549	19,169	22,093	25,099
International Passenger Enplanements Requiring FIS	291	784	611	561	604	645	689	735	265	273	281	289	1,013	1,328	1,658
International Passenger Enplanements Precleared	946	332	245	219	230	240	250	258	784	836	891	950	297	340	392
Total Passenger Enplanements ('000)	15,157	14,935	12,975	14,637	15,365	16,019	16,649	17,265	17,862	18,480	19,122	19,788	20,479	23,761	27,149
Load Factor (Percent)	73.7	77.2	77.0	77.0	77.0	77.0	77.0	77.0	77.0	77.0	77.0	77.0	77.0	77.0	77.0
Departing Seats ('000)	20,567	19,348	16,851	19,009	19,955	20,804	21,622	22,422	23,197	24,000	24,834	25,699	26,596	30,858	35,258
Average Seats per Flight	134	134	134	135	137	138	140	141	143	143	143	143	143	146	146
Passenger Flight Departures	153,172	140.4,09 9	125,502	140,656	146,107	150,666	154,806	158,745	161,722	167,317	173,130	179,160	185,416	211,995	241,281
Passenger Flight Operations	**306,344**	**288,198**	**251,004**	**281,311**	**292,215**	**301,333**	**309,612**	**317,489**	**323,444**	**334,634**	**346,260**	**358,320**	**370,832**	**423,990**	**482,561**

Sources: GOAA; John F. Brown Company, Inc., 2002.

Enplanement figures may not sum to totals due to rounding.

A number of flights recorded by the air traffic controllers at MCO that were not reported by the operators of those flights were identified. These flights were labeled as "Other Commercial"[6] and projected that the annual number would remain level, equivalent to the most recent 7-year average, through the forecast period.

There is no reason to expect that the number of general aviation and military flights at the airport will show either a material growth or decrease through the forecast period. Consequently, the preliminary revised FAA TAF for general aviation and military flights at MCO was adopted.

3.4.4.2 Operations Forecast

The forecast of aircraft operations at MCO, as was the case with the passenger forecast, calls for a substantial (11.5 percent) drop in FY 2002, followed by a 10.4 percent growth in FY 2003. Total MCO flight operations are projected to regain the FY 2000 level, the previous peak year, in the FY 2006 timeframe. Stated in another way, a combination of factors including the current economic slowdown, the aftermath of the September 11 attacks and the problems in the airline industry is resulting in a deferral of operations activity growth at the airport.

The projection of 552,282 aircraft operations at MCO in FY 2022 reflects an average annual growth of 2.3 percent per year during the forecast period. This growth will be led by the all-cargo carriers (3.6 percent per year) and passenger jet operations (2.9 percent). As described earlier, minimal growth for "Other Commercial," general aviation, and military operations at the airport is expected and it is projected that passenger turboprop operations will decline at the average rate of about 0.8 percent per year over the FY 2001-2022 period (Table 3-23.)

The TAF, prepared in July 2002 by FAA, calls for 518,337 aircraft operations at MCO in FY 2020. This figure is 1.3 percent lower than the Master Plan projections of 525,100 operations in that year. Figure 3-8 compares the Master Plan operations forecast with the TAF.

3.5 DERIVATIVE FORECASTS

Two additional sets of forecasts were prepared that involved the development of more detailed measures of aviation demand at MCO. These projections were derived from the activity forecasts presented in Section 3.4, using various estimated relationships between the detailed measures and aggregate annual activity.

The first set of forecasts presented in this section is a breakdown of flight operations by type of aircraft. The second set of forecasts project peak-month and peak-hour activity, both for passengers and flight operations.

[6] "Other Commercial" includes maintenance ferry flights, other non-revenue operations, and general aviation operations that were misclassified.

TABLE 3-23
FORECAST OF FLIGHT OPERATIONS
(FOR THE 12 MONTHS ENDED SEPTEMBER 30)

	Actual		Projected	Forecast												AACGR 2001-2022 (Percent)
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2017	2022	
Total Operations	**367,367**	**342,315**	**302,876**	**334,570**	**346,385**	**356,340**	**365,250**	**373,791**	**380,479**	**392,440**	**404,877**	**417,790**	**431,200**	**488,844**	**552,282**	**2.3**
Passenger Carriers	**306,344**	**288,198**	**251,004**	**281,311**	**292,215**	**301,333**	**309,612**	**317,489**	**323,444**	**334,634**	**346,260**	**358,320**	**370,832**	**423,990**	**482,561**	**2.5**
Jet Aircraft	252,272	248,290	215,158	244,741	257,149	268,186	278,651	288,915	297,568	307,864	318,559	329,654	341,166	392,191	448,782	2.9
Turboprop Aircraft	54,072	39,908	35,846	36,570	35,066	33,147	30,961	28,574	25,875	26,771	27,701	28,666	29,667	31,799	33,779	-0.8
All-Cargo Carriers	**14,198**	**13,454**	**10,344**	**11,759**	**12,671**	**13,508**	**14,138**	**14,802**	**15,535**	**16,306**	**17,117**	**17,970**	**18,867**	**23,354**	**28,221**	**3.6**
Integrators	10,708	10,146	7,932	9,053	9,694	10,383	10,920	11,486	12,120	12,789	13,494	14,239	15,024	19,110	23,535	4.1
Other All-Cargo	3,490	3,308	2,412	2,706	2,976	3,125	3,219	3,315	3,415	3,517	3,623	3,731	3,843	4,243	4,685	1.7
Other Commercial	**9,126**	**8,094**	**8,328**	**8,300**	**8,300**	**8,300**	**8,300**	**8,300**	**8,300**	**8,300**	**8,300**	**8,300**	**8,300**	**8,300**	**8,300**	**0.1**
General Aviation	**33,113**	**27,606**	**27,600**	**27,600**	**27,600**	**27,600**	**27,600**	**27,600**	**27,600**	**27,600**	**27,600**	**27,600**	**27,600**	**27,600**	**27,600**	**0.0**
Military	**4,587**	**4,963**	**5,600**	**5,600**	**5,600**	**5,600**	**5,600**	**5,600**	**5,600**	**5,600**	**5,600**	**5,600**	**5,600**	**5,600**	**5,600**	**0.6**

AACGR (Percent)

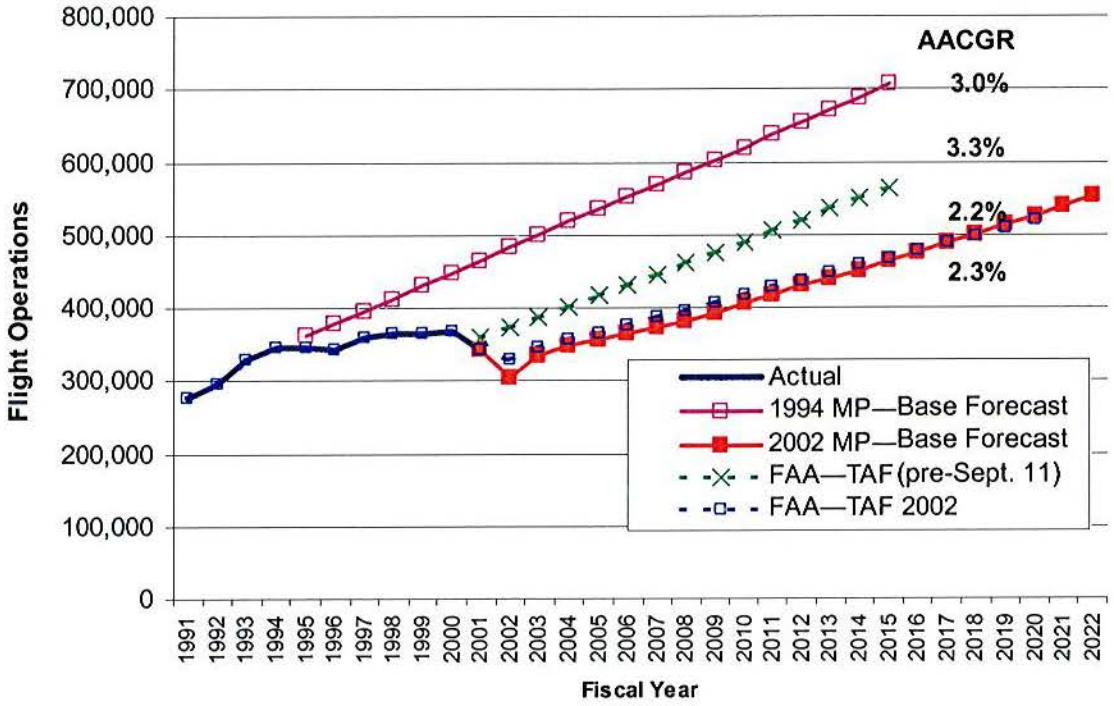
	Actual		Projected										2012-2017	2017-2022	
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012		
Total Operations	—	**-6.8**	**-11.5**	**10.5**	**3.5**	**2.9**	**2.5**	**2.3**	**1.8**	**3.1**	**3.2**	**3.2**	**3.2**	**2.5**	**2.5**	—
Passenger Carriers	—	**-5.9**	**-12.9**	**12.1**	**3.9**	**3.1**	**2.7**	**2.5**	**1.9**	**3.5**	**3.5**	**3.5**	**3.5**	**2.7**	**2.6**	—
Jet Aircraft	—	-1.6	-13.3	13.7	5.1	4.3	3.9	3.7	3.0	3.5	3.5	3.5	3.5	2.8	2.7	—
Turboprop Aircraft	—	-26.2	-10.2	2.0	-4.1	-5.5	-6.6	-7.7	-9.4	3.5	3.5	3.5	3.5	1.4	1.2	—
All-Cargo Carriers	—	**-5.2**	**-23.1**	**13.7**	**7.8**	**6.6**	**4.7**	**4.7**	**5.0**	**5.0**	**5.0**	**5.0**	**5.0**	**4.4**	**3.9**	—
Integrators	—	-5.2	-21.8	14.1	7.1	7.1	5.2	5.2	5.5	5.5	5.5	5.5	5.5	4.9	4.3	—
Other All-Cargo	—	-5.2	-27.1	12.2	10.0	5.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	—
Other Commercial	—	**-11.3**	**2.9**	**-0.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	—
General Aviation	—	**-16.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	—
Military	—	**8.2**	**12.8**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	—

Sources: GOAA; John F. Brown Company, Inc., 2002.

Notes: AACGR = Average annual compound growth rate.

Figures may not sum to totals due to rounding.

FIGURE 3-8
COMPARISON OF OPERATIONS FORECASTS
(FISCAL YEARS 2002 THROUGH 2022)



Sources: GOAA; FAA; ZHA, Inc.; John F. Brown Company, Inc., 2002.
AACGR = Average annual compound growth rate.

3.5.1 AIRCRAFT FLEET MIX

The types of aircraft operating at an airport, referred to herein as the aircraft fleet mix, are an important consideration in planning terminal and airfield improvements. The methodology used to project the number of flight operations, by aircraft category or type, for each of the categories of operations at the airport is described in this section.

3.5.1.1 Methodology

The first step was to develop a time series of operations data, by aircraft type, for each fiscal year in the FY 1993-2001 period. For commercial flights, GOAA staff provided statistical data as reported to the airport by the air carriers for their passenger and all-cargo operations. These data provided the detailed fleet-mix data required for roughly 97 percent of the combined air carrier and commuter operations recorded at MCO by the FAA traffic controllers. Fleet-mix data pertaining to the "Other Commercial" operations (i.e., the remaining 3 percent of the air carrier and commuter operations) were unavailable.

Passenger flight operations were categorized into jet aircraft groupings by type (wide-body, narrow-body, regional jets, and some sub-categories thereof) and turboprop aircraft groupings by size (50 seats or more, 30 to 46 seats, and 10 to 19 seats). All-cargo flight operations were broken out into two main groups by type of operation: a) the integrated carriers (hereafter, integrators) such as FedEx, UPS, ABX Air, Inc., Emery Worldwide, and DHL; and b) all other all-cargo operations. In each group, the operations were categorized by aircraft size developing general categories referred to as "Large" (aircraft such as A300, A310, B-767, and DC-10), "Medium" (aircraft such as B-727, B-757, and DC-8), and "Small" (aircraft such as propeller and small jet).

For the general aviation and military operations at MCO, there was no ready source of detailed statistical data. The results of a survey of flight strips carried out from July 10-16, 2002, by FAA staff in the airport traffic control tower (ATCT) at the airport were obtained and compiled. These data provided a one-week snapshot of general aviation and military operations by aircraft type used, and that profile was applied to the historical time series of total operations in each category. In addition to jet, turboprop, and single-engine piston aircraft groupings, twin-engine piston operations for general aviation and helicopter operations for the military were defined.

The next step integrated the flight operations forecast described earlier and the compiled base of historical fleet-mix data. A "nested forecast" technique was used for projecting passenger operations, which was projected on two levels. In the macro level of the forecast model, estimates were made of the year-to-year changes that will occur to the percentage of operations conducted by each type of aircraft. For example, it was estimated that regional jets, which accounted for 4.2 percent of all operations at MCO in 2001, would gradually grow to 10 percent of all operations by 2022. Then, in the micro-level of the forecast model, changes in the mix of aircraft types making up each of the aircraft groupings were projected.

The fleet-mix projections for the all-cargo operations were based largely on historical trends. For general aviation and military operations, the fleet-mix profile described above was applied to all forecast years.

3.5.1.2 Fleet-Mix Forecast

In the forecast model, the projected total operations were distributed to the passenger aircraft groupings according to the projected percentage inputs. The model was also used to measure the impact of the projected inputs on passenger operations and total seats offered, and to calculate a measure of average seats per flight through the forecast period. The results of the fleet-mix forecast are summarized in Tables 3-24 (for all categories of operations) and 3-25 (for passenger flight operations only). A forecast by specific aircraft type is presented in Table 3-25.

TABLE 3-24
FORECAST FLIGHT OPERATIONS, BY CATEGORY OF CARRIER AND AIRCRAFT
(FOR THE 12 MONTHS ENDED SEPTEMBER 30)

	Actual					Projected					Forecast				
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2017	2022
Total Flight Operations	**367,367**	**342,315**	**302,876**	**334,570**	**346,385**	**356,340**	**365,250**	**373,791**	**380,479**	**392,440**	**404,877**	**417,790**	**431,200**	**488,844**	**552,282**
Passenger Carriers	**306,344**	**288,198**	**251,004**	**281,311**	**292,215**	**301,333**	**309,612**	**317,489**	**323,444**	**334,634**	**346,260**	**358,320**	**370,832**	**423,990**	**482,561**
Jet Aircraft	252,272	248,290	215,158	244,741	257,149	268,186	278,651	288,915	297,568	307,864	318,559	329,654	341,166	392,191	448,782
Wide-body	25,988	24,240	20,710	23,483	24,673	26,282	27,586	28,892	32,435	33,557	34,723	35,932	37,187	46,279	53,854
Narrow-body	211,550	213,626	180,838	204,127	213,961	222,058	229,608	236,911	238,352	246,599	255,166	264,053	273,274	308,654	350,050
Regional Jet	14,735	10,424	13,610	17,132	18,515	19,846	21,456	23,113	26,781	27,708	28,670	29,669	30,705	37,258	44,878
Turboprop Aircraft	54,072	39,908	35,846	36,570	35,066	33,147	30,961	28,574	25,875	26,771	27,701	28,666	29,667	31,799	33,779
All-Cargo Carriers	**14,198**	**13,454**	**10,344**	**11,759**	**12,671**	**13,508**	**14,138**	**14,802**	**15,535**	**16,306**	**17,117**	**17,970**	**18,867**	**23,354**	**28,221**
Large (e.g., A300/310, B-767)	2,176	3,040	4,306	4,915	5,263	5,636	5,928	6,235	6,579	6,942	7,325	7,729	8,155	10,373	12,774
Medium (e.g., B-727, B-757)	9,736	8,572	4,704	5,339	5,767	6,137	6,411	6,699	7,015	7,347	7,696	8,062	8,447	10,332	12,379
Small (e.g., Cessna 208)	2,285	1,782	870	976	1,074	1,127	1,161	1,196	1,232	1,269	1,307	1,346	1,386	1,531	1,690
Other (not identified)	2	60	464	530	567	607	639	672	709	748	789	833	879	1,118	1,377
Other Commercial	**9,126**	**8,094**	**8,328**	**8,300**	**8,300**	**8,300**	**8,300**	**8,300**	**8,300**	**8,300**	**8,300**	**8,300**	**8,300**	**8,300**	**8,300**
General Aviation	**33,113**	**27,606**	**27,600**	**27,600**	**27,600**	**27,600**	**27,600**	**27,600**	**27,600**	**27,600**	**27,600**	**27,600**	**27,600**	**27,600**	**27,600**
Jet	—	—	3,864	3,864	3,864	3,864	3,864	3,864	3,864	3,864	3,864	3,864	3,864	3,864	3,864
Turboprop	—	—	3,036	3,036	3,036	3,036	3,036	3,036	3,036	3,036	3,036	3,036	3,036	3,036	3,036
Twin-engine Piston	—	—	7,728	7,728	7,728	7,728	7,728	7,728	7,728	7,728	7,728	7,728	7,728	7,728	7,728
Single-engine Piston	—	—	12,972	12,972	12,972	12,972	12,972	12,972	12,972	12,972	12,972	12,972	12,972	12,972	12,972
Military	**4,587**	**4,963**	**5,600**	**5,600**	**5,600**	**5,600**	**5,600**	**5,600**	**5,600**	**5,600**	**5,600**	**5,600**	**5,600**	**5,600**	**5,600**
Jet	—	—	2,016	2,016	2,016	2,016	2,016	2,016	2,016	2,016	2,016	2,016	2,016	2,016	2,016
Turboprop	—	—	2,632	2,632	2,632	2,632	2,632	2,632	2,632	2,632	2,632	2,632	2,632	2,632	2,632
Single-engine Piston	—	—	840	840	840	840	840	840	840	840	840	840	840	840	840
Helicopter	—	—	112	112	112	112	112	112	112	112	112	112	112	112	112

Sources: Actual - GOAA, FAA ATC.
Projected and Forecast - John F. Brown Company, Inc., 2002.

TABLE 3-25
FORECAST PASSENGER FLIGHT OPERATIONS, BY AIRCRAFT TYPE
(FOR THE 12 MONTHS ENDED SEPTEMBER 30)

Aircraft Category/ Aircraft Type (Model)	Actual		Projected	Forecast												
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2017	2022
Total Passenger Carrier Operations	367,367	342,315	302,876	334,570	346,385	356,340	365,250	373,791	380,479	392,440	404,877	417,790	431,200	488,844	552,282
Passenger Carriers	306,344	288,198	251,004	281,311	292,215	301,333	309,612	317,489	323,444	334,634	346,260	358,320	370,832	423,990	482,561
Jet Aircraft	252,272	248,290	215,158	244,741	257,149	268,186	278,651	288,915	297,568	307,864	318,559	329,654	341,166	392,191	448,782
Wide-body	25,988	24,240	20,710	23,483	24,673	26,282	27,586	28,892	32,435	33,557	34,723	35,932	37,187	46,279	53,854
A380-800	—	—	—	—	—	—	—	—	512	530	548	567	587	1,177	1,795
B-747	2,796	2,572	2,174	2,737	2,999	3,319	3,648	3,994	4,670	4,832	5,000	5,174	5,355	6,765	7,181
L-1011	4,337	2,266	504	391	329	266	189	101	—	—	—	—	—	—	—
B-777	1,867	1,258	1,502	1,955	2,218	2,567	2,937	3,337	4,478	4,633	4,794	4,961	5,135	7,354	8,976
DC-10	2,210	1,808	348	313	246	177	95	—	—	—	—	—	—	—	—
MD-11	194	778	2,318	2,346	2,300	2,301	2,274	2,225	2,303	2,383	2,466	2,552	2,641	2,745	2,244
A340 (300)	24	2	2	39	82	177	284	404	768	794	822	851	880	1,569	2,244
B-767	13,110	13,940	12,398	14,097	14,729	15,515	16,029	16,526	17,086	17,678	18,292	18,929	19,590	22,935	26,703
A300/310	1,352	1,468	1,438	1,566	1,728	1,918	2,083	2,254	2,553	2,641	2,733	2,828	2,927	3,734	4,712
All Other	101	148	26	39	41	44	47	51	64	66	68	71	73	—	—
Narrow-body	211,867	214,080	180,838	204,127	213,961	222,058	229,608	236,911	238,352	246,599	255,166	264,053	273,274	308,654	350,050
B-737 (300/400/700/800)	42,078	50,862	56,522	69,884	75,694	81,824	86,588	91,413	98,040	101,432	104,956	108,611	112,404	127,548	145,405
B-757	36,336	39,492	42,324	48,756	51,845	53,822	56,253	58,650	58,407	60,427	62,527	64,704	66,964	74,865	80,781
MD-80	21,991	22,622	16,818	13,002	12,097	10,910	9,600	8,090	2,086	2,158	2,233	2,311	2,392	—	—
B-727 (200)	18,000	11,710	4,542	3,250	1,728	—	—	—	—	—	—	—	—	—	—
A320	7,256	9,986	14,098	16,252	18,146	20,001	22,079	24,269	27,117	28,056	29,030	30,041	31,090	38,819	48,468
A319	1,025	2,934	5,882	8,126	9,505	10,910	12,479	14,157	16,688	17,265	17,865	18,487	19,133	24,955	32,312
A321	—	356	2,412	3,250	3,802	4,364	4,992	5,663	6,258	6,474	6,699	6,933	7,175	11,091	16,156
B-737 (100/200/500)	69,461	62,446	25,322	25,787	25,501	24,933	23,315	21,488	17,848	18,465	19,107	19,772	20,463	18,819	16,151
DC-9	13,891	10,900	4,092	3,328	2,469	1,609	752	—	—	—	—	—	—	—	—
B-717	1,260	2,126	8,796	12,482	13,166	13,677	13,542	13,175	11,903	12,315	12,742	13,186	13,647	12,550	10,771
B-727 (100)	222	180	22	—	—	—	—	—	—	—	—	—	—	—	—
MD-87	33	12	8	9	9	8	8	7	6	6	7	7	7	7	6
All Other	318	454	—	—	—	—	—	—	—	—	—	—	—	—	—
Regional Jet	14,735	10,424	13,610	17,132	18,515	19,846	21,456	23,113	26,781	27,708	28,670	29,669	30,705	37,258	44,878
Turboprop	54,072	39,908	35,846	36,570	35,066	33,147	30,961	28,574	25,875	26,771	27,701	28,666	29,667	31,799	33,779
50+ seats	4,012	4,922	3,942	4,754	5,611	6,298	6,811	7,144	6,986	7,228	7,479	7,740	8,010	9,222	10,134
30-46 seats	35,260	24,868	23,600	24,502	23,143	21,545	19,815	18,002	16,302	16,866	17,451	18,059	18,690	19,398	20,268
10-19 seats	14,801	10,118	7,774	7,314	6,312	5,303	4,335	3,429	2,588	2,677	2,770	2,867	2,967	3,180	3,378
Other (not identified)	—	—	530	—	—	—	—	—	—	—	—	—	—	—	—

Sources: Actual - GOAA, FAA ATC.
Projected and Forecast - John F. Brown Company, Inc., 2002.

Trends of some significance that emerged from the projection of the passenger carrier fleet-mix included the following:

1. Wide-body aircraft are expected to grow as a percentage of all passenger operations at MCO, from about 8.5 percent in FY 2001 to about 11 percent by FY 2022;

2. It is anticipated that the New Large Aircraft (represented by the A380-800) will debut at MCO before the end of the decade, and will be operated 2-3 times daily in the latter part of the forecast period;

3. Regional jets will likely more than quadruple their operations at MCO by FY 2022, accounting for nearly 10 percent of all passenger flights; and

4. Turboprop aircraft operations will decline somewhat from existing levels but will tend to plateau after mid-decade, reflecting the reality that certain routes will not support jet service.

For the all-cargo carriers, where it is assumed that the integrators account for most of the growth, it is expected that use of larger jet aircraft will grow at a faster rate over the next 20 years than the traditional Boeing 727 type of freighter operations. This trend is based, in part, on the need for the integrators to maintain their competitive edge on costs, by operating efficiently with increasingly larger aircraft, and on the likelihood that they will continue to capture cargo market share from the scheduled passenger airlines.

3.5.2 PEAK PERIOD ACTIVITY

For airport planners, it is often the peak loading, rather than the average level of activity, that is the critical design factor in planning for new and expanded facilities. This sub-section details the analysis of peak period activity at MCO for both passengers and flight operations.

3.5.2.1 Peak Passenger Flows

Analysis of passenger peaking began by obtaining a monthly time series of enplaned passenger data covering the FY 1993-2001 period from GOAA records. The data were grouped into domestic, international, and total enplanements. For each of the three types of enplanements, the peak month in each year was determined and the percentage of annual enplanements that occurred in that month was calculated. The average of the peak-month percentages for the 9 years was used as the peak month factor in the projection of monthly enplanement peaks. An identical approach was taken in order to calculate the corresponding deplanement and total passenger peak month factor in each year for domestic, international, and total passengers.

Using GOAA data, estimates of domestic, international, and total deplanements were developed by assuming that the ratio of deplanements to enplanements (as calculated from FYs 1993 to 2001 data) will remain constant over the next 20 years, and by applying this ratio to the enplanement projection to determine deplanements in FYs 2002, 2007, 2012, and 2022.

The daily peak passenger flows were calculated by dividing the peak monthly flows by 31 (days in the month), with the exception of international deplanements. Next, international deplanements were categorized into pre-cleared passengers and passengers requiring FIS. For pre-cleared passengers, 31 days was used to calculate the daily peak passenger flows; for deplaning passengers requiring FIS, 22 days was used. The rationale for this approach was that pre-cleared passenger flows show characteristics similar to domestic activity flows, while non-pre-cleared passenger flows are much more peaked in character. The 22-day factor was obtained from the 1995 Master Plan Forecast. The

daily peak passenger flow for total international deplanements is the sum of the daily peak passenger flows for pre-cleared deplanements and deplanements requiring FIS. It should be noted that in developing the forecast for the 1994 Master Plan, 30 days was used for domestic passengers and 22 days was used for international passengers.

For passenger peak hour factors (enplaned and deplaned), the peak hour factors that were established in the MCO 2002 *North Terminal Capacity Study* were applied to domestic and total passengers. However, the AvAirPros study did not provide data that could be used as international peak hour factors.

Given the lack of data on hourly international passenger flows, seat data from the *Official Airline Guide* were used to determine international peak hour factors. Arriving and departing seat data were used from July in the years 2000, 2001, and 2002. Summing the arriving and departing seats provided the data for the analysis of total passenger flows. In every case, the average number of seats for each hour of the day throughout the month was calculated, the peak hour was identified from those calculations, and the percentage of average daily seats that occurred in that peak hour was reached. The 3-year average of those peak hour factors in the projection of hourly passenger peaks were used. The projected peak hour values were then calculated by multiplying the projected passengers on an average day of the peak month by the appropriate peak hour factors.

The results of the analyses are presented in Tables 3-26, 3-27, and 3-28 for total passengers, enplaned passengers, and deplaned passengers, respectively.

3.5.2.2 Peak Flight Operations

Although FAA tracks and reports flight operations at the airport, the categorization of that data is different than the categorization used in this forecast assignment. Consequently, for the peaking analysis, data obtained from GOAA were used for passenger and all-cargo operations (reported to the airport by the carriers), but additional data for general aviation and military operations were needed. FAA ATC staff at the airport provided the additional data required.

3.5.2.3 Passenger Flight Peaks

Similar to the approach to passenger flows described earlier, monthly flight arrival data provided by GOAA staff for the FY 1993-2001 period was used to analyze the monthly flight peaking pattern for passenger flights. The number of arrivals was doubled to determine the number of operations. The same methodology (as for enplanements) was then followed to derive the peak month factor for domestic and international flights in each year. These peak month factors were averaged for the 9 years and the results were used in the projection of monthly passenger flight peaks.

TABLE 3-26
PEAK PERIOD - TOTAL PASSENGERS
(FOR THE 12 MONTHS ENDED SEPTEMBER 30)

	2000	2001	2002P	2007	2012	2022
Overall Peak Month - March						
Total Passengers	---	**30,019,625**	**26,133,915**	**34,769,949**	**41,246,978**	**54,691,438**
Peak Month (9.6 percent of annual)	---	2,881,884	2,508,856	3,337,915	3,959,710	5,250,378
Average Day	---	92,964	80,931	107,675	127,733	169,367
Peak Hour	---	9,018	8,498	11,306	12,773	16,937
Domestic Passengers	---	**27,755,106**	**24,385,440**	**32,739,264**	**38,568,028**	**50,499,188**
Peak Month (9.8 percent of annual)	---	2,720,000	2,389,773	3,208,448	3,779,667	4,948,920
Average Day	---	87,742	77,089	103,498	121,925	159,643
Peak Hour	---	8,511	8,904	10,867	12,193	15,964
International Passengers	---	**2,264,519**	**1,748,475**	**2,030,685**	**2,678,950**	**4,192,250**
Peak Month (7.9 percent of annual)	---	178,897	138,130	160,424	211,637	331,188
Average Day	---	5,771	4,456	5,175	6,827	10,683
Peak Hour	---	993	780	888	1,172	1,834
International Peak Month - July						
International Passengers	---	**2,264,519**	**1,748,475**	**2,030,685**	**2,678,950**	**4,192,250**
Peak Month (10.9 percent of annual)	---	246,833	190,584	221,345	292,006	456,955
Average Day	---	7,962	6,148	7,140	9,420	14,740
Peak Hour	---	1,370	1,076	1,226	1,617	2,530
Peak Hour Factors (Percent)	**2000**	**2001**	**2002**	**2007**	**2012**	**2022**
Total Passengers	9.7	9.7	10.5	10.5	10.0	10.0
Domestic Passengers	9.7	9.7	10.5	10.5	10.0	10.0
International Passengers	16.8	17.2	17.5	17.2	17.2	17.2

Data compiled by John F. Brown Company, Inc., 2002.

Notes: P = Projected.

Peak Month Factors are based on GOAA data for FYs 1993 through 2001.

Peak Hour Factors for total and domestic passengers are based on the average of enplanement and deplanement peak hour factors established in the AvAirPros 2002 North Terminal Capacity Study.

Peak Hour Factors projected for international passengers in FYs 2007, 2012, and 2022 are based on scheduled seats from the Official Airline Guide and represent the average of peak hour factors for FYs 2000, 2001, and 2002.

TABLE 3-27
PEAK PERIOD - PASSENGER ENPLANEMENTS
(FOR THE 12 MONTHS ENDED SEPTEMBER 30)

	2000	2001	2002P	2007	2012	2022
Overall Peak Enplanement Month - March						
Total Enplanements	---	**14,934,819**	**12,975,000**	**17,265,000**	**20,479,000**	**27,149,000**
Peak Month (9.5 percent of annual)	---	1,418,808	1,232,625	1,640,175	1,945,505	2,579,155
Average Day	---	45,768	39,762	52,909	62,758	83,199
Peak Hour	---	5,034	4,374	5,820	6,590	8,736
Domestic Enplanements	---	**13,818,866**	**12,120,000**	**16,272,000**	**19,169,000**	**25,099,000**
Peak Month (9.7 percent of annual)	---	1,340,430	1,175,640	1,578,384	1,859,393	2,434,603
Average Day	---	43,240	37,924	50,916	59,980	78,536
Peak Hour	---	4,756	4,172	5,601	6,298	8,246
International Enplanements	---	**1,115,953**	**855,000**	**993,000**	**1,310,000**	**2,050,000**
Peak Month (7.8 percent of annual)	---	87,044	66,690	77,454	102,180	159,900
Average Day	---	2,808	2,151	2,499	3,296	5,158
Peak Hour	---	859	678	713	940	1,472
International Peak Enplanement Month - August						
International Enplanements	---	**1,115,953**	**855,000**	**993,000**	**1,310,000**	**2,050,000**
Peak Month (11.2 percent of annual)	---	124,987	95,760	111,216	146,720	229,600
Average Day	---	4,032	3,089	3,588	4,733	7,406
Peak Hour	---	1,234	973	1,024	1,350	2,113
Peak Hour Factors (Percent)	**2000**	**2001**	**2002**	**2007**	**2012**	**2022**
Total Enplanements	11.0	11.0	11.0	11.0	10.5	10.5
Domestic Enplanements	11.0	11.0	11.0	11.0	10.5	10.5
International Enplanements	23.5	30.6	31.5	28.5	28.5	28.5

Data compiled by John F. Brown Company, Inc., 2002.

Notes: P = Projected.

Peak Month Factors are based on GOAA data for FYs 1993 through 2001.

Peak Hour Factors for total and domestic enplanements are based on results from the AvAirPros 2002 *North Terminal Capacity Study.*

Peak Hour Factors projected for international enplanements in FYs 2007, 2012, and 2022 are based on scheduled seats from the *Official Airline Guide* and represent the average of peak hour factors for FYs 2000, 2001, and 2002.

TABLE 3-28
PEAK PERIOD - PASSENGER DEPLANEMENTS
(FOR THE 12 MONTHS ENDED SEPTEMBER 30)

	2000	2001	2002P	2007	2012	2022
Overall Peak Deplanement Month - March						
Total Deplanements (1.015 times enplanements)		**15,084,806**	**13,158,915**	**17,504,949**	**20,767,978**	**27,542,438**
Peak Month (9.7 percent of annual)	---	1,463,226	1,276,415	1,697,980	2,014,494	2,671,616
Average Day	---	47,201	41,175	54,774	64,984	86,181
Peak Hour	---	3,918	4,118	5,477	6,173	8,187
Domestic Deplanements (1.012 times enplanements)		**13,936,240**	**12,266,440**	**16,467,264**	**19,399,028**	**25,400,188**
Peak Month (9.8 percent of annual)	---	1,365,752	1,202,013	1,613,792	1,901,105	2,489,218
Average Day	---	44,057	38,775	52,058	61,326	80,297
Peak Hour	---	3,657	3,878	5,206	5,826	7,628
International Deplanements (1.045 times enplanements)		**1,148,566**	**893,475**	**1,037,685**	**1,368,950**	**2,142,250**
Peak Month (8.0 percent of annual)	---	91,885	71,478	83,015	109,516	171,380
Average Day	---	4,019	3,118	3,601	4,716	7,322
Peak Hour	---	1,113	939	1,057	1,385	2,150
International Precleared	---	**341,832**	**255,503**	**269,610**	**310,365**	**409,640**
Peak Month (12.5 percent of annual)	---	42,729	31,938	33,701	38,796	51,205
Average Day	---	1,378	1,030	1,087	1,251	1,652
Peak Hour	---	324	200	236	271	358
International Requiring FIS	---	**806,734**	**637,973**	**768,075**	**1,058,585**	**1,732,610**
Peak Month (7.2 percent of annual)	---	58,085	45,934	55,301	76,218	124,748
Average Day	---	2,640	2,088	2,514	3,464	5,670
Peak Hour	---	903	789	908	1,252	2,049
International Peak Deplanement Month - July						
International Deplanements (1.045 times enplanements)		**1,148,566**	**893,475**	**1,037,685**	**1,368,950**	**2,142,250**
Peak Month (11.9 percent of annual)	---	136,679	106,324	123,485	162,905	254,928
Average Day	---	5,293	4,152	4,912	6,629	10,625
Peak Hour	---	1,466	1,250	1,442	1,947	3,120
International Precleared	---	**341,832**	**255,503**	**269,610**	**310,365**	**409,640**
Peak Month (7.1 percent of annual)	---	24,270	18,141	19,142	22,036	29,084
Average Day	---	783	585	617	711	938
Peak Hour	---	184	114	134	154	203
International Requiring FIS	---	**806,734**	**637,973**	**768,075**	**1,058,585**	**1,732,610**
Peak Month (12.3 percent of annual)	---	99,228	78,471	94,473	130,206	213,111
Average Day	---	4,510	3,567	4,294	5,918	9,687
Peak Hour	---	1,543	1,348	1,552	2,139	3,500
Peak Hour Factors (Percent)	**2000**	**2001**	**2002**	**2007**	**2012**	**2022**
Total Deplanements	8.3	8.3	10.0	10.0	9.5	9.5
Domestic Deplanements	8.3	8.3	10.0	10.0	9.5	9.5
International Deplanements	30.3	27.7	30.1	29.4	29.4	29.4
International-Precleared	22.1	23.5	19.4	21.7	21.7	21.7
International-Requiring FIS	36.4	34.2	37.8	36.1	36.1	36.1

Data compiled by John F. Brown Company, Inc., 2002.

Notes: P = Projected.

The percentage of deplanements vs. enplanements is based on GOAA data for FYs 1993 through 2001.

Peak Month Factors for total, domestic, and international deplanements are based on GOAA data for FYs 1993-2001.

Peak Month Factors for international deplanements pre-cleared and requiring FIS are based on GOAA data for FYs 1999 through 2001.

Peak Hour Factors for total and domestic deplanements are based on results from the AvAirPros 2002 North Terminal Capacity Study.

Peak Hour Factors projected for international deplanements in FYs 2007, 2012, and 2022 are based on scheduled seats from the Official Airline Guide and represent the average of peak hour factors for FYs 2000, 2001, and 2002.
Average day is based on a 31-day month for pre-cleared international deplanements and on a 22-day month for international deplanements requiring FIS.
Average day for total international deplanements is the sum of the average day for deplanements pre-cleared and requiring FIS.
Assumes that all arriving international passengers who made connections required FIS clearance at MCO.

The average daily passenger flight operations were calculated by dividing the peak month operations by 31. Then, the approach described earlier for international enplanements was used to develop the peak hour factors. The only difference was that scheduled flight operations were used rather than seats from the *Official Airline Guide*. Again, the average of the peak hour factors from March 2000, 2001, and 2002 (for domestic) and July 2000, 2001, and 2002 (for international) were used in the projection of hourly passenger flight operations peaks.

Calculations of peak-month and peak-hour passenger flight operations are presented in Table 3-29.

TABLE 3-29
PEAK PERIOD - PASSENGER FLIGHT OPERATIONS
(FOR THE 12 MONTHS ENDED SEPTEMBER 30)

	2000	2001	2002P	2007	2012	2022
Total Passenger Operations	---	**288,198**	**251,004**	**317,489**	**370,832**	**482,561**
Peak Month (8.9 percent of annual)	---	25,650	22,339	28,257	33,004	42,948
Average Day	---	827	721	912	1,065	1,385
Peak Hour	---	66	60	75	88	114
Domestic Operations	---	**273,412**	**234,453**	**299,229**	**347,111**	**446,123**
Peak Month (8.9 percent of annual)	---	24,334	20,866	26,631	30,893	39,705
Average Day	---	785	673	859	997	1,281
Peak Hour	---	63	55	70	81	104
International Operations	---	**14,786**	**16,539**	**18,260**	**23,721**	**36,438**
Peak Month (9.9 percent of annual)	---	1,464	1,637	1,808	2,348	3,607
Average Day	---	47	53	58	76	116
Peak Hour	---	9	8	9	12	18
Peak Hour Factors (Percent)						
Total Passenger Operations	8.5	8.0	8.3	8.3	8.3	8.3
Domestic Operations	8.3	8.0	8.1	8.1	8.1	8.1
International Operations	12.8	18.2	14.7	15.2	15.2	15.2

Data compiled by John F. Brown Company, Inc., 2002.

Notes: P = Projected.
Peak Month Factors are based on GOAA data for FYs 1993 through 2001.
Peak Hour Factors for passenger carriers are based on *Official Airline Guide* flight data.
Peak Hour Factors projected for FYs 2007, 2012, and 2022 represent the average of peak hour factors for FYs 2000, 2001, and 2002.

3.5.2.4 Other Flight Peaks

For all-cargo operations, the peak month factors were calculated in the same way as for passenger flights. However, in the absence of any data on hourly cargo flight operations, a peak hour factor (10 percent) was estimated for use in the projection of hourly cargo operations peaks.

For general aviation and military operations, peaking tends not to be particularly prominent or follow a predictable pattern. However, monthly operations data for FY 2001 was obtained from FAA that

was used to identify the peak month and to calculate a peak month factor. FAA staff also provided a detailed, hourly breakdown of general aviation and military operations for each day of March 2001 and 2002. From that data, peak hour factors that were developed were used in the projection of general aviation and military operations peaks.

For total operations at MCO, the same data sources and methodology as described for general aviation and military operations were used to develop the total overall operations peak data.

Calculations of peak month and peak hour flight operations for each of the operating categories (passenger carriers, all-cargo operators, general aviation, military, and the overall total) are presented in Table 3-30.

TABLE 3-30
PEAK PERIOD - FLIGHT OPERATIONS
(FOR THE 12 MONTHS ENDED SEPTEMBER 30)

	2000	2001	2002P	2007	2012	2022
Total Operations	---	**342,315**	**302,876**	**373,791**	**431,200**	**552,282**
Peak Month (9.2 percent of annual)	---	31,493	27,865	34,389	39,670	50,810
Average Day	---	1,016	899	1,109	1,280	1,639
Peak Hour	---	77	72	87	100	128
Passenger Carrier Operations	---	**288,198**	**251,004**	**317,489**	**370,832**	**482,561**
Peak Month (8.9 percent of annual)	---	25,650	22,339	28,257	33,004	42,948
Average Day	---	827	721	912	1,065	1,385
Peak Hour	---	66	60	75	88	114
All-Cargo Operations	---	**13,454**	**10,344**	**14,802**	**18,867**	**28,221**
Peak Month (10.7 percent of annual)	---	1,440	1,107	1,584	2,019	3,020
Average Day	---	46	36	51	65	97
Peak Hour	---	5	4	5	7	10
General Aviation Operations	---	**27,606**	**27,600**	**27,600**	**27,600**	**27,600**
Peak Month (10.1 percent of annual)	---	2,788	2,788	2,788	2,788	2,788
Average Day	---	90	90	90	90	90
Peak Hour	---	7	7	7	7	7
Military Operations	---	**4,963**	**5,600**	**5,600**	**5,600**	**5,600**
Peak Month (9.0 percent of annual)	---	**447**	504	504	504	504
Average Day	---	14	16	16	16	16
Peak Hour	---	1	1	1	1	1
Peak Hour Factors (Percent)						
Total Operations	na	7.6	8.0	7.8	7.8	7.8
Passenger Carrier Operations	8.5	8.0	8.3	8.3	8.3	8.3
All-Cargo Operations	10.0	10.0	10.0	10.0	10.0	10.0
General Aviation Operations	8.0	8.0	8.0	8.0	8.0	8.0
Military Operations	9.0	9.0	9.0	9.0	9.0	9.0

Data compiled by John F. Brown Company, Inc., 2002.

Notes: P = Projected.
na = not available.
Total Operations data includes "Other Commercial" operations.
Peak Month Factors for Total Operations is based on FAA data for FY 2001.
Peak Month Factors for Passenger and All-Cargo carriers are based on GOAA data for FYs 1993 through 2001.
Peak Month Factors for General Aviation and Military operations are based on FAA Tower data for FY 2001.
Peak Hour Factors for the passenger carriers are based on flight schedules from the *Official Airline Guide*.
Peak Hour Factors for Total Operations are based on FAA Tower data for FY 2001.
Peak Hour Factors for All-Cargo carriers were estimated by John F. Brown Company, Inc.
Peak Hour Factors for General Aviation and Military are based on FAA Tower data for FY 2001.
Peak Hour Factors projected for FYs 2007, 2012, and 2022 represent the average of peak hour factors for FYs 2000, 2001, and 2002.

MASTER PLAN UPDATE

ORLANDO INTERNATIONAL AIRPORT

SECTION 4.0

DEMAND/CAPACITY ANALYSIS AND FACILITY REQUIREMENTS

Prepared for:
GREATER ORLANDO AVIATION AUTHORITY

Prepared by:
The URS Team

August 2004

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SECTION 4.0

DEMAND/CAPACITY ANALYSIS AND FACILITY REQUIREMENTS

4.1 INTRODUCTION

Section 3.0 presented the revised forecast of enplaned passengers, aircraft operations, and cargo tonnage through the year 2022. This section uses the revised aviation demand forecasts, dated November 2002, to determine the capability of specific components of Orlando International Airport (MCO), such as airfield, airspace and air traffic control (ATC), terminal, cargo, general aviation, support facilities, and surface transportation. The goal of this section is to determine whether these components can accommodate projected levels of demand without incurring unacceptable levels of delay or decreases in levels of service (LOS). When capacity deficiencies are identified, a determination is made of the approximate size and timing of new facility requirements for MCO.

The following procedures were used to judge the extent of facility improvements required:

- From the forecasts, determine which facilities are required to satisfy the short-, intermediate-, and long-term demand.
- Review in-house information, reports, and data supplied by the Greater Orlando Aviation Authority (GOAA) Planning Department.
- Perform and/or document demand/capacity analyses of the various facilities that exist or will be required through 2022.
- Assess which existing facilities can be expanded, phased out, or relocated.
- Develop a list of facility requirements to satisfy future demand during the 20-year planning period.

While following this process, it is necessary that the master planning process provide a balance between each of the primary airport components addressed previously. There is no benefit in providing more terminal facilities than the airfield system can accommodate. Likewise, it is pointless to provide either of these facilities if there is some restriction on airspace or airfield capacity. Consequently, each component at MCO must be addressed by maximizing its capacity within the context of each component achieving the same capability.

4.2 AIRFIELD

4.2.1 HANDBOOK METHODOLOGY DEMAND/CAPACITY ANALYSIS

Two methodologies are used to examine the capacity of the airfield. The first methodology is the Federal Aviation Administration's (FAA) "handbook" methodology described in Advisory Circular (AC) 150/5060-5, entitled *Airport Capacity and Delay*. This methodology uses a series of tables and equations to calculate an airfield's hourly capacity and its annual capacity. The second methodology consists of computer simulations using the FAA's Airport and Airspace Simulation Model, SIMMOD. The computer simulations conduct a more detailed examination that considers operational and physical factors unique to MCO. The following subsections provide a discussion of the handbook methodology and the results derived from that methodology followed by a discussion of the computer simulation methodology and its results.

The handbook methodology describes how to measure an airfield's hourly capacity and its annual capacity, which is referred to as annual service volume (ASV). Hourly capacity is defined as the maximum number of aircraft operations that can be accommodated by the airfield system in one hour. It is used to assess the airfield's ability to accommodate peak hour operations.

ASV is defined as a reasonable estimate of an airport's annual capacity. As the number of annual operations increases and approaches the airport's ASV, the average delay incurred by each operation increases. When annual operations are equal to the ASV, average delay to each operation is approximately 1 to 4 minutes depending upon the mix of aircraft using the airport. When the number of annual operations exceeds the ASV, moderate to severe congestion will occur and average delay per aircraft operation will increase. ASV is used to assess the adequacy of the airfield design, including the number and orientation of runways.

A calculation of the airfield's hourly capacity and ASV using the handbook methodology depends upon a number of factors including the following:

- Meteorological Conditions - The percentage of time that visibility or cloud cover is below certain minimums.
- Aircraft Mix - The percentage of operations conducted by different categories of aircraft.
- Runway Use - The percentage of time each runway is used.
- Percent Touch-and-Go - The percent of touch-and-go operations in relation to total aircraft operations.
- Percent Arrivals - The percent of arrivals in relation to departures during peak hours.
- Exit Taxiway Locations - The number and locations of exit taxiways for landing aircraft.

4.2.1.1 Meteorological Conditions

Meteorological conditions have a significant effect upon runway use, which, in turn, affects an airfield's capacity. During Visual Meteorological Conditions (VMC), runway use is usually determined by the direction of the prevailing winds. During Instrument Meteorological Conditions (IMC), runway use is dictated by a combination of prevailing winds and the type and availability of instrument approach procedures. Operational factors and noise abatement considerations also affect runway use. MCO has an ATCT that is operational 24 hours a day.

On the basis of meteorological data for MCO, it is estimated the airport operates under VMC conditions 95.6 percent of the time and IMC conditions the remaining 4.4 percent of the time. Horizontal visibility and ceiling minimums are below Category I (CAT I) approach criteria approximately 1.5 percent of the time.

4.2.1.2 Aircraft Fleet Mix

Variations in aircraft approach speeds and landing distances affect runway occupancy times, which, in turn, affect airfield capacity. Table 4-1 summarizes representative aircraft types found in each aircraft classification. Based on the aircraft fleet mix presented in Section 3.0 of this Master Plan Update, it is estimated that Class D aircraft comprise 8 percent of aircraft operations, Class C aircraft comprise 82 percent of aircraft operations, and Class A and Class B comprise 10 percent of aircraft operations. The airport's mix index is calculated at 106 percent, determined by the following equation:

Mix Index (106) = Class C Operations (82) + (3 * Class D Operations (8))

TABLE 4-1
TYPICAL AIRCRAFT FLEET MIX

Class	Aircraft Type	
Class A	Small Single-Engine (Gross weight 12,500 pounds or less)	
Typical Aircraft	Cessna 172/182	Mooney 201
	Beech, Bonanza	Piper Cherokee/Warrior
Class B	Small, Twin-Engine (Gross weight 12,500 pounds or less)	
Typical Aircraft	Beech Baron	Mitsubishi MU-2
	Cessna 402	Piper Navajo
	Rockwell Shrike	Cessna Citation I
	Beechcraft 99	Beech King Air
Class C	Large Aircraft (Gross weight 12,500 pounds to 300,000 pounds)	
Typical Aircraft	Douglas DC-9	A-320/A-321
	Boeing 727	MD-80
	Boeing 737	A-319
	Boeing 757	Embraer 135/145
	CRJ-200	CRJ-700
Class D	Large Aircraft (Gross weight more than 300,000 pounds)	
Typical Aircraft	Boeing 767	Airbus A-330
	Boeing 777	Boeing 747

Source: URS, September 2003.

4.2.1.3 Runway Use

Runway use data for MCO were obtained from the airport's Federal Aviation Regulation (FAR) Part 150 *Noise Compatibility Study*, which was completed in 2001. Runway use data contained in the study were gathered from MCO's Noise and Operations Monitoring System (NOMS) and ATC personnel interviews. Analysis of the data indicates that MCO's predominant mode of operation is a south flow condition, with Runways 18L/R and 17L/R in use approximately 85 percent of the time. The remaining 15 percent of the time MCO is in a north flow operation, utilizing Runways 36L/R and 35L/R.

The Fourth Runway (17L/35R) went into operation in early 2004. This additional runway was constructed to increase airport capacity and will predominantly be used by air carrier and commuter/regional aircraft. The use of this runway changes the runway utilization rates. The estimated runway utilization rates, with and without the Fourth Runway (17L/35R), are presented in Tables 4-2 and 4-3.

TABLE 4-2
RUNWAY USE PERCENTAGES
1999 CONDITIONS

Runway	Arrival Percentages			Departure Percentages		
	Air Carrier/ Commuter	Cargo	Military/ General Aviation	Air Carrier/ Commuter	Cargo	Military/ General Aviation
18L	17	25	25	34	50	50
18R	34	50	50	17	25	25
17L	0	0	0	0	0	0
17R	34	9	9	34	9	9
Total for South Flow	**85**	**84**	**84**	**85**	**84**	**84**
36L	6	9	9	3	5	5
36R	3	5	5	6	9	9
35L	6	2	2	6	2	2
35R	0	0	0	0	0	0
Total for North Flow	**15**	**16**	**16**	**15**	**16**	**16**

Source: Transportation Solutions, MCO Part 150 Study, March 2001.

TABLE 4-3
RUNWAY USE PERCENTAGES
PROJECTED 2004 CONDITIONS

Runway	Arrival Percentages			Departure Percentages		
	Air Carrier/ Commuter	Cargo	Military/ General Aviation	Air Carrier/ Commuter	Cargo	Military/ General Aviation
18L	17	25.5	25.5	34	51	51
18R	34	51	51	17	25.5	25.5
17L	8.5	0	0	4	0	0
17R	25.5	8.5	9	30	8.5	8.5
Total for South Flow	**85**	**85**	**85**	**85**	**85**	**85**
36L	6	9	9	3	4.5	4.5
36R	3	4.5	4.5	6	9	9
35L	4.5	1.5	1.5	5	1.5	1.5
35R	1.5	0	0	1	0	0
Total for North Flow	**15**	**15**	**15**	**15**	**15**	**15**

Source: Transportation Solutions, MCO Part 150 Study, March 2001.

4.2.1.4 Touch-and-Go Operations

A touch-and-go operation occurs when an aircraft lands and takes off without making a full stop. This is usually done for the purpose of practicing landings. Touch-and-go operations do not occupy the runway as long as a full-stop landing or a departure. Therefore, an airfield with a high percentage of touch-and-go operations can normally accommodate a greater number of operations. Based on a review of ATC counts for local operations, touch-and-go activity does not typically occur at MCO. Therefore, based on data presented in FAA AC 150/5060-5, *Airport Capacity and Delay*, a factor of 1.0 is used in these calculations.

4.2.1.5 Percentage Arrivals

The number of arrivals as a percentage of total aircraft operations has an important influence on a runway's hourly capacity. For example, a runway used exclusively for arrivals has a different capacity than a runway used exclusively for departures or a runway used for a mixture of arrivals and

departures. In general, the higher the percentage of arrivals, the lower the hourly capacity of a runway. This is because arrivals usually have a longer runway occupancy time than departures. Arrivals are assumed to comprise 50 percent of peak hour operations at MCO.

4.2.1.6 Exit Taxiway Locations

Exit taxiways affect airfield capacity because their locations along runways influence runway occupancy times for aircraft. The longer an aircraft remains on a runway, the lower the capacity of the runway. When exit taxiways are properly located, landing aircraft can quickly exit the runway, thereby increasing the capacity of the runway.

According to FAA criteria, exit taxiways for a runway having a mix index of 106 should be in the range of 5,000 to 7,000 feet from the runway's threshold for maximum effectiveness at reducing runway occupancy time. Table 4-4 presents information on the location of exit taxiways on runways at MCO.

TABLE 4-4
RUNWAY EXIT TAXIWAY LOCATIONS

Runway	Number of Exit Taxiways*	Distance from Runway Threshold (in feet)
18R	1	6,450
36L	1	5,554
18L	1	5,905
36R	1	5,472
17R	2	6,108 / 5,000
35L	2	5,077 / 5,874
17L	1	6,493
35R	2	5,786 / 6,917

Source: URS, September 2003.
* Located within range of 5,000 to 7,000 feet from runway threshold.

4.2.2 HANDBOOK METHODOLOGY CAPACITIES

The hourly and annual capacity of the MCO airfield was calculated using the methodologies specified in FAA AC 150/5060-5. Hourly capacity values were determined for both the three-runway and four-runway systems using the following equation:

Hourly capacity of the runway component = C * T * E

Where: C = Base Capacity

T = Touch-and-Go Factor

E = Exit Factor

The base capacity number (C) is derived from the hourly airfield capacity graphs contained in the FAA AC. The graphs for the three-runway system are shown on Figures 4-1 and 4-2, while the graphs for the four-runway system are shown on Figures 4-3 and 4-4.

4.2.2.1 Three-Runway Hourly Capacities

The base capacity number is 150 for VMC and 117 for IMC. The touch-and-go factor is also derived from the capacity graphs using information previously presented. The T factor is 1.0 for both VMC and IMC. The exit factor is derived from the capacity graphs using information previously presented on the location of taxiway exits. The exit factor is 0.88 for VMC and 0.99 for IMC.

Using the data presented in the preceding sections and the graphs on Figures 4-1 and 4-2, it was determined the three-runway airfield's hourly capacity during VMC, assuming 50 percent arrivals, is 132 operations (150 * 1 * 0.88). The airfield's hourly capacity during IMC, also assuming 50 percent arrivals, is 116 operations (117 * 1 * 0.99). These data are presented on Figure 4-5.

4.2.2.2 *Four-Runway Hourly Capacities*

The same process used for the three-runway system was also applied for the four-runway system. The resulting hourly capacities were 182 for VMC and 117 for IMC. Review of these results indicate that the four-runway value for IMC appears incorrect. The results from the capacity graphs indicates that only one more operation (117) would occur during IMC with a four-runway system as compared to the number of operations that would occur with a three-runway system (116). This is because the handbook methodology does not properly account for triple simultaneous instrument approaches that can occur at MCO with the four-runway system. Therefore, other sources of capacity data were consulted to account for the limitations of the handbook methodology.

In 2001, the FAA produced a report entitled *Airport Capacity Benchmark Report 2001.* The report provides an analysis of estimated hourly capacity values for 31 of the nation's busiest airport including MCO. The report provided estimates of the hourly capacity values at MCO during VMC and IMC for the three- and four-runway systems. The estimated hourly capacity of the four-runway system with IMC was 139 to 147 operations. That range of operations is significantly higher than the 117 derived from the handbook methodology and appears to properly account for the additional capacity that the Fourth Runway (17L/35R) will provide.

Further review of the handbook methodology indicates that use of a 40 percent arrivals factor instead of a 50 percent arrivals factor produces an hourly capacity estimate of 143. This value is in the middle of the range estimated in the benchmark report and was, therefore, used to complete the handbook methodology capacity analysis.

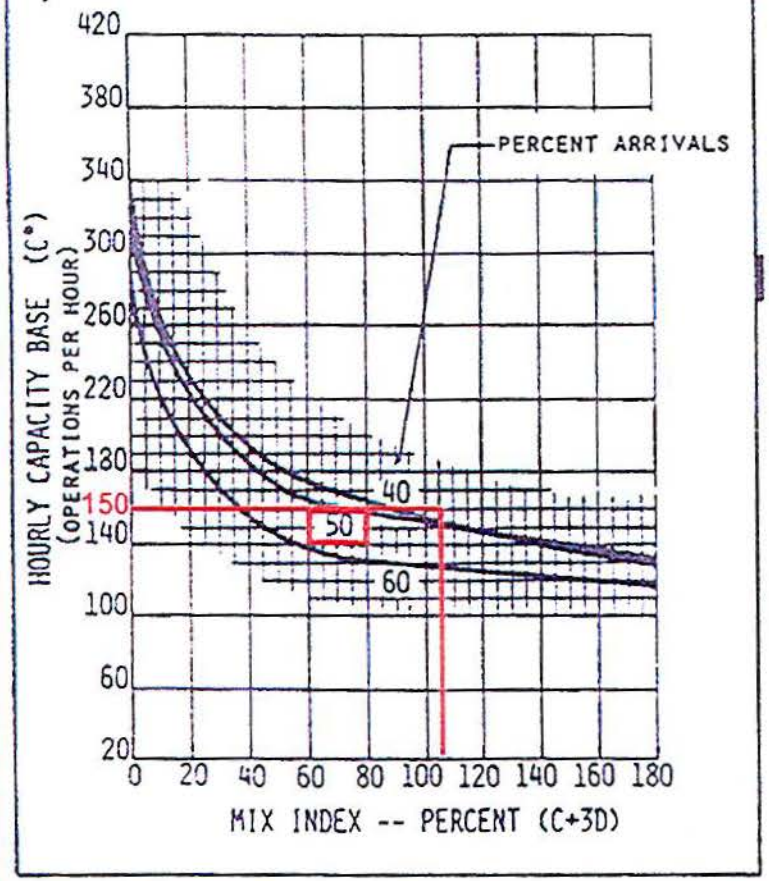
The hourly capacities derived for the three- and four-runway systems are compared to the projection of peak hour operations in Table 4-5. As the table indicates, the unconstrained projection of peak hour operations will exceed the three-runway IMC capacity and will approach the three-runway VMC capacity by the year 2022. However, the four-runway capacities of 182 and 143 will not be exceeded. Thus, it can be concluded that the four-runway system will have sufficient capacity to accommodate forecasted peak hour operations without incurring significant delay. These data are presented on Figure 4-5.

TABLE 4-5
HOURLY AIRFIELD CAPACITY

	Three-Runway System		Four-Runway System		
Year	VMC Hourly Capacity	IMC Hourly Capacity	VMC Hourly Capacity	IMC Hourly Capacity	Unconstrained Forecast Peak Hour Operations
2002	132	116	182	143	72
2007	132	116	182	143	87
2012	132	116	182	143	100
2022	132	116	182	143	128

Source: URS, September 2003.

HOURLY CAPACITY BASE C°



TOUCH & GO FACTOR T

Percent Touch & Go	Mix Index--Percent(C+3D)	TOUCH & GO FACTOR T
0	0 to 180	1.00
1 to 10	0 to 70	1.03
11 to 20	0 to 70	1.05
21 to 30	0 to 40	1.11
31 to 40	0 to 10	1.20
41 to 50	0 to 10	1.24

C° x T x E = Hourly Capacity

EXIT FACTOR E

To determine Exit Factor E:

1. Determine exit range for appropriate mix index from table below
2. For arrival runways, determine the average number of exits(N) which are: (a) within appropriate exit range, and (b) separated by at least 750 feet
3. If N is 4 or more, Exit Factor = 1.00
4. If N is less than 4, determine Exit Factor from table below for appropriate mix index and percent arrivals

Mix Index--Percent(C+3D)	Exit Range (Feet from threshold)	EXIT FACTOR E								
		40% Arrivals			50% Arrivals			60% Arrivals		
		N=0	N=1	N=2 or 3	N=0	N=1	N=2 or 3	N=0	N=1	N=2 or 3
0 to 20	3000 to 4000	0.76	0.88	0.94	0.65	0.83	0.93	0.62	0.79	0.90
21 to 50	3000 to 5500	0.83	0.90	0.96	0.72	0.83	0.94	0.72	0.83	0.93
51 to 80	3500 to 6500	0.85	0.91	0.96	0.75	0.84	0.92	0.75	0.84	0.92
81 to 120	5000 to 7000	0.90	0.94	0.97	0.82	0.88	0.95	0.80	0.87	0.94
121 to 180	5500 to 7500	0.93	0.78	1.00	0.20	0.21	0.39	0.35	0.35	0.38

FIGURE 3-13. HOURLY CAPACITY OF RUNWAY-USE DIAGRAM NOS. 18, 21, 22 FOR VFR CONDITIONS.

Source: FAA AC 150/5060-5

FIGURE: 4-1

VMC HOURLY AIRFIELD CAPACITY GRAPH FOR THREE-RUNWAY SYSTEM

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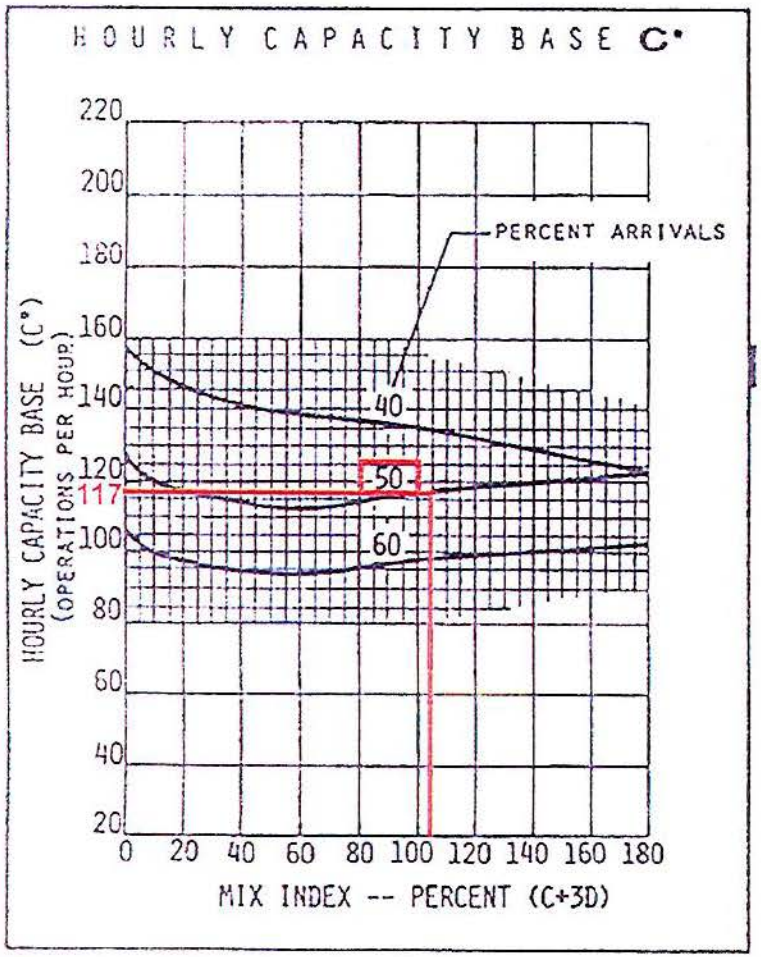

TOUCH & GO FACTOR T

T = 1.00

C° x T x E = Hourly Capacity

EXIT FACTOR E

To determine Exit Factor E:

1. Determine exit range for appropriate mix index from table below
2. For arrival runways, determine the average number of exits(N) which are: (a) within appropriate exit range, and (b) separated by at least 750 feet
3. If N is 4 or more, Exit Factor = 1.00
4. If N is less than 4, determine Exit Factor from table below for appropriate mix index and percent arrivals

Mix Index--Percent(C+3D)	Exit Range (Feet from threshold)	EXIT FACTOR E								
		40% Arrivals			50% Arrivals			60% Arrivals		
		N=0	N=1	N=2 or 3	N=0	N=1	N=2 or 3	N=0	N=1	N=2 or 3
0 to 20	2000 to 4000	0.98	0.99	1.00	0.98	0.99	1.00	0.98	0.99	1.00
21 to 50	3000 to 5500	0.90	0.96	0.98	0.90	0.96	0.98	0.90	0.96	0.98
51 to 80	3500 to 6500	0.92	0.98	1.00	0.92	0.98	1.00	0.91	0.97	1.00
81 to 120	5000 to 7000	0.95	0.99	1.00	0.92	0.99	1.00	0.91	0.98	1.00
121 to 180	5500 to 7500	0.95	0.99	1.00	0.90	0.97	1.00	0.90	0.97	1.00

FIGURE 3-55. HOURLY CAPACITY OF RUNWAY-USE DIAGRAM NOS.: 18,22,26,31,36 FOR IFR CONDITIONS.

Source: FAA AC 150/5060-5

FIGURE: 4-2

IMC HOURLY AIRFIELD CAPACITY GRAPH FOR THREE-RUNWAY SYSTEM

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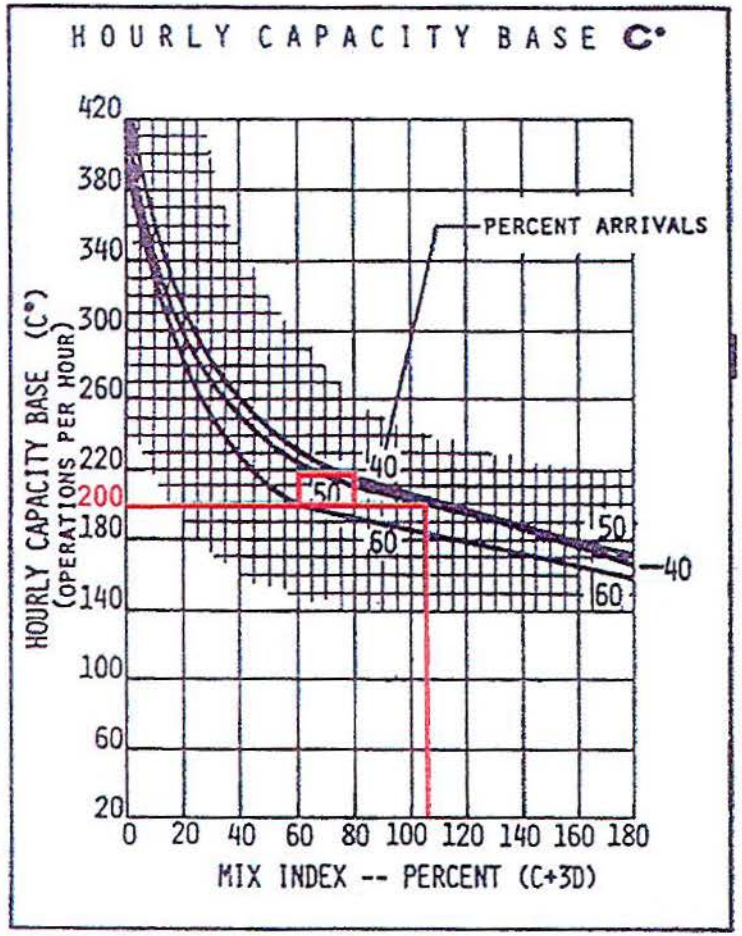

TOUCH & GO FACTOR T

Percent Touch & Go	Mix Index--Percent (C+3D)	TOUCH & GO FACTOR T
0	0 to 180	1.00
1 to 10	0 to 70	1.03
11 to 20	0 to 70	1.10
21 to 30	0 to 40	1.19

C° x T x E = Hourly Capacity

EXIT FACTOR E

To determine Exit Factor E:

1. Determine exit range for appropriate mix index from table below
2. For arrival runways, determine the average number of exits(N) which are: (a) within appropriate exit range, and (b) separated by at least 750 feet
3. If N is 4 or more, Exit Factor = 1.00
4. If N is less than 4, determine Exit Factor from table below for appropriate mix index and percent arrivals

Mix Index--Percent (C+3D)	Exit Range (Feet from threshold)	EXIT FACTOR E								
		40% Arrivals			50% Arrivals			60% Arrivals		
		N=0	N=1	N=2 or 3	N=0	N=1	N=2 or 3	N=0	N=1	N=2 or 3
0 to 20	2000 to 4000	0.76	0.88	0.94	0.72	0.86	0.94	0.64	0.82	0.93
21 to 50	3000 to 5500	0.83	0.90	0.96	0.80	0.88	0.95	0.72	0.83	0.93
51 to 80	3500 to 6500	0.85	0.91	0.95	0.82	0.89	0.95	0.75	0.84	0.92
81 to 120	5000 to 7000	0.89	0.93	0.97	0.87	0.91	0.96	0.81	0.87	0.94
121 to 180	5500 to 7500	0.94	0.98	0.99	0.92	0.97	0.99	0.89	0.96	0.98

FIGURE 3-24. HOURLY CAPACITY OF RUNWAY-USE DIAGRAM NO. 40 FOR VFR CONDITIONS.

Source: FAA AC 150/5060-5

FIGURE: 4-3

VMC HOURLY AIRFIELD CAPACITY GRAPH FOR FOUR -RUNWAY SYSTEM

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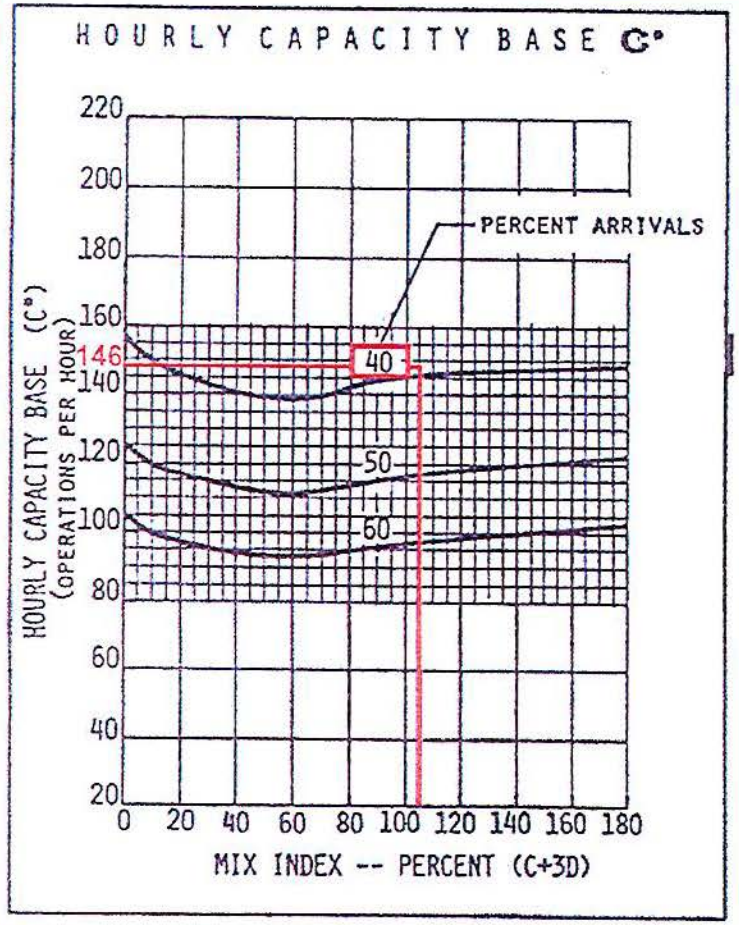

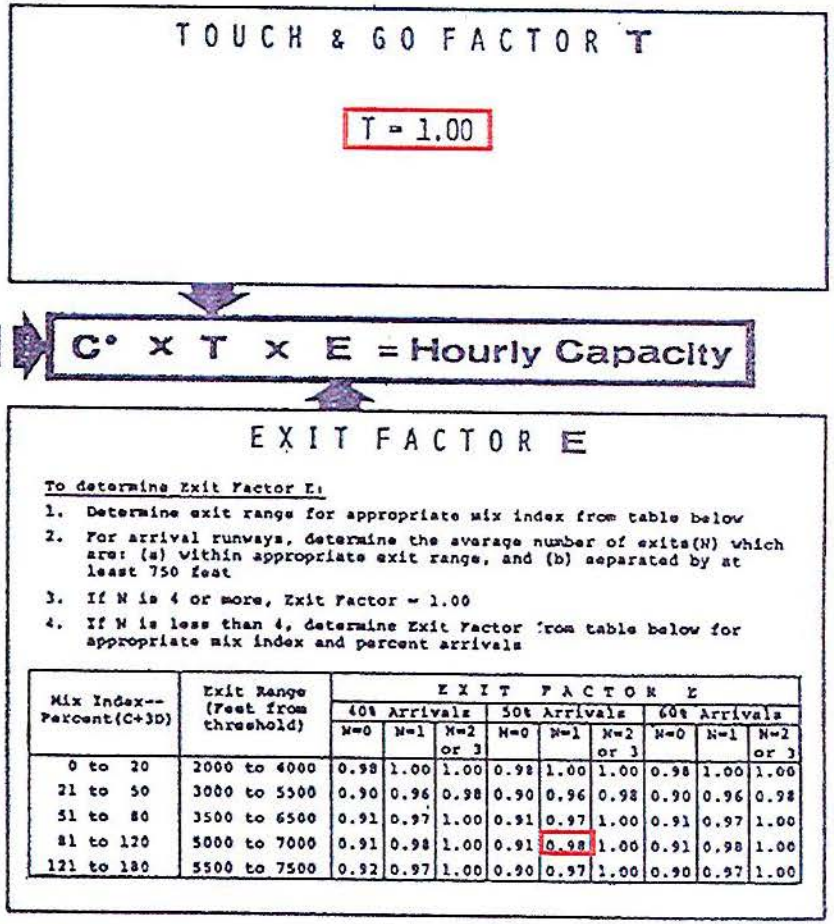

Mix Index--Percent(C+3D)	Exit Range (Feet from threshold)	EXIT FACTOR E								
		40% Arrivals			50% Arrivals			60% Arrivals		
		N=0	N=1	N=2 or 3	N=0	N=1	N=2 or 3	N=0	N=1	N=2 or 3
0 to 20	2000 to 4000	0.98	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00
21 to 50	3000 to 5500	0.90	0.96	0.98	0.90	0.96	0.98	0.90	0.96	0.98
51 to 80	3500 to 6500	0.91	0.97	1.00	0.91	0.97	1.00	0.91	0.97	1.00
81 to 120	5000 to 7000	0.91	0.98	1.00	0.91	0.98	1.00	0.91	0.98	1.00
121 to 180	5500 to 7500	0.92	0.97	1.00	0.90	0.97	1.00	0.90	0.97	1.00

FIGURE 3-58. HOURLY CAPACITY OF RUNWAY-USE DIAGRAM NOS.: 32-35,37-42 FOR IFR CONDITIONS.

Source: FAA AC 150/5060-5

FIGURE: 4-4

IMC HOURLY AIRFIELD CAPACITY GRAPH FOR FOUR -RUNWAY SYSTEM

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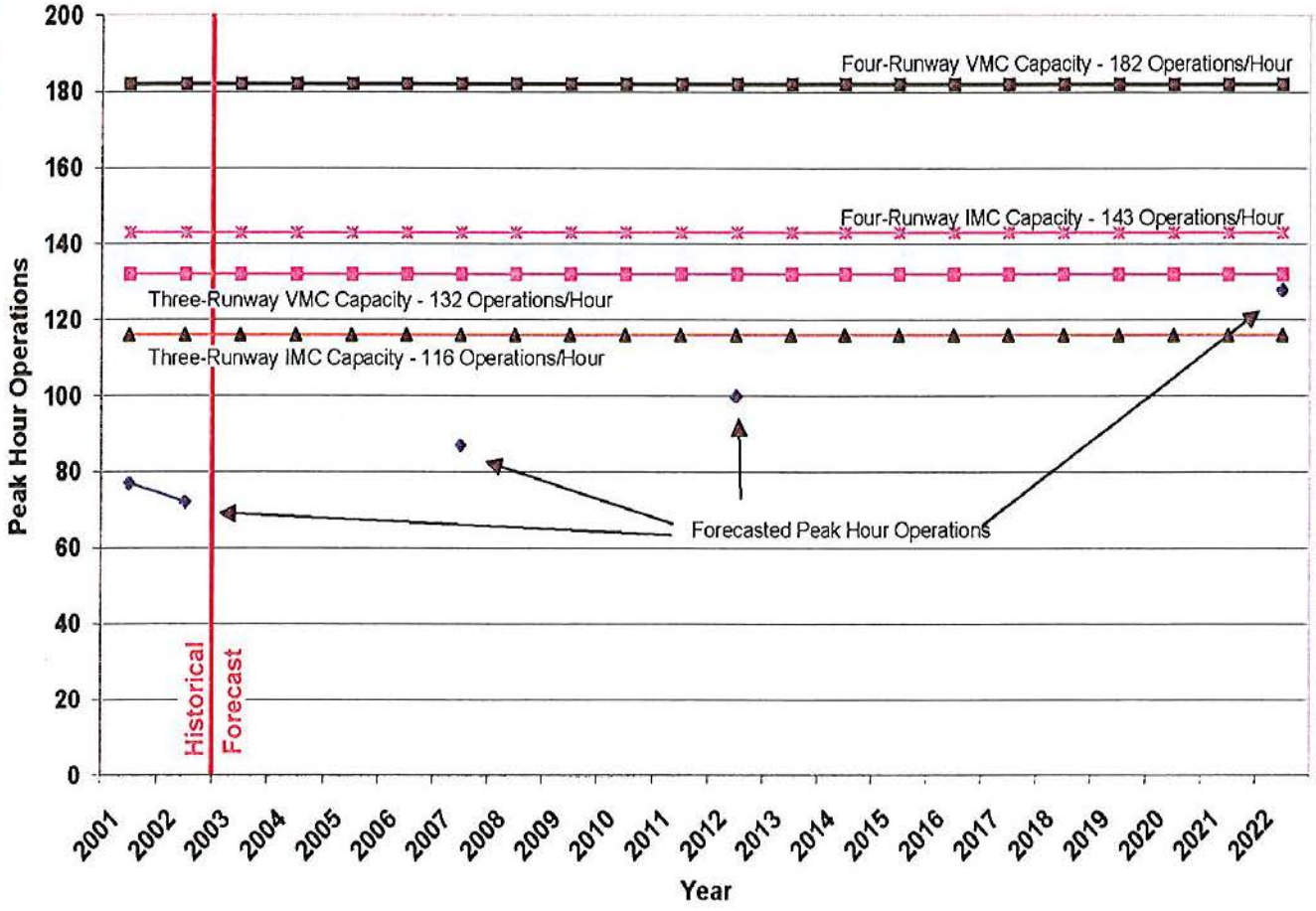

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PEAK HOUR DEMAND AND CAPACITY

FIGURE: 4-5

4.2.2.3 *Annual Capacity*

An airfield's ASV is calculated by determining the following three items:

- The weighted hourly capacity: C
- The daily demand ratio: D
- The hourly demand ratio: H

The weighted hourly capacity is calculated via a formula considering the hourly capacity values during VMC and IMC as well as the percentage of time that each weather condition occurs. The weighted hourly capacity of MCO is calculated to be 128 operations for the three-runway system and 165 operations for the four-runway system. These capacities are only used for calculating ASV. They do not have any other use and should not be compared to hourly levels of demand.

The daily demand ratio is calculated by dividing the annual number of aircraft operations by the average daily operations during the peak month. This calculation used data for calendar year 2001 and results in a daily demand factor of 337 (342,315/1,016). This value falls within the range of 310 to 350 listed in the FAA AC as being typical for an airport with a fleet mix similar to that of MCO.

The hourly demand ratio is calculated by dividing the average daily operations during the peak month by the average peak hour operations during the peak month. This calculation also used data for 2001 and results in a daily demand factor of approximately 13 (1,016/77). This ratio is also within the range of 11 to 15 listed in the FAA AC as being typical for an airport such as MCO.

Using the values derived, the ASV for MCO is presented in the following equation:

Three-Runway ASV = C (128) * D (337) * H (13) = 560,000 operations

Four-Runway ASV = C (165) * D (337) * H (13) = 723,000 operations

Considering the fact that the D and H ratios will vary from year to year in response to changes in aircraft operations and peaking characteristics, information from other sources, and use of professional judgment, it was deemed reasonable to express the airport's ASV in terms of ranges rather than a single level. Therefore, a range of 500,000 to 550,000 is recommended as the ASV for the three-runway system and a range of 700,000 to 740,000 is recommended as the ASV for the four-runway system (Figure 4-6).

As shown in Table 4-6, the high range of the airport's four-runway ASV exceeds the projected annual aircraft operations throughout the study period. By the year 2022, it is estimated that annual operations will comprise 75 percent of the four-runway ASV.

TABLE 4-6

COMPARISON OF ASV AND ANNUAL DEMAND

Year	Forecasted Aircraft Operations	Estimated Four-Runway ASV	Forecasted Operations as a Percentage of ASV
2002	302,876	740,000	41
2007	373,791	740,000	51
2012	431,200	740,000	58
2022	552,282	740,000	75

Sources: FAA AC 150/5060-5, Airport Capacity and Delay.
URS, September 2003.

FAA's AC 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems, Table 3-2*, specifies that when an airport's annual operations (arrivals and departures) approach 100 percent ASV, the construction of additional airfield enhancement projects should be underway. In addition, the airport sponsor should initiate planning studies to evaluate means of increasing airfield capacity when annual operations approach 60 to 75 percent of the calculated ASV.

4.2.3 SIMMOD AIRFIELD CAPACITY ANALYSIS

In addition to using the handbook methodology, the demand/capacity analysis used computer simulations to examine the four-runway airfield's ultimate capacity. The analysis was conducted using SIMMOD. Simulations were conducted for south-flow, VMC, and primarily with segregated operations (i.e., arrivals on the outer runways and departures on the inner runways). These simulations were conducted during peak-arrival hours and utilized triple simultaneous approaches. The 2022 aviation activity demand schedule (i.e., with 1,640 daily operations representing 552,000 annual operations) was increased by 10 percent increments, and the simulation was run iteratively to produce delay results for several future demands beyond the 2022 demand projections. The resulting delay statistics indicate that the four-runway layout reaches its capacity at approximately 2,160 daily operations or 730,000 annual operations. In addition to the analysis of airfield capacity, SIMMOD was used to assess the delay reduction value of constructing a second north crossfield taxiway.

4.2.3.1 Demand Levels Analyzed

A 24-hour SIMMOD event file was created using the hourly distribution of scheduled aircraft operations for March 2003 and the projected number of aircraft operations in 2022. The number of aircraft operations was then increased each hour to represent projected demand beyond 1,640 daily operations projected in the year 2022. This was done to determine the demand level that could be accommodated by the four-runway configuration. Some de-peaking of the schedule was done to spread the peak hour demand into the previous and succeeding hours. The number of aircraft operations was increased in 10 percent increments to develop three forecast schedules that are referred to as Demand Levels 1, 2, and 3, respectively. Table 4-7 summarizes the daily and peak hour aircraft operations for each forecast demand level.

TABLE 4-7
AIRCRAFT OPERATIONS FORECASTS

Demand Level	Daily Operations	Peak Arrival Hour Operations	Peak Departure Hour Operations
2022 (Base)	1,640	68	71
1	1,804	71	75
2	1,984	75	79
3	2,182	80	83

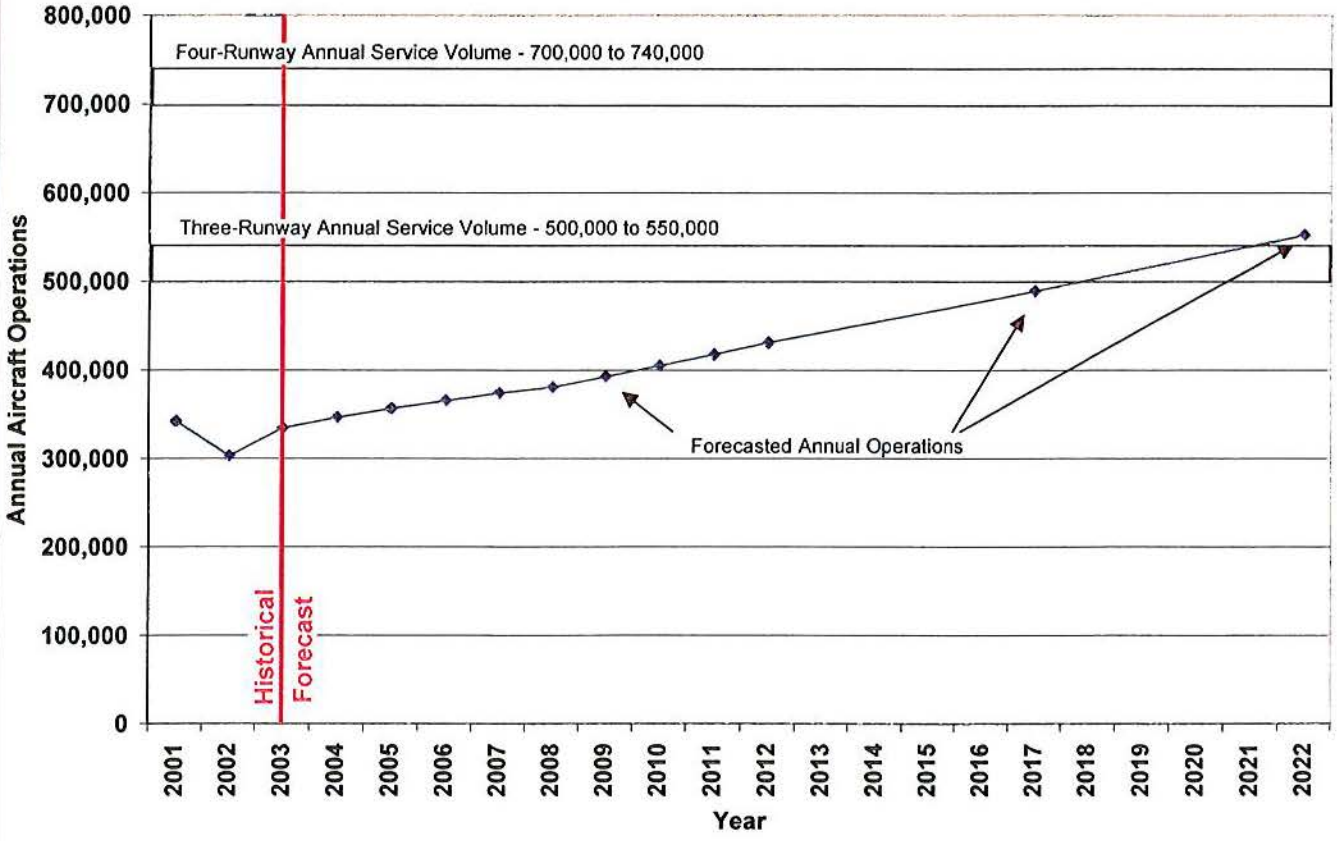
Source: TransSolutions, 2003.

Figure 4-7 shows the hourly demand profile for the SIMMOD arrival and departure traffic for the 2022 schedule and for each of these three newly developed demand levels.

4.2.3.2 Airfield Delay

When using a simulation model, the primary measures of airfield/airspace capacity are:

- Arrival delay consisting of delay experienced in the air and on the ground, and
- Departure delay consisting of taxi-out delay and departure queue delay. The results presented here focus on airfield and departure queue delay, not the ramp/gate operations.



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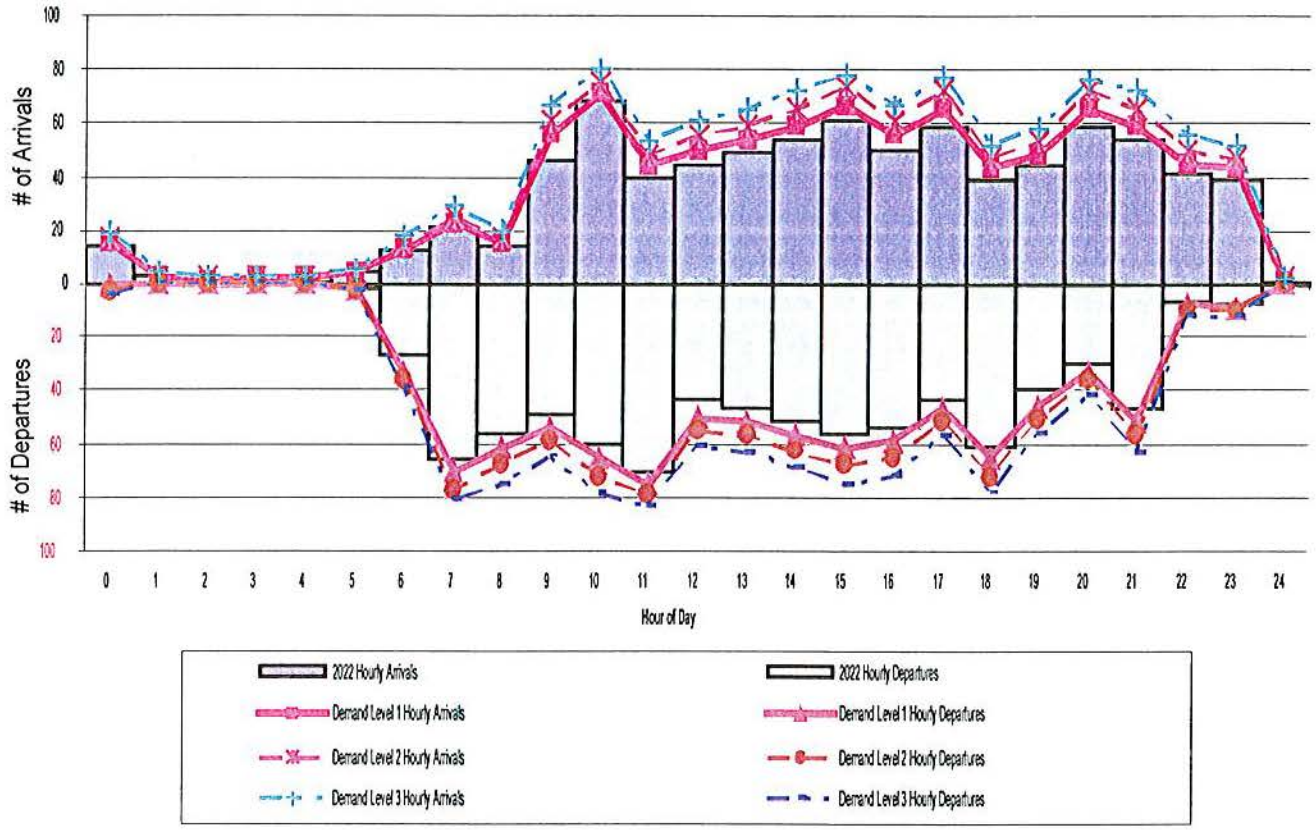
ANNUAL DEMAND AND ANNUAL SERVICE VOLUME

FIGURE: 4-6



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DAILY OPERATIONS BY HOUR

FIGURE: 4-7

Delay is measured as the difference in the amount of time an aircraft actually lands or departs the runway and the time it would have used the runway if it were able to move unimpeded throughout the airfield/airspace system. For example, if there is only one aircraft taxiing out to depart and it obtains immediate departure clearance, the aircraft would have no delay.

FAA's *National Plan of Integrated Airport Systems* (NPIAS) estimates capacity is reached when the overall average delays are in the 3- to 5-minute range, which averages both aircraft arrivals and departures. Generally, average arrival delays less than 3 to 4 minutes are considered to be acceptable for a large hub airport, while departure taxi-out delays often reach an average of 6 to 8 minutes before one considers that the capacity has been reached.

Table 4-8 summarizes the daily average arrival and departure delays for the three demand levels.

TABLE 4-8
COMPARISON OF DAILY AVERAGE ARRIVAL AND DEPARTURE DELAYS FOR FORECASTED DEMAND LEVELS

Demand Level	Average Arrival Delay (minutes)		Average Departure Delay (minutes)	
	Air Delay + Ground Delay	Number of Arrivals	Ground Delay + Queue Delay	Number of Departures
2022 (Base)	2.6	820	1.6	820
1	2.8	901	2.1	901
2	3.4	992	3.0	992
3	5.1	1,091	6.5	1,091

Source: TransSolutions, 2003.

As seen in Table 4-8, the daily average arrival and departure delays for Demand Levels 1 and 2 are within acceptable levels. However, when the daily traffic count is increased 10 percent from 1,984 (Demand Level 2) to 2,182 operations (Demand Level 3), the daily average arrival delay exceeds the acceptable level of 4 minutes. The daily average departure delay is also significantly high at 6.5 minutes. Figure 4-8 plots the average hourly arrival and departure delays for the three demand levels.

4.2.3.3 SIMMOD Airfield Capacity Results

To determine when the four-runway layout will reach capacity, average daily delays were plotted against the daily aircraft operations count. The "capacity-delay" curves project the delays forward using an exponential function.

Figure 4-9 presents the arrival and departure demand levels identified in Table 4-8 and compares them to the acceptable average daily departure and arrival delay. Projections of these demand levels are also presented. As shown on Figure 4-9, arrival delays become unacceptable when the traffic demand exceeds 2,044 operations, and departure delays become unacceptable above 2,310 daily operations. Therefore, it can be concluded that the capacity that can be accommodated by the four-runway layout lies within the range of 2,044 to 2,310 daily operations. The forecasts consistently used 337 equivalent days in calculating average day, peak month operations counts for the annual demand projections. Thus, the daily number of aircraft operations was multiplied by the equivalent days (337) to determine the annual capacity. The four-runway layout at MCO can accommodate from 690,000 to 780,000 annual operations before capacity is reached. This range equates to 67 million annual passengers (MAP) to 77 MAP, based on the 2022 fleet mix assumptions.

To further identify the annual capacity, the arrival and departure delays were averaged to calculate a total flight delay and then the NPIAS level of 5 minutes of acceptable delay was considered. This

resulted in 2,160 daily operations or 730,000 annual operations. This conclusion generally agrees with the conclusion drawn using the handbook methodology.

4.2.3.4 SIMMOD Analysis of North Crossfield Taxiway

SIMMOD was also used to assess the delay reduction value of constructing a second north crossfield taxiway. However, this analysis used a more detailed metric than was used for airfield capacity analyses. To analyze the effects of the additional north crossfield taxiway, the delays experienced by each aircraft in that area were tallied for each simulated day.

Table 4-9 presents the overall daily delay with and without the second north crossfield taxiway. The addition of a second north crossfield taxiway reduces total daily delay by over 15 minutes (50 percent), reducing the number of aircraft delayed by over 60 percent in mixed mode. In segregated mode, the total daily delay reduces by 27 minutes (90 percent), reducing the number of aircraft delayed by over 80 percent.

TABLE 4-9
TAXI DELAY COMPARISON OF SINGLE VERSUS DOUBLE NORTH CROSSFIELD TAXIWAY

Mode of Operation*	Scenario	Number of Aircraft Experiencing Delay Accessing North Crossfield Taxiway	Total Delay (minutes)
Mixed	Four Runways with Single North Crossfield Taxiway	92	30.0
	Four Runways with Double North Crossfield Taxiway	35	14.8
Segregated	Four Runways with Single North Crossfield Taxiway	112	30.8
	Four Runways with Double North Crossfield Taxiway	22	3.4

Source: TransSolutions, 2003.

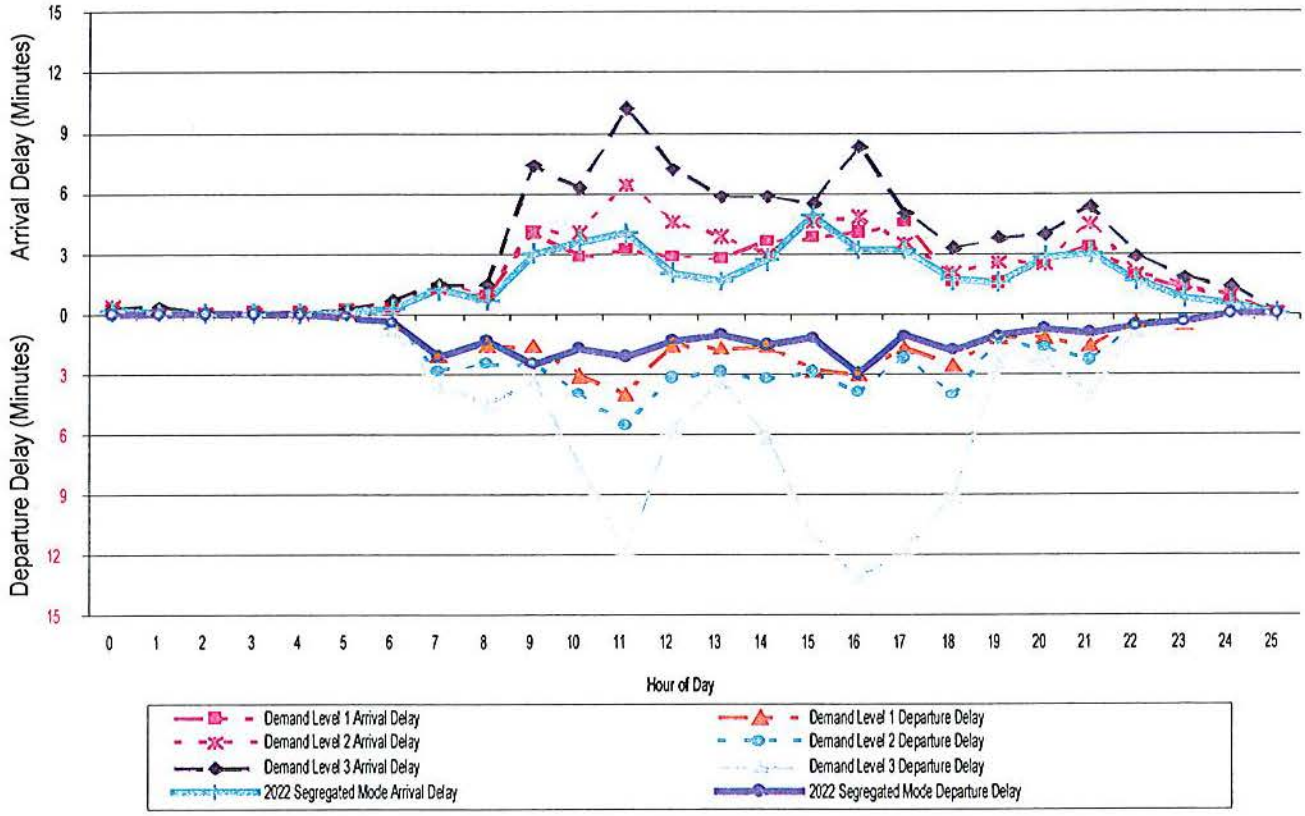
As the number of aircraft operations increases, air traffic controllers prefer to operate airports in a segregated mode (i.e., eastbound arrivals and departures on the east airfield and westbound arrivals and departures on the west airfield). This method of operation reduces the number of aircraft that must be repositioned in the air and reduces controller workload. However, this mode of operation increases the use of crossfield taxiways because aircraft need to cross the airfield to get to their appropriate gates or departure queues. Hence, the second north crossfield taxiway will provide even greater benefit when the airport operates in a segregated mode of operation.

4.2.3.5 Summary of SIMMOD Analysis

The MCO airfield and surrounding airspace is able to accommodate the projected 2022 traffic demand with the four-runway airfield. Segregation of operations results in a much lower overall departure delay and is recommended as the traffic level increases to 2022 demand levels. The addition of a second north crossfield taxiway reduces the number of aircraft delayed to/from the north taxiway by over 60 percent in mixed mode and by over 80 percent in segregated mode of operation.

4.2.4 AIRFIELD REQUIREMENTS

The airfield capacity analysis indicates that the four-runway system will provide adequate capacity through the duration of the study period. Additional airfield capacity may be required beyond the study period depending upon numerous factors including long-range growth of aircraft operations. While a fifth runway is not required within the timeframe of this study, it may be needed in the future. Therefore, the relevant issue with respect to an additional runway becomes one of land use planning



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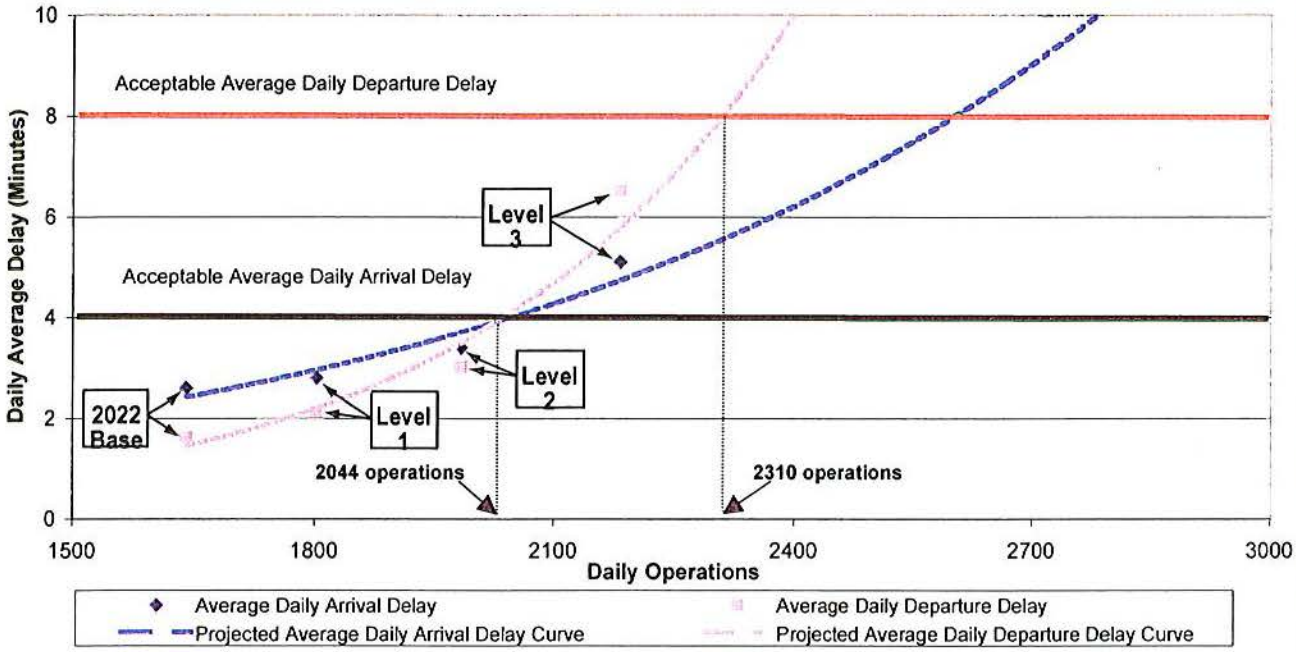
AVERAGE HOURLY DELAYS FOR DEMAND LEVELS (IN MINUTES)

FIGURE: 4-8



Note: Please refer to Table 4.2-8 for corresponding demand levels.

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AVERAGE DAILY DELAYS

FIGURE: 4-9

and potentially reserving land for the development of such a runway at some undetermined point in the future. The alternatives analysis will assess the options for reserving land use for that purpose.

Capacity-driven airfield requirements identified for this study include the following projects:

- High-Speed Exit Taxiways - Construction of two new high-speed exit taxiways would reduce runway occupancy times for arrivals on Runways 18R, 18L, and 36R. One proposed taxiway would connect Runway 18R to Taxiway B south of Taxiway E. This exit taxiway would reduce runway occupancy time for arrivals on Runway 18R and 18L that cannot turn off at Taxiway E. Another high-speed exit taxiway is proposed south of Taxiway J. It would allow arrivals on Runway 36R to connect to Taxiway C1. This would reduce runway occupancy time on Runway 36R.
- Miscellaneous Taxiway Improvements - New connector taxiways are recommended near Airside 2 to improve taxiway flow. These include a connector from Taxiway G1 to Taxiway H and a connector from Taxiway H2 to the Airside 2 apron.
- North Crossfield Taxiway (Taxiway K) - The SIMMOD analysis revealed that a second north crossfield taxiway would provide significant delay reduction benefits and would become especially important to ATC if segregated operations were attempted. Therefore, a second north crossfield taxiway is recommended.
- Extension of Runway 17R - An extension of Runway 17R to the north for a distance of 1,500 feet would provide a runway length of 11,500 feet and would provide the ability to depart long-haul flights on the east side of the airport.
- North and Mid-Crossfield Taxiways between Runways 17R and 17L - The construction of a second set of taxiways to the east runway would provide the ability to operate a mixture of departures and arrivals on that runway. This may become important in the future when additional aviation development on the east side of the airport generates departures on Runway 17L/35R or when periods of maintenance close Runway 17R/35L.

Other airfield projects have been identified (i.e., runway length extensions) that will complement the capacity-driven airfield requirements. These projects are described in detail in Section 5.0, Airfield Plan. Appendix G discusses FAA guidelines for A380 taxiing operations.

4.3 AIRSPACE/AIR TRAFFIC CONTROL

4.3.1 NAVIGATIONAL AID REQUIREMENTS

The four parallel runway system at MCO is served by 12 published precision-instrument and 14 non-precision instrument approach procedures. Runways 18L, 18R, 17L, 17R, 36R, 35L, and 35R are served by CAT I Instrument Landing Systems (ILS) that offer approach minimums as low as 200-foot cloud ceiling and 1/2 mile or 1,800-foot Runway Visual Range (RVR) visibility minimums. Runways 17L, 17R, 36R, 35L, and 35R are equipped with CAT II ILS that offer reduced approach minimums of 100-foot cloud ceiling and RVR distances of 1,200 feet. Runways 35L and 36R are equipped with CAT IIIa/b ILS that offer unrestricted cloud ceiling approach minimums and RVR distances as low as 600 feet. Use of CAT II or IIIa/b published instrument approaches are restricted to aircraft and crew that are equipped and qualified to conduct such procedures. All MCO runways are served by non-precision area navigation (RNAV)/global positioning system (GPS) or VHF omni-directional range (VOR)/distance measuring equipment (DME) approach procedure capabilities. Runways 18L and 36L are currently served by non-precision RNAV/GPS or VOR/DME approach capabilities only. Runway 17L/35R has CAT II ILS capability at each end. Future planning considerations include the future enhancement of the ILS facilities on this runway to provide CAT III approach capabilities.

It is the desire of GOAA to provide precision instrument approach capabilities to Runways 18L and 36L in the future. These approach procedures will utilize either existing ground-based ILS-type facilities or emerging space based (GPS) Local Area Augmentation System and Wide Area Augmentation System (LAAS/WAAS) technologies.

4.3.1.1 Navigational Aid Setback Requirements and Considerations

Currently, both Runways 18L and 18R have Runway End Safety Areas (RESAs) that do not extend the required 1,000-foot length beyond the north end of each respective runway. The RESA for Runway 18L extends only 922 feet and the RESA for Runway 18R extends only 696 feet. As such, both non-standard RESA conditions will be rectified by the combined actions of displacing both runway thresholds to the south and extending both runways to the south. Accordingly, the localizer antenna array and localizer shelter serving the ILS approach to Runway 36R are now located within 745 and 695 feet, respectively, of the north end of Runway 18L. The current FAA design guidelines require the localizer antenna array to be located at least 1,000 feet beyond the runway end and outside of the Runway Safety Area (RSA). This non-standard localizer location will be rectified when the RSA improvements are accomplished.

No other impacts or encroachments to ground-based navigational aid (NAVAID) facilities currently exist at MCO.

4.3.1.2 Anticipated Future Navigational Technologies at MCO

Discussions with FAA indicate that large origin and destination (O&D) airports such as MCO will be offered a variety of new space-based navigational capabilities that will utilize the emerging LAAS/WAAS technologies currently under development.

The extent and capabilities of these new enhanced published approach procedures are not currently known, nor is the required protection and siting specifications for the associated protection of Terminal Instrument Procedures (TERPS) or the ancillary on-site ground-based navigational facilities. It is anticipated, however, that such ground-based facilities will be sited and operated without imposing adverse impacts to current geometric setbacks or future facility development.

4.3.2 AIRPORT TRAFFIC CONTROL TOWER LINE OF SIGHT REQUIREMENTS

The airport's new state-of-the-art Airport Traffic Control Tower (ATCT) has an elevation of 345 feet above ground level (AGL) and is located on the south side of the airport's main terminal building. Based upon a comprehensive site selection process, the ATCT provides air traffic controllers an unobstructed line of sight of the airport's four runways, north crossfield taxiway, all four airside terminals, and future South Terminal Complex structures and apron areas. The ATCT replaces a 230-foot AGL ATCT that served the airport since the early 1980s.

The development of the new ATCT was predicated on fully satisfying the need to provide airport traffic tower personnel with an unobstructed line of sight of all airside pavements and designated "movement areas" that are operated under the direct and positive control of the FAA ATCT. Airside movement areas typically include all runways, taxiways, and designated areas of interface between airside and landside operations. "Non-movement" areas may include but would not be limited to, terminal apron areas operated under "local" ramp ground control operations or other airside leased apron areas around the airport.

When considering the development of future airport facilities in proximity of the runway/taxiway system, an ATCT line of sight analysis must be conducted in accordance with pre-established FAA criteria. Facility siting, planning, or development of such facilities must meet ATCT line of sight requirements that, by their nature, serve as paramount safety considerations. Line-of-sight analysis is conducted using trigonometric analysis techniques that consider such factors as the relative height of

the ATCT observer above a required visibility area, the slant distance of the visibility area from the observer, the ground elevation, AGL height, and orientation of the proposed facility.

Further, such requirements may limit the character of land use or the physical extent, shape, orientation, height, or operational use of facilities. All facility development planning must include an analysis of the potential impacts imposed by building structures, shadow effects caused by the shape, size of the facilities, or its appurtenances. To a lesser extent, architectural considerations may also include the potential reflectivity of glass or metal facades that may impose reflected glare from the rising or setting sun.

In an effort to address the need to plan for the future development of four specific land areas located between Runway 17R/35L and the Fourth Runway (17L/35R), preliminary line of sight analyses were conducted by GOAA in 1999. The four areas are shown on Figure 4-10 and are comprised of areas east and west of Heintzelman Boulevard and north and south of the southernmost crossfield taxiways connecting the two respective runways. Based on these studies, a three-dimensional planning envelope was identified that slopes upwardly from east to west. Areas east of Heintzelman Boulevard would be limited to AGL heights ranging from 10 feet to approximately 50 feet. Areas west of Heintzelman Boulevard would be limited to AGL heights ranging from 70 feet to approximately 130 feet.

A complementary line of sight height limitation envelope is also associated with the north side of the south crossfield taxiways that connect the two east airfield runways.

Airport Surface Detection Equipment (ASDE-X) provides highly accurate data, which has many potential applications. The primary application is to provide controllers with positive identification of aircraft on the surface in all weather conditions.

4.3.3 TERMINAL INSTRUMENT PROCEDURES CONSTRAINTS AND CONSIDERATIONS (TERPS)

TERPS associated with all published instrument approach procedures are required to provide adequate protection of navigable airspace imposed by both natural and manmade objects. Such objects would include, but would not be limited to, rising terrain, trees, buildings/structures and their appurtenances, vehicles, ground-based support and navigational equipment, and aircraft.

Because of the relative location and proximity of Airside 2 to the approach end of Runway 17R, certain operational limitations are imposed to aircraft landing on Runway 17R and to aircraft taxiing on the Airside 2 apron north of the existing airside terminal building. These limitations are related to TERPS clearance requirements that protect aircraft landing operations from the north to the south to Runway 17R. This potential for such TERPS-related restrictions will be negated or eliminated at such time that Runway 17R/35L is extended northward to connect to the full build out of the dual parallel north crossfield taxiway system.

Future proposed expansion of Airside 2 includes the extension of Wings 7 and 9 and the construction of the third Wing 8. These proposed airside improvements would require FAA TERPS evaluation.

4.4 TERMINAL FACILITIES

Terminal facility requirements for MCO are a function of its characteristics for passenger travel patterns, airline schedules, and the uniqueness of its travel market. These characteristics include the level of passenger and aircraft activity; the number and type of airlines serving MCO; the operating requirements of the airlines; and local factors such as the number of connecting passengers, international passengers, and passengers transferring from cruise ship surface transportation, etc.

The capacity of each element of the terminal complex can vary depending on the acceptable level of delay or crowding and processing time. For example, a passenger traveling for business may be less tolerant of terminal congestion than a passenger traveling for leisure.

To develop a terminal facilities program for MCO, a demand/capacity analysis needs to be performed for each major terminal component. Based on design day flight schedules and peak hour projections of passengers and aircraft movements, calculations are made to determine passenger processing and passenger hold areas, gates, and other industry determinants of demand.

For the MCO Master Plan Update, a key resource document has been reviewed for applicability to establishing terminal capacity at MCO. The *2002 North Terminal Capacity Update Study*, dated April 2002, was prepared by Airport & Aviation Professionals, Inc. The Authority plans to utilize these capacity values based on their internal review in 2003. The key facility components of the terminal complex, including landside facilities such as terminal roadways and ramps and garage parking, are addressed in terms of functional throughput capacity and assessed a capacity value expressed in terms of MAP. Based on review by URS airport planning personnel and subsequent meetings with the GOAA Planning Department, it was determined that the level of analysis and resultant conclusions were valid and applicable in addressing the capacity of the North Terminal Complex.

4.4.1 NORTH TERMINAL COMPLEX

4.4.1.1 Existing Capacity

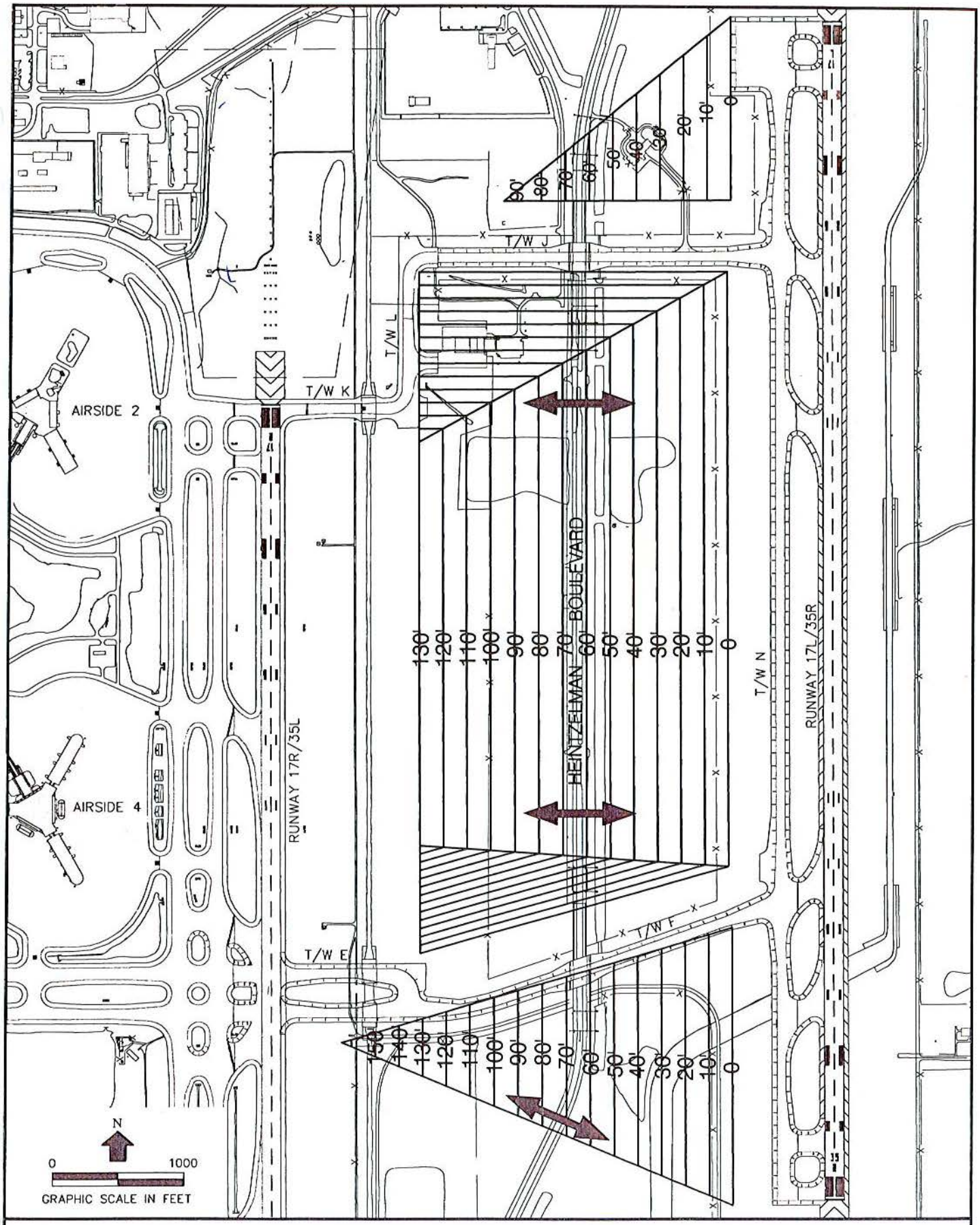
The North Terminal Complex occupies 854 acres and is comprised of a landside processing building and four airside buildings totaling approximately 4.4 million square feet. The size of the North Terminal Complex is as follows:

- Landside Terminal Building - 2,876,540 square feet
- Airside 1 - 340,224 square feet/25 gates
- Airside 2 - 301,401 square feet/16 gates
- Airside 3 - 309,522 square feet/24 gates
- Airside 4 - 550,448 square feet/24 gates and 11 commuter positions

Figure 4-11 depicts the North Terminal Complex.

Three studies were undertaken since 2000 to address the functional capacity of the North Terminal Complex. These efforts were prepared by GOAA staff and outside consultants for the Airline Airport Affairs Committee (AAAC). The conclusions of the three studies were based on existing infrastructure without enhancements and yielded the following. The Authority plans to continue these terminal facility capacity analyses.

- August 2000 - Without facility improvements, the capacity for the North Terminal Complex would range between 28 MAP and 36 MAP, depending on the specific component in question.
- March 2002 - After the September 11, 2001 tragedy, GOAA and its consultants re-examined the impacts from airline schedules, passenger travel patterns, and new security measures. With enhanced security procedures and airline scheduling, the capacity was estimated between 36 MAP and 40 MAP.
- April 2004 - GOAA conducted an internal review of the 2002 study with new peak hour data and existing terminal enhancements. GOAA validated the original findings of the 2002 study with few exceptions and the overall capacity range of 36 MAP to 40 MAP is still attainable.



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HEINTZELMAN BOULEVARD
BUILDING RESTRICTION HEIGHT LIMITATIONS FOR LINE OF SIGHT

FIGURE:
4-10

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Based on the 2002 study, the current terminal capacity as estimated by GOAA for each key component is shown in Table 4-10.

TABLE 4-10
CURRENT LANDSIDE TERMINAL FACILITY CAPACITY

Functional Element	MAP
Parking Garage	34.0
Passenger Security	42.7
Baggage Makeup	36.0
Ticketing Lobby	39.4
Baggage Claim	38.5
Automated Guideway Transit (AGT)	50+
Vertical Circulation	38.0
Entering and Exiting Weaves	38.5
Landside Terminal Curbs	38.3
Terminal Roads and Ramps	37.0

Source: 2002 North Terminal Capacity Update Study, Orlando International Airport, Airport & Aviation Professionals, Inc., April 2002.

4.4.1.2 Enhanced North Terminal Complex Capacity

Table 4-11 delineates the enhanced capacity values for the North Terminal Complex. The previously shown values were existing facilities without improvements. The enhanced capacity measures, which are a combination of both operational as well as physical improvements, improve the overall capacity of the terminal. Those components of the terminal being enhanced are as follows:

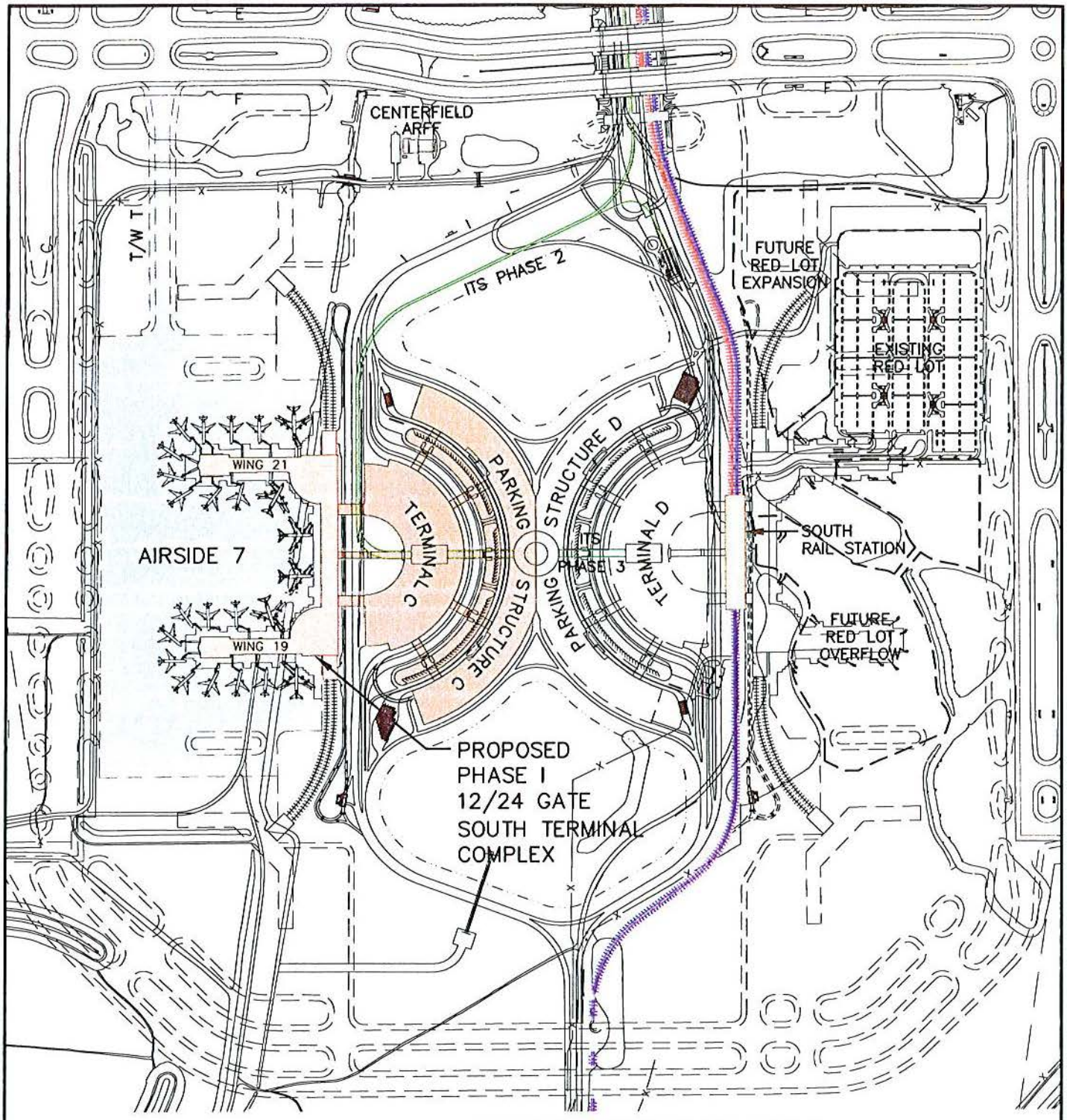
- Landside Terminal Vertical Circulation - Improving elevator cores from two to three banks and upgrading garage elevators;
- Terminal Roads and Ramps - Operational enforcement at the enplaning/deplaning curb and enforcement of re-circulation;
- Entering and Exiting Weaves - Operational enforcement at the curb and enforcement of re-circulation;
- Landside Terminal Curbs - Latest traffic mix and flattening of peak hour has yielded higher curbside capacity;
- Baggage Makeup - Transportation Security Administration (TSA) initiatives have resulted in improved throughput;
- Passenger Security Checkpoints - Subject to TSA approval, re-configured checkpoint layouts and increased screening units; and
- Ticketing Lobby - Improved counter utilization and E-ticketing stations/kiosks.
-

Based on the foregoing, most of the North Terminal Complex components can achieve the peak hour impacts attributed to 40 MAP. The surface transportation components such as terminal roadways, ramps, and garage parking remain in the 37 MAP to 38 MAP capacity level even with improved operational measures. A more detailed assessment of the surface transportation system can be found in Section 4.8.

TABLE 4-11
FINDINGS OF 2002 CAPACITY UPDATE STUDY

Functional Element	2000 Reconciled Capacity Estimate (MAP)	2000 Enhanced Capacity Estimate (MAP)	2002 Enhanced Capacity Estimate (MAP)	Remarks
Landside Terminal Vertical Circulation	28	38	38	GOAA is proceeding with modification of two-bank elevator cores to three-bank cores as well as a modernization of garage elevators.
Terminal Roads and Ramps	37	37	37	Strict enforcement of no standing at curbs has resulted in additional traffic on terminal loop roads. Enforcement of movement patterns at loop roads should eliminate this recent problem.
Entering and Exiting Weaves	34.5	38.5	38.5	Strict enforcement of no standing at curbs has resulted in additional traffic on terminal loop roads. Enforcement of movement patterns at loop roads should manage this problem.
Landside Terminal Curbs	34.5	36.5	38.3	Latest traffic mix findings coupled with the revised capacity peak suggest that the curb capacity has increased.
Garage Public Parking	34	34	34	Latest parking-rate-driven statistics coupled with the return of 3,000 spaces previously removed from use indicate an increase in garage capacity.
Ticketing Lobby	38	38	39.4	Revised analysis resulted in increased capacity. Counter utilization and E-ticketing brings up the existing capacity.
Baggage Claim	34	39	38.5	Current baggage belt size indicates an increased capacity.
Baggage Makeup	36	36	36	Analysis from 2000 study generally remains valid. Future EDS requirements may have an impact on baggage system capacity.
Federal Inspection Service (FIS) Capacity	34	39.5	N/A	N/A
Security Checkpoints	38	39.5	42.7	Reconfigured security checkpoint layouts and additional security screening units will increase capacity. This is awaiting TSA approval.
Plant Utility	N/A	N/A	N/A	Preliminary analysis indicates that the current plant capacity is adequate.
AGT	N/A	N/A	N/A	AGT capacity is not a foreseeable concern.

Source: 2002 North Terminal Capacity Update Study, Orlando International Airport, Airport & Aviation Professionals, Inc., April 2002.



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24 GATE SOUTH TERMINAL PHASE 1 DEVELOPMENT PLAN OPTION

FIGURE: 4-12

commercial passenger aircraft. Future security requirements have the potential to further reduce belly freight volumes.

The cargo forecast indicates that the majority of growth will occur in the integrator category with significantly less growth of belly freight and very little growth in the "other" all-cargo category. However, of the growth in the belly freight category, international carriers are expected to account for the majority of the increase.

Projections of cargo building requirements were made on the basis of ratios for square feet of floor space per annual tons of cargo handled. Past experience has shown that these ratios are typically in the range of 1 to 2 square feet of cargo building floor space per ton of cargo handled for all-cargo and integrators. For belly-freight this ratio is typically toward the lower end of the range.

For this analysis, existing ratios were examined by type of cargo and are shown in Table 4-13. The analysis found that ratios during 2000 and 2001 were 2.07 square feet per ton for all-cargo and 1.17 square feet per ton for belly freight. The ratios for both items appear to be on the high end of the anticipated range. It is likely that efficiencies could bring these ratios downward in the future. It is reasonable to assume that belly-freight could achieve a ratio of 1 or lower. With respect to all-cargo, a ratio of 1.5 seems to be the high end of what can reasonably be expected.

TABLE 4-13
COMPARISON OF CARGO PROCESSED
AND EXISTING CARGO BUILDING SPACE

Category	Tons of Cargo Processed in 2001 (Enplaned and Deplaned)	Existing Building Floor Area (square feet)	Building Space Utilization Rate
All-Cargo	182,000	375,866	2.06
Belly Freight	102,000[1]	120,000	1.17
Total	**282,000**	**495,866**	---

Source: URS, 2003.

[1] Belly freight in 2001 was unusually low; therefore, data for 2000 was used.

Calculation of future air cargo building space requirements was done by applying ratios of 1 square foot per ton for belly freight and 1.5 square feet per ton for the all-cargo category. Table 4-14 presents these space requirements.

TABLE 4-14

PROJECTION OF CARGO BUILDING SPACE REQUIREMENTS

Year	Forecast of Belly Freight	Belly Freight Building Requirements at 1 square foot/ton	Forecast of All-Cargo	All-Cargo Building Requirements at 1.5 square feet/ton	Total Cargo Building Requirements
2001 Actual	78,000	120,000	182,000	375,866	495,866
2007	120,000	120,000	247,000	370,500	490,500
2012	135,000	135,000	359,000	538,500	673,500
2017	155,000	155,000	498,000	747,000	902,000
2022	177,000	177,000	661,000	991,500	1,168,500

Source: URS, 2003.

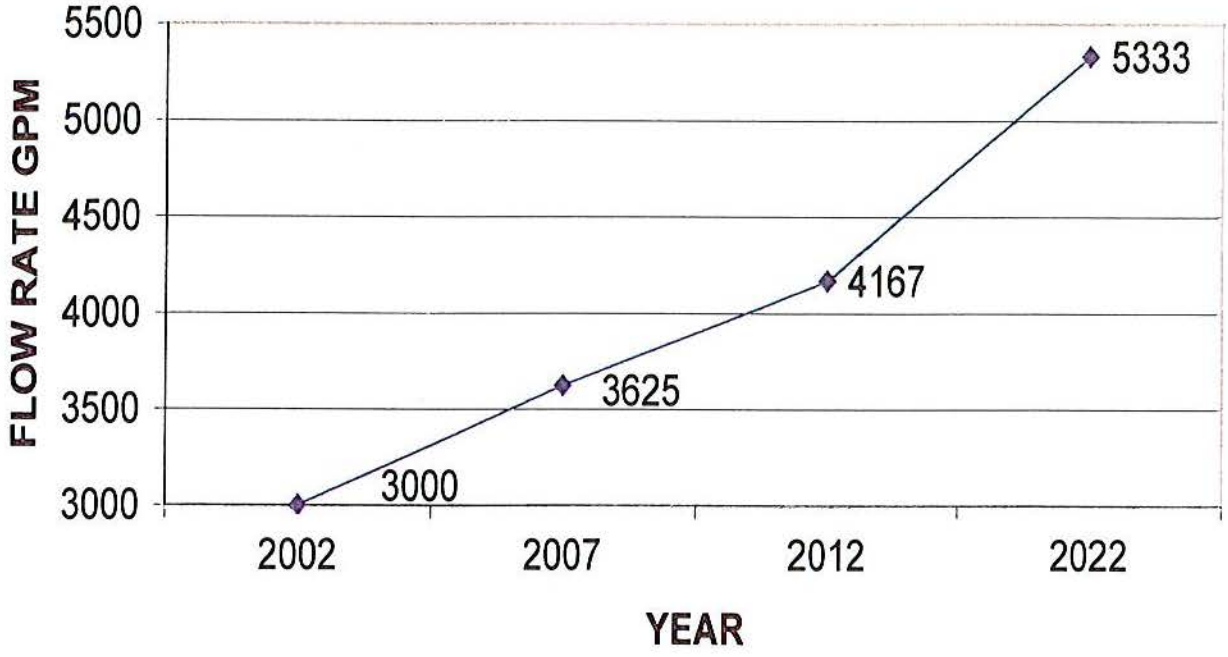
Requirements for airport parking ramp cannot be calculated via an equation. Ramp requirements depend on numerous factors including the degree to which facilities are consolidated. When facilities are in a common location, apron efficiencies can be achieved because not all aircraft will need parking at the same time. When cargo facilities are dispersed, or are exclusively used by a single carrier, apron requirements increase due to the inherent inefficiencies.

Air cargo apron requirements are usually several times the area required for cargo buildings. Existing cargo ramp is in the magnitude of four times the amount of building floor area. If this relationship were maintained, gross ramp requirements would be in the range of 110 acres.

4.6 AVIATION/AIRCRAFT FACILITY REQUIREMENTS

This section addresses the aviation/aircraft demand capacity and facility requirements needs for MCO. For planning purposes, this study has grouped aviation-related functions such as airline aircraft maintenance facilities, corporate jet aircraft maintenance centers, flight training centers, and two general aviation components (fixed base operators [FBOs] and corporate aircraft storage hangars) under this category.

Table 4-15 summarizes the existing aviation/aircraft facilities inventory at MCO.



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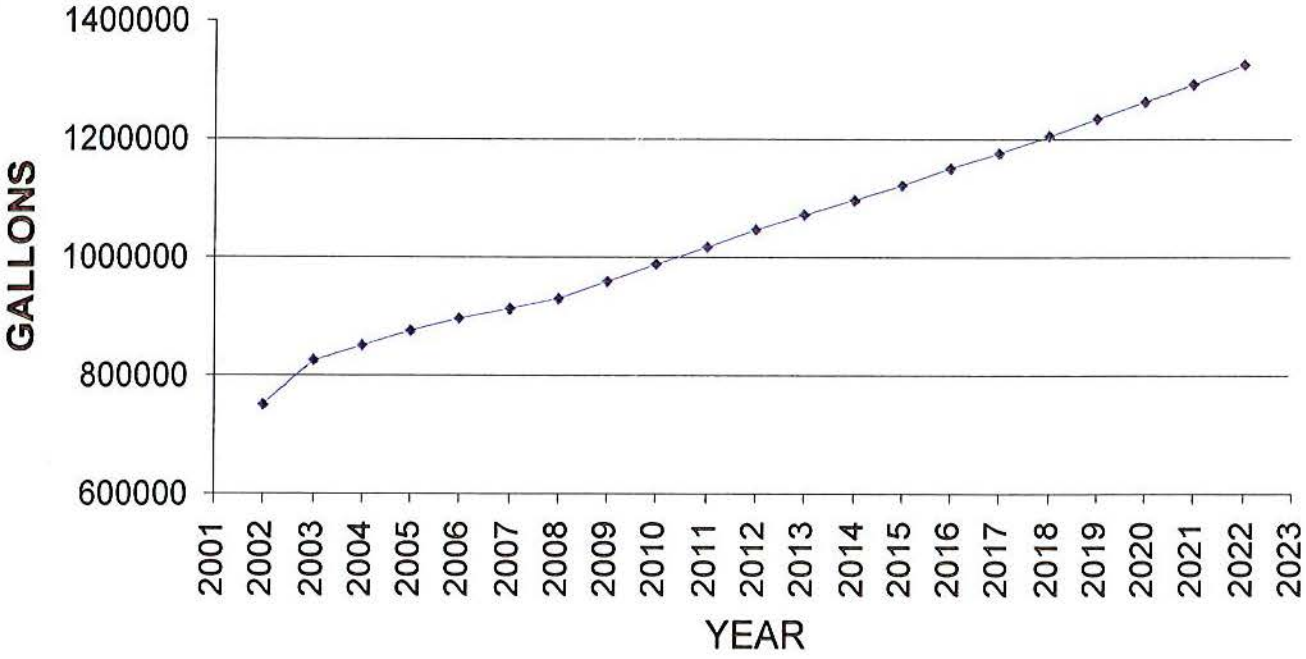
PROJECTED PEAK FLOW RATES

FIGURE: 4-14



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PROJECTED PEAK MONTH / AVE. DAY FUEL DEMAND

FIGURE: 4-15

as 2 minutes. From these actions, it is anticipated that ICAO Contracting States or Member Nations (including the U.S.) will be required to comply with these newly amended minimum response time standards. The recommendations (lesser status than a standard and one that gives some flexibility in implementation) specifies a reduced response time of 2 minutes, whereas the current standard stipulates a 3-minute minimum response time to any point on the operational runway. Although yet to be mandated, the ICAO's technical governing body, Air Navigation Commission (ANC), has reviewed this recommendation. Based on ANC recommendations, the ICAO council has approved and adopted the new specifications.

The timeline for the proposed implementation of these reduced minimum ARFF vehicle response times is not known. These new requirements, however, may serve to dictate the need for additional ARFF facilities on the airport. Additional ARFF facility sites may ultimately need to be established at MCO.

4.8 SURFACE TRANSPORTATION

4.8.1 AIRPORT ROADWAYS

Future traffic projections were estimated to analyze the future operating conditions on airport roadways. Traffic projections were prepared for three future analysis years (2010, 2015, and 2025). The traffic projections were conducted utilizing the following enplanement levels for each analysis year:

- Year 2010 - 40 MAP at the North Terminal Complex
- Year 2015 - 45 MAP total: 35 MAP at the North Terminal Complex and 10 MAP at the South Terminal Complex
- Year 2025 - 60 MAP total: 35 MAP at the North Terminal Complex and 25 MAP at the South Terminal Complex

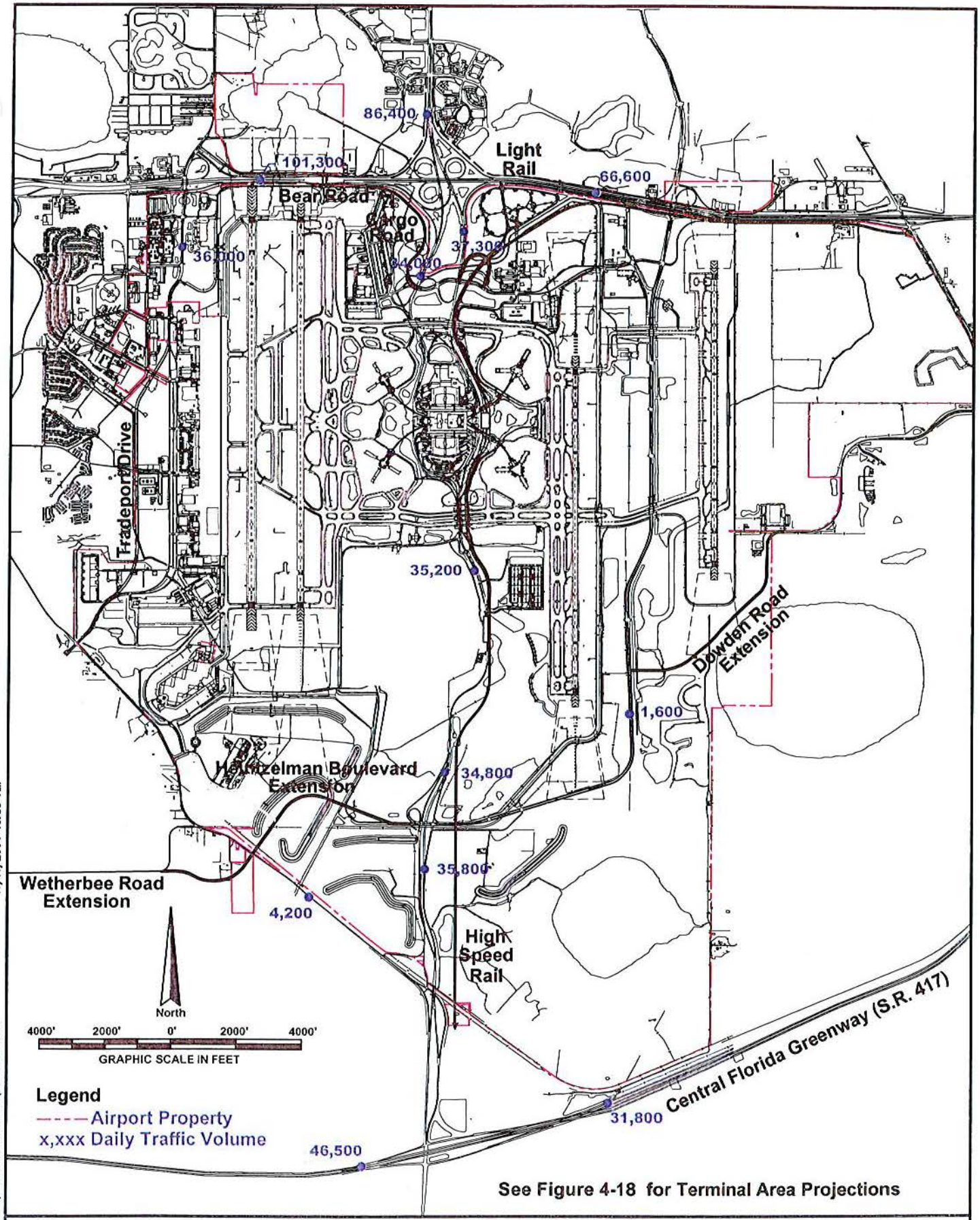
The complete documentation of the methodology and procedure used in the development of the future traffic projections is described in the Surface Transportation Forecast (HDR Engineering, Inc.). Figures 4-17 through 4-22 show the future traffic projections for each of the analysis years.

An evaluation of the future traffic operations was conducted to identify deficiencies and develop recommendations for improvements. This evaluation consisted of a capacity analysis of the future roadway network using the traffic projections. The capacity analysis was based on the methods outlined in the Highway Capacity Manual, Transportation Research Board, 2000 (2000 HCM). LOS D for peak hour volumes is considered the minimum acceptable operating condition for the MCO roadway network. For the purpose of this analysis, several improvements to the existing roadway network were assumed for the future year roadway networks in 2010, 2015, and 2025.

4.8.1.1 Year 2010

Several roadway improvements have been completed since 2000. The following existing facilities (2003) are included in the 2010 roadway network:

- Cargo Road - Widened to four lanes between Bear Road and Heintzelman Boulevard
- Heintzelman Boulevard - New construction, four-lane divided roadway between Cargo Road and South Access Road
- Heintzelman Boulevard/South Access Road Interchange - New construction
- Goldenrod Road Extension - New construction, four-lane divided roadway between Hoffner Road and Cargo Road/Heintzelman Boulevard
- State Road 528/Goldenrod Road Interchange - New construction



GREATER ORLANDO AVIATION AUTHORITY
URS Orlando International Airport Master Plan Update

2010 PROJECTED PEAK SEASON REGIONAL AVERAGE DAILY TRAFFIC VOLUMES

FIGURE: 4-17

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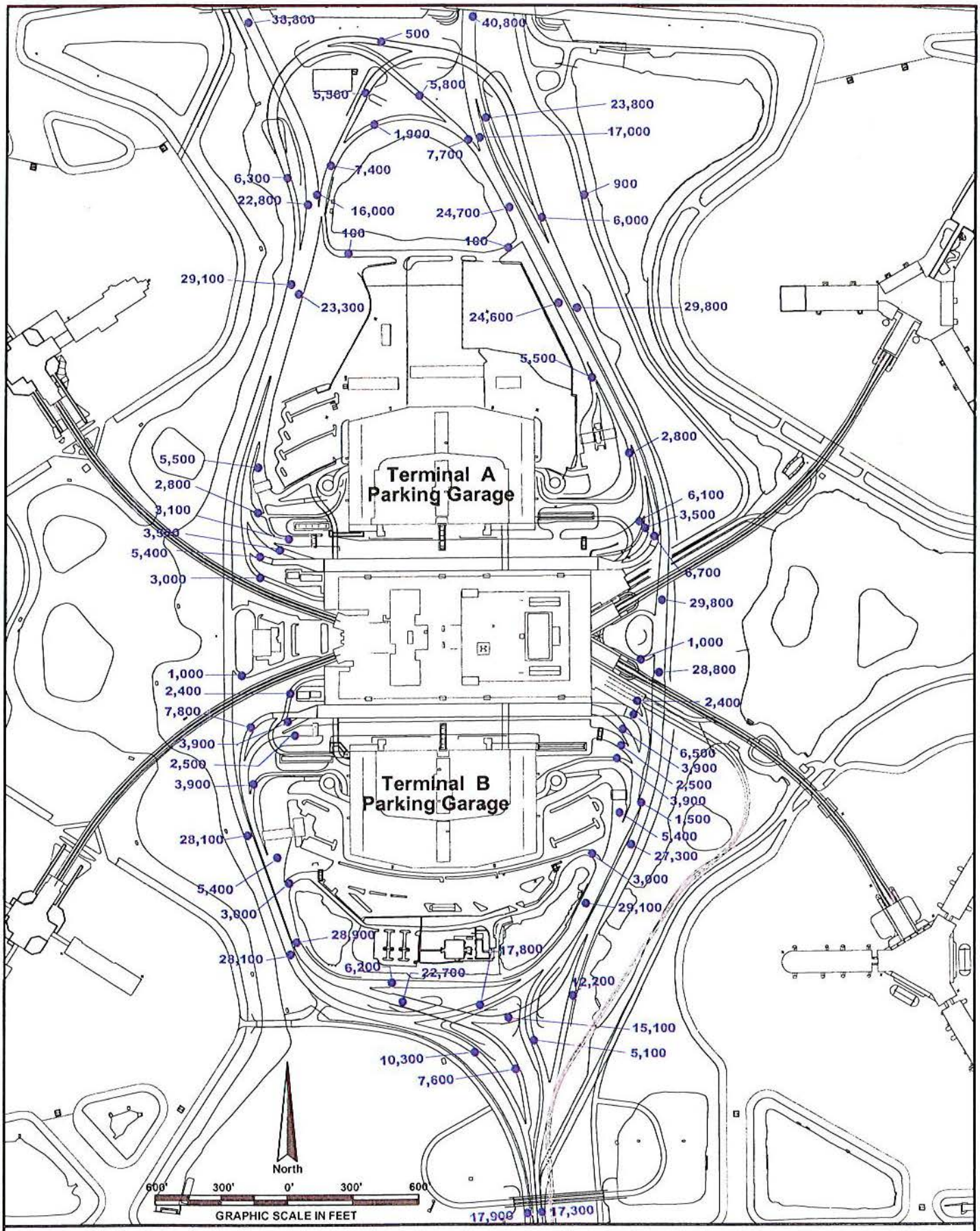

GREATER ORLANDO AVIATION AUTHORITY
URS Orlando International Airport Master Plan Update

2010 PROJECTED PEAK SEASON AVERAGE DAILY TRAFFIC VOLUMES

FIGURE: 4-18

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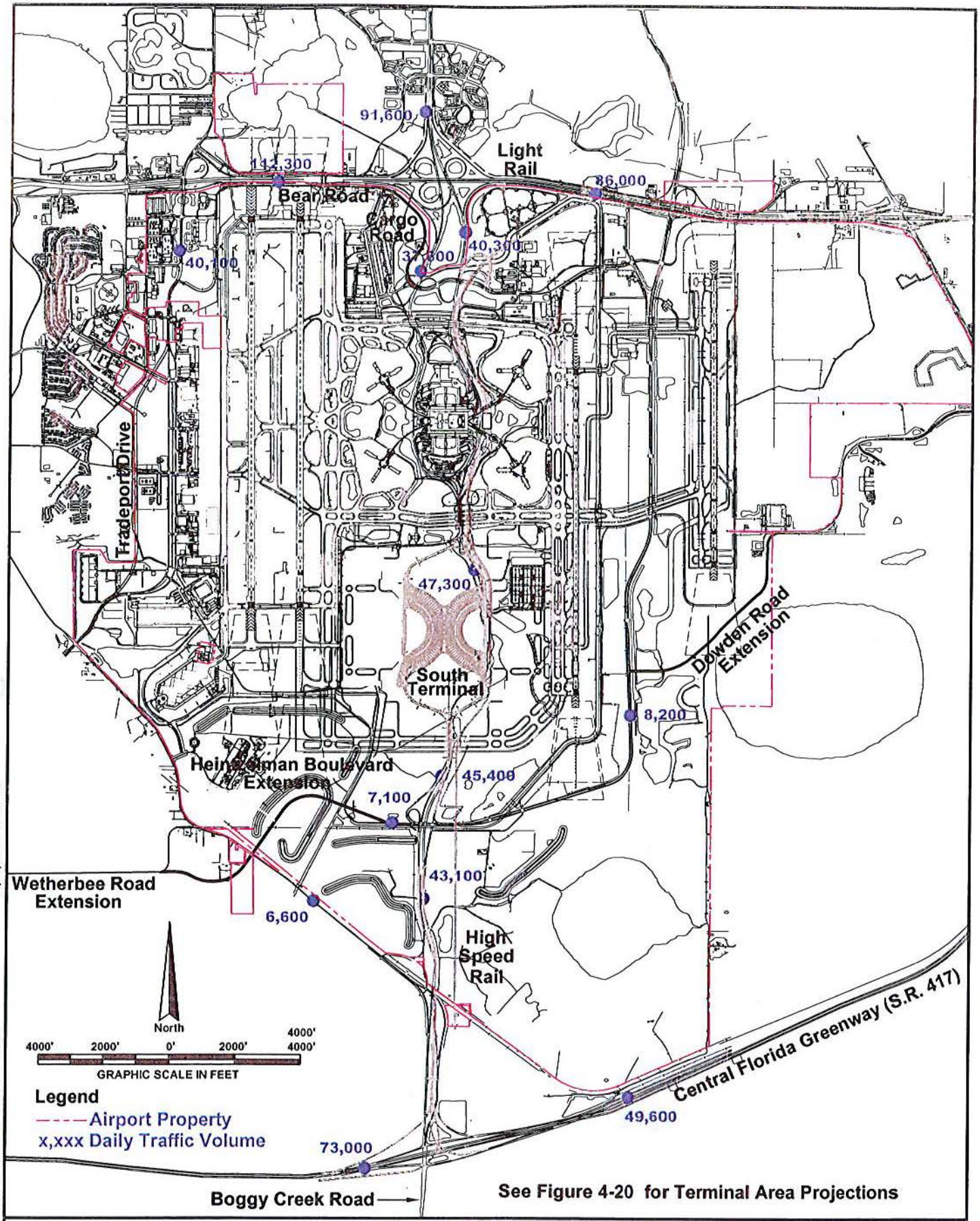
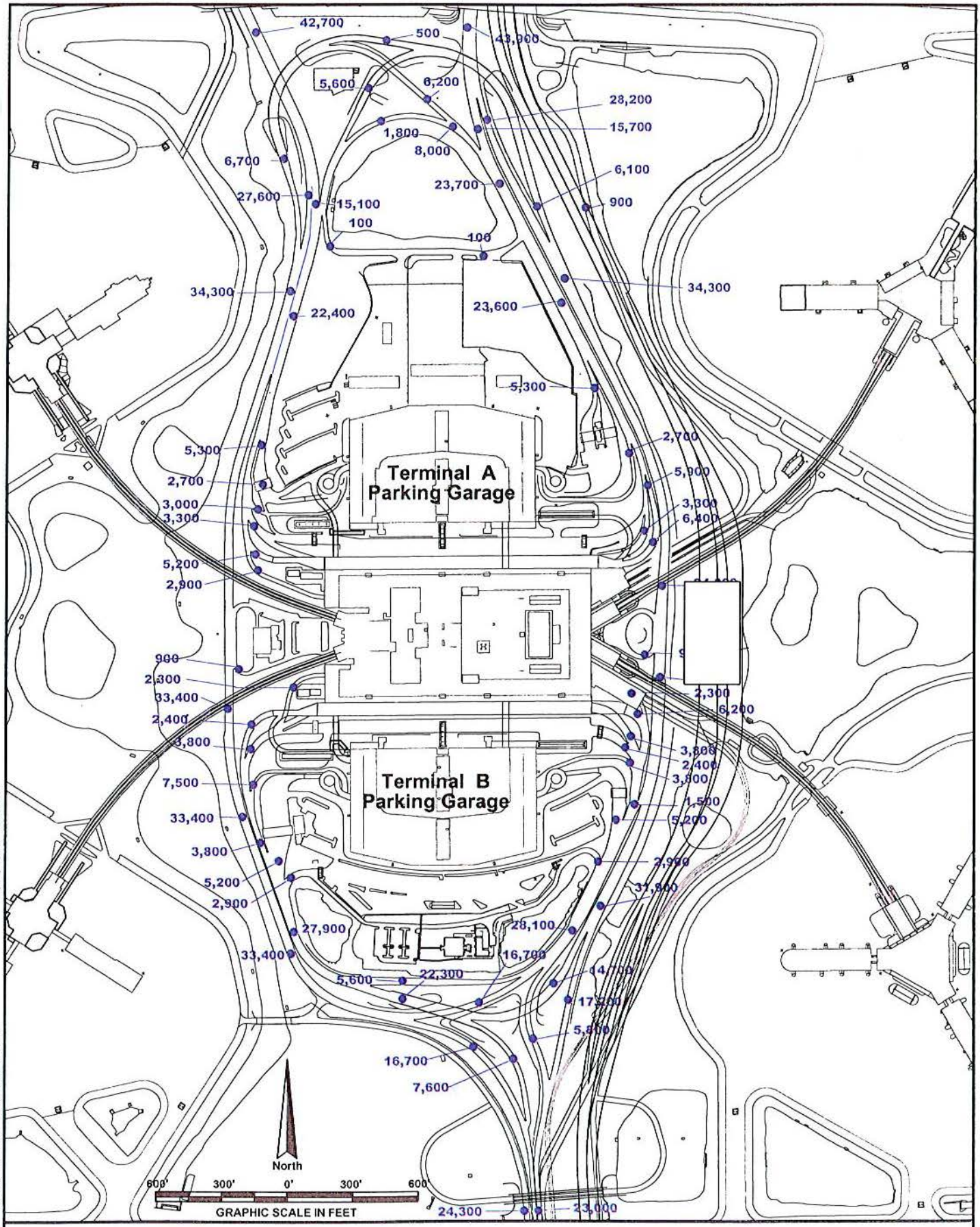


T:\PROJECTS\MAS\AN\FINAL EXHIBITS '04\FIG 4-19.DWG 11/11/2004 10:59 AM

GREATER ORLANDO AVIATION AUTHORITY
URS Orlando International Airport Master Plan Update

2015 PROJECTED PEAK SEASON REGIONAL AVERAGE DAILY TRAFFIC VOLUMES

FIGURE: 4-19



GREATER ORLANDO AVIATION AUTHORITY
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2015 PROJECTED PEAK SEASON AVERAGE DAILY TRAFFIC VOLUMES

FIGURE: 4-20

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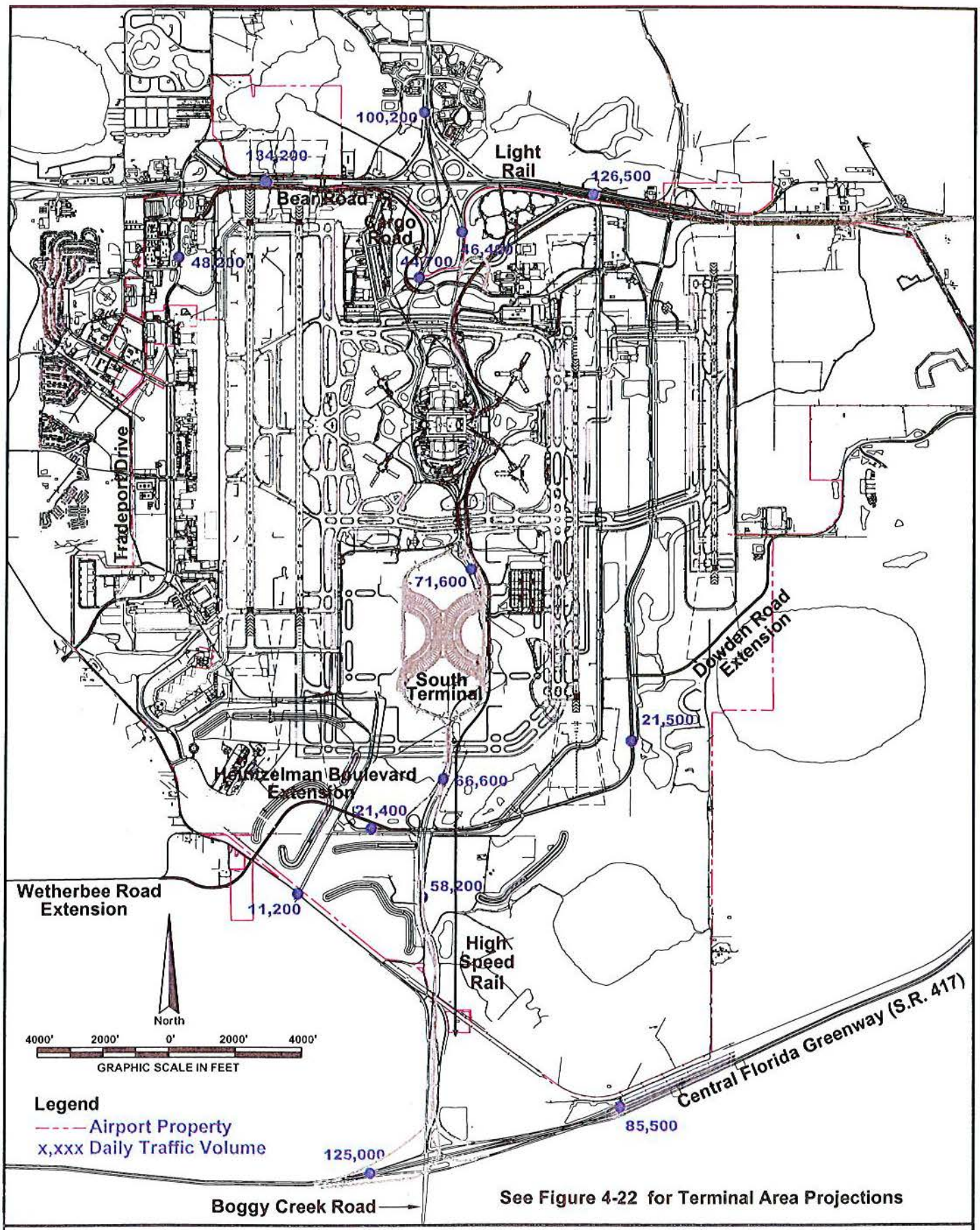

GREATER ORLANDO AVIATION AUTHORITY
URS Orlando International Airport Master Plan Update

2025 PROJECTED PEAK SEASON REGIONAL AVERAGE DAILY TRAFFIC VOLUMES

FIGURE: 4-21

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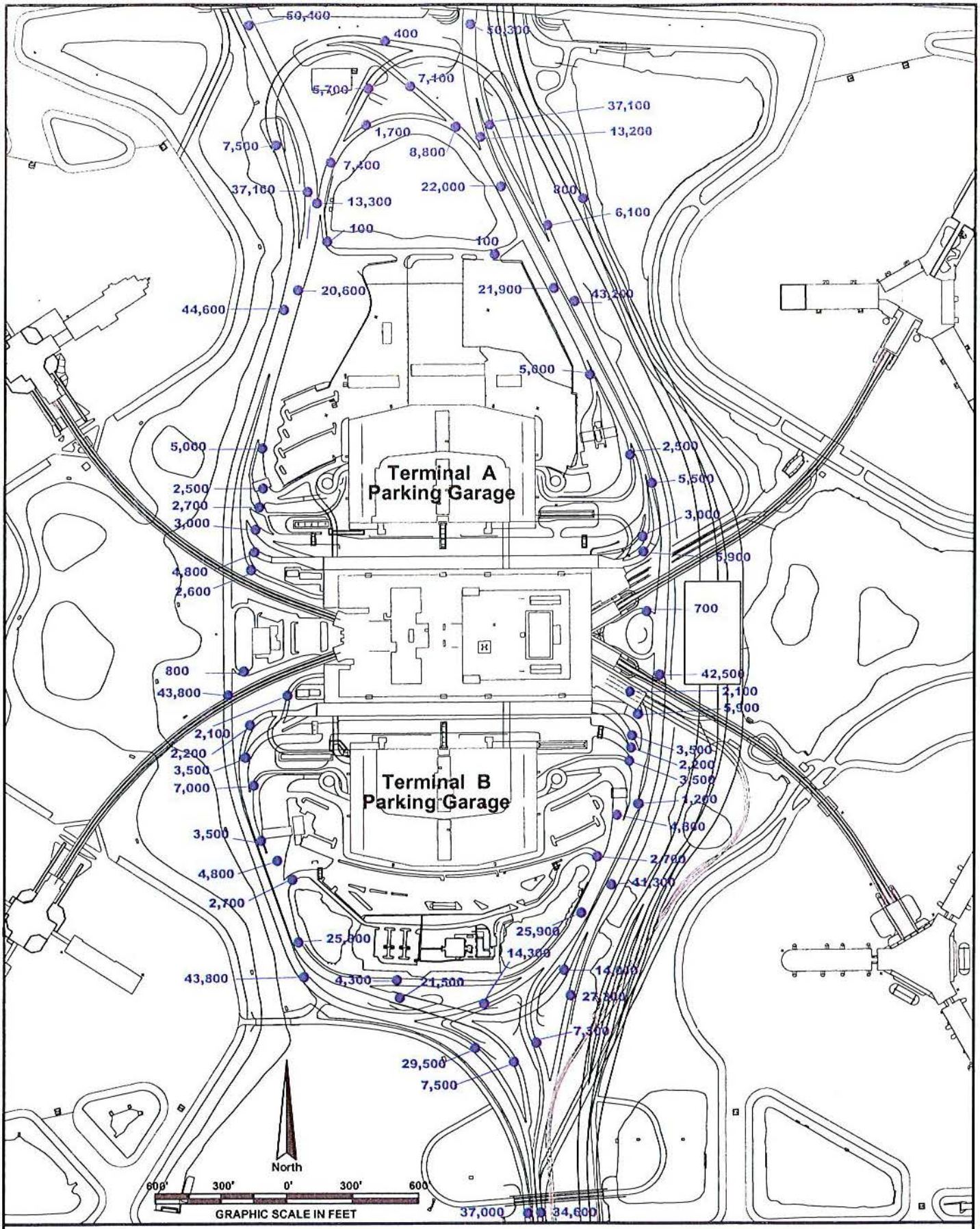

GREATER ORLANDO AVIATION AUTHORITY
URS Orlando International Airport Master Plan Update

2025 PROJECTED PEAK SEASON AVERAGE DAILY TRAFFIC VOLUMES

FIGURE: 4-22

T:\PROJECTS\MAS...AN\FINAL EXHIBITS '04\FIG 4-22.DWG 11/11/2004 10:59 AM

TABLE 4-21

UNSATISFACTORY LOS IN YEAR 2015

Station Number	Location	Number of Lanes	Daily Volume	Peak Hour Volume	Maximum Service Volume	LOS
39	Tradeport Drive North of Bear Road	2	40,100	1,998	1,850	F
4	Southbound Weave from State Road 528 to Cargo Road	3	37,600	2,681	N/A	E

Sources: HDR Engineering, Inc.; URS, 2003.

The following improvements are recommended to address the projected deficiencies for the year 2015:

- Tradeport Drive Between Bear Road and State Road 528 (Station 39) - Widen to six lanes, and
- Southbound Airport Boulevard Weave Between State Road 528 and Cargo Road (Station 4) - Widen to four lanes (interim improvement).

4.8.1.3 Year 2025

In addition to the assumed and recommended improvements for 2015, the following improvement is assumed to be in place by 2025:

- South Access Road Between Airport Boulevard and Heintzelman Boulevard (Station 940) - Widen to six lanes.

Table 4-22 lists the locations that are projected to operate at an unsatisfactory LOS in 2025.

TABLE 4-22

UNSATISFACTORY LOS IN YEAR 2025

Station Number	Location	Number of Lanes	Daily Volume	Peak Hour Volume	Maximum Service Volume	LOS
9B	Southbound Airport Boulevard South of Terminal A	2	37,100	2,645	2,300	E
12B	Northbound Airport Boulevard South of ramp from Terminal A	2	37,100	2,645	2,300	E
31A	Southbound Airport Boulevard Ramp to Southbound South Access Road	2	29,500	2,363	1,940	F
32A	Northbound South Access Road Ramp to Northbound Airport Boulevard	2	27,300	1,946	1,940	E
910	South Access Road South of Heintzelman Boulevard Interchange (Northbound and Southbound)	2	58,200	2,561	2,300	F
3	Northbound Airport Boulevard Weave from Cargo Road to State Road 528	4	46,400	3,308	N/A	E
12	Northbound Airport Boulevard Weave from Terminal A/B Merge to Cargo Road	4	50,300	3,586	N/A	F

Sources: HDR Engineering, Inc.; URS, 2003.

The following improvements are recommended to address the projected deficiencies for the year 2025:

- Southbound Airport Boulevard South of Ramp to Terminal A (Station 9B) - Widen to three lanes,
- Northbound Airport Boulevard South of Ramp from Terminal A (Station 12B) - Widen to three lanes,
- Northbound South Access Road Ramp to Northbound Airport Boulevard (Station 32A) - Widen to three lanes,
- Southbound Airport Boulevard Ramp to Southbound South Access Road (Station 31A) - Widen to three lanes,
- South Access Road Between Heintzelman Boulevard and Boggy Creek Road (Station 910) - Widen to six lanes, and
- Northbound Airport Boulevard Between Cargo Road and State Road 528 (Station 3) and Northbound Airport Boulevard Between Terminal A/B Merge and Cargo Road (Station 12) - Construct Braided Roadway Concept A-1 to address cut-through traffic.
-

4.8.2 PARKING

4.8.2.1 Public Parking

Public parking is available for both short-term and long-term parking occupancy. Short-term parking is available in the North Terminal parking garages. The Terminal A garage, the Terminal B garage, and the terminal top levels at the North Terminal provide a total of 9,577 parking spaces for short-term parking including 204 spaces in a surface lot adjacent to the Terminal B garage.

Long-term parking is provided in three satellite lots located on airport property. The Blue Lot is located in the NWTSA just north of Cargo Road. The Blue Lot is open daily to provide long-term parking for airport passengers. The Gold Lot is located on the west side of Tradeport Drive at Bear Road. The Red Lot is located south of the mid-crossfield taxiway on the east side of South Access Road. The Gold and Red Lots are utilized for peak periods such as holidays when the Blue Lot is full. Shuttle service is provided from these lots to the terminal. The total existing capacity for satellite parking is 10,934 spaces.

Parking demand was estimated based on the current ratio of peak parking occupancy to enplaned passengers for both short-term (terminal) and long-term (satellite) parking.

The forecasted peak parking demand levels are listed below:

- North Terminal at 40 MAP
  - Projected demand: 23,600 spaces (10,300 spaces at the terminal)
- North Terminal at 35 MAP, South Terminal at 10 MAP
  - Projected demand: 26,550 spaces (9,000 spaces at the North Terminal, 2,600 spaces at the South Terminal)
- North Terminal at 35 MAP, South Terminal at 25 MAP
  - Projected demand: 35,400 spaces (9,000 spaces at the North Terminal, 6,500 spaces at the South Terminal)

The projected demand was combined with a 10 percent reserve capacity to develop recommended facility requirements for public parking. The future parking space requirements are recommended as follows:

- North Terminal at 40 MAP
  - Total demand: 25,960 spaces (5,449 additional spaces - 723 terminal spaces and 4,726 satellite parking spaces)
- North Terminal at 35 MAP, South Terminal at 10 MAP
  - Total demand: 29,205 spaces (8,694 additional spaces - 2,600 spaces at the South Terminal and 6,094 satellite parking spaces)
- North Terminal at 35 MAP, South Terminal at 25 MAP
  - Total demand: 38,940 spaces (18,429 additional spaces - 6,500 spaces at the South Terminal and 11,929 satellite parking spaces)

The following public parking improvements are recommended to accommodate projected parking demand:

- Expand Blue Lot Satellite Parking - Provides 3,100 additional spaces
- Expand the Red Lot Satellite Parking (Phase A) - Provides 3,465 additional spaces

4.8.2.2 Employee Parking

The projected demand for employee parking is based on traffic counts taken at the employee parking lot. Parking demand estimates for each enplanement level are listed below:

- 40 MAP North Terminal Complex - 5,900 spaces
- 35 MAP North Terminal Complex, 10 MAP South Terminal Complex - 6,600 spaces
- 35 MAP North Terminal Complex, 25 MAP South Terminal Complex - 8,800 spaces

The current employee parking lot has a capacity of 4,500 spaces. The projected demand results in the following future space requirements assuming the existing capacity is maintained:

- North Terminal at 40 MAP - 1,400 additional spaces
- North Terminal at 35 MAP, South Terminal at 10 MAP - 2,100 additional spaces
- North Terminal at 35 MAP, South Terminal at 25 MAP - 4,300 additional spaces

The following employee parking improvements are recommended to accommodate projected parking demand:

- Expand existing employee lot to the southwest to provide 1,800 additional striped spaces.

4.8.3 RENTAL CAR FACILITIES

There are approximately 3,865 ready/return spaces at the North Terminal. The number of spaces leased in 2000 by on-site rental car companies was 3,818. Three scenarios (low, intermediate, and high) were developed to estimate the projected demand at 40 MAP for ready/return spaces. The low demand forecast is based on the assumption that the number of spaces leased in 2000 plus recent requests from on-site rental car companies for 723 additional spaces will satisfy the demand for 40 MAP. The intermediate demand forecast is based on the assumption that the number of spaces leased in 2000 was equal to the demand in 2000 at 30.8 MAP. The intermediate demand for 40 MAP was

projected utilizing the ratio of passenger demand forecasts between 30.8 MAP and 40.8 MAP. The high demand forecast for 40 MAP is the combination of the low demand forecast plus requests from off-site rental car companies (totaling 1,704 spaces) that have indicated an interest to relocate on-site in recent surveys conducted by GOAA Planning staff. The 45 MAP and 60 MAP demand forecasts for each scenario were extrapolated utilizing the ratio of rental car demand to passenger demand at 40 MAP. These demand forecasts are summarized in Table 4-23. The existing leasehold agreements with on-site rental car providers will expire in the first quarter of 2009. In preparation of the lease negotiations, options to modify and/or expand the current rental car ready/return areas are currently being reviewed.

TABLE 4-23
READY/RETURN SPACE REQUIREMENTS

Passenger Demand Forecast	Existing Capacity (spaces)	Ready/Return Space Requirements			New Facility Requirements (spaces)		
		Low Demand	Intermediate Demand	High Demand	Low Demand	Intermediate Demand	High Demand
40 MAP	3,865	4,541	4,960	6,245	676	1,095	2,380
45 MAP[1]	3,865	5,110	5,580	7,030	1,245	1,715	3,165
60 MAP[2]	3,865	6,810	7,440	9,370	2,945	3,575	5,505

Source: URS, 2004.
[1] Assumes 35 MAP at the North Terminal and 10 MAP at the South Terminal.
[2] Assumes 35 MAP at the North Terminal and 25 MAP at the South Terminal.

4.8.4 MASS TRANSIT

Proposed transit facilities serving MCO include high-speed rail (HSR) and light rail transit (LRT). Both projects are currently in the planning stages and the preliminary alignments are subject to change during the ongoing National Environmental Policy Act (NEPA) process. It is anticipated that HSR will enter MCO from the south on the east side of South Access Road and exit to the northeast on the south side of State Road 528. LRT is expected to enter MCO from the north, to the east of State Road 436, circulate through the airport, and exit to the north. HSR stations are planned on the east side of the North and South Terminals.

The proposed alignments for HSR and LRT were reviewed to identify critical rail crossing locations of major facilities on airport property. The envelope requirements for HSR include a minimum clear width of 44 feet and a minimum vertical clearance of 20 feet. The envelope requirements for LRT include a minimum clear width of 44 feet and a minimum vertical clearance of 16 feet. The critical rail crossing locations are listed below:

- Heintzelman Boulevard at South Access Road
- Mid-Crossfield Taxiways (E and F)
- AGT for Airside 2
- AGT for Airside 4
- North Crossfield Taxiways (J and K)
- Cargo Road
- State Road 528 east of State Road 436
- Goldenrod Road at State Road 528

A review of the design plans for the ongoing expansion of the mid-crossfield taxiway bridge indicates that the expanded bridge will accommodate the minimum rail envelopes. A review of the north crossfield taxiways and the AGTs for Airsides 2 and 4 indicates that the existing structures can accommodate the minimum rail envelopes. Goldenrod Road (at State Road 528) and Cargo Road will require reconstruction to provide the minimum rail envelopes. State Road 528 (east of State Road 436) is at grade. It is recommended that LRT cross over State Road 528 at this location.

APPENDICES – VOLUME 1

AIRPORT MASTER PLAN UPDATE
ORLANDO INTERNATIONAL AIRPORT

APPENDIX A

AIRPORT MASTER PLAN UPDATE
ORLANDO INTERNATIONAL AIRPORT

Annual Economic Impacts of Orlando International Airport prepared for the Airport Master Plan Update

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July 2004

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Economic Impacts of
Orlando International Airport

Total Annual Economic Impact

Orlando International Airport (OIA) is the gateway to the heart of Florida, a destination for both the business and vacation traveler, domestic and foreign. Located southeast of downtown Orlando, OIA is easily accessible to most major Florida cities, business centers, attractions, deep-water ports, the Space Coast, and world-famous beaches; corporations often cite the airport as a primary factor in deciding to locate their operations in or near Orlando.

OIA's total estimated annual economic impact to Florida can be summarized in the following three categories: direct impact, indirect impact, and induced impact. Within the airport community, there are over 150 business and government agencies with more than 16,600 badged employees who earn an estimated $605 million in annual wages. These factors generate a direct annual economic impact of approximately $4.3 billion. Using RIMS II for calculations, indirect impact further generates an estimated $3.1 billion creating approximately $1 billion in annual wages and salaries which supports an additional 45,500 jobs in the community. The combined total for annual direct and indirect impacts generated through the business activity at OIA totals around $7.4 billion annually and supports over 62,000 jobs with $1.6 billion wage and salary base.

Induced impact represents economic activity that is made possible and sustained by OIA but not necessarily generated by OIA. It is estimated that 40% of Central Florida tourism related economic activity, some $13.3 billion, is induced by the airport. As shown in the following table, when this induced impact is combined with the direct and indirect impacts, a total annual economic impact of $20.7 billion is created by Orlando International Airport.

Type of Impact	Annual Impact (in dollars)	Annual Wages generated	Annual Jobs generated
Direct	$ 4.3 billion	$ 605 million	16,600
Indirect	$ 3.1 billion	$ 1.0 billion	45,500
Induced	$ 13.3 billion	$1.6 billion	62,100
	$ 20.7 billion	**Total annual economic impacts to Florida**	

The economic impact calculations also indicate that for every job created at the airport, approximately 2.74 jobs are generated in the community, and for each dollar spent in airport activity generates nearly two dollars in the local economy.

Orlando International Airport

After achieving international status in 1976, Orlando JetPort was renamed Orlando International Airport. In March 1985, OIA recorded its first million passengers in one month. As OIA continued to grow, it was the 11th fastest growing passenger airport in the world at the end of calendar year 2003. Based on its rolling twelve months of passenger traffic ending April 2004 and recent ACI-NA (Airports Council International-North America) data, OIA is now the 2nd fastest growing major airport in the world. With four north-south parallel runways, OIA provides simultaneous all-weather, triple-flow instrument approach capability which is available at only five airports in the U.S. Its 1,000-acre passenger terminal complex is comprised of four satellite passenger terminals (airsides) with 90 airport gates and two international arrival facilities. The airport, which is comprised of approximately 13,300 acres, also includes fixed base operators, cargo, general aviation, and scheduled & charter passenger airline facilities.

The Greater Orlando Aviation Authority (Authority), created in 1975 by a special State of Florida legislative act, operates and manages both Orlando International and Orlando Executive Airports. Its mission has been, and continues to be, "to advance Orlando and Central Florida as the premier intermodal gateway for global commerce." The Authority began with two primary goals: to become a major player in global transportation and to create an experience that traveling passengers and customers see as safe, secure, comfortable, efficient and affordable. Through the development of commercial properties and facilities, it has reached its goal of becoming a major player in global transportation. The Authority continues to pursue its second goal through architecture, ambiance and awareness of passenger comfort. Currently, OIA is completing its concessions renovations program, creating a mall-like atmosphere with new restaurants and more retail stores. For the last ten years, OIA has been awarded for its outstanding customer service by various international organizations such as International Air Transport Association (IATA) and J.D. Power and Associates.

Visitor Impact

Approximately 95% of the OIA passengers begin or end their flights at OIA and include tourists, business travelers, and convention attendees. According to OIA's February 2004 passenger survey, nearly 80% of visitors who flew into OIA stated that Orlando was their primary travel destination. Nearly 30% of all the surveyed passengers were here on business. The survey also found that nearly 75% of the passengers who fly in spend at least one night in Orlando and almost 50% spend five or more nights. In addition to car rentals, visitors use other types of ground transportation such as taxies, limousines, shuttles, and buses. As well as remaining the largest rental car market in the world, OIA is also the 17th busiest port of entry for international visitors in the continental United States.

Many of the 42 million visitors who visit Orlando's attractions such as Walt Disney World, Universal Studios, SeaWorld, and the expanded Orange County Convention Center, fly into and from Orlando International Airport. This Central Florida visitor market represents $22 billion in annual direct spending and $35 billion in total annual economic impact on the local economy.

This significant domestic O&D (origination and destination) market is what generates the induced impact on Florida's economy. To compare, in 2002 OIA and Atlanta's Hartsfield International Airport (AHIA) had similar O&D annual passengers activity levels, 21.5 million and 23.6 million respectively. Although AHIA ranked fourth in annual O&D passenger traffic and OIA was fifth, OIA's O&D share of total passengers was nearly triple that of AHIA's (81% to 31%). With a higher O&D passenger percentage and an even larger multi-day visitor market than AHIA, a greater induced economic impact is realized by local economy through the support of OIA.

Business Impact

Business visitors associated with local industries are involved in aerospace and space travel, laser optics, computer simulation and national business conventions. Orange County operates the second largest convention center in America with nearly 900 shows booked into the future hosting approximately 1.5 million attendees with an economic impact of about $17 billion.

OIA also continues to expand its role as a global hub for intermodal distribution. Orlando accounts for approximately 80% of the cargo activity in Central Florida which is funneled through OIA's 1,400-acre integrated cargo complex. This cargo complex has direct airside access and contains the 198-acre Foreign Trade Zone and a modern U.S. Department of Agriculture (USDA) Plant Inspection Station with several perishable related handling facilities. Overnight express mail and cargo services such as FedEx, UPS and DHL are strongly represented at OIA. All airlines transport belly cargo, nearly 50% of all cargo brought into OIA. In 2003, about 213,000 domestic and international tons of cargo were processed through OIA. As the third largest airport in land mass area, it has developed only 35% of its property which provides other areas available for future expansion.

Known for its world-class in tourism and entertainment, Orlando is also recognized as the national center for simulation and is the third leading center for domestic film production. With the technology center and digital media converging, Orlando is developing a strong presence in the computer software and gaming industries as well as having a solid relationship with military industry. Key to the economic success and continued strength to Central Florida's economy is the impact and influence of the Orlando International Airport and its central location in Florida.

Approximately 50% of Florida's population are located within 125 miles of Orlando, and almost 1.6 million people live in the greater metropolitan Orlando area. In addition to recognizing the impact that tourism brings to Orlando, community and industry leaders work hand-in-hand with higher education institutions dedicated to advancing the growth of Central Florida to become a corporate office and high-tech hub. Stretching from the Florida east to west coasts, 100 companies have established a high-tech corridor over a 21 county region. Centered in this corridor, 40 of these high-tech companies have headquartered their operations in Orlando. Orlando has one of the most advanced telecommunications infrastructures, the second largest in America, and the region's utility services are noted for reliability.

Central Florida has positioned itself as an international force in global business with Orlando International Airport at its center. As OIA continues to expand, it will accommodate the ongoing economic growth and economic diversity in Central Florida as it maintains its leading economic and employment gains made locally in recent years and support Central Florida's evolution into a worldwide center for technology, commerce, agriculture and tourism.

Methodology

The method used to calculate the economic impacts of this report are based on RIMS II (Regional Input-Output Modeling System) which is widely used both in the public and private sector to calculate the interindustry relationships within regions and conduct regional economic impact analyses.

Developed by the U.S. Bureau of Economic Analysis (BEA) in the 1970s, RIMS II bases its method on an accounting framework called an I-O (input-output) table. This table derives information from two data sources: BEA's national I-O table which shows the input and output structure of nearly 500 U.S. industries and BEA's regional economic accounts which are used to adjust the national I-O table to show a region's industrial structure and trading patterns.

For further information about RIMS II method, visit the U.S. Bureau of Economic Analysis' website at www.bea.doc.gov.

1.0 Direct Economic Effects

The Greater Orlando Aviation Authority (GOAA) is the operating and managing authority for the Orlando International Airport (OIA). OIA includes approximately 13,300 acres, four north-south parallel runways and represents the third largest airport in landmass in the United States. The four runways have separations that provide massive capacity capable of providing simultaneous triple flow instrument landings and takeoffs, available at only a few airports in the U.S.

There is an estimated 4.8 million square feet of building and terminal space are located at OIA. Terminal space represents four airside buildings with gates and one landside terminal building. Other on-site buildings include hangars, office space, aviation support related businesses, cargo/shipping, repair/maintenance facilities, and airport tenants.

There are over 16,600 badged employees working for over 150 businesses and government agencies within the airport community. These workers earn an estimated $605 million in wages annually.

The direct economic impact of business activity at OIA is estimated at $4.3 billion per year. This activity takes place in ten different business concentrations within the OIA complex. These ten areas of economic activity include:

- Airline Carriers Ticket Revenue
- On-site, Off-site Parking
- Commercial Ground Transport Sales
- Rental Cars Sales On-site
- Rental Cars Sales Off-site
- Terminal Area Retail Concessions
- On-Site Hotel
- On-Site private operations
- GOAA Budget Expenditures
- Construction

Passenger airline carriers operating at OIA include both commercial scheduled service and unscheduled charter service. Some commercial and international carriers book large blocks of passenger tour groups and often fill planes with tours. The Orlando visitor market is so large and dynamic that nearly three-fourths of OIA economic activity is generated in plane fares. Of $3 billion in annual airfares, it is estimated some $450 million remains in the local economy to pay for operations and maintenance, employee wages, passenger services, and airport fees. Air carrier employment is estimated at 3,800 employees with associated annual wages of $170.9 million.

On-site and off-site parking generate approximately $41 million per year. These include parking on-site garages as well as off-site satellite parking services and facilities. Currently at OIA are three parking garages and three satellite parking lots. Some 360 persons are employed in self-park and garage facilities and earn approximately $8.3 million in wages annually.

Commercial ground transport services include taxis, buses, limousines and other local transportation services. These services generate $120 million per year in total activity. Ground transport related employment is estimated at 1,700 employees earning wages of $60 million. Rental car companies both on-site and off-site generate $397 million in annual sales and employ 4,400 persons paying approximately $133 million in wages.

Inside the OIA landside terminal building, concession tenants include news and gift shops, specialty and themed retail, food court business, and the Hyatt Regency OIA hotel. Among the concession operations, total sales activity is $124 million annually. This level of economic activity provides employment for 1,300 persons. Annual wages related to this employment are about $34 million.

Within the OIA complex, there are nearly 150 airport-related businesses. These include commercial carrier services such as in-flight catering, airplane maintenance, pilot training, freight forwarding, and cargo handling. It is estimated these businesses generate $257 million in economic activity on an annual basis and employ 2,000 personnel. Wages earned among these workers reach $92 million annually.

As the airport authority, GOAA generates significant economic activity. This includes terminal building maintenance, facility repair, administrative work, and funding and managing capital construction programs. Over 700 persons are employed by GOAA and earn wages of approximately $30 million per year.

Major capital construction projects have been implemented since the airport's inception. These projects have included an expanded terminal building, new airside buildings and gates, air traffic control tower, runways and taxiways. Capital construction projects will continue to occur at least through 2019 and additional new projects will be planned. Because construction projects are ongoing and long-term, construction employment at OIA has become permanent and employs 2,200 workers. Construction wages are estimated to reach $77 million annually. Economic activity from construction is approximately $193 million annually.

Table 1 specifies the direct economic activity associated with the Orlando International Airport. This table also provides estimated employment and wages associated with direct economic activity. Total direct economic activity at OIA is estimated at $4.3 billion annually.

Table 1
Direct Economic Activity at OIA - FY 2003

	Direct Economic Activity	Wages	Employment
Net GOAA Budget Exp.	172,000,000	29,600,000	747
Airline Ticket Revenue	2,952,000,000	170,900,000	3,797
On Site, off site Parking	41,000,000	8,300,000	360
Commercial Ground Transport	120,000,000	60,000,000	1,714
Rental Cars Sales on-site*	272,000,000	95,200,000	3,173
Rental Cars Sales off-site*	125,000,000	37,500,000	1,250
Concessions	97,000,000	29,100,000	970
Terminal Hotel	27,000,000	5,300,000	350
On-site private operations	257,000,000	92,500,000	2,055
Construction	193,000,000	77,000,000	2,200
	$ 4,256,000,000	$ 605,400,000	16,617

* Car rental sales exclude payments to GOAA budget

Sources: RIMS II, Fishkind & Associates, Inc.

2.0 Indirect Economic Activity

Indirect economic activity stems from the multiplier effect of direct spending in the local economy. For example, airline industry workers may own a home in the Orlando area. Spending the wages they earn to buy groceries and furnish their home represents the multiplier effect. Similarly, the airline may engage in spending through contracts for services with other local businesses. Thus, through use of the Regional Input-output Modeling System (RIMS II), the multiplier effect can be measured, representing the degree to which earned income and revenues by airport businesses is re-spent and multiplied throughout the local economy.

Spending that takes place locally is only a portion of revenues and economic activity generated by airport businesses. The remainder of revenue is spent outside the local economy for purchases or supplies not available locally or for debt service payments or internal corporate requirements. Based on local interviews and survey data collected from businesses resident at OIA, it is estimated 38 percent of direct economic activity is re-spent in the local economy. This generates $1.6 billion annually in regional spending, benefiting the local economy. The RIMS multipliers are then applied to this spending level to estimate the multiplier effect or indirect economic impact of OIA business activity. Table 2 shows the regional spending levels and RIMS II final demand multipliers.

Table 2
Regional Spending and Final Demand Multipliers

	Direct Economic Activity	Percent Regional Spending	Regional Expenditures	Final Demand Multipliers		
				Output	Wages	Employment
Net GOAA Budget Exp.	172,300,000	95%	163,400,000	2.0199	0.5303	20.0
Airline Ticket Revenue	2,952,000,000	25%	738,000,000	1.8893	0.5363	21.7
On-site, off-site Parking	41,000,000	50%	20,500,000	1.9164	0.6390	32.8
Commercial Ground Transport	120,000,000	90%	108,000,000	1.9675	0.8475	40.5
Rental Cars Sales on-site*	272,000,000	65%	176,800,000	1.9675	0.8475	40.5
Rental Cars Sales off-site*	125,000,000	65%	81,250,000	1.9675	0.8475	40.5
Concessions	97,000,000	50%	48,500,000	1.8605	0.5630	40.5
Hotels	27,000,000	50%	13,500,000	2.0774	0.6978	38.0
On-site private operations	257,000,000	65%	167,050,000	2.1756	0.7546	31.6
Construction	193,000,000	50%	96,500,000	2.0055	0.6099	29.1
TOTAL	**$ 4,256,000,000**	**38%**	**$ 1,613,500,000**			

* Car rental sales exclude payments to GOAA budget

Sources: RIMS II, Fishkind & Associates, Inc.

Based on the application of RIMS II multipliers to the regional direct spending, the indirect economic impact of business activity at OIA is estimated. Regional spending on an annual basis reaches $1.6 billion. Multiplier impacts result in an indirect economic impact of $3.2 billion annually. This level of economic activity supports an additional 45,600 jobs and $1.0 billion in wages, in the Orlando economy. Table 3 shows the indirect economic impact of business activity at OIA.

Table 3
Indirect Economic Output – Orlando Regional Economy

	Output	Wages	Employment
Net GOAA Budget Exp.	330,000,000	86,700,000	3,300
Airline Ticket Revenue	1,394,000,000	395,800,000	16,000
On-site, off-site Parking	39,000,000	13,100,000	700
Commercial Ground Transport	212,000,000	91,500,000	4,400
Rental Cars Sales on-site	348,000,000	149,800,000	7,200
Rental Cars Sales off-site	160,000,000	68,900,000	3,300
Concessions	90,000,000	27,300,000	2,000
Terminal Hotel	28,000,000	9,400,000	500
On-site private operations	363,000,000	126,100,000	5,300
Construction	194,000,000	58,900,000	2,800
TOTAL	**$ 3,158,000,000**	**$ 1,027,500,000**	**45,500**

Source: RIMS II and Fishkind & Associates, Inc.

The combined direct and indirect economic impact of business activity at Orlando International Airport is $7.4 billion on an annual basis. This supports 62,100 jobs in the Orlando area economy and contributes $1.6 billion in annual wages. Table 4 illustrates the combined direct and indirect economic impacts of business activity at OIA.

Table 4
Total Economic Impact of Orlando International Airport

	Output	Wages	Employment
Net GOAA Budget Exp.	502,000,000	116,300,000	4,047
Airline Ticket Revenue	4,346,000,000	566,700, 000	19,797
On Site, off site Parking	80,000,000	21,400, 000	1,060
Commercial Ground Transport	332,000,000	151,500,000	6,114
Rental Cars Sales on site	620,000,000	245,000, 000	10,373
Rental Cars Sales off site	285,000,000	106,400, 000	4,550
Concessions	187,000,000	56,400, 000	2,970
Hotels	55,000,000	14,700, 000	850
On Site private operations	620,000,000	218,600, 000	7,355
Construction	387,000,000	135,900, 000	5,000
TOTAL	**$7,414,000,000**	**$ 1,632,900,000**	**62,117**

Source: RIMS II and Fishkind & Associates, Inc.

3.0 Induced Economic Effects

Induced economic impacts represent economic activity sustained and enabled by OIA, but not necessarily caused by OIA. The Central Florida visitor industry is among these induced impact areas. The visitor industry includes business, convention and leisure visitors, where leisure visits include local vacations, visiting friends and relatives as well as arriving cruise ship passengers destined for area seaports.

In 2003, one million square feet of additional convention space was opened, doubling the size of the convention center. The Orlando Convention Center is now the second largest in prime exhibit space in the United States. Orlando is becoming established as a leading global convention destination. Nearly 3.5 million attended group meetings and conventions in 2002. There are 11 cruise ships which sail regularly from Port Canaveral, originating more than four million cruise ship passengers annually. Market wide, more than 42 million persons visit central Florida each year. It is estimated of total visitor arrivals, eight million arrive for overnight visits by air through OIA.

With the Orlando market as a final destination, air arrivals are critically important to the regional economy. Overnight air arrivals stay for more nights than overnight auto arrivals. International visitors are predominantly air arrivals who support the tourist industry with longer than average length of stay as well as supporting the local real estate industry, through the purchase of vacation homes. With greater use of rental cars and other local transportation, overnight air visitors spend more per day in the local market. The economic impacts of air visitors represent an induced economic impact of OIA. It is estimated the total economic impact of the central Florida visitor industry is $35 billion, with $13.3 billion attributable to air arrivals. Appendix 3 provides detailed tourism impact information.

All economic impacts of Orlando International Airport, including $4.3 billion direct impact, $3.2 billion indirect impact and $13.3 billion induced impact totals $20.7 billion, as of year 2003.

4.0 Economic Effects of Businesses Located at OIA

The economic impacts and associated wage and employment impacts of business activity on the Orlando regional economy has been detailed in the prior sections. In the process of understanding and quantifying OIA business activity and estimating regional spending levels, Fishkind & Associates, Inc. conducted five interviews with on-site companies and collected direct survey data from 25 firms located within OIA. Broad categories of companies responding to both survey and direct interviews include air carriers, maintenance and repair facilities, rental car companies and terminal building concessions. The detailed information collected during the survey and interview process enables us to better illustrate the means by which business activity at OIA is integrated throughout the entire community. The interview and survey results also show how businesses at OIA directly impact and benefit the local economy.

It is important to understand the extensive synergies between and among companies in the OIA community. There is a high degree of reliance individual tenant companies have on other companies located within OIA. This reliance includes a wide range of activity from daily routines to occasional requests. The following are snapshots of operations for specific companies located at OIA that illustrate the synergies and business-to-business relationships.

Continental Airlines Maintenance and Repair

The Continental Airlines maintenance facility is one of five such facilities in the United States. The facility was opened in 1988 and a planned expansion into new hangar facilities is underway. Scheduled aircraft maintenance and repair is performed at the facilities on the GOAA campus. This includes engine repair and replacement, system modifications, inspections, interior rebuilds, entertainment systems and parts replacement. In addition to scheduled maintenance, work on through-flight planes is also performed. Because of the large number of parts used for scheduled and unscheduled activities, Continental relies heavily on daily delivery of parts and equipment from FedEx which is located on-site. In cases where costly unplanned maintenance of an airplane is involved, the company will use local air carriers to ship and receive parts via commercial scheduled flights to achieve same day parts delivery from across the United States. Thus the airline itself is a heavy user of the air freight capability offered by GOAA tenants.

Specialty repairs performed at the Continental facility include hot section repairs which represent engine areas exposed to high heat and temperature. For these specialty repairs local machine shops and fabricators are used. Local companies used for these activities include for example WW Grainger; North America's leading supplier of facilities maintenance and products such as motors, tools, lighting, safety gear, janitorial supplies, and other equipment that keep businesses up and running.

Fuel system repairs are specialty work and critical to safe operation of airplanes. For fuel system repairs including tanks, bladders, and fuel cells the company Floats and Fuel Cells is

used. There are over a dozen locally owned or operated specialty companies in the Orlando area which are regularly used by Continental for specialty repairs. Some of these companies include:

- Air Centers of Florida
- Aerobridge Works Inc.
- Air Gas South
- Alpha Welding Service
- Brown Aviation Tool
- Cameron and Barkley
- Hydraulic Supply Co.
- McMaster Carr
- MSC Industrial Supply
- Orlando Drum
- Orlando Hose and Fluid
- Precision Avionics
- Simplex Grinnell
- Spec Tool
- SunCal Grinding
- Wesco Aircraft Hardware

The Continental Airlines maintenance operations also include refurbishing of airplane interiors and avionics component parts replacement. This includes upholstery, seating, carpets entertainment systems and associated wiring as well as cockpit avionics. Local firms are subcontracted to perform some of this work. These firms include Stewart and Stevenson and Lion Apparel and ICS Aircraft Enhancement.

To maintain operations at the airport, the maintenance facility itself must be kept in good repair. Local firms such as Bonner Roofing and AEI Electrical are used for building upkeep and repair. Other firms used to maintain and provide services to the Continental staff and facility include Dewalt Services, Eldorado Chemical, Florida Recycling, Zagers Sanitary Supply and Zephyrhills Natural Spring Water.

Water/wastewater and electricity service are provided by Orlando Utilities Commission (OUC). For OUC, having large corporate customers such as those located at OIA helps diversify the customer base and ultimately keeps utility rates lower for all customers.

Virgin Atlantic Airways

Virgin Atlantic Airways, based in England, is a scheduled commercial passenger air carrier providing service to the Orlando market. As well as its commercial passenger carrier service, Virgin maintains two separate, additional business units in the Orlando market. One is Virgin Cargo and the other is Virgin Holidays.

Virgin's cargo subsidiary provides international airfreight and other services. Cargo service offered include "must ride" packages, unaccompanied baggage, wholesale cargo with airport to door delivery, as well as onforwarding services to over 100 destinations worldwide. Onforwarding offers secondary transportation leg connections by air or truck.

Virgin Holidays is an integral travel service working closely with Virgin Airways. Virgin Holidays books travel tours, group tours, and vacation packages from England to Orlando. As a UK based operation, the tour packages are primarily designed to bring international visitors to the Orlando market. Though Virgin is a scheduled commercial carrier, during peak

vacation/holiday season all flights originating from the UK are usually booked with Virgin Holidays tour package customers as though it were a charter operation. There are normally three flights per day. During peak season, as many as four or five flights per day originate from the UK to Orlando. Virgin Holidays is the now the largest provider of North American tour packages from the UK to the United States.

The level of growth experienced by Virgin Airways and Virgin Holidays is a reflection of the establishment and expansion of the Orlando visitor market as a global destination. Virgin Atlantic Airways entered the Orlando market in 1991 with three local staff and two flights per week. Today, there are 67 staff and 22 inbound flights per week. The expectation is as many as five additional weekly flights will be added in the upcoming peak season, eventually becoming year round additional service.

By bringing nearly 2,000 persons per day to the Orlando market, there is considerable local demand generated for food, lodging, ground transportation and, of course, entertainment. These services are arranged and provided through Virgin Holidays tour packages. The tour package utilizes the extensive tourism industry services available in the Orlando market. The economic impact and benefit to local hotels, restaurants and rental car companies is significant. Virgin reports the average length of stay for a Virgin Holiday tour package visitor is 14 days. Not all international visitors who arrive via other airlines or services stay this long, so the Virgin Holiday program is of great benefit to the local economy because the visitor length of stay is longer.

In order to provide quality services to international visitors at competitive prices, Virgin Holidays buys hotel room blocks in advance from area hoteliers such as Disney and Rosen. Other lodging is also used and there is an increasing number of single family "vacation" homes in Osceola and Lake Counties owned and or rented by international visitors. In recent years as much as one-third to one-half of the single family construction activity in Polk County has been directly attributable to internationally owned vacation homes. This activity directly supports the local construction industry. Vacation Homes, which are individually owned by international investors and vacationers, have been a significant component of the Central Florida real estate market for 20 years. Builders such as Beazer, Morrison Homes, and other national home builders cater to this demand.

The volume of visitors generates significant annual revenues for local businesses. Other aspects of Virgin Holiday services includes a "baggage check-in" retail store front in the Disney village. This allows an abbreviated and much smoother airport departure experience. Guests simply board the planes having checked baggage and received a boarding pass at Disney earlier in the day. It also allows guests to enjoy vacation times as much as a half day longer, further benefiting area businesses.

With more than 302,000 total aircraft operations per year at OIA, Virgin's 22 weekly flights (44 operations) represent less than 1% of annual aircraft operations at OIA. This level of activity is too small to maintain ground crews, baggage handlers and operational crews for inspection, maintenance and repair. As a result, these airline support services are contracted out by Virgin Airways to major airlines at OIA and other OIA service providers. Boarding

door staff, customer service and ticket staff represent the only staff Virgin and other airlines, with a relatively small presence, maintain at OIA. For OIA, with airport ground services available, an increasing level of diversity in service and transportation routes such as those offered by Virgin Atlantic Airways can be offered. For fueling and baggage handling services, ground service companies such as ASIG are used. For under wing ground service, Virgin contracts with Delta Airlines. For airplane maintenance, contracting is with British Airways. By using British Airways for operational maintenance, UK flight regulations, repairs and specifications may be maintained, making international operations easier for Virgin. Finally, LSG Skychef provides 4,000 meals per day for Virgin passengers. Virgin is the largest Skychef customer at OIA.

Virgin Atlantic Airways plans to continue to grow at OIA. As this growth occurs, Virgin's interaction and influence on the local economy will also grow, encompassing areas from real estate to tourism to transportation services, catering and beyond.

Cessna Orlando Citation Service Center

There are nine factory-owned Cessna Citation service centers located in the United States. The Orlando service facility has been operational for 20 years and is the largest Citation service center outside the Wichita, Kansas factory.

Orlando Citation Service Center is undergoing large scale expansion at the present time. New hangar, repair and office space is being constructed totaling 200,000 square feet of space, at a cost of $30 million. Cessna has partnered with GOAA in obtaining bond financing for this unique aircraft repair facility. Planned opening of the new hangar is June 2004. Orlando Cessna Citation employs 165 people and plans to hire an additional 30 new employees per year. Current payroll at the Cessna Orlando facility is $6 million per year including wages and fringe benefits. All employees earn more than $10 per hour.

Cessna Orlando is a specialty repair facility conducting repair and service work only on Cessna Citation jet aircraft. This includes all service from hydraulics replacement to engine hot section repair, avionics, and electrical. However, jet interiors are not serviced by Cessna and this work is contracted with local service providers such as Interiors-in-Flight.

With its campus in Daytona Beach, Embry Riddle Aeronautical University relies on the Cessna Orlando maintenance and repair facilities for hands-on training and real time experience. Embry students from the Airframe and Powerplant program are offered summer internships at Cessna. For students who are successful at summer training internships, aircraft maintenance positions are often available for them at Cessna when they graduate. This allows young people to stay in the community and build long-term ties to the area. Cessna recruits new hires through AeroTech, a national employment search agency. Most new employment hires come from the local area. The Orlando economy is fortunate to have stable technical jobs available in growing companies, which offer long-term career opportunities. The availability of career based employment opportunities builds a more stable community.

Training and education work both ways at Cessna. Not only do students receive real time training and have internship opportunities at Cessna, but each employee receives, on average, over 40 hours of additional training per year. Detailed training is provided to improve safety and technical proficiency in Cessna employees. Much of this training takes place at the Orlando training facility of FlightSafety International. FlightSafety has become the newest and central training facility for Cessna Orlando employees. Custom built Cessna flight simulators have been developed at FlightSafety in Orlando, further expanding the corporate relationship and reliance built between these two local aviation service companies.

Vanguard Car Rental USA, Inc.

Vanguard Car Rental USA, Inc. operates National Car Rental and Alamo Rent A Car and provides primary ground transportation to visitors to the Central Florida market. Vanguard uniquely supports the business visitor to Central Florida. While the mix of visitors to the market overall are 80% leisure and 20 percent business, Vanguard customers are 60% leisure and 40% business. Auto rental services are extremely important to servicing the needs of the visiting business community.

Vanguard relies on local companies throughout the community to outsource specific sets of work and meet operational needs for fuel and oil. Many different companies located at OIA outsource services for ground vehicle or fleet maintenance and repair, cleaning services, electrical and facility maintenance and repair and specialty machining. Many of these firms have been resident at OIA for more than 10 years. They offer permanent jobs plus benefits and are growing, adding additional staff and positions as the airport and community continues to grow.

Specialty work such as minor dent repairs are outsourced to local Central Florida companies such as Dent Wizard, for paintless dent repair.

Vanguard generally hires targets local residents. It is estimated 99% of Vanguard new hires come from the local resident population, rather than corporate transfers or relocations. There are ongoing programs with Vo-Tech schools to train auto mechanics, auto maintenance and management programs. Vanguard utilizes these services in the community.

Hudson News

Hudson News provides retail convenience good and sundries to OIA travelers and airport employees. Hudson sells newspapers, magazines, books, souvenirs, travel accessories and over the counter medicines such as aspirin and cold remedies. Among local businesses supplying Hudson News, the Orlando Sentinel provides daily newspapers. Over 100 vendors provide Hudson with retail products for sale.

Hudson News maintains two locations in the terminal buildings and employs tow part-time staff and 23 full-time staff. Positions include cashiers, supervisors and management. Typically, promotions such as cashier to supervisor occur from within, providing advancement for employees.

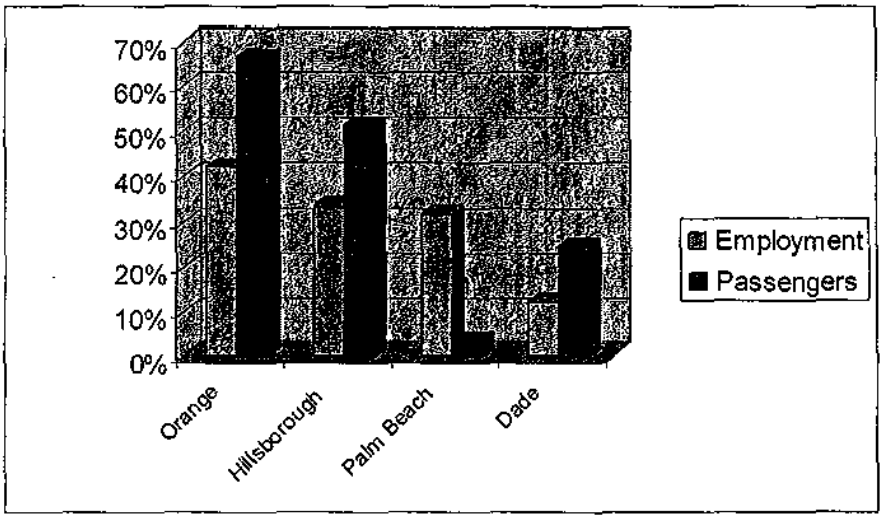
Appendix 1

The Effects of OIA On Regional Economic Growth

OIA has changed the structure of the Central Florida economy. Expanded airline service and a first class passenger terminal facility have stimulated and catalyzed the areas tourist based economy. Furthermore, the availability of expanded airline service has supported business activity and population growth. These generate induced economic impacts. The methodology used to evaluate these changes includes a growth index comparison among Orlando and other large Florida urban areas. In this way, the relationship between economic structure, population growth and airline service and can be evaluated. To conduct this comparative analysis, three Florida urban markets in Hillsborough (Tampa), Miami-Dade (Miami), and Palm Beach counties were selected to compare and contrast with Orange County.

Among these urban markets, the highest percentage employment growth and largest volume of job creation occurred in Orange County between 1990 and 2003. Orange County also had greater growth in deplaning passenger traffic than the other markets during this period. From 1990-2003 the Orange County market considerably outpaced Florida's other urban markets in overall economic expansion. Figure 1 compares employment growth and deplaning passenger growth among the urban markets.

Figure 1
Total Percent Changes in Major Urban Markets 1990-2003



In looking at the growth index comparison among ten separate employment concentrations shown in Table 5, the Orange County market has the highest index rating for five of the ten measures and ranks second in the remainder. The index level is determined by using local industry rate of growth divided by the statewide rate of growth in the same industry. The ten categories examined were chosen because 1) they represent a broad cross section of economic activity in the local markets, 2) they reflect economic growth areas statewide, and 3) are reflective of air transportation activity. Among these ten industry measures combined, Orange County has an index growth average more than double the level found in the other urban markets examined. Based on the average of these index measures, the Orange County economy has been dramatically stronger over the past decade than the comparative urban Florida markets.

The strength of the tourism industry contributes substantially to the economic strength seen in Orange County. The dramatic index growth figures for amusement recreation and hotel illustrate this aspect. The role of OIA in supporting this strength is critical. Of all overnight visitors to the Orlando market during 2002, 36% arrived by air. Without the capacity of OIA to accommodate the volume of air visitors, the Central Florida attractions market would be considerably smaller and would have encountered significant transportation bottlenecks in its ability to grow and sustain the visitor volumes occurring today. The Central Florida visitor market represents $22 billion in annual direct spending and $33 billion in total economic impact. As much as one-third of total tourism related economic activity, some $10 billion, is made possible and sustained by OIA. While it is important to recognize the tourism industry and the local attractions have caused this level of activity, these induced impacts created by OIA play a key role in supporting and facilitating Central Florida's tourist industry.

Table 5
Index of Employment Growth Relative to Industry Growth Statewide 1990-2000

	Orange	Palm Beach	Hillsborough	Dade	Florida
Amusement/Recreation	8.23	1.08	0.82	0.06	1.00
Hotel	4.82	0.54	-0.29	0.30	1.00
Air Transportation	2.00	1.02	0.58	0.42	1.00
Transportation Services	1.87	0.98	1.37	1.09	1.00
Retail Trade	1.51	0.92	0.68	0.42	1.00
Finance	1.44	1.27	1.79	-0.39	1.00
Engineering/Research	1.44	1.10	1.48	1.02	1.00
Services	1.19	0.97	1.20	0.44	1.00
Wholesale Trade	0.97	2.11	0.22	0.39	1.00
Business Services	0.88	1.07	0.83	0.31	1.00
Average (unweighted)	**2.44**	**1.11**	**0.87**	**0.41**	**1.00**

Appendix 2

manent Economic Impacts
Orlando MSA Tourism Industry

			Final Demand Output	Direct Effect Earnings Dollars	Direct Effect Employment (number of jobs)
Total Tourist Spending	**$21,801,079,545**		**$6,540,323,863**	**2,947,533,680**	**128,412**
Percent of spending, retained locally, comprises final demand output (Fishkind)			30%		
Indirect imapcts			**$13,164,799,894**	**$5,275,554,444**	**214,829**
Total Economic Impact			**$34,965,879,439**	**$8,223,088,124**	**343,242**
Industry Aggregation Multipliers for Tourism Industry			**2.0129**	**1.7898**	**1.67**
Visitor Industry Share Attributable to Air Arrivals*		38%	**$13,287,034,187**	**$3,124,773,487**	**130,432**

*Share based on air arrivals as a percent of overnight visitors

Source: Fishkind & Associates, Inc., Orange Osceola Convention Visitors Bureau, D.K. Shifflet Inc.

Appendix 3

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
	DIRECT Economic Activity	Wages	Employment	Percent Regional Spending	Regional Expenditures	Final Demand Multipliers Multipliers Output	Wages	Employment	INDIRECT ECONOMIC IMPACT Output	Wages	Employment	TOTAL ECONOMIC IMPACT Output	Wages	Employment
Net GOAA Budget Exp	172,286,684	29,578,129	747	95%	163,672,350	2.0199	0.5303	20	330,601,779	86,795,447	3,273	502,888,463	116,373,576	4,020
Airline Ticket Revenue	3,004,767,000	170,865,000	3,797	25%	751,191,750	1.8893	0.5363	21.7	1,419,226,573	402,864,136	16,301	4,423,993,573	573,729,136	20,098
On Site, off site Parking	40,674,166	8,280,000	360	50%	20,337,083	1.9164	0.639	32.8	38,973,986	12,995,396	667	79,648,152	21,275,396	1,027
Commercial Ground Transport	120,000,000	60,000,000	1,714	90%	108,000,000	1.9675	0.8475	40.5	212,490,000	91,530,000	4,374	332,490,000	151,530,000	6,088
Rental Cars Sales on site*	271,997,156	95,199,005	3,173	65%	176,798,151	1.9675	0.8475	40.5	347,850,363	149,836,433	7,160	619,847,519	245,035,438	10,334
Rental Cars Sales off site*	124,587,529	37,376,259	1,246	65%	80,981,894	1.9675	0.8475	40.5	159,331,876	68,632,155	3,280	283,919,405	106,008,414	4,526
Concessions	96,672,221	29,001,666	967	50%	48,336,111	1.8605	0.563	40.5	89,929,334	27,213,230	1,958	186,601,555	56,214,897	2,924
Hotels	27,335,000	5,250,000	350	50%	13,667,500	2.0774	0.6978	38	28,392,865	9,537,182	519	55,727,865	14,787,182	869
On Site private operations	256,875,000	92,475,000	2,055	65%	166,968,750	2.1756	0.7546	31.6	363,257,213	125,994,619	5,276	620,132,213	218,469,619	7,331
Construction	192,500,000	77,000,000	2,200	50%	96,250,000	2.0055	0.6099	29.1	193,029,375	58,702,875	2,801	385,529,375	135,702,875	5,001
TOTAL	$4,307,694,756	$605,025,059	16,609	38%	1,626,203,589				$2,990,053,988	$1,034,101,472	45,610	7,490,778,119	1,639,126,531	62,219

APPENDIX B

AIRPORT MASTER PLAN UPDATE
ORLANDO INTERNATIONAL AIRPORT

Chronological Timeline of Events at MCO

1970

- Delta Airlines starts scheduled service
- Eastern Airlines starts scheduled service
- National Airlines starts scheduled service
- Southern Airlines starts scheduled service

1974

- McCoy Air Force Base closed

1975

- Deed received by City for surplus land for airport facility use
- Greater Orlando Aviation Authority (GOAA) created by special legislative act

1976

- Airport granted international airport status
- Airport renamed Orlando International Airport

1978

- Braniff International Airways starts scheduled service
- Construction begins on new (North) Terminal Complex
- Delta Airlines becomes a signatory airline
- Airport granted Foreign Trade Zone (FTZ) status
- Orlando International Airport (MCO) named fastest growing airport in the U.S.
- Ozark Air Lines starts scheduled service
- Passenger traffic exceeds 5 million annual passengers (MAP) for the first time (5,182,264)
- Trans World Airlines starts scheduled service
- United Airlines starts scheduled service
- US Airways starts scheduled service

1979

- Allegheny Airlines starts scheduled service
- Airport designated as a Large Hub by the Federal Aviation Administration (FAA) (at least one percent of the total U.S. passenger traffic)
- Mackey International Airlines starts scheduled service
- Northwest Airlines starts scheduled service
- Republic Airlines starts scheduled service

1980

- Northwest Airlines becomes a signatory airline
- Trans World Airlines becomes a signatory airline
- US Airways becomes a signatory airline

1981

- American Airlines starts scheduled service
- Continental Airlines starts scheduled service
- North Terminal Complex building opens
- New York Air starts scheduled service
- Piedmont Air Line starts scheduled service

1982

- Airport property annexed into City of Orlando
- Development of Orlando Tradeport launched
- Midway Airlines starts scheduled service
- Northeastern Airlines starts scheduled service
- United Airlines becomes a signatory airline

1983

- Construction begins on International Concourse

1984

- Continental Airlines becomes a signatory airline
- Florida Express Airlines starts scheduled service
- Icelandair starts the first scheduled international service from Orlando
- International Concourse opened, complete with U.S. Customs and Immigration Services
- Peoples Express starts scheduled service

1985

- Arrow Air starts scheduled service
- Bahamasair starts scheduled service
- British Airways starts scheduled service
- Midway Airlines starts scheduled service
- One million passengers use the airport in one month (March) for the first time
- Pride Air starts scheduled service
- Passenger traffic exceeds 10 MAP for the first time (10,034,065)
- Transtar Airlines starts scheduled service
- World Airways starts chartered service

1986

- Air Atlanta starts scheduled service
- ATA Airlines starts scheduled service
- Approved issue of $86 million revenue bonds for initiation of Phase II of airport expansion
- Airport reaches 1990 passenger projection of 12 MAP

1987

- American Airlines becomes a signatory airline
- Comair starts scheduled service
- Construction begins on parking garages
- Receives approval for a U.S. Department of Agriculture (USDA) station
- Suncoast Air starts scheduled service

1988

- Aero Costa Rica starts scheduled service
- Bonds issued for $430 million for the Phase II Capacity Improvement Program
- Comair becomes a signatory airline
- KLM Royal Dutch Airlines starts scheduled service to the Netherlands
- Passenger traffic exceeds 15 MAP for the first time (16,497,262)
- Virgin Atlantic Airways starts chartered service from England

1989

- Canada 3000 Airlines starts chartered service
- International traffic grows 106 percent
- Third Runway (17R/35L) opens

1990

- Aeropostal Airlines starts scheduled service to Venezuela
- Air Jamaica starts scheduled service
- Third airside terminal (Airside 4) opens with 24 gates and 15 commuter aircraft positions
- Federal Inspection Service facilities increased international arrivals processing capacity to 2,000 passengers per hour
- US Airways Express starts scheduled service

1991

- Cargo traffic exceeds 150,000 annual short tons for the first time (153,814)
- Carnival Airlines starts scheduled service
- LTU International Airways starts scheduled service to Germany
- Hotel atrium opens on the east end of the terminal
- Terminal top parking garage opens

1992

- Air Transat starts chartered service from Canada
- America West Airlines starts scheduled service
- Hyatt Regency Orlando International Airport opens in airport terminal
- Key Airlines starts scheduled service
- Kiwi International Airlines starts scheduled service
- USDA Plant Inspection Station and Perishables Center opens
- Passenger traffic exceeds 20 MAP for the first time (21,147,888)
- Virgin Atlantic Airways starts scheduled service to England

1993

- Cargo traffic exceeds 200,000 annual short tons for the first time (211,104)
- Lacsa Airlines starts scheduled service to Costa Rica
- Leisure starts scheduled service
- Morris Air starts scheduled service
- Spirit Airlines starts scheduled service
- ValuJet Airlines starts scheduled service

1994

- Aeroflot starts scheduled service
- AirTran Airways starts scheduled service
- American Eagle starts scheduled service
- Continental Lite starts scheduled service
- Martinair Holland starts scheduled service
- Saudi Arabian Airlines starts seasonal scheduled service
- Ultrair starts scheduled service
- Varig Brasil Airlines starts chartered service from Brazil

1995

- Air Canada starts scheduled service
- Canadian Airlines starts scheduled service
- Gulfstream International Airlines starts scheduled service
- Midway Airlines starts scheduled service
- North Walk and South Walk retail shopping facilities in the terminal completed
- Airport ranked by *Airport Monitor* as the number one airport in North America for overall customer convenience

1996

- Aeromexico starts scheduled service
- AirTran Airways becomes a signatory airline
- ATA Airlines becomes a signatory airline
- Cayman Airways starts scheduled service
- Delta Express starts scheduled service with 33 flights per day to 12 destinations
- Eastwind Airlines starts scheduled service
- El Al starts operating seasonal scheduled service to Israel
- Excalibur Airlines starts chartered service from England
- JetTrain starts scheduled service
- Laker Airways starts chartered service from England
- Nations Air starts scheduled service
- Orlando hosts the National Business Aircraft Association annual convention
- Airport ranked by Airports Council International as the fastest growing major airport in the world
- Airport ranked by *Auto Rental News* as the top rental car site among U.S. airports
- Airport ranked by International Air Transport Association (IATA) as the number one airport in North America for overall passenger satisfaction
- Southwest Airlines starts scheduled service with 19 flights per day to 7 destinations, and becomes a signatory airline
- Passenger traffic exceeds 25 MAP for the first time (25,587,773)
- Vanguard Airlines starts scheduled service
- Varig Brasil Airlines starts scheduled service to Brazil
- Western Pacific Airlines starts scheduled service

1997

- Aerolineas Argentinas starts scheduled service
- Air Aruba starts chartered service
- AirTran Airways selects Orlando as the site for its new headquarters
- CityBird starts scheduled service to Belgium
- Copa Airlines starts chartered service from Guatemala
- Flying Colours starts chartered service from England
- LanChile starts seasonal scheduled service
- Mexicana Airlines starts scheduled service
- Midwest Express starts scheduled service
- $965 million "Majority-in-Interest" ballot approved for airport expansion programs
- ProAir Airlines starts scheduled service
- Airport ranked by *Auto Rental News* as the top rental car site among U.S. airports
- Airport ranked by IATA as the number one airport in North America for overall passenger satisfaction
- World's first in-airport microbrewery opens in MCO

1998

- Canada 3000 Airlines starts scheduled service
- Cargo traffic exceeds 250,000 annual short tons for the first time (262,365)
- Fourth airside terminal (Airside 2) construction begins
- MetroJet starts scheduled service
- Parking garages expand to accommodate 1,600 more vehicles
- Airport ranked by *Auto Rental News* as the top rental car site among U.S. airports
- Airport ranked by IATA as the number one airport in North America for overall passenger satisfaction
- Royal Aviation starts scheduled service to Canada
- Ground breaking at South Terminal Complex
- VASP starts chartered service from Brazil

1999

- Aeropostal Airlines starts scheduled service to Venezuela
- Air Aruba starts scheduled service
- Air Transat starts scheduled service to Canada
- Britannia resumes chartered service from England
- FedEx announces plans to build a regional service center
- Receives approval for construction of Fourth Runway (17L/35R)
- Frontier Airlines starts scheduled service
- Ground transportation concourse opens on Level 1 of the North Terminal Complex
- Lauda Air starts scheduled service to Austria
- Satellite parking lot "Blue" opens
- South Terminal Complex site preparation starts
- Spirit Airlines becomes a signatory airline
- Sun Country Airlines starts scheduled service, and becomes a signatory airline
- Virgin Atlantic Airways becomes a signatory airline

2000

- Fourth terminal airside (Airside 2) opens
- AvStar Completion Center opens on Tradeport
- British Airways becomes a signatory airline
- Copa Airlines starts scheduled service to Panama
- JetBlue Airways starts scheduled service and becomes a signatory airline
- Midway Airlines becomes a signatory airline
- North crossfield taxiway opens

CURRENT DEVELOPMENTS

2001

- FedEx regional service facility opens on Tradeport

2002

- New Airport Traffic Control Tower opens - tallest in North America

2003

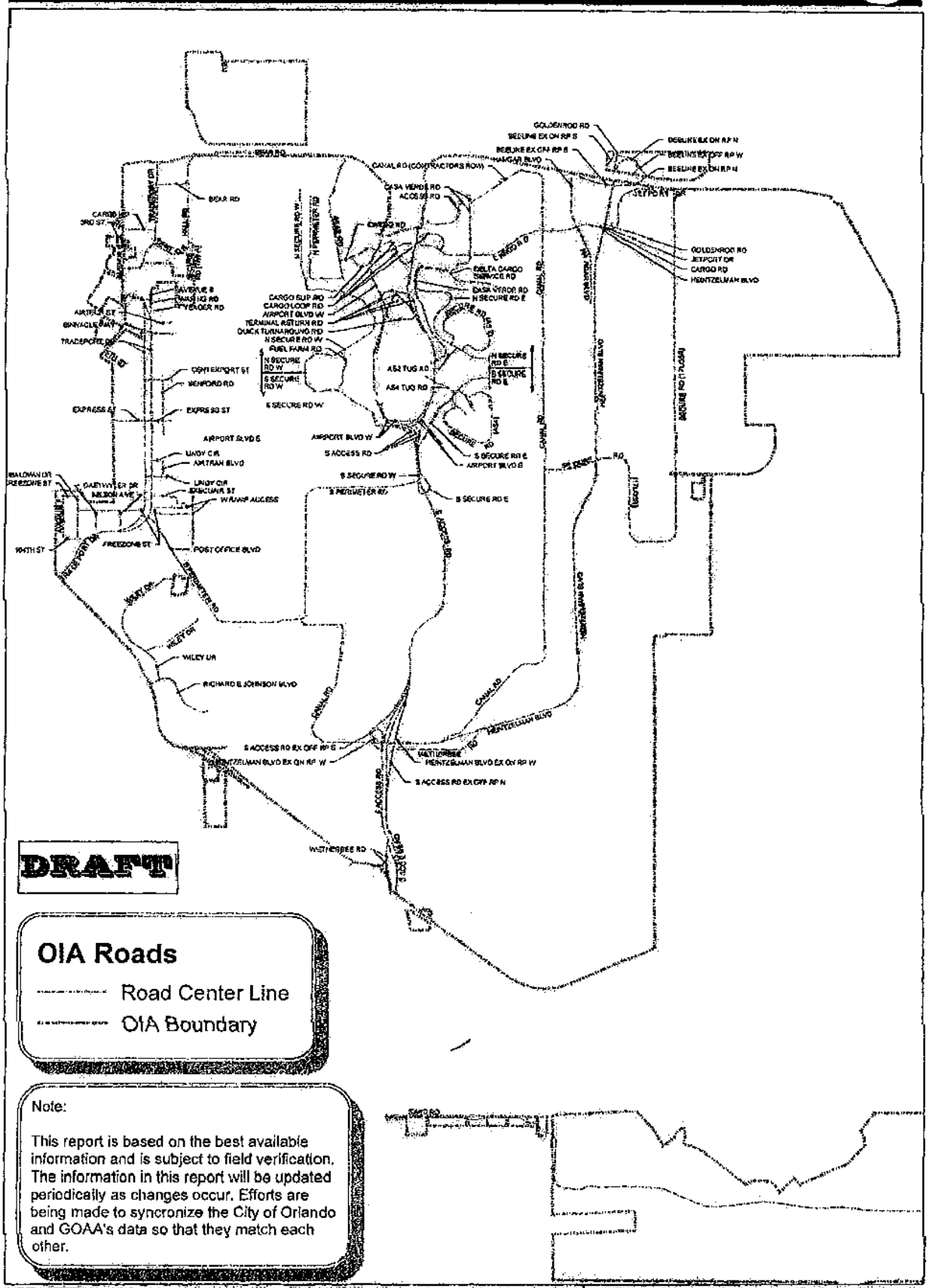
- Alaska Airlines starts scheduled service
- Major renovation of airport shops and restaurants is complete
- Thomas Cook, Powered by Condor, starts scheduled service to Germany

Source: *MCO Master Plan Executive Summary*, ZHA, December 1995.
GOAA MCO official website, *Airport History*, June 2004.

APPENDIX C

AIRPORT MASTER PLAN UPDATE
ORLANDO INTERNATIONAL AIRPORT

On Airport Roads



On Airport Roads

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GREATER ORLANDO AVIATION AUTHORITY

104TH ST

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
104TH ST	ROADS	ASPHALT	10642.9	0.2	0.2		
		Road Totals	*10642.9*	*0.2*	*0.2*	*584.7*	*0.1*

3RD ST

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
3RD ST	ROADS	ASPHALT	24793.4	0.6	0.4		
		Road Totals	*24793.4*	*0.6*	*0.4*	*577.5*	*0.1*

5TH ST

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
5TH ST	ROADS	CONCRET	21580.4	0.5	0.3		
		Road Totals	*21580.4*	*0.5*	*0.3*	*776.1*	*0.1*

A SIDE TERM ACCESS & GAR INGRESS

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
A SIDE TERM ACCESS & GAR IN	ROADS	ASPHALT	99317.6	2.3	1.6		
		Road Totals	*99317.6*	*2.3*	*1.6*		

A SIDE TERMINAL ACCESS

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
A SIDE TERMINAL ACCESS	ROADS	BRIDGE	342.7	0.0	0.0		
A SIDE TERMINAL ACCESS	ROADS	BRIDGE	94732.3	2.2	1.5		
A SIDE TERMINAL ACCESS	ROADS	ASPHALT	129555.9	3.0	2.0		
		Road Totals	*224630.9*	*5.2*	*3.5*		

ACCESS RD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
ACCESS RD	ROADS	ASPHALT	12669.9	0.3	0.2		
ACCESS RD	ROADS	ASPHALT	39370.3	0.9	0.6		
		Road Totals	*57021.1*	*1.2*	*0.8*	*2154.1*	*0.4*

AIRPORT BLVD E

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
AIRPORT BLVD E	ROADS	ASPHALT	9624.2	0.2	0.1		
AIRPORT BLVD E	ROADS	BRIDGE	4223.3	0.1	0.1		

AIRPORT BLVD E

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
AIRPORT BLVD E	ROADS	ASPHALT	323685.9	7.4	5.1		
AIRPORT BLVD E	ROADS	BRIDGE	3230.0	0.1	0.1		
AIRPORT BLVD E	ROADS	ASPHALT	55398.0	1.3	0.9		
AIRPORT BLVD E	ROADS	ASPHALT	114544.9	2.6	1.8		
AIRPORT BLVD E	ROADS	BRIDGE	8553.6	0.2	0.1		
AIRPORT BLVD E	ROADS	ASPHALT	403.0	0.0	0.0		
		Road Totals	*515992.9*	*11.9*	*8.2*	*21533.5*	*2.2*

AIRPORT BLVD W

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
AIRPORT BLVD W	ROADS	ASPHALT	11292.3	0.3	0.2		
AIRPORT BLVD W	ROADS	ASPHALT	64155.6	1.5	1.0		
AIRPORT BLVD W	ROADS	ASPHALT	14122.6	0.3	0.2		
AIRPORT BLVD W	ROADS	ASPHALT	333569.0	7.7	5.3		
AIRPORT BLVD W	ROADS	ASPHALT	2463.9	0.1	0.0		
AIRPORT BLVD W	ROADS	BRIDGE	9437.4	0.2	0.1		
AIRPORT BLVD W	ROADS	BRIDGE	8534.0	0.2	0.1		
		Road Totals	*443309.9*	*10.2*	*7.0*	*11398.1*	*2.2*

AIRTECH ST

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
AIRTECH ST	ROADS	ASPHALT	31841.1	0.7	0.5		
		Road Totals	*31841.1*	*0.7*	*0.5*	*967.2*	*0.1*

AIRTRAN BLVD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
AIRTRAN BLVD	ROADS	ASPHALT	27355.0	0.6	0.4		
		Road Totals	*27355.0*	*0.6*	*0.4*	*514.5*	*0.1*

AS2 TUG RD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
AS2 TUG RD	ROADS	ASPHALT	20920.0	0.5	0.3		
AS2 TUG RD	ROADS	ASPHALT	2112.6	0.1	0.0		
		Road Totals	*23032.6*	*0.5*	*0.4*	*1410.5*	*0.3*

AS4 TUG RD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
AS4 TUG RD	ROADS	ASPHALT	28928.2	0.7	0.5		
AS4 TUG RD	ROADS	ASPHALT	1551.0	0.0	0.0		
		Road Totals	*30519.3*	*0.7*	*0.5*	*1222.8*	*0.3*

AVENUE B

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
AVENUE B	ROADS	ASPHALT	2970.2	0.1	0.1		
		Road Totals	*2970.2*	*0.1*	*0.1*	*339.0*	*0.1*

AVENUE C

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
AVENUE C	ROADS	ASPHALT	30506.9	0.7	0.5		
		Road Totals	*30506.9*	*0.7*	*0.5*	*1339.9*	*0.2*

AVENUE F

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
AVENUE F	ROADS	ASPHALT	34733.3	0.8	0.6		
		Road Totals	*34733.3*	*0.8*	*0.6*	*3836.8*	*0.3*

B SIDE TERMINAL ACCESS

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
B SIDE TERMINAL ACCESS	ROADS	BRIDGE	16522.8	0.4	0.3		
B SIDE TERMINAL ACCESS	ROADS	ASPHALT	166820.7	4.3	3.0		
B SIDE TERMINAL ACCESS	ROADS	BRIDGE	1324.5	0.0	0.0		
B SIDE TERMINAL ACCESS	ROADS	BRIDGE	82178.8	2.1	1.5		
B SIDE TERMINAL ACCESS	ROADS	ASPHALT	3687.1	0.1	0.1		
B SIDE TERMINAL ACCESS	ROADS	ASPHALT	683.8	0.0	0.0		
		Road Totals	*305297.8*	*7.0*	*4.8*		

BALDWIN DR

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
BALDWIN DR	ROADS	ASPHALT	47133.3	1.1	0.7		
		Road Totals	*47133.3*	*1.1*	*0.7*	*2360.2*	*0.4*

On Airport Roads

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BEAR RD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
BEAR RD	ROADS	ASPHALT	418619.5	9.6	6.6		
		Road Totals	*418619.5*	*9.6*	*6.6*	*12201.4*	*2.3*

BEELINE EX OFF RP E

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
BEELINE EX OFF RP E	ROADS	ASPHALT	46765.5	1.1	0.7		
		Road Totals	*46765.5*	*1.1*	*0.7*	*1472.7*	*0.3*

BEELINE EX OFF RP W

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
BEELINE EX OFF RP W	ROADS	ASPHALT	35093.7	0.8	0.6		
		Road Totals	*35093.7*	*0.8*	*0.6*	*1319.3*	*0.3*

BEELINE EX ON RP N

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
BEELINE EX ON RP N	ROADS	ASPHALT	24588.8	0.6	0.4		
BEELINE EX ON RP N	ROADS	ASPHALT	27573.4	0.6	0.4		
		Road Totals	*52162.2*	*1.2*	*0.8*	*2221.4*	*0.5*

BEELINE EX ON RP S

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
BEELINE EX ON RP S	ROADS	ASPHALT	12965.7	0.3	0.2		
		Road Totals	*12965.7*	*0.3*	*0.2*	*499.9*	*0.1*

BENFORD RD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
BENFORD RD	ROADS	ASPHALT	52110.4	1.2	0.8		
		Road Totals	*52110.4*	*1.2*	*0.8*	*1829.5*	*0.3*

BINNACLE WAY

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
BINNACLE WAY	ROADS	ASPHALT	3744.8	0.1	0.1		
BINNACLE WAY	ROADS	ASPHALT	17686.5	0.4	0.3		
BINNACLE WAY	ROADS	ASPHALT	10232.7	0.2	0.2		
		Road Totals	*31662.8*	*0.7*	*0.5*	*1021.6*	*0.1*

BOGGY CREEK RD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
BOGGY CREEK RD	ROADS	ASPHALT	225.4	0.0	0.0		
BOGGY CREEK RD	ROADS	ASPHALT	938.5	0.0	0.0		
		Road Totals	*1163.9*	*0.0*	*0.0*		

CANAL BRIDGE

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
CANAL BRIDGE	ROADS	BRIDGE	2338.3	0.1	0.0		
		Road Totals	*2338.3*	*0.1*	*0.0*		

CANAL RD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
CANAL RD	ROADS	ASPHALT	18826.0	0.4	0.3		
CANAL RD	ROADS	ASPHALT	8464.4	0.1	0.1		
CANAL RD	ROADS	ASPHALT	38723.5	0.8	0.6		
CANAL RD	ROADS	ASPHALT	154974.4	3.6	2.5		
CANAL RD	ROADS	ASPHALT	179043.6	4.1	2.8		
		Road Totals	*399834.1*	*9.1*	*6.3*	*25961.2*	*4.9*

CANAL RD (CONTRACTORS ROW)

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
CANAL RD (CONTRACTORS RO	ROADS	ASPHALT	83922.2	1.9	1.3		
		Road Totals	*83922.2*	*1.9*	*1.3*	*4537.1*	*0.8*

CARGO LOOP RD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
CARGO LOOP RD	ROADS	ASPHALT	27021.9	0.6	0.4		
CARGO LOOP RD	ROADS	ASPHALT	30219.2	0.7	0.5		
CARGO LOOP RD	ROADS	ASPHALT	15348.9	0.3	0.2		
		Road Totals	*72590.0*	*1.7*	*1.2*	*3779.7*	*0.8*

CARGO RD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
CARGO RD	ROADS	ASPHALT	66107.8	1.5	1.0		
CARGO RD	ROADS	ASPHALT	85240.4	2.0	1.4		
CARGO RD	ROADS	ASPHALT	41887.3	1.0	0.7		
CARGO RD	ROADS	ASPHALT	346998.3	8.0	5.1		

CARGO RD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
CARGO RD	ROADS	BRIDGE	11555.0	0.3	0.2		
CARGO RD	ROADS	BRIDGE	11833.1	0.3	0.2		
CARGO RD	ROADS	BRIDGE	4430.6	0.1	0.1		
CARGO RD	ROADS	BRIDGE	5258.5	0.1	0.1		
		Road Totals	*613199.0*	*14.1*	*9.6*	*16345.3*	*3.0*

CARGO SLIP RD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
CARGO SLIP RD	ROADS	ASPHALT	30365.2	0.7	0.5		
		Road Totals	*30365.2*	*0.7*	*0.5*	*1297.6*	*0.2*

CASA VERDE RD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
CASA VERDE RD	ROADS	ASPHALT	10269.3	0.2	0.2		
CASA VERDE RD	ROADS	ASPHALT	5611.9	0.1	0.1		
CASA VERDE RD	ROADS	ASPHALT	4034.9	0.1	0.1		
CASA VERDE RD	ROADS	ASPHALT	161615.5	4.2	2.9		
CASA VERDE RD	ROADS	BRIDGE	9894.9	0.2	0.2		
CASA VERDE RD	ROADS	ASPHALT	76218.0	1.8	1.2		
		Road Totals	*367664.6*	*8.6*	*5.3*	*7915.6*	*1.5*

CENTERPORT ST

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
CENTERPORT ST	ROADS	ASPHALT	9619.4	0.2	0.1		
CENTERPORT ST	ROADS	ASPHALT	21086.0	0.5	0.3		
		Road Totals	*30705.3*	*0.7*	*0.5*	*916.5*	*0.2*

DAETWYLER DR

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
DAETWYLER DR	ROADS	ASPHALT	19016.2	0.4	0.3		
		Road Totals	*19016.2*	*0.4*	*0.3*	*648.1*	*0.1*

DELTA CARGO SERVICE RD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
DELTA CARGO SERVICE RD	ROADS	ASPHALT	107145.3	2.5	1.7		

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DELTA CARGO SERVICE RD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
		Road Totals	*107145.3*	*2.5*	*1.7*	*3929.2*	*0.7*

DENTON HALL RD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
DENTON HALL RD	ROADS	ASPHALT	55782.9	1.3	0.9		
DENTON HALL RD	ROADS	ASPHALT	22734.4	0.5	0.4		
		Road Totals	*78517.3*	*1.8*	*1.3*	*3393.4*	*0.7*

EXECUAIR ST

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
EXECUAIR ST	ROADS	ASPHALT	29053.7	0.7	0.5		
		Road Totals	*29053.7*	*0.7*	*0.5*	*1260.7*	*0.2*

EXPRESS ST

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
EXPRESS ST	ROADS	ASPHALT	12870.5	0.3	0.2		
EXPRESS ST	ROADS	ASPHALT	9412.8	0.2	0.1		
EXPRESS ST	ROADS	ASPHALT	10137.4	0.2	0.2		
EXPRESS ST	ROADS	ASPHALT	33365.4	0.8	0.5		
		Road Totals	*65585.9*	*1.5*	*1.0*	*1986.0*	*0.4*

FREEZONE ST

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
FREEZONE ST	ROADS	ASPHALT	9176.3	0.2	0.1		
FREEZONE ST	ROADS	ASPHALT	48110.5	1.1	0.8		
FREEZONE ST	ROADS	ASPHALT	34902.3	0.8	0.5		
		Road Totals	*91589.9*	*2.1*	*1.4*	*3946.9*	*0.7*

FUEL FARM RD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
FUEL FARM RD	ROADS	ASPHALT	36203.4	0.8	0.6		
		Road Totals	*36203.4*	*0.8*	*0.6*	*1298.8*	*0.2*

GOLDENROD RD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
GOLDENROD RD	ROADS	ASPHALT	62092.8	1.4	1.0		
GOLDENROD RD	ROADS	BRIDGE	2513.9	0.1	0.0		
GOLDENROD RD	ROADS	ASPHALT	153833.5	3.6	2.6		
		Road Totals	*218219.0*	*5.1*	*3.6*	*7243.9*	*1.4*

HANGAR BLVD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
HANGAR BLVD	ROADS	ASPHALT	73503.2	1.7	1.2		
HANGAR BLVD	ROADS	ASPHALT	68951.8	1.6	1.1		
		Road Totals	*142463.8*	*3.3*	*2.3*	*4281.3*	*0.8*

HEINTZELMAN BLVD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
HEINTZELMAN BLVD	ROADS	ASPHALT	163439.6	3.8	2.6		
HEINTZELMAN BLVD	ROADS	BRIDGE	10245.6	0.2	0.2		
HEINTZELMAN BLVD	ROADS	BRIDGE	9874.9	0.2	0.2		
HEINTZELMAN BLVD	ROADS	ASPHALT	1011712.0	23.2	16.0		
HEINTZELMAN BLVD	ROADS	ASPHALT	17931.6	0.4	0.3		
HEINTZELMAN BLVD	ROADS	ASPHALT	17959.0	0.4	0.3		
HEINTZELMAN BLVD	ROADS	ASPHALT	148960.5	3.4	2.4		
		Road Totals	*1381243.2*	*31.7*	*21.8*	*72784.3*	*13.8*

HEINTZELMAN BLVD EX ON RP W

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
HEINTZELMAN BLVD EX ON RP	ROADS	ASPHALT	29883.3	0.7	0.5		
HEINTZELMAN BLVD EX ON RP	ROADS	ASPHALT	48547.9	1.1	0.8		
HEINTZELMAN BLVD EX ON RP	ROADS	BRIDGE	9559.2	0.2	0.1		
		Road Totals	*88130.4*	*2.0*	*1.3*	*4414.6*	*0.8*

HYATT VALET

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
HYATT VALET	ROADS	CONCRET	22431.5	0.5	0.3		
		Road Totals	*22431.5*	*0.5*	*0.3*		

JETPORT DR

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles

JETPORT DR

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
JETPORT DR	ROADS	ASPHALT	88107.3	2.0	1.4		
		Road Totals	*88107.3*	*2.0*	*1.4*	*3435.0*	*0.6*

LINDY CIR

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
LINDY CIR	ROADS	ASPHALT	8530.8	0.2	0.1		
LINDY CIR	ROADS	ASPHALT	28692.4	0.7	0.5		
		Road Totals	*37223.0*	*0.9*	*0.6*	*1281.1*	*0.2*

N PERIMETER RD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
N PERIMETER RD	ROADS	ASPHALT	85716.0	2.0	1.4		
		Road Totals	*85716.0*	*2.0*	*1.4*	*3330.1*	*0.7*

N SECURE RD E

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
N SECURE RD E	ROADS	ASPHALT	135410.3	3.1	2.1		
		Road Totals	*135410.3*	*3.1*	*2.1*	*5197.1*	*0.8*

N SECURE RD W

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
N SECURE RD W	ROADS	ASPHALT	55000.6	1.3	0.9		
		Road Totals	*55000.6*	*1.3*	*0.9*	*3837.3*	*1.6*

NILSON AVE

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
NILSON AVE	ROADS	ASPHALT	10478.4	0.2	0.2		
		Road Totals	*10478.4*	*0.2*	*0.2*	*517.8*	*0.1*

POST OFFICE BLVD W

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
POST OFFICE BLVD W	ROADS	ASPHALT	83687.8	1.9	1.3		
		Road Totals	*83687.8*	*1.9*	*1.3*	*1422.2*	*0.2*

On Airport Roads

DRAFT

GREATER ORLANDO AVIATION AUTHORITY

QUICK TURNAROUND RD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
QUICK TURNAROUND RD	ROADS	ASPHALT	28214.6	0.7	0.5		
		Road Totals	*28214.6*	*0.7*	*0.5*	*1668.7*	*0.3*

RICHARD E JOHNSON BLVD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
RICHARD E JOHNSON BLVD	ROADS	ASPHALT	65682.8	1.5	1.0		
		Road Totals	*65682.8*	*1.5*	*1.0*	*3051.6*	*0.5*

S ACCESS RD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
S ACCESS RD	ROADS	BRIDGE	726.0	0.0	0.0		
S ACCESS RD	ROADS	ASPHALT	310881.6	7.1	4.9		
S ACCESS RD	ROADS	BRIDGE	4675.0	0.1	0.1		
S ACCESS RD	ROADS	BRIDGE	18402.0	0.4	0.3		
S ACCESS RD	ROADS	BRIDGE	16970.3	0.4	0.3		
S ACCESS RD	ROADS	BRIDGE	2216.0	0.1	0.0		
S ACCESS RD	ROADS	ASPHALT	118377.8	2.7	1.9		
S ACCESS RD	ROADS	ASPHALT	389267.9	8.9	6.1		
		Road Totals	*861517.1*	*19.8*	*13.6*	*2150.5*	*3.0*

S ACCESS RD EX OFF RP N

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
S ACCESS RD EX OFF RP N	ROADS	ASPHALT	58531.2	1.3	0.9		
		Road Totals	*58531.2*	*1.3*	*0.9*	*710.5*	*0.1*

S ACCESS RD EX OFF RP S

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
S ACCESS RD EX OFF RP S	ROADS	ASPHALT	65283.5	1.5	1.0		
		Road Totals	*65283.5*	*1.5*	*1.0*	*2862.4*	*0.5*

S PERIMETER RD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
S PERIMETER RD	ROADS	ASPHALT	39962.6	0.9	0.6		
S PERIMETER RD	ROADS	ASPHALT	282453.3	6.5	4.5		
		Road Totals	*322415.9*	*7.4*	*5.1*	*13402.1*	*2.5*

S PERIMETER RD (OLD)

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
S PERIMETER RD (OLD)	ROADS	ASPHALT	49781.5	1.1	0.8		
S PERIMETER RD (OLD)	ROADS	ASPHALT	13552.5	0.3	0.2		
S PERIMETER RD (OLD)	ROADS	ASPHALT	5433.7	0.1	0.1		
		Road Totals	*68767.8*	*1.6*	*1.1*		

S SECURE RD E

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
S SECURE RD E	ROADS	ASPHALT	152274.7	3.5	2.4		
		Road Totals	*152274.7*	*3.5*	*2.4*	*6739.1*	*1.3*

S SECURE RD W

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
S SECURE RD W	ROADS	BRIDGE	4385.4	0.1	0.1		
S SECURE RD W	ROADS	ASPHALT	91297.8	2.1	1.4		
S SECURE RD W	ROADS	ASPHALT	2401.6	0.1	0.0		
		Road Totals	*98084.8*	*2.3*	*1.6*	*6478.6*	*1.2*

SAND RD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
SAND RD	ROADS	ASPHALT	541653.2	12.4	8.6		
		Road Totals	*541653.2*	*12.4*	*8.6*	*22363.9*	*4.3*

SECURE RD (17L/35R)

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
SECURE RD (17L/35R)	ROADS	ASPHALT	40903.5	0.9	0.7		
SECURE RD (17L/35R)	ROADS	ASPHALT	1116.2	0.0	0.0		
SECURE RD (17L/35R)	ROADS	ASPHALT	399527.4	9.2	6.3		
		Road Totals	*441547.0*	*10.1*	*7.0*	*18426.1*	*3.4*

SECURE RD (AS2)

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
SECURE RD (AS2)	ROADS	ASPHALT	108318.6	2.5	1.7		
		Road Totals	*108318.6*	*2.5*	*1.7*	*4346.0*	*0.8*

SECURE RD (AS4)

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
SECURE RD (AS4)	ROADS	ASPHALT	153541.5	3.5	2.4		
		Road Totals	*153541.5*	*3.5*	*2.4*	*6397.5*	*1.3*

SECURE RD (T/W A)

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
SECURE RD (T/W A)	ROADS	ASPHALT	19193.3	0.4	0.3		
		Road Totals	*19193.3*	*0.4*	*0.3*	*1244.0*	*0.2*

SERVICE ROAD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
SERVICE ROAD	ROADS	ASPHALT	1304.6	0.0	0.0		
SERVICE ROAD	ROADS	ASPHALT	2061.7	0.1	0.0		
		Road Totals	*3366.3*	*0.1*	*0.1*		

TENANT SERVICE ROAD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
TENANT SERVICE ROAD	ROADS	ASPHALT	33862.5	0.8	0.5		
TENANT SERVICE ROAD	ROADS	ASPHALT	17347.8	0.4	0.3		
		Road Totals	*51210.1*	*1.2*	*0.8*		

TERMINAL RETURN RD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
TERMINAL RETURN RD	ROADS	BRIDGE	16159.8	0.4	0.3		
TERMINAL RETURN RD	ROADS	ASPHALT	86047.9	2.0	1.4		
TERMINAL RETURN RD	ROADS	BRIDGE	2799.2	0.1	0.0		
TERMINAL RETURN RD	ROADS	BRIDGE	9388.5	0.2	0.1		
TERMINAL RETURN RD	ROADS	ASPHALT	27533.2	0.6	0.4		
TERMINAL RETURN RD	ROADS	ASPHALT	18431.3	0.4	0.3		
		Road Totals	*160349.6*	*3.7*	*2.5*	*6497.5*	*1.3*

TRADEPORT DR

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
TRADEPORT DR	ROADS	ASPHALT	601079.6	13.8	9.5		
TRADEPORT DR	ROADS	ASPHALT	221525.8	5.1	3.5		
		Road Totals	*822605.4*	*18.9*	*13.0*	*27709.4*	*4.3*

W RAMP ACCESS

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
W RAMP ACCESS	ROADS	ASPHALT	47762.4	1.1	0.8		
W RAMP ACCESS	ROADS	ASPHALT	9232.9	0.2	0.1		
W RAMP ACCESS	ROADS	ASPHALT	31330.5	0.7	0.5		
W RAMP ACCESS	ROADS	ASPHALT	25150.8	0.6	0.4		
		Road Totals	*114476.5*	*2.6*	*1.8*	*0.0*	*0.5*

WARING RD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
WARING RD	ROADS	CONCRET	6852.8	0.1	0.1		
		Road Totals	*6852.8*	*0.1*	*0.1*	*413.9*	*0.1*

WETHERBEE RD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
WETHERBEE RD	ROADS	ASPHALT	22730.4	0.5	0.4		
WETHERBEE RD	ROADS	BRIDGE	5835.2	0.1	0.1		
WETHERBEE RD	ROADS	ASPHALT	39765.0	0.9	0.6		
WETHERBEE RD	ROADS	ASPHALT	3984.9	0.1	0.1		
WETHERBEE RD	ROADS	ASPHALT	31184.2	0.7	0.5		
		Road Totals	*103199.8*	*2.4*	*1.6*	*6626.1*	*1.3*

WILEY DR

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
WILEY DR	ROADS	ASPHALT	186568.5	4.3	3.0		
		Road Totals	*186568.5*	*4.3*	*3.0*	*6422.4*	*1.3*

YEAGER RD

Road Name	Land Use	Material Type	Area	Acres	Lane Miles	Total Length (ft)	Total Miles
YEAGER RD	ROADS	CONCRET	26883.5	0.6	0.4		
		Road Totals	*26883.5*	*0.6*	*0.4*	*570.7*	*0.1*
		Grand Totals	*11,341,448.3*	*260.4*	*179.8*	*1,224,741.6*	*234.7*

APPENDIX D

AIRPORT MASTER PLAN UPDATE
ORLANDO INTERNATIONAL AIRPORT

Orlando Interr nal Airport Layout Plan Supplement (Drainage)
Wildlife Habitat Reduction/Mitigation Agreement: Phase I
(Approved January 19, 2001)

Yellow denotes completion

	Project Description	Current Status/Schedule	Remarks
PHASE I			
1	Construct north-south canal with 2:1 side slopes per new cross section and sod slopes. (S003)	Work is included in BP-316, Bid Alternate 1. Construction completion scheduled for February 2004.	
2	Extend 4 way - 8' x 5' box culvert (designed for aircraft loading). (301)	Completed under BP-301 July 2001.	
3	Construct Heintzelman Canal to pond P-1 to circumvent HP-2. (S003)	Completed under BP-S003 August 2001.	
4	Construct new portions of BP 301 borrow pit P1 & BP S002 ponds I-1, I-2 & I-3 to 2:1 side slopes and sod slopes. (301 & S002)	P-1 work completed under BP-301 July, 2001. Modification of Ponds I-1, I-2 and I-3 is currently under construction BP-S002. Estimated completion date is May, 2004.	
5	Eliminate HP-2 and build no more cross drains for 72" RCP; 2 of 6 installed. (plug existing pipes). (S003)	Completed under BP-S003 May 2000.	
6	New outfall into Mud Lake Conservation Area will be out of the BP 301 borrow pit P-1 by modifying BP 301 outfall structure. (301)	The P-1 permanent outfall structure has been completed and was made opertional in March 2004. ~~but will not be operational until widening of the Heintzelman Canal under BP-316, the Fourth Runway Project, has been completed. Anticipated operation date is April 2004.~~	
7	No change to S003 ponds HP-5 & HP-7. (S003)	No action required.	
8	S005 install 8" - 12" rock rip rap to side slopes and implement aggressive wildlife management techniques. S009 no change.	The S005 pond is a temporary facility that will be modified again under South Terminal construction. No rip-rap was installed because BP-S005 had already been completed and because of the temporary nature of this pond. Aggressive wildlife management techniques have been implemented.	
9	Eliminate HP-3 pond. (S003)	HP-3 was eliminated under BP-S003 May 2000.	
10	Modify BP 234/BP 250 ponds on AOA side slopes to 2:1. Sod to water line/intense maintenance. (234/250 - ponds A2, A3, & E03)	Funding has been identified in PFC #9. ~~However, there are outstanding construction issues with both the BP-234 (litigation over dewatering issues) and BP-250 (quality of pond construction) contractors that must be resolved prior to start of any new construction on these ponds. It is not feasible to accurately forecast when these issues will be resolved, but resolution is expected within the next 12 months.~~ Art/Frank: Don't we have FAA approval not to modify these ponds?	
11	Land side (public access) of ponds E02, MT North, pond 7 and north pond to have 4:1 side slopes (234/250). The Authority will study existing ponds adjacent to Airside 1 & 3 as mitigation and based upon the results of this study will request AIP funding to implement recommendations to reduce habitat.	The Federal Aviation Administration (FAA), in concert with the Florida Department of Transportation, has funded a Statewide Airport Stormwater Study. The purposes of this study art: (1) to characterize airside stormwater quality; and (2) to develop a Best Management Practices Manual applicable to airports in the State of Florida. The results of this study could affect how water runoff is treated at Orlando International Airport. MEA Group Inc. is the consultant performing the Statewide Airport Stormwater Study. The Greater Orlando Aviation Authority has directly retained MEA Group Inc. (agreement dated February 28, 2002) and associated subconsultants to evaluate water quality at this airport and include this airport in the Statewide Study. Installation of equipment is has been completed. This study is scheduled to last approximately 18 to 24 months. The results of this study could directly affect this project.	
12	Goldenrod ponds constructed with 2:1 side slopes with 8" - 12" rock rip rap. Fill old borrow pits 2 & 3 prior to opening of interchange. Fill old borrow pit No.1 prior to opening of 4th runway. (OOCEA 903)	Goldenrod pond modifications were completed by Orlando Orange County Expressway Authority (OOCEA)'s contractor in March 2003. Construction of the filling of Borrow Pit 1 ~~will be complete by December 2003. The~~ and the filling of Borrow Pit 2 and Borrow Pit 3 is was completed in January 2004. ~~underway with completion scheduled for September 2003.~~	
13	Fill Gee Bee Canal and build a new canal with 2:1 side slopes (sod) further east of proposed secure road. Mitigate loss of wetlands, and clear & grub, demuck and back-fill with suitable material. (316)	~~Work is included in BP-316, Bid Alternate 1. Construction completion anticipated by September 2003.~~ Work was completed in August 2004.	

Orlando Intern' 'nal Airport Layout Plan Supplement (Drainage)
Wildlife Habita. .eduction/Mitigation Agreement: Phase I
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	Project Description	Current Status/Schedule	Remarks
14	Modify BP 318 and BP 294 to dry ponds. (318/294 - Tradeport alert area)	Construction completed September 2000 and May 2001, respectively.	
15	Install 60" RCP pipe to 4th runway drainage canal to replace BP-301 wet ditch. GOAA intends to request an amendment to the LOI for the 4th runway to fund this project. GOAA intends to complete construction prior to opening of the 4th runway.	~~Work is included in BP-316, Bid Alternate 1. Construction is underway with completion scheduled for October 2003.~~ Work was completed in August 2004.	
16	Provide staff on the airfield to ensure wetland habitat is adequately patrolled.	The Wildlife Section of Airside Operations at Orlando International Airport consists of four full time employees (2 wildlife technicians, 1 wildlife biologist, 1 wildlife supervisor). Every member of the Wildlife Section actively disperses birds, mammals and reptiles during their respective shift. All members of the Wildlife Section, and other Airside Operations personnel, are FAR 139 qualified and actively disperses birds, mammals and reptiles from the Aircraft Operations Area. Wildlife personnel are on duty 7 days per week.	
	Implement management techniques including removal of vegetation and fish from all water bodies.	The Wildlife Section of Airside Operations works in conjunction with the Maintenance Department to identify and prioritize those waterways that require vegetation and sediment removal to reduce their potential as wildlife attractants. Vegetation and sediments are trucked off site for drying so as not to act as additional wildlife attractant. Hoop nets have been deployed in airfield water bodies to collect forage and sport fish as well as turtles to reduce the airfield water bodies' attractiveness to wading birds and ospreys. The Florida Fish and Wildlife Conservation Commission has removed fish from airfield water bodies via electro-fishing.	
	Authority has added wildlife biologist staff position as of September 2000.	A wildlife biologist was added to the Airside Operations staff September 2000. The biologist conducts regular surveys on the airfield to: (1) Detect changes in bird / wildlife populations (i.e. arrival and departures of migrant birds); (2) Develop and maintain historical data to determine seasonal variations; (3) Recognize areas on the field or water bodies that become bird / wildlife attractants as the result of meteorological conditions, construction activity, or changes in habitat.	
	All future ponds with no rip rap will require aggressive wildlife management techniques up to the water edges.	Wildlife personnel use a variety of pyrotechnics fired from 22 caliber pistols, 12 gauge shot guns and 37 mm launchers. Lethal bird removals are conducted with non toxic steel shot when the potential for engine ingestion or aircraft collision is significant in accordance to 68A-12.0009(7)(a) of the State of Florida Wildlife Code. Wildlife vehicles are equipped with automated avian distress calls system, which deters birds from using the immediate area.	

Orlando Intern nal Airport Layout Plan Supplement (Drainage)
Wildlife Habitat ..eduction/Mitigation Agreement: Phase I
(Approved January 19, 2001)

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	Project Description	Current Status/Schedule	Remarks
17	Design and construct the east airfield drainage system to only treat development runoff from the 4th runway, Heintzelman Boulevard and the area which is currently developed or being negotiated for development in the mid field area (i.e., AVIS, National Rent-A-Car) until such time as the FDOT/FAA pilot study is completed. A. If study shows acceptable level of quality, modify the design/permits to transfer the water quality treatment to the mid field area. B. If the pilot study pollutant levels indicate additional needed treatment, modify the design/permits to add treatment for full development within the mid field area in pond P-1. C. If development within the mid field area occurs prior to completion of the pilot study, (i.e., rental car facilities) each site will have to provide on-site water quality treatment facilities in accordance with the FAA Advisory Circular. D. Utilize design criteria, as authorized by Chapter 62-40 F.A.C. to (Pond P-1). Reduce aerial extent of water quality treatment facilities. Water quality mass balance models will be utilized to demonstrate at least 80% reduction of the average annual load of pollutants that would cause or contribute to violations of state water quality standards.	Design for BP-S003 and BP-315/316/317 is complete. The Federal Aviation Administration (FAA), in concert with the Florida Department of Transportation, has funded a Statewide Airport Stormwater Study. The purposes of this study art: (1) to characterize airside stormwater quality; and (2) to develop a Best Management Practices Manual applicable to airports in the State of Florida. The results of this study could affect how water runoff is treated at Orlando International Airport. MEA Group Inc. is the consultant performing the Statewide Airport Stormwater Study. The Greater Orlando Aviation Authority has directly retained MEA Group Inc. (agreement dated February 28, 2002) and associated subconsultants to evaluate water quality at this airport and include this airport in the Statewide Study. Installation of equipment is scheduled for completion April 2002. This study is scheduled to last approximately 18 to 24 months after installation of equipment is complete. The results of this study could directly affect this project.	
18	Remove 3.2+/- acres wetland east of pond P-1 and south of 4th runway.	~~Work is included in BP-316 Base Bid and construction is underway. Estimated completion date is October 2003.~~ Work was completed in August 2004..	
19	Utilize borrow pit (M-5) to provide fill source for back-filling ponds A & B, Comair pond and Airside pond.	Selection of source for fill to backfill ponds A & B, Comair pond and Airside pond will be evaluated when projects move forward.	
20	In concept, the new ponds located in the north and south terminal central core area will use 4:1 sodded side slopes and will require intensive wildlife management techniques. New ponds in the south terminal complex should be located in the "pond corridor" as shown on the ALP. Ponds outside this area and near operational areas and approaches, will be 2:1 slope with rock rip rap.	See amendment to ALP dated April 20, 2001. These design requirements will be implemented during design phase of South Terminal Complex.	

Orlando International Airport Layout Plan Supplement (Drainage)
Wildlife Habitat Reduction/Mitigation Agreement: Phase I
(Approved January 19, 2001)

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Project Description	Current Status/Schedule	Remarks
PHASE II		
Fill conveyance pond between A/S 2 and 4 & add 72" RCP to drain	Filling of conveyance pond between A/S 2 and 4 & add 72" RCP to drain ~~is included in BP 342 and is expected to be completed by September 2003.~~ was completed in January 2004.	
PHASE III		
Remove remnant wetlands 51.14 acres	Phase III remnant wetlands area has been permitted. Awaiting identification of funding.	
PHASE IV		
Fill Stilling Basin "A."	Wetland habitat will be patrolled through constant vigilance and pond management. Exploration of various proven technologies in the reduction of wildlife habitat will continue, for possible use prior to the availability of funds for filling in these areas.	
PHASE V		
Fill 3rd Runway Borrow Pit.	Wetland habitat will be patrolled through constant vigilance and pond management. Exploration of various proven technologies in the reduction of wildlife habitat will continue, for possible use prior to the availability of funds for filling in these areas.	
PHASE VI		
Fill Comair Pond.	Wetland habitat will be patrolled through constant vigilance and pond management. Exploration of various proven technologies in the reduction of wildlife habitat will continue, for possible use prior to the availability of funds for filling in these areas.	

APPENDIX E

AIRPORT MASTER PLAN UPDATE
ORLANDO INTERNATIONAL AIRPORT

APPENDIX A
Forecast Comparisons

Exhibit 1

COMPARISON OF PASSENGER ENPLANEMENT FORECASTS

ORLANDO INTERNATIONAL AIRPORT

(Fiscal Years 2002 through 2022)

Fiscal	Master Plan Forecast—Sept. 2001			Bond Fcst.	FAA TAF
Year	Low	Base	High	Mar. 2002	Aug. 2002
2000	15,157,431	15,157,431	15,157,431	15,157,431	14,683,594
2001A	14,934,818	14,934,818	14,934,818	14,934,818	14,483,116
2002P	12,975,000	12,975,000	12,975,000	12,775,000	12,681,788
2003F	14,098,000	14,637,000	14,929,000	14,301,000	13,680,901
2004	14,843,000	15,365,000	15,865,000	14,866,000	14,299,936
2005	15,484,000	16,019,000	16,738,000	15,380,000	14,918,972
2006	16,055,000	16,649,000	17,563,000	15,864,000	15,538,008
2007	16,585,000	17,265,000	18,350,000	16,353,000	16,157,045
2008	17,028,000	17,862,000	19,089,000	16,861,000	16,776,082
2009	17,484,000	18,480,000	19,859,000	17,376,000	17,395,118
2010	17,951,000	19,122,000	20,663,000	17,900,000	18,014,156
2011	18,431,000	19,788,000	21,503,000	-	18,633,191
2012	18,927,000	20,479,000	22,378,000	-	19,252,229
2017	21,309,000	23,761,000	26,917,000	-	22,347,412
2020	-	-	-	-	24,204,523
2022	23,671,000	27,149,000	31,909,000	-	-
Year-over-year percentage change					
2000-2001	-1.5%	-1.5%	-1.5%	-1.5%	-1.4%
2001-2002	-13.1	-13.1	-13.1	-14.5	-12.4
2002-2003	8.7	12.8	15.1	11.9	7.9
2003-2004	5.3	5.0	6.3	4.0	4.5
2004-2005	4.3	4.3	5.5	3.5	4.3
2005-2006	3.7	3.9	4.9	3.1	4.1
2006-2007	3.3	3.7	4.5	3.1	4.0
2007-2008	2.7	3.5	4.0	3.1	3.8
2008-2009	2.7	3.5	4.0	3.1	3.7
2009-2010	2.7	3.5	4.0	3.0	3.6
2010-2011	2.7	3.5	4.1	-	3.4
2011-2012	2.7	3.5	4.1	-	3.3
Average Annual Compound Growth					
2003-2010	3.5%	3.9%	4.8%	3.3%	4.0%
2007-2012	2.7	3.5	4.0	-	3.6
2012-2017	2.4	3.0	3.8	-	3.0
2017-2022	2.1	2.7	3.5	-	-
2001-2010	2.1%	2.8%	3.7%	2.0%	2.5%
2001-2020	-	-	-	-	2.7%
2001-2022	2.2%	2.9%	3.7%	-	-

Source: GOAA; FAA; John F. Brown Company, Inc.

Notes: A=Actual, P=Projected, F=Forecast.

Exhibit 2
COMPARISON OF OPERATIONS FORECASTS
ORLANDO INTERNATIONAL AIRPORT
(Fiscal Years 2002 through 2022)

Fiscal	Master Plan Fcst.—Sep 2002		FAA TAF Fcst.—Aug. 2002	
Year	Operations	Yr.-over-Yr. % Change	Operations	Yr.-over-Yr. % Change
2000	367,368		367,368	
2001A	342,315	-6.8%	342,315	-6.8%
2002P	302,876	-11.5	328,769	-4.0
2003F	334,570	10.5	344,822	4.9
2004	346,385	3.5	355,028	3.0
2005	356,340	2.9	365,234	2.9
2006	365,250	2.5	375,441	2.8
2007	373,791	2.3	385,648	2.7
2008	380,479	1.8	395,855	2.6
2009	392,440	3.1	406,061	2.6
2010	404,877	3.2	416,269	2.5
2011	417,790	3.2	426,475	2.5
2012	431,200	3.2	436,682	2.4
2015	-		467,302	
2017	488,844		487,716	
2020	-		518,337	
2022	552,282		-	
Average Annual Compound Growth				
2007-2012	2.9%		2.5%	
2012-2017	2.5		2.2	
2017-2022	2.5		-	
2001-2020	-		2.2%	
2001-2022	2.3%		-	

Source: GOAA; FAA; John F. Brown Company Inc.
Notes: A=Actual, P=Projected, F=Forecast.

APPENDIX F

AIRPORT MASTER PLAN UPDATE
ORLANDO INTERNATIONAL AIRPORT

APPENDIX B
Economic Base for Air Transportation
From March 2002 MCO Bond Feasibility Report

ECONOMIC BASE FOR AIR TRANSPORTATION

A. OVERVIEW

The Orlando Metropolitan Statistical Area (hereinafter MSA, or the Area) provides a solid base of economic activity for the continued growth and development of air transportation. A consistently good economic performance over the past three decades bodes well for the sustained growth of the local economy throughout the forecast period.

The Orlando area encompasses one of the most important entertainment and hospitality centers in the world. It is a relatively young and dynamic economy with a long-term growth outlook that is better than the national average. The strength of the economy is evident in its ability to absorb a large influx of new residents who are drawn by the area's employment opportunities.

Seven of the top ten U.S. theme parks, based on attendance, are located in or near the Orlando MSA. The Orange County Convention Center is the second largest facility of its kind in the U.S., with about 1.4 million square feet of exhibit and meeting room space, and will soon be expanded to 2.6 million square feet. In 2000, the Orlando state-of-the-art entertainment and hospitality complex attracted over 43 million visitors, whose spending generated an economic impact of close to $21 billion dollars on the Area economy.

Situated at the center of Florida's most important high-tech corridor, with its proximity to the Kennedy Space Center on the Atlantic coast, Orlando has attracted a number of high-tech firms, which have located along Interstate 4 that connects the Gulf coast with the Atlantic coast.

The outlook for the local economy is very favorable throughout the forecast period. However, the onslaught of the national recession, which according to the National Bureau of Economic Research began in March 2001, and the events of September 11, which have taken a particularly heavy toll on the hospitality industry, have raised questions concerning possible deleterious long-term effects on visitor flow into the Orlando area. On the other hand, an unexpectedly strong GDP showing in the fourth quarter of 2001 is an indication that the recession may be brief and shallow. Year-end figures on hotel occupancy and visitors to the major theme parks have begun to show a recovery from the lows experienced after September 11. More importantly, enhanced security measures imposed by the federal government and complemented by similar actions by state and local governments may provide the basis for greater confidence in air travel and increased attendance at major theme parks.

Based on long-term projections of the Congressional Budget Office issued in January 2002, the U.S. economy will grow at an average rate of 3.1 percent during the 2003-2010 period, which is somewhat slower than the 3.6 percent rate during the most recent expansion period 1992-2000. The Bureau of Labor Statistics, in a forecast dated November 2001, projects GDP growth of 3.4 percent per annum during 2000-2010. Non-agricultural employment is also expected to grow at a moderately slower rate during the forecast period than the expansion period of the 1990s. While this has been a relatively shallow recession, the recovery is expected to be less dynamic than in previous cycles. The terrorist attacks of September 11 have sapped business and consumer confidence, thus leading to less sanguine expectations. At the same time, the risk of future terrorist attacks contributes to greater uncertainty in the economic outlook. On the other hand, international trade and tourism should benefit from positive economic developments in the Americas as well as in Europe and Asia. We expect that Orlando's competitive advantage in the tourism industry and emerging high-tech

manufacturing and service industries, combined with a continued influx of new residents, will support continued growth in real personal income and employment, and that this growth will continue to outperform both the state and the nation. Future expansion in the Area's theme parks and convention facilities will facilitate a rate of visitor growth generally in line with the growth of the national economy.

B. AIR TRADE AREA

The local air trade area of the Airport is centered in the Orlando MSA (consisting of Lake, Orange, Osceola and Seminole counties), in which Orlando is the primary city. (See Figure 3.)

Florida, in terms of population, is the fourth largest state in the nation. It has been, and is projected to continue to be, one of the fastest growing states. In the past four decades, Florida has been growing at a faster rate than the nation as a whole, at an annual average rate of 3.0 percent compared to 1.1 percent for the U.S. Since Orlando is located at the center of the state, the extended service area for the airport spans 20 counties with a population of about 6.1 million.

The Orlando MSA represents 10.3 percent of the state population, 9.8 percent of its income, and about 12.8 percent of its non-agricultural employment. Since 1960, the Orlando Area's rate of population growth has averaged about 4.1 percent per year, almost four times the rate of national population growth.

REGIONAL AIRPORT

Orlando Sanford International Airport (Sanford Airport or SFB) occupies approximately 2,000 acres on a site 24 miles northeast of downtown Orlando in Seminole County adjacent to the communities of Lake Mary and Heathrow. The airport, which is owned by the City of Sanford and operated by the Sanford Airport Authority, was certified for commercial service in 1996. In 2001, 620,000 passengers were enplaned at SFB, up from 335,000 in 1996. International enplaned passengers were 480,000 (77 percent of total) in 2001, up in absolute terms from 307,000 (92 percent) in 1996.

The airport primarily serves a leisure charter market from the United Kingdom. The principal charter operators in this market include Airtours, Air 2000, American Trans Air, Britania Airways, JMC, and Monarch.[6] Vacation Express provides charter service to Aruba, Cancun, Costa Rica, Jamaica, and Punta Cana. Pan American Airways, a recent startup airline, operates 5 daily nonstop flights to six domestic destinations from SFB. Vacation Express also provides domestic charter service from six cities.

The main runway at Sanford Airport is 9,600 feet long and capable of accommodating operations by large air carrier aircraft. The airport also provides two additional parallel runways for general aviation operations (both 3,500 feet long) and a crosswind runway (6,000 feet) for air carrier aircraft. The airport has two terminals: Terminal A, which is a two-story, 5-gate terminal designed for international charter operations, and Terminal B, which is a two-story, 7-gate, 120,000 square-foot terminal designed to accommodate domestic operations and some international operations that might

6. Britania Airways relocated from SFB to MCO in 1999, but relocated back to SFB effective January 2002 pursuant to an agreement that makes SFB the airline's Orlando area gateway for the next seven years. The airline plans to operate year-round service from the U.K. using 315-seat B767-300ER aircraft and expects to carry about 80,000 passengers per year.

overflow from Terminal A.[7] TBI plc, a London-based company that recently purchased Airports Group International (AGI) and operates 40 airports worldwide including, among others, London Luton, Belfast, and Cardiff, operates and manages the passenger terminals at SFB pursuant to a long-term management contract. The company paid $7.5 million towards cost of constructing Terminal B, which cost $27 million in total.[8]

Interstate 4 and the Central Florida Greeneway (SR 417), a toll road, are the primary highways providing regional access to the vicinity of the Sanford Airport from the north and south. State Route 46 provides access from the east via Interstate 95 and from the west via Interstate 4; however, completion of the new segment of SR 417 will significantly enhance access from the west. The State of Florida plans to expand SR 415 to a four-lane, limited access road, which would enhance access with southwest Volusia County and Daytona Beach.

Table II.1
COMPARATIVE DRIVING DISTANCES
ORLANDO INT'L AIRPORT (MCO) AND SANFORD INT'L AIRPORT (SFB)

Origin	Destination	Miles	Driving Time (Minutes)[1]	Routing
MCO	SFB	32	45	Via SR 417 (Greeneway)
MCO	Orlando City Center	12	20	Via SR 436
SFB		24	35	Via I-4
MCO	Daytona Beach City Center	67	80	Via I-4
SFB		44	60	Via I-4
MCO	Disney World[2]	23	35	Via SR 528 (Bee Line)
SFB		46	65	Via I-4
MCO	International Drive[3]	13	21	Via SR 528 (Bee Line)
SFB		34	50	Via I-4

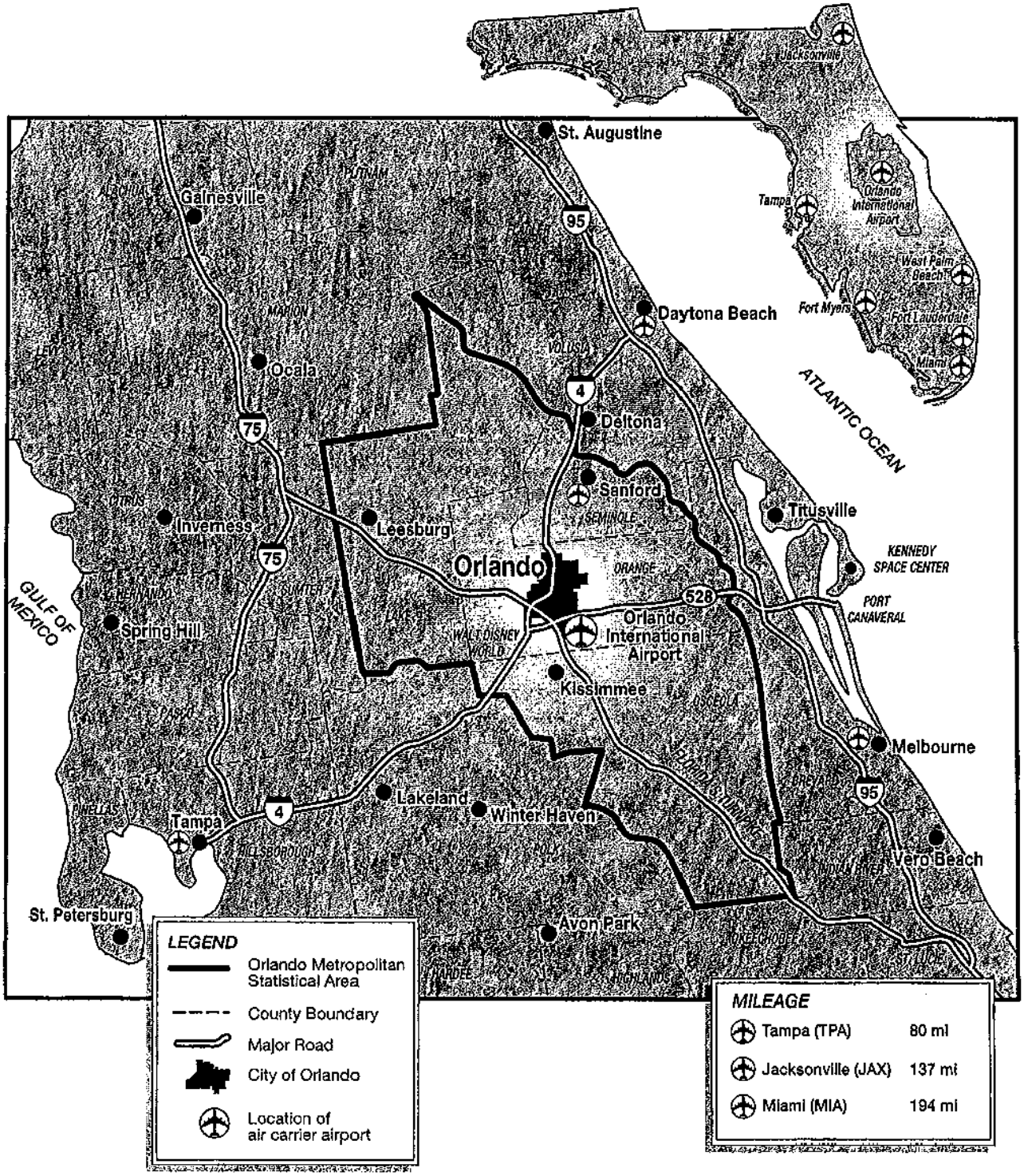
Sources: John F. Brown Company Inc.; Expedia Incorporated.

Notes:
1. Driving time during rush hours can be considerably longer.
2. Includes Magic Kingdom, EPCOT, MGM Studios, Typhoon Lagoon, Pleasure Island and Animal Kingdom.
3. Includes Universal Studios, Islands of Adventure, Sea World, Wet n Wild, as well as area convention centers and hotels.

7. The Sanford Airport Authority reports that Terminal B has a capacity of 3 million annual passengers.
8. The Sanford Airport Authority is currently asking the State of Florida to defer payments on several loans. The Sanford Airport Authority, which reported net property, plant, and equipment of $66.2 million in FY2001, had long-term debt of $16.5 million.

Figure 3

ORLANDO–MSA VICINITY MAP



PREPARED BY JOHN F. BROWN COMPANY, INC.

The structure of the Area economy is strongly oriented to the entertainment and hospitality sectors. The development of large and popular theme parks within the MSA, since 1972, has contributed to the Area's evolution as a world center for entertainment. In recent years, an emergent high-tech cluster has added a new and promising dimension to the Orlando Area economy.

C. DEMOGRAPHIC PROFILE

POPULATION

Orlando is the third most populous MSA in the state, accounting for approximately 10.3 percent of the state's 2000 population. The most populous MSA is Tampa – St. Petersburg – Clearwater, which includes Hillsborough, Hernando, Pasco, and Pinellas counties, with 15.0 percent; and second is Miami – Dade, with 14.1 percent. Orlando led the state in population growth through the 1990s and, according to the University of Florida Bureau of Economic and Business Research, should maintain that leading position for at least the next ten years.

The Orlando Area population increased at nearly five times the rate of increase for the nation from 1970 to 1980 (an average of 5.9 percent per year for Orlando compared to 1.2 percent growth for the nation), at about four times the national rate from 1980 to 1990, and more than double the national rate during the 1990s. (See Table II.2.) In addition, the Area population grew at twice the rate of state population growth over the past 30 years.

The strong population growth of the Orlando MSA between 1970 and 2000 was driven primarily by net population inflows. New residents have been attracted by the development of huge theme parks and of a promising high-tech industry cluster. The dynamic growth of these two industries has also contributed to the growth of other industries and service providers in the area.

Table II.2
POPULATION TRENDS
(In thousands)

	United States	Florida	Orlando MSA	Orlando as % of U.S.	Orlando as % of Florida
1960	179,979	4,952	338	0.19%	6.8%
1970	201,895	6,865	453	0.22	6.6
1980	227,225	9,840	805	0.35	8.9
1990	249,403	13,009	1,225	0.49	9.4
2000	282,125	16,087	1,662	0.59	10.3
2010F	306,615	18,967	2,062	0.67	10.9
Historical AAG:					
1960-1970	1.2%	3.3%	3.0%		
1970-1980	1.2	3.7	5.9		
1980-1990	0.9	2.8	4.3		
1990-2000	1.2	2.2	3.1		
Projected AAG:					
2000-2010	0.9%	1.7%	2.3%		

Sources: U.S. data—U.S. Department of Commerce, Bureau of Census;
Orlando and Florida data—University of Florida, Bureau of Economic and Business Research.
Notes: AAG=Average annual rate of growth. F=Forecast.

For the period through 2010, the University of Florida's Bureau of Economic and Business Research projects the Orlando MSA population to grow at about 2.3 percent per year, which is faster than the rate for the state as a whole and more than double the rate of national population growth.

The Orlando population is younger than the state population overall. Roughly two-thirds of Area residents are under the age of 45 compared to about 60 percent for the state. (See Table II.3.) In general, the age distribution in the Orlando Area resembles the national age distribution much more closely than that of Florida, which tends to be more heavily weighted by seniors.

Table II.3
AGE DISTRIBUTION
(2000)

	United States	Florida	Orlando MSA
19 and under	28.6%	25.3%	27.5%
20 – 34	20.9	18.8	21.9
35 – 54	29.4	28.5	29.7
55 – 64	8.6	9.8	8.5
65 and above	12.4	17.6	12.4
Total	100.0%	100.0%	100.0%
Median Age	35.3	38.7	35.3

Source: U.S. Department of Commerce, Bureau of the Census.

Participation rates for business and leisure air travel vary by age group. According to the Air Transport Association's *1998 Air Travel Survey* (latest data available), respondents aged between 35 and 54 accounted for 53 percent of reported air trips by adults, compared to persons aged between 18 and 34 who accounted for 28 percent and persons 55 years and over who accounted for 19 percent. The 35-to-54 age bracket was found to account for even a greater portion of business travel: of all reported business trips, 61 percent were taken by respondents aged between 35 and 54. The proportion of the Orlando Area's population in the 35-to-54 age bracket is 29.7 percent compared to 28.5 percent for the state, suggesting that the Orlando Area population may have a higher propensity than the rest of Florida to travel by air.

ETHNIC DIVERSITY

The Orlando Area has become more cosmopolitan in recent years. The increase in international visitors to the many Area tourist attractions has created a growing need for bilingual and multilingual employees. Most residents of foreign origin in the Orlando MSA are of Hispanic descent, whose share of total population doubled from 8.2 percent in the 1990 census to 16.5 percent in the 2000 census. Puerto Ricans now represent about 8.5 percent of the total Area population, followed by Mexicans with 2.0 percent and Cubans 1.1 percent. Hispanics of other nationalities constitute about 4.9 percent of the total. Their residence in the Orlando Area also generates international travel for visits with family and friends.

EDUCATION

The educational attainment of the Orlando MSA population generally compares favorably to that of the state and the nation. The 2000 Census statistics depict a well-educated work force. (See Table II.4.) About 85 percent of the population 25 years and over are high school graduates, compared to the state and the nation (each about 82 percent). At the same time, about 33 percent of

the Area population holds a college or university degree, compared to about 30 percent of state residents and less than 32 percent across the nation. The University of Central Florida (UCF), with 35,800 students, is the most important higher education institution in the Orlando MSA. Founded in 1963, UCF expects enrollment to exceed 48,000 by 2010.

Table II.4
EDUCATIONAL ATTAINMENT
Population 25 years and over
(percent of total)

	U.S.	Florida	Orlando MSA
Less than high school	18.4%	17.9%	15.0%
High school graduate	29.5	30.5	29.9
Some college, no degree	20.5	21.2	22.0
Associate Degree	6.5	7.2	8.0
Bachelor's Degree	16.1	15.1	17.6
Graduate or Professional Degree	9.0	8.1	7.5
	100.0%	100.0%	100.0%

Source: U.S. Department of Commerce, Bureau of the Census.

INCOME

Trends in the growth and distribution of income in the Orlando Area are a determining factor in locally-originating demand for air transportation. Growth of income can be attributed to the expansion of economic activity, which consists of increased output from existing firms and the creation of new businesses. The growth in business activity generates demand for business air travel. The income generated by increased economic activity leads to greater discretionary income of individuals, which in turn is positively related to demand for air transportation associated with leisure travel.

Since 1970, total real personal income (in 1996 dollars) in the Orlando MSA has expanded at a faster rate than for both the state and the nation. (See Table II.5.) The economy of the Orlando Area changed radically beginning in the 1970s, from one based primarily on agriculture to one based largely on entertainment and hospitality. The rapid rates of real personal income growth registered between 1970 and 1990 have been more moderate in the 1990s, although they are still higher than the growth rates shown by the U.S. and Florida as a whole. During the 1990s, the Orlando Area economy began to diversify into high-tech manufacturing and distribution of goods. The strategy for the development of those two sectors takes advantage of Orlando's ideal location at the center of the state and its proximity to aerospace and defense-related facilities in the Area.

The Orlando MSA ranks fifth in the state in total real personal income. Following the 2001-2002 national recession, personal income for the U.S., Florida, and the Orlando Area is projected to resume growth through 2010. The University of Florida Bureau of Economic and Business Research projects continued strong growth of personal income in the Orlando Area that will outperform both the state and the nation.

Table II.5
TOTAL PERSONAL INCOME TRENDS
(in millions of 1996 dollars)

Year	United States	Florida	Orlando MSA	Orlando as % of U.S.	Orlando as % of Florida
1970	$3,004,286	$97,312	$7,196	0.2%	7.4%
1980	4,209,201	176,347	13,972	0.3	7.9
1990	5,726,031	301,856	26,741	0.5	8.9
2000	7,737,351	418,356	41,165	0.5	9.8
2010F	10,627,775	629,430	66,394	0.6	10.5
Historical AAG:					
1970-1980	3.4%	6.1%	6.9%		
1980-1990	3.1	5.5	6.7		
1990-2000	3.1	3.3	4.4		
Projected AAG:					
2000-2010	3.2%	4.2%	4.9%		

Sources: U.S. data—U.S. Department of Commerce, Bureau of Economic Analysis; projections based on data from the U.S. Bureau of Labor Statistics.
Orlando and Florida data—University of Florida, Bureau of Economic Business Research.
Nominal figures adjusted by consumer spending deflator.
Notes: AAG=Average annual rate of growth. F=Forecast.

As shown in Table II.6, the Orlando Area's real personal income per capita in 2000 ($24,768) was 90 percent of the national average ($27,425) and 95 percent of the state average ($26,006). During the 1970s, the Area's growth in per capita income lagged significantly behind that of the state and the nation. That situation changed in subsequent years, as the entertainment and hospitality sectors began to expand.

The Area's slower real per capita income growth during the period 1990-2000 corresponds to a similar national and state-wide trend. The slower growth rate of real per capita income, compared to total personal income, can be attributed to the strong population growth. The slowdown observed during 1990-2000 also reflects a moderate decline in manufacturing employment in line with the State and the nation.

The projections for 2000-2010 show the Orlando Area's per capita personal income expanding at a slightly higher rate than the state and the nation. During this period, both Florida and Orlando return to their historical growth trend, after a dip in the previous decade. The University of Florida foresees stronger productivity growth during the 2000-2010 period as a determining factor in the higher growth of real per capita income.

Table II.6
PER CAPITA PERSONAL INCOME TRENDS
(In 1996 dollars)

	United States	Florida	Orlando MSA	Orlando as % of U.S.	Orlando as % of Florida
1970	$14,880	$14,175	$15,885	106.8%	112.1%
1980	18,524	17,921	17,357	93.7	96.9
1990	22,959	23,204	21,829	95.1	94.1
2000	27,494	26,177	25,024	91.0	95.6
2010F	34,662	33,405	32,199	93.0	96.4
Historical AAG:					
1970-1980	2.2%	2.4%	0.9%		
1980-1990	2.2	2.6	2.3		
1990-2000	1.8	1.2	1.4		
Projected AAG:					
2000-2010	2.3%	2.5%	2.6%		

Sources: U.S. data—U.S. Department of Commerce, Bureau of Economic Analysis; projections based on data from the U.S. Bureau of Labor Statistics.
Orlando and Florida data—University of Florida, Bureau of Economic Business Research.
Nominal figures adjusted by consumer spending deflator.
Notes: AAG=Average annual rate of growth. F=Forecast.

D. ECONOMIC BASE

One of the principal drivers of the Orlando economy is the national economy. The key sector of tourism is heavily reliant on U.S. visitors. The health of the U.S. economy is thus an instrumental factor in the demand for Orlando's goods and services.

The outlook for the local economy is very favorable throughout the forecast period. However, the onslaught of the national recession, which according to the National Bureau of Economic Research began in March 2001, and the events of September 11, which have taken a particularly heavy toll on the hospitality industry, have raised questions concerning possible deleterious long-term effects on visitor flow into the Orlando area. On the other hand, an unexpectedly strong GDP showing in the fourth quarter of 2001 is an indication that the recession may be brief and shallow. Year-end figures on hotel occupancy and visitors to the major theme parks have begun to show a recovery from the lows experienced after September 11. More importantly, enhanced security measures imposed by the federal government and complemented by similar actions by state and local governments may provide the basis for greater confidence in air travel and increased attendance at major theme parks.

Following the 2001-2002 recession, the U.S. economy is forecast to grow at an average rate of 3.1 percent during 2003-2010, which is somewhat slower than the 3.6 percent rate during the expansion period 1992-2000. The U.S. economic growth assumption is based on long-term projections issued in January 2002 by the Congressional Budget Office and the U.S. Bureau of Labor Statistics. As shown in the previous section, projected growth in real per capita income in the U.S. during 2000-2010 should average 2.3 percent per year. Recent testimony by the Chairman of the Federal Reserve at the semi-annual monetary policy report to the Congress before the Committee on

Financial Services on February 27, 2002, indicated that the 2001-2002 recession has not been as harsh as originally expected, and that a recovery in 2002 would result in GDP growth of 2.5 percent for the fourth quarter with respect to the same period in 2001, which is also in line with this forecast. Regarding the events of September 11 and subsequent recovery in business and consumer confidence in December, the Fed Chairman indicated that if the recovery does indeed occur during the first half of 2002, the U.S. will have experienced "a significantly milder downturn than the long history of business cycles would have led us to expect." Since Orlando is expected to outperform the nation in employment growth, the favorable national trend for the period 2003-2010 will be reflected in a similar positive trend for the Orlando economy.

EMPLOYMENT BY SECTOR

The economy of the Orlando area has expanded to create employment opportunities for its growing population. The Area outpaced Florida and the nation in the creation of non-agricultural employment over the past three decades. (See Table II.7.) During that period of time, employment grew strongly (averaging about 6 percent per year) compared to the U.S. (about 2 percent) and Florida (about 4 percent). Orlando's dynamic employment growth can be attributed largely to the development of several major theme parks starting in the 1970s.

Even though employment growth slowed during the 1990-2000 period, Orlando continued to outperform both the state and the nation. The Area ranks third in the number of jobs and second in employment growth in the state. According to the University of Florida's Bureau of Economic and Business Research, employment in the Orlando MSA will continue to outpace both the state and the nation through 2010.

Table II.7
TOTAL NON-AGRICULTURAL EMPLOYMENT TRENDS
(annual average, in thousands of jobs)

	United States	Florida	Orlando MSA	Orlando as % of U.S.	Orlando as % of Florida
1970	70,880	2,152	164	0.23%	7.6%
1980	90,406	3,579	313	0.35	8.7
1990	109,403	5,387	611	0.56	11.3
2000	131,759	7,076	908	0.69	12.8
2010F	154,425	8,608	1,181	0.76	13.7
Historical AAG:					
1970-1980	2.5%	5.2%	6.7%		
1980-1990	1.9	4.2	6.9		
1990-2000	1.9	2.8	4.0		
Forecast AAG:					
2000-2010	1.6%	2.0%	2.7%		

Sources: U.S. data: Historical and Forecast—U.S. Department of Labor, Bureau of Labor Statistics; Orlando and Florida data—University of Florida, Bureau of Economic Business Research.
Notes: AAG=Average annual rate of growth, F=Forecast.

The breakdown of non-agricultural employment figures in Table II.8 compares the structures of the economies of the Orlando MSA, the state, and the nation. The Area economy is oriented principally to the services (hospitality, amusement, recreation, personal services, business services, and health care) and trade sectors, which accounted for 43.5 and 24.1 percent, respectively, of the Area's 2000 non-agricultural employment.

The employment figures clearly depict Orlando's emergence as a world-class entertainment center during the 1970s, and the further development of the recreation and hospitality industries in the 1980s and 1990s. During these three decades, total employment expanded at average growth rates of 6.7, 6.9, and 4.0 percent respectively. This compares to lower rates of employment increases in the state (5.2 percent per year in the 1970s, 4.2 percent in the 1980s, and 2.8 percent in the 1990s) and across the nation (2.5, 1.9, and 1.9 percent). The engines of employment growth were the entertainment and hospitality sectors, as reflected by the very strong growth of services employment that increased at about 9 percent per annum, on average, between 1970 and 2000.

The trade sector also developed at a fast pace, with average annual growth of nearly 6 percent over the last 30 years. With more than 44 million square feet of retail stores, Orlando attracts many shoppers. Festival Bay, for example, has 1.1 million square feet of shops, restaurants and entertainment. The Millennium Mall, with over 150 upscale retail stores, will open in 2002.

The Orlando Area manufacturing sector expanded in the 1970s and 1980s, at a time when the nation's manufacturing sector was shrinking; however, the national manufacturing malaise finally caught up with the Orlando MSA in the 1990s. Although employment in that sector fell to about 50,200 in 1994 from 58,300 in 1990, it gradually climbed back to about 54,500 in 2001. Electronic equipment is the most important sub-sector, which reflects the rise of high-tech manufacturing in the Orlando area. Well-known high-tech firms located in the Orlando MSA include Lockheed Martin, Siemens ICN and Cirent Semiconductor. While total employment in manufacturing slipped during the 1990s, the emerging high-tech industry helped to increase the value-added generated by this sector.

Real estate is the most important activity within the FIRE (finance, insurance and real estate) sector in the Orlando Area, with about 34 percent of total employment in that sector. Business expansion in Orlando, especially related to entertainment, hospitality and high-tech, has been feeding the need for industrial, commercial and office space. According to the Economic Development Commission of Mid-Florida, Cushman and Wakefield includes Orlando among the most active office markets.

According to the Economic Development Commission of Orlando, companies with corporate headquarters located in the Orlando MSA include Automobile Association of America (AAA), ChepUSA, Dixon Ticonderoga, and Tupperware International.

Several of the largest foreign-owned companies in Florida are also located in the Orlando MSA: Hubbard Construction Company Inc. (France), Grand Cypress Florida Inc., operator of hotels and motels (Japan), Mivan Florida Inc, general contractors (Northern Ireland), Siemens Westinghouse Power Corp. turbines and generators (Germany), Enviroworks Inc., coated fabrics (Denmark), Wet N' Wild Florida, amusement park (Canada).

Table II.8
NON-AGRICULTURAL EMPLOYMENT DISTRIBUTION, BY INDUSTRY
(2000)

Area	Mfg	TPU	Trade	FIRE	Serv	Govt	Min Constr	Total
Orlando MSA	6.0%	4.9%	24.1%	5.6%	43.5%	10.2%	5.7%	100.0%
Florida	6.9	5.0	24.8	6.3	37.3	14.1	5.6	100.0
United States	14.0	5.3	23.0	5.7	30.7	15.7	5.5	100.0
EMPLOYEES BY INDUSTRY (in thousands)								
Orlando MSA								
1970	25.6	10.1	41.3	10.6	30.8	26.9	18.1	163.5
1980	40.2	16.6	82.5	21.9	82.4	47.0	22.0	312.8
1990	58.3	31.7	159.4	35.8	212.8	73.1	39.4	611.0
2000	54.7	44.1	218.9	50.8	395.0	92.3	51.6	907.9
Florida								
1970	322.5	154.4	545.9	131.3	416.2	397.8	184.0	2,152.0
1980	456.4	220.8	939.8	254.2	814.5	618.8	274.9	3,579.0
1990	522.1	278.4	1,444.0	370.7	1,593.0	846.7	332.1	5,387.0
2000	486.6	357.8	1,757.8	443.3	2,639.7	994.3	396.0	7,075.5
United States								
1970	19,367	4,515	15,040	3,645	11,548	12,554	4,211	70,880
1980	20,285	5,146	20,310	5,160	17,890	16,241	5,373	90,405
1990	19,076	5,777	25,774	6,709	27,934	18,304	5,829	109,403
2000	18,469	7,019	30,331	7,560	40,460	20,681	7,241	131,759
AVERAGE ANNUAL GROWTH BY INDUSTRY								
Orlando MSA								
1970-1980	4.6%	5.1%	7.2%	7.5%	10.3%	5.7%	2.0%	6.7%
1980-1990	3.8	6.7	6.8	5.0	10.0	4.5	6.0	6.9
1990-2000	-0.6	3.4	3.2	3.6	6.4	2.4	2.7	4.0
Florida								
1970-1980	3.5%	3.6%	5.6%	6.8%	6.9%	4.5%	4.1%	5.2%
1980-1990	1.4	2.3	4.4	3.8	6.9	3.2	1.9	4.2
1990-2000	-0.7	2.5	2.0	1.8	5.2	1.6	1.8	2.8
United States								
1970-1980	0.5%	1.3%	3.0%	3.5%	4.5%	2.6%	2.5%	2.5%
1980-1990	-0.6	1.2	2.4	2.7	4.6	1.2	0.8	1.9
1990-2000	-0.3	2.0	1.6	1.2	3.8	1.2	2.2	1.9

Source: U.S. Department of Labor, Bureau of Labor Statistics.
Notes: Estimates are currently projected from March 1994 benchmark levels.
Mfg=manufacturing; TPU=transportation and public utilities; FIRE=finance, insurance, and real estate.
Numbers may not sum to totals due to rounding.

Table II.9
MAJOR ORLANDO MSA EMPLOYERS

Name	Industry	Employees
Walt Disney World Company	Entertainment	55,000
Florida Hospital	Health Care	12,800
Universal Orlando	Entertainment	12,000
Orlando Regional Healthcare	Health Care	12,000
Lockheed Martin	Mfg - Defense	5,053
Central Florida Investments	Finance	5,000
University of Central Florida	Education	4,808
Darden Restaurants	Restaurant	4,675
Sprint	Telecommunications	4,295
SeaWorld of Florida	Entertainment	4,000
AT&T Wireless	Telecommunications	3,298
SunTrust	Banking	3,473
Siemens ICN	Telecommunications	3,200
BellSouth	Telecommunications	3,275
Valencia Community College	Education	2,440
Orlando Utilities Commission	Utility	1,025

Source: Economic Development Commission of Mid-Florida, 2001.

TOURISM—LEISURE AND BUSINESS

A total of 43.2 million visitors traveled to the Orlando MSA by all modes of transport in 2000, up 1.6 percent over the 1999 total. (See Table II.10.) During the 1995-2000 period, visitor trips to Orlando grew at nearly 6 percent per year. Domestic visitors increased at 6.2 percent per year, while international visitors grew at an annual average of 3.0 percent. In 2000, 8.6 percent of the total visitors hailed from outside the U.S. According to the Orlando Convention and Visitors Bureau (CVB), the majority of international visitors were from the U.K and Western Europe, accounting for 61.6 percent of total international visitors, while South America (21.9 percent) and Asia (5.3 percent) made up much of the remainder.

Table II.10
VISITORS TO ORLANDO MSA
(in thousands)

Sector Type of Visit				% of Total		
U.S. Origin	1992	1995	2000	1992	1995	2000
Domestic	23,478	29,205	39,533	85.3%	90.1%	91.4%
Leisure	18,604	22,653	30,595	67.6	69.9	70.7
Florida	*10,956*	*11,715*	*15,484*	*39.8*	*36.1*	*35.8*
Non-Florida	*7,647*	*10,937*	*15,111*	*27.8*	*33.8*	*34.9*
Business	4,875	6,553	8,938	17.7	20.2	20.7
Florida	*2,909*	*4,067*	*4,327*	*10.6*	*12.5*	*10.0*
Non-Florida	*1,966*	*2,485*	*4,611*	*7.1*	*7.7*	*10.7*
International	4,052	3,202	3,730	14.7	9.9	8.6
Total	27,530	32,407	43,263	100.0%	100.0%	100.0%

Sources: D.K. Shifflet & Associates; U.S. Department of Commerce, Tourism Industries; Orlando CVB Research Department

Of the domestic visitors, those traveling to Orlando for leisure reasons accounted for 77 percent of the total, with the remainder (23 percent) visiting on business. The top five non-Florida cities of origin were New York, Boston/Manchester, Atlanta, Philadelphia and Chicago.

International visitors to Orlando accounted for about 9 percent of total visitors in 2000, originating principally in the U.K. and Europe, followed by Canada and Latin America. The top five countries were the U.K., which accounted for 1.3 million visitors, Canada (660,000), Brazil (192,000), Germany (154,000), and Argentina (145,000). Many visitors from Latin America enter the U.S. through Miami, and then either drive to Orlando or connect to a domestic flight.

According to the Orlando CVB, the majority (83 percent) of overseas travelers in 2000 visited for leisure purposes (amusement/theme parks, shopping, and dining). Orlando was the third most popular U.S. destination for overseas visitors, with 11.6 percent of the total, after New York (22.0 percent) and Los Angeles (13.6 percent).

One of the factors explaining the swings in international visitors to Orlando is the fluctuation in the value of the individual foreign currencies. Demand for tourism services is driven by both disposable income and the costs associated with travel and visiting individual destinations. Therefore, the flow of international visitors to Orlando is sensitive to fluctuations in currency values. Based on the principal markets, the relevant currencies would include: the Euro, the Canadian dollar, and the Brazilian Real. In the case of the European market, the cost of one U.S. dollar increased from 0.861 Euros in January of 1999, to a peak of 1.172 Euros in June 2001, or a 36 percent increase in costs to a European visitor. As the U.S. dollar become more expensive for European visitors, their demand for travel to the U.S. and Orlando has diminished. On the other hand, a depreciation of the U.S. dollar would lower the Euro – U.S. dollar rate, and thus encourage more Europeans to visit attractions in Orlando.

According to the Orlando CVB, visitors contributed $20.9 billion in economic impact to the Orlando MSA in the year 2000. The key characteristics of Orlando MSA visitors in 2000 are shown in Table II.11.

Table II.11
ORLANDO MSA VISITOR CHARACTERISTICS
(2000)

Characteristics	Domestic-Leisure	Domestic-Business	International
Average Nights Stayed	4.8	3.9	9.7
Average Party Size	2.9	1.8	2.4
Spending per Visitor	$570	$879	$760
Expenditures per Party	$1,653	$1,582	$1,824
Economic Impact (billions)	$15.0	$3.6	$2.3

Source: Orlando CVB Research Department

ACCOMMODATIONS

The 2000 year-end room count for the Orlando MSA was nearly 103,000, up 4 percent from the 1999 total. The supply of rooms has kept pace with growing demand. (See Table II.12.) Over the past ten years, demand, supply and average room rates all increased at about 3 percent per year on average, and the occupancy rates averaged consistently above the 70 percent mark. However, this

trend was temporarily halted in 2001. The overall occupancy rate in the Orlando MSA fell to 64.3 percent in 2001, versus 72.6 percent in 2000. Reflecting the recessionary pressures in the country, occupancy rates in the six months prior to September 11, were, on average, 6 percentage points below previous year's levels. During September through November 2001, occupancy rates plunged to 16 percentage points below the previous year's levels. December marked the start of a recovery, as the average occupancy rate was only 6.5 percentage points below the level in the previous year.

Table II.12
ORLANDO MSA HOTEL OCCUPANCY

Year	No. of Rooms	Room Nights Available	Room Nights Occupied	Occupancy	Average Daily Rate	Revenue per Room
1980	32,200	11,785,200	8,249,640	70.0%	$34.00	$23.80
1985	52,783	19,265,795	12,715,425	66.0	51.00	33.66
1990	76,260	26,623,114	20,088,201	75.5	66.20	49.98
1995	84,327	30,387,345	22,652,295	74.6	68.55	51.14
2000	102,821	36,873,956	26,701,934	72.6	89.83	65.22
1990-2000 AAG		3.3%	3.0%		3.2%	2.9%

Source: Orlando CVB.
Notes: Revenue per room equals Average Daily Rate times Occupancy percentage.
AAG=Average annual rate of growth.

Tourism—Leisure

Orlando is one of the primary tourist destinations in the U.S. With its focus on entertainment-based theme parks, the Orlando MSA has garnered a significant share of the U.S. travel market and is also a popular destination for international visitors. According to the Orlando/Orange County Convention Bureau:

- Tourism/recreation contributes $50.72 billion in taxable sales for Florida
- Travel-related employment represents 12 percent of state-wide employment in Florida
- The typical U.S. family vacationing in Florida spends almost $208 in taxes (6 percent sales tax, $2/day rental car surcharge, 5 percent hotel charge for tourist development tax, and $3/outbound passenger airport fee) during its 5-day stay

The tourism industry in the Orlando MSA has maintained consistently positive growth for the past three decades. According to Orlando-based Fishkind & Associates, total direct employment in the tourism industry was 126,000 in 2000, while indirect employment was 85,000, for a total of 211,000, or 23 percent of total non-agricultural employment in the Orlando MSA. As industries across the country experienced a downturn after the September 11 terrorist attacks, tourism was one of the hardest-hit industries, with Central Florida and Las Vegas suffering the biggest losses. In the aftermath, more than 1,500 hotel and restaurant workers in the Orlando Area lost their jobs. The unemployment rate jumped to 4.8 percent in November. Driven by heavy discounting, hotel earnings are significantly below prior year levels, despite a slow up-tick in occupancy rates. In the Orlando area, room rates have been discounted by 20 to 50 percent, according to the President of the Hotel Motel Association of Central Florida. On the other hand, the expected turnaround of the U.S. economy in 2002, combined with greater attention to security needs of travelers, bodes well for a recovery in the tourism sector.

ATTRACTIONS

As shown in Table II.13, seven of the top 10 theme parks in the U.S. are located in the Orlando MSA.

Table II.13
U.S. THEME PARK LEADERS

		Attendees (Millions)		
Park	Location	1999	2000	2001
Magic Kingdom	Orlando MSA	15.2	15.4	14.8
Disneyland	Anaheim, CA	13.5	13.9	12.4
EPCOT	Orlando MSA	10.1	10.6	9.0
Disney-MGM Studios	Orlando MSA	8.7	8.9	8.4
Animal Kingdom	Orlando MSA	8.6	8.3	7.8
Universal Studios	Orlando MSA	8.1	8.1	7.3
Islands of Adventure	Orlando MSA	3.4	6.0	5.5
SeaWorld Orlando	Orlando MSA	4.7	5.2	5.1
Disney's California Adventure[1]	Anaheim, CA	-	-	5.0
Universal Studios	Universal City, CA	5.1	5.2	4.7

Source: Amusement Business Magazine.
Notes: 1. Opened in 2001.

Table II.14 summarizes the attendance at major Orlando theme parks since 1980. The Disney Company's market share has declined as more attractions were added; its biggest competitor is Universal Studios. In 1980, Disney's share was 82 percent of total park attendance and, by 2001, this share had dropped to 67 percent. At the same time, the lower rate of growth of visitors to Disney parks in the 1990s reflects the longevity of this attraction, which first opened for business in the early 1970s. Even with increased competition, however, Disney still had a dominant share among the major players. During the 1990s, total visitors to the major theme parks grew by 5.9 percent per year. The U.S. economic recession, exacerbated by the disaster of September 11, led to an 8 percent decline in visitor arrivals to Orlando in 2001.

Table II.14
ATTENDANCE AT MAJOR ORLANDO THEME PARKS

	Attendees (000s)				2001
Theme Park	1980	1990	2000	2001	Share (%)
Walt Disney World*	13,783	28,400	43,260	39,902	67.0
Universal Orlando**		2,800	14,100	12,810	21.5
SeaWorld	3,023	3,994	5,200	5,100	8.6
Wet 'n Wild	n.a.	1,130	1,300	1,326	2.2
Gatorland	n.a.	n.a.	400	400	0.7
Totals	16,806	36,324	64,260	59,538	100
Percent Change, 2001 vs. 2000				-8.0%	

Source: Amusement Business Magazine, G.J. Williams & Associates estimates.
Notes: *Includes Magic Kingdom, EPCOT, MGM Studios, Typhoon Lagoon, Pleasure Island and Animal Kingdom in 1980 and in 1990, but excludes Typhoon Lagoon and Pleasure Island in 2000 and 2001.
**Includes Islands of Adventure, which opened in 1999.
The numbers shown above represent park attendance. An individual visiting two or more parks will show in each park's attendance figures.
n.a.=not available.

The principal tourist attractions in Orlando MSA include the following:

Magic Kingdom

Magic Kingdom is the centerpiece of Walt Disney World. The visitor is treated to a number of rides and revues including Space Mountain, Thunder Mountain, Splash Mountain and many others. Magic Kingdom was the first theme park in Orlando when it opened in 1972. The park had 15.4 million visitors in 2000, and is the most popular attraction in the U.S.

EPCOT Center

EPCOT Center, another Disney theme park, provides a showcase of technology and foreign cultures in Future World and World Showcase. In Future World, the visitor can explore new technologies and find adventure at sites such as Test Track and Honey I Shrunk the Audience. A stroll through World Showcase allows the sampling of cultures, architecture and dining from throughout the world. EPCOT Center opened in October 1982, and has averaged 10.4 million visitors annually since that time.

Animal Kingdom

Animal Kingdom, opened in April 1998, is Disney's newest theme park. The attraction areas include Africa, Asia, and Safari Village. Animals on show include zebras, tigers, lions and elephants on the Kilimanjaro Safari and gorillas and hippos on the Pangani Exploration trail. Visitors to the park numbered 8.3 million in 2000.

Disney's MGM Studios

Visitors to the Disney-MGM studios experience the movies at a full production studio. Visitors learn about the movie-making process at sites such as Indiana Jones Epic Stunt Spectacular and the Backstage Studio Tour. Disney-MGM opened in May 1989, and has averaged about 9 million visitors annually.

Universal Studios Florida

Universal is a working TV and movie production studio where visitors experience movie-themed rides—such as Kongfrontation, Back to the Future-The Ride, and Terminator 2: 3D—and view behind-the-scenes making of films such as Alfred Hitchcock: The Art of Making Movies. Universal Studios Florida opened in June 1990. Park visitors numbered 8.1 million in 2000.

Universal Studios Islands of Adventure

Islands of Adventure offers visitors five themed islands with high-tech thrill rides and attractions with favorite cartoon characters. The park opened in the summer of 1999 and had 6 million visitors in 2000.

SeaWorld

SeaWorld is an aquatic theme park where frequent daily shows allow guests to see killer whales, dolphins, walruses, penguins and others. SeaWorld opened in 1974, and was bought by

Anheuser-Busch in 1989.Anheuser-Busch added new attractions and revamped others to make the experience both fun and educational. SeaWorld had 5.2 million visitors in 2000.

Wet 'n Wild

Located in the heart of the tourist district on International Drive, Wet 'n Wild offers a wide array of water-based rides and attractions for all ages. Opened in March 1977, the park was recognized by Amusement Business Magazine as the nation's best-attended water park. Wet 'n Wild has averaged 1.3 million visitors annually through the 1990s and early 2000s.

Gatorland

Gatorland is Florida's largest alligator attraction. Spread out over 50 acres, Gatorland is a functioning commercial alligator farm as well as an educational resource. A visitor can learn about crocodiles, alligators and other wildlife through displays and live shows performed throughout the day. Gatorland opened in 1949, and has had 400,000 visitors in each of the last two years.

ARTS AND CULTURE

The Orlando MSA is home to many cultural attractions. A listing of the major cultural sites, and attendance figures for the latest year, are included in Table II.15. A summary of selected cultural activities follows:

Table II.15
ORLANDO MSA MUSEUMS AND SCIENCE CENTERS

Name	2000 Attendance
Orlando Science Center	419,282
Fort Christmas Historical Park	148,217
Orlando Museum of Art	113,968
Maitland Art Center	70,266
Morse Museum of American Art	62,000
Holocaust Memorial Center	40,000
Flying Tigers Warbird Museum	30,000
Cornell Fine Arts Museum	25,468
Orange County Regional History Center	25,000
Winter Garden Heritage Museum	25,000
Maitland Historical Society	11,000
Menello Museum of American Folk Art	10,000
Zora Neale Hurston Museum	10,000
Albin Polasek Museum	8,000
Winter Park Historical Museum	3,257

Source: Orlando Business Journal 2002 Book of Lists.

SPORTS

The Orlando MSA is home to a number of sports events and facilities. For the golfer, there are more than 80 courses that can be played year-round. The Orlando MSA hosts two events on the PGA Tour: The Bay Hill Invitational and the Walt Disney World Classic. Orlando is home to two professional basketball teams: the Orlando Magic of the NBA and Orlando Miracle of the WNBA. Major football games played in Orlando are the Citrus Bowl, Tangerine Bowl, and Florida Classic.

The Walt Disney World Wide World of Sports Complex hosts more than 40 different sports at its facility. The goal is to allow athletes from all over the world to compete against each other on professional quality playing surfaces designed to give athletes of all ages the ability to perform at the highest level. The large majority of competitors at these events travel from outside the state to participate.

Disney's Wide World of Sports Baseball Complex is the spring training home of the Atlanta Braves as well as the home field of the Orlando Rays, the Class AA affiliate of the Tampa Bay Devil Rays. The baseball stadium has over 9,000 seats and is the largest of all the major league baseball Spring training sites.

The Walt Disney 200, held at the Walt Disney World International Speedway, is the opening race for the Indy Racing League. The race attracts approximately 30,000 fans annually.

CRUISES

Cruise ship passengers through Port Canaveral, the world's second busiest cruise port, increased from 900,000 passengers in 1990 to 3.5 million in 2001. Although cruise activity at Port Canaveral started in the mid 1980s, the most significant traffic growth occurred during the latter half of the 1990s. (See Table II.16.) The number of passengers fell in 2001, because of the national recession and the events of September 11. Six cruise lines, including Disney Cruise Line, operate out of Port Canaveral year-round. Six cruise terminals are in operation, and two more are under consideration. Many out-of-state cruise ship passengers arrive and depart Florida via Orlando International Airport.

Table II. 16
CRUISE SHIP PASSENGERS
PORT CANAVERAL
(embarkation and debarkation)

	Cruise Ship Passengers	Percentage Change
1990	900,484	
1991	1,040,046	15.5%
1992	1,049,072	0.9
1993	1,070,343	2.0
1994	891,529	-16.7
1995	1,018,144	14.2
1996	1,135,724	11.5
1997	1,458,655	28.4
1998	1,852,117	27.0
1999	2,902,479	56.7
2000	3,839,049	32.3
2001	3,548,379	-7.6
AAG:		
1990-2000	15.6%	

Source: Canaveral Port Authority.
Note: AAG=Average annual rate of growth.

TOURISM—BUSINESS

As shown in Table II.17, almost 9 million visitors came to Orlando for business purposes in 2000, using all modes of transport. This figure represents an increase of 9.3 percent over the 1999 figure. Business travel is further segmented into group meetings (convention, seminar/training, or other group meetings) and transient business. Transient business travel is comprised of two components: residents who travel to other locations on business, and non-residents who come to the area in order to conduct specific business activities with companies located in the Orlando area. Group meetings experienced strong growth over the past few years (9.5 percent in 1999 and 17.4 percent in 2000), while the transient business component showed a 3.4 percent increase in 1999, followed by a decline of 2.6 percent in 2000.

Table II.17
BUSINESS TRAVEL TO ORLANDO

	Travelers (000s)			% Change from Prev. Year	
Purpose	1998	1999	2000	1999	2000
Group Meetings	4,420	4,840	5,683	9.5%	17.4%
Transient Business	3,230	3,340	3,254	3.4	-2.6
Totals	7,650	8,180	8,937	6.9%	9.2%

Source: D.K. Shifflet & Associates

Group Meetings

The wealth of convention and meeting space, and the available diversions for families of convention attendees, together maintain Orlando on the short list of convention and meeting planners. The Orlando/Orange County Convention Bureau estimates that 2.33 million and 3.67 million visitors, respectively, came to the Orlando Area in 1995 and 2000 for meetings and conventions.

The primary facility in the region is the Orange County Convention Center (OCCC). Ranked as one of the nation's top convention facilities by Tradeshow Week, OCCC has 1.1 million square feet of exhibition space and 313,000 square feet of meeting room space available. The OCCC is undergoing an expansion that will increase exhibition space by 1.0 million square feet to 2.1 million, and meeting room space by approximately 180,000 square feet to 492,000. . When completed in late 2003, the complex will have a total of 2.6 million square feet of exhibition and meeting room space. OCCC has 116 definite bookings and 56 tentative groups scheduled to utilize that space. It is expected that these conventions will attract 3 million attendees to the International Drive area and will generate $3.6 billion dollars in direct spending in the Orlando area.

Table II.18 shows group-meeting visitors to the OCCC in selected years between 1983 and 2000.The totals shown in the table are aggregates of Conventions & Tradeshows, Consumer Shows, Banquets, Meetings, and Public Ticketed Events. There has been a steady increase in the number of attendees, with an especially marked increase in the five-year period between 1995 and 2000, when the number of attendees grew at an average rate of 8.1 percent per annum. The growth in total convention activity was led by conventions and trade shows, with consumer shows, banquets, meetings and public ticketed events posting moderate growth during that period. More than two-thirds of all attendees during 1985-2000 were associated with conventions and trade shows. Another important trend has been the growth in the number of attendees per event, which grew from 3,700 in 1985 to over 5,000 in 2000. Planned expansions in convention center facilities due in the Fall of 2003 may result in further increases in event attendance.

Table II.18
ORANGE COUNTY CONVENTION CENTER ACTIVITY, SELECTED YEARS

Year	Number of Events	Attendees	Attendees/ Event
1985	135	500,571	3,708
1990	239	596,050	2,494
1995	168	700,429	4,169
2000	205	1,035,353	5,050

Source: Orlando Convention and Visitors Bureau.

In addition to the purpose-built OCCC, many of the larger hotels in the Orlando Area have space allocated for conventions and group meetings. (See Table II.19.)

Table II.19
LARGEST CONVENTION HOTELS IN THE ORLANDO MSA

Hotel	Meeting Space (Sq. Ft.)
Gaylord Palms Resort and Convention Center	400,000
Walt Disney World Swan and Dolphin	257,800
Orlando World Center Marriott	214,000
Renaissance Orlando Resort at SeaWorld	185,000
The Rosen Center Hotel	106,000
Disney's Coronado Springs Resort	95,000
Disney's Contemporary Resort	90,000
Wyndham Palace Resort and Spa	90,000
Portofino Bay Hotel at Universal Studios	77,000
Sheraton World Resort	75,000
Disney's Yacht and Beach Club Resorts	73,000
Caribe Royale Resort Suites and Villas	65,000
Hyatt Regency Grand Cypress	65,000
Hilton at Walt Disney World Resort	64,000
Radisson Hotel Orlando	60,000
The Rosen Plaza Hotel	60,000
The Peabody Orlando	57,000
Hyatt Orlando	55,000
Hyatt Regency Orlando Int'l Airport	42,000
Disney's Grand Floridian	40,000
Wyndham Orlando Resort	30,000

Source: Orlando Business Journal 2002 Book of Lists.

Osceola County is showing confidence in the convention market by supporting a plan to develop a convention center. The plan that has been placed before the Osceola County Commission, which has already approved an initial search for a developer, calls for a 486,000 sq. ft. facility with 250,000 sq. ft. of exhibit space and 37,500 sq. ft. of meeting space.

Transient Business

This market segment has benefited from the dynamic expansion of the Orlando economy. Strong growth in population and employment during the 1970-2000 period has contributed to the expansion in business travel. The engine of growth has been a world-class tourism industry, with additional impetus from a strong defense and high-tech sector. This type of travel is correlated with the growth in business activity, and the projection that the growth rate of the Orlando economy will exceed that of the state and the nation will be similarly reflected in faster growth of business travel. A competitive cost environment has also favored the Orlando economy in attracting new businesses, which in turn generate additional travel demand.

OTHER SECTORS

High Technology

The Orlando MSA is part of Florida's high-tech corridor that stretches from Sarasota on the Gulf coast and runs along Interstate 4, across the center of the state, to Daytona Beach on the Atlantic coast. The high-tech industry in Orlando was initially propelled by the defense and aerospace industry in the 1950s. Two pioneering firms in the area were Martin Marietta and Lockheed Martin, which also served as important incubators for spin-off companies. The principal clusters for Orlando's high-tech sector are optics and photonics, modeling/simulation/training, information technology, and microelectronics. Prestigious industry leaders such as Lockheed Martin, Siemens Telecom Network, Siemens Westinghouse Power Generation, Convergys, Veritas, Bell South, AT&T and Sprint Communications lead the list of companies that have helped to establish the Central Florida high-tech corridor.

The defense industry has contributed to the development of the high-tech sector in Orlando. Most of the firms are located in Orange County and include manufacturers of ammunition, small arms, tanks, guided missiles, and space vehicles. The principal employer is Lockheed Martin. The U.S. government's decision to substantially increase defense spending, following September 11, should have a favorable impact on Orlando's defense-related companies.

Modeling, simulation, and training technologies evolved out of defense spending in the 1960s, with the establishment of the Army and Navy simulation and training systems commands in Orlando. The development of major theme parks in the Area provided further impetus to the development of simulation technologies for theme park rides and virtual reality games, especially at Disney World and at MGM and Universal Studios. The Central Florida Research Park, located adjacent to the University of Central Florida, has served as an important incubator of new technologies. Other software applications developed by Orlando firms include financial management, database management, and billing systems. Growing enrollment at the University of Central Florida's computer science and computer engineering programs bodes well for the availability of a well-trained technical workforce.

During the past decade, the telecommunications industry in the U.S. surged as a result of technological innovations, market deregulation, and strong market expansion. The Orlando Area's telecommunications sector is concentrated in Seminole County. Major employers include BellSouth, Siemens, Time Warner Entertainment, Sprint, and AT&T. The services provided by these companies include missile tracking for the defense industry, cable television, and telephone communications.

Orlando is successfully developing its semiconductor manufacturing capabilities. There are currently 2,600 workers employed in 18 companies, concentrated primarily in Orange County. The top employer is Cirent Semiconductor, with approximately 1,600 employees.

International Trade

International trade has benefited from the development of Orlando's manufacturing industries, particularly high-tech manufacturers. Total exports processed at Orlando International Airport in 2000 were $537.8 million. During 1995-2000 the value of exports increased at an average of 9.5 percent per year. The Airport is strategically located to serve the European, Latin American, and Caribbean markets.

Traditionally, Europe has been the principal trading partner for Orlando. Approximately 75 percent of total exports go to Europe, with more than half destined for the U.K. (See Table II.20.) In addition to the U.K. the other principal European markets are Germany, Ireland, Italy, and the Netherlands. Within Latin America, the largest Orlando export market is Brazil, with about 2.5 percent of total exports. Imports processed at the Airport reflect a similar geographical pattern. Orlando's principal commodity exports reflect the local manufacturing base, namely, measuring equipment, telecommunications equipment, semiconductors, and optical equipment.

With a population of 376.4 million, the European Union (EU) is the second largest global market after North America. The EU is comprised of Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, and the U.K. As part of the currency unification program, the Euro Area was established in January 1999, when the euro was introduced; participating members of the Euro Area are Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxembourg, Netherlands, Portugal, and Spain. Greece joined in January 2001. In 2000, the U.K., Orlando's most important trading partner, was the fourth most important trading partner for the U.S. with total trade of $85 billion.

With a population in 2000 of 515.6 million, and a GDP of about $2.0 trillion, Latin America is a major market with strong trade linkages with the rest of the world. During 1990-99, GDP growth averaged 3.0 percent per year. The establishment of the North American Free Trade Agreement (NAFTA) between the U.S., Canada, and Mexico in 1994 has strengthened trade relations between Florida and Mexico. Because of its strategic geographic location, the Airport stands to benefit from the growing volume of trade between Latin America and the rest of the world.

Table II.20
2000 INTERNATIONAL AIR CARGO
Clearing Customs at Orlando International Airport
(in millions of US dollars)

Exports to:	Air Cargo	Imports from:	Air Cargo
United Kingdom	292.1	United Kingdom	314.0
Ireland	33.4	Federal Republic of Germany	59.7
Italy	19.4	Italy	23.9
Federal Republic of Germany	17.5	Israel	23.5
Malaysia	16.2	France	19.6
Netherlands	15.9	Ireland	18.8
Saudi Arabia	13.9	Netherlands	14.9
Armenia	12.6	Denmark	14.4
Brazil	11.7	Brazil	11.0
Norway	7.5	Belgium	9.3

Source: U.S. Department of Commerce.

E. ASSUMPTIONS RELATED TO THE AIR TRAFFIC FORECAST

For purposes of the air traffic forecast, this report assumes the following:

- The growth of the Orlando MSA population will exceed that of the state and the nation, with resulting positive implications for resident travel.
- The expansion of existing theme parks will contribute to healthy growth of visitors to these attractions. Attendance at the parks will grow at about one to two percentage points lower than the corresponding growth rate in the 1990s.
- The high-tech industry will continue to support economic development in Orlando. Increases in defense spending in the U.S. will benefit the defense-related high-tech sector.
- The growth in working-age population, combined with a competitive cost structure, will enable Orlando to continue to attract new businesses, especially high-tech manufacturing and services.
- The outlook for the local economy is very favorable throughout the forecast period. However, the events of September 11, which took a particularly heavy toll on the hospitality industry during the fourth quarter of 2001, have raised questions concerning possible deleterious long-term effects on visitor flow into the Orlando MSA. We believe that the events of September 11 will have minimal, if any, long-term impact on the flow of visitors to Orlando.
- Following the 2001-2002 recession, the U.S. economy will expand at a moderately slower rate than in the expansion period of the 1990s, nevertheless Orlando should expand at a faster pace than the national economy.
- Growth in Europe is expected to pick up as in the U.S. but with a lag. Thus growth is expected to slow down again in 2002, followed by a moderate recovery in 2003. Nevertheless, given the sensitivity of many European visitors to changes in currency values, future swings in exchange rates will contribute to some volatility in the growth of this market segment.
- The Latin American and Caribbean region will expand at a moderately higher rate than during the 1990s. Thanks to successful economic and political reforms, growth in the region will be more stable, with lower currency volatility, and diminishing inflation. These factors will contribute to growth in international visitors from the region at a rate at least equal to the 1995-2000 average.

APPENDIX G

AIRPORT MASTER PLAN UPDATE
ORLANDO INTERNATIONAL AIRPORT

AUG 29 2003
614

Copy 600
610
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program managers

U.S. Department of Transportation
Federal Aviation Administration

Memorandum

Subject: INFORMATION: Engineering Brief No. 63 Use of Non-Standard 75-Foot-Wide Straight Taxiway Sections for Airbus A380 Taxiing Operations

Date: AUG - 4 2003

From: Director of Airport Safety and Standards, AAS-1

Reply to Attn. of:

To: All Regions
Attn: Manager, Airports Division

Engineering Brief No. 63, "Use of Non-Standard 75-Foot Wide Straight Taxiway Sections for Airbus A380 Taxiing Operations," is attached. Approval authority for modifications to standards complying with the specific conditions of this engineering brief is delegated to the Regional Office level. In general, the specific conditions cover operational restrictions on the A380, taxiway designs, and safety issues such as jet blast, that may occur along the designated A380 taxiing route(s).

When you approve a modification to standards using this engineering brief, please provide a copy to the Airport Engineering Division, AAS-100.

J. R. White for

David L. Bennett
Director of Airport Safety and
Standards, AAS-1

Attachment

ENGINEERING BRIEF NO. 63

USE OF NON-STANDARD 75-FOOT-WIDE STRAIGHT TAXIWAY SECTIONS FOR AIRBUS 380 TAXIING OPERATIONS

August 2003

A. BACKGROUND

Within the next few years, we expect several U.S. airports to receive Airbus A380 aircraft, starting with a passenger version in late 2005 and followed by a freighter derivative in 2008. The airplane, categorized as a Design Group (DG) VI airplane, is the largest commercial airplane expected to serve the United States.

In Advisory Circular 150/5300-13, *Airport Design*, the FAA recommends taxiway straight section widths of 100 feet for DG VI aircraft. Most existing taxiway systems at affected airports, however, were built to DG V standards, with recommended taxiway straight section widths of 75 feet.

In an effort to mitigate impacts, the Airport Engineering Division, AAS-100, in 1999 ran field tests that focused on taxiway widths for straight sections. These field tests measured the wander rate of Boeing 747 airplanes from the taxiway centerline of 75-foot taxiways to determine if it would be possible to reduce the 100-foot taxiway width standard for all DG-VI-airplanes. Concurrently, Airbus Industries informed the FAA that it would equip the A380 with a taxiing camera system (TCS) to assist the flight crew in taxiing.

Based on the preliminary field test results and the availability of the TCS, we have determined that it is possible to allow the use of existing non-standard 75-foot-wide straight taxiway sections by this airplane on an interim basis under specific conditions. The conditions outlined below are necessary to ensure the safety of the passengers and crew and to prevent aircraft damage due to large excursions from the taxiway centerline. One of these conditions is that airport authorities must submit for FAA review proposed designated A380 taxiway routes.

B. PURPOSE

This engineering brief is provided to allow Regional Division Managers to approve modifications to standards for A380 taxi routes using 75-foot-wide straight taxiway sections.

This guidance applies to existing taxiways only. New construction should comply with DG-VI standards.

C. DEFINITIONS

1. **Interim Basis.** A 5-year evaluation period to observe the in-service taxiing characteristics of A380s.
2. **Overall Taxiway Width.** The sum of the widths of the shoulders and full-strength taxiway pavement.
3. **Taxiing Camera System.** A TCS installed on A380s that is available to assist flight crews during taxiing.

D. SPECIFIC CONDITIONS

Approval of modifications to standards for the use of 75-foot wide straight taxiway sections by A380 aircraft are subject to the conditions detailed below.

1. **Taxi Routes.** Proposed taxi routes must be designated by the airport authority.

2. **Taxiing Speed.** Taxiing speed for A380s is limited to *taxilane* speed criteria, i.e., a maximum of 15 mph. If a section of a taxiway route has an imposed lower taxiway speed, then it shall apply to the A380. Research from the sites evaluating Boeing 747 taxiway centerline wander rates demonstrated comparable taxiing speeds.

3. **Taxiing Camera System (TCS):** A380s will be equipped with a TCS.

4. **Taxiway Centerline Lighting:** Taxiway centerline lighting shall meet the longitudinal spacing requirements detailed in Table #1 of AC 150/5340-28, *Low Visibility Taxiway Lighting Systems*, for below 1200 feet RVR.

5. **Overall Taxiway Width.** The overall taxiway width must be at least 180 feet. Airports must construct the additional shoulder width in accordance with AC 150/5300-13, *Airport Design*, paragraph 803, "Shoulders and Blast Pads."

6. **Jet Blast Effects Along Designated A380 Taxiway Routes:**
   a. **Pre-A380 Service.** Airport authorities must take remedial actions to minimize excessive jet blast exposures for those areas identified by the FAA.
   b. **Post-A380 Service.** Airport authorities must take remedial actions to minimize excessive jet blast exposures for newly identified areas that become troublesome.

7. **Excursions from Non-standard Taxiways.**
A modification to standards should be withdrawn if there are repeated excursions from full-strength taxiway pavements, defined as one excursion per month.

Signed

Rick Marinelli
Manager, Airport Engineering Division, AAS-100