SECTION 3

DEMAND/CAPACITY ANALYSIS AND FACILITY REQUIREMENTS

This Section analyzes the ability of the existing facilities at Melbourne International Airport (MLB), as documented in Section 1, to accommodate the aviation demand forecasts developed in Section 2. Strategic Planning Activity Levels (SPAL) have been established for several airport operational scenarios, which have been reviewed and approved by MLB staff and members of the Technical Advisory Committee (TAC).

The Airport's major component areas including airspace, airside and landside facilities have been analyzed to determine the necessary facility requirements. Typical industry requirements for commercial aviation and general aviation demand have been identified for various activity levels, which dictate the required facilities. It is important to note an airport's primary components must be in balance with each other to achieve system optimization. Specific facility expansion and airport development alternatives to adequately meet the projected demand are addressed in Section 4.

3.1 AIRSPACE

Elements associated with an airport's local and surrounding airspace are evaluated in the Demand/Capacity Analysis to ensure projected aviation demand can be met. Additionally, impacts to the airspace and air traffic procedures resulting from proposed modifications to airport facilities will be considered prior to initiating any development alternative. The airspace elements evaluated for MLB included the following:

- Surrounding Airspace
- Air Traffic Control (ATC)
- Obstructions to Navigable Airspace
- Navigational Aids

3.1.1 Surrounding Airspace

The airspace within a 25 nautical mile (N.M.) radius of MLB was examined to identify factors that may impact aircraft operations of the forecasted activity. MLB is encompassed by Class D airspace, which is defined by a circle centered on the Airport, with a radius of five N.M. and extends from the surface to 1,900 feet Mean Sea Level

(MSL). MLB is located approximately 40 N.Ms. east of Orlando International Airport and approximately 25 N.Ms. east of the Class B airspace associated with Orlando International Airport. Additionally, the Class C airspace associated with West Palm Beach International Airport is positioned approximately 80 N.Ms. south of MLB, while the Class C airspace associated with Daytona Beach Regional Airport is located approximately 55 N.Ms. north.

Military activity in the surrounding airspace also has the potential of impacting Airport operations. As described in Section 1, a number of Military Operating Areas (MOAs) have been designated in the airspace surrounding MLB. Patrick Air Force Base, the nearest military installation to MLB, is located approximately 10 N.Ms. northeast. As a result of the close proximity of Patrick Air Force Base, the northeastern boundary of the Class D airspace associated with MLB serves as the southwestern boundary of the Class D airspace associated with Patrick Air Force Base.

3.1.2 Air Traffic Control Services and Facilities

Control within the National Airspace System is maintained by incorporating a network of Air Traffic Control facilities, which include Flight Service Stations (FSS), Air Route Traffic Control Centers (ARTCC), Terminal Radar Approach Control (TRACON) facilities and Air Traffic Control Towers (ATCT). While FSSs and ATCTs are primarily involved with the coordination of air traffic operations within the terminal environment, TRACON facilities coordinate air traffic in the approach and departure segments of flight and ARTCCs coordinate air traffic operations within the enroute segment.

As discussed in Section 1, air traffic services for the local and surrounding MLB airspace is provided by on-site as well as off-site air traffic control facilities. On-site air traffic facilities at include an ATCT. Off-site facilities providing air traffic services include the Daytona Beach and Orlando TRACON for directing approach and departure traffic, the Miami ARTCC for directing enroute Instrument Flight Rules (IFR) traffic, and the St. Petersburg FSS for relaying weather information and communicating Notices to Airmen (NOTAMS).

3.1.2.1 Melbourne International Airport ATCT

In the U.S. there are approximately 350 operating FAA and contract Air Traffic Control Towers. ATCT controllers are responsible for directing the landing and takeoffs of arriving and departing aircraft. Additionally, these controllers are responsible for directing aircraft on the ground and maintaining the airport's Automatic Terminal Information Service (ATIS).

The ATCT located at MLB is a non-federal installation, which is also referred to as a Contract Tower. This arrangement allows the FAA to maintain ownership of the facility and equipment, and provide contract ATC personnel which are obtained from the private sector. Presently, tower personnel include eight air traffic controllers. These controllers, who are contracted through Robinson Aviation, provide air traffic services for aircraft operating on the ground (ground control) or in the immediate airspace surrounding the airport (tower control).

The existing MLB ATCT was constructed in 1966 and is located west of Runway 5/23, south of Runway 9R/27L, near the intersection of Taxiways "A" and "Q". The Tower, which operates daily from 6:00 a.m. to midnight, consists of a cab for air traffic control operations, administrative and storage areas distributed among different levels. As documented in the 1996 Master Plan Update, ATCT facilities have exceeded their useful life and do not meet current state or federal requirements, or Americans with Disabilities Act accessibility requirements. The elevation of the cab floor, which is approximately 47.5 feet above ground level, presents significant line-of sight issues for current operations and future airport development. Current line-of-sight deficiencies exist for viewing the eastside of the terminal concourse and a portion of Taxiway "K" obscured by the VOR. Future development around the airfield, particularly adjacent to Taxiway "C" may be constrained due to ATCT visibility. Additionally, projected operations reported in Section 2 indicate an increase of 49.14% by 2021. Therefore, planning for future ATC staffing and facilities should take into consideration the projected increase.

3.1.2.2 Daytona Beach and Orlando TRACON

Control of aircraft transitioning between the enroute and terminal segment of flight are under the guidance of TRACON facilities operating approach and departure control. Approximately 185 TRACON facilities are located throughout the U.S. TRACONS typically control airspace below an altitude of 15,000 feet MSL and within a 30 N.M. radius of an airport, exclusive of airspace controlled by the ATCT. TRACON facilities use radar and air/ground communications to ensure separation between aircraft arriving, departing or transiting the airspace controlled by the facility.

A TRACON facility is not located at MLB. Therefore, separation of aircraft in the approach or departure mode of flight is the responsibility of the Daytona Beach and Orlando TRACON facilities. For the airspace immediately surrounding and directly above MLB, Daytona Beach TRACON provides air traffic services for aircraft operating up to an altitude of 5,000 feet MSL. Therefore, Daytona Beach TRACON provides separation and queuing for aircraft executing instrument approaches at MLB. Communications with the Daytona Beach TRACON can be established on the 132.65 MHz radio frequency. The Orlando TRACON provides air traffic services for aircraft operating between 5,000 feet MSL and 12,000 feet MSL. For aircraft operating in the vicinity of MLB and between the altitudes of 5,000 and 12,000 feet MSL, communications with the Orlando TRACON can be established on the 124.80 MHz radio frequency. For aircraft operating above 12,000 feet MSL, air traffic services become the responsibility of the Miami ARTCC.

3.1.2.3 Miami ARTCC

ARTCCs are established primarily to provide Air Traffic Service to aircraft operating on IFR flight plans within controlled airspace, and principally during the enroute phase of flight. There are 21 ARTCCs, which control enroute traffic for the U.S. and parts of the Atlantic and Pacific Oceans. Control of enroute traffic in the airspace surrounding MLB is the responsibility of Miami Center.

Miami Center's airspace is composed of approximately 500,000 square miles, which is divided into 31 sectors and includes all of south Florida, a portion of the Gulf of Mexico and the portion of the Atlantic Ocean extending between south Florida and Puerto Rico.[1] Miami Center's airspace is bordered to the north by airspace controlled by Jacksonville Center, to the south by the San Juan Center Radar Automated Radar Terminal Systems Processing (CENRAP) facility, and foreign centers associated with Santo Domingo, Port-au-Prince and Havana.

[1] Miami Center: Facts, Figures & History

3.1.3 Obstructions To Navigable Airspace

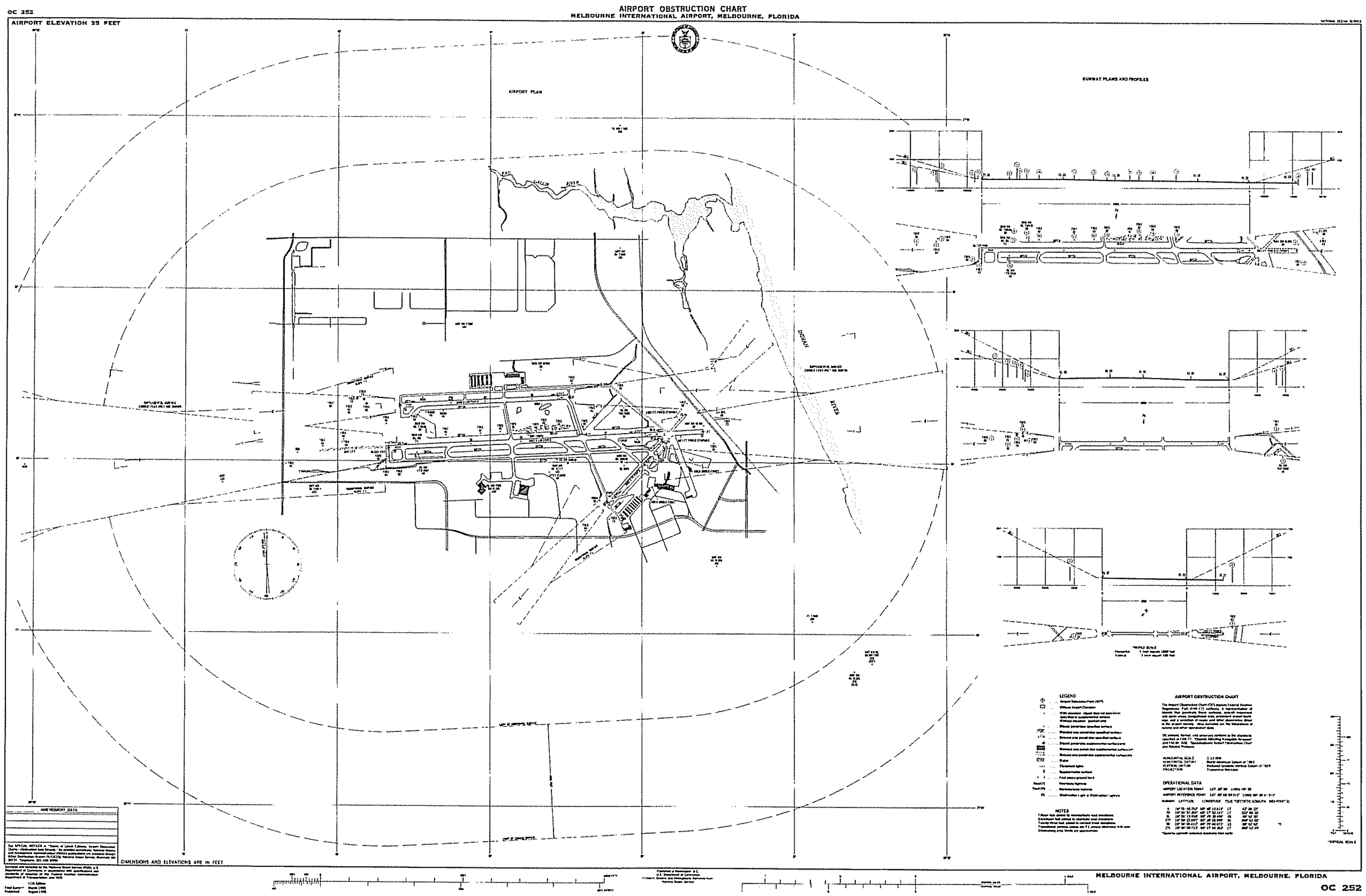
An Obstruction Chart (OC) and an Obstruction Data Sheet (ODS) has been previously prepared for MLB by the U.S. Department of Commerce's National Oceanic and Atmospheric Administration (NOAA). The OC, which was developed in March 1995, provides location and elevation data for obstructions and other objects positioned within the Airport's immediate airspace and is illustrated in Figure 3-1.

Runway 5/23 is located south of Runways 9R/27L and 9L/27R in the southeastern quadrant of Airport property. Two obstructions, which are both trees, have been identified within the horizontal limits of the approach slope associated with Runway 5/23. One obstruction is located 1,150 feet from the approach end of Runway 5 and has an elevation of 64 feet MSL, while the other obstruction is located 1,591 feet from the approach end of Runway 23 and has an elevation of 62 feet. Neither obstruction penetrates the Runway's Part 77 imaginary surfaces.

Runway 9R/27L is positioned north of Runway 5/23 and parallel to 9L/27R. A total of 21 obstructions have been identified within the horizontal limits of the approach slopes and surfaces associated with Runway 9R/27L. Five of the 21 obstructions are trees located beyond the approach end of Runway 9R. Although the OC and ODS indicate that four of the five trees penetrate the 50:1 approach slope defined for the Runway 9R Instrument Landing System (ILS) instrument approach, Airport staff have removed those trees.

Four of the 21 obstructions affiliated with Runway 9R/27L are located beyond the approach end of Runway 27L. Of the four obstructions, two are trees, one is a flagpole and one is an antenna attached to a building. All four obstructions are within the horizontal limits of the 34:1 approach slope established for the non-precision instrument approaches, which serve Runway 27L. However, none of the four obstructions vertically penetrate the 34:1 approach slope.

Of the 21 obstructions associated with Runway 9R/27L, 12 are positioned alongside the runway's paved surface and range in distance between 475 and 209 feet from the runway centerline. All of the 12 obstructions penetrate the Part 77 7:1 surface. Four of the 12 obstructions have been placed in their respective positions as a result of functionality and are components of the airport's navigational aids, which are equipped



Source: National Oceanic & Atmospheric Administration (NOAA) (1996)

RS&H
Reynolds, Smith and Hills Inc.
Architectural, Engineering, Planning
and Environmental Services
Jacksonville, Florida

Melbourne International Airport
Master Plan Update

Figure 3-1
Obstruction Chart

with obstruction lighting. The remaining eight items denoted as obstructions penetrating the Part 77 7:1 surface are identified as trees on the ODS, which have been removed by MLB staff.

Runway 9L/27R parallels Runway 9R/27L to the north. Seven obstructions are identified on the OC Chart for Runway 9L/27R. Five of the seven obstructions are trees located beyond the approach end of Runway 9L within the horizontal limits of the runway's approach slope. Although the ODS indicates three of the five trees penetrate the vertical limits of the 34:1 approach slope established for the non-precision instrument approach associated with Runway 9L, the trees have been removed.

Two of the seven obstructions identified for Runway 9L/27R are located beyond the approach end of Runway 27R within the horizontal limits of the runway's approach slope. While one of the obstructions is a tree (which has been removed), the other is a Terminal Very High-Frequency Omni Range with Distance Measuring Equipment (TVOR/DME) equipped with obstruction lighting. Neither obstruction penetrates the 34:1 approach surface.

NOAA completed the obstruction survey used to produce the existing OC and ODS in March 1995. As shown through a review of the OC and ODS associated with the survey, a majority of the penetrating objects, which consist of trees, have been removed. However, due to the age of the OC and ODS, it is recommended the Airport request an update to the OC from NOAA, or periodically survey the approach and departure areas for obstructions to generate accurate, up to date, obstruction information.

3.1.4 Radio Navigational Aids (NAVAIDS) and Landing Aids

Radio NAVAIDs and landing aids are generally those facilities which assist the pilot in locating the Airport or provide horizontal and vertical guidance to the runway environment for landing.

Radio NAVAIDs provided at MLB include a Terminal Very High-Frequency Omni Directional Radio Range (TVOR) and a Non-Directional Radio Beacon (NDB). In addition to providing guidance to and from the Airport, the TVOR and NDB are used to support several non-precision instrument approaches to Runways 9L/27R and 9R/27L.

A TVOR provides horizontal azimuth guidance to aircraft navigating to and from an airport. The TVOR provided at MLB is identified as the Melbourne VOR and uses the 110.0 MHz radio frequency. The TVOR is located on the eastern side of the Airport approximately 500 feet south of the Runway 9L/27R extended runway centerline and approximately 1,900 feet west of Apollo Boulevard.

Instrument approaches at MLB which primarily use the Melbourne VOR include the VOR (or GPS) Runway 27L instrument approach and the VOR Runway 9R instrument approach. The VOR Runway 27L instrument approach is defined by the 102 degree radial off of the Melbourne VOR, which allows pilots to track inbound to the approach end of Runway 27L on a heading of 282 degrees. Vertical minimums for the Runway 27L VOR approach vary between 580 feet MSL and 660 feet MSL, depending on the category of aircraft and whether the approach is conducted with a straight-in landing or "circling" operation with a landing on a different runway. Horizontal visibility minimums for the approach vary between one and two miles, which also depends on aircraft category and whether the landing is conducted straight-in or circling. The VOR Runway 9R instrument approach is defined by the 264 degree radial off of the Melbourne VOR, which allows pilots to track inbound to the approach end of Runway 9R on a heading of 84 degrees. Vertical descent minimums for the Runway 9R VOR approach vary between 600 feet MSL and 760 feet MSL depending on aircraft category and whether the landing is conducted straight-in or circling. Horizontal visibility minimums for the approach vary between 2,400 feet using the Runway Visual Range (RVR) or one-half mile visibility, and 6000 feet RVR or two and one-quarter mile visibility.

A Non-Directional Radio Beacon (NDB) transmits low/medium frequency radio signals that provide bearing information and guidance to aircraft. An NDB is typically found at or near an airport, or associated with the final approach fix for an Instrument Landing System (ILS) approach. The NDB located at MLB is identified as the Satellite NDB and uses the 257 kHz radio frequency. The NDB is located west of the airfield approximately 3.5 N.Ms. from the approach end of Runways 9L and 9R.

An NDB instrument approach is established for Runway 9R at MLB using the Satellite NDB. The NDB Runway 9R instrument approach is defined by the 270-degree radial off of the Satellite NDB, which allows pilots to track inbound to the station on a heading of

90 degrees. Vertical descent minimums for the Runway 9R NDB approach vary between 460 feet MSL and 660 feet MSL, depending on the category of aircraft and whether the landing is conducted straight-in or circling. Horizontal visibility minimums vary between 4,000 feet RVR or three-quarters of a mile visibility, and 6000 feet RVR or two miles visibility.

To provide precision approach capabilities into MLB, an ILS has been installed for Runway 9R. The ILS contains the following components:

- Glide Slope
- Localizer
- Outer Marker
- Middle Marker

Vertical guidance for the ILS 9R approach is provided by a glide slope, which is set to allow for a 2.80-degree descent angle to the runway environment. Equipment used to project the glide slope signal is located near the approach end of Runway 9R. The localizer, which provides horizontal guidance, uses the 108.30 MHz radio frequency and an inbound heading of 90-degrees. The localizer equipment is positioned near the extended runway centerline associated with the approach end of Runway 27L. Vertical descent minimums for a straight-in ILS 9R approach are 233 feet MSL and visibility minimums are 2,400-feet RVR or one-half of a mile visibility. The ILS 9R approach is also supplemented with a Medium Intensity Approach Lighting System (MALSR), Runway End Identification Lights (REILs), Touchdown Zone Lighting (TDZ) and Runway Centerline lights.

An approach has also been established for Runway 27L utilizing the localizer system for the Runway 9R ILS approach, and the 108.30 MHz radio frequency (i.e., a Localizer Backcourse Approach or "LOC BC" Approach). The Localizer Backcourse Runway 27L approach follows an inbound approach course of approximately 270-degrees. Vertical descent minimums for the approach vary between 460 feet MSL and 660 feet MSL depending on aircraft category and whether the landing is conducted straight-in or circling. Horizontal visibility minimums for the approach vary between one and two miles.

A Global Positioning System (GPS) is a satellite based positioning and navigation system providing latitude, longitude, altitude and time information to aircraft installed with GPS receivers. GPS is currently approved as a supplemental navigational aid for enroute and non-precision instrument approaches. Based on existing VOR and NDB instrument approaches into MLB, non-precision instrument GPS overlay approaches have been established for Runways 9R and 27L. Additionally, stand-alone GPS approaches have been established for Runways 9L and 27R.

Through the FAA's refinement of GPS technology and the ongoing development of Differential Global Positioning System (DGPS) instrumentation, all runways at MLB could eventually be provided with precision approach capability barring any unforeseen environmental impacts. Therefore, it is recommended that MLB pursue the establishment of stand-alone DGPS approach capabilities for all runways. Existing and projected NAVAID facility requirements for MLB are identified in Table 3.1.

Table 3.1
NAVAID FACILITY REQUIREMENTS

	Existing	2006	2011	2021
Runway 9L				
Instrument Approach	Non-Precision	Precision	Precision	Precision
Approach Type	GPS	ILS,DGPS	ILS,DGPS	ILS,DGPS
Approach Slope	34:1	50:1	50:1	50:1
Runway 27R				
Instrument Approach	Non-Precision	Non-Precision	Non-Precision	Non-Precision
Approach Type	GPS	GPS	DGPS	DGPS
Approach Slope	34:1	34:1	34:1	34:1
Runway 9R				
Instrument Approach	Precision	Precision	Precision	Precision
Approach Type	ILS,VOR,NDB	ILS,VOR,NDB,DGPS	ILS,VOR,NDB,DGPS	ILS,VOR,NDB,DGPS
Approach Slope	50:1	50:1	50:1	50:1
Runway 27L				
Instrument Approach	Non-Precision	Non-Precision	Non-Precision	Non-Precision
Approach Type	LOC-BC,VOR	LOC-BC,VOR,DGPS	LOC-BC,VOR,DGPS	LOC-BC,VOR,DGPS
Approach Slope	34:1	34:1	34:1	34:1
Runway 5				
Instrument Approach	Visual	Visual	Visual	Visual
Approach Type	None	None	None	None
Approach Slope	20:1	20:1	20:1	20:1
Runway 23				
Instrument Approach	Visual	Visual	Visual	Visual
Approach Type	None	None	None	None
Approach Slope	20:1	20:1	20:1	20:1

Source: Melbourne International Airport ALP (2001) compiled by RS&H.

3.2 AIRFIELD FACILITIES

Airfield facilities include runways, taxiways, safety areas, object free areas and protection zones. This section addresses the ability of MLB's existing airfield facilities to accommodate future aviation demands.

Criteria used to determine size and location of airfield facilities are outlined in FAA Advisory Circular (AC) 150/5300-13, *Airport Design*. In AC 150/5300-13 the FAA has established airfield dimensional standards pertaining to runway and taxiway widths, separations, safety areas, object free areas and building setbacks based on the design aircraft and corresponding Airport Reference Code (ARC).

3.2.1 Airport Reference Code and Design Aircraft

The ARC system is implemented by FAA to relate airfield design criteria to the operational and physical characteristics of aircraft operating and expecting to operate at an airport. To determine airfield facility requirements, FAA planning guidelines recommend the identification of an existing and future ARC for each of the airport's runways. The ARC value is composed of two variables, which include the Aircraft Approach Category and Airplane Design Group associated with the design aircraft of a specific runway. The design aircraft is typically defined as the most demanding aircraft, which performs at least 250 annual departures (or 500 annual operations) from a given runway.

To determine a specific runway's ARC, the approach speed and wing span associated with the runway's design aircraft is matched with the Aircraft Approach Categories and Airplane Design Groups shown in Tables 3.2 and 3.3. Although specific design aircraft have not previously been identified at MLB, the ARC for each runway has been determined. The following list shows the existing ARCs identified on the Airport Layout Plan (ALP) Update completed in 2001.

- Runway 9R/27L D-IV
- Runway 9L/27R C-IV
- Runway 5/23 A-I

Table 3.2
AIRCRAFT APPROACH CATEGORY AND AIRPLANE DESIGN GROUP

Aircraft Approach Category	Approach Speed
Category A	Speed less than 91 knots
Category B	Speed 91 knots to less than 121 knots
Category C	Speed 121 knots to less than 141 knots
Category D	Speed 141 knots to less than 166 knots
Category E	Speed 166 knots or more
Airplane Design Group	**Wingspan**
Category I	Less than 49 feet
Category II	49 feet to less than 79 feet
Category III	79 feet to less than 118 feet
Category IV	118 feet to less than 171 feet
Category V	171 feet to less than 214 feet
Category VI	214 feet to less than 262 feet

Source: FAA Advisory Circular 150/5300-13

Before identifying future ARCs associated with runways located at MLB an analysis was conducted of the airfield's existing and projected fleet mix and runway utilization. This analysis was completed through coordination with ATC personnel, Airport staff and officials representing the Airport's two fixed- base operators (FBO), Atlantic Jet Center and Florida Institute of Technology (FIT). Additionally, consideration was given to the projected number of aircraft operations and passenger enplanements documented in Section 2. The results of this analysis are presented in Tables 3.4, 3.5 and 3.6. A summary of existing and projected ARC dimensional criteria for each runway is presented in Table 3.7. Presently, air carrier aircraft serving MLB utilize Runway 9R/27L 70% of the time and Runway 9L/27R 30% of the time. In the future, however, operations performed by aircraft possessing more stringent departure characteristics will be conducted exclusively on Runway 9R/27L. Therefore, air carrier aircraft shown in Table 3.6 were separated according to projected runway utilization ratios.

3.2.1.1 Runway 9R/27L Design Aircraft and ARC

Based on the ARC identification criteria previously described, the existing design aircraft for Runway 9R/27L is the McDonnell-Douglas-88 (MD-88). The MD-88 currently performs 2,052 annual operations using Runway 9R/27L. With a wingspan of 107 feet 10 inches and an approach speed of 135 knots, the MD-88 is classified as a C-III

Table 3.3
AIRPLANE DESIGN GROUP AIRCRAFT

Airplane Design Group	Representative Aircraft
I	Beech Baron 58A, Cessna 150. Gates Learjet 35A, Piper Navajo, McDonnell Douglas F-18, General Dynamics F-16
II	Beech King Air C90, Canadair Regional Jet, Cessna Citation III, Gulfstream IV, Grumman F-14, Saab 340
III	Airbus A-320, Boeing 727, Boeing 737, Douglas DC-9, Fokker 100, Gulfstream V, McDonnell-Douglas MD-80
IV	Boeing 757, Boeing 767, Airbus A-300, Douglas, DC-10, Lockheed C-141, Boeing MD-17, Boeing MD-11
V	Airbus 330/340, Boeing 747, Boeing 777
VI	Antonov AN-124, Lockheed C-5B

Source: FAA Advisory Circular 150/5300-13

aircraft. Runway 9R/27L is currently classified as an ARC D-IV runway, which requires compliance with design criteria more stringent than design criteria associated with a C-III ARC. Therefore, no modifications to Runway 9R/27L will be necessary to meet existing design aircraft requirements. However, the projected design aircraft for Runway 9R/27L is the Boeing 747 and/or Airbus 330/340 series, which are typically used for international charter operations. Selection of this future design aircraft for Runway 9R/27L resulted from several discussions between the Airport and several European aircraft charter/tour operators, and a projection of the number of operations on the runway through the end of the planning period (see Table 3.6). It is projected that the charter operators will begin service to MLB in mid to late 2004 using the B-747-200 and/or Airbus 330/340 aircraft. Estimates indicate MLB will initially be receiving two aircraft per week, which equates to approximately 208 annual operations. However, anticipated growth in the demand for European travelers coming to Melbourne will result in an increase in the number of aircraft arrivals to between four and five aircraft per week by end of the planning period, which equates to approximately 520 annual operations including maintenance and ferry flights. The B-747 and/or Airbus 330/340 are classified as D-V aircraft. Therefore, it is recommended future planning and design for Runway 9R/27L be predicated on an ARC of D-V to accommodate the larger aircraft by the end of the planning period.

Table 3.4
EXISTING AND PROJECTED FLEET MIX

Aircraft and Category	Existing (2002) Percentage of Operations	Existing (2002) Number of Operations	Projected (2021) Percentage of Operations	Projected (2021) Number of Operations
Air Carrier				
A-320			5 3%	819
A-380			0.2%	37
B-737-300			22.4%	3,445
B-737-800			3.1%	476
B-747, A-330/340			3 4%	520
B-757			1.3%	193
B-767			1.3%	193
BE100 King Air	21.2%	1,436	0.0%	0
CRJ 50	48 5%	3,285	43 4%	6,681
MD-88	30.3%	2,052	19.7%	3,036
Sub Total	100.0%	6,773	100.0%	15,400
General Aviation				
Single Engine	77.4%	140,829	77.4%	202,478
Light Twin				
Beech Baron	4.1%	7,460	4.1%	10,726
Beech Dutches	3.2%	5,822	3.2%	8,371
Piper Seneca	1.6%	2,911	1.6%	4,186
Piper Navajo	1 7%	3,093	1.7%	4,447
Turboprop				
BE-C-90 King Air	1.0%	1,819	1.0%	2,616
BE-F-90 King Air	2.2%	4,003	2.2%	5,755
BE200 King Air	1.0%	1,819	1.0%	2,616
Piper Cheyenne	0 5%	910	0 5%	1,308
Rockwell Commander	0.5%	910	0.5%	1,308
Jet				
Citation Jet	1.5%	2,729	1.5%	3,924
Challenger	0.7%	1,274	0.7%	1,831
Falcon	1.0%	1,819	1.0%	2,616
G-III	1.3%	2,365	1 3%	3,401
Hawker	1.0%	1,819	1 0%	2,616
Learjet 25	0.3%	546	0.0%	0
Learjet 35	0 8%	1,456	1.1%	2,878
Westwind	0.2%	364	0.2%	523
Sub Total	100.0%	181,949	100.0%	261,600
Military				
C-130	16 4%	113	16.4%	164
E-8C (B-707)	23.9%	164	23.9%	239
F-16	6.0%	41	6.0%	60
KC-10 (DC-10)	12.8%	88	12 8%	128
T-38	40.9%	281	40.9%	409
Sub Total	100.0%	688	100.0%	1,000
Grand Total	100.0%	189,410	100.0%	278,000

Source: Melbourne Airport Authority
Compiled by RS&H

Table 3.5
EXISTING RUNWAY UTILIZATION

Aircraft and Category	Runways 9R/27L	Runways 9L/27R	Runways 5/23	Totals
Air Carrier				
Air Carrier (% of Ops/Runway)	100%	0%	0%	100%
A-320	0	0	0	0
A-380	0	0	0	0
B-737-300	0	0	0	0
B-737-800	0	0	0	0
B-747-200	0	0	0	0
B-757	0	0	0	0
B-767	0	0	0	0
BE100 King Air	1,436	0	0	1.436
CRJ 50	3,285	0	0	3.285
MD-88	2,052	0	0	2,052
Air Carrier Total	6,773	0	0	6,773
General Aviation (GA)				
Single Engine (% of Ops/Runway)	20%	40%	40%	100%
Single Engine	28,166	56,331	56,331	140,829
Light Twin (% of Ops/Runway)	40%	40%	20%	100%
Beech Baron	2.984	2.984	1,492	7,460
Beech Dutches	2.329	2.329	1,164	5,822
Piper Seneca	1.164	1.164	582	2.911
Piper Navajo	619	1,237	1,237	3,093
Turboprop (% of Ops/Runway)	45%	45%	10%	100%
BE-C-90 King Air	819	819	182	1.819
BE-F-90 King Air	1.801	1.801	400	4,003
BE200 King Air	819	819	182	1.819
Piper Cheyenne	409	409	91	910
Rockwell Commander	409	409	91	910
GA Jet (% of Ops/Runway)	50%	50%	0%	100%
Citation Jet	1.365	1.365	0	2,729
Challenger	637	637	0	1.274
Falcon	910	910	0	1,819
G-III	1,183	1,183	0	2.365
Hawker	910	910	0	1.819
Learjet 25	273	273	0	546
Learjet 35	728	728	0	1.456
Westwind	182	182	0	364
GA Total	45,706	74,490	61,753	181,949
Military				
Military (% of Ops/Runway)	70%	30%	0%	100%
C-130	79	34	0	112
E-8C (B-707)	115	49	0	164
F-16	29	12	0	41
KC-10 (DC-10)	62	26	0	88
T-38	197	84	0	281
Military Total	482	207	0	688
Grand Totals	52,962	74,696	61,753	189,410

Source: Melbourne Airport Authority
Runway Utilization Percentages provided by MLB ATC

Denotes existing runway design aircraft.

Table 3.6
PROJECTED (2021) RUNWAY UTILIZATION

Aircraft and Category	Runways: 9R/27L	Runways: 9L/27R	Runways: 5/23	Totals
Air Carrier[1] (% of Ops/Runway)	70%	30%	0%	100%
A-320	572	246	0	818
B-737-300	2,411	1.033	0	3.445
B-737-800	333	143	0	476
BE100 King Air	0	0	0	0
CRJ 50	4.677	2,004	0	6.681
MD-88	2,125	911	0	3,036
Air Carrier (Group I) Total	10,119	4,337	0	14,456
Air Carrier[2] (% of Ops/Runway)	100%	0%	0%	100%
A-380	37	0	0	37
B-747. A-330/340	520	0	0	520
B-757	193	0	0	193
B-767	193	0	0	193
Air Carrier (Group II) Total	944	0	0	944
General Aviation (GA)				
Single Engine (% of Ops/Runway)	20%	40%	40%	100%
Single Engine	40,496	80,991	80,991	202,478
Light Twin (% of Ops/Runway)	40%	40%	20%	100%
Beech Baron	4.290	4.290	2,146	10.726
Beech Dutches	3.348	3.348	1.675	8.371
Piper Seneca	1.674	1.674	838	4.186
Piper Navajo	1,778	1,778	891	4,447
Turboprop (% of Ops/Runway)	45%	45%	10%	100%
BE-C-90 King Air	1,177	1.177	262	2.616
BE-F-90 King Air	2,590	2,590	575	5.755
BE200 King Air	1.177	1.177	262	2,616
Piper Cheyenne	589	589	130	1,308
Rockwell Commander	589	589	130	1,308
GA Jet (% of Ops/Runway)	50%	50%	0%	100%
Citation Jet	1.962	1.962	0	3,924
Challenger	916	916	0	1.831
Falcon	1.308	1.308	0	2.616
G-III	1.700	1.700	0	3,401
Hawker	1.308	1,308	0	2.616
Learjet 25	0	0	0	0
Learjet 35	1.439	1.439	0	2.878
Westwind	262	262	0	523
GA Total	66,603	107,097	87,900	261,600
Military (% of Ops/Runway)	70%	30%	0%	100%
C-130	114	49	0	163
E-8C (B-707)	167	72	0	239
F-16	42	18	0	60
KC-10 (DC-10)	90	38	0	128
T-38	286	123	0	409
Military Total	700	300	0	1,000
Grand Totals	78,366	111,734	87,900	278,000

Source: Melbourne Airport Authority, Compiled by RS&H
[1]Air Carrier aircraft projected to operate on both Runways 9L/27R & 9R/27L
[2]Air Carrier aircraft able projected to only operate on Runway 9R/27L

[box] Denotes projected runway design aircraft.

Table 3.7
EXISTING AND PROJECTED ARC REQUIREMENTS

	Runway 9R/27L			Runway 9L/27R			Runway 5/23		
	Existing Dimension	Existing Required Dimension	Future Required Dimension	Existing Dimension	Existing Required Dimension	Required Dimension Future	Existing Dimension	Existing Required Dimension	Future Required Dimension
ARC	D-IV	D-IV	D-V	C-II	C-II	D-IV	A-I	A-I	A-1
R/W Length	[1]10,181'	10,181'	11,600'	6,000'	6,000'	7,200'	3,000'	3,000'	3,000
R/W Width	150'	150'	150'	150'	150'	150'	75'	75'	75"
R/W Shoulder Width	25'	25'	[2]**35'**	25'	25'	25'	10'	10'	10"
R/W Blast Pad Width	200'	200'	220'	-	200'	200'	[4]75"	80'	80"
R/W Blast Pad Length	[3]200'	200'	400'	-	200'	200'	100'	100'	100"
R/W Safety Area Width	500'	500'	500'	500'	500'	500'	120'	120'	120"
R/W Safety Area Length	1,000'	1,000'	1,000'	1,000'	1,000'	1,000'	240'	240'	240"
R/W OFA Width	800'	800'	800'	800'	800'	800'	250'	250'	250"
R/W OFA Length (beyond runway end)	1,000'	1,000'	1,000'	1,000'	1,000'	1,000'	240'	240'	240"
T/W Width	75'-90'	75'	75'	40'	**75'**	**75'**	40'	25'	25"
T/W Shoulder Width	**25'**	**25'**	**35'**	22'	10'	25'	10'	10'	10"
T/W Safety Area Width	**171'**	**171'**	**214'**	85'	79'	171'	49'	49'	49"
T/W OFA Width	**259'**	**259'**	**320'**	131'	131'	259'	89'	89'	89"
T/L OFA Width	**225'**	**225'**	**276'**	115'	115'	225'	79'	79'	79"
R/W Centerline to Parallel T/W Centerline	495'	400'	400'	**325'**	**400'**	**400'**	200'	150'	150"
R/W Centerline to Aircraft Parking Area	1,410'	500'	500'	351'	500'	500'	449'	125'	125"
T/W Centerline to Parallel T/W / T/L Centerline	N/A	N/A	N/A	153'	105'	105'	170'	69'	69"

Abbreviations:
ARC - Airport Reference Code
OFA - Object Free Area
R/W - Runway
T/W - Taxiway
T/L - Taxilane
Source: Melbourne International Airport ALP
FAA AC 150/5300-13

[1]Pavement associated with Runway 9R/27L measures 10,181-feet in length. However, only 9,481-feet are available for aircraft landing on Runway 27L as a result of a 700-foot displaced threshold.

[2]Highlighted values denote airfield elements requiring modifications to meet ARC facility design criteria outlined in AC 150/5300-13.
[3]Blast pad on west end Runway 9R/27L is only 100 feet in length.
[4]Existing blast pad on northeast end of Runway only.

3.2.1.2 Runway 9L/27R Design Aircraft and ARC

The existing design aircraft for Runway 9L/27R is the Gulfstream III (G-III). As shown in Table 3.5 the G-III currently performs 1,183 annual operations using Runway 9L/27R. With a wingspan of 77 feet 10 inches and an approach speed of 136 knots, the G-III is classified as a C-II aircraft. As previously mentioned the current ALP identifies the ARC for 9L/27R as C-IV. However, the existing separation distance between the runway and parallel taxiway (i.e., 325 feet) are not sufficient to meet Airplane Design Group IV standards. The separation distance between the runway and taxiway are sufficient to comply with Airplane Design Group II standards, for all categories of aircraft. Therefore, the existing ARC for Runway 9L/27R is C-II.

The projected design aircraft for Runway 9L/27R is the MD-88, based on approximately 30% of the total or 911 annual operations for this aircraft utilizing the runway by the end of the planning period, see Table 3.6. As previously mentioned, the MD-88 maintains an ARC of C-III. However, in order to maintain an ARC of C-III for Runway 9L/27R, 400 feet of separation distance is required between the runway and taxiway centerline. The existing separation between the runway and parallel taxiway are not sufficient to allow the runway to be classified with an ARC of C-III. Therefore, modifications to the separation distances between the runway and taxiway are required.

It was also previously recommended in this Section that Runway 9L/27R be able to accommodate future precision instrument approaches, either through implementation of an ILS system or with GPS technology. The development of precision instrument approach procedures for this runway, with visibility minimums of less than three-quarters of a mile, will require 400 feet of separation distance between the runway and taxiway centerlines for C-III aircraft. Therefore, future planning for this runway should include development of a parallel taxiway at this separation distance. It should be noted that this separation distance is also the same for Category D aircraft.

The future ARC for Runway 9L/27R as reflected on MLB's current ALP is D-IV. In order to accommodate the MD-88 as the future design aircraft for this runway, separation standards between the runway and taxiway must be increased, as discussed above. By increasing the separation standards to accommodate the design aircraft, the runway will also be able to accommodate D-IV type aircraft. Therefore, it is recommended that the future ARC for the runway, as reflected on the current ALP, remain D-IV.

3.2.1.3 Runway 5/23 Design Aircraft and ARC

Runway 5/23 at MLB is a utility class runway used to facilitate the Airport's general aviation demand, and complies with FAA design standards applicable to a runway which accommodates small airplanes exclusively. At present, the Runway's ARC is A-I. The A-I ARC designation results from the B55 Beechcraft Baron being the design aircraft for the runway. The B55 Beechcraft Baron has a wingspan of 37.8-feet and an approach speed of 90 knots, and in 2002 performed 1,492 operations on Runway 5/23.

Due to long-term expansion requirements for terminal facilities associated with the anticipated introduction of international charter service, which is discussed later in this Section, Runway 5/23 may need to be relocated at some point in the future. The future ARC for this runway however will remain A-1.

3.2.2 Airfield Capacity

Using the guidelines outlined in FAA's AC 150/5060-5, *Airport Capacity and Delay*, an Airport demand capacity analysis was conducted for existing (2002), 2006, 2011 and 2021 conditions. For any runway system, VFR hourly capacity is greater than IFR hourly capacity, based on any airport's ability to serve aircraft in clear weather. In IFR conditions, aircraft movement in and out of an airport is sequenced by ATC, and aircraft separation distances are increased for flight safety purposes. Therefore, the amount of aircraft operations in and out of an airport under IFR conditions is essentially restricted or reduced when compared to VFR conditions.

The most common method of measuring airfield capacity is by determining an airport's Annual Service Volume (ASV). ASV is defined as a reasonable estimate of the number of annual aircraft operations which can be performed at an airport given an acceptable amount of delay. The level of delay considered acceptable to a particular airport may differ from the level deemed acceptable at a similar airport. As a result, the level of delay can influence the estimated capacity for a given airfield. ASV takes into account several airfield characteristics, such as:

- Runway and taxiway configuration

- Runway utilization
- Instrument and Visual Meteorological Conditions
- Touch and Go factors
- Aircraft mix categories
- Runway lighting

In FAA AC 150/5060-5, several ranges of VFR and IFR hourly operations and ASV annual operations have been developed for differing runway use configurations. The relative percentage of operations by classes of aircraft (or aircraft mix indexes, based on maximum takeoff weight) influences the hourly capacity and ASV in each runway system. The aircraft mix index represents the level of operations by class of aircraft. FAA recommends planning capacity enhancement projects when the annual number of operations performed at the airport reaches 60% of the airports total ASV, which is referred to as the demand/capacity ratio. Likewise, FAA recommends capacity enhancement projects be completed when the demand capacity ratio reaches 80% of ASV.

Airfield capacity is also influenced by the availability of parallel runways. For instance, a single runway can accommodate between 195,000 and 240,000 annual aircraft operations, whereas a dual parallel runway system can serve between 260,000 and 370,000 annual aircraft operations. Increasing the separation distance between parallel runways will also increase an airport's capacity, because of the runway systems' ability to accommodate simultaneous operations.

The primary factor influencing airfield capacity is runway configuration. The existing runway system (i.e., Runways 9L/27R, 9R/27L and 5/23) at MLB can be described as an intersecting-parallel runway system (See Figure 3-2). Through correspondence with air traffic control services personnel, it was determined that approximately 65% of all aircraft operations at MLB are conducted on Runway 9L, Runway 9R and Runway 5, or from a predominantly west to east direction, while approximately 35% of all aircraft operations are conducted on Runway 27R, Runway 27L and Runway 23 or from east to west. In order for the demand capacity calculations to accurately reflect the overall capacity resulting from the runway configuration, the analysis was conducted applying these runway utilization values. The MLB demand capacity analysis prepared for existing

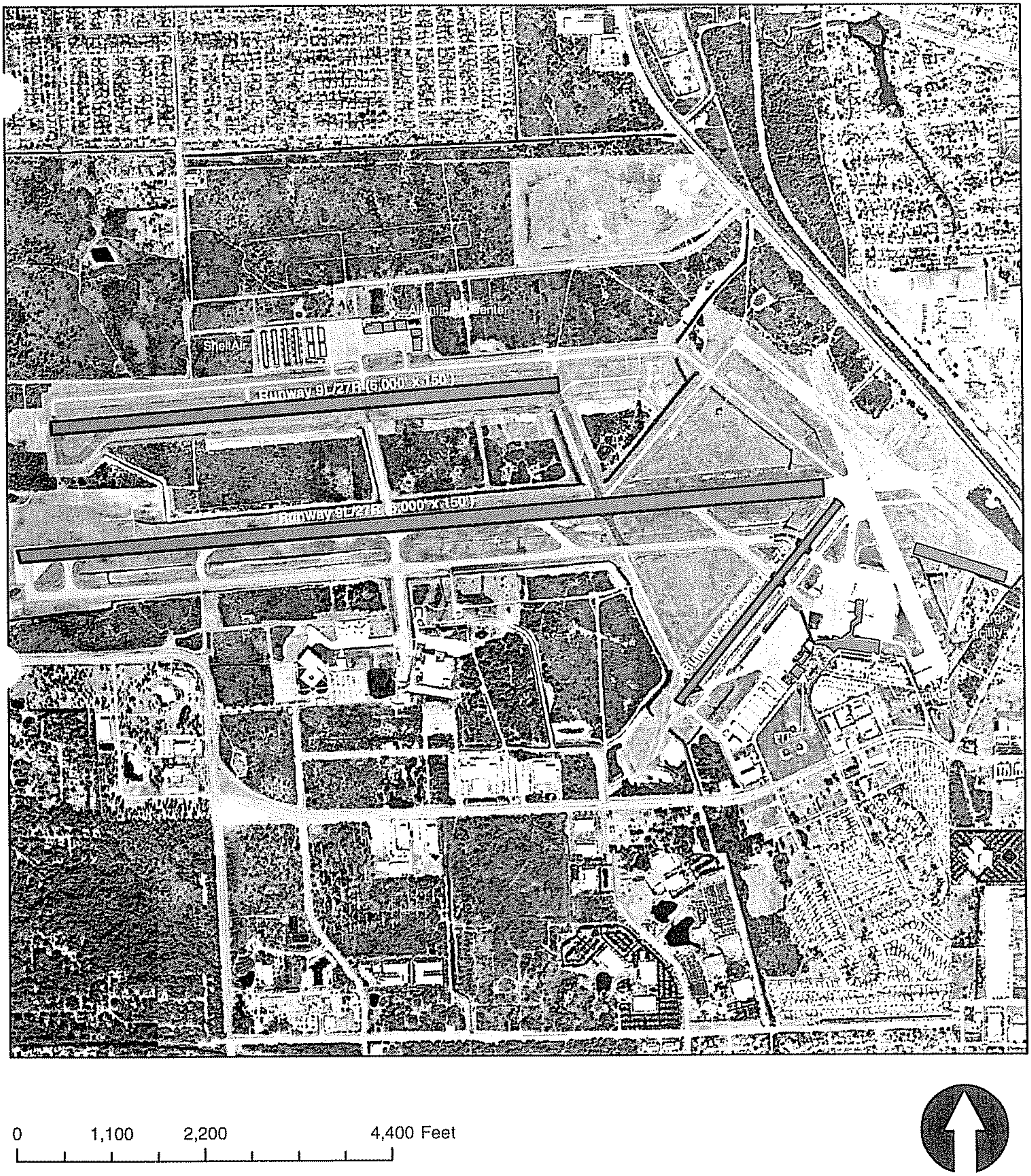


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Figure 3-2

Existing Runway System

(2002) conditions, future 2006, 2011 and 2021 conditions is presented in Table 3-8.

Table 3.8
MELBOURNE INTERNATIONAL AIRPORT
DEMAND/CAPACITY ANALYSIS (2002 - 2021)

	Planning Period							
	Existing		2006[1]		2011		2021	
Configuration	West-East	East-West	West-East	East-West	West-East	East-West	West-East	East-West
Total Annual Ops	186,000		205,000		229,000		278,000	
Utilization per Config. (%)	65%	35%	65%	35%	65%	35%	65%	35%
Utilization per Config. (ops)	120,900	65,100	133,250	71,750	148,850	80,150	180,700	97,300
ASV per Config.	385,000	355,000	355,000	355,000	355,000	355,000	355,000	355,000
ASV Operations per Config.	250,250	124,250	250,250	124,250	250,250	124,250	250,250	124,250
Total Airfield ASV	374,500		374,500		374,500		374,500	
Annual Demand./Capacity Ratio	49.7%		54.7%		61.1%		74.2%	
Total Annual VFR Ops	138,964		163,200		184,400		226,800	
Total Annual Peak Hour Ops	82		90		101		122	
Annual VFR Peak Hour Ops	61		72		81		100	
Annual VFR Ops per Config.	90,327	48,637	106,080	57,120	119,860	64,540	147,420	79,380
VFR Peak Hour Ops per Config.	40	21	47	25	53	28	65	35
FR Hourly Capacity per Config.	295	197	197	197	197	197	197	197
VFR ASV Ratio per Config.	192	69	128	69	128	69	128	69
VFR Peak Hour ASV	261		261		261		261	
Annual VFR Demand/Capacity Ratio	23.4%		27.6 %		31.1%		38.3%	
Total Annual IFR Operations	47,036		41,800		44,600		51,200	
Annual IFR Peak Hour Ops	21		18		20		23	
Annual IFR Ops per Config.	30,573	16,463	27,170	14.630	28.990	15,610	33,280	17,920
IFR Peak Hour Ops per Config.	13	7	12	6	13	7	15	8
IFR Hourly Capacity per Config.	59	59	59	59	59	59	59	59
IFR ASV Ratio per Config.	38	21	38	21	38	21	38	21
IFR Peak Hour ASV	59		59		59		59	
Annual IFR Demand/Capacity Ratio	35.6%		30.5%		33.9%		38.9%	

Abbreviations
ASV – Annual Service Volume
Config. – Configuration
IFR – Instrument Flight Rules
Ops – Operations
VFR – Visual Flight Rules

Source: FAA AC 150/5060-5
FAA Airport Design Software
MLB Air Traffic Services

As introduced previously and explained in greater detail in later portions of this Section, Runway 5/23 may need to be relocated and/or closed to accommodate long-term growth of the international terminal facility. If Runway 5/23 is closed and not replaced, total airfield capacity will decline to approximately 355,000 ASV. Airfield demand is forecasted to be approximately 205,000 annual operations by 2006, or a demand capacity ratio of 57.7%.

In 2011 MLB is projected to facilitate 229,000 annual aircraft operations, while the airfield's overall capacity will be 374,500 annual operations. The 229,000 annual operations projected for 2011 indicates the airfield will be operating at 61.1% capacity. As previously described, planning for capacity enhancements or demand management strategies should be initiated when aircraft operation levels reach 60% of the airfield's capacity. 60% airfield capacity at MLB, which equates to 224,000 annual aircraft operations is projected to occur sometime around 2010. Therefore, upon reaching 224,000 annual aircraft operations, planning for capacity enhancements or demand management strategies should be initiated.

By 2021, 278,000 annual aircraft operations are projected to be conducted at MLB. At this demand level, the airfield will be operating at 74.2% capacity. Similar to the planning of capacity enhancements being initiated at 60% of airfield capacity, construction of capacity enhancements or implementation of demand management strategies should be underway or completed when airfield capacity reaches 80%, which equates to approximately 299,000 annual aircraft operations. This level of aircraft operations is not projected to occur until beyond the end of the planning period.

3.2.2.1 Annual Aircraft Delay

As demand approaches capacity, individual aircraft delay is increased at an exponential rate. Successive hourly demands exceeding the hourly capacity result in unacceptable delays. For a given capacity, there is a tradeoff between demand and delay, with increases in demand accommodated only at the cost of longer and more frequent delays. Even when traffic is relatively low with respect to capacity, a change in an airport's operating conditions may reduce capacity and thereby increase delay associated with a given level of demand. In addition to the influence of weather conditions, flight scheduling and peaking characteristics are primary causes of delay. Travelers prefer certain arrival and departure times, and as a result, airlines schedule their operations accordingly. This peaking of demand produces overloads, traffic queues and forms of congestion, which translate into delay at the point of incidence. The "ripple effect" from the delay at the point of incidence is then transferred to other connecting points within the airport and airspace network resulting in additional compounded delay. The relationship between delay and demand capacity is sensitive. Ideally, during a given hour, if aircraft using an airport sought service at a continuous rate equal to that at which aircraft operations could be processed, and if operating conditions were constant throughout the hour, operations could reach the airport's highest capacity without significant delays. However, the actual rate at which aircraft arrive and depart is never continuous. As demand approaches airport capacity, delays related to congestion will occur. When demand exceeds airport capacity, delays become more significant, occurring at an increasing rate, which may require hours for an airport to completely recover from compounding delays.

FAA methodology allows for the determination of average delay per operation as well as total minutes of aircraft delay on an annual basis. The estimate of annual delay includes arriving and departing aircraft operations during both IFR and VFR conditions. Essentially, the ratio of projected demand to ASV is utilized in FAA's AC 150/5060-5 and *FAA's Airport Design Software Version 4.2* to determine a conservative estimate of the average delay per aircraft. This value is then applied back to the annual demand levels to estimate the total amount of annual aircraft delay. The FAA outlines a range of delay values based on the ratio of demand to capacity.

Existing and projected annual delay ratios for MLB are presented in Table 3.9. Estimated delay per aircraft operation in the base year for FAA low and high ratios of aircraft delay range from 6 seconds (0.1 minutes) to 12 seconds (0.2 minutes). Delays per aircraft operation are expected to remain unchanged through 2006. However, total annual delay will become greater as a result of the increased number of projected aircraft operations, and if Runway 5/23 is eventually closed and not replaced. Delays per aircraft operation are anticipated to increase slightly by 2011. By 2021 delay per aircraft operation is expected to nearly double as average delay per operation for the low average is projected to be 12 seconds (0.2 minutes), and the average delay per operation for the high average is projected to be 24 seconds (0.4 minutes). As shown in Table 3.9, annual aircraft delay projected for MLB through the end of the planning period will be insignificant and result in no need for additional facilities.

Table 3.9
ANNUAL AIRCRAFT DELAY

Year	Annual Aircraft Operations	Average Delay per Aircraft Operation, Low Ratio (Minutes)	Average Delay per Aircraft Operation, High Ratio (Minutes)	Average Total Annual Delay (Minutes)
2002	186,000	0.1	0.2	13
2006	205,000	0.1	0.2	20
2011	229,000	0.1	0.3	28
2021	278,000	0.2	0.4	44

Source: FAA AC 150/5060-5
FAA Airport Design Software

3.2.2.2 Capacity Enhancements

In 2021 a total of 278,000 aircraft operations are projected for MLB. Although the VFR peak hour demand capacity ratio in 2021 is projected to be 38.3% and the IFR peak hour demand capacity ratio is projected to be 38.9%, the total airfield ASV is projected to reach only 74.2%. Therefore, Specific Planning Activity Levels (SPALs) were calculated for determining when to begin planning and developing capacity enhancement projects. Assuming the runway utilization ratios and configuration remain constant, planning for capacity enhancement projects should begin when the total number of annual aircraft operations reaches 224,700 or 99 peak hour operations. Additionally, capacity enhancement measures should be actively in place when the total number of annual aircraft operations reaches 299,600 or 132 peak hour operations.

Methods of enhancing airfield capacity include modification of ATC procedures, physical airfield improvements and administrative demand management. The FAA's mission relative to ATC and demand capacity is to balance air traffic demand for the National Airspace System (NAS) with system capacity in order to ensure maximum efficiency in the utilization of the NAS. Traffic management initiatives are utilized to limit the volume of traffic allowed into or out of an airport. The most common initiatives are the mile-in-trail or minute-in-trail restrictions, traffic reroutes, ground delay programs and ground stops. To better manage aircraft traffic in a way that maintains a smooth flow of aircraft to and from airports with minimum delay and provides a more efficient method of combating delay, FAA is implementing Traffic Management Systems (TMS). TMSs are computer software packages devised to assist in the management of aircraft traffic at and around airports by monitoring and suggesting the least disruptive traffic management initiative when capacity is reached.

Physical airfield improvements to enhance capacity at MLB may include modification or addition of high-speed taxiway exits to Runway 9R/27L thereby decreasing runway occupancy times. Additionally, the potential for a third parallel runway to address future required airfield capacity was previously investigated. Due to existing airport land uses, facility locations and roadway right-of-ways, on-airport land capable of supporting a third parallel runway is limited to an area positioned north of the existing 9L/27R and GA area. However, construction of a third parallel runway on the northern portion of the Airport's property was determined to be unfeasible as a result of the location's relative proximity to residential areas and MLB's planned expansion of the aviation-industrial area.

A primary factor influencing an airport's decision to proceed with a physical airport improvement is the project's benefit-to-cost ratio. Historically, FAA's policy has been to accommodate all growth of air traffic demand. However, as the benefit-to-cost ratio has decreased due to rising economic costs, administrative methods of managing capacity and delay have become more prevalent.

Administrative methods of managing capacity and delay promote more economically efficient use of existing facilities rather than adding true capacity. An effective administrative method is for an airport's governing body to restrict access by setting quotas on passenger enplanements or on the number and type of aircraft operations to be accommodated. The following is a list of other administrative measures of managing capacity and delay:

- Divert a portion of the intended air traffic (primarily GA) to reliever airports.
- Balance the use of aircraft among several metropolitan air carrier airports.
- Re-hub or redistribute transfer traffic from busy airports to under-used airports.

Administrative methods of managing delay are not conducive to supporting the positive economic impacts and benefits associated with MLB. Additionally, modification of ATC procedures would be cumbersome and require a high degree of coordination as a result of approach and departure control functions being carried out by Orlando and Daytona Beach TRACON. Therefore, physical airport improvements or diversion of general aviation traffic to reliever facilities are recommended to address future capacity issues. Consideration should be given to incorporating additional high-speed exits into future taxiway designs.

3.2.3 Runway Requirements

This section addresses specific requirements relative to the ability of the existing runways located at MLB to facilitate the projected aviation demand. At a minimum, runways must have the proper width, length and strength to safely accommodate the design aircraft identified for each runway associated with the airfield.

3.2.3.1 Runway Designation

A runway designation identifies a runway according to the facility's magnetic azimuth. Runway designation markings are provided on each end of a runway and are used by pilots to identify landing facilities. A runway designation consists of a number and, on parallel runways, is supplemented with a letter. The designation number represents the whole number nearest the magnetic azimuth when viewed from the direction of approach. For example, where the magnetic azimuth is 183-degrees, the runway designation would be 18, and for a magnetic azimuth of 87-degrees, the runway designation would be 9.

Magnetic azimuth is determined by adjusting the geodetic azimuth associated with a runway to compensate for magnetic declination. Magnetic declination is the difference between true north and magnetic north, and is denoted on aeronautical sectionals with isogonic lines accompanied by a degree value followed by an easterly or westerly directional guide. An easterly directional guide indicates the associated magnetic declination degree value should be subtracted from the geodetic azimuth to obtain magnetic azimuth, while a westerly directional guide indicates the value should be added to obtain magnetic azimuth.

Magnetic declination values do not remain constant in time and vary throughout the world as a result of the earth not being uniformly magnetized. The source of magnetic declination is the motion of molten metallic fluid located between 1,740 miles and 3,100 miles below the earth's surface. This fluid contains high concentrations of iron, nickel and cobalt, which possess highly charged electrons. The continuous movement of the fluid causes the magnetic field to change slowly over time resulting in an angular difference between true north and magnetic north. The following is a list of factors, which influence declination:

- Location
- Local Magnetic Anomalies
- Elevation
- Secular Change
- Diurnal Change
- Solar Magnetic Activity

The geodetic azimuth for runways located at MLB were last verified by the National Geodetic Survey in June of 1998. The survey also determined the magnetic declination for the area surrounding Melbourne, Florida is 5.0° west. Therefore, to determine the magnetic azimuth for the runways located at MLB, 5.0° should be added to the geodetic azimuth associated with each of the six runway ends. The geodetic azimuth and magnetic azimuth associated with each runway end is presented in Table 3.10.

Table 3.10
MLB RUNWAYS GEODETIC AND MAGNETIC AZIMUTH

Runway End	Geodetic Azimuth	Magnetic Azimuth
9R	086° 52' 43"	091° 52' 43"
27L	266° 53' 33"	271° 53' 33"
9L	086° 52' 33"	091° 52' 33"
27R	266° 53' 05"	271° 53' 05"
5	042° 06' 21"	047° 06' 21"
23	222° 06' 32"	227° 06' 32"

Source: National Geodetic Survey
Complied by RS&H

Applying FAA runway designation criteria previously described and the information provided in Table 3.10, the existing designations associated with the runways located at MLB were examined. The whole number nearest the magnetic azimuths of Runways 9L/27R and 9R/27L is 9 and 27. Therefore, no changes are recommended to runway designations associated with these runways. However, as a result of the calculations for

Runway 5/23 conducted during the Master Plan Update process, the designation of Runway 5/23 (formerly 4/22 at the inception of this planning effort) were changed during this update to reflect a change in magnetic azimuth for the runway.

3.2.3.2 Runway Length

FAA AC 150/5325-4A, *Runway Length Requirements for Airport Design* and the *FAA Airport Design Software Version 4.2D* provide guidelines to determine the ultimate runway length required at an airport facility. Table 3.11 provides general recommended runways lengths for small and large aircraft. To determine ultimate runway lengths, these methods apply airfield conditions including elevation, mean daily maximum temperature and effective runway gradient. Additional elements considered in the analysis include design aircraft data such as take-off weight, length of haul and payload using individual aircraft performance manuals published by the manufacturers.

Table 3.11
GENERAL RECOMMENDED RUNWAY LENGTHS

Aircraft Category	Recommended Runway Length
Small Airplanes (Less than 12,500 lbs.)	
100% of Fleet (Less than 10 seats)	3,650'
Small Airplanes (Less than 12,500 lbs.)	
100% of Fleet (10 or more seats)	4,260'
Large Airplanes (12,501 lbs. – 60,000 lbs.)	
75% of Fleet @ 60% Useful Load	4,760'
75% of Fleet @ 90% Useful Load	6,800'
100% of Fleet @ 60% Useful Load	5,530'
100% of Fleet @ 90% Useful Load	8,410'
Large airplanes (Greater than 60,000 lbs.)	
500 Mile Stage Length	5,020'
1,000 Mile Stage Length	5,960'
2,000 Mile Stage Length	7,620'
3,000 Mile Stage Length	8,970'
4,000 Mile Stage Length	10,020'
5,000 Mile Stage Length	10,770'
6,000 Mile Stage Length	11,230'
7,000 Mile Stage Length	11,380'

Source: FAA Airport Design Microcomputer Program AD 4 2D
Complied by RS&H

Currently Runway 9R/27L measures 10,181 feet in length. However, the threshold associated with the approach end of 27L is displaced 700 feet. As a result of this displacement, only 9,481 feet of the total 10,181 feet is available for landing on Runway 27L. Runway 9L/27R currently measures 6,000 feet in length. Runway 5/23, which is restricted to small aircraft, measures 3,000 feet in length.

Two methods were used to determine the appropriate runway lengths at MLB. The first method incorporated the use of FAA AC 150/5325-4A, *Runway Length Requirements For Airport Design*, while the second method applied the *FAA Airport Design Software Version 4.2D.* Using the data provided in FAA AC 150/5325-4A, takeoff distances were determined for the future design aircraft (B-747-200) originating at MLB and flying to London, England. Additionally, takeoff distances were determined for the same aircraft originating at MLB and flying to Frankfurt, Germany. The stage length from MLB to London, England is 3,749 miles, while the stage length from MLB to Frankfurt, Germany is 4,102 miles. A breakdown of the runway length analysis conducted using *FAA AC 150/5325-4A* is presented in Table 3.12.

Table 3.12
FAA AC 150/5325-4A RUNWAY LENGTH ANALYSIS – B-747-200

Criteria	Value	
Destination	London	Frankfurt
Distance	3,749 Nautical Miles	4,102 Nautical Miles
Maximum Takeoff Weight	785,000 lbs.	785,000 lbs
*Maximum Allowable Takeoff Gross Weight	784,984 lbs.	784,984 lbs.
Temperature	90° F.	90° F.
Elevation	33 ft. MSL	33 ft. MSL
Empty Weight & Fuel Reserves	426,000 lbs.	426,000 lbs.
Fuel (47 lb./Mi.)	176,203 lbs.	192,794 lbs.
Passengers (200 lb. ea.)	91,200 lbs.	91,200 lbs.
Luggage (2 per passenger @ 28.6 lb. ea.)	26,083 lbs.	26,083 lbs.
Takeoff Weight	719,486 lbs.	736,077 lbs.
Runway Distance Required	9,959 ft.	10,181 ft.
*Maximum Allowable Takeoff Gross Weight	750,600 lbs.	750,600 lbs
Runway Distance Required	11,896 ft.	11,896 ft.
Maximum Takeoff Weight	785,000 lbs.	785,000 lbs
Runway Distance Required	11,450 ft.	11,450 ft.

*NOTE: Maximum Allowable Takeoff Gross Weight is Maximum Takeoff Weight corrected for temperature and elevation.
Source: RS&H

The maximum takeoff weight of a B-747-200 is 785,000 pounds as documented in *FAA AC 150/5325-4A*. The temperature used in this analysis represents the mean daily maximum temperature of the hottest month of the year. While the hottest month of the year in Melbourne is July, the mean daily maximum temperature is 90-degrees Fahrenheit. The elevation applied is the elevation of the Airport measured at the Airport Reference Point, which is 33-feet mean sea level (MSL). Considering these variables, the maximum allowable takeoff gross weight for a 747-200 at MLB is 784,984 pounds. Empty weight equals the weight of the B-747-200 aircraft excluding the weight of the crew, fuel load and payload. Fuel reserves represents the weight of fuel required to fly to an alternate airfield should landing at the destination airport be unachievable as a result of weather or other unforeseen circumstances. Assuming the fuel burn for a B-747-200 is 47 pounds per Nautical Mile as suggested in *FAA AC 150/5325-4A*, a flight from MLB to London, England would require 176,203 pounds of fuel and a flight from MLB to Frankfurt, Germany would require 192,794 pounds of fuel. The analysis shown in Table 3.12 also assumes a weight of 200 pounds for each passenger, which includes 442 revenue passengers, 11 flight attendants and three flight crewmembers totaling 91,200 pounds. Additionally, the calculations assume each revenue passenger, flight attendant and flight crewmember are traveling with two pieces of luggage. Weight and balance calculations used by many airlines assume a weight of 200 pounds per seven pieces of luggage, which is the equivalent of 28.6 pounds per individual piece of luggage.

Applying the runway length requirement method outlined in *FAA AC 150/5325-4A*, a B-747-200 operating from MLB to London, England would have a takeoff weight of 719,486-pounds and require a runway length of 9,959 feet. A B-747-200 operating from MLB to Frankfurt, Germany would have a takeoff weight of 736,077 pounds and require a runway length of 10,181 feet. As a basis of comparison, runway length requirements were also calculated for maximum takeoff weight conditions. As depicted in Table 3.12, maximum takeoff weight for a B-747-200 is 785,000 pounds. A B-474-200 at this weight would require a runway 11,450 feet in length for takeoff.

The second method used to review runway length requirements at MLB applied the *FAA Airport Design Software Version 4.2D*. The runway length analysis conducted using *FAA Airport Design Software Version 4.2D* is presented Table 3.13. Using this method, runway lengths necessary for aircraft operating stage lengths of 500 N.M., 1,000 N.M., 3,749 N.M. and 4,102 N.M. were examined. Similar to the *FAA AC 150/5325-4A* method previously described, the purpose of examining runway length requirements for stage lengths of 3,749 N.M. and 4,102 N.M. was necessitated as a result of the possibility of an international charter operator initiating service in 2004 to United Kingdom and European cities, and in later years to South American destinations. The value of 3,749 N.M. represents the distance between MLB and London, England, while the 4,102 N.M. value represents the distance between MLB and Frankfurt, Germany.

Table 3.13
FAA AIRPORT DESIGN SOFTWARE VERSION 4 2D
RUNWAY LENGTH ANALYSIS

Airport and Aircraft Criteria	Stage Length: 500 N.M.	1,000 N.M.	3,749 N.M.	4,102 N.M.
Airport and Runway Data				
Airport Elevation	33-ft. MSL	33-ft. MSL	33-ft. MSL	33-ft. MSL
Mean daily temperature of the hottest month.	90° F.	90° F.	90° F.	90° F
Maximum difference in runway centerline elevation.	10-ft.	10-ft.	10-ft.	10-ft.
Stage length for aircraft of more than 60,000 pounds	500 N.M.	1,000 N.M.	3,749 N.M.	4,102 N.M.
Runway condition	Wet	Wet	Wet	Wet
Runway Lengths Recommended For Given Aircraft				
Small airplanes with approach speeds less than 30 Knots	300-ft.	300-ft.		
Small airplanes with approach speeds less than 50 Knots	800-ft.	800-ft.		
Small airplanes with less than 10 passenger seats				
75% of these small airplanes	2,510-ft.	2,510-ft.		
95% of these small airplanes	3,080-ft.	3,080-ft		
100% of these small airplanes	3,650-ft.	3,650-ft.		
Small airplanes with 10 or more passenger seats	4,260-ft.	4,260-ft.		
Large airplanes of 60,000 pounds or less				
75% of these large airplanes at 60% useful load.	5,350-ft.	5,350-ft.	5,350-ft.	5,350-ft.
75% of these large airplanes at 90% useful load.	7,000-ft.	7,000-ft.	7,000-ft	7,000-ft.
100% of these large airplanes at 60% useful load.	5,530-ft.	5,530-ft.	5,530-ft.	5,530-ft.
100% of these large airplanes at 90% useful load.	8,410-ft.	8,410-ft.	8,410-ft.	8,410-ft
Airplanes of more than 60,000 pounds	5,020-ft.	5,960-ft.	9,790-ft.	10,110-ft.

Source: FAA Airport Design Software Version 4 2D

The *FAA Airport Design Software Version 4.2D* applied airport and runway data, which included the airport's elevation, the mean daily temperature of the hottest month of the year, the maximum difference in runway centerline elevation, and assigned stage lengths to determine the required runway lengths for MLB. For each stage length examined, wet runway conditions were selected to generate runway lengths reflective of a worse case scenario. Small aircraft are unlikely to be operating stage lengths greater than 1,000 N.M. Therefore, required runway distances for small aircraft operating a 3,749 N.M. stage length or 4,102 N.M. stage length were not examined.

For small aircraft, the required runway lengths were identical regardless of stage length examined. Runway lengths required for small aircraft ranged from 300 feet for aircraft with approach speeds of less than 50 knots, to 4,260 feet for aircraft with less than 10 seats. FAA defines large aircraft as those having a maximum takeoff weight greater than 12,500 pounds. The runway length analysis method conducted using FAA's airport design software provides runway requirements for large aircraft of 60,000 pounds or less. Aircraft in this category primarily include corporate aircraft such as the Cessna Citation III (22,000 pounds), Dassault Falcon 20 (28,660 pounds) and Gates Learjet 35 (18,300). The runway length analysis conducted for MLB using the *FAA Airport Design Software Version 4.2D* indicates 100% of large aircraft weighing 60,000 pounds or less with a useful load of 60% of maximum capacity require 5,530 feet of runway for takeoff. When loaded to 90% of maximum useful load, the analysis indicates 75% of large aircraft weighing 60,000 pounds or less require 7,000 feet of runway for takeoff. To accommodate 100% of large aircraft of 60,000 pounds or less loaded to 90% of maximum useful load, 8,410 feet of runway is required for takeoff.

The runway length analysis method conducted using FAA's airport design software also provides runway requirements for aircraft weighing more than 60,000 pounds. Aircraft in this category primarily include air carrier class aircraft. The runway length analysis conducted for MLB using the *FAA Airport Design Software Version 4.2D* indicates aircraft weighing more than 60,000 pounds require 5,020 feet of runway to achieve a 500 N.M. stage length and 5,960 feet of runway to achieve a 1,000 N.M. stage length. Additionally, aircraft operating from MLB to London, England (3,749 N.M.) weighing more than 60,000-pounds require 9,790 feet of runway, while aircraft with the same weight characteristics operating from MLB to Frankfurt, Germany (4,102 N.M.) require 10,110 feet of runway.

As shown using the two runway length analysis methods, to facilitate the B-747-200 at MLB an approximate runway length between 10,110 feet and 11,450 feet will be required. Currently Runway 9R/27L measures 10,181 feet in length. Therefore, current runway length should be sufficient to accommodate most operations of the future design aircraft throughout the planning period. However, the 1996 Master Plan Update analyzed the ability of the airfield to accommodate a main runway of maximum length, while maintaining full RSA's and RPZ's on airport property. The results of this analysis concluded that a runway length of 11,600 feet was feasible. This would be accomplished by implementation of a proposed 1,419 foot westward extension of Runway 9R/27L. Although construction of this extension is not warranted at this time, future aircraft fleet mix and aircraft stage length may dictate a different result. Therefore, current planning efforts will continue to include an option of extending Runway 9R/27L to an ultimate length of 11,600 feet, to be implemented when demand and aircraft operational requirements so dictate.

Runway 9L/27R at MLB currently measures 6,000 feet in length. However, considering the Airport's projected fleet mix, airfield operational flexibility will be compromised if lengthening improvements to Runway 9L/27R are not conducted. Therefore, plans previously formalized to extend Runway 9L/27R 740 feet east and 460 feet west are recommended. The 1,200-foot extension will bring the runway to a total length of 7,200 feet. Although the runway will not possess the length necessary to facilitate a B-747-200 following the extension, Runway 9L/27R will be capable of accommodating 1,000 N.M. stage lengths for 100% of large aircraft weighing less than 60,000 pounds carrying 60% of useful load. Furthermore, Runway 9L/27R will be capable of accommodating 1,000 N.M. stage lengths for 75% of large aircraft weighing less than 60,000 pounds carrying 90% of useful load.

3.2.3.3 <u>Runway Width</u>

Runway width requirements for airport design are included in *FAA AC 150/5300-13*. The facility design standards are predicated on the ARC associated with a runway's design aircraft and approach visibility minimums.

Runway 9R/27L is the primary air carrier runway at MLB and measures 150-feet in width and is aligned with twenty-five (25) foot wide paved shoulders. The current ARC code for Runway 9R/27L is D-IV. As previously discussed the projected ARC for Runway 9R/27L is D-V as a result of the B-747/A-330/A-340 type aircraft becoming the runway's design aircraft. Criteria contained in *FAA AC 150/5300-13* indicates a runway width of 150 feet with thirty-five (35) feet wide paved shoulders is required for meeting D-V ARC facility design specifications. Therefore, additional shoulder width modifications for Runway 9R/27L are recommended.

Runway 9L/27R is a secondary runway at MLB and measures 150-feet in width, but does not include paved shoulders. The current ARC code for Runway 9L/27R is C-II, while the projected ARC code is D-IV. Criteria contained in *FAA AC 150/5300-13* indicates a runway width of 150 feet is required for meeting D-IV ARC facility design specifications. Additionally, FAA recommends runways which maintain an ARC code of

D-IV be equipped with twenty-five feet wide paved shoulders. Therefore, the construction of paved shoulders is recommended for Runway 9L/27R.

Runway 5/23 is a crosswind runway at MLB which is dedicated for use by small aircraft only. Runway 5/23 measures 75 feet in width and currently maintains an ARC of A-I. Since this runway is dedicated to small aircraft exclusively and conforms to current F.A.A. design standards, no facility enhancements or improvements are necessary or recommended.

3.2.3.4 Runway Protection Zones

For the protection of people and property on the ground, the FAA has identified an area of land off each runway end as the Runway Protection Zone (RPZ). For paved runways, the trapezoidal-shaped RPZ is centered in the extended runway centerline starting 200 feet from the paved end of the runway. The RPZ varies in width and length based on runway instrument approach classification. The Airport, through fee simple ownership or easements, should control the land located within the RPZ. Table 3.14 shows the RPZ dimensions required throughout the planning period for each runway located at MLB.

While desirable to clear all objects from the RPZ, some uses are permitted provided they do not attract wildlife, are outside of the Runway Object Free Area, and do not interfere with navigation signals. Automobile parking, although discouraged, may be permitted. Land uses prohibited from the RPZ are residences, places of public assembly (churches, hospitals, office buildings, shopping centers, etc.) and fuel storage facilities.

Table 3.14
RUNWAY PROTECTION ZONE REQUIREMENTS

	Existing	2006	2011	2021
Runway 9R				
Inner Width	1,000'	1,000'	1,000'	1.000'
Outer Width	1,750'	1,750'	1,750'	1,750'
Length	2,500'	2,500'	2,500'	2,500'
Runway 27L				
Inner Width	1,000'	1,000'	1,000'	1,000'
Outer Width	1,510'	1,510'	1,510'	1,510'
Length	1,700'	1,700'	1,700'	1,700'
Runway 9L				
Inner Width	500'	1,000'	1,000'	1,000'
Outer Width	1,010'	1,750'	1,750'	1,750'
Length	1,700'	2,500'	2,500'	2,500'
Runway 27R				
Inner Width	500'	500'	500'	500'
Outer Width	1,010'	1,010'	1,010'	1,010'
Length	1,700'	1,700'	1,700'	1,700'
Runway 5				
Inner Width	250'	250"	250"	250"
Outer Width	450'	450"	450"	450"
Length	1,000'	1,000"	1,000"	1,000"
Runway 23				
Inner Width	250'	250"	250"	250"
Outer Width	450'	450"	450"	450"
Length	1,000'	1,000"	1,000"	1,000"

Source: Compiled by RS&H

3.2.3.5 Runway Safety Area Requirements

A Runway Safety Area (RSA) is an area centered on the runway centerline and is designed to enhance the safety of aircraft that undershoot, overrun or veer off the runway. Table 3.15 provides the RSA requirements through the end of the planning period for each runway at MLB, and it should be noted that all RSA's conform to current FAA design standards. The RSA should also support and provide greater accessibility for fire fighting and rescue equipment during aircraft accidents and incidents. The design of the RSA must conform to the following:

- Cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations;
- Drained by grading or storm sewers to prevent water accumulation;
- Capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and fire fighting equipment, and the occasional passage of aircraft without causing structural damages to the aircraft; and

- Be free of objects, except for objects that need to be located in the RSA because of their function.

Table 3.15
RUNWAY SAFETY AREA REQUIREMENTS

	Existing	2006	2011	2021
Runway 9R/27L				
Width	500'	500'	500'	500'
Length Beyond Runway End	1,000'	1,000'	1,000'	1,000'
Runway 9L/27R				
Width	500'	500'	500'	500'
Length Beyond Runway End	1,000'	1,000'	1,000'	1.000'
Runway 5/23				
Width	120'	120'	120'	120'
Length Beyond Runway End	240'	240'	240'	240'

Source: Compiled by RS&H.

3.2.3.6 Runway Object Free Area Requirements

The Runway Object Free Area (OFA) is an area on the ground centered on the runway centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for objects that need to be located in the OFA for aircraft navigation or ground maneuvering purposes. The Runway OFA is a two-dimensional surface comprising both the Runway OFA and the Precision Object Free Area (POFA). Table 3.16 provides the Runway OFA requirements through the end of the planning period for each runway at MLB.

Table 3.16
RUNWAY OBJECT FREE AREA REQUIREMENTS

	Existing	2006	2011	2021
Runway 9R/27L				
Width	800'	800'	800'	800'
Length Beyond Runway End	1,000'	1,000'	1,000'	1,000'
Runway 9L/27R				
Width	800'	800'	800'	800'
Length Beyond Runway End	1,000'	1,000'	1,000'	1,000'
Runway 5/23				
Width	250'	250'	250'	250'
Length Beyond Runway End	240'	240'	240'	240'

Source: Compiled by RS&H.

3.2.3.7 Runway Orientation

Meteorological conditions play an important role in the operation of an airport and must be taken into account when considering runway orientation. A runway's orientation relative to the direction of the prevailing winds is critical to the safe operation of aircraft. Crosswinds are wind components which move in a direction perpendicular to the runway or path of the aircraft. Therefore, prevailing winds associated with the geographic location of an airport are the primary factor used in determining runway orientation.

As stated in *FAA AC 150/5300-13*, the FAA recommends that a runway system provide a minimum of 95% wind coverage based on a specific runway's ARC. The 95% wind coverage value is computed on the premise a given runway should be oriented not to allow a crosswind component exceeding 10.5 knots, 13.0 knots, 16.0 knots or 20 knots more than 5% of the time depending upon ARC. Table 3.17 identifies the crosswind components and ARCs established by the FAA.

Table 3.17
CROSSWIND COMPONENTS AND AIRPORT REFERENCE CODES

Crosswind Components	Airport Reference Codes
10.5 knots	A-I and B-I
13.0 knots	A-II and B-II
16.0 knots	A-III, B-III and C-I through D-III
20.0 knots	A-IV through D-VI

Source: FAA AC 150/5300-13

A runway wind coverage analysis was conducted using the *FAA Airport Design Software Version 4.2D.* Historical wind data used for the runway wind analysis was obtained from the National Climatic Data Center and is composed of observations collected at MLB over a period beginning in 1993 and ending in 2002. Runway windroses were developed for Instrument Flight Rules (IFR) weather conditions and All-Weather conditions. The windrose illustrating All-Weather conditions is presented Figure 3-3. The windrose illustrating IFR conditions is presented Figure 3-4.

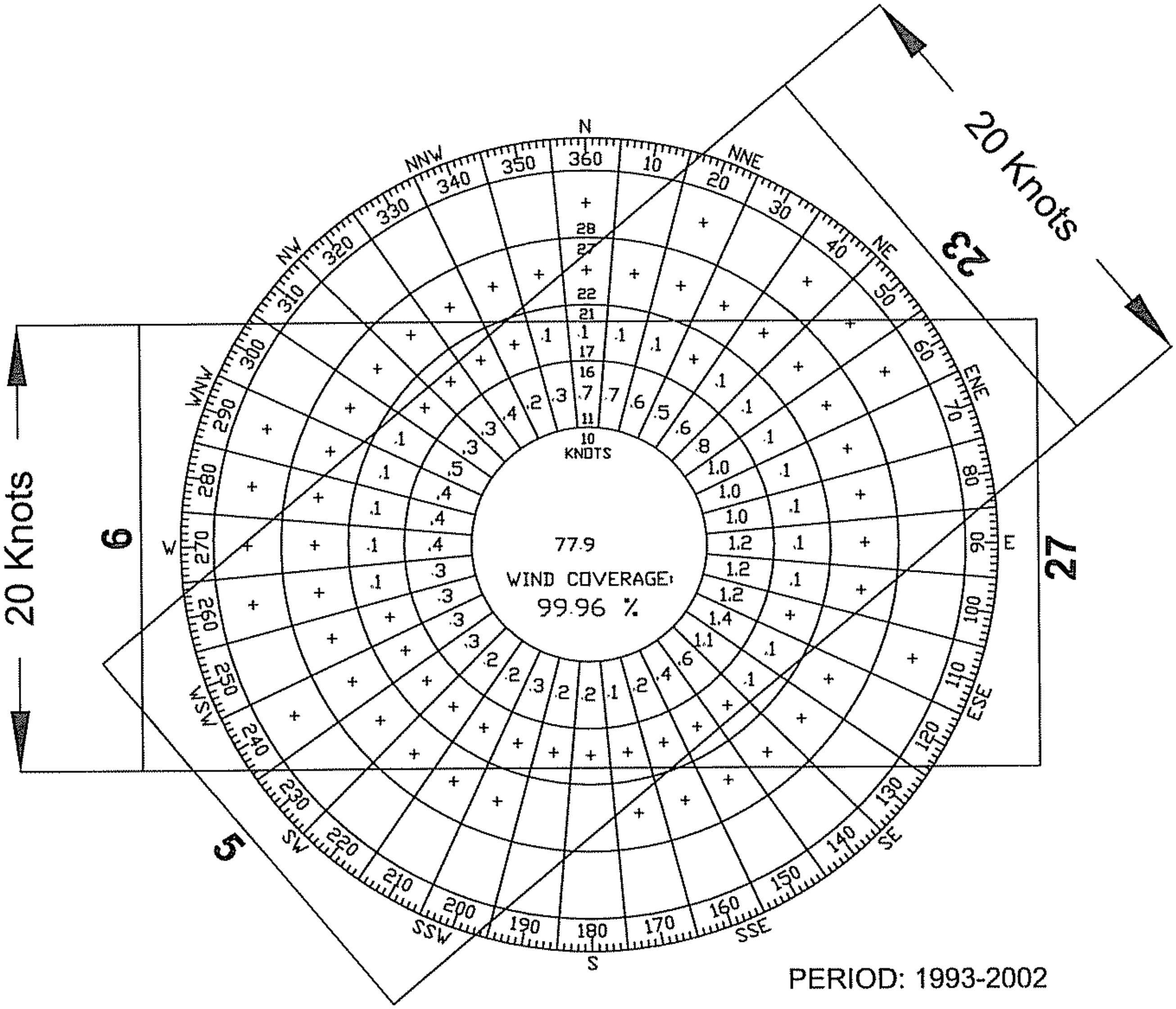
Applying the FAA wind coverage criteria previously described, runway wind coverage was computed for 10.5 knots, 13.0 knots, 16.0 knots and 20.0 knots. The existing ARC for 9R/27L is D-IV and the projected ARC is D-V. As shown in Table 3.17, for D-IV and D-V runways FAA recommends a wind coverage of 95% or greater for a crosswind component of 20 knots. For the 20-knot crosswind component, Runway 9R/27L provides 99.79% wind coverage in the All-Weather condition scenario and 98.80% wind coverage in the IFR conditions scenario. In both, All-weather and IFR scenarios, wind coverage required for Runway 9R/27L exceeds the recommended 95% suggested by FAA for existing and future conditions.

The existing ARC for Runway 9L/27R is C-II and the projected ARC is D-IV. For C-II runways FAA recommends a wind coverage of 95% or greater for a crosswind component of 13 knots. For D-IV runways FAA recommends a wind coverage of 95% or greater for a crosswind component of 20 knots. When applying the 13-knot crosswind component, Runway 9L/27R provides 96.60% wind coverage in the All-Weather condition scenario and 90.24% wind coverage in the IFR conditions scenario. For the 20-knot crosswind component, Runway 9L/27R provides 99.79% wind coverage in the All-Weather condition scenario and 98.80% wind coverage in the IFR conditions scenario. In both, All-weather and IFR scenarios wind coverage required for Runway 9L/27R exceeds the recommended 95% suggested by FAA for future conditions.

The existing ARC for Runway 5/23 is A-I. Coverage for a 10.5 knot crosswind for all runways equals 96.73% for the All-weather condition, and 91.18% for the IFR conditions scenario. Coverage for a 10.5 knot crosswind for Runway 5/23 only equals 90.17% for the All-weather condition, and 85.03 for the IFR conditions scenario. In the event Runway 5/23 is abandoned in the future to accommodate long-term growth of the international terminal, wind coverage scenarios were also examined without Runway 5/23. Under the scenario where Runway 5/23 is abandoned and not replaced, coverage for a 10.5 knot crosswind equals 93.19% for the All-weather condition, and 84.11% for the IFR conditions. The All-weather wind coverage ratio for the overall airfield without Runway 5/23 falls below the F.A.A. recommended level of 95%.

MELBOURNE INTERNATIONAL AIRPORT

ALL-WEATHER WINDROSE



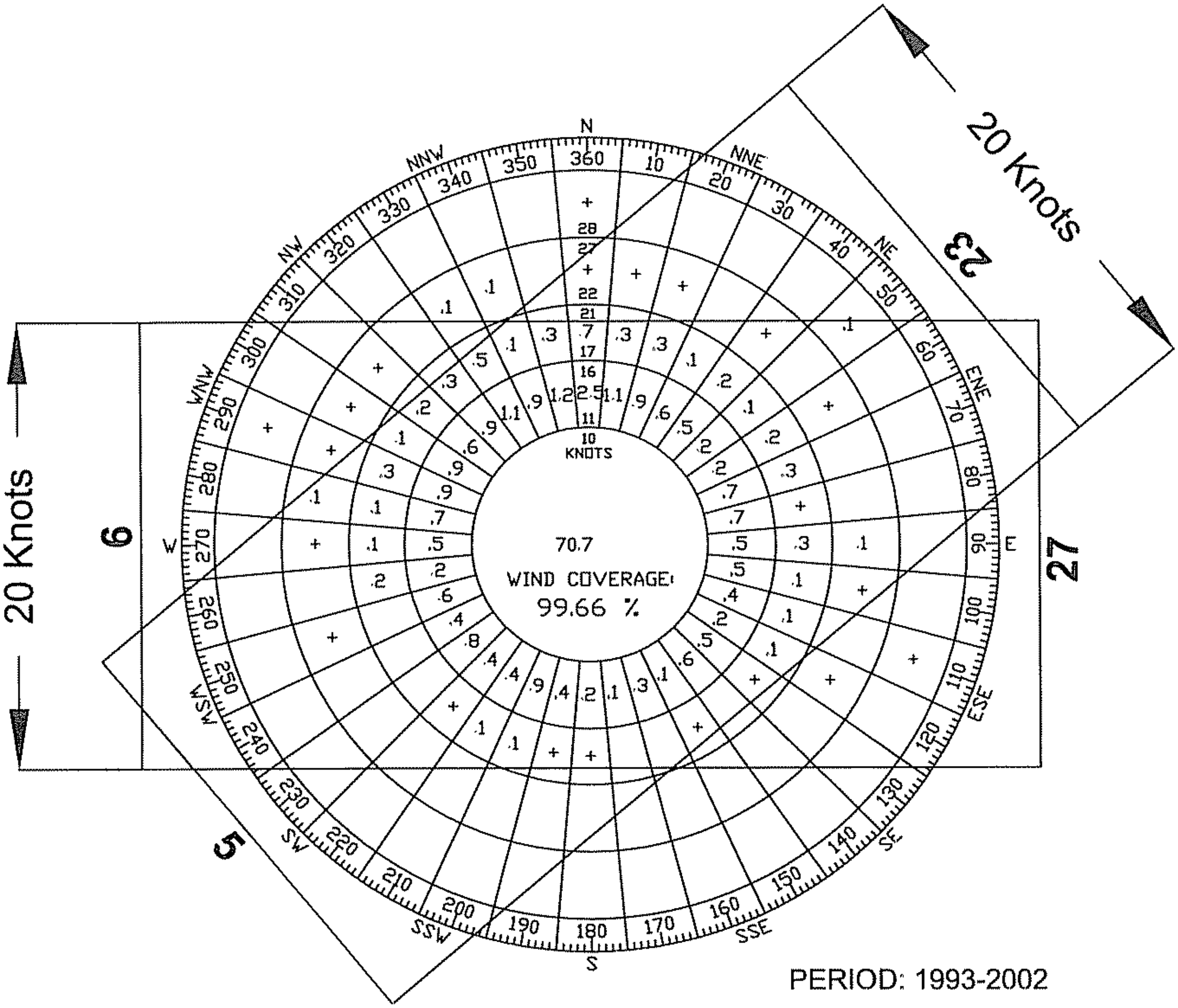
PERIOD: 1993-2002

	CROSSWIND COMPONENT (KT.)			
RUNWAY	10.5	13.0	16.0	20.0
9/27	93.19	96.60	99.10	99.79
5/23	90.17	95.04	99.01	99.82
Combined	96.73	98.88	99.77	99.96

Source: NOAA

MELBOURNE INTERNATIONAL AIRPORT

IFR WINDROSE



PERIOD: 1993-2002

	CROSSWIND COMPONENT (KT.)			
RUNWAY	10.5	13.0	16.0	20.0
9/27	84.11	90.24	96.28	98.80
5/23	85.03	91.54	96.88	99.03
Combined	91.18	95.98	98.73	99.66

Source: NOAA

3.2.4 Taxiway Requirements

A proper taxiway system should provide freedom of movement to and from the runways of an airport under a variety of operating conditions. Table 3.18 presents all taxiway dimensional standards to be applied at MLB. This includes entrance and exit taxiways, taxiway run-up areas, apron taxiways and taxilanes. Improvements to an existing taxiway system are warranted to address issues including capacity enhancement, improved efficiency of aircraft movements on the airfield, and to increase access to developing portions of the airport. Some of the basic design principles for an efficient taxiway system include the following:

- Provide each runway with a full parallel taxiway
- Construct the number of by-pass, multiple access or connector taxiways as required to ensure efficient access to each runway and runway end.
- Provide taxiway hold areas for each runway end.
- Build all taxiway routes as direct as possible.
- Provide adequate curve and fillet radii.
- Avoid developing areas which might create ground traffic congestion.
- Ensure taxiways are adequate to serve projected aircraft ARC.

3.2.4.1 Runway 9R/27L Taxiways

Runway 9R/27L is served by Taxiway 'A', which is a parallel taxiway located 495-feet south of the runway as measured from centerline to centerline. Taxiways serving as connectors between Taxiway 'A' and Runway 9R/27L include Taxiway 'L', Taxiway 'N', Taxiway 'Q', Taxiway 'P', Taxiway 'C' and Taxiway 'R'. The width of Taxiway 'A' and associated connector taxiways vary between 75 and 90-feet. All sections of the taxiway system established to serve Runway 9R/27L meet the required width and separation distance standards specified in FAA AC 150/5300-13 for the facility's existing D-IV and projected D-V ARC. However, when the ARC for Runway 9R/27L is upgraded to D-V, it is recommended that 35 foot paved shoulders for the supporting taxiway system be constructed.

Table 3.18
TAXIWAY REQUIREMENTS

	Existing	2006	2011	2021
Runway 9R/27L				
Taxiway Width	75'	75'	75'	75'
Taxiway Shoulder Width	25'	25'	25'	35'[1]
Taxiway Safety Area Width	171'	171'	171'	214'
Taxiway Object Free Area Width	259'	259'	259'	320'
Taxiway Centerline to Parallel Runway Centerline	495'	400'	400'	400'
Runway 9L/27R				
Taxiway Width	40'	75'	75'	75'
Taxiway Shoulder Width	25'	25'	25'	25'
Taxiway Safety Area Width	171'	171'	171'	171'
Taxiway Object Free Area Width	259'	259'	259'	259'
Taxiway Centerline to Parallel Runway Centerline	325'	400'	400'	400'
Taxiway Centerline to Parallel Taxilane Centerline	153'	105'	105'	105'
Runway 5/23				
Taxiway Width	40'	40'	40'	40'
Taxiway Shoulder Width	10'	10'	10'	10'
Taxiway Safety Area Width	49'	49'	49'	49'
Taxiway Object Free Area Width	89'	89'	89'	89'
Taxiway Centerline to Parallel Runway Centerline	200'	200'	200'	200'
Taxiway Centerline to Parallel Taxilane Centerline	170'	170'	170'	170'

Source: Compiled by RS&H.
[1]Paved taxiway shoulders are recommended.

Taxiway 'A' begins at the approach end of Runway 9R and extends east parallel to Runway 9R/27L before intersecting with Runway 5/23 and terminating at the air carrier ramp. Additionally, Taxiway 'A' serves as a connector taxiway on the west end of Runway 9R/27L, which allows aircraft the ability to depart on Runway 9R using the entire runway length.

Since Taxiway 'A' does not extend the entire length of Runway 9R/27L, departing aircraft operating from the air carrier ramp use Taxiway 'T' to access Runway 27L, while aircraft operating from the cargo facilities use Taxiway 'U'. The number of taxiways, intersections and points of convergence located in this area of the Airport are a result of the location and orientation of Runway 5/23 relative to Runway 9R/27L.

3.2.4.2 Runway 9L/27R Taxiways

Runway 9L/27R is positioned north of Runway 9R/27L and south of the Airport's designated general aviation area. Runway 9L/27R is presently served by Taxiway 'K', which is a full-length parallel taxiway positioned 325-feet north of the runway and measuring 40-feet in width. Taxiways serving as connectors between Taxiway 'K' and

Runway 9L/27R include Taxiway 'M' and Taxiway 'Q'. In addition to serving as a connector taxiway, Taxiway 'Q' extends across the entire width of the airfield connecting the north side of the Airport with the facilities associated with the airport's industrial tenants located on the south side of the Airport. Taxiway 'M,' which connects Runway 9L/27R with the overflow air carrier apron, measures 75-feet in width. The portion of Taxiway 'Q' north of Runway 9L/27R and connects the Airport's designated GA area with Runway 9R/27L measures 40-feet in width. The portion of Taxiway "Q" between the parallel runways is 75-feet in width. The remaining portion of Taxiway 'Q', which extends from Runway 9R/27L to the aprons utilized by the Airport's industrial tenants located on the south side measures 90-feet in width.

Through a review of the facility design criteria outlined in *FAA AC 150/5300-13*, the existing taxiway width and distance between the centerlines associated with Runway 9L/27R and Taxiway 'K' centerline required for meeting the facility's future D-IV ARC are inadequate. To meet FAA requirements for the D-IV ARC, the separation distance between the centerlines associated with Runway 9L/27R and Taxiway 'K' should be 400-feet as opposed to the existing 325-feet. Additionally, the width of the taxiways designed to facilitate Runway 9L/27R should measure a minimum of 75-feet in width to fulfill the FAA requirements for D-IV ARC.

To address taxiway width and separation distance deficiencies associated with Taxiway 'K,' it is recommended that either Taxiway "K" be relocated to the required separation distance, or a new parallel taxiway be constructed south of Runway 9L/27R. The recommended solution will be examined further in Section 4 of this report.

3.2.4.3 Runway 5/23 Taxiways

Runway 5/23, which serves small general aviation aircraft only, is positioned adjacent to the air carrier facilities and south of Runway 9R/27L. Runway 5/23 is served by Taxiway 'D', which is a full-length parallel taxiway positioned 200-feet south of the runway and measures 40-feet in width. Taxiways serving as connectors between Taxiway 'D' and Runway 5/23 include Taxiway 'C', Taxiway 'A', Taxiway 'R', Taxiway "V" and Taxiway 'E'. In addition to being instrumental in providing access to Runway 5/23, Taxiway 'D' also provides small aircraft access to the approach end of Runway 27L. All sections of the taxiway system established to serve Runway 5/23 meet the required width and separation distance standards specified in FAA AC 150/5300-13 for the facility's existing A-I. Therefore, no modifications to the taxiway system associated with Runway 5/23 are recommended.

3.2.4.4 New Taxiways

Currently aircraft arriving or departing Runway 9R/27L whose ultimate destination or origination is the north side of the Airport, must taxi via a mid-field taxiway and cross one of both parallel runways. For purposes of convenience, ease of traffic movement on the airfield, and the elimination of unnecessary runway crossings, a connector taxiway is proposed which will link the approach end of Runway 9R with the approach end of Runway 9L.

3.2.5 Pavement Strength

Pavement strength is a realistic approximation of load-bearing capability required by an airfield surface to facilitate an average level of activity. The pavement strength values documented in the *FAA Airport Facility Directory (AFD)* are not intended to be interpreted as maximum allowable weights or as an operating limitation. Many airport pavements are capable of supporting limited operations with gross weights of 25% to 50% in excess of the pavement strengths published in the *AFD*. When desiring to operate into an airport at weights in excess of those published in the *AFD*, airport users are responsible for coordinating the operation with airport management.

The method typically applied to determine a pavement's structural integrity relative to the surface's projected design aircraft is the Aircraft Classification Number (ACN)/Pavement Classification Number (PCN) system. If the ACN associated with a runway's projected design aircraft is equal to or less than the PCN assigned to the respective runway, the projected design aircraft can operate on the pavement subject to any limitation on tire pressure[2]. Although the ACN can be calculated using tables and charts provided by manufacturers of the runway's design aircraft, the PCN is established through an engineering assessment of the runway. Since a pavement evaluation to determine the PCN values of the runways at MLB has not been completed, projected runway strength values were estimated through an analysis of the Maximum Gross Take-Off Weights (MGTOW) associated with the existing and projected design aircraft. Prior to initiating

[2] Airport Facility Directory (March 2003)

any pavement strength improvements at MLB, a formal pavement design and site survey including soil borings are recommended for all runways.

Presently Runway 9R/27L is constructed of asphalt and has pavement strength of 100,000 pounds for single-wheel type landing gear, 165,000 pounds for dual-wheel type landing gear and 300,000 pounds for dual-tandem type landing gear. The current pavement strength of 9R/27L is adequate for serving MLB's existing fleet mix and the fleet mix projected to be operating at the Airport throughout the initial phases of the planning period. In the future however, the design aircraft for Runway 9R/27L will be the B-747-200, which has double dual-tandem landing gear and a MGTOW of 785,000-pounds. By the year 2021, the B-747-200 is expected to be performing approximately 252 departures or 504 operations annually on 9R/27L. As a result, the pavement should be strengthened to at least 75% of the MGTOW of the 747-200. Considering the number of projected annual B-747-200 departures and assuming the pavement planned for 9R/27L will facilitate limited operations by aircraft with gross weights in excess of 25% to 50% of the pavement's strength, the recommended minimum weight bearing capacity is 589,000-pounds for double dual-tandem type landing gear aircraft.

Runway 9L/27R at MLB is constructed of asphalt and has pavement strength of 60,000-pounds for single-wheel type landing gear and dual-wheel type landing gear. Considering the fleet mix currently operating on Runway 9L/27R is composed of primarily corporate aircraft, the current pavement strength is adequate for fulfilling the runway's design requirements. The future design aircraft for Runway 9L/27R is the MD-88, which maintains dual-wheel type landing gear and MGTOW of 149,500-pounds. Compared to dual-tandem and double dual-tandem aircraft landing gear types, the dual-wheel landing gear system maintains the greatest potential to damage airport surfaces. By the year 2021 the MD-88 is projected to perform approximately 455 departures or 910 operations annually on 9L/27R and 1,062 departures or 2,124 operations annually on Runway 9R/27L. Because of landing gear type associated with the MD-88 and projected regularity of the aircraft's operations at the Airport, the pavement strength for Runway 9L/27R is recommended to be increased to at least 150,000-pounds for dual-wheel type landing gear.

Runway 5/23 has a pavement strength of 26,000-pounds for single-wheel type landing gear. The current pavement strength associated with Runway 5/23 is adequate for meeting the needs of the existing fleet mix. As a result, no modifications to the pavement strength associated with Runway 5/23 is recommended.

3.2.6 Pavement Conditions

Pavement conditions were reviewed in order to determine the timing of facility upgrades or improvements. Table 3.19 provides a summary of existing airfield pavement conditions and recommended facility requirements for rehabilitation and maintenance of these pavements to allow the existing and projected facilities to continue to serve future aviation demand.

Table 3.19
MELBOURNE INTERNATIONAL AIRPORT PAVEMENT CONDITIONS

Pavement Surface	Composition	Existing Condition	2006	2011	2021	Notes
Runway 9R-27L	Asphalt Grooved	Good	Maintain	Maintain	Rehabilitate & Strengthen	9,481 feet of Runway overlayed in 1997/98. 700 feet of the approach end of 27L overlayed in 2001. Total runway length of 10,181 feet.
Runway 9L-27R	Asphalt	Good	Maintain	Rehabilitate	Maintain	Runway surface in good condition except in areas of pavement markings. Runway was widened and strengthened in 1992.
Runway 5/23	Asphalt	Good	Maintain	Rehabilitate	Maintain	Runway was reconstructed in 1991.
Taxiway "A"	Asphalt	Good	Maintain	Rehabilitate	Maintain	Taxiway "A" west of Taxiway "R" was overlayed in 1990. Taxiway "A" between Taxiway "R" and the apron was constructed in 1988.
Taxiway "C"	Asphalt	Good	Maintain	Rehabilitate	Maintain	Taxiway "C" between Runway 9R/27L and 9L/27R was overlayed and strengthened in 1992. Taxiway "C" south of Taxiway "A" was reconstructed in 1985 but remains in good condition.
Taxiway "D"	Asphalt	Fair	Rehabilitate	Maintain	Maintain	Taxiway "D" was constructed in 1979.
Taxiway "K"	Asphalt	Good	Rehabilitate	Maintain	Maintain	Taxiway "K" was constructed/overlayed in 1980/85.
Taxiway "L"	Asphalt	Good	Maintain	Rehabilitate	Maintain	Taxiway "L" was overlayed in 1990.
Taxiway "M"	Asphalt	Good	Maintain	Maintain	Rehabilitate	Taxiway "M" was overlayed and widened in 2002.
Taxiway "N"	Asphalt	Fair	Rehabilitate	Maintain	Maintain	Taxiway "N" was constructed in 1985.
Taxiway "P"	Asphalt	Good	Maintain	Rehabilitate	Maintain	Taxiway "P" was overlayed in 1990.
Taxiway "Q"	Asphalt	Poor	Maintain	Rehabilitate	Maintain	Taxiway "Q" between Runway 9L-27R and 9R-27L reconstructed, strengthened and widened in 2003. Between 9R and "A" overlayed in 1990. South of Taxiway "A" constructed in 1986 and in poor condition.
Taxiway "R"	Asphalt	Good	Maintain	Rehabilitate	Maintain	Taxiway "R"overlayed in 1990.
Taxiway "T"	Asphalt	Fair	Maintain	Rehabilitate	Maintain	A portion of Taxiway "T" between the approach end of Runway 27L and the apron is in fair condition and was overlayed in 1985.
Taxiway "U"	Asphalt	Good	Maintain	Maintain	Maintain	A portion of Taxiway "U" between the approach end of Runway 27L and the apron was reconstructed in 2003.
Taxiway "V"	Asphalt	Good	Maintain	Rehabilitate	Maintain	Taxiway "V" constructed in 1979 and extended in 1988/89.
Air Carrier Apron	Concrete/ Asphalt	Good	Maintain	Rehabilitate	Maintain	The air carrier apron was constructed in 1988 and requires joint seal replacement.
FIS Apron	Concrete	Good	Maintain	Maintain	Rehabilitate	The FIS Apron was constructed in 1995.
FIT Apron	Asphalt	Poor	Rehabilitate	Maintain	Maintain	The FIT apron is original WWII construction. A northwest extension of the apron was constructed in 1979.
Gruman Phase 1	Asphalt	Fair	Rahabilitate	Maintain	Maintain	The Phase 1 Gruman apron (west of Taxiway "Q") was constructed in 1986.
Gruman Phase 2	Asphalt	Good	Maintain	Maintain	Rehabilitate	The Phase 2 Gruman apron (east of Taxiway "Q") was constructed in 1995.
North GA Apron	Asphalt	Fair	Rehabilitate	Maintain	Maintain	The North GA Apron (west of Atlantic Jet Center) was constructed in 1982 and expanded in 1985.
Air Carrier Multi-use apron	Concrete	Good	Maintain	Maintain	Maintain	New apron constructed in 2002.
Aircraft Maintenance Aprons	Concrete	Good	Maintain	Maintain	Maintain	New aprons constructed in 2002.

Source: AEC, RS&H

3.3 DOMESTIC AIR CARRIER AND TERMINAL FACILITIES

The role of the airport passenger terminal is to provide a facility which balances present and future needs for passenger convenience, baggage handling, aircraft operations, ground access, business commerce and operational control. The primary objective is to facilitate the movement of passengers and baggage between surface and air transportation modes with a minimum amount of time, confusion and inconvenience.

The terminal provided at MLB is a centralized facility in which processing of passenger ticketing, baggage check-in, baggage claim, security screening and aircraft boarding are achieved in one building. A primary advantage of a centralized facility is the ability of the airport and air carriers to focus efforts in a concentrated area, thereby minimizing duplication of personnel costs and allowing for the consolidation of facility and operational equipment. Additionally, a centralized terminal provides an airport the ability to consolidate passenger transfer, simplify vehicle and passenger information systems and provide a common area for passenger services and amenities. As a result, centralized terminals are typically less expensive to operate than other types of terminals.

3.3.1 Terminal Capacity and Facility Requirements

The terminal capacity and facility requirements analysis for MLB was conducted using forecast information presented in Section 2. Depending on the type of facility being examined, the terminal analysis utilized the forecast number of annual enplanements, annual passengers or annual aircraft operations to obtain the Airports' projected space requirements. To determine future space requirements for the terminal, peak hour demand values were also applied to determine the level of accommodations necessary to facilitate passenger traffic during the most critical hour of the year. After determining the terminal space values, Strategic Planning Activity Level (SPAL) values were calculated to serve as numerical thresholds for MLB personnel to use in planning additional facilities.

An airport terminal consists of a complex network of individual elements with different demand levels and capacity requirements. Facility expansion adds incremental growth to various elements as needed. As a result the need for additional facilities does not occur simultaneously with all airport elements. Therefore, space deficiencies identified with terminal elements in the future may be resolved through space reallocation rather than through constructing additional space.

3.3.1.1 Terminal Requirements

The overall size of a terminal is referred to as the terminal footprint. The size of an airport's terminal and amenities provided should correspond to the travel characteristics of the community in which it serves. FAA recommends a minimum size allotment of 150-square-feet per peak hour passenger. Through discussions with aviation architects, Airport Staff and other industry leaders, and due to increased passenger dwell times as a result of enhanced security, 250-square-feet per peak hour passenger was determined to be the basis for use in planning the future size of MLB's terminal. Table 3.20 depicts the existing terminal space condition and future facility requirements.

Not including the existing International Terminal (IT) facilities, MLB's terminal includes 149,574-square-feet of space. The ratio of existing terminal space to the existing peak hour passenger level is 510-square-feet per peak hour passenger, which is an indication portions of the existing domestic terminal facility are currently under utilized. Relative to the 20-year planning period, overall spatial needs of the terminal will need to be addressed between 2006 and 2021. Relative to the calculated SPAL value, overall terminal space will reach capacity at 442,500 annual enplanements (885,000 annual passengers). Additional SPAL values are presented in summary form in Section 3.8.

3.3.1.2 Airline Gates

An important attribute of an airport passenger terminal is the number of aircraft parking positions or gates. Consequently an emphasis should be placed on understanding actual gate demand prior to construction and creation of a terminal development strategy which provides for easy gate expansion when demand requires.

The method used to determine the number of gates required for the domestic terminal considered peak hour demand and gate utilization rates. The method, which is outlined in FAA AC 150/5360-13, *Planning and Design Guidelines for Airport Terminal Facilities*, applied the peak hour gate utilization rate to future activity levels in order to estimate future gate requirements. Presently, there are three aircraft operations during the peak hour and six available gates. Therefore, on average each gate will accommodate 0.5

Table 3.20

AIR CARRIER TERMINAL FACILITY REQUIREMENTS

	Existing	2006	2011	2021
Annual Enplanements	200,032	388,500	550,400	686,000
Annual Passengers	400,064	777,000	1,100,800	1,372,000
Peak Hour Passengers	293	570	807	1,006
SF/Total Peak Hour Passengers	[1]510	250	250	250
Annual Domestic Operations	6,952	9,582	12,779	14,892
Peak Hour Domestic Operations	3	4	6	7
Total Terminal Area (SF)	149,574	142,450	201,813	251,533
Airline Space (SF)	47,765	47,009	66,598	83,006
Number of Gates	6	5	6	7
Ticket Counter Length (LF)	225	210	297	370
Ticket Counter Area	5,594	2,097	2,970	3,702
Offices & Administration	7,257	5,989	8,485	10,575
Outbound Baggage Area	10,936	8,838	12,520	15,605
Baggage Claim Area	7,358	6,426	9,104	11,347
Baggage Claim Length (LF)	224	190	269	335
Passenger Departure Lounge	11,385	15,861	22,470	28,006
Operations Facilities	5,235	7,799	11,049	13,771
Public Space (SF)	50,889	56,980	80,725	100,613
Waiting	8,390	2,268	3,213	4,004
Security	1.713	1,960	2,777	3,461
General Circulation	39,742	48,718	69,020	86,024
Restrooms	1,044	4,034	5,715	7,123
Concession Space (SF)	13,971	24,217	34,308	42,761
General Concessions	3,664	9,139	12,948	16,138
Advertising	-	581	823	1,026
Ground transportation	2,741	2,908	4,120	5,136
Food & Drink	7,566	10,227	14,488	18,058
Miscellaneous	-	1,359	1,925	2,399
Airport Management (SF)	36,949	14,245	20,181	25,153
Auto Parking Spaces	1,255	1,516	2,147	2.679
Short Term Spaces	282	254	360	449
Long Term Spaces	699	889	1,260	1,572
Employee Spaces	154	130	183	229
Rent-a-car Spaces	120	243	344	429
Curb Front (LF)	571	315	446	556
Enplaning Curb	257	141	200	250
Deplaning Curb	314	173	246	306

Source: Airport Terminal Space Concept Program
[1]Calculation based on current passenger demand and available terminal space. Future planning criteria is 250 square foot per peak hour passenger.

aircraft operations during the Airport's peak hour. FAA recommends a domestic gate utilization factor of between 0.9 and 1.1 peak hour aircraft operations. The existing gate utilization factor of 0.5 at MLB indicates the terminal gates have the ability to accommodate an increase of peak hour operations of between approximately 50% and 80%. To project the number gates required at MLB, a utilization rate of 1.1 was applied.

The purpose of using a gate utilization rate of 1.1 was to enhance the Airport's future ability to reduce peak hour congestion, allow air carriers serving the Airport the ability to continue providing an increased level of service and better position the Airport to attract additional air service. With respect to the 20-year planning period, the existing number of gates at MLB will be sufficient through 2011, but will need to be increased prior to 2021. With respect to the calculated SPAL value, additional gates will need to be provided prior to the Airport reaching 11,365 annual air carrier operations.

3.3.1.3 Airline Space

Airline space includes ticket counter area, administrative offices, passenger departure lounges, operations facilities and baggage claim area. FAA recommends 33% of the total terminal area be dedicated to airline space. The existing area designated as airline space at MLB is 47,765 square-feet. With respect to the 20-year planning period, this area is sufficient for meeting the Airport's needs through 2011, but will need to be increased prior to 2021. The calculated SPAL value indicates MLB's existing airline space will accommodate 433,000 annual enplanements (866,000 annual passengers).

3.3.1.4 Public Space

Public space includes waiting areas, security, general circulation areas and restrooms. FAA recommends 40% of the total terminal area be dedicated to public space. The existing area designated as public space at MLB is 50,889 square-feet. This area is sufficient for meeting the Airport's needs through 2006 with respect to the 20-year planning period. However, public space will need to be increased prior to 2011. The calculated SPAL value indicates MLB's existing public space will accommodate 397,000 annual enplanements (794,000 annual passengers).

3.3.1.5 Concessions

Space designated as concessions includes areas leased by the Airport for advertising, ground transportation services, food and drink facilities, and general concessions such as gift shops, banks and game rooms. Considerations regarding the location of concession space include storage capabilities, delivery vehicle accessibility, airline passenger accessibility and employee parking location. FAA recommends 17% of the total terminal area be dedicated to concessions. The existing area dedicated to concessions at MLB is 13,971 square-feet. Assuming an allowance of 250 square-feet per peak hour passenger, the existing area established for concessions is sufficient for meeting the Airport's present needs. However, the need for concession space by 2006 is 24,217 square-feet, nearly double the existing concession space. The calculated SPAL value indicates MLB's existing concession space will accommodate 296,000 annual enplanements (592,000 annual passengers). Therefore, plans to increase the amount of existing concession space is recommended and will be examined in further detail in Section 4 of this report.

3.3.1.6 Airport Management

Airport management space includes areas used for airport administrative purposes, custodial storage and utility storage. Considerations regarding the location of airport management space include storage capabilities, location relative to security checkpoints, accessibility and location relative to airline concourses. FAA recommends 10% of the total terminal area be dedicated to airport management space. The existing area dedicated to airport management at MLB is 36,949-square-feet. The existing area established for airport management purposes is sufficient for meeting the Airport's needs throughout the planning period. Additionally, the SPAL value calculated for airport management space indicates the existing area will be sufficient until the Airport reaches approximately 1,489,000 annual enplanments (2,978,000 annual passengers).

3.3.1.7 Enplaning and Deplaning Curb

Terminal frontage is a critical element in the performance of the Airport's terminal ground access system. Congestion at the terminal interface is common at many airports as a result of curb design deficiencies. This is because curb design is tied to airport activity characteristics such as peak-passenger volume, annual enplanement levels, modes of transportation accessing the terminal and curb dwell time. Curb length along a terminal will vary and should be designed specifically for the travelling community in which it serves.

The curb front provided at MLB measures 571-feet in length. Of the total curb length, 257-feet are intended to be used by enplaning passengers, while the remaining 314-feet is intended to be used by deplaning passengers. The analysis used to generate projected curb length values assumed approximately one-third of the projected peak hour enplanements and approximately one-half of peak hour deplanements would be transported to or from the Airport's curb. Additionally, an overlap factor of 16% was incorporated to include deplaning passengers being picked up at the enplaning curb and vice versa. Values presented in Table 3.20 indicate the existing curb length provided at MLB is sufficient to meet the Airport's needs throughout the planning period. The SPAL value calculated for curb length at MLB indicates the existing curb facility can accommodate approximately 707,000 enplanements (1,414,000 annual passengers). However, these values do not take into consideration the intermodal nature of the MLB terminal facility.

The intermodal aspect of an airport terminal is a subjective element relative to quantifying adequate curb length. Currently Greyhound Bus Lines operates a city station at MLB. Additionally, the airport terminal serves as a regular stop for Space Coast Area Transit Authority (SCAT), the area's local bus service. As a result, the existing curb length meets the needs of the Airport today. However, a combination of the projected increase in peak hour demand and continued development of intermodal facilities at the airport will ultimately dictate the existing curb length be more adequately adapted to accommodate the unique nature of ground transportation services at the Airport.

3.3.1.8 Auto Parking

As previously outlined in the Section 1, auto parking at MLB consists of a total of 1,255 parking spaces. Of the 1,255 parking spaces, 282 are short term, 699 are long-term, 154 are employee parking, and 120 are rent-a-car spaces. The existing parking facilities at MLB are illustrated in Figure 3.5.

Most airports provide short-term parking lots as a matter of convenience and courtesy to the traveling public. Short-term parking is typically considered to be less than three hours in duration. Turnover is encouraged through use of meters and/or higher parking rates. At MLB, the number of required short-term parking spaces was calculated based on a ratio of approximately two and one-quarter parking spaces per peak hour passenger. Available short-term parking spaces at MLB are sufficient through 2006, but will need to be increased prior to 2011. SPAL values calculated for short-term parking indicate the existing short-term lot can facilitate approximately 432,000 annual enplanements (864,000 annual passengers).

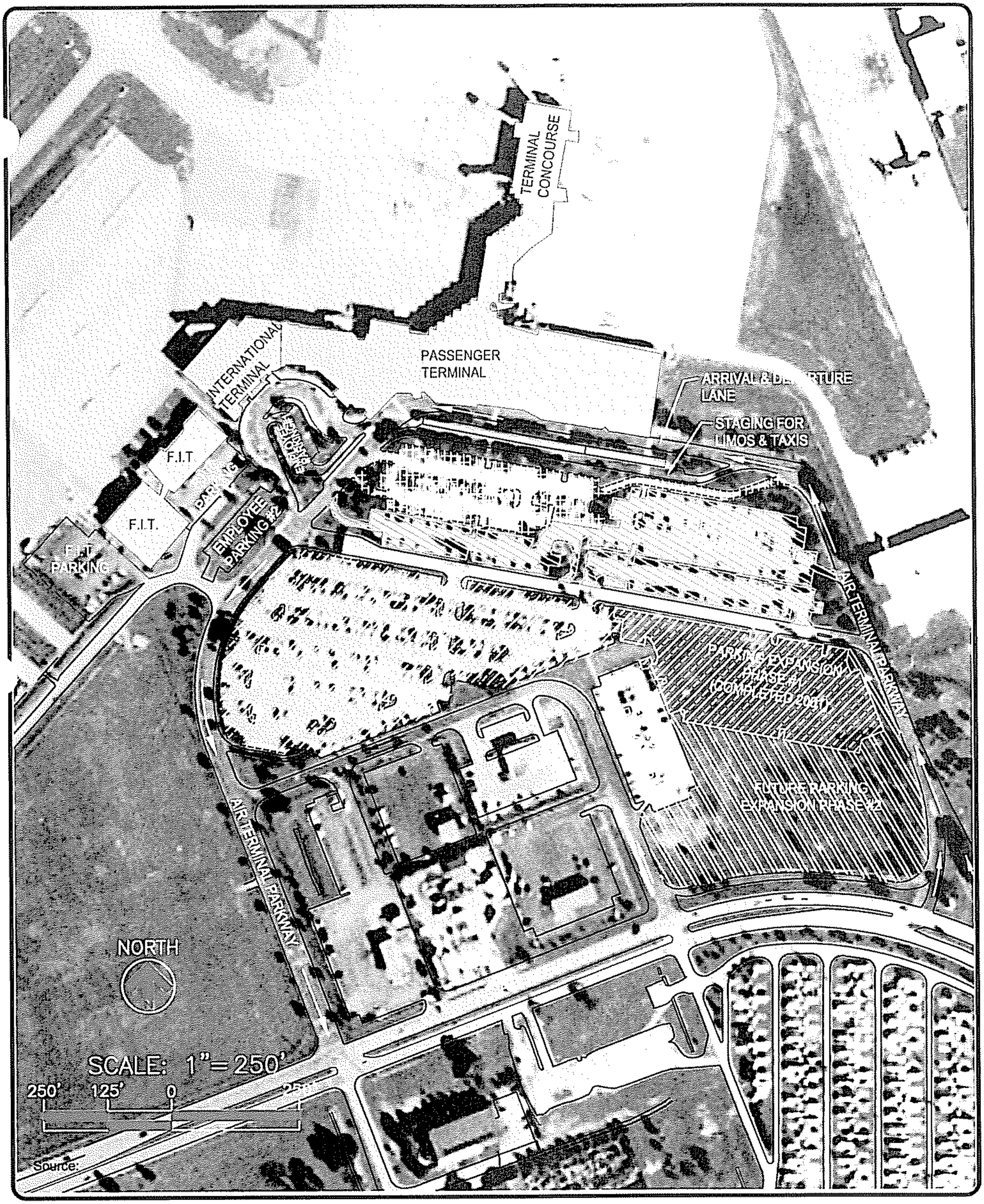


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Figure 3-5

Existing Automobile
Parking Areas

Projected long-term parking needs at MLB were calculated based on one parking space for every 3.5 short-term parking spaces. Presently, 699 long-term parking spaces are available. However, for purposes of the 20-year planning period, 889 spaces will be needed by the year 2006. In addition, 1,260 long-term spaces will be needed by year 2011, while 1,572 spaces will be needed by year 2021. SPAL values calculated for long-term parking indicate the existing number of long-term spaces can facilitate approximately 305,000 annual enplanements (610,000 annual passengers).

Projected employee-parking needs at MLB were calculated based on one parking space per 3,000 annual enplanements. Presently, 154 employee-parking spaces are available. For purposes of the 20-year planning period, the existing employee parking facilities are adequate for meeting the Airport's needs through 2006. However, 183 employee spaces will be needed by 2011 and 229 employee spaces will be needed by year 2021. SPAL values calculated for employee parking needs indicate the existing number of employee-parking spaces can facilitate approximately 462,000 annual enplanements (924,000 annual passengers).

Projected rent-a-car parking needs at MLB were calculated based on one parking space for every 1,600 annual enplanements. This planning factor usually takes into consideration the affects of a strong local market as well as the enplanement base. Presently, 120 rent-a-car-parking spaces are available. For purposes of the 20-year planning period, 243 spaces will be needed in 2006, while 344 spaces will be needed in 2011 and 429 spaces in 2021. A summary of the parking requirements if presented in Table 3.21.

Table 3.21
SUMMARY OF PARKING REQUIREMENTS

Type of Space	Existing	2006	2011	2021
Short-term	282	254	360	449
Long-term	699	889	1,260	1,572
Employee	154	130	183	229
Rent-a-car	120	243	344	429
TOTAL	1,255	1,516	2,147	2,679

Source: RS&H

Calculations for projected parking requirements at MLB do not take into account impacts resulting from improvements to the Airport's International Terminal facility, which will be discussed later in this section. Modifications to the international facility could result in a westward and ultimate northwestward expansion, which may eventually impact Runway 5/23 and provide additional developable area to accommodate parking and ground transportation requirements.

3.4 INTERNATIONAL TERMINAL FACILITIES

Airports with international traffic require space for federal inspection of passengers, aircraft, crewmembers, baggage and cargo. Federal Inspection Station facilities are designed in accordance with the *Airport Federal Inspection Facilities Guidelines* publication, which outlines the necessary areas allocated for each agency operating within the International Terminal (IT). The area within an IT facility contains space dedicated to accommodating various divisions within the Department of Homeland Security. These divisions include the U.S. Customs and Boarder Protection (USCBP), and Public Health Services (PHS).

Table 3.22 contains a listing of the spatial elements associated with each service department, which are recommended to be included within an airport IT. The following is a summary of each service department's purpose.

- USCBP – Controls the entrance and clearance of aircraft arriving in and departing from the U.S. and inspects crewmembers, passengers, baggage and cargo to determine admissibility for entering the U.S. A determination can then be made as to whether any or all are subject to duty, free of duty or prohibited, and protects American agriculture by preventing the introduction of injurious plant and animal pests and diseases.
- PHS – Are responsible for the prevention, introduction, transmission or spread of communicable diseases from foreign countries into the U.S. or associated territories.

Arriving international passengers are required to be isolated from all other passengers, visitors and non-agency personnel until processing has been completed. After deplaning the aircraft, international passengers initially complete the immigration and PHS inspection process before entering the baggage claim area of the international terminal. After claiming their baggage, international passengers complete the Customs and APHIS inspection process before being allowed to exit the terminal.

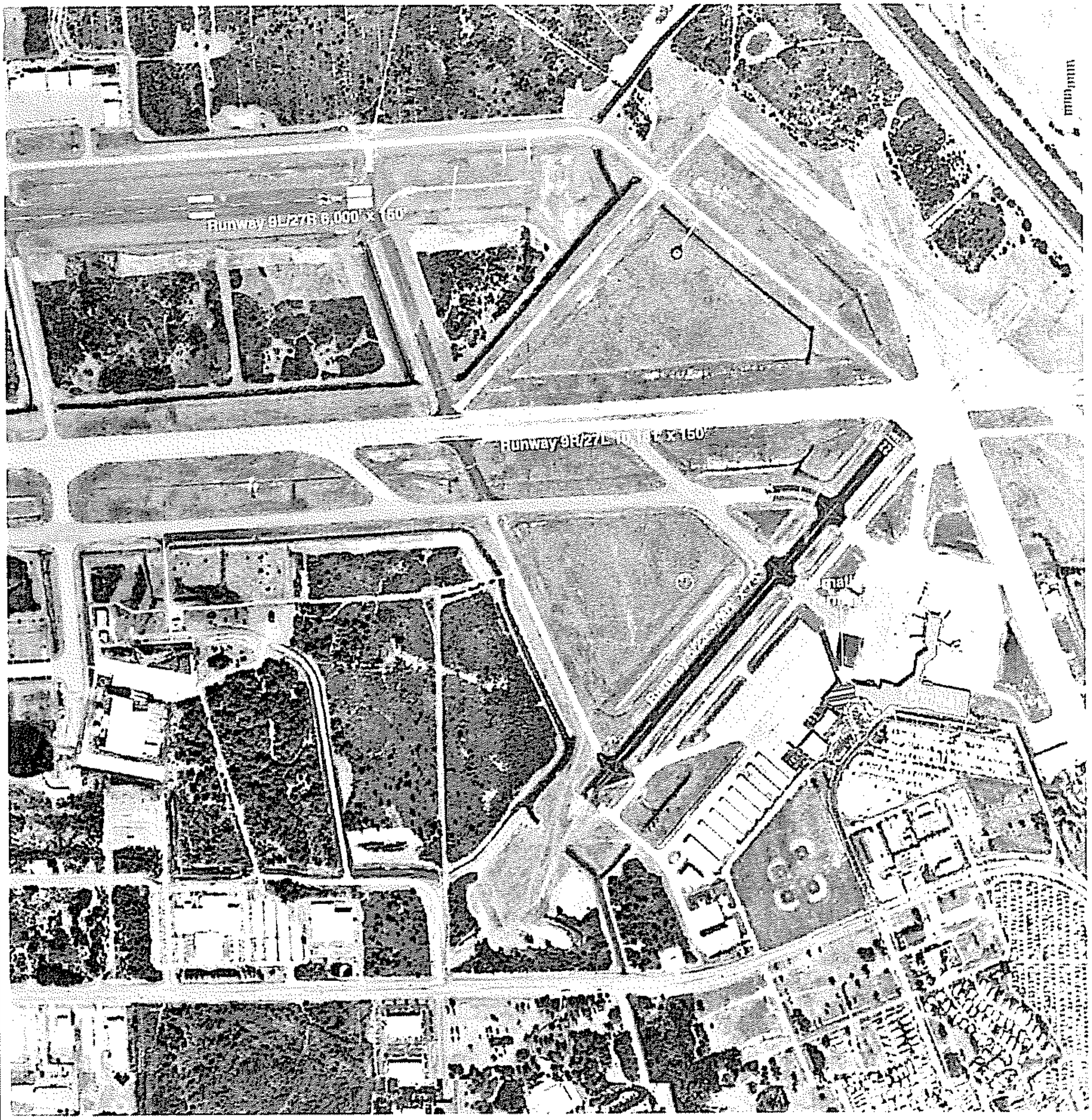
Table 3.22
INTERNATIONAL TERMINAL SPATIAL ELEMENTS

Elements
U.S. Customs & Boarder Protection
Piggyback Booths[1]
Queuing Space
General Office Space
Conference/Training Room
Break/Lunch Room
ADIT/Lab Office[2]
Secondary Inspection Booths/ Area[3]
Interview Rooms
Supervisors Offices
Port Directors Office
Clerk/Stenographer Space
Employee Locker & Toilet
Storage Space
Search Rooms
Conference & Training Room
Rover Control Center
Public Space with Counter
Hold Rooms with Toilets
Employee Locker Room
Computer Room
Garbage Disposal Units
Baggage Claim Belt
Laboratory
Officer in Charge Office
Inspectors Office
U.S. Public Health Service
Supervisors Office
General Office Space
Clerk/Reception Area
Isolation Area

[1]Each Piggyback Booth contains two work stations.
[2]ADIT - Alien Documentation Identification Telecommunication
[3]Each Secondary Inspection Booth contains two work stations.
Source: Airport Federal Inspection Facilities Guidelines - MAA

3.4.1 Existing International Terminal Facilities

Existing IT facilities provided at MLB are located on the western end of the domestic passenger terminal. Figure 3-6 illustrates the position of the IT relative to the domestic passenger terminal, existing auto parking facilities and the Airport's runway system. The addition of the IT at MLB was completed in 1996 and contains approximately 44,000 square feet. Of the total 44,000 square feet, 19,777 square feet is utilized by federal



0 650 1,300 2,600 Feet

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Figure 3-6
International Terminal Location

agencies for providing inspection services to arriving international passengers, 6,436 Square feet is dedicated to accommodating departing international passengers and the remaining 26,213 square feet serves as general circulation space.

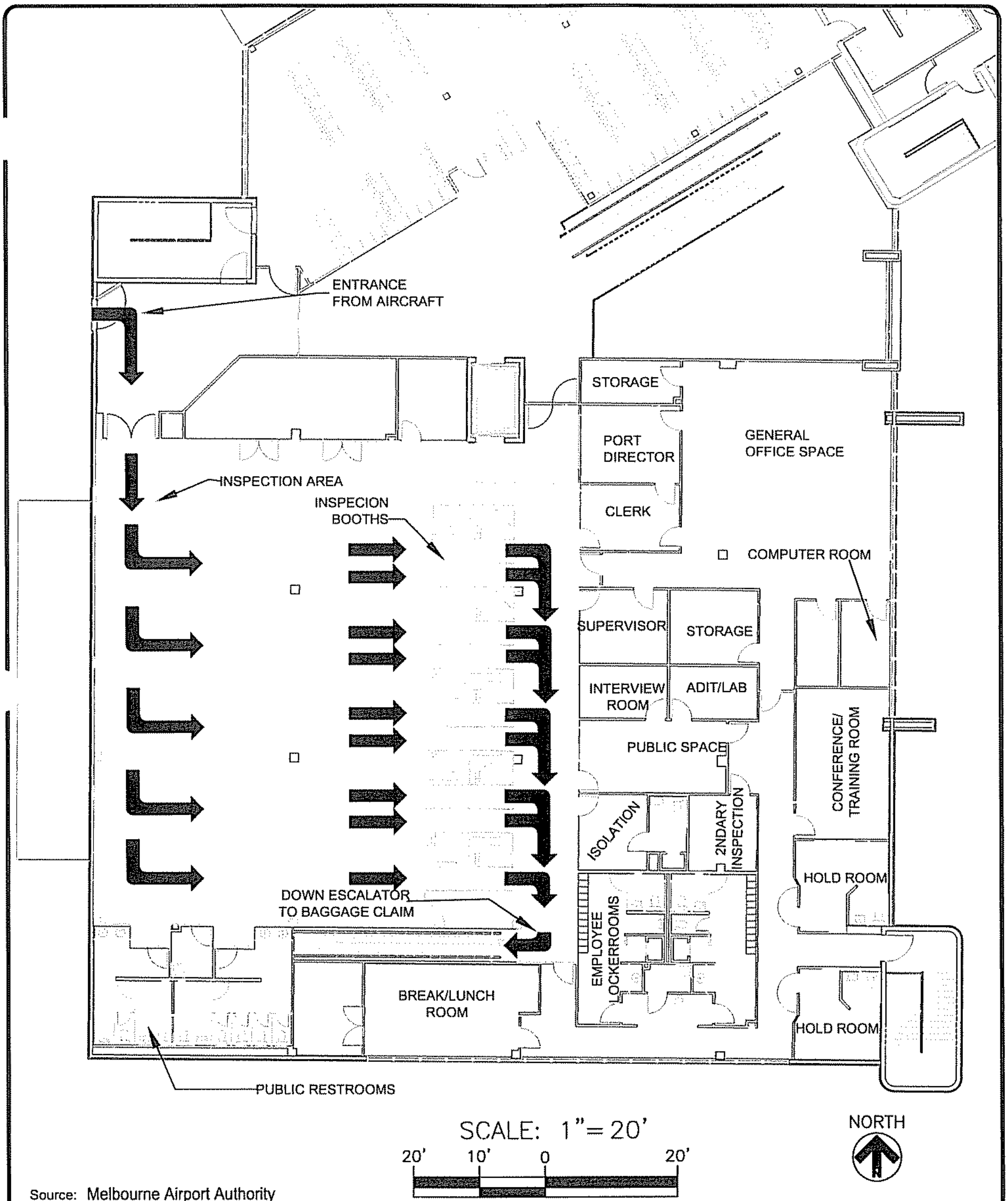
The *Airport Federal Inspection Facilities Guidelines* publication outlines the spatial areas required for each component associated with each federal agency operating within the IT facility. Federal inspection responsibilities and duties are primarily carried out during the arrival phase of a flight. As a result, federal inspection and clearance facilities, which are associated with international arrivals, and international departure facilities were evaluated independently. Spatial values for international departure elements such as departure lounge areas, concession areas and other facilities common to domestic terminals are not included in the federal inspection facilities guidelines. Area requirements for these elements are computed by applying the same methods used in determining spatial requirements for domestic terminal facilities. Presented in Table 3.23 are the spatial areas associated with the existing IT facility. Figures 3-7 and 3-8 illustrate the flow of arriving international passengers and the sequence of inspection activities.

The peak hour capacity of a federal inspection facility is based on the size of the facility and the hourly volume of passengers to be processed. The *Airport Federal Inspection Facilities Guidelines* publication identifies the necessary sizes of facilities per given number of peak hour passengers. Comparing the facility sizing criteria outlined in the *Airport Federal Inspection Facilities Guidelines* publication with existing IT facilities provided at MLB, the capacity was determined to be approximately 330 peak hour passengers. A chart composed of the numerical sizing data presented the *Airport Federal Inspection Facilities Guidelines* publication, which identifies the peak hour capacity of the MLB IT facility is presented in Figure 3-9.

Table 3.23
EXISTING INTERNATIONAL FACILITIES

Facility Component	Existing Area
U.S. CBP	
Number of Piggyback Booths[1]	5
Number of Secondary Inspection Booths[2]	3
Number of Garbage Disposal Units	1
Piggyback Booths & Queuing (Sq.Ft.)	5,391
Secondary Inspection Units & Queuing (Sq.Ft.)	2,698
General Office Space	1,710
Conference/Training	326
Break/Lunch Room	359
Secondary Inspection Area	118
Interview Rooms	107
Supervisors Offices	493
Port Directors Office	177
Officer in Charge	517
Clerk/Reception	151
Employee Locker & Toilet	578
In-Bond Room	133
ADIT/Lab[3]	259
Rover Control Center	351
Cashier	103
Techs Room	54
Search Rooms	198
Public Space with Counter	243
Airport Director & Secretary	0
Storage	629
Hold Rooms w/Toilets	353
Computer Room	102
Bag Belt	4,332
U.S. PHS	
General Office Space	209
Isolation Area	186
Total (Sq.Ft.)	19,777

[1]Each Piggyback Booth contains two work stations.
[2]Each Secondary Inspection Booth contains two work stations.
[3]ADIT – Alien Documentation Identification Telecommunication.
Source: Airport Federal Inspection Facilities Guidelines
Melbourne Airport Authority



Source: Melbourne Airport Authority

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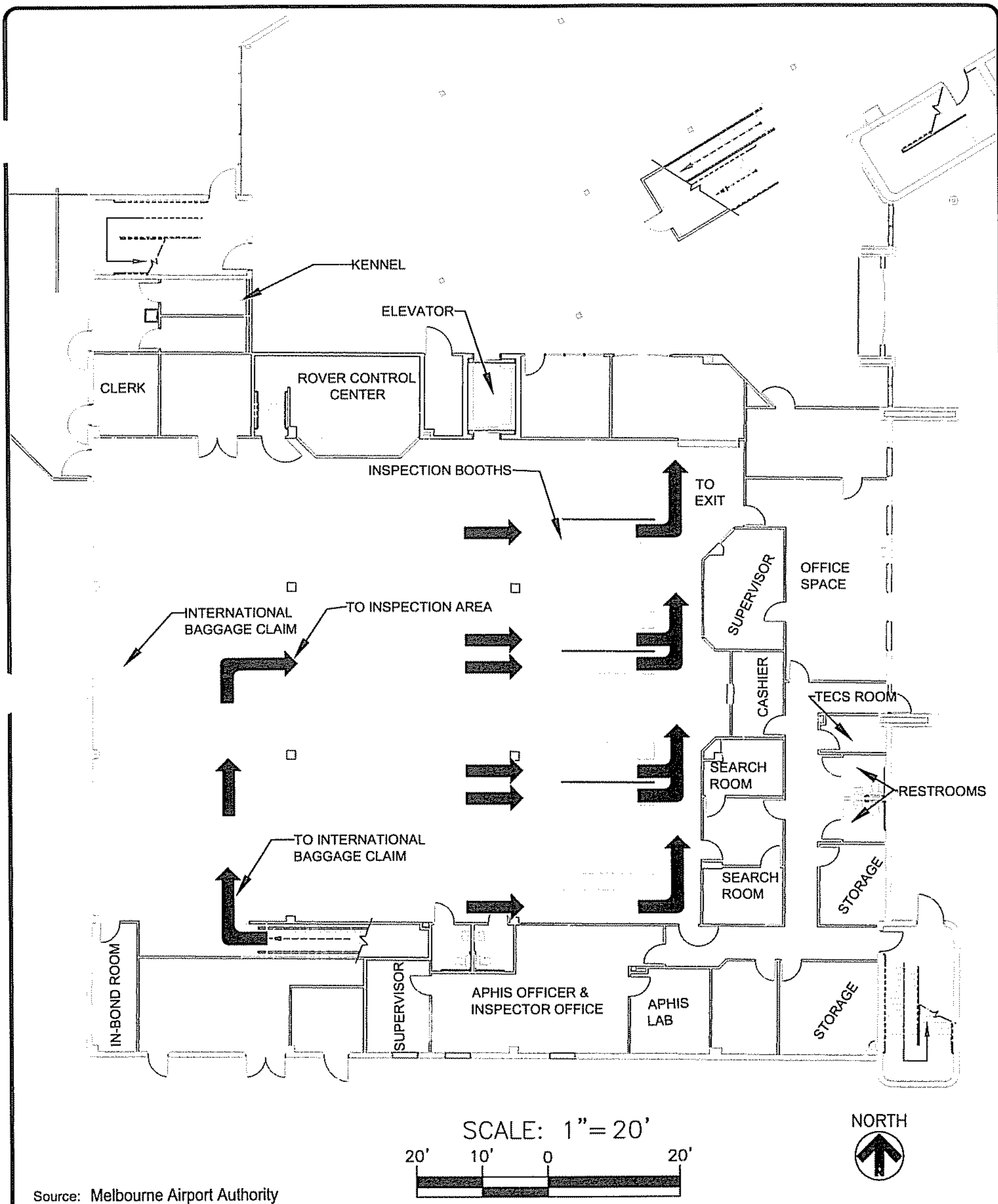
Figure 3-7
International Passenger Arrival Flow
Second Floor



Source: Melbourne Airport Authority

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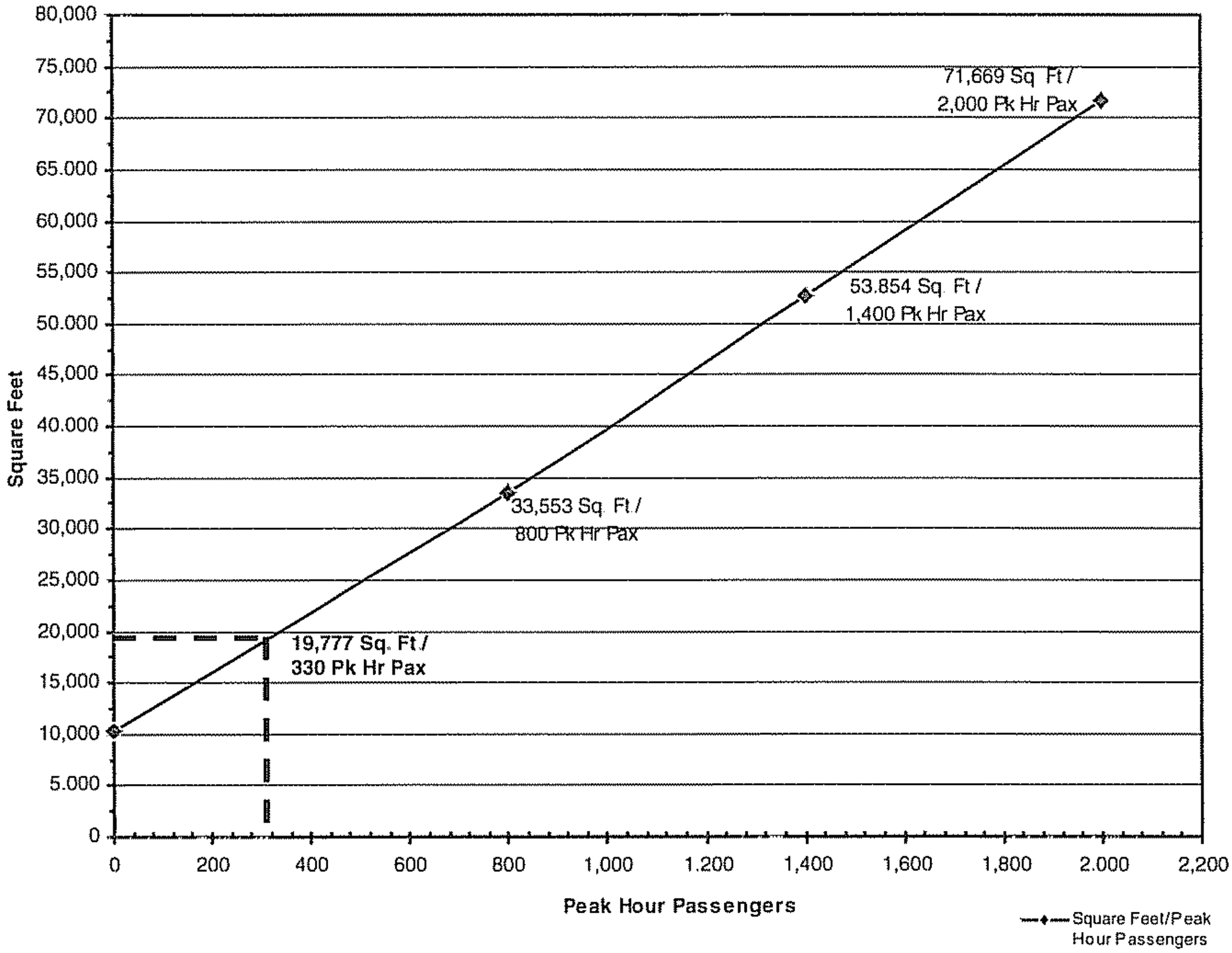
Architectural, Engineering, Planning
and Environmental Services
Jacksonville, Florida

Melbourne International Airport
Master Plan Update

Figure 3-8
International Passenger Arrival Flow
First Floor

FIGURE 3-9
INTL. FACILITY
PEAK HOUR CAPACITY



3.4.2 Projected International Terminal Facility Demand

Use of the international arrival and departure facility is currently limited to serving international flights conducted by Vintage Props and Jets Incorporated, which has two arrivals daily from the Bahamas, in addition to the infrequent charter operation. The aircraft fleet operated by Vintage Props and Jets Incorporated is composed of Beechcraft 100 (BE-100) aircraft, which are configured to provide a maximum seating for 10 passengers. In the future Vintage Props and Jets Incorporated plans to continue to provide service between the Bahamas Islands and MLB. Although a plan to modify the fleet of aircraft operated by Vintage Props and Jets has not been determined, a conservative integration of Canadair Regional Jets (CRJ) in the near future is anticipated to provide additional capacity. For analysis, an average future load factor of 85% was assumed. An 85% load factor on a BE100 equals approximately nine passengers and on a CRJ approximately 43 passengers. To determine the future needs of the IT facility, the evaluation assumed the flight schedule operated by Vintage Props and Jets would remain the same while the equipment used would reflect an integration over time of CRJ aircraft.

Additionally, a charter company located in England has expressed significant interest in beginning service to MLB from European cities. In the summer of 2003 discussions between this company and MLB focused on providing the company permission to use the IT facilities. Additionally, initial plans include the possibility of service to MLB in mid to late 2004 and may include the arrival of one B-747/A-330/A-340 type aircraft per day, for up to three days per week. The B-747-200 provides seating for approximately 500 passengers, and the Airbus-330/340 is configured for approximately 370 passengers. For purpose of determining the appropriate size of facilities needed to accommodate the anticipated service, seating configuration and projected passenger volumes for the larger aircraft (i.e., B-747-200) will be used.

Projections indicate each charter will maintain a load factor of at least 85% or approximately 425 passengers. The arrival and departure of at least one B-747-200 per day is anticipated to continue through calendar year 2006. From year 2006 to year 2011 international charter service to MLB is expected to increase to an arrival and departure of at least two B-747-200 aircraft per day from European and possibly South American locations. Beyond year 2011, international charter service to MLB is expected to continue to increase to approximately five B-747-200 aircraft per day by year 2021.

3.4.2.1 International Passenger Arrival and Departure Distribution

The facility needs for processing passengers is predicated on peak hour demand of arriving international passengers. Similarly, the need for international departure facilities are predicated on peak hour demand of departing international passengers preparing to enplane. The rate at which arriving and departing international passengers are anticipated to be disbursed through the IT facility is presented in Table 3.24. Values

Table 3.24
INTERNATIONAL PASSENGER ARRIVAL AND DEPARTURE DISTRIBUTION BY TIME

	Minutes After Arrival						
Aircraft	0-10	10-20	20-30	30-40	40-50	50-60	60-70
B-747-200	5%	75%	100%	0%			
BE100	100%	0%	0%				
CRJ	50%	100%	0%				

	Minutes Before Departure						
Aircraft	220-210	210-200	200-190	190-180	180-170	170-160	160-150
B-747-200	0%	0%	0%	50%	50%	60%	75%
BE100	0%	0%	0%	0%	0%	0%	0%
CRJ	0%	0%	0%	0%	0%	0%	0%
Aircraft	150-140	140-130	130-120	120-110	110-100	100-90	90-80
B-747-200	75%	85%	100%	100%	100%	100%	100%
BE100	0%	0%	20%	25%	30%	50%	75%
CRJ	10%	40%	60%	75%	75%	75%	90%
Aircraft	80-70	70-60	60-50	50-40	40-30	30-20	20-10
B-747-200	100%	100%	100%	100%	100%	100%	100%
BE100	75%	100%	100%	100%	100%	100%	100%
CRJ	90%	100%	100%	100%	100%	100%	100%
Aircraft	10-0						
B-747-200	100%						
BE100	100%						
CRJ	100%						

Source: RS&H.

representing arriving and departing passenger distribution percentages are expected to remain constant throughout the planning period. For passengers deplaning the B-747-200 the analysis assumed approximately 5% of the aircraft's total passengers will have entered the federal inspection facility within 10 minutes after the aircraft has reached the gate. Within 10 to 20 minutes after deplaning has begun, the analysis assumed approximately 75% of the aircraft's total passengers will have entered the facility. Within 30 minutes after arrival, the analysis assumed 100% of the aircraft's passengers will have deplaned and entered the facility. The anticipated amount of time for a passenger to exit the B-747-200 aircraft, collect luggage and complete the inspection process was estimated at 40 minutes, as recommended by industry leaders. As a result, the number of passengers within the IT will decrease to approximately 60% of the aircraft's total passenger load within 40 to 50 minutes after arrival of the flight. Within approximately 60 to 70 minutes after the flight's arrival, 100% of the aircraft's passenger load was assumed to have completed the federal inspection process and exited the terminal facility.

For departing B-747-200 aircraft, 50% of the passengers are anticipated to check-in approximately three hours (180 minutes) before departure. The analysis assumed the percentage of passengers' checking-in would steadily increase over time before reaching 75%, which occurs approximately 150 minutes before departure. The percentage of passengers checked-in and disbursed in the terminal was presumed to remain constant until increasing to 100% approximately 120 minutes before departure.

The BE100 and CRJ aircraft associated with Vintage Props and Jets maintain passenger capacities far less than the passenger capacity provided by the B-747-200. As a result, arriving and departing BE100 and CRJ aircraft have the capability of enplaning and deplaning at a significantly higher rate as compared to the B-747-200. Therefore, passenger distribution rates for BE100 and CRJ aircraft presented in Table 3.24 were adjusted to reflect the different passenger capacities.

3.4.2.2 International Arrival and Departure Peak Hour Demand

To determine peak hour demand, arrival and departure processing rates presented in Table 3.24 were applied to arrival and departure characteristics associated with each international flight.

Following the start-up of international charter service in 2004, the peak hour demand of passengers arriving at the IT facility will be approximately 376 passengers. This peak hour demand is marginally larger than capacity of the current facility and should not create significant processing delays. The evaluation of arriving international flights also assumed Vintage Props and Jets Incorporated would continue operating the existing flight schedule using the BE100 aircraft. Additionally, the evaluation assumed the B-747-200 associated with the international charter would be scheduled to arrive between 11:00am and 1:00pm. Since the operating schedules of international flights are assumed, the possibility exists for simultaneous arrival of international aircraft resulting in a degree of overlap. In the event of an overlap of arriving international flights however, impacts to the spatial elements within the IT would be insignificant as a result of the relatively small number of passengers associated with the BE100 aircraft.

Beginning in 2004 the distribution of departing international passengers into the IT facility will result in a peak hour demand of 425 passengers. The evaluation of departing international flights assumed Vintage Props and Jets Incorporated would continue operating the existing departure flight schedule using the BE100 aircraft. The evaluation further assumed the B-747-200 associated with the international charter would be scheduled to depart between 1:00pm and 3:00pm. Although assumptions used for the evaluation of international departures resulted in some overlap of flights, the relatively small passenger capacity associated with the BE100 aircraft would result in an insignificant impact to the spatial elements associated with the MLB international departure facilities.

In 2006 international charter service is expected to increase to approximately two flights per day using the B-747-200 (or similar) aircraft. Arrival characteristics of international flights and distribution of passengers requiring federal inspection processing in 2006 result in the peak hour demand of the IT to increase to approximately 657 passengers. The evaluation of arriving international flights assumed Vintage Props and Jets Incorporated would continue operating the existing flight schedule. However, the aircraft used to conduct Vintage Props and Jets Flight 301 would be changed from a BE100 aircraft to a CRJ, which provides seating for 50 passengers. Additionally, the evaluation assumed the second B-747-200 associated with the international charter service would arrive almost concurrently with the first flight. The suggested overlap of deplaning activities associated with the two aircraft is the basis for the large increase in number of peak hour passengers as compared to international flight operations projected for the 2004 to 2006 time period.

Departure characteristics of international flights for 2006 result in the peak hour demand of the international departure facilities to increase to approximately 850 passengers. The evaluation of departing international flights for 2006 assumed Vintage Props and Jets Incorporated would continue operating the existing flight schedule, but replace the BE100 aircraft operating on Flight 301 with a CRJ. In terms of the relationship between aircraft size and passenger check-in characteristics, the larger seating capacity associated with the CRJ means the amount of time required to complete the check-in process for the entire passenger load will be greater as compared to the BE100. Therefore, a greater number of passengers will be placed in the international departure facilities for a greater amount of time. The evaluation of 2006 international service further assumed the B-747-200 aircraft associated with the two international charters would be scheduled almost simultaneously with the first flight. The suggested overlap of passenger check-in activities associated with the two aircraft result in the large increase in number of peak hour passengers placed in the departure facilities as compared to international flight operations projected for the 2004 to 2006 time period.

In 2011 international charter service is expected to increase to three flights daily using the B-747-200 (or similar) aircraft. The increased number of international arrivals will result in the peak hour demand for the federal inspection facility to increase to approximately 733 peak hour passengers. The analysis of arriving international flights for 2011 assumed Vintage Props and Jets Incorporated would continue operating the existing flight schedule. However, both daily flights operated by Vintage Props and Jets Incorporated would be conducted using CRJ aircraft. As previously mentioned, the CRJ provides seating for 50 passengers. The evaluation assumed the arrival of the B-747-200 aircraft would be evenly spaced 20-minutes apart beginning at approximately 11:00am. The significant increase of the peak hour demand associated with processing arriving international passengers is the result of the overlap of deplaning activities caused by each flights' 20-minute arrival separation. To avoid increasing peak hour demand values, the arrival of the each B-747-200 aircraft would need to be spaced at greater intervals.

Anticipated departure characteristics of international flights for 2011 result in the peak hour demand of the international departure facilities to increase to approximately 1,127 passengers. The analysis of departing international flights for year 2011 assumed Vintage Props and Jets Incorporated would continue operating the existing flight schedule. However, both daily flights operated by Vintage Props and Jets Incorporated would be conducted using CRJ aircraft. The evaluation of anticipated 2011 international service further assumed the B-747-200 aircraft associated with the three international charters would be scheduled to depart at 20-minute intervals beginning around 2:00pm. Similar to the arrivals, the significant increase in number of peak hour passengers placed in the departure facilities as compared to international flight operations projected for previous years is attributed to check-in activities for the three flights occurring simultaneously. To prevent an increase in departing peak hour passengers, departures would need to be spaced at intervals of approximately two-hours.

In 2021 international charter service at MLB is projected to increase to five daily flights using the B-747-200 (or similar) aircraft. The increased number of international arrivals will result in the peak hour demand for federal inspection facilities to remain constant at approximately 733 peak hour passengers. 2021 peak hour demand values for international arrivals are no different when compared to 2011 peak hour demand values. The consistency associated with the 2021 international operations peaking characteristics is attributed to the assumption that each of the five B-747-200 aircraft will arrive at equal intervals of 20 minutes and require equal amounts of time for passenger processing. The analysis of arriving international flights for 2021 assumed Vintage Props and Jets Incorporated would operate one additional flight as compared to previous years and all flights operated by Vintage Props and Jets would be conducted using CRJ aircraft.

Anticipated departure characteristics of international flights for 2021 result in the peak hour demand of the international departure facilities to increase to approximately 1,860 passengers. The analysis of departing international flights for 2021 assumed Vintage Props and Jets Incorporated would operate one additional departure as compared to previous years and all departures operated by Vintage Props and Jets would be conducted using CRJ aircraft. The evaluation of anticipated 2021 international service further assumed the B-747-200 aircraft associated with the five international charters would be scheduled to depart at 20-minute intervals beginning at approximately 2:00pm. The significant increase in number of peak hour passengers placed in the departure facility is attributed to check-in activities for the five charter flights occurring simultaneously and the amount of time required for international passengers to arrive at the airport prior to departure for check-in processing. Presented in Table 3.25 is a summary of the peak hour demand values determined for international arrival and departure facilities. It should be noted that the projections of international traffic presented in the section are merely best guess estimates of potential future activity. The associated peak hour demand values are further translated in the following section to specific facility requirements to handle the anticipated level of demand.

Table 3.25
ANTICIPATED PEAK HOUR DEMAND FOR INTERNATIONAL FACILITIES (2004-2021)

		Peak Hour Passenger Demand			
	Existing	2004	2006	2011	2021
International Arrival Facilities	43	376	657	733	733
International Departure Facilities	9	425	850	1,127	1,860

Source: Compiled by RS&H.

3.4.3 International Arrival Facility Requirements

Included among the spatial elements of an international terminal are specific arrival facilities dedicated to serving international passengers. Arrival facilities include the spatial elements associated with the federal inspection process, and a reception area for welcoming passengers and providing them with ground transportation alternatives for exiting the airport. As previously mentioned, components of the federal inspection process include areas used to accommodate U.S. Customs and Boarder Protection, and Public Health Service, and the sizing requirements for spatial elements composing a federal inspection facility are outlined in the *Airport Federal Inspection Guidelines* publication. Dimensions of the facility are determined according to the number of peak hour international arriving passengers. The facility sizing criteria provided in the *Airport Federal Inspection Guidelines* publication is presented in Table 3.26, along with the area encompassed by the existing federal inspection facilities located at MLB.

Projected spatial requirements for the federal inspection facility located at MLB is presented in Table 3.27. In 2004, the facility is adequately sized to accommodate the projected 376 peak hour international passenger arrivals, which will result from the initiation of international charter service. By 2006 the number of arriving peak hour international passengers is expected to increase to 657, since the projected number of B-747-200 arrivals increases to two concurrent operations daily. As noted by the *Airport Federal Inspection Facilities Guidelines* publication, size recommendations for federal inspection components associated with airports are based on serving 800, 1400 and 2000 arriving peak-hour international passengers. Since the international passenger demand projected for 2004 and 2006 is less than 800, spatial requirements for the

Table 3.26
AIRPORT FEDERAL INSPECTION GUIDELINE REQUIREMENTS

Facility Component	Existing Area	Peak Hour Passengers 800	1400	2000
U.S. CBP				
Number of Piggyback Booths	5	8	14	20
Number of Secondary Inspection Booths	3	8	14	20
Number of Garbage Disposal Units	1	5	10	10
Piggyback Booths & Queing (Sq.Ft.)	5,391	8,160	14,280	20,400
Secondary Inspection Units & Queing (Sq. Ft.)	2,698	6,273	10,883	15,359
Officer in Charge	517	200	200	200
Customs Supervisor	209	300	400	500
Inspectors Office	0	440	750	1,200
Customs Office	515	800	1,400	2,000
In-Bond Room	133	200	400	500
Cashier	103		As Required	
Techs Room	54	150	200	200
Search Rooms	198	160	272	462
Public Space w/Counter	243	150	200	250
Airport Director & Secretary	0	350	350	350
Rover Control Center	351	300	400	500
General Office Space	1,195	1,300	2,150	3,000
Conference/Training	326	550	700	800
Break/Lunch Room	359	350	400	500
Secondary Inspection Area	118	250	375	600
Interview Rooms	107	80	160	240
Supervisors Offices	284	300	550	600
Port Directors Office	177	200	200	225
Clerk/Reception	151	160	310	410
Employee Locker & Toilet	578		As Required	
ADIT/Laboratory	259	370	550	600
Bag Belt	4,332	7,038	12,322	17,612
Storage	629	200	200	200
Hold Rooms w/Toilets	353	225	225	450
Computer Room	102	100	100	100
Sub-Total	19,382	28,919	48,390	67,496
U.S. PHS				
Supervisors Office	0	200	200	200
Clerk/Reception	0	150	150	150
General Office Space	209	400	400	400
Isolation Area	186	160	160	160
Sub-Total	395	910	910	910
Grand Total	19,777	29,829	49,300	68,406

Source: Airport Federal Inspection Facilities Guidelines

Table 3.27

PROJECTED IT FACILITY REQUIREMENTS (2004-2021)

Facility Component	Existing 2002	Projected 2004	2006	2011	2021
Peak Hour Passengers	43	376	657	733	733
U.S. CBP					
Number of Piggyback Booths	5	4	7	8	8
Number of Secondary Inspection Booths	3	4	7	8	8
Piggyback Booths & Queing (Sq.Ft.)	5,391	3,680	7,360	8,160	8,160
Secondary Inspection Units & Queing (Sq. Ft.)	2,698	3,204	5,507	6,273	6,273
Customs Supervisor	209	233	283	300	300
Customs Office	515	400	700	800	800
In-Bond Room	133	147	185	200	200
Cashier	103	As Required			
Techs Room	54	136	146	150	150
Search Rooms	198	112	146	160	160
Public Space w/Counter	243	117	142	150	150
Airport Director & Secretary	0	350	350	350	350
Rover Control Center	351	233	283	300	300
General Office Space	1,195	733	1,158	1,300	1,300
Conference/Training	326	167	192	200	200
Break/Lunch Room	359	200	200	200	200
Secondary Inspection Area	118	186	232	250	250
Interview Rooms	107	27	67	80	80
Supervisors Offices	151	119	142	150	150
Port Directors Office	177	192	198	200	200
Clerk/Reception	151	160	160	160	160
Employee Locker & Toilet	578	As Required			
ADIT/Lab	107	150	150	150	150
Bag Belt	4,332	5,185	6,520	7,038	7,038
Storage	370	100	100	100	100
Hold Rooms w/Toilets	353	179	212	225	225
Computer Room	102	100	100	100	100
Sub-Total	18,321	16,110	24,533	26,996	26,996
U.S. PHS					
Supervisors Office	0	200	200	200	200
Clerk/Reception	0	150	150	150	150
General Office Space	209	400	400	400	400
Isolation Area	186	160	160	160	160
Sub-Total	395	910	910	910	910
Animal & Plant Health Inspection Service					
Number of Garbage Disposal Units	1	4	5	5	5
Officer in Charge	517	200	200	200	200
Inspectors Office	0	315	405	440	440
Laboratory	152	173	207	220	220
Supervisors Office	133	79	94	150	150
Clerk/Stenographer	0	0	0	0	0
Storage	259	100	100	100	100
Conference/Training	0	136	146	150	150
Break/Lunch Room	0	136	146	150	150
Sub-Total	1,061	1,139	1,298	1,410	1,410
Grand Total	19,777	18,159	26,741	29,316	29,316

Source: Airport Federal Inspection Facilities Guidelines Compiled by RS&H

facility were extrapolated from the numerical data presented in the *Airport Federal Inspection Facilities Guidelines* publication.

Although the current demand for federal inspection services facilitated by the IT is 43 arriving peak hour international passengers, the facility has the capability of serving approximately 330 arriving peak-hour international passengers. Therefore, if desired, only slight modifications are necessary for meeting the peak-hour international passenger demand of 376 projected for 2004. To meet the international passenger demand of 657 arriving peak-hour passengers anticipated for 2006, expansion of the existing IT is necessary. Conceptual planning alternatives for expanding the IT are discussed in Section 4.

In 2011 the IT facility is projected to require the processing of 733 arriving peak hour international passengers. Although international traffic at MLB is expected to continue to grow through 2021 as a result of the number of daily B-747 arrivals increasing to five, the number of peak hour international arriving passengers served by the facility is expected to remain constant at 733. The number of arriving peak hour international passengers for 2011 and 2021 were determined based-on a consistent 20-minute interval of arriving aircraft. As a result, the assumed 20-minute aircraft arrival interval produced a consistent inflow rate of passengers entering the facility after deplaning, and a consistent outflow rate of international passengers exiting the facility after completing the federal inspection process. Slight delays in aircraft arrivals or passenger processing however, could decrease the interval between arriving aircraft thereby increasing the number of passengers placed in the facility at one time. As a result, the number of arriving peak-hour international passengers accommodated by the IT could exceed 733. To compensate for unexpected events such as mechanical failures or lack of inspection personnel, IT facility requirements should be determined based-on 800 arriving peak-hour international passengers.

After the federal inspection process is completed, passengers will exit the facility and transition to ground transportation. Ground transportation facilities must be sufficiently sized to accommodate a large influx of arriving passengers. In addition, virtually all arriving international passengers will require either bus or van transportation to their final destination, or will use rental car services. Furthermore, international charter passengers are typically part of a tour package and will receive information from tour operators upon entering the ground transportation area. Therefore, it is recommended that a "Reception Area" be developed as part of the international terminal facility and be sufficiently sized to accommodate arriving passengers, tour operators and other grand transportation providers.

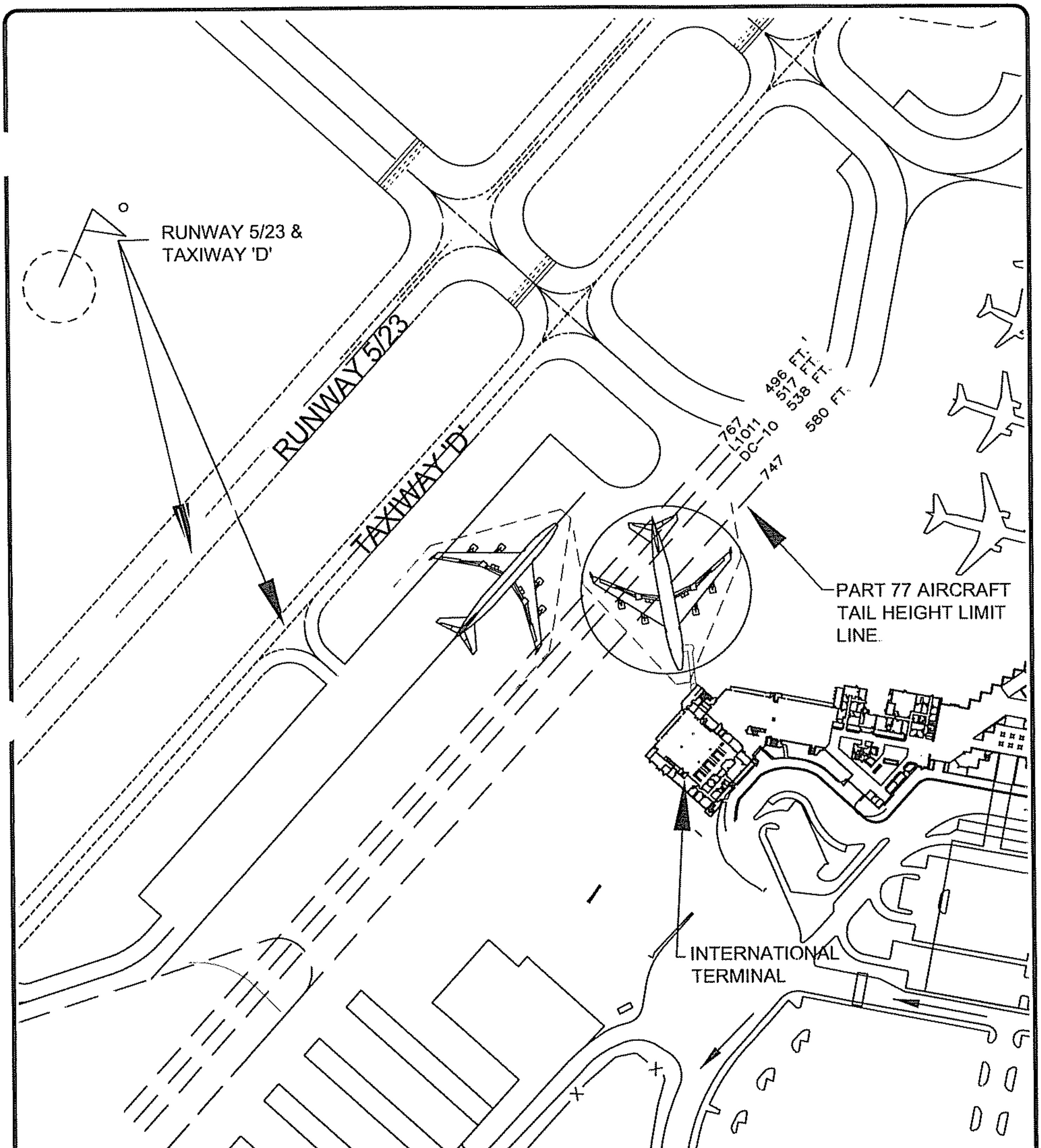
3.4.4 International Departure Facilities

Spatial elements used by departing international passengers include facilities dedicated to providing space for entities such as aircraft gates, departure lounges, airlines, passenger circulation, food and drink establishments and duty free concessions. Similar to elements associated with the domestic passenger terminal, the size of an airport's international departure facilities and level of amenities provided should correspond to the needs of the traveling community in which it serves.

The need for future facilities used to accommodate departing international traffic will be driven by passenger loads associated with the projected B-747-200 (or similar) aircraft as compared to the passenger loads associated with the existing BE-100 and projected CRJ aircraft operated by Vintage Props and Jets. Furthermore, consideration should be given to the possible aircraft operational constraints resulting from the spatial requirements presented by the B-747-200 aircraft and the area necessary for Vintage Props and Jets to operate in the future.

3.4.4.1 International Aircraft Apron and Gates

For the purpose of accommodating aircraft accessing the international terminal, an apron measuring 264,960 square feet is provided. For enplaning and deplaning passengers, the international terminal provides one aircraft gate and passenger boarding bridge. Additionally, the necessary improvements have been constructed for the adaptation of a second passenger boarding bridge to the international terminal building. The apron, which was initially constructed in 1995, is composed of concrete and in excellent condition. The location of Runway 5/23 relative to the apron has the potential to restrict aircraft parking options as a result of aircraft tail height penetrating the 7 to 1 imaginary surface described in FAR Part 77. The existing aircraft apron associated with the international facility and horizontal measurements representing the intersection of aircraft surfaces and FAR Part 77 surfaces are illustrated in Figure 3-10.



[1] Represents the horizontal distance from runway centerline necessary for each aircraft type to meet FAR Part 77 standards.

Source: Compiled by R.S&H

RS&H

Reynolds, Smith and Hills Inc.

Architectural, Engineering, Planning
and Environmental Services
Jacksonville, Florida

Melbourne International Airport
Master Plan Update

Figure 3-10

Intersection of Aircraft Surfaces &
Part 77 Airspace Imaginary Surfaces

The existing apron and passenger boarding bridge associated with the international facility is sufficient for accommodating a single daily B-747-200 aircraft projected to begin international service in 2004, as well as continued daily service provided by Vintage Props and Jets using the BE100 aircraft. Although the existing apron will accommodate the projected 2004 demand, planning and design of additional or improved airside facilities should be initiated to meet the anticipated demand in 2006 and beyond.

In 2006 international air traffic at MLB is projected to include two daily, and possibly concurrent, B-747-200 aircraft along with continued daily service provided by Vintage Props and Jets. By 2006 it is anticipated one of the two daily flights operated by Vintage Props and Jets will be conducted using a CRJ. To facilitate the international demand projected for 2006, assuming continued use of the existing apron, an additional passenger boarding bridge will need to be added to the existing international terminal facility to provide a parking position for the additional B-747-200. As previously mentioned, the international terminal building is designed to accept an additional passenger boarding bridge. In addition to passenger boarding bridge improvements, parking positions for aircraft operated by Vintage Props and Jets may require relocation in order to provide the necessary space for B-747-200 aircraft positioned at respective gates. As a result of service conducted by the B-747-200 aircraft, in 2006 the international apron will be operating at capacity. Therefore, construction of airside improvements including apron space and international terminal space to facilitate additional aircraft passenger boarding bridges are recommended. As discussed further in Section 4, once these improvements are implemented and depending on the final configuration of the IT, operational impacts to Runway 5/23 may occur.

International service to MLB in 2011 is projected to include three daily, and possibly concurrent, B-747-200 aircraft. Additionally, both daily flights operated by Vintage Props and Jets are projected to be conducted using CRJ aircraft. The three B-747-200 aircraft are anticipated to arrive in 20-minute intervals and depart approximately two hours after deplaning. To facilitate international demand projected for 2011, construction of passenger boarding bridges and apron space to accommodate three B-747-200 aircraft and two CRJ aircraft simultaneously will be required.

In 2021 international service to MLB is projected to include five daily B-747-200 aircraft. Additionally, international operations conducted by Vintage Props and Jets are projected to increase to three daily flights using CRJ aircraft. Similar to the 2011 scenario, the five B-747-200 aircraft are expected to arrive in 20-minute intervals and depart approximately two hours after deplaning. To facilitate international demand projected for 2021, construction of passenger boarding bridges and apron space to accommodate five B-747-200 aircraft and three CRJ aircraft simultaneously will be required.

3.4.4.2 International Passenger Departure Lounges

Presently federal standards do not provide specific sizing recommendations for international departure facilities. Because of increased time required for international processing, passengers typically arrive and complete check-in activities well in advance of the flight's departure as compared to domestic flights. As a result, international passengers spend an increased amount of time within an airport's departure lounge. Therefore, requirements for international departure lounge space at MLB were determined taking into consideration travel characteristics associated with the population utilizing the facilities and the amount of time passengers will likely be placed in the facility. The analysis conducted for international departure lounge space is presented in Table 3.28.

Table 3.28

MLB INTERNATIONAL DEPARTURE LOUNGE REQUIREMENTS (2004-2021)

	Existing (2002)	2004	2006	2011	2021
Criteria					
Departing B-747-200 Aircraft	0	1	2	3	5
Available Passenger Seats per Aircraft	0	500	500	500	500
Total Available Passenger Seats	0	500	1,000	1,500	2,500
Load Factor (%)	0	85%	85%	85%	85%
Total Departing Passenger Load	0	425	850	1,275	2,125
Passengers In Departure Lounge (%)	0	100%	100%	100%	100%
Peak Hour Departing Passengers	0	425	850	1,275	1,700
Peak Hour Departing Passengers Seating (%)	0	90%	90%	90%	90%
Peak Hour Departing Passengers Standing (%)	0	10%	10%	10%	10%
Area Requirements					
Peak Hour Departing Passengers Seating (Sq Ft.)	4,079	5,738	11,475	17,213	22,950
Peak Hour Departing Passengers Standing (Sq Ft.)	453	425	850	1,275	1,700
Enplane/Deplane Corridor (Sq Ft.)	444	300	300	300	300
Check-In Area (Sq Ft.)	965	400	400	400	400
Circulation Area (20%) (Sq.Ft.)	0	1,373	2,605	3,838	5,070
Total Holdroom Area	5,941	8,235	15,630	23,025	30,420

Source: Compiled by R,S&H

As previously discussed, 50% of the international passengers will initially begin entering the departure facilities approximately 180 minutes prior to departure. Additionally, 100% of the international passengers will be placed in the departure facilities approximately 120 to 130 minutes prior to departure. Therefore, the analysis conducted for international departure lounge space assumed 90% of the passengers associated with the departing B-747-200 aircraft would require seating as a result of the amount of time passengers will be placed in the facility. For seating, each passenger was allocated 15-square-feet. The analysis further assumed 10% of the passenger load associated with each departing B-747-200 would remain standing and require 10-square-feet each. The analysis for the enplane/deplane corridor, which serves as the vestibule between the departure lounge and passenger boarding bridge, assumed a maximum capacity of 30 passengers each requiring 10-square-feet. Since the enplane/deplane corridor serves primarily as a transition point between the terminal structure and boarding bridge, future spatial requirements are projected to remain constant throughout the planning period.

The analysis to determine the space required for passenger check-in at the departure gate assumed a maximum capacity of 40 passengers each requiring 10-square-feet. Because of the consistent nature of the demand associated with the departure gate check-in area, requirements are anticipated to remain unchanged throughout the planning period.

Circulation space includes the area needed for natural movement between each departing passenger and providing transitional corridors used to obtain access to other facilities positioned within the departure gate area. Requirements for circulation space associated with the international departure facilities were assumed to represent 20% of the total area projected for the departing passengers' seating and standing area, enplane/deplane corridor and check-in area.

The total area of the holdroom associated with the existing international departure facility is 5,941-square-feet. Of this area 4,532-square-feet is utilized as a departure lounge, 444-square-feet serves as the enplane/deplane corridor and 965-square-feet is designated as check-in area. With the introduction of scheduled international charter service in 2004, the international holdroom facilities will need to be expanded to 8,235-

square-feet. Of the total 8,235-square-feet projected for the holdroom area, 6,163-square-feet will be needed for the departure lounge.

In 2006 additional B-747 (or similar) aircraft are projected to be serving MLB, and at least two of the operations are anticipated to be concurrent. The anticipated schedule of the additional B-747 indicates both aircraft will be arriving and departing within approximately 20 to 30 minutes of each other. Therefore, facilities will need to be provided to serve 850-peak hour departing passengers. As a result, total holdroom area will need to be increased to 15,630-square-feet. Of the total 15,630-square-feet, 12,325-square-feet will need to be dedicated to serving seated and standing passengers within the departure lounge.

In 2011 a third concurrent operation of a B-747 (or similar) aircraft is projected to be serving MLB on a weekly basis. The anticipated departure schedule of the three B-747s indicates all aircraft will be arriving and departing within a 60 to 75 minute time frame. As a result of the proximity of the departures, holdroom facilities will need to be provided to serve 1,275-peak hour departing passengers. Therefore, total holdroom area will need to be increased to 23,025-square-feet. Of the total 23,025-square-feet, 18,488-square-feet will need to be dedicated to serving seated and standing passengers within the departure lounge.

In 2021 five concurrent operations of a B-747 (or similar) aircraft are projected to be serving MLB on a weekly basis. The approximate schedule of the five B-747s indicates all aircraft will be arriving and departing within 20-minute intervals. As a result of the proposed departure times, holdroom facilities will need to be provided to serve 1,700-peak hour departing passengers. Therefore, total holdroom area will need to be increased to 30,420-square-feet. Of the total 30,420-square-feet, 24,650-square-feet will need to be dedicated to serving seated and standing passengers within the departure lounge.

3.4.4.3 <u>International Departure Concessions</u>

Concessions located in areas associated with international departure facilities primarily include duty free shops, food and drink services and ground transportation facilities. Current federal standards do not provide a specific recommendation for concession space associated with an airport's international departure facility. To determine the size of concessions for the international departure facilities at MLB, the analysis implemented the computations conducted for determining the spatial requirements of the international departure lounge areas in conjunction with FAA recommendations for concession space associated with domestic facilities.

For domestic terminals, FAA recommends 17% of the terminal be used for providing concession space. The analysis conducted for determining concessions placed within the international departure area at MLB assumed a proportional relationship between the recommended international departure lounge areas and necessary concession space for meeting future demand. However, many of the concessions located in domestic terminals do not have an applicable role in international departure facilities. Therefore, the analysis took into consideration the reduced need for certain concessions by removing the unnecessary elements. After computing the total concession space needed in the facility, a breakdown of the area needed for general concessions, food and drink establishments was calculated using the distribution factors recommended by the FAA for domestic concession areas. Facility requirements suggested for concessions positioned within the international departure facilities located at MLB are presented in Table 3.29.

Table 3.29

MLB INTERNATIONAL DEPARTURE CONCESSION SPACE REQUIREMENTS (2004-2021)

	Existing Conditions	2004	2006	2011	2021
Duty Free Shops and General Concessions	0	3,918	7,836	11,752	17,027
Food and Drink Facilities	0	7,682	15,256	22,883	30,511
Total Concession Space	0	11,600	23,092	34,635	47,538

Source: Compiled by RS&H

3.4.5 International Terminal Parking Facilities

Due to the proximity of the International Terminal to the domestic terminal, the existing parking lots can service both facilities. However, projections for the expansion of existing parking facilities only take into account the growth of domestic passengers. Therefore, projections for the amount of parking space necessary to service anticipated demand for international charter activity must be developed. Table 3.30 depicts the parking spaces necessary based on projected international arriving passenger demand.

Table 3.30

Parking Requirements - International Terminal

	2004	2006	2011	2021
Short-term	5	10	15	20
Long-term	0	0	0	0
Employee	15	29	42	83
Rent-a-car	106	159	212	265
TOTAL	126	198	269	368

Source: RS&H

For purposes of calculating the additional parking space required to support international charter activity, it was assumed that approximately 50% of the arriving passengers would utilize rental cars for their ground transportation needs. Based on this assumption, approximately 106 additional rental car spaces will be required in 2004, 159 in 2006, 212 in 2011 and 265 in 2021. It was also assumed that 45% of the arriving passengers would utilize charter bus service for ground transportation, the remaining 5% would utilize other ground transportation services, and no long-term parking spaces would be required. Furthermore, the international charter activity would also create an additional demand for employee parking. Based on the demand for parking spaces associated with the international charter activity, coupled with the forecasted demand for domestic passengers, an immediate need exists for increased parking spaces. The alternatives for accommodating the increased demand for parking is depicted in Section 4, and summary of the overall parking demand for MLB in presented in Section 3.8.

3.4.6 Summary of International Terminal Requirements

Although the existing international terminal should be sufficient to accommodate the introduction of international charter service, increased demand may dictate that the facility be expanded to accommodate concurrent operations of large aircraft. Table 3.31 provides a summary of the facility requirements based on peak hour passenger demand for arrival processing, departure lounge, and concession/duty free space. In the event separate check-in facilities are required for the IT, additional space will be required.

Table 3.31
SUMMARY OF INTERNATIONAL TERMINAL REQUIREMENTS

	Existing	2004	2006	2011	2021
Peak Hour Arriving Passengers		376	657	733	733
Peak Hour Departing Passengers		425	850	1,127	1,860
Federal Inspection Areas	19,777	18,159	26,741	29,829	29,829
Departure Lounge	5,941	8,235	15,630	23,025	30,420
Concession/Duty Free	0	11,600	23,092	34,635	47,538
TOTAL	25,718	37,994	65,463	87,489	107,787

Source: RS&H

3.5 GENERAL AVIATION DEMAND/CAPACITY AND FACILITY REQUIREMENTS

The primary purpose of General Aviation (GA) facilities is to provide services to itinerant and based aircraft. A recent review of airport activity statistics for MLB indicated the number of aircraft currently based at the Airport had increased since receiving FAA approval of the Aviation Demand Forecasts presented in Section 2. Therefore, to appropriately quantify projected GA facility requirements for MLB, growth rates for based aircraft identified in Section 2 were applied to the most recent based aircraft data reflecting the substantial increase. Values identifying the number of existing and projected-based aircraft at MLB are presented in Table 3-32.

Table 3.32
MLB BASED AIRCRAFT (2003-2021)

Aircraft Type	Existing (2002)	2006	2011	2021
Single Engine	130	142	158	195
Multi Engine	29	32	35	43
Jet Engine	17	19	21	25
Helicopter	3	3	4	4
Total	179	196	218	267

Source: MLB, Compiled by RS&H.

The GA areas at MLB consist of airside and landside facilities that include the Fixed Base Operator (FBO) areas, hangar facilities, apron areas, tie-down areas, terminal areas and ancillary facilities. Generally, all services provided by the FBO's should occur within their leased premises, including employee and customer parking. GA services provided directly by MLB include T-hangars and transient apron areas for overflow parking of aircraft. The remainder of this section discusses in detail the specific GA facilities provided at MLB, and presents future requirements to meet forecasted demand.

3.5.1 Aircraft Aprons and Tie-downs

The existing apron facilities at MLB dedicated to serving GA aircraft consist of various areas for parking, tie-down, circulation and general aircraft movement to and from parking and storage hangars. These apron areas are normally associated with the FBO operated by the Florida Institute of Technology (FIT) and Atlantic Jet Center, and provide parking for based as well as transient aircraft. In addition, there are several apron areas not directly associated with the FBO's which are used either for transient aircraft overflow parking or associated with future hangar development. Figures 3-11 and 3-12 provide a graphic depiction and summary of the existing apron and tie-down space provided at MLB. The existing apron and tie-down areas associated with the operation of the FBO's at MLB are further described in the remainder of this Section, as well as the facilities required to accommodate future demand.

3.5.1.1 Fixed Base Operators

The apron area associated with the operation of FIT consists of approximately 311,656-square-feet of paved surface, which is used to accommodate approximately 80 tie-down positions. These tie-downs are used to accommodate based aircraft, primarily used for flight school purposes, and transient aircraft. Of the total 311,656-square-feet of paved apron area, approximately 51,275-square-feet of apron space is used by transient aircraft, and 260,381-square-feet of apron space is provided for based aircraft parking and tie-downs. (see Figure 3-11).

The apron area associated with the operation of Atlantic Jet Center consists of approximately 356,384-square-feet of paved surface used to accommodate approximately 40 tie-downs for based as well as transient aircraft. Of the total 356,384-square-feet of paved apron area, approximately 147,301-square-feet of apron space is provided for transient aircraft, and 209,083-square-feet of apron space is dedicated to providing parking and tie-downs for based aircraft (see Figure 3-12). The apron area for transient aircraft is provided in front of the Atlantic Jet Center facility as well as the apron space adjacent to the other corporate/multi-use hangar facilities. The parking and tie-

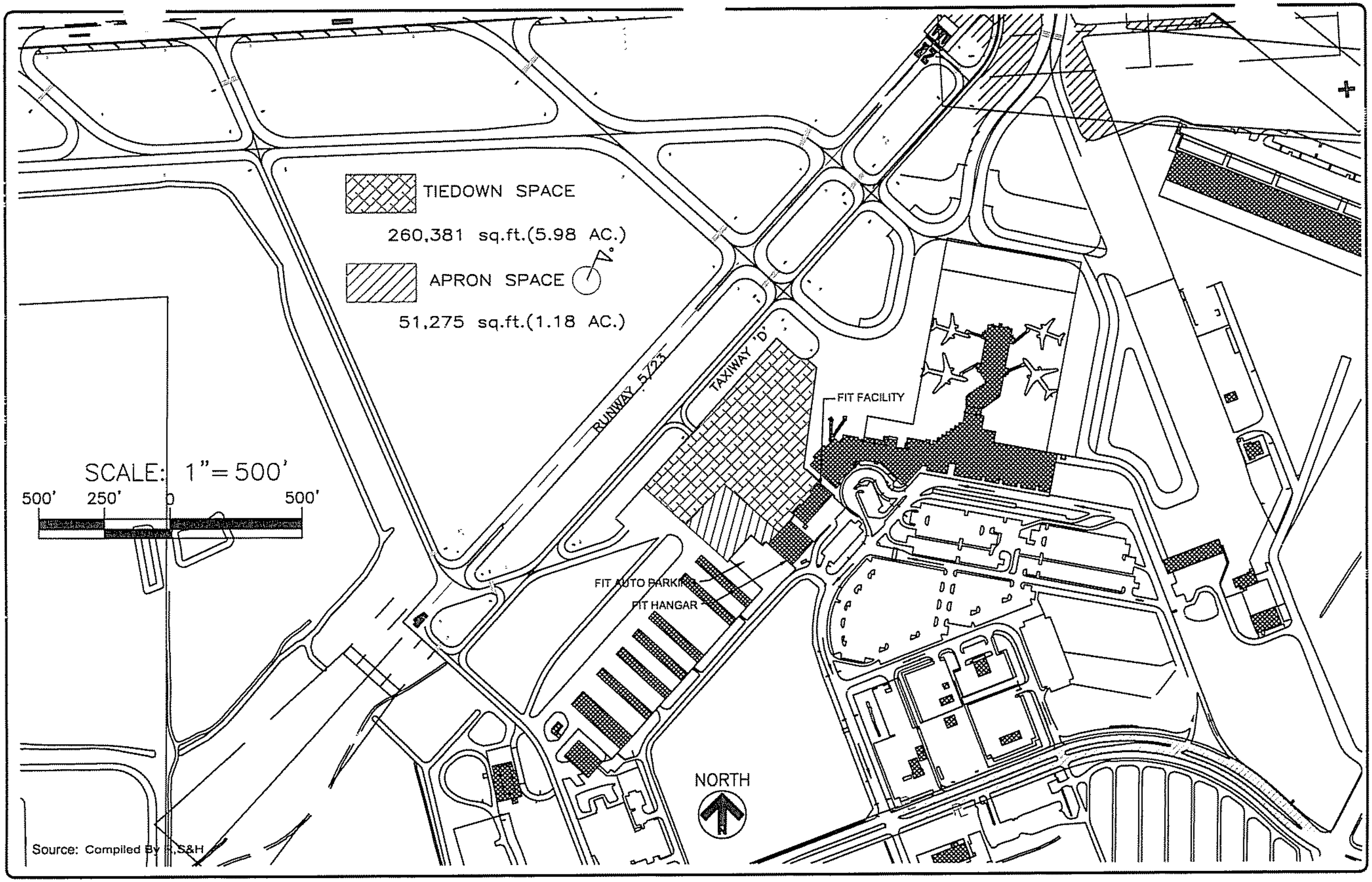


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Figure 3-11

F.I.T. Aircraft Parking and Storage
Facilities

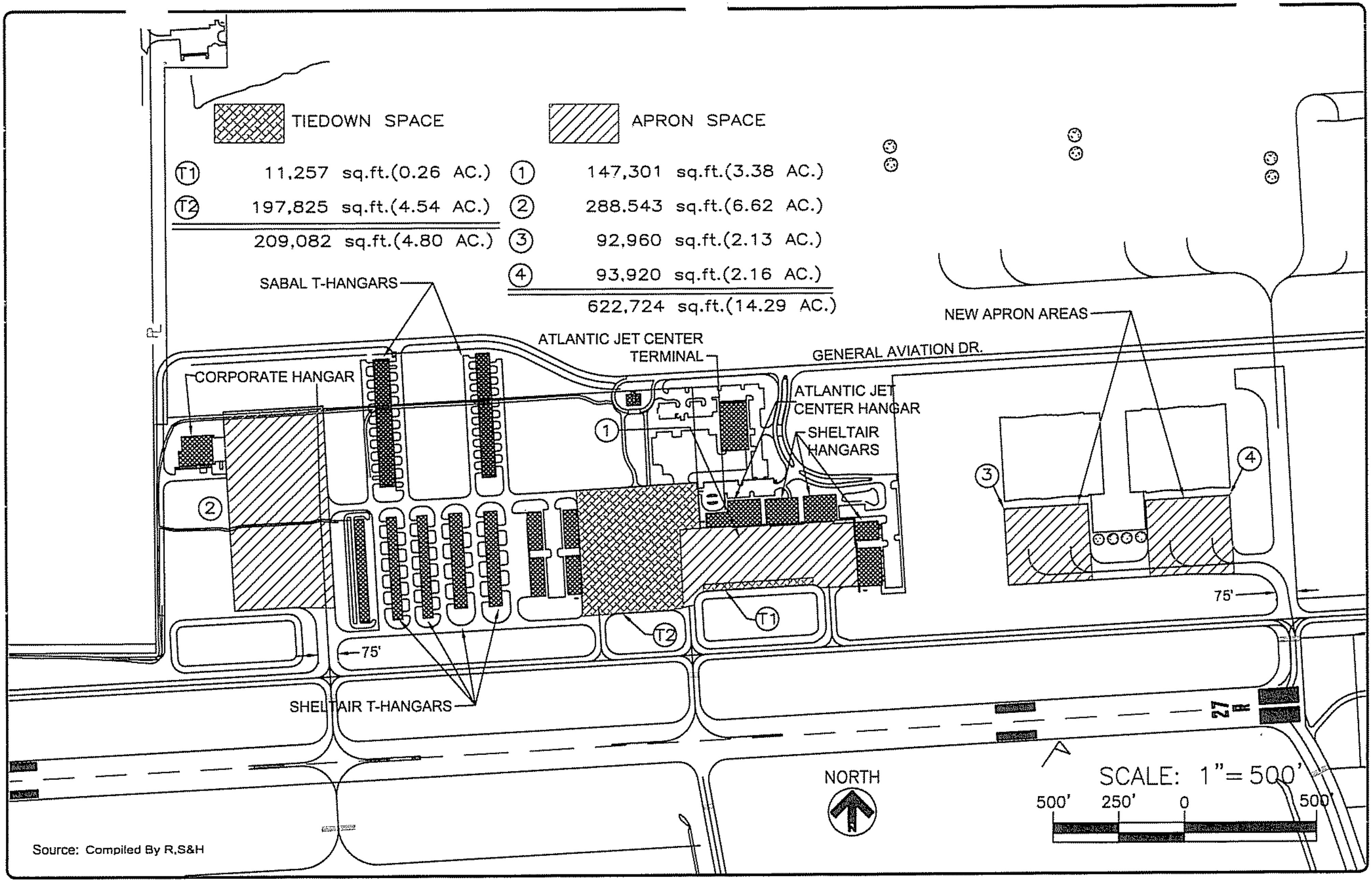

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Figure 3-12

Atlantic Jet Center Aircraft Parking
and Storage Facilities

down area for based aircraft is located immediately west of the Atlantic Jet Center facility.

The Airport has an additional 288,543-square-feet of apron area for the overflow parking of transient or long-term aircraft, located west of the Sheltair T-hangars. Additionally, two apron areas, each approximately 90,000-square-feet in size, have been constructed east of the Atlantic Jet Center facilities, to accommodate the construction of future aircraft storage or maintenance facilities, or to accommodate an air carrier in the long-term. Specific apron requirements to accommodate the forecasted demand for local and transient aircraft throughout the planning period are discussed below.

3.5.1.2 Itinerant Apron Parking Requirements

Areas designated for the parking of transient aircraft are termed itinerant aprons. In order to develop projections for the amount of apron space required to accommodate itinerant parking demand through the end of the planning period, GA aircraft fleet mix (by size of aircraft), daily aircraft parking demand and space planning considerations must be analyzed. Based on the 20-year forecasts for aircraft activity, the itinerant GA aircraft fleet mix was estimated to be 77.4% single-engine, 15.8% multi-engine, and 6.8% percent turbojet. These aircraft operations were also projected to be 50% local and 50% itinerant in nature. Therefore, by 2006, 97,200 itinerant GA operations are projected, with 107,300 itinerant operations by the year 2011, and 130,800 by 2021.

Daily parking demand is calculated by spreading the annual demand evenly throughout the year, and applying a peaking factor to determine daily demand. After establishing the daily demand for itinerant parking, planning allocations based on aircraft size must be applied to the demand to determine overall space requirements. Planning allocations for itinerant aircraft types require 3,600-square-feet of parking space for single-engine aircraft, 5,400-square-feet of space for multi-engine aircraft and 7,200-square-feet of space for turbojet aircraft. The analysis assumed a maximum of 50% of the total daily itinerant aircraft would be on the apron at one time. Table 3.33 represents the forecasted GA itinerant apron requirements through the year 2021.

In order to accommodate the current demand for itinerant parking, 270,000-square-feet of apron space is required. By the end of the planning period, 412,200 square-feet will be required. Currently 487,119-square-feet of apron space is available and allocated for itinerant use. This includes 147,301-square-feet dedicated to Atlantic Jet Center, 51,275-square-feet dedicated to FIT, and 288,543 available for overflow parking. In consultation with both FBO's it was determined that approximately 80% of the itinerant aircraft use Atlantic Jet Center, and 20% use FIT. In order to accommodate the current demand for itinerant parking, FIT requires 54,000 square feet of apron, and the Atlantic Jet Center requires 216,000 square feet. Applying these factors to the demand for itinerant parking by 2021, approximately 329,760-square-feet of apron space is required by Atlantic Jet Center, and 82,440-square-feet of space by FIT. This calculation assumes that the Atlantic Jet Center and FIT remain separate functioning FBO facilities. However, there is the possibility that FIT will relocate their flight school/FBO operation to the north side of the Airport and occupy facilities presently under the control of Atlantic Jet Center. Even if the Atlantic Jet Center and FIT combine their operations, there will be sufficient transient apron space to accommodate demand through the end of the planning period.

Table 3.33
MLB ITINERANT GA AIRCRAFT APRON PARKING REQUIREMENTS (2002-2021)

Planning Period	Daily Itinerant Operations[1]	Itinerant Aircraft On Apron At One Time	Aircraft Type	Number of Aircraft	Area (sf)
Existing (2002)	260	65	Single Engine	50	180,000
			Multiengine	10	54,000
			Turbojet	5	36,000
			Total	65	270,000
2006	297	74	Single Engine	57	205,200
			Multiengine	12	64,800
			Turbojet	5	36,000
			Total	74	306,000
2011	327	82	Single Engine	63	226,800
			Multiengine	13	70,200
			Turbojet	6	43,200
			Total	82	340,200
2021	399	99	Single Engine	76	273,600
			Multiengine	15	81,000
			Turbojet	8	57,600
			Total	99	412,200

[1] With 10% peak factor applied.

Source: Compiled by RS&H, 2003

3.5.1.3 Local Parking Apron/Tie-down Requirements

Local aircraft parking is planned to ensure adequate tie-down space for those aircraft not anticipated to require hangar storage. The sizing for tie-down positions varies according to aircraft size, and includes space for taxilanes, circulation and fueling. The required space per based aircraft is similar to the itinerant aircraft formula. By applying this standard planning criteria to the based aircraft forecast, approximately 183,600-square-feet of apron will be required for parking by based aircraft in year 2006; 203,400-square-feet of apron space in 2011; and 248,400-square-feet of apron space in 2021, (see Table 3.34).

Table 3.34

LOCAL GA AIRCRAFT TIEDOWN/PARKING APRON REQUIREMENTS (2002-2021)

Planning Period	Total Based Aircraft	Based Aircraft Requiring Tiedown	Aircraft Type	Number of Aircraft	Area (sf)
Existing (2002)	179	41	Single Engine	32	115,200
			Multiengine	7	37,800
			Turbojet	2	14,400
			Total	41	167,400
2006	196	45	Single Engine	35	126,000
			Multiengine	8	43,200
			Turbojet	2	14,400
			Total	45	183,600
2011	218	50	Single Engine	39	140,400
			Multiengine	9	48,600
			Turbojet	2	14,400
			Total	50	203,400
2021	267	61	Single Engine	48	172,800
			Multiengine	10	54,000
			Turbojet	3	21,600
			Total	61	248,400

Source: Compiled by RS&H, 2003

In order to accommodate the current demand for local aircraft parking and tie-down space, 167,400-square-feet of apron space is required. Currently 469,464-square-feet of apron space is available. This includes 209,083-square-feet dedicated to Atlantic Jet Center, and 260,381-square-feet dedicated to FIT.

A review of based aircraft activity revealed that approximately two-thirds of the based aircraft that require parking and/or tie-down space use FIT, while approximately one-third use Atlantic Jet Center. Applying these factors to the demand for local parking and tie-downs, by 2021 approximately 77,400-square-feet of apron space is required by the Atlantic Jet Center, and 154,800-square-feet of space by FIT. This calculation again assumes that the Atlantic Jet Center and FIT operate as independent FBO facilities. In the event FIT relocates to the north side of the Airport and occupies facilities currently owned by the Atlantic Jet Center (as previously discussed), approximately 232,200 square-feet of apron space will be required for local parking and tie-downs by the end of the planning period. However, only 209,083 square-feet is currently available for use at the Atlantic Jet Center. In the event FIT relocates to the north side, additional local parking and tie-down space may be required near the end of the planning period.

3.5.2 Aircraft Hangars

There is a consistent demand for additional hangar space by based aircraft owners and other owners who wish to relocate to MLB. Currently there are 139 T-hangars, of which Sheltair owns 63 and the Melbourne Airport Authority owns 55. In addition, Sabal Aviation is constructing 21 t-hangars to meet additional demand. When completed, the GA facilities at MLB will offer a total of 139 t-hangars with an additional 21 in the planning stage. Table 3.35 summarizes the existing hangar facilities at MLB.

Atlantic Jet Center, a full-service FBO, currently leases a 19,255-square-foot hangar and office building from Sheltair. Sheltair owns four other multi-use hangar and office buildings, adjacent to the Atlantic Jet Center, which are leased to various aviation related businesses. FIT, the other full-service FBO at MLB, occupies a 12,480-square-foot hangar, and 8,280-square-foot office building located adjacent to the International Terminal. There are also several privately owned corporate and multi-use hangar facilities located around the airport.

Table 3.35
AIRCRAFT STORAGE FACILITIES

Hangar Provider		Facility Type: Conventional Hangars (sf.)	Facility Type: Number of T-Hangars
FIT	1	12,480	
Hangar L.L.C.	1	13,500	
Harris	1	10,800	
Melbourne Airport Authority			55
Sabal			21
Sheltair	1	19,255	63
	1	18,928	
	1	16,825	
	1	12,484	
	1	12,173	
	1	7,516	
	1	7,516	
	1	7,516	
	1	7,516	
	1	6,242	
	1	4,700	
South Brevard Aviation	1	9,900	
Totals	15	167,351	139

Source: Melbourne International Airport

T-hangars currently accommodate approximately 78% of all based aircraft, while corporate/multi-use hangars accommodate approximately 7%. By maintaining these percentages to determine future facility requirements, a total of 191 t-hangars, and 19 corporate/multi-use hangars will be necessary to accommodate all based aircraft by 2021. Table 3.36 below illustrates a summary of the hangar requirements throughout the planning period.

Table 3.36
PROJECTED GA AIRCRAFT STORAGE FACILITIES (2002-2021)

Structure	Existing (2002)	2006	2011	2021
Aircraft in T-Hangars	129	141	157	191
Aircraft in Conventional Hangars	13	14	15	19

Source: MAA, Compiled by RS&H

3.5.3 Fuel Storage

The retail sale of aviation fuel at MLB is performed by both FIT and Atlantic Jet Center. Atlantic Jet Center currently operates an above ground fuel farm facility on the north side of the airport which has a capacity of 20,000 gallons of Jet A fuel and 20,000 gallons of 100LL Aviation Gasoline (AVGAS). The fuel facility used by FIT is owned by South Brevard Aviation. This fuel facility is located adjacent to the South Brevard Aviation Hangar and consists of one 10,000-gallon jet fuel tank and one 10,000-gallon AVGAS tank. Aircraft Services International (ASI) provides fueling services for scheduled air carrier operators serving MLB. The fuel farm facility operated by ASI is located southwest of the MLB T-hangars, and consists of two 50,000-gallon jet fuel tanks. Although not used for the retail sale of aviation petroleum products, Hangar L.L.C. has their own fuel farm with a capacity of 10,000 gallons of Jet A.

Retail fuel consumption data associated with MLB was obtained from Atlantic Jet Center, FIT and ASI. Fuel consumption information was used to calculate an average ratio of gallons of fuel pumped by type to the number of annual aircraft operations performed by GA piston-engine aircraft, GA turbine-engine aircraft and scheduled air carrier turbine engine aircraft. For GA aircraft operations, this analysis yields a ratio of 2.30-gallons of AVGAS per piston-engine aircraft operation and 20.75-gallons of jet fuel per turbine-engine aircraft operation. For scheduled air carrier operations, this analysis yields a ratio of 233-gallons of jet fuel per scheduled air carrier aircraft operation. A projection of the required increase in fuel capacity (by type of fuel) throughout the planning period was determined by applying these ratios to the forecast increase in annual operations. It is estimated that by the end of the planning period, approximately 672,017-gallons of Jet A and 528,739-gallons of AVGAS will be supplied annually to GA aircraft. Jet fuel supplied to scheduled air carrier aircraft by the end of the planning period is estimated to be 3,588,600-gallons annually. The capacity of fuel storage facilities should provide the ability to store at least a seven day or one-week supply of the specific type of fuel. Table 3.37 illustrates the required fuel storage capacity at MLB throughout the planning period assuming a seven-day fuel supply. The maximum required storage capacities for GA purposes will be 10,140-gallons for AVGAS and 12,888-gallons for jet fuel, while the maximum fuel storage capacity for scheduled air carrier purposes will be 68,823-gallons. Therefore, the existing fuel storage facilities located at MLB will accommodate the necessary capacities throughout the planning period.

Table 3.37

PROJECTED FUEL STORAGE REQUIREMENTS (2002-2021)

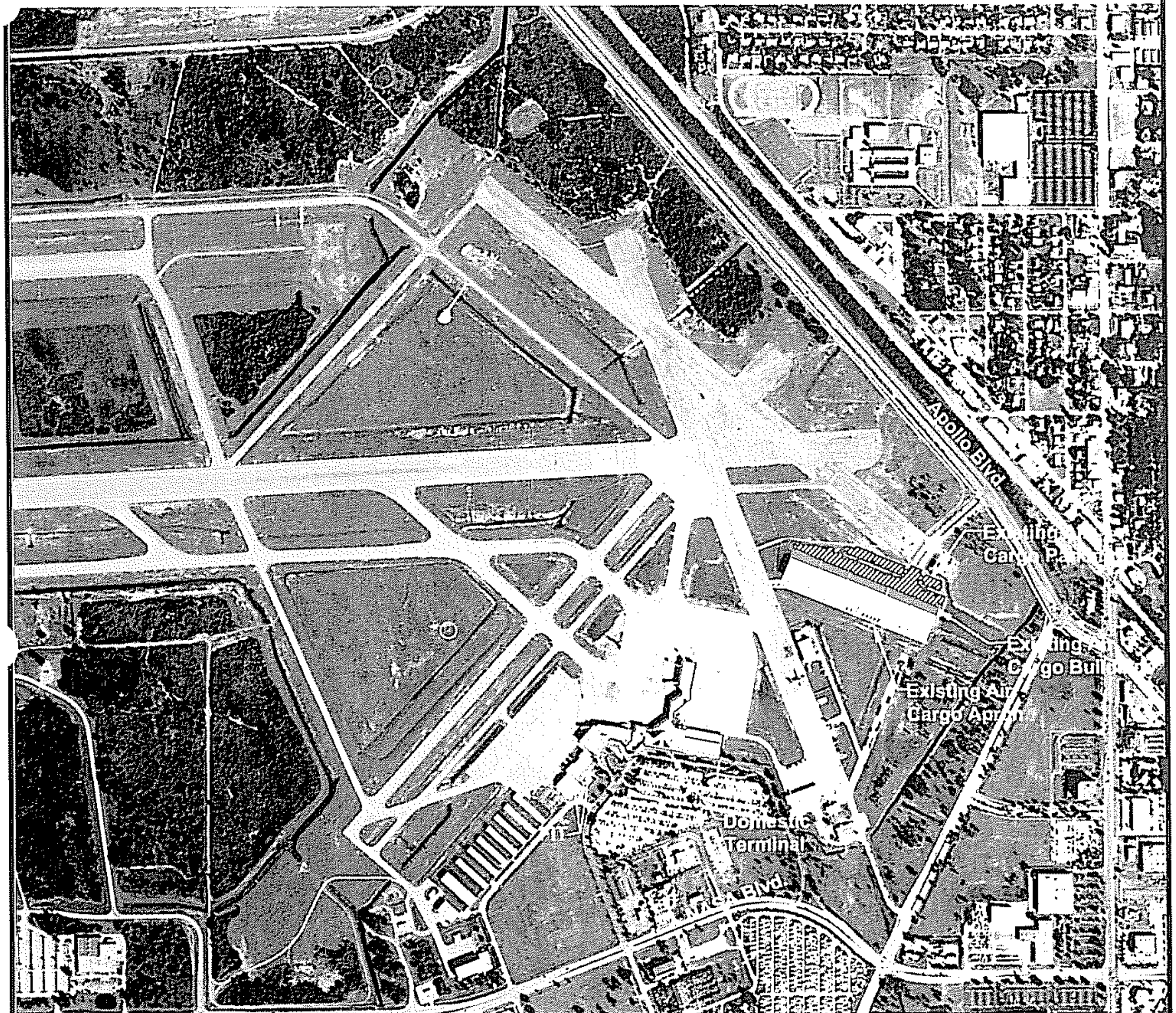
Fuel Type	Existing Capacity	2006	2011	2021
GA AVGAS	30,000	7,535	8,318	10,140
GA-Jet Fuel	30,000	9,680	10,644	12,888
Air Carrier-Jet Fuel	100,000	43,349	58,097	68,823

Source: Atlantic Jet Center, FIT & ASI

It should noted however that the facility requirements calculated for fuel storage capacity was predicated on domestic scheduled air service only, with historical fuel consumption figures used as the baseline for the analysis. With the anticipated introduction of international charter service using B-747/A-330/A-340 type aircraft, fuel storage capacity may not be sufficient to adequately accommodate the service. It is estimated that if international charter service begins at the Airport, a maximum of four flights per week may be scheduled. For each flight it is assumed that approximately 18,000 gallons of fuel will be required for transatlantic flight, or a weekly consumption of approximately 72,000 gallons. Given this estimated fuel consumption for international charter service, existing fuel storage capacity will not be sufficient to accommodate the initial demand. Therefore, prior to the introduction of international service, at least one (1) additional 50,000 gallon jet fuel storage tank may be necessary to maintain the recommended seven-day minimum supply.

3.6 CARGO FACILITIES

Air cargo facilities at MLB are positioned on the east side of the airfield near Apollo Boulevard. The location of the air cargo facilities relative to the Airport's runway and taxiway system is illustrated in Figure 3-13. The existing facility provides a total of 120,000 square feet of storage space. Presently, limited air cargo service is provided at MLB. However, in the absence of a full-service air cargo operator, the cargo facility has been sub-divided and leased to several different airport tenants. Table 3.38 shows the breakdown of leased space. The airside apron located at the air cargo facility measures approximately 1,000-feet in length and 60 feet in width, and is available for truck access only. Additional space is available for future construction of an aircraft parking apron.



SCALE: 1"= 1,000'

1,000' 500' 0 1,000'

NORTH

Source: Melbourne International Airport

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Figure 3-13
Air Cargo Facility Location

Table 3.38
BREAKDOWN OF LEASED AIR CARGO SPACE

Leasing Company	Area Leased (sq. ft.)
Aircraft Services Incorporated	6,000
Container Freight Station	6,000
Forward Logistics	9,000
Iron Mountain Storage	40,000
Northrop-Grumman	30,000
Rockwell	15,000
Yowell	14,000
Total Area	120,000

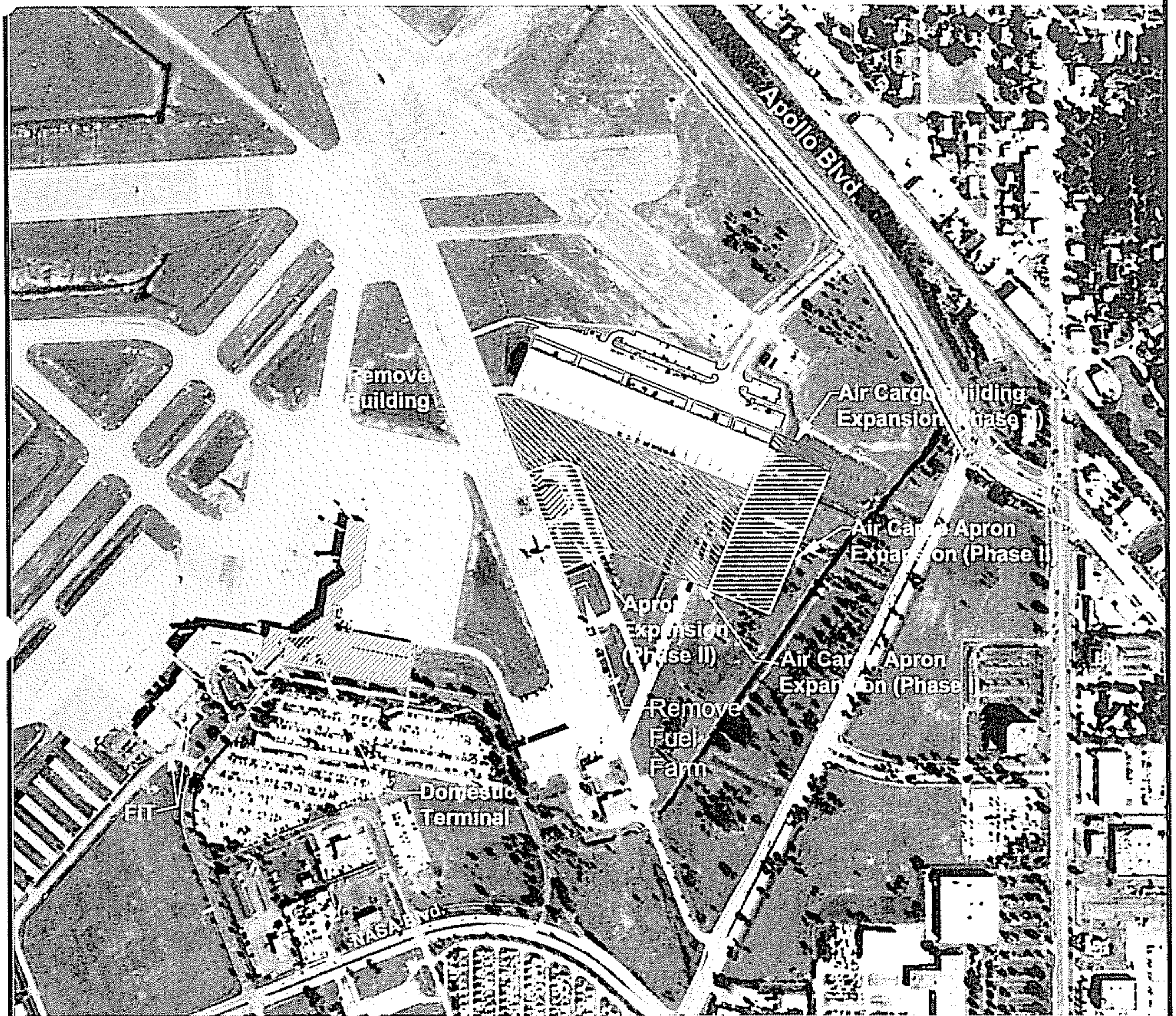
Source: Melbourne International Airport

The previous ALP Update and Master Plan Update prepared for MLB identifies a two-phase widening project for the air-cargo apron. The proposed widening of the air cargo apron is presented in Figure 3.14. Any expansion of the air cargo apron needs to take into consideration the impacts and design of the future domestic terminal apron to avoid conflicts between aircraft taxiing to and from both facilities.

3.7 AIRCRAFT RESCUE AND FIREFIGHTING (ARFF) FACILITY

The primary objective of an Aircraft Rescue and Firefighting service is to save lives by minimizing the catastrophic effects associated with an aircraft accident or incident. At MLB, ARFF personnel respond to approximately 20 alarms annually. To staff the facility, ARFF personnel are contracted through the City of Melbourne. Presently 18 firefighters employed by the City of Melbourne maintain the training requirements necessary to provide ARFF services.

While the level of emergency response capabilities or Index Level required by airport operators is identified in *Federal Aviation Regulations (FAR) Part 139*, ARFF facility design standards are outlined in FAA AC 150/5210-15, *Airport Rescue and Fire Fighting Station Building Design*. The ARFF Index Level is determined by a combination of the length of passenger air carrier aircraft serving the airport and average daily departures of scheduled air carrier aircraft. For the purpose of Index Level determination, air carrier aircraft are grouped according to length, which is presented in Table 3.39.



SCALE: 1" = 600'

600' 300' 0 600'

NORTH

Source: Melbourne International Airport

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Figure 3-14
Proposed Air Cargo Facility
Improvements

TABLE 3.39
ARFF INDEX GROUPS

Index Group	Aircraft Length (feet) At Least	Aircraft Length (feet) Less Than	Sample Aircraft
A	0 Feet	90 Feet	Canadair Regional Jet
B	90 Feet	126 Feet	B-737, DC-9
C	126 Feet	159 Feet	B-727, B-757
D	159 Feet	200 Feet	DC-10, L1011, B-767
E	≥ 200 Feet		B-747, C-5A, A-380

Source: FAR Part 139

To comply with ARFF requirements provided in *FAR Part 139,* an airport is mandated to provide emergency response capabilities necessary to meet the requirements of the Index Group associated with the longest passenger air carrier aircraft operating five or more average daily scheduled departures. In the event less than five average daily scheduled departures are executed by air carrier aircraft in the longest Index Group represented at the airport, the next lower Index Group is applied.

Associated with each Index Group are minimum requirements relative to rescue and firefighting equipment as well as amount and type of fire extinguishing agent to be provided. The minimum requirements for each Index Group are presented in Table 3.40.

3.7.1 <u>ARFF Index Group</u>

Presently, the ARFF facility located at MLB is maintained to the requirements prescribed for Aircraft Index Group C operations. Maintaining the ARFF Index Group C requirements are a result of the facility being outfitted to specifications necessary for providing ARFF services based on the criteria established by FAA for the MD-88 aircraft, which measures 147-feet and 10-inches in length. Until the events of September 11, 2001, the MD-88 made-up a significant percentage of air carrier aircraft operations at MLB. Since the events of September 11, 2001 however, MD-88 operations at MLB have declined and now account for an average of 2.8 daily departures.

TABLE 3.40
ARFF INDEX GROUP
MINIMUM REQUIREMENTS

Index Group	Number of Vehicles	Extinguishing Agent
A	1	Carrying at least 500 pounds of sodium-based dry chemical or halon 1211 -or- Carrying at least 450 pounds of potassium based dry chemical and water with a commensurate quantity of Aqueous Film Forming Foam (AFFF) to total 100 gallons for simultaneous dry chemical and AFFF foam application.
B	1	Carrying at least 500 pounds of sodium-based dry chemical or halon 1211 and 1,500 gallons of water and the commensurate quantity of AFFF for foam production. - or -
	2	One vehicle meeting the vehicle specification standards required for meeting Index Group A requirements. -and- One vehicle carrying an amount of water and the commensurate quantity of AFFF so that the total quantity of water for foam production carried by both vehicles is at least 1,500 gallons.
C	2	One vehicle carrying at least 500 pounds of sodium-based dry chemical or halon 1211 and 1,500 gallons of water and the commensurate quantity of AFF for foam production. -and- One vehicle carrying an amount of water and the commensurate quantity of AFFF so that the total quantity of water for foam production carried by both vehicles is at least 3,000 gallons. -or- Three vehicles, one meeting the vehicle specification standards required for meeting Index Group A requirements, and two vehicles carrying an amount of water and the commensurate quantity of AFFF so that the total quantity of water for foam production carried by both vehicles is at least 3,000 gallons
D	3	One vehicle meeting the vehicle specification standards required for meeting Index Group A requirements. -and- Two vehicles carrying an amount of water and the commensurate quantity of AFFF so that the total quantity of water for foam production carried by all three vehicles is at least 4,000 gallons.
E	3	One vehicle meeting the vehicle specification standards required for meeting Index Group A requirements. -and- Two vehicles carrying an amount of water and the commensurate quantity of AFFF so that the total quantity of water for foam production carried by all three vehicles is at least 6,000 gallons.

Source: FAR Part 139
Compiled by RS&H

To determine the current ARFF needs and appropriate Index Group for MLB, an air carrier departure schedule for the airport was reviewed. The departure schedule is provided in Table 3.41. Taking scheduled flight frequencies into consideration, 9.29 daily departures on average are operated from MLB. Of the 9.29 daily departures, 6.43 daily departures are conducted by Index Group A aircraft, while 2.86 daily departures are conducted by Index Group C aircraft. Index Group C aircraft are represented at the Airport, but do not conduct an average of five daily departures. Therefore, the ARFF requirements for MLB, based on the airport's existing departure schedule, must meet the specifications for Index Group B aircraft.

Table 3.41
AIR CARRIER DEPARTURE SCHEDULE

Air Carrier	Aircraft	Flight No.	Index Group	Frequency
Delta	MD-88	438	C	Daily
Delta Connection / Atlantic Southeast Airlines	CRJ	4519	A	Daily
Vintage Props & Jets	BE100	103	A	Daily
Delta Connection / Comair	CRJ	5479	A	Daily
Delta Connection / Comair	CRJ	5853	A	Saturday
Delta	MD-88	1221	C	Daily
Vintage Props & Jets	BE100	301	A	Daily
Delta Connection / Comair	CRJ	5324	A	Daily
Delta Connection / Comair	CRJ	5854	A	Saturday
Delta Connection / Atlantic Southeast Airlines	CRJ	4584	A	Saturday
Delta	MD-88	1060	C	M,T,W,T,F,SU
Delta Connection / Atlantic Southeast Airlines	CRJ	4530	A	Daily

BE100 – Beechcraft King Air B-100
CRJ – Canadair Regional Jet
MD-88 – McDonnell-Douglas –DC-9-88
Source: Melbourne International Airport

To determine future ARFF Index Group classifications for MLB, the airport's projected aircraft fleet mix was broken down according to Index Groups and number of average daily scheduled departures expected to be conducted by aircraft associated with each Index Group. The results of this analysis are presented in Table 3.42.

In 2006 air carrier aircraft are projected to conduct an average of 13.28 daily departures from MLB. The number of average daily scheduled departures for air carrier aircraft is expected to increase to 17.80 by 2011 and further increase to 21.09 by 2021. The number of average daily departures conducted by Index Group E aircraft represents potential charter service between European cities and MLB using the B-747 (or similar) type aircraft. European charters using the B-747 aircraft could begin as early as mid to

Table 3.42
PROJECTED AVERAGE DAILY DEPARTURES BY INDEX GROUP

Index Group	2006	2011	2021
Index Group A	5.06	6.46	8.51
Index Group B	1.81	2.28	1.61
Index Group C	5.59	7.69	8.06
Index Group D	0.66	1.07	2.11
Index Group E	0.16	0.30	0.80
Total Daily Departures	13.28	17.80	21.09

Source: FAR Part 139
Compiled by RS&H

late 2004. Although service to MLB from European cities will be administered through a charter service, all arrivals and departures will be conducted on a scheduled basis. As a result, projected operations by Index Group E aircraft were considered in the ARFF Index Group determination process.

In 2006 an average of 5.59 daily scheduled departures are anticipated to be conducted from MLB by Index Group C aircraft. However, Index Group E aircraft, which represents the longest Index Group forecast to serve the airport, are projected to perform an average of 0.16 daily scheduled departures from MLB. Although average scheduled daily departures projected for Index Group C aircraft are greater than five, the forecasted presence of the Index Group E aircraft in the MLB fleet mix was used as the factor in determining the 2006 ARFF Index Group requirements. Since the average projected number of daily scheduled departures performed by Index Group E aircraft is less than five, MLB will be required to maintain an ARFF classification of Index Group D. It should also be noted that although this calculation is making a projection for 2006, as soon as the international charter service is introduced on a scheduled basis with the B-747 type aircraft, MLB will be required to comply with Index D ARFF requirements.

In 2011 an average of 7.69 daily scheduled departures are anticipated to be conducted from MLB by Index Group C aircraft. However, Index Group E aircraft are projected to perform an average of 0.30 daily scheduled departures from MLB. Since the average projected number of daily scheduled departures performed by Index Group E aircraft is less than five, MLB will be required to maintain an ARFF classification of Index Group D.

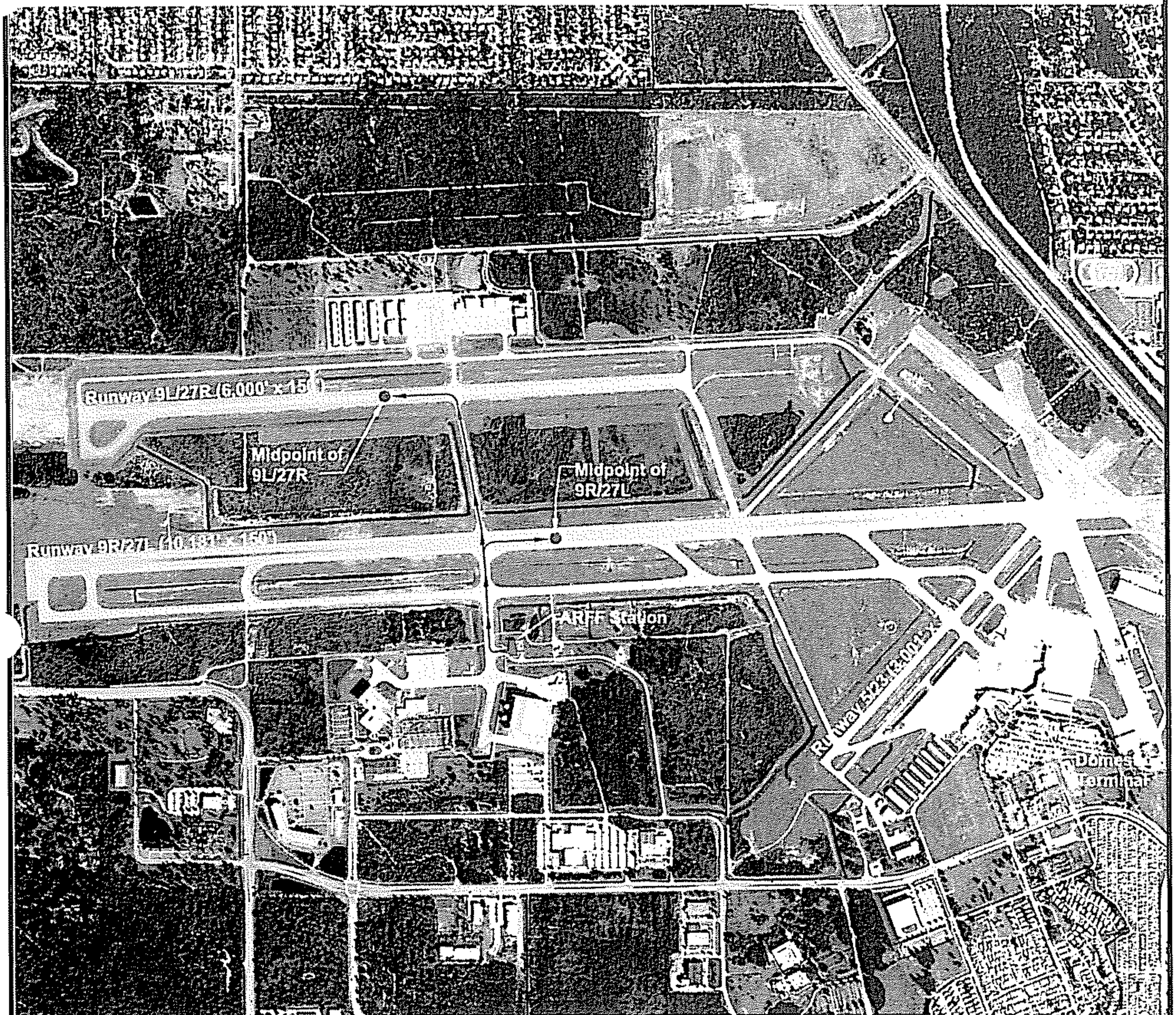
In 2021 Index Group C aircraft are projected to conduct an average of 8.06 daily scheduled departures from MLB, while Index Group E aircraft are projected to conduct an average of 0.80 daily scheduled departures. Although projected to perform less than five scheduled daily departures, Index Group E aircraft represents the longest Index Group aircraft forecast to be operating in 2021. As a result, MLB will be required to maintain an ARFF classification of Index Group D. The following is a brief summary of Index Group D requirements.

- 1 vehicle with the capability of carrying at least 500 pounds of sodium-based dry chemical or halon 1211; or with the capability of carrying at least 450 pounds of potassium-based dry chemical and water with a commensurate quantity of AFFF to total 100-gallons for simultaneous application.
- 2 vehicles with the capability of carrying an amount of water and the commensurate quantity of AFFF so the total quantity of water for foam production carried by all three vehicles is at least 4,000 gallons.

3.7.2 ARFF Location

The ARFF facility associated with MLB is positioned near the midpoint of Runway 9R/27L. The location of the ARFF facility is illustrated in Figure 3-15. The preferred location of an ARFF facility is one that is centrally located relative to the airfield and permits quick and unobstructed response to all areas. Additionally, the location of an airport's ARFF facility should optimize the operational ARFF vehicle factors and permit the lowest possible response times.

Air carrier flight operations at MLB are conducted on both Runway 9R/27L and Runway 9L/27R. Runway 9L/27R represents the runway located furthest from the location of the ARFF facility, which serves air carrier aircraft. In accordance with *FAR Part 139*, the existing location of the MLB ARFF station provides ARFF vehicles the ability of reaching the midpoint of 9L/27R (the farthest runway serving air carrier aircraft) or any other specified point of comparable distance on the movement area and begin the application of distinguishing agents within three minutes from the time of the alarm.



SCALE: 1"= 1,500'

1,500' 750' 0 1,500'

NORTH

Source: Melbourne International Airport

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and Environmental Services
Jacksonville, Florida

Melbourne International Airport
Master Plan Update

Figure 3-15

ARFF Location

3.7.3 ARFF Facilities

The ARFF station at MLB is single-story structure and accommodates four firefighters and two on-duty officers per shift. The structure is of metal frame construction and encompasses an area of approximately 7,645-square-feet. Of the total square-footage, approximately 2,850-square-feet provides accommodations for living, sleeping and administrative space, while the remaining 4,795-square-feet includes four vehicle bays used to store and maintain ARFF vehicles and equipment. To analyze the existing ARFF facility, *FAA AC 150/5210-15 – Airport Rescue and Firefighting Station Building Design* was employed to determine appropriate space allocations for dormitories, day room and classroom training area.

Dormitory spaces for firefighters and officers within MLB's ARFF station make-up approximately 764-square-feet of the total area associated with the building. The dormitory spaces are in fair to good condition. Of the total dormitory space, approximately 300-square-feet is designated as officers' quarters and the remaining 464-square-feet of dormitory space is constructed to provide sleeping quarters for firefighters. The existing officers quarters includes a bathroom, a workspace for fulfilling administrative responsibilities and a sleeping area. The existing dormitory space for firefighters contains bunks and locker storage for each firefighter on duty, as well as bathroom facilities.

For officers quarters, FAA recommends a separate dormitory space of 180-square-feet be provided to accommodate up to two officers per shift. The dormitory area for firefighters should be large enough to accommodate one bunk and locker facilities for each firefighter per duty shift and allow approximately 70-square-feet per firefighter. Although FAA makes no specific recommendations regarding separate facilities according to gender, a separate dormitory space should be included to accommodate female firefighters. The existing space provided for officer's quarters at the ARFF facility is sufficient for meeting the Airport's needs throughout the planning period. Although the existing ARFF station contains separate male and female bathroom facilities, the structure does not provide separate sleeping facilities for female firefighters. Therefore, design and construction of additional dormitory space to provide for female firefighters is recommended.

The existing day room associated with the ARFF station Imeasures 204- square-feet. The day room provides a place where ARFF personnel can relax or study while on break. The minimum recommended size of an ARFF day room is 10-square-feet per firefighter per shift. Considering the current number of firefighters per shift at the ARFF facility, the existing day room space is sufficient according to FAA standards for meeting the facility's needs throughout the planning period.

A specific area of an ARFF station should be designated for the purpose of conducting practical and classroom training exercises. The space should allow for a blackboard, projection screen, bulletin board, visual learning aids, maps and other necessary training aids. Additionally, the space should provide adequate storage space for instructional materials, audio visual aids, equipment and supplies. FAA recommends the training space should allow a minimum of 30-square-feet per firefighter per shift.

The area dedicated to ARFF training measures approximately 270-square-feet. Of the total area associated with the training area, approximately 60-square-feet is dedicated to providing storage, while the remaining 210-square-feet is intended solely for training purposes. As previously stated, a total of 18 firefighters employed by the City of Melbourne maintain credentials necessary for providing ARFF services. To facilitate the Airport's ARFF capability, the City of Melbourne and MLB have devised a rotation system which allows firefighters to rotate between ARFF duties at the Airport and firefighter duties at stations in the City of Melbourne. To compensate for conflicting firefighter duty-schedules, training exercises necessary for meeting *FAR Part 139* requirements are conducted in a single comprehensive session and include all 18 ARFF personnel. Applying 30-square-feet per firefighter, an area of 540-square-feet is recommended for a dedicated training area. Therefore, expansion of the existing training area from 210-square feet to at least 540-square-feet is recommended.

3.7.4 <u>ARFF Personnel and Equipment</u>

Currently the on-duty ARFF staff consists of four firefighters and two officers. The Airport's ARFF classification is projected to be Index Group D throughout the planning period. Index Group D specifications require the implementation of no less than three vehicles. Considering each vehicle will require a driver, the ARFF facility will require a minimum of three on-duty personnel to meet Index Group D specifications. As a result the existing number of on-duty staff members is adequate for meeting the Index Group D specifications required for operation of the ARFF facility throughout the planning period.

Equipment used by the ARFF facility includes two Oshkosh 1500 fire trucks, one E1 fire truck and one GMC 2500 rescue and apparatus truck. A breakdown of the MLB ARFF equipment and capabilities associated with each is provided in Table 3.43.

Table 3.43
MLB ARFF EQUIPMENT

Year	Model	Ownership	Equipment Description
1998	Oshkosh 1500	Melbourne Airport Authority	1,500-Gallon water pump truck 500-Pound dry chemical capacity AFFF capacity commensurate to 4,500-Gallons water
2000	Oshkosh 1500	Melbourne Airport Authority	1,500-Gallon water pump truck 500-Pound dry chemical capacity AFFF capacity commensurate to 4,500-Gallons water Piercing nozzle
1989	E1 1500	Melbourne Airport Authority	1,500-Gallon water pump truck
1992	GMC 2500	City of Melbourne	Rescue and apparatus truck

Source: MLB

The 1998 and 2000 Oshkosh 1500 fire trucks used by the ARFF facility are owned by MLB and are in good condition. The 1989 E1 1500-fire truck is also owned by MLB and is being activated in anticipation of being required to meet Index D requirements, and is in good condition. The1992 GMC 2500 rescue and apparatus truck is owned by the City of Melbourne, available for use at the Airport and is in good condition. In order to accommodate the anticipated scheduled international charter service, an additional ARFF vehicle, capable of allowing the Airport to maintain an Index D status, will be fulfilled by utilizing the1989 E-1 1,500 gallon truck until a replacement can be secured. Furthermore, it is projected that once Index D status is achieved, this will need to be maintained throughout the end of the planning period.

3.8 SURFACE ACCESS

One of the goals and objectives of this Master Plan Update effort, as identified in Section 1, was to improve access to Interstate Highway 95. As a truly intermodal facility, an airport must offer convenient access to the interstate highway system for the movement of people and goods. Convenient interstate highway access in critical to the economic success of any airport. The need for direct access from MLB to I-95 was evaluated in the Master Plan Update, from the overall standpoint of attempting to improve mobility and help relive the local roadway system of peak hour congestion issues. The congested roadway segments during peak periods include US-192 to the south of the Airport, Eau Gallie Blvd.(SR 518) and Sarno Road to the north, and Airport/Apollo Blvd. to the east. Due to continued commercial development of business sites adjacent to the Airport and along the roadway segments adjacent to the Airport, direct access to the interstate is necessary. New direct interstate access will also help to relieve congestion on the existing interchanges at Eau Gallie Blvd./I-95 and US 192/I-95.

The analysis included an examination of the traffic generated by the Airport and its surrounding land uses under future (2020) conditions, to be consistent with regional planning efforts. Traffic demand was derived from essentially two sources: 1) Brevard 2020 Travel Demand Model (existing plus committed network); and 2) International Traffic Engineers Trip Generation Manual calculations based on the size of the land uses surrounding the Airport, as well as traffic generated as a result of Airport operations. The total traffic projected as a result of these two independent sources was then added to the trips generated due to the daily passenger movements at MLB to arrive at a total demand for trips generated as a result of Airport activity. An examination of the total demand for trips was then conducted to determine if the airport traffic alone warranted a direct interstate connection and interchange. In order to fully present the findings of this traffic analysis, an explanation of the traffic demand derived from the two sources identified above is necessary.

3.8.1 Brevard 2020 Travel Demand Model

The Brevard 2020 Travel Demand Model calculates trip generation demand based on a geographical unit of analysis called a Traffic Analysis Zone (TAZ). The TAZ is used to connect and define land use values to transportation networks. Within a TAZ, centroids are used to identify centers of activity. A centroid connects that TAZ to the roadway facilities, using centroid connectors. The zonal and land use data for each TAZ is located in what are called ZDATA files. For purposes of evaluating the traffic associated with MLB, the following ZDATA files were examined:

- ZDATA 1 file: This file includes trip (traffic) production (i.e., household characteristics or households generating trips on the roadway network).

- ZDATA 2 file: This file includes trip attraction data (i.e., employees attracted to a specific location).
- ZDATA 3 file: This file contains special generator data that covers major activity centers such as airports, universities, military bases, etc., that cannot be adequately accounted for in the ZDATA 1 and 2 files.

Melbourne International Airport is located in TAZ 246 in the Brevard 2020 Model. The surrounding zones that include airport land uses are 284, 254, 249, 251 and 235 and were also used in the analysis of airport related traffic impacts (see Figure 3.16).

According to the Brevard 2020 Model, TAZ 246 will generate 48,568 peak season weekday average daily trips (PSWADT) by 2020. Total traffic by year 2020 from TAZ 246 and all other TAZ's surrounding the Airport will be 104,118 PSWADT. A model output conversion factor (MOCF) was also used to convert the peak season trips to annual average daily traffic (AADT). A MOCF factor of 0.91 was used for Brevard County. This was obtained from the 2001 Florida Traffic Information CD published by the State of Florida Systems Planning Office. This resulted in AADT of 94,747 for the Airport and its' surrounding land used in the year 2020 (see Table 3.44).

Table 3.44

TRAFFIC GENERATED BY TAZs BASED ON BREVARD MODEL

	TRAFFIC FROM BREVARD MODEL			
TAZ*	1990		2020	
	PSWADT***	AADT****	PSWADT	AADT
284	1910	1738	7273	6618
254	7445	6775	9547	8688
249	11970	10893	21280	19365
251	5344	4863	8230	7489
*246***	*31186*	*28379*	*48568*	*44197*
235	7152	6508	9220	8390
TOTAL	65007	**59156**	104118	**94747**

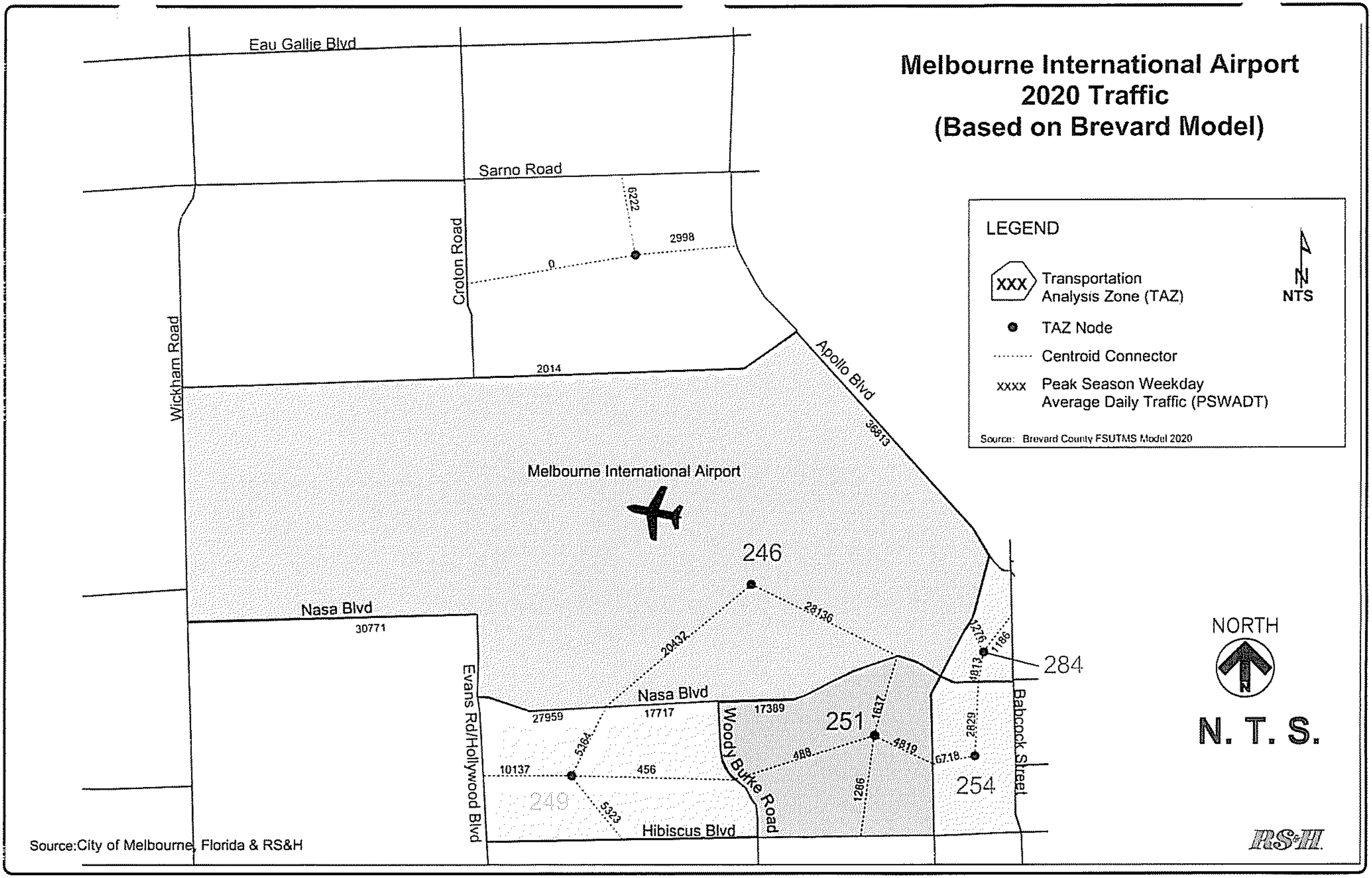
* Traffic Analysis Zone

** Zone 246 includes the Airport

*** Peak Season Weekday Average Daily Traffic

**** Annual Average Daily Traffic

Source: RS&H



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and Environmental Services
Jacksonville, Florida

Melbourne International Airport
Master Plan Update

Figure 3.16
Traffic Analysis Zones

3.8.2 ITE Trip Generation Manual Calculations

Land uses surrounding the Airport vary greatly, including industrial, commercial, office and residential. The area bordering the Airport includes mostly aerospace and technological industries, along with scattered residential communities and heavy commercial development. The Master Plan Update shows future land use to include approximately 2800 acres of Airport property, of which approximately 1200 acres is a industrial/commercial/residential land use mix. There is also about 600 acres of vacant land available for development.

Each of the study TAZ's include one or a mix of land uses mentioned above. The land area in square feet was calculated for each of the land uses and a Floor to Area Ratio (FAR) was assumed for the different land uses. This FAR value was used to convert land area to building size in square feet by multiplying the FAR with land area. This building size in square feet was then used to estimate the number of trips. The ITE Trip Generation Manual gives the trips generated based on building size and type of land use. Table 3.45 shows the FAR values used for various land uses and also traffic generated by each TAZ.

Table 3.45

FUTURE TRIP GENERATION FOR AIRPORT AND SURROUNDING LAND USES (BUILD OUT)

TAZ	Land Use	ITE Land Use	Land Area sq ft	Bldg. Size sq ft	FAR FAR	# of Floors in Bldg.	# of Employees	# of Trips
284	Commercial	Shopping Center	2055000	328800	0.16	1		14654
254	Commercial	Shopping Center	575000	92000	0.16	1		6461
249	Industrial/Office	Business Park	5970000	1134300	0.19	1	3764	12937
251	Residential	SF 4 units/acre	5845752	537	-		2140	4865
	Industrial/Office	Business Park	2465000	468350	0.19	1	1521	5780
246	Commercial	Shopping Center	3523750	528562 5	0.15	1		19885
	Industrial/Office	Business Park	4030000	765700	0.19	1	2522	8976
	Aviation/Industrial	Warehouse	20226250	4652037 5	0.23	1	9820	17451
235	Aviation/Industrial	Warehouse	2997500	689425	0.23	1	891	2885
	Commercial	Shopping Center	3053125	488500	0.16	1		18902
							TOAL TRIPS	**112795**
							ENPLANEMENT TRIPS	**9205**
							TOTAL DAILY TRIPS	**122000**

Source: RS&H

Based on the above methodology, a total of 112795 trips were estimated to be generated by the Airport and its surrounding land uses by 2020. In addition 9205 passenger enplanement trips were projected for 2020 based on Master Plan forecasts of enplanement growth. Using the ITE Trip Generation Manual methodology, by 2020 the Airport and the surrounding land uses would generate approximately 122,000 daily trips.

The analysis reveals that the Airport generated traffic alone will not warrant a new direct connection between the Airport and I-95. The analysis also shows that although the traffic projections from the 2020 Brevard Model are lower, the Airport traffic from ITE trip generation and enplanements are not significantly higher to justify a new interchange. From the trip generation tables it can be seen that the Brevard 2020 Model predicts approximately 95000 trips in 2020 while the 2020 scenario using the ITE Trip Generation Manual methodology predicts a total of 122000 trips. The difference in the number of trips between the two scenarios is 27000 daily trips or 2700 trips during the peak hour assuming peak hour factor (K factor) of 0.10. Assuming a directional split of 0.55, we get 1485 trips in the peak direction, which can be accommodated in a single additional lane added to the existing network. Although the traffic analysis concluded that the airport generated traffic alone does not warrant a new direct connection to Interstate 95, as previously mentioned various roadway segments which connect the Airport to the interstate highway are at capacity.

The Melbourne International Airport Access Transportation Alternative Feasibility Study prepared by DRMP, Inc. in September 1998, shows that I-95 (from US-192 to Eau Gallie Boulevard) and US-192 (from I-95 to Airport Boulevard) will perform at a Level of Service F in 2020. US-192 is a major roadway and an important access between the Airport and I-95. Some of the other roadways in the area including Wickham, NASA Boulevard and Ellis Road will also operate at threshold capacities by 2020. These roadways are critical components for accessing the Airport. The DRMP study concludes with a recommendation for a new I-95 interchange possibly with the extension of Ellis road. The other recommendations of the study include realignment of NASA Boulevard, widening of Ellis road and extension of Palm Bay Beltway. The new interchange would provide a direct route between I-95 and the Airport, and also remove some traffic from the existing interchanges at US-192 and Eau Gallie Boulevard, thus enhancing the mobility of the region. The development of an Ellis Road extension and new I-95 interchange will not only provide relief for some of the roadway segments projected to be at capacity in 2020, but will improve overall mobility and connectivity for all major development areas at the Airport. Therefore, it is a recommendation of this Master Plan Update that consistent with previous regional planning efforts and projected future traffic, a direct connection between Melbourne International Airport and I-95 be developed along a corridor which encompasses Ellis Road and the proposed I-95 interchange for the extension of the Palm Bay Parkway.

3.9 RAIL ACCESS

Located along the eastern boundary of the Airport, adjacent to Apollo Blvd., is the main north/south rail line for Florida East Coast Railway, L.L.C. (FECR). This rail line, operated exclusively by FECR, is a 351-mile long corridor connecting Miami and Jacksonville. FECR track connects in Jacksonville with Norfolk Southern Railway Company and CSX Transport, providing rail connections to the rest of North America. The FECR line also provides exclusive rail service to the ports of Palm Beach, Port Everglades and Miami. Cargo routinely carried along the FECR track include commodities such as automobiles, crushed stone, cement, trailers-on-flatcars, containers-on-flatcars, and basic consumer goods. FECR operates a transload center in Cocoa, Florida, providing full-service re-load, transload, boxcar and flatcar unloading, inside and outside storage, hydraulic and forklift capability.

As stated in Section 1, a goal of the Master Plan Update effort is to increase intermodal connectivity between varying modes of transportation, including rail. The location of the FECR mainline track adjacent to the Airport provides opportunities for enhanced cargo as well as passenger connectivity. However, due to national economic trends, expansion of cargo and passenger rail opportunities are unlikely in the near-term. A proposed location for an Amtrak rail station adjacent to the Airport has been identified and should remain a part of the Airport's long-term planning goals. In addition, designation of a potential light-rail or automated people mover corridor linking the proposed rail station to the MLB passenger terminal is recommended to protect the ability to develop such service in the future.

3.10 HOTEL/CONFERENCE CENTER

As part of the Master Plan Update process and reported in detail under separate cover, an analysis of the feasibility of developing an on-airport hotel/conference center facility was conducted. The established goals for the development of such a facility include increasing aviation related airport activity, furthering the development of compatible land use, diversifying the economic base and fulfilling an unmet demand. Based on the overall analysis it was determined that demand for conference center facilities would total approximately 137 events and generate approximately 119,000 event attendees in the first year of operation. By the tenth year of operation 154 events and 157,000 attendees are projected. The proposed facility would host exhibitions, meetings and conferences, and other business, social and community events, and position the airport to attract additional aviation related activity who travel to Melbourne to attend certain functions or events. The operation of the facility would generate approximately $21 million in new economic activity for the Airport and surrounding community, and support an estimated 210 new jobs. The analysis also recommended various site configurations and expansion alternatives, with a recommended alternative presented in Section 4.

3.11 STRATEGIC PLANNING ACTIVITY LEVEL (SPAL) FACILITY REQUIREMENTS

Strategic Planning Activity Levels (SPALs) for the different components and entities associated with future development of the Airport, have been defined and summarized in the following tables. These SPAL values are "triggering mechanisms" for use in determining the timing of related facility development. Presented in Table 3-46 is a summary of airfield facility requirements. SPAL values computed in terms of annual aircraft operations for airfield capacity are provided in Table 3.47. Upon reaching 284,000 annual aircraft operations, airfield capacity improvements must be implemented to avoid unnecessary delay.

A summary of the domestic air carrier passenger terminal requirements and SPAL values relative to number of annual enplanements are presented in Table 3.48. Table 3.49 contains a summary of projected international terminal facility requirements. Table 3.50 contains a summary of the parking requirements for both domestic and international passenger demand. Presented in Table 3.51 is a summary of GA facility requirements.

Table 3.46

SUMMARY OF PROJECTED AIRFIELD REQUIREMENTS

Airfield Component	Existing (2002)	2006	2011	2021
ARC				
9R/27L	D-IV	D-V	D-V	D-V
9L//27R	C-IV	D-IV	D-IV	D-IV
5/23	A-I	A-1	A-1	A-1
Runway Length				
9R/27L	10,181'	11,600'	11,600'	11,600'
9L//27R	6,000'	6,000'	7,200'	7,200'
5/23	3,000'	3,000'	3,000'	3,000'
RPZ				
9R				
Inner Width	1,000'	1,000'	1,000'	1,000'
Outer Width	1,750'	1,750'	1,750'	1,750'
Length	2,500'	2,500'	2,500'	2,500'
27L				
Inner Width	1,000'	1,000'	1,000'	1,000'
Outer Width	1,510'	1,510'	1,510'	1,510'
Length	1,700'	1,700'	1,700'	1,700'
9L				
Inner Width	500'	1,000'	1,000'	1,000'
Outer Width	1,010'	1,750'	1,750'	1,750'
Length	1,700'	2,500'	2,500'	2,500'
27R				
Inner Width	500'	500'	500'	500'
Outer Width	1,010'	1,010'	1,010'	1,010'
Length	1,700'	1,700'	1,700'	1,700'
5				
Inner Width	500'	500'	500'	500'
Outer Width	700'	700'	700'	700'
Length	1,000'	1,000'	1,000'	1,000'
23				
Inner Width	500'	500'	500'	500'
Outer Width	700'	700'	700'	700'
Length	1,000'	1,000'	1,000'	1,000'
RSA				
9R/27L				
Width	500'	500'	500'	500'
Length Beyond Runway End	1,000'	1,000'	1,000'	1,000'
9L/27R				
Width	500'	500'	500'	500'
Length Beyond Runway End	1,000'	1,000'	1,000'	1,000'
5/23				
Width	120'	120'	120'	120'
Length Beyond Runway End	240'	240'	240'	240'
ROFA				
9R/27L				
Width	800'	800'	800'	800'
Length Beyond Runway End	1,000'	1,000'	1,000'	1,000'
9L/27R				
Width	800'	800'	800'	800'
Length Beyond Runway End	1,000'	1,000'	1,000'	1,000'

Table 3.46 (Continued)

5/23				
Width	250'	250'	250'	250'
Length Beyond Runway End	240'	240'	240'	240'
Instrument Approaches & Navaids				
9L				
Instrument Approach	Non-Precision	Precision	Precision	Precision
Approach Type	GPS	ILS,GPS	ILS,GPS	ILS,GPS
Approach Slope	34:1	50:1	50:1	50:1
27R				
Instrument Approach	Non-Precision	Non-Precision	Non-Precision	Non-Precision
Approach Type	GPS	DGPS	DGPS	DGPS
Approach Slope	34:1	34:1	34:1	34:1
9R				
Instrument Approach	Precision	Precision	Precision	Precision
Approach Type	ILS,VOR,NDB	ILS,VOR,NDB, DGPS	ILS,VOR,NDB, DGPS	ILS,VOR,NDB, DGPS
Approach Slope	50:1	50:1	50:1	50:1
27L				
Instrument Approach	Non-Precision	Non-Precision	Non-Precision	Non-Precision
Approach Type	LOC-BC,VOR	LOC-BC, VOR,DGPS	LOC-BC, VOR,DGPS	LOC-BC VOR,DGPS
Approach Slope	34:1	34:1	34:1	34:1
5				
Instrument Approach	Visual	Visual	Visual	Visual
Approach Type	None	None	None	None
Approach Slope	20:1	20:1	20:1	20:1
23				
Instrument Approach	Visual	Visual	Visual	Visual
Approach Type	None	None	None	None
Approach Slope	20:1	20:1	20:1	20:1
ARFF Index	C	D	D	D

Source: Compiled by R,S&H

Table 3.47
AIRFIELD CAPACITY SUMMARY AND SPAL VALUES

Airfield Configuration	Existing (2002)	2006	2011	2021	SPAL (Operations)
Total Annual Operations	186,000	205,000	229,000	278,000	
Total Airfield Capacity					
Total Airfield ASV	374,500	374,500	374,500	374,500	**284,000 Annual Operations**
Annual Demand Capacity Ratio	49.7%	54.7%	61.1%	74.2%	
VFR Capacity					
VFR Peak Hour ASV	261	261	261	261	**157 Peak Hour VFR Operations**
VFR Peak Hour ASV	23.5%	27.6%	31.1%	38.3%	
IFR Capacity					
IFR Peak Hour ASV	59	59	59	59	**36 Peak Hour VFR Operations**
IFR Peak Hour ASV	35.6%	30.5%	33.9%	38.9%	

Source: Compiled by R,S&H

Table 3.48
DOMESTIC AIR CARRIER TERMINAL SUMMARY

Airport Element	Existing (2002)	2006	2011	2021
Annual Enplanements	200,032	388,500	550,400	686,000
Annual Passengers	400,064	777,000	1,100,800	1,372,000
Peak Hour Passengers	293	570	807	1,006
SF/Total Peak Hour Passengers	510	250	250	250
Annual Domestic Operations	6,952	9,582	12,779	14,892
Peak Hour Domestic Operations	3	4	6	7
Total Terminal Area (SF)	149,574	142,450	201,813	251,533
Airline Space (SF)	47,765	47,009	66,598	83,006
Number of Gates	6	5	6	7
Ticket Counter Length (LF)	225	210	297	370
Ticket Counter Area	5,594	2,097	2,970	3,702
Offices & Administration	7,257	5,989	8,485	10,575
Outbound Baggage Area	10,936	8,838	12,520	15,605
Baggage Claim Area	7,358	6,426	9,104	11,347
Baggage Claim Length (LF)	224	190	269	335
Passenger Departure Lounge	11,385	15,861	22,470	28,006
Operations Facilities	5,235	7,799	11,049	13,771
Public Space (SF)	50,889	56,980	80,725	100,613
Waiting	8,390	2,268	3,213	4,004
Security	1,713	1,960	2,777	3,461
General Circulation	39,742	48,718	69,020	86,024
Restrooms	1,044	4,034	5,715	7,123
Concession Space (SF)	13,971	24,217	34,308	42,761
General Concessions	3,664	9,139	12,948	16,138
Advertising	-	581	823	1,026
Ground transportation	2,741	2,908	4,120	5,136
Food & Drink	7,566	10,227	14,488	18,058
Miscellaneous	-	1,359	1,925	2,399
Airport Management (SF)	36,949	14,245	20,181	25,153
Auto Parking Spaces	1,255	1,516	2,147	2,679
Short Term Spaces	282	254	360	449
Long Term Spaces	699	889	1,260	1,572
Employee Spaces	154	130	183	229
Rent-a-car Spaces	120	243	344	429
Curb Front (LF)	571	315	446	556
Enplaning Curb	257	141	200	250
Deplaning Curb	314	173	246	306

Source: Compiled by R,S&H

Table 3.49

SUMMARY OF PROJECTED INTERNATIONAL FACILITY REQUIREMENTS

	Existing	Projected			
Facility Component	2002	2004	2006	2011	2021
Peak Hour Passengers	43	376	657	733	733
Federal Inspection Facilities					
U.S. CBP					
Number of Piggyback Booths	5	4	7	8	8
ISpatial Requirements (Sq Ft.)	18,321	16,610	24,533	27,509	27,509
PHS Spatial Requirements (Sq Ft)	395	910	910	910	910
Number of Secondary Inspection Booths	3	4	7	8	8
Number of Garbage Disposal Units	1	4	5	5	5
APHIS Spatial Requirements (Sq Ft)	1,061	1,139	1,298	1,410	1,410
SUB-TOTAL	19,777	18,159	26,741	29,829	29,829
International Departure Facilities					
Duty Free Shops and General Concessions	0	3,918	7,836	11,752	17,027
Food and Drink Facilities	0	7,682	15,256	22,883	30,511
Departure Lounge	5,914	8,235	15,630	23,025	30,420
SUB-TOTAL	5,914	19,835	38,722	57,660	77,958
TOTAL	25,718	37,994	65,463	87,489	107,787

Source: Airport Federal Inspection Facilities Guidelines
Compiled by RS&H

Table 3.50

SUMMARY OF PARKING REQUIREMENTS

Domestic Requirements	Existing	2004	2006	2011	2021
Short-term	282	254	254	360	449
Long-term	699	889	889	1260	1572
Employee	154	130	130	183	229
Rent-a-car	120	243	243	344	429
SUB-TOTAL	1255	1516	1516	2147	2679
International Requirements	**Existing**	**2004**	**2006**	**2011**	**2021**
Short-term	282	5	10	15	20
Long-term	699	0	0	0	0
Employee	154	15	29	42	83
Rent-a-car	120	106	159	212	265
SUB-TOTAL	1255	126	198	269	368
TOTAL REQUIREMENTS	**1255**	**1642**	**1714**	**2416**	**3047**

Source: RS&H

Table 3.51

SUMMARY OF PROJECTED GA FACILITIES

GA Element	Existing (2002)	2006	2011	2021
Itinerant Aircraft Apron (Aircraft/Sq.Ft.)				
Single Engine	50 / 180,000	57 / 205,200	63 / 226,800	76 / 273,600
Multi Engine	10 / 54,000	12 / 64,800	13 / 70,200	15 / 81,000
Turbojet	5 / 36,000	5 / 36,000	6 / 43,200	8 / 57,600
Based Aircraft Tiedown (Aircraft/Sq.Ft.)				
Single Engine	32 / 115,200	35 / 126,000	39 / 140,400	48 / 172,800
Multi Engine	7 / 37,800	8 / 43,200	9 / 48,600	10 / 54,000
Turbojet	2 / 14,400	2 / 14,400	2 / 14,400	3 / 21,600
Aircraft T-Hangars	129	141	157	191
Aircraft in Conventional Hangars	13	14	15	19
Fuel Storage				
GA AVGAS	30,000	7,535	8,318	10,140
GA Jet Fuel	30,000	9,680	10,644	12,888
Air Carrier Jet Fuel	100,000	43,349	58,097	68,823

Source: Compiled by R,S&H