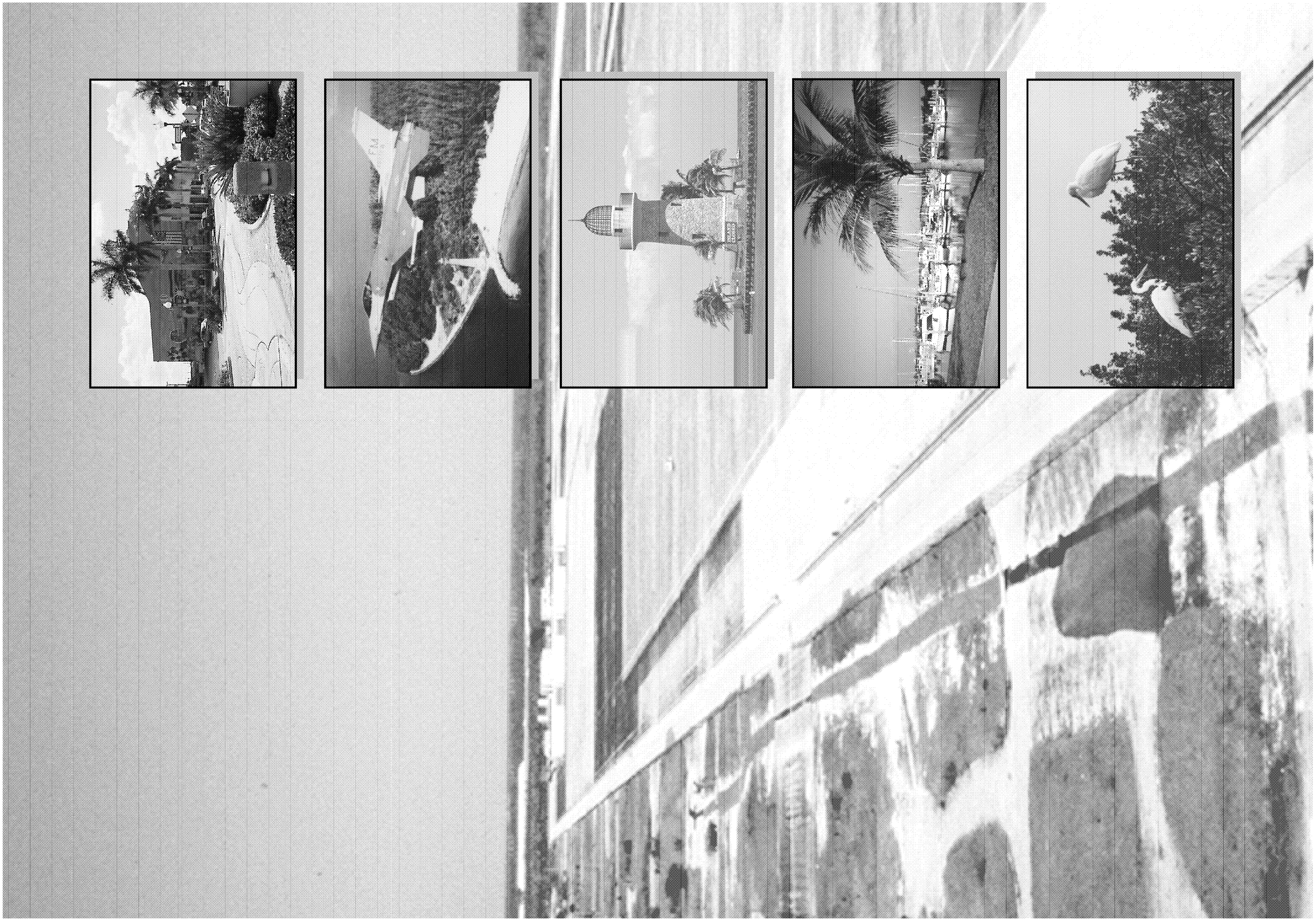
A Airport Planning Technical Report



ADDENDUM TO APPENDIX A

FAA's Analysis of Aviation Growth and Airport Capacity:

The Potential Role of Former Homestead AFB as a Civil Airport

September 2000

Purpose

This paper addresses FAA's perspective on the civil aviation need to reuse Homestead AFB as a commercial service airport.

It is difficult to forecast the details of future aviation activity with precision, particularly for a surplus military airport such as Homestead AFB where there is no history of civil use. However, demographic and economic factors that influence the scale and distribution of aeronautical demand are well understood. A number of national and local factors exert a powerful influence over aviation growth and airport requirements to accommodate that growth.

National Factors

National Importance: The performance of the air transportation system affects the lives of millions of people daily, and any major disruption brings a quick reaction. Severe congestion during the summer of 2000 was covered extensively by the national news media. Aviation system performance and capacity, including the need for more runways to relieve congested airports, are of national concern. In the US Congress, the Senate and House have both held recent hearings on this issue, and the Secretary of Transportation and FAA Administrator are engaged in finding solutions.

Size and growth of the air transportation industry: Commercial aviation has flourished in the United States. In 1998, 680 million passengers enplaned at US airports.

The industry is considered fairly mature, and growth is no longer as rapid as it was in the high-growth periods after the introduction of jet aircraft and economic deregulation of air transportation. Growth in aviation during the next ten years is expected to be slightly faster than growth in the economy overall, with domestic passenger enplanements increasing at 3.6% per annum.

The international and cargo segments of air transportation will have higher growth rates. The most rapidly growing passenger market will be to and from Latin America, increasing at 6.1% per annum. Domestic air cargo is expected to grow at 5.4% annually and international at 6.7%. While about half of all cargo is now carried in the belly compartments of passenger aircraft, growth will be more rapid for dedicated cargo aircraft or freighters.

The growth of all segments (domestic and international, passengers and cargo) is expected to double the demand for air transportation at Miami International Airport in less than 20 years.

National economic significance: Aviation plays a disproportionately important role in the US, where less than 5% of the world's population consumes about 40% of all air transportation. About 90% is for domestic travel. This high rate of air travel is partly due to trip distances, which are about twice as long in the US as in Europe. Many important products are shipped by air, particularly high value, low weight, perishable commodities. In foreign trade, about 1/3 of US exports and ¼ of imports by value are shipped by air. The great importance of air transportation has led to increasing concern about the adequacy of airports in metropolitan areas.

Concentration of traffic: Commercial air transportation tends to concentrate at a single airport until it is forced to redistribute by congestion and delay. Concentration of traffic permits airlines to enjoy the economic benefits of large-scale operations and avoid expenditures on redundant staff and equipment at supplemental airports. Passengers also benefit, and tend to prefer very busy airports because of the wide range of services and multiple alternatives available there. The concentration is most obvious in metropolitan areas. The busiest 25 airports in the US account for 63% of all passenger enplanements. International traffic is even more concentrated at a few traditional ports of entry.

Specialized roles in multi-airport systems: Concentration often results in congestion and delay. The busiest 25 airports account for about 86% of delays to air traffic in excess of 15 minutes. Severe congestion can offset the advantages of concentration of traffic, forcing some redistribution of traffic to other airports. When this occurs, a system of specialized airports develops. In the first phase of specialization, general aviation aircraft relocate from the commercial service airport to conveniently located reliever airports. The Miami area has an extensive system of reliever airports serving general aviation, including Opa Locka, Kendall-Tamiami Executive, Homestead General Aviation, and the Dade-Collier Training and Transition Airport.

Further specialization is difficult to achieve because many aspects of commercial aviation are interrelated and are most efficient when they are co-located. For example, international air cargo is usually co-located with international passenger operations in order to give shippers access to low cost space in the baggage holds of passenger aircraft. Domestic passenger flights are co-located with international in order to facilitate connections. Similarly, the operators of commuter aircraft and regional jets usually want to co-locate with major airlines because many of their passengers are connecting with flights to another ultimate destination.

Some specialized carriers can prosper at supplemental airports. Lower cost carriers that do not interconnect with other airlines, most notably Southwest Airlines, will often locate at a supplemental airport where adequate runway length and passenger terminal facilities are available, if that airport offers convenient access to a large passenger market. Integrated cargo carriers such as FedEx and UPS have been willing to operate at outlying airports that offer good highway access, no restrictions on night flights, and access to lower cost labor and facilities. Charter passenger operations can also be attracted to supplemental airports. For example, Orlando Sanford Airport enplanes about 400,000 passengers annually, almost entirely on charter flights.

A supplemental airport may also develop into a full service passenger facility providing short and medium haul air transportation to residents of the surrounding area. This tends to occur when the primary airport is severely congested and the secondary airport is very convenient to a substantial part of the market. The scale of service at the secondary airport may be constrained by opposition from neighbors to aircraft noise and by competition from carriers at the primary airport.

Local Factors

Tourism: Tourists use air transportation as a preferred means of access to Florida resort areas. This has motivated Florida's airports to emphasize the level of service provided to air passengers. Every effort is made to ensure that travelers have a pleasant experience, with a minimum of crowding, stress and delay, and maximum convenient access to concessions such as food and car rental. The high level of activity at Miami International and its complex role as an international airport have made it difficult to maintain a high level of service. Growth in demand and increased congestion will further strain the level of service at Miami in the future.

Gateway to Latin America: International air transportation tends to concentrate sharply at gateway airports, which are located in large cities with convenient location in terms of short flight distance to foreign destinations. Miami has a very strong position as the gateway to Latin America, which was reinforced recently by a major investment of American Airlines in a modern passenger facility. A number of US cities, including Orlando, Houston and New Orleans, are eager to attract Latin American traffic, but Miami has a distinct advantage in maintaining its current dominant role, due to historic, geographic and demographic considerations. International traffic generally requires long runways, in the range of 10,000 to 12,000 feet, to permit departures by heavily loaded, long-haul aircraft. It also places relatively heavy demands on runways and terminals, because it peaks sharply at preferred travel times and requires specialized gates and dedicated Federal inspection facilities. Miami has accommodated this in part by developing terminal facilities that can be used by both domestic and international flights (swing gates).

Space Limitations at Miami International: Miami International is the tenth busiest US airport, with over 16 million passengers enplaned annually, but it occupies a relatively small site of 3,300 acres. The average size of the 31 busiest airports in the US, with activity ranging from 9 to 38 million enplanements annually, is 6,054 acres, almost twice as large as Miami. Only two of the nine airports that are busier than Miami International have smaller land areas—Phoenix, which primarily handles domestic traffic, and Newark, which handles much less international cargo. Miami is making good use of its limited space, developing an efficient multistory terminal building and proposing to move access facilities to an off-airport intermodal center, but continuing growth in demand will inevitably lead to crowding and congestion.

New Airport Construction: Florida has a very extensive system of airports, largely developed for military purposes during World War II and then converted to civil use and gradually improved and supplemented to meet rising demand. Only one major new commercial service airport has been built in Florida—Fort Myers/Southwest Florida Regional Airport. Extensive efforts during the past thirty years have not produced a viable site for a supplemental air carrier airport in the Miami area. The heavy use of airspace by existing airports and the lack of large plots of suitable vacant land (I.e., not currently urbanized or within dedicated park/refuge/preserve/conservation areas) make a major new airport in the region extremely unlikely.

Expansion of Existing Airports: The roles and capacity of the existing airports in the Miami area are largely determined by their location, size, facilities, and historical pattern of use (see Attachment 1). Fort Lauderdale-Hollywood International Airport has the potential to divert some growth in demand from Miami International, and it is already performing that role, serving passenger demand from northern Dade to central Palm Beach County. The airport is busy and has recently expanded its facilities; its potential to further supplement Miami International is limited. Opa Locka Airport may be expanded and converted to commercial use, but runway length and environmental/community factors limit its prospects to accommodate all of the future demand. The only other airport with notable potential to supplement Miami International is Homestead.

Potential Future Role of Homestead as a Civil Airport

Need: Miami International is a very busy airport that will face serious congestion during the next 10 to 20 years. The airport cannot be expanded beyond the fourth runway, so some redistribution or curtailment of traffic growth will probably be necessary.

Suitability for Civil Use: Even though it has only a single runway, Homestead is well suited to accommodate commercial traffic. Its runway dimensions and airfield orientation are very similar to Fort Myers/Southwest Florida International Airport, which serves a range of air carrier, air taxi, general aviation and military users. The location of Homestead to the south of Miami International's congested airspace and its past use as a military airfield would make it easier to develop approach and departure procedures for civil operations. Its availability would increase the capacity and flexibility of the regional airport system.

Users: The potential users of Homestead (and the time frame in which they could be expected to develop) include:

- General aviation (immediate)
- US Air Force Reserve and Florida Air National Guard (immediate)
- Specialty niche low cost air carrier (near-term)
- Charter operations (near-term)
- Air cargo operations, particularly integrated carriers (near-term)
- Local non-connecting domestic and Caribbean markets (long-term)

Civil activity would probably develop gradually at Homestead and include growth in traffic that might otherwise be served at Miami International.

Economic Factors: Growth in civil activity would stimulate the economy of the Homestead area, providing a substantial number of relatively high paying jobs, and making the area more attractive to types of businesses that require access to air transportation. It would also serve the local demand for air transportation, which is expected to increase substantially as the area south of Miami is developed for residential use. Absent a commercial service airport between Miami and the Keys (Marathon or Key West), there would be extended travel times for people in this area to a more distant airport.

Conversion to civil aviation would make cost-effective public use of the public investment in Homestead. It would cost more than $100 million to duplicate the existing runway, and the replacement value of the entire airport, including land and infrastructure—if a replacement location could be found—would probably exceed $500 million.

Environmental Factors: The addition of commercial runway capacity at any location will have environmental impacts. The amount of land included in national parks, preserve, conservation areas, etc. is so extensive in south Florida that it is virtually impossible to avoid flying over them, regardless of airport location (See map in Attachment 2). In FAA's opinion, the Homestead SEIS's analysis of environmental impacts does not predict a level of impact to the national parks or ecosystem sufficient to preclude Homestead from serving commercial aviation—particularly when mitigation is included. Homestead has been a highly active airfield for years and will, in any case, remain operational for military and other government aircraft use. To construct and operate a comparable commercial runway at another location would result in greater environmental impacts than adding civil use to the existing Homestead runway.

Alternatives: The alternatives to accommodating some portion of future commercial aviation growth at Homestead are limited. The current system of airports in the region does not appear to be sufficient, except on a short-range basis, to meet the increasing demand for air transportation. Some redistribution of traffic to Fort Lauderdale-Hollywood International Airport and Opa Locka (provided Opa Locka fulfills a commercial service role) would be expected, but these airports have limits (refer to Attachment 1). Any further redistribution of traffic would require extensive airport expansion that currently appears unlikely, but might become locally acceptable if congestion reached crisis proportions. The length of time required to plan, environmentally assess, and construct a major new commercial runway is typically at least 10 years.

In a highly congested situation, the lack of airport capacity would stifle further growth in air transportation, curtailing competition and raising costs. The situation would discourage discretionary travel and limit the options for low cost niche carriers and charters. Severe congestion could eventually offset the geographic advantage of Miami and lead to the fragmentation and relocation of some international passenger and cargo activity to other major cities.

Attachment 1 – Airfield Capacity in Southeast Florida

Attachment 2 – Map of Southeast Florida

Attachment 1

Airfield Capacity in Southeast Florida

Miami International Airport (MIA):

- FAA supported the need for a fourth air carrier runway and completed an EIS.
- Homestead was not a viable solution to MIA's capacity problem in the short term (2000–2005) due to uncertainty of re-use.
- An analysis by the FAA Technical Center in August 1999 calculated the airfield capacity, with the fourth runway, to be 648,000 operations annually. Using the most recent FAA forecast information, the airport is forecast to reach capacity between 2009 and 2010. Dade County Aviation Department's most recent estimate is 2010.
- As capacity is reached, aircraft delays increase. In 1998, before the fourth runway, air traffic delays at MIA were estimated to cost the airlines more than $75 million in aircraft operating costs.
- There is no other land available at MIA to accommodate any other major capacity improvement without significant impact to the surrounding communities by acquiring these communities and relocating people.
- For Calendar Year 1999, MIA was 60% origin and destination (O&D), meaning that 60% of its passengers begin or end their trips in the airport's regional market area.
- MIA is about an hour car ride north of Homestead.

Fort Lauderdale-Hollywood International Airport (FLL):

- FAA is preparing an EIS to extend and widen the south runway. If this project is approved and completed, there will be no more land available to accommodate improvements to add capacity. The airport is restricted by I-95 on the west, US 1 and FEC Railroad on the east, dense residential and I-595 on the north, and dense residential and Griffin Road (6-lane) to the south.
- According to the FAA's 1993 Capacity Enhancement Plan and using the latest FAA Terminal Area Forecast, FLL will be considered a congested airport in 2014–2015, factoring in the extension and widening of the south runway. This congestion determination is based on FAA's National Plan of Integrated Airports System (1998–2002) guidance that the practical capacity of an airport is reached when the average delay per aircraft operation is in the range of 3 to 5 minutes. At this point the estimated annual delay cost to the users is $30.0 million.
- FLL is primarily an origin and destination (O&D) airport, with approximately 95% of its passengers beginning or ending their trips in the airport's regional market area.

- According to FLL's preliminary draft EIS, the air service region for FLL encompasses central Palm Beach County to northern Dade County. FLL is about a 40-minute car ride (27 miles) north from MIA, assuming no ground traffic congestion.

Opa Locka Airport (OPF):

- Miami-Dade County has indicated the possibility of Opa Locka as a supplemental commercial service airport to MIA in addition to Homestead. (As a one-runway airport only, Homestead alone would not fully meet future airport capacity needs.)
- The longest runway is 8,002 feet and designed to B-727 loading, but cannot be further expanded without relocation of roads to maintain a standard safety area. There are also two shorter runways that can minimally (at best) be expanded. The County is currently studying the possibility of extending one or two runways.
- The Miami Dade Aviation Department (MDAD) has indicated interest in applying to FAA for a Part 139 Certificate, which would permit scheduled air carrier service.
- Residential communities are located in both approaches of the 8,000-foot runway, and there are environmental and community concerns about commercial service and possible expansion.
- Even if expansion is achieved, OPF is not viewed as providing sufficient capacity and service capability to negate the need for Homestead.
- OPF is about an hour car ride (40 miles) from Homestead and about a half-hour car ride (9 miles) from MIA.

Kendall-Tamiami Executive Airport (TMB):

- The longest runway is under 5,000 feet. Although this runway can be expanded, the airport is surrounded by dense residential development.
- TMB is not currently considered to be a reasonable candidate for expansion for commercial service.

Dade-Collier Training & Transition Airport (TNT):

- TNT has a 10,500-foot runway with an Instrument Landing System approach and full parallel taxiway. It is an ideal commercial service runway.
- TNT is located in the Big Cypress just north of Everglades NP. Although there is room to expand, it would be seriously challenged on environmental grounds. TNT was prevented from expanding in the late 1960's by the Everglades Jetport Pact.
- TNT is 35 miles west of MIA and is served by a two-lane road (US 41).

- High-speed rail from TNT to Miami would probably be needed in order to provide adequate ground access to TNT, if environmental issues could be resolved.

Marathon Airport (MTH):

- Closest commercial airport to the south of Homestead. It is about a 2-hour car ride (83 miles) from Homestead. This airport is limited to a 5,000-foot runway with no room for expansion. The existing runway-taxiway separation would not safely accommodate larger aircraft.

Key West International Airport (EYW):

- This airport is about a 3-hour car ride (134 miles) from Homestead. This airport is limited to a 4,800-foot runway with no room for expansion. The existing runway-taxiway separation would not safely accommodate larger aircraft.

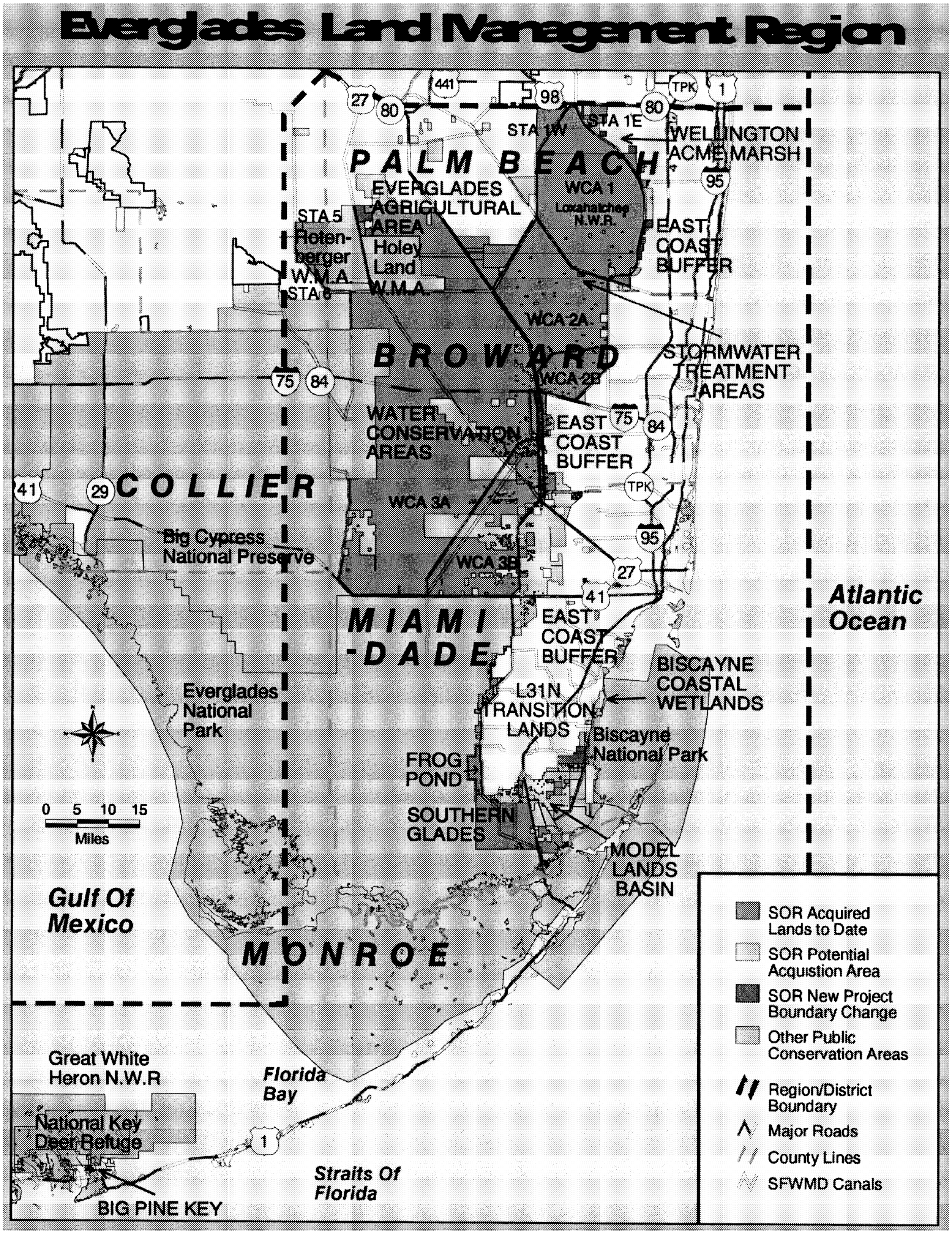
Homestead General Aviation Airport (X51):

- Not viable for commercial service.

Opa-Locka West Airport (X46):

- Not viable for commercial service.

Map of Southeast Florida



Source: SFWMD 1999a

HOMESTEAD REUSE SEIS

AIRPORT PLANNING DATA TECHNICAL REPORT

Prepared for FAA and USAF

Prepared by Landrum & Brown

October 24, 2000

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INTRODUCTION

This technical report was prepared to provide aviation planning data for use and in support of the Homestead Reuse Supplemental Environmental Impact Statement (SEIS). The information contained in this report is based on previous planning and environmental studies conducted for Homestead Airport as well as other relevant South Florida airport planning studies, supplemented or updated by Landrum & Brown where appropriate. The report is organized in four chapters as follows:

- *Chapter 1 - Proposed Project Airport/Airspace Planning Data*. This chapter reviews, validates and updates existing planning data relative to the Homestead Reuse SEIS's Proposed Project. This proposal consists of developing the Homestead site into a commercial service airport.

- *Chapter 2 - Miami-Dade County's Plans for Future Runway Development At Homestead*. This chapter presents Miami-Dade County's plans for development of a second runway at Homestead Airport and provides planning data for when a second runway may be needed in the future. Additional information is provided regarding the difficulties in establishing new commercial service airports and the general approvals governing airport project development.

- *Chapter 3 - Aviation Activity Related to Commercial Spaceport Alternative*. The facilities and operations requirements if Homestead would be developed as a Commercial Spaceport are described in this chapter based on available information from interested operators and governing agencies.

- *Chapter 4 - South Florida Aviation Demand and Airport Capacity*. A summary of South Florida's forecast aviation demand and the ability to meet this demand with existing airports is presented in this chapter. Supporting information regarding Miami-Dade County's search for a new commercial service airport site over the past 30 years is also presented.

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CHAPTER 1. PROPOSED PROJECT – AIRPORT/AIRSPACE PLANNING DATA

1. INTRODUCTION

The purpose of this chapter is to review, validate and update, as needed, existing planning data related to the Homestead Reuse Supplemental Environmental Impact Statement (SEIS) Proposed Project for the years 2000, 2005, and 2015. The following key elements are included in this review:

- Activity Forecast
- Facility Requirements and Land Use
- Airspace Flight Tracks

The recommendations in this chapter are based on our understanding of Miami-Dade County's (the County) objectives pertaining to the development of Homestead Regional Airport (HST), which are summarized in the following section.

This chapter also includes a description of the aviation activity and facilities for a scenario beyond the year 2015 in which HST could reach the capacity of its single runway.

2. SUMMARY OF MIAMI-DADE COUNTY'S OBJECTIVES PERTAINING TO HOMESTEAD REGIONAL AIRPORT

The analysis of forecasts and facility requirements for the Proposed Project Alternative is based on Miami-Dade County's objectives pertaining to HST development. These objectives are:

- Conveyance of the base for use as a commercial airport.

- Continued development of Miami International Airport (MIA) as South Florida's primary domestic and international commercial airport. The County's current Airport Development Program for MIA is estimated to cost on the order of $4 billion, and includes a fourth runway.

- Development of HST as a supplemental air carrier airport to MIA. HST is expected to accommodate any type of aviation activity occurring in the County such as scheduled air carrier, cargo, maintenance, charter, military, and general aviation aircraft activity.

The County's Comprehensive Development Master Plan (CDMP) was amended on June 16, 1998, to include the State's limited approval of the County's plans for HST, obtained through the Florida Statutes, Chapter 288 process. The amended CDMP limits development by 2005 to the existing runway and portions of the ultimate functional uses described in the *1994 Homestead Air Force Feasibility Study, Airport Master Plan*. The SEIS will assume the limited development reflected in the amended CDMP for 2005. Full 2015 buildout is also stated in the CDMP as an objective, although it is not pursued at this time. Any development of HST beyond the level currently pursued would require additional approvals by the State and the County Commissioners.

It is expected that conveyance could occur in the year 2000. General aviation activity could start as soon as the County opened the airport for civilian use, which would be soon after transfer. Substantial air carrier activity could not occur until passenger terminal facilities are completed. If design and construction commence immediately after conveyance and approvals are in place, initial landside facilities could be available as early as 2002.

3. REVIEW AND PRELIMINARY ASSESSMENT OF PLANNING DATA FOR PROPOSED PROJECT

Landrum & Brown (L&B) has examined the following Homestead planning documents with the purpose of identifying and reviewing previous analysis related to the aviation activity forecasts, facility requirements and airspace flight tracks for the Proposed Project Alternative:

- *The Homestead Air Force Base Feasibility Study, Airport Master Plan,* Post, Buckley, Schuh, & Jernigan, 1994, (the 1994 Master Plan). The 1994 Master Plan is the basic planning document for HST. The Master Plan identifies and evaluates various development concepts for HST and provides detailed airport plans and a financial feasibility analysis. This report was the basis for the Airport Layout Plan.

  The 1994 Master Plan developed aviation projections based upon a market analysis of Miami-Dade County and specifically the Homestead area, consistent with national factors that influence aviation demand. The report presents forecasts of commercial passengers, aircraft maintenance activity, military use, general aviation activity, and air cargo tonnage from which aircraft operations estimates were developed. In addition, facility requirements were derived for each type of activity to identify necessary improvements to the airfield, ramp, terminal, ground access, etc.

- *Final Environmental Impact Statement (FEIS),) Disposal and Reuse of Homestead Air Force Base, Florida,* U.S. Air Force, 1994, (the 1994 FEIS). The 1994 FEIS was conducted to analyze and evaluate impacts associated with the disposal of Homestead Air Force Base.

- *Draft Homestead Air Force Base FEIS Review*, 1997, (the 1997 Draft FEIS Review). The U.S. Air Force undertook a review of the above FEIS in 1997 to evaluate it based on new information and specific concerns raised by the public. The study, which is a contractor's preliminary draft that was never finished, modified projections of aviation activity for HST from those presented earlier in the 1994 Master Plan and the 1994 FEIS.

- *The Proposed Development Plan for the Homestead Air Reserve Base,* 1994 (HABDI). The Homestead Air Base Developers, Inc., a private group, prepared a proposed redevelopment plan for the Homestead Air Reserve Base (HARB) in 1994. This plan proposed complete redevelopment of the non-military portion of the property to maximize re-use of the facility and increase the economic benefits of the HST's assets. This plan also provides for the expansion of facilities to accommodate the activity projections of the 1994 Master Plan.

- *Draft 1996 Dade County Aviation System Plan,* Dames & Moore, 1996, (the Draft 1996 Aviation System Plan). The Dade County Aviation System Plan was submitted to the County in 1996, but has not been adopted by the County. The concept of the study was to provide an overall direction and coordination of the development of all airport facilities within the County. The focus of the report was on satisfying the overall aviation demand of the region by "assigning" the anticipated growth of aviation activity to specific County airports. This report updated the Miami International Airport's 1994 Master Plan Update projections and presented new general aviation projections for the region. HST was designated as a supplemental commercial airport to MIA that would serve a role of military joint-use, passenger, cargo, and general aviation.

- *Proposed Comprehensive Development Master Plan for Metropolitan Dade County, Florida, Revised 1998,* (the CDMP). This is Dade County's comprehensive planning document, including a draft aviation plan. The plan does not include specific forecasts for individual airports. However, it does require that public agencies plan for increased aviation activity in the region. As defined in the plan, HST's role is to allow growth of commercial service, general aviation and military traffic. Homestead General Aviation Airport is assigned the role of serving general aviation traffic. MIA remains the principal commercial service airport of the region.

Other documents, such as the FAA's Terminal Area Forecast and national 1998 FAA Aviation Forecast report, were also reviewed for their applicability to HST. Preliminary results of the assessment of planning data are presented in the following sections.

(1) Activity Forecast

Most aviation forecasts are not based solely on linear or other mathematical projections of demand, but also on the demographic and economic background of both the entire country and specific geographic region involved, as well as airline and numerous other factors. In addition, an aviation forecast is highly dependent upon competitive market factors that result in consumer/user choices among airports. Forecasting for HST is particularly complex because the airport is a "start-up" of a proposed commercial facility rather than growth of an existing public airport.

This forecast and those previously developed for HST were developed in an unconstrained manner. That is, it is assumed that no airspace capacity, facility limitations, environment issues, lack of funding, land compatibility issues, or other factors will artificially limit or stop the growth of HST. Further, this and the previous analysis assume that free market factors alone would influence aviation demand.

As previously stated in the 1994 Master Plan, because no historical aviation activity data (other than military use) exists for HST, all forecasts were developed using information from other base closure reuse efforts, other commercial airports, existing and anticipated competitive market information, and the consultant's best judgement, as well as the judgement of local aviation officials, the FAA, Air Force, and other responsible parties.

In conclusion, this analysis is based upon what we believe to be reasonable evaluations of current and future conditions. Please recognize that projections are dependent upon numerous future events and uncertainties, therefore, actual results may vary from projections. We have, however, attempted to be optimistic, expecting that HST will attract some of the region's aviation activity. Thus, our estimates are probably a reasonable upper bound of activity that may not occur until further in time than projected.

1.1 Review of Existing Activity Forecasts for Proposed Project Alternative

Several forecasts of aviation activity have been presented for HST as part of previous planning studies. **Table 1-1** compares forecasts of commercial passengers, air cargo tons, based aircraft, and aircraft operations from previous documents.

Table 1-1
Comparative Existing Forecast

	1994 Master Plan			1994 FEIS[1/]			1997 Draft FEIS Review			Draft 1996 Aviation System Plan [2/]		
	2000	**2005**	**2015**	**2000**	**2005**	**2015**	**2000**	**2005**	**2015**	**2000**	**2005**	**2015**
Enplaned Passengers	159,941	515,360	1,308,920	922,655	1,008,439	1,300,426	159,941	515,360	1,308,920	N/A	N/A	6,796,000
Air Cargo Tons	7,280	155,101	329,835				7,280	155,101	329,835	N/A	N/A	N/A
Based Aircraft	114	123	149				114	123	149	N/A	N/A	N/A
Aircraft Operations												
Passenger	7,610	23,620	51,220	0	25,130	32,690	7,610	23,620	51,220	N/A	N/A	149,000
Air Cargo	1,560	12,790	21,450	0	8,160	12,120	1,560	12,790	21,450	N/A	N/A	N/A
Maintenance	570	940	1,470	520	580	1,080	570	940	1,470	N/A	N/A	N/A
General Aviation	87,180	98,010	123,160	120,600	146,600	161,300	87,180	98,010	90,152	N/A	N/A	N/A
Military	39,310	39,310	39,310	39,310	39,310	39,310	24,654	27,895	35,708	N/A	N/A	N/A
Total Operations	136,230	174,670	236,610	160,430	219,780	246,500	121,574	163,255	200,000	N/A	N/A	275,000

Notes: Neither the 1994 HABDI plan nor the 1998 CDMP include specific forecasts for HST.
1/ Forecasts in the 1994 FEIS are for years 1999,2004 and 2014. Commercial passengers are shown in 2000, but no operations.
2/ The Draft 1996 Aviation System Plan forecast document does not contain a complete breakdown of forecast activity for 2015 and contains no forecasts for 2000 and 2005.

The 1994 Master Plan forecast has the most extensive level of analysis and justification of projections. It provides an extensive review and detailed explanation of assumptions of factors on which airport master plan aviation forecasts are typically based, including:

- Potential domestic and international service markets for HST
- Niche roles for commercial passenger and air cargo service
- Location of existing Origin and Destination (O&D) demand in South Florida relative to HST versus competing airports
- Potential for passenger connecting service
- Location of general aviation based aircraft owners relative to HST
- Share of demand captured from existing airports
- Industry trends in aircraft fleet
- Industry annual rates of growth

The Draft 1996 Aviation System Plan developed projections of aviation activity for HST based on a different approach and set of assumptions than the master plan. According to the Draft 1996 Aviation System Plan, at some point, commercial aviation demand in the County will grow so large that MIA would lack capacity to handle the volume; excess demand is assumed to then be handled entirely at HST. This results in the assignment of a larger volume of MIA passenger demand to HST than realistic, and it is not a methodology that is accepted by the FAA as a substitute for more rigorous airport master planning. Without a solid air service network and a strong Origin and Destination (O&D) demand base, HST will not capture the high level of passenger demand projected in the Draft 1996 Aviation System Plan forecast. As a "start-up" of a commercial facility, located in a more rural area of the

County, HST cannot generate the local O&D demand and air service network to support the level of commercial service assigned in the Draft 1996 Aviation System Plan, at least until the County's O&D base grows out to the HST area.

In summary, the 1994 Master Plan is the most rigorous of all forecasts developed for HST and it is based on industry standard analytical methods. Thus, the 1994 Master Plan forecast has been identified as the basis on which to assemble the updated SEIS forecast. Additionally, the 1994 Master Plan forecast has been accepted by Miami-Dade County and is the basis of the currently FAA conditionally approved Airport Layout Plan.

However, while the logic and methodology of the master plan are considered to be valid, the projections must be updated to reflect changes that have occurred since 1994. One change of circumstance is that the timing for attainment of the activity levels in the 1994 Master Plan forecast has been delayed. Delays have occurred because the base turnover, construction of new facilities, and marketing of HST did not start five years ago, when anticipated. Substantial time is necessary for the developer(s) to obtain approvals, develop financing, obtain tenant commitments, build/improve/revise facilities, move in, obtain customers/users, etc. HABDI states in their proposal, "It will take twelve to fifteen years to fully develop the base and have the plan fully operational."

The remainder of this section presents the 1994 Master Plan forecast as the foundation for the SEIS activity forecast, but revises the timetable and/or basis for realization of the activity levels based upon current conditions. Because HST is a "start-up" commercial service airport, attainment of any future levels of activity, as projected in previous documents or as updated in this document, are somewhat problematical since it depends on numerous economic factors that are out of the County's control. But for study purposes, they represent an optimistic potential that could be analyzed as a reasonable upper bound for physical and environmental planning. Note that a primary purpose of a master plan is to reserve land and plan for facilities so that, as demand occurs, the necessary facilities have been anticipated. In this regard, it is better to plan for facilities that may actually not be needed as early as they are projected in planning documents like airport master plans.

1.1-1 Commercial Passenger Activity

Homestead Regional Airport has no commercial passenger service at this time, but passenger service is a key future role of the airport. Some of the factors that suggest that commercial passenger traffic may develop at HST are:

- Passenger traffic in the United States and in South Florida is growing; HST could capture some of that future demand.
- Miami International Airport is a busy, congested facility; air traffic from it could spill over or be encouraged to relocate to HST by the County.

- A new airline or an existing airline could establish a service point, or possibly a hub, at HST to serve the southern portion of Miami-Dade County and avoid the competition of MIA.

- HST could develop passenger service to accommodate local demand; this would likely be a regional (commuter) carrier, but it could include jet carriers.

- The airport could someday develop into a connecting facility serving air traffic to the Caribbean and Latin America. This would include potential service to Cuba, if the current sanctions are lifted. Alternatively, other international air service, such as charters, is possible.

While there are a number of factors, such as those listed above, that suggest commercial passenger service activity will grow at HST, other events listed below could occur in the future which would cause commercial passenger traffic not to develop rapidly at HST.

- Although not considered likely by FAA, national and/or local aviation activity might not grow as much as predicted.

- MIA, Fort Lauderdale, Marathon, and other airports could continue to fully serve the needs of South Florida visitors and residents. To meet these aviation demand needs:

  - These airports would have to expand as necessary.

  - Measures would have to be developed and implemented by the FAA that increases existing airspace/airport capacity.

  - Larger aircraft, better airline scheduling, and/or other airline efforts to further expand airfield capacity at existing airports would have to be implemented.

- The current international hub role of MIA could be diminished in the future as other airports (Orlando, Tampa, Atlanta, San Juan, etc.) grow in importance and/or as more direct air service from New York, Chicago, Dallas, etc. reduces the need for a Latin hub.

- Airline business practices and/or alliances could result in a reduction in the number of airports with air carrier service. Nationally there has been a slight annual decrease of airports with commercial service.

- High-speed rail and other mass transit alternatives could reduce the need for regional air service and/or attract air passengers to other airports in the state.

Given the unpredictable nature of the factors that influence commercial air passenger demand, the 1994 Master Plan establishes a reasonable upper-bound benchmark for facility planning. The Master Plan identifies two types of demand that may be attracted to HST as follows:

- Market-Driven – Almost all of the greater Homestead area's origin and destination (O&D) passenger demand is currently handled at MIA. Yet the MIA Master Plan found that approximately 27.8 percent of MIA's passenger base might actually live physically closer to HST. Physical location of an airport within a metropolitan area is one of several factors affecting the airline passenger's choice for air service. Therefore, it is reasonable to assume that HST may capture some of MIA's demand, particularly that which is time, or dollar sensitive.

  This type of demand is projected in the 1994 Master Plan to be 1,053,630 passengers in 2015. The largest component of this travel is viewed to have Latin American and Caribbean destinations. Little or no connecting service is foreseen at HST, since connecting activity depends on an extensive domestic and international air service network (i.e., a large number of destinations and frequent service) which is not likely to exist at HST by 2015. MIA will continue to serve as the primary airport in the region for domestic and international connections.

- Niche or Non-Market-Driven – In addition to the attraction of certain segments of passenger air traffic from MIA, the 1994 Master Plan also identifies the opportunities for new air carriers to offer service from HST. The prime example is service to Cuba, if and when the market reopens. The second example is new airlines initiating service from HST or existing airlines not currently serving MIA initiating service at HST. Such carriers include Midway, American Trans Air (ATA), or Southwest. Foreign service to other points in Central or South America and/or the Caribbean is also possible by existing or new carriers.

Even though the assumptions in the 1994 Master Plan forecast are reasonable, it has been nearly five years since this study was conducted and infrastructure improvements to handle commercial passenger demand have not yet begun at HST. Therefore, the demand that was predicted in the Master Plan for the year 2000 should be assumed to occur in 2005. Once the facilities are in place, anticipated traffic could increase at a faster rate resulting in reaching the demand originally predicted in the 1994 Master Plan by 2015.

The updated commercial passenger forecast is shown in **Table 1-2**. Notice that the year 2000 forecast in the Master Plan is now assumed to occur five years later in 2005, while the 2015 forecast is identical to the Master Plan.

Table 1-2
Commercial Passenger Activity Forecast

Enplaned Passengers	**2000**	**2005**	**2015**
Long-Term, Market Driven Demand			
Latin American/Caribbean International	0	0	870,970
Domestic	0	0	182,660
Subtotal	0	0	1,053,630
Niche Market Service			
Latin American/Caribbean International	0	45,700	72,950
Domestic	0	114,240	182,340
Subtotal	0	159,940	255,290
TOTAL	0	159,940	1,308,920
Aircraft Operations		**2005**	**2015**
Long-Term, Market Driven Demand			
Latin American/Caribbean International	0	0	34,510
Domestic	0	0	4,550
Subtotal	0	0	39,060
Niche Market Service			
Latin American/Caribbean International	0	4,570	7,300
Domestic	0	3,040	4,860
Subtotal	0	7,610	12,160
TOTAL	0	7,610	51,220

The above projections represent a significant growth of passenger and related aircraft operations activity which on the average is 23.4 percent annually for passengers, and 21.0 percent for operations. These compare to 3.7 percent annual growth rate of passengers projected by FAA industry wide. While the projected growth for HST is very high, it is the result of the establishment of new commercial air service at a new commercial airport and may in fact be possible. As previously stated, these forecasts are considered to represent an upper bound for environmental and planning purposes and the projected levels may not be attained until post-2015 if actual demand grows at a lower rate than projected. This is, therefore, a conservative forecast to use for the prediction of environmental impacts because the expected activity levels are anticipated to occur only in or after 2015.

1.1-2 General Aviation

Previous forecasts for HST have assumed that general aviation (GA) would constitute the largest portion of the airport's operations. However, several events since the time of the original master plan forecast have dramatically changed the factors that affect the outlook for GA traffic. These factors as well as other more general industry trends are:

- Homestead General Aviation Airport, located approximately ten miles from HST, was assumed to remain open, but with a limited focus on sport aviation (gliders and ultralights) and agricultural aviation. Most of Homestead General's based aircraft were assumed to ultimately relocate to HST. Today, Homestead General is open despite its past pounding by Hurricane Andrew. This GA alternative to HST has two full service fixed-base operators that are currently in business focusing on general aviation and it is the location of several other aircraft related businesses. Homestead General serves a valuable role of basing and training for light aircraft away from the congestion and conflicts with large, high-speed jets. With one north-south and one east-west runway, Homestead General also provides crosswind capability that is necessary for small aircraft and is not available at HST. The Airport also has a separate grass landing area for ultralight aircraft (Runway 9U–27U). Miami-Dade County reported 54,876 operations and approximately 45 based aircraft, 15 of which are ultra-light aircraft, at Homestead General in 1997.

- Many of the general aviation aircraft in the Homestead area were destroyed by the hurricane. Homestead General lost approximately 50 aircraft and Kendall-Tamiami lost some 325. In addition, on February 2 of 1998, 147 aircraft were destroyed by a tornado at Opa-Locka Airport. Since few new general aviation aircraft are being built and time is necessary for acquisition of used units and restoration of local airport storage facilities, many of these aircraft have not been replaced. Therefore, the total demand for general aviation facilities is likely not as large as foreseen in previous studies. While some or all of this demand may eventually return, caution is necessary in the expectation for return of general aviation activity to previously forecasted levels.

- The assumption that general aviation activity will coexist at HST with large volumes of commercial passenger, cargo, and military traffic is also doubtful. This coexistence assumption is in spite of references in several previous studies that high performance and general aviation aircraft do not prefer to mix at the same airport. The 1997 Draft FEIS Review decreases the general aviation traffic forecast slightly because of this important issue. The concern is that jet blast and wake turbulence from jet aircraft interfere with small general aviation aircraft and/or their vast speed difference in the air greatly increases the need for aircraft separation distances to preserve safety. Therefore, most general aviation pilots avoid mixing with commercial activity, if possible, by performing the majority of their operations at exclusively or predominantly general aviation airports. This often leads to the decision of GA aircraft owners to base their aircraft at a GA airport rather than a commercial type airport. Note that there are two general types of GA traffic – the small, normally single engine type aircraft and the jets or large turboprops of corporations. It is the more numerous small single-engine aircraft that do not prefer to mix with commercial flights.

- Much of the current activity at Homestead General is touch-and-go operations from aircraft based in Dade, Broward, and Collier Counties. These operations, by their nature, can occur at almost any GA airport in South Florida, so future growth of this type of activity is doubtful at HST as it transitions to greater use by large aircraft.

- Current regional GA demand is met by existing facilities, which historically have served a much larger volume of operations (as shown in **Table 1-3**) and which in general have experienced a decrease in activity over the past several years. Table 1-3 shows that in total, the County's airports, have historically accommodated over one million GA operations, while in 1997 total operations were under one half million.

Table 1-3
Historical General Aviation Operations At Miami-Dade County Airports

	Opa-Locka <u>OPF</u>	Kendall-Tamiami <u>TMB</u>	Homestead GA <u>X51</u>	Opa-Locka West <u>X46</u>	Dade-Collier Training <u>TNT</u>	Homestead Regional <u>HST</u>	Miami Int'l <u>MIA</u>	<u>TOTAL</u>
1976	405,862	289,116	115,150	90,000	18,232	N/A	55,842	974,202
1977	452,113	334,021	113,000	90,000	19,983	N/A	66,624	1,075,741
1978	502,376	412,741	111,000	75,000	28,876	N/A	72,791	1,202,784
1979	554,757	431,360	111,600	80,250	31,079	N/A	76,137	1,285,183
1980	414,675	419,302	104,980	80,000	33,323	N/A	71,431	1,123,711
1981	358,542	392,781	104,980	80,000	22,535	N/A	63,021	1,021,859
1982	303,188	295,215	105,170	80,000	8,870	N/A	58,789	851,232
1983	215,463	312,461	105,170	100,000	8,870	N/A	58,789	800,753
1984	167,427	307,771	113,000	100,000	5,194	N/A	73,623	767,015
1985	175,253	302,043	113,300	100,000	7,788	N/A	55,519	753,903
1986	184,103	316,919	119,648	100,000	7,788	N/A	58,300	786,758
1987	197,979	284,566	121,000	104,500	11,370	N/A	56,839	776,254
1988	199,537	303,781	119,640	107,671	12,116	N/A	58,127	800,872
1989	161,408	362,884	117,523	104,500	13,000	N/A	68,112	827,427
1990	188,621	362,240	122,798	104,500	41,907	N/A	79,415	899,481
1991	199,604	336,002	131,762	104,500	15,814	N/A	70,768	858,450
*1992	196,897	263,669	60,000	79,000	14,000	N/A	80,934	694,500
1993	220,947	239,264	48,000	80,400	19,054	N/A	71,199	678,864
1994	215,669	209,680	46,500	80,400	19,054	N/A	70,908	642,211
1995	181,714	190,631	35,730	80,400	21,678	5,449	71,473	587,075
1996	145,502	162,370	42,700	60,000	25,612	5,449	62,800	504,433
1997	117,950 1	180,741	54,876	16,000	13,804	1,000	64,142	448,513

* Hurricane Andrew – Aug. 24, 1992.
Source: Miami-Dade County Aviation Department

The basic premise of previous GA forecasts for HST was for strong growth of based GA aircraft and related increase in the number of GA aircraft operations in Miami-Dade County. This concept appears to be overly optimistic based on the continuing decline and/or static nature of the local market. The result is a need to estimate the HST GA activity to a more attainable level. This was done by reviewing the assumptions used to develop the 1994 Master Plan GA forecast and updating these assumptions, as needed. The GA forecast of the Master Plan is presented in **Table 1-4**.

Table 1-4
1994 Master Plan General Aviation Forecast

Based Aircraft	**2000**	**2005**	**2015**			
Single-Engine	58	65	80			
Multi-Engine	10	12	16			
Jet	2	3	4			
Helicopter	4	5	6			
TOTAL	74	85	106			
Operations by Aircraft Category				**Operations per Based Aircraft**		
Single-Engine	72,650	80,870	100,210	1,253	1,244	1,253
Multi-engine	10,430	12,100	16,260	1,043	1,008	1,016
Jet	2,090	2,550	3,610	1,045	850	903
Helicopter	2,010	2,490	3,080	503	498	513
TOTAL	87,180	98,010	123,160			
Operations by Destination				**Flights per Based Aircraft**		
Local	41,410	44,105	49,264	560	519	465
Itinerant	45,770	53,905	73,896	619	634	697
TOTAL	87,180	98,010	123,160			

Source: 1994 Master Plan

The Master Plan states that "because operational levels in a general aviation system are tied closely to the number of aircraft based within the system, based aircraft forecasts are crucial to the validity of the overall forecast of aviation demand."

To calculate a base number of aircraft for HST, from which to project into the future, the Master Plan assumed that most of the pre-hurricane based aircraft at Homestead General and 30 percent of aircraft based at other airports in the Homestead region, would relocate to HST. This foundation level of 97 based aircraft was then increased through the study period at the same average annual growth rate of 1.85 percent as defined in the Draft 1996 Aviation System Plan. The resultant number of based aircraft was adjusted downward recognizing that the derived estimate likely provided an absolute upper bound and that it may be more difficult than anticipated to attract GA aircraft to HST. The final forecast of based aircraft, shown in Table 1-4, was 74 aircraft in the year 2000 increasing to 106 aircraft by 2015.

As stated previously, there are only 45 aircraft currently based at Homestead General which is approximately half of the 80 to 100 aircraft based prior to the Hurricane. Additionally, 15 of the 45 aircraft are ultra-lights which are not envisioned to operated at HST. Therefore, the Master Plan assumption that some 70 aircraft would relocate from Homestead General to HST is no longer valid, since this number exceeds the number of actual aircraft at Homestead General.

In addition, the total number of based aircraft in the County has been declining rather than increasing, and other primary GA airports such as Kendall-Tamiami and Opa-Locka, as well as other private airports, have available general aviation capacity. The result is that the current condition is entirely different from 1994 when the Master Plan stated: "In South Florida, though, there are virtually no alternative facilities for general aviation aircraft owners to use."

For these reasons, the updated forecast estimates a lower number of based GA aircraft at HST as follows:

Table 1-5
Based Aircraft Forecast

	2000	2005	2015
Single-Engine	21	23	27
Multi-Engine	10	12	16
Jet	2	3	4
Helicopter	4	5	6
TOTAL	37	43	53

Total based aircraft at HST is forecast to approximately half of previous estimates. Thirty-seven aircraft are estimated in the year 2000, which is slightly higher than the 30 GA aircraft currently based at Homestead General not including the ultra-lights. This assumes that a considerable number of new users will be attracted to HST despite the apparent current lack of demand for GA airport capacity in the immediate Homestead region. This updated based GA aircraft estimate is assumed to provide an upper bound for environmental planning purposes and is not necessarily assured.

The updated based aircraft forecast preserves all the multi-engines, jet, and helicopter based aircraft originally contemplated in the 1994 Master Plan to be based at HST. These are the higher performance portion of South Dade County demand that may be attracted to the longer runway and control tower at HST and would be less intimidated by sharing the airport with high performance military aircraft. The decrease in based aircraft is all in the lower performance, single-engine category of aircraft.

The modified GA aircraft operations forecast utilizes the same ratios previous utilized in the Master Plan to identify the operations per aircraft type and the split between local and itinerant flights. The updated forecast of GA operations is as follows:

Table 1-6
General Aviation Operations Forecast

Operations by Aircraft Category	**2000**	**2005**	**2015**
Single-Engine	26,304	27,993	33,821
Multi-engine	10,430	12,100	16,260
Jet	2,090	2,550	3,610
Helicopter	2,010	2,490	3,080
TOTAL	40,834	45,133	56,771
Operations by Destination			
Local	19,396	20,310	22,708
Itinerant	21,438	24,823	34,063
TOTAL	40,834	45,133	56,771

Note: Less than 500 operations occurred on a special use, permissive basis in 1997.

1.1-3 Aircraft Maintenance

Previous forecasts have indicated the potential demand for aircraft maintenance facilities at HST. The 1994 Master Plan assumes that MD-82, MD-11, and B-767 or equivalent aircraft will receive their C and D checks at HST as described below.

The FAA mandates a range of periodic maintenance services which are typically described by letter designation ranging from "A Check" to "D Check". "A Check" designates the most basic form of routine aircraft maintenance, while "D Check" designates the most complex, costly and time-consuming form of aircraft maintenance. On the basis of these checks and at the request of the aircraft owner/operator, other maintenance, repair or updates are performed on customer aircraft.

The four types of FAA mandated aircraft checks are explained below, but only the extensive C and D checks are expected at HST. The A and B checks are normally conducted while aircraft remain overnight at the airline's principal hub airports.

- A Check – Encompasses a nose to tail and wing tip to wing tip visual inspection for any observable abnormality in the fuselage and control surfaces.

- B Check – Includes the A check inspection, as well as an expanded investigation of internal areas of the aircraft such as oxygen systems, fire detection and suppression systems and emergency lighting. Various access panels are removed to inspect key electrical and mechanical areas of the aircraft.

- C Check – This extensive aircraft maintenance procedure consists of both the cumulative inspection requirements of A and B checks and additional inspections including the removal of the aircraft's entire interior and exterior fuselage walls, ceilings and floors and flight controls for inspection and repair. In addition, an internal inspection of fuel tanks and engines is conducted. The aircraft flight deck itself is largely dismantled and inspected by avionics experts. There is also a considerable amount of non-destructive testing (NDT) during the C check including x-rays and ultrasonic testing of the airframe and power systems.

- D Check – As the most extensive aircraft maintenance procedure, the D check includes all the elements of the C check with additional NDT as well as the removal of the landing gear system, the aircraft's engines and, in some cases, the wings.

The 1994 Master Plan's forecast of aircraft maintenance activity at HST is a logical expectation since certain existing facilities are potentially available to be converted to maintenance use and the airport is capable of handling large commercial aircraft. Therefore, the Master Plan forecast of aircraft maintenance operations for 2015 is validated except initial operations are delayed five years because of the five-year delay in turnover of the base so that the maintenance hangars can be converted for commercial use. The updated aircraft maintenance forecast is presented below.

Table 1-7
Aircraft Maintenance Operations Forecast

	2000	2005	2015
Aircraft Operations	0	570	1,470

The forecast above assumes a four-bay maintenance operation in the initial year growing to a complete eight to ten bays by 2015. Half the visiting aircraft are assumed to stay two weeks in a C check and half to stay two months in a D check. After maintenance, each aircraft is assumed to fly an average of six operations to verify the airworthiness of the plane prior to return to service.

1.1-4 Air Cargo

Two different types of air cargo are envisioned by the 1994 Master Plan as developing at HST as follows.

- Express Cargo – By far the fastest growing segment of the air cargo industry is the growth of small package express carriers such as Fed Ex, United Parcel Service (UPS) and Airborne. This segment of the air cargo industry has seen double digit annual growth for most of the last decade. For example, Fed Ex, the largest express carrier, had $12.7 billion in revenue in 1997 making it almost as large as Delta Airlines in revenue and with more aircraft (581 to 559). The express hub scenario for HST envisions one of the overnight express carriers supplementing service or moving from MIA to

HST. Extensive Latin American service is also envisioned in this scenario to link with the domestic express flights.

- Latin American/Caribbean Trade Center Scenario – This concept anticipates that HST becomes an important ground transportation hub supporting the just-in-time transport of flowers and agricultural commodities between and among the United States, the Caribbean, Latin America, and possibly Europe. This requires the growth of high volume transport of such agricultural commodities with HST being the trans-shipment and/or U.S. Customs inspection point. The second part of this scenario assumes growth of factories and/or trade centers built adjacent to the airfield where goods are bought, sold, manufactured, warehoused, repackaged or otherwise manipulated.

Just like air passengers, most air cargo to Miami-Dade County currently goes through MIA. But, just like passengers, it is reasonable to assume that some of this traffic and/or new traffic could be attracted to HST, as assumed in the 1994 Master Plan. What will not likely be attracted to HST is mail and other cargo that transfers from one aircraft to another and thus relies upon extensive domestic and international connecting service. Some of this air cargo moves in the belly of passenger aircraft as an adjunct to passenger flights.

The 1994 Master Plan air cargo forecast for 2015 calls for 18,850 annual aircraft operations of express carriers and 2,600 of Latin American/Caribbean Trade Center type service. This forecast is accepted as a potential upper bound of air cargo activity that could occur at HST by 2015. Although air cargo service to HST could potentially start soon after transfer because certain types of air cargo loading/unloading require only aircraft ramp space, any substantial air cargo operation at the airport will require customs clearance warehousing, repackaging, etc. that may require substantial on-airport or close-to-airport facilities. The net result is that air cargo growth at HST is partially dependent on the availability of warehouse facilities, as well as market influences. Since no infrastructure is currently in place to support air cargo, the year 2000 Master Plan traffic estimate is delayed to 2005, but by 2015 the full infrastructure (particularly the vital U.S. Customs capability) is assumed to be in place so that the anticipated air cargo activity can occur. The updated air cargo forecast is presented below.

Table 1-8
Air Cargo Forecast

	2000	**2005**	**2015**
Aircraft Operations			
Express Carrier Operator	0	0	18,850
Miscellaneous Cargo Activity	0	1,560	2,600
TOTAL	0	1,560	21,450
Total Enplaned Tons	0	8,040	329,835

1.1-5 Military/Government Activity

The Air Force forecast used in the 1994 Final Environmental Impact Statement (FEIS) was revised for the 1997 Draft FEIS Review. The Air Force recommends that the revised numbers be updated to account for the following:

- More current information is available concerning operations by the Air Force units and by the U.S. Customs Service.
- A steady level of operations in future years is projected by the Office of Air Force Reserves and the U.S. Customs Service. Therefore, this level of operations should be assumed to remain constant in future years.

The updated military and government operations forecast is presented in **Table 1-9**.

Table 1-9
Military/Government Operations Forecast

	Current	2000	2005	2015
Aircraft Operations				
Military	16,224	16,224	16,224	16,224
U.S. Customs	3,600	3,600	3,600	3,600
TOTAL	**19,824**	**19,824**	**19,824**	**19,824**

Sources: U.S. Air Force, U.S. Customs Service.

Although the Air Force has no plans for a second wing at Homestead ARS, the capability to support a second wing exists. The SEIS will acknowledge the long-range possibility of an additional wing at Homestead, however, the discussion of related impacts will be qualitative, not quantitative (i.e. noise contours would not be modeled for that possibility).

1.1-6 Forecast Summary

The updated aircraft operations forecast for HST is summarized in **Table 1-10** for the years 2000, 2005 and 2015. Current aircraft operations at Homestead ARS are also included in this table. Forecast operations for 2015 are compared graphically with previous forecasts in **Exhibit 1-1**.

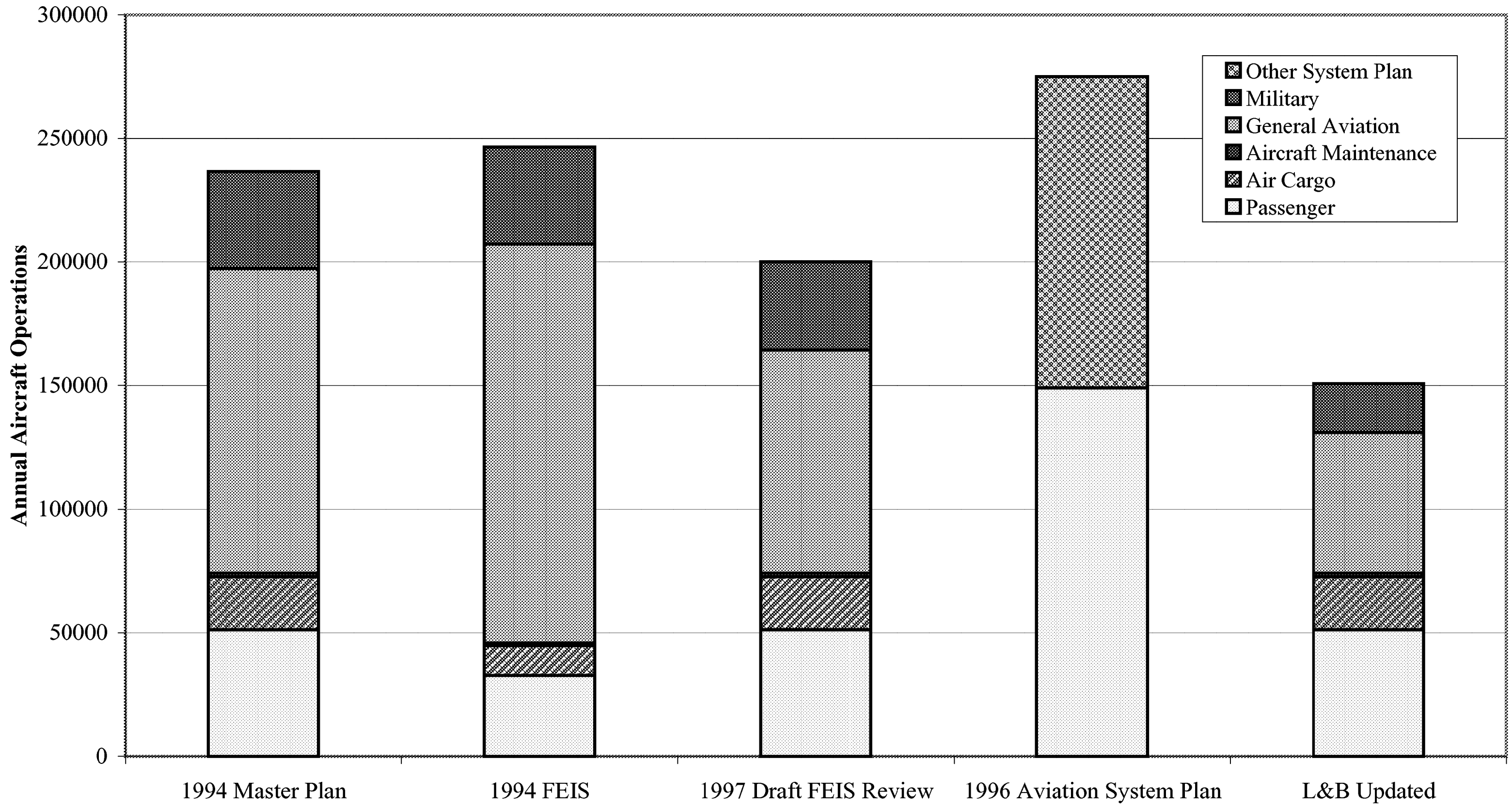
The anticipated commercial fleet mix and flight origins/destinations is the same, or in the same proportion, as presented in the 1994 Master Plan because the basic forecast assumptions and methodology remain unchanged. The anticipated commercial passenger fleet mix, shown in Table 1-10, consists mostly of turboprop commuter aircraft. The commuter fleet also includes some regional jet aircraft. Air carrier jet operations are primarily by narrowbody type aircraft such as the Boeing 737 series, Airbus 320 and MD80. Some Boeing 757 and widebody aircraft such as the Boeing 767 and MD11 are also projected to operate at HST.

Table 1-10
HOMESTEAD REUSE SEIS
AIRPORT PLANNING DATA TECHNICAL REPORT
Aircraft Operations Forecast Summay

			Current	------------FORECAST	-------------	
			(1997)	2000	2005	2015
Commercial Passenger						
Long Term, Market Driven						
Latin America, Caribbean, International						
Turboprop	(Dash-8,ATR-42, SWM, SF3)		0	0	0	22,130
Regional Jet	(CRJ, EM4)		0	0	0	7,260
Narrowbody Jet	(B-737/500/300/900, A320)		0	0	0	4,460
Widebody Jet	(MD-11, B-767)		0	0	0	660
Domestic						
Turboprop	(Dash-8,ATR-42, SWM, SF3)		0	0	0	1,490
Regional Jet	(CRJ, EM4)		0	0	0	760
Narrowbody Jet	(B-737/500/300/900, A320)		0	0	0	1,410
B-757	(B-757)		0	0	0	380
Widebody Jet	(MD-11, B-767)		0	0	0	510
TOTAL Market Driven						39,060
Niche Market Service						
Latin America, Caribbean, International						
Turboprop	(Dash-8,ATR-42, SWM, SF3)		0	0	4,570	7,300
Domestic						
Narrowbody Jet	(B-737/500/300/900, A320, MD-80)	1/	0	0	3,040	4,860
TOTAL Niche Market			0	0	7,610	12,160
TOTAL COMMERCIAL			0	0	7,610	51,220
General Aviation						
Single engine	(C150, C172)			26,304	27,993	33,821
Multi Engine	(PA31)			10,430	12,100	16,260
Jet	(Lear, Citation)			2,090	2,550	3,610
Helicopter				2,010	2,490	3,080
TOTAL GA				40,834	45,133	56,771
Aircraft Maintenance						
Turboprop	(Dash-8,ATR-42, SWM, SF3)		0	0	330	620
Narrowbody Jet	(B-737 series, A-320, MD-80, B-727)		0	0	120	410
Widebody Jet	(MD-11, B-767)		0	0	120	440
TOTAL MAINTENANCE			0	0	570	1,470
Cargo						
Express Carrier						
Narrowbody Jet	(B-727, MD-80)		0	0	0	12,570
Heavy Jet	(B-757, B-767, MD-11)		0	0	0	6,280
Miscellaneous Cargo						
Turboprop	(Cessna Caravan, King Air)		0	0	1,040	0
Narrowbody Jet	(B-727, MD-80)		0	0	520	2,600
TOTAL CARGO			0	0	1,560	21,450
Military/Government						
U.S. Air Force	F-16C		12,000	12,000	12,000	12,000
U.S. Air Force	F-15		1,100	1,100	1,100	1,100
Transient	C-141 (C-17 in 2015)	2/	104	104	104	104
Transient	C-5		20	20	20	20
Transient	P-3		1,500	1,500	1,500	1,500
Transient	H65		1,500	1,500	1,500	1,500
U.S. Customs	PA31		900	900	900	900
U.S. Customs	C206		900	900	900	900
U.S. Customs	H60		900	900	900	900
U.S. Customs	C550		900	900	900	900
TOTAL MILITARY/GOVERNMENT			19,824	19,824	19,824	19,824
TOTAL OPERATIONS			19,824	60,658	74,697	150,735

Note: Representative aircraft are provided by category. Actual fleet will depend on the carriers operating at HST.
1/ MD-80 aircraft is assumed to operate in 2005 but not in 2015 under this category.
2/ C-141 is assumed to be replaced by the C-17 by 2015.
Prepared by Landrum & Brown
10/24/00

Homestead Reuse SEIS
2015 Aircraft Operations Comparative Forecast



Note: Other System Plan is the sum of Air Cargo, Maintenance, General Aviation and Military

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10/24/00

Exhibit 1-1

Typical general aviation aircraft are Cessna 150 and 172, Piper 34 and Lear and Citation jet aircraft. The aircraft maintenance fleet has a larger proportion of turboprop aircraft in the earlier time period (2005) but includes more jet aircraft, narrowbody and widebody, in 2015. Most cargo operations are projected to be by jet aircraft, including retrofitted Boeing 727.

The military and government fleet mix includes a wide range of aircraft from low performance single engine Cessna turboprops to the high performance F16 and F15 fighter jet aircraft. The future fleet mix is based on current activity at Homestead ARS. The U.S. Air Force recommends maintaining the existing fleet mix in future years due to the uncertainty of projecting future types of aircraft. However, the C-141 aircraft is projected to be retired from the Air Force inventory before 2015. The C-17 aircraft is assumed to replace the C-141 aircraft in the 2015 forecast.

1.2 Maximum Use of Single Runway - Activity Forecast

The purpose of this section is to provide a projection of demand beyond the end of the forecast period in 2015 to the point where the maximum capacity of a single runway is reached. Of course, any such look so far into the future is highly speculative, but the purpose is to examine the future character of HST as the airport reaches capacity. For post-2015 forecasting, it is assumed that commercial passenger activity is the principal component of growth. The County's growing population and economy are anticipated to continue to increase the demand for commercial passenger services. Air cargo operations are also anticipated to increase at HST as the airport serves local demand and offers an alternative to MIA, FLL, etc. All other types of demand are likely to remain static or even decline as congestion at HST forces the highly discretionary GA traffic to lower cost and less busy alternative airports. The resulting long-term forecast is presented in the following table. Projections were made as described below, starting with 2015 forecast demand, until the annual aircraft operations forecast reached the capacity estimate of 231,000 annual operations which is approximately in the year 2038. The basis for this capacity estimate is presented later in Sections 2.2 and 2.3 of the report.

Table 1-11
Maximum Single Runway Use Scenario
Commercial Passenger and Operations Forecast

		Annual Aircraft Operations					
Year	Enplaned Passengers	Passenger	Maintenance	Air Cargo	Military	GA	Total
2000	0	0	0	0	19,824	40,834	60,658
2005	159,940	7,610	570	1,560	19,824	45,133	74,697
2010	457,464	19,747	915	5,783	19,824	50,620	96,889
2015	1,308,920	51,220	1,470	21,450	19,824	56,771	150,735
2038	3,933,230	126,243	1,470	26,966	19,824	56,771	231,274

- Commercial Passengers - As stated earlier, the forecast growth of commercial passenger activity at HST between 2005 and 2015 is very substantial, as the airport establishes itself as a new commercial air service facility. Post-2015, passenger activity is forecast to increase at a more modest growth, comparable to the industry average based on the continued growth of the local economy and population base. The Boeing Corporation's June 1998 forecast predicts that near term passenger growth will average 4.9 percent annually. This near term forecast growth was assumed to project post-2015 passengers since the same forces acting on aviation demand today will likely be in place in the future. Based on this growth rate, enplaned passengers could increase from 1.3 million to 3.9 million by 2038.

- Passenger Aircraft Operations - As passengers increase an average of 4.9 percent per year, related aircraft operations are projected to increase at 4.0 percent annually. This slower growth is assumed as aircraft increase slightly in seating capacity. Average enplanements per departure thus increase from 51.1 in 2015 to 62.3 in 2038.

- Aircraft Maintenance - It is assumed that a fully-functioning aircraft maintenance facility will be established at HST by 2015. Post-2015 maintenance operations are not projected to grow, thus reflecting the expected "maturing" of the maintenance facility that would occur as a reasonable market share is reached at HST. The aircraft overhaul and maintenance industry is very competitive and a large number of both airline and contract facilities exist, suggesting that it is not reasonable to expect continuing increase in activity.

- Air Cargo - Air cargo arrivals are anticipated to increase to 30 per day by 2015. This volume of operations is representative of today's daily service by any of the large overnight express companies at other airports plus an average of 25 freight aircraft per day. Such a substantial air freight operation is unlikely to grow at a high rate after 2015 in terms of number of flights since each air cargo company's hub is assumed to be connected by that time with HST. Air cargo volume could continue to grow, however as larger aircraft are substituted over time. Air freight volume will likely grow at 3.2 percent per year after 2015 causing the average air cargo aircraft to increase in size.

- Military/Government - Military and government operations are assumed to remain stable post-2015 at 19,824 annually.

- General Aviation - As the airport gets busier with commercial air traffic, GA activity would be expected to decline. For planning purposes, however, the annual GA aviation activity for 2015 was assumed to remain stable through 2038. Larger turboprop and jet aircraft would be expected to increase as smaller GA aircraft decrease.

By 2038, at maximum capacity of a single runway, HST could be approaching 4 million annual enplaned passengers, which is approximately the size of today's Indianapolis, San Antonio, Albuquerque or Columbus airports. This is far below the activity level of a major airport such as Miami International. Passenger aircraft operations could exceed 126,000 annually, with a total of approximately 231,000 total operations for the airport by all aircraft. The fleet mix and markets served could slowly evolve from those forecast for 2015 as shown in **Table 1-12**.

For comparison, San Diego's Lindbergh Field where commercial passenger, military and general aviation aircraft share a single runway and highly congested Southern California skies in 1997 recorded some 229,000 annual operations. This volume of activity is similar to the projected maximum operations forecast for HST. Lindbergh Field is the busiest single runway commercial service airport in the United States.

(2) Aviation Facility Requirements and Land Use

The level and type of facilities that will need to be in place at HST are a function of the projected aviation demand. On the airside, the activity volumes and fleet mix will determine any future need for a second runway. On the landside, enplaned passenger, based aircraft, and cargo volumes would determine the appropriate terminal, general aviation, cargo, and aircraft maintenance facility sizes.

This section compares the facility requirements or level of development defined for HST in existing documents and recommends reasonable assumptions of facilities to use in the SEIS, based on the facilities identified in these existing documents and the updated demand forecasts. This comparison addresses the major facilities required to operate a commercial service airport.

2.1 Comparison of Existing HST Facility Requirements

The County's plans for developing HST after transfer are documented in the 1994 Master Plan and Airport Layout Plan (ALP), the 1996 long-term lease with base developer HABDI and the 1998 CDMP. The facility requirements defined in each document are compared in **Table 1-13** including the role of the airport as described in each case.

- Airport Master Plan and ALP - As the likely future sponsor of the airport, the County prepared a master plan and ALP. The 1994 Master Plan contains a detailed analysis of facilities required to meet the forecast demand in the years 2000, 2005, and 2015. As shown in Table 1-12, the Master Plan recommends the development of a second runway for general aviation and commuter use at the 2005 demand level and development of this second runway for air carrier use at the 2015 demand level. Terminal and cargo facilities are gradually expanded up to 386,000 S.F. of terminal space and 550,000 S.F. for cargo in 2015.

Table 1-12
HOMESTEAD REUSE SEIS
AIRPORT PLANNING DATA TECHNICAL REPORT
Aircraft Operations Forecast
Maximum Use of a Single Runway

		Current	--FORECAST ---	
		(1997)	2015	2038
Commercial Passenger				
Long Term, Market Driven				
Latin America, Caribbean, International				
Turboprop	(Dash-8,ATR-42, SWM, SF3)	0	22,130	4,500
Regional Jet	(CRJ, EM4)	0	7,260	28,500
Narrowbody Jet	(B-737/500/300/900, A320)	0	4,460	17,500
Widebody Jet	(MD-11, B-767)	0	660	660
Domestic				
Turboprop	(Dash-8,ATR-42, SWM, SF3)	0	1,490	2,500
Regional Jet	(CRJ, EM4)	0	760	11,500
Narrowbody Jet	(B-737/500/300/900, A320)	0	1,410	13,500
B-757	(B-757)	0	380	4,000
Widebody Jet	(MD-11, B-767)	0	510	510
TOTAL Market Driven			39,060	83,170
Niche Market Service				
Latin America, Caribbean, International				
Turboprop	(Dash-8,ATR-42, SWM, SF3)	0	7,300	25,573
Domestic				
Narrowbody Jet	(B-737/500/300/900, A320, MD-80) 1/	0	4,860	17,500
TOTAL Niche Market		0	12,160	43,073
TOTAL COMMERCIAL		0	51,220	126,243
General Aviation				
Single engine	(C150, C172)		33,821	29,000
Multi Engine	(PA31)		16,260	21,000
Jet	(Lear, Citation)		3,610	3,610
Helicopter			3,080	3,161
TOTAL GA			56,771	56,771
Aircraft Maintenance				
Turboprop	(Dash-8,ATR-42, SWM, SF3)	0	620	430
Narrowbody Jet	(B-737 series, A-320, MD-80, B-727)	0	410	600
Widebody Jet	(MD-11, B-767)	0	440	440
TOTAL MAINTENANCE		0	1,470	1,470
Cargo				
Express Carrier				
Narrowbody Jet	(B-727, MD-80)	0	12,570	8,500
Heavy Jet	(B-757, B-767, MD-11)	0	6,280	10,500
Miscellaneous Cargo				
Turboprop	(Cessna Caravan, King Air)	0	0	0
Narrowbody Jet	(B-727, MD-80)	0	2,600	7,966
TOTAL CARGO		0	21,450	26,966
Military/Government				
U.S. Air Force	F-16C	12,000	12,000	12,000
U.S. Air Force	F-15	1,100	1,100	1,100
Transient	C-141 (C-17 in 2015) 2/	104	104	104
Transient	C-5	20	20	20
Transient	P-3	1,500	1,500	1,500
Transient	H65	1,500	1,500	1,500
U.S. Customs	PA31	900	900	900
U.S. Customs	C206	900	900	900
U.S. Customs	H60	900	900	900
U.S. Customs	C550	900	900	900
TOTAL MILITARY/GOVERNMENT		19,824	19,824	19,824
TOTAL OPERATIONS		19,824	150,735	231,274

Source: Table 1-10 and Landrum & Brown assessment of 2038 fleet mix.

Note: Representative aircraft are provided by category. Actual fleet will depend on the carriers operating at HST.
1/ MD-80 aircraft is assumed to operate in 2005 but not in 2015 under this category.
2/ C-141 is assumed to be replaced by the C-17 by 2015.
Prepared by Landrum & Brown
10/24/00

Table 1-13
Facility Requirements Comparison

	Long-Term Planning		Near-Term Approvals [3/]
	Master Plan [1/]	HABDI Proposal [2/]	
Role	A commercial airport that will supplement MIA and FLL and will accommodate increased commercial demand.	An international/ Regional hub, which will relieve overburdened facilities at MIA.	A commercial airport to supplement MIA and to fulfil the County's future aviation needs.
Airside`			
- Runway - NAVAIDS	2005 – 2nd runway at 5,500 feet for general aviation and commuter use 2015 – 2nd runway at 9,000 feet Runway 5 – upgrade ILS to CAT II/III Runway 23 – establish straight-in approach	Not described Not described	One runway, but the two-runway ALP is part of the CDMP, and the County will continue to monitor the need for it. Ultimately, the County seeks to achieve full buildout of the ALP (2 runways).
Landside			
- Terminal	2000 - 22,000 S.F. (30,000 domestic) 2005 - 152,000 S.F (35,000 domestic) 2015 - 386,000 S.F. (95,000 domestic)	28,000 S.F. 126,000 S.F. 284,000 S.F.	Start design and construction 95,000 S.F. (includes several non-terminal interim uses) -
- General Aviation	2000 - 167,000 S.F. [4/] 2005 - 193,000 S.F. [4/] 2015 - 241,000 S.F. [4/]	Not described Not described Not described	Not described 122,000 S.F. [5/] 122,000 S.F. [5/]
- Cargo	2000 - 13,000 S.F. 2005 - 261,000 S.F. 2015 - 550,000 S.F.	120,000 S.F. 202,500 S.F. 295,500 S.F.	Start design and construction 126,000 S.F. -
- Aircraft Maintenance	2000 - 640,000 S.F. [6/] 2005 - 1,280,000 S.F. [6/] 2015 - 1,600,000 S.F. [6/]	Not described Not described Not described	Not described 181,000 [5/] 181,000 [5/]

1/ Homestead AFB Feasibility Study Airport Master Plan Report, December, 1994, Post Buckley Shuh & Jernigan.
2/ Homestead Air Base Developers, Inc. Proposed Development Plan, November, 1994.
3/ Dade County Comprehensive Development Master Plan, as amended June 16, 1998.
4/ Includes FBO terminal area, hangar area, and ramp area.
5/ Includes only hangar area.
6/ Includes hangar and apron area.

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General aviation hangar area, ramp area, and fixed base operator (FBO) terminal area will require approximately 241,000 S.F. by 2015. Aircraft maintenance hangar and apron area will require an estimated 1,600,000 S.F. to accommodate development through 2015.

The 1994 Master Plan's methodology for determining HST's future facility requirements for each of the main types of landside and airside facilities (i.e. runways, terminal and cargo) was based on FAA Advisory Circulars 150/5060, Airport Capacity and Delay; 150/5300-13, Airport Planning and Design; and 150/5360-13, Planning and Design Guidelines for Airport Terminal Facilities. These documents provide industry standard recommendations for calculating runway capacity and building size based on the volume and mix of aircraft operations, passengers and cargo tons projected to occur at the airport. The 1994 Master Plan utilized ratios based on industry standards to compute terminal, general aviation, cargo, and aircraft maintenance facility requirements. The ratios were analyzed and were found to be acceptable to use for the updated facility requirements. These ratios are as follows:

- Terminal – terminal square feet divided by annual enplaned passenger projections
- General Aviation – general aviation square feet divided by general aviation hangar space projections
- Cargo – cargo square feet divided by annual cargo tons projections
- Aircraft Maintenance – aircraft maintenance area (square feet) divided by aircraft maintenance hangar space projections

The 1994 Master Plan facility requirements are reflected in the HST Airport Layout Plan (ALP) which is a graphic depiction to scale of existing and ultimate airport facilities, their location on the airport and pertinent clearance and dimensional information required to show relationships with applicable FAA standards. Along with the airfield configuration of runways, taxiways, and aircraft aprons, the terminal area and other landside development are shown schematically. A separate drawing shows the Imaginary Surfaces (airspace) as described in 14 CFR Part 77.

The purpose of the ALP is to:

- Serve as a public document
- Provide a record of current and future aeronautical requirements
- Assure that planned airport facilities are consistent with aviation safety and operational efficiency

- Serve as a reference for community deliberations on land use proposals and budget and resource planning

The FAA conditionally approved the ALP on October 20, 1994. Conditional approval means that the FAA has reviewed the plan for any interference with navigable airspace or nearby airports, has considered objects that may affect navigable airspace, and has reviewed the applicable airport design standards. A conditionally approved ALP also means that depicted development is subject to further environmental and other applicable (Federal, State, local) review and approval prior to implementation.

- HABDI Lease - The HABDI lease goes into effect after conveyance and certain improvements and conditions are met by the County. It allows Homestead Air Base Developers Inc. to develop the airfield, terminal, and aviation portion of the base for 45 years, and the support areas for 55 years. The County will be the sponsor and operator-of-record for the airfield, and the HABDI may operate the airfield for the County.

  The facility requirements stated in the HABDI documents are mostly lower than the Master Plan's requirements, with exception of the cargo requirements for the year 2000. The HABDI aviation development proposal is consistent and generally less aggressive than the 1994 Master Plan's recommended development.

- 1998 CDMP - The County's Comprehensive Development Master Plan (CDMP), as amended on June 16, 1998, limits development at HST to the existing runway and partial development of the ultimate functional uses described in the 1994 Master Plan. In total, 95,000 S.F. of terminal, 122,000 S.F. of general aviation hangar area, 181,000 S.F. of aircraft maintenance hangar area, and 126,000 S.F. of cargo are included in this initial phase of development.

For the purpose of the SEIS it is assumed that the initial development of HST will be consistent with the CDMP. The CDMP states that full 2015 buildout of HST, consistent with the ALP and the HABDI plan, is a future objective which will require additional approvals by the State and the County Commissioners.

2.2 Updated Facility Requirements

The 1994 Master Plan's major facility requirements are updated in this section, as needed, based on the updated activity forecast. The results are presented below.

- Airfield - Airfield Capacity is defined as the maximum number of aircraft operations that an airfield configuration can accommodate during a specific interval of time, when there is continuous demand (i.e. an aircraft is always waiting to depart or land). This is referred to as the ultimate capacity, or the maximum throughput rate. Capacity can be expressed hourly and annually. Annual capacity is also referred to as annual service volume (ASV) and is a function of the hourly capacity as well as the daily, weekly, and seasonal demand patterns at an airport. Measures of airport capacity and aircraft delay are needed to design and evaluate airport development and improvement projects.

The 1994 Master Plan calculated airfield capacity using the methodology documented in FAA Advisory Circular (AC) 150/5060-5, *Airport Capacity and Delay*. This document provides two methods to compute capacity, as described in Chapters 2 and 3 of AC 150/5060-5. The first method calculates capacity based on the number and configuration of runways and the aircraft fleet mix, relying on standard assumptions about other airfield configuration and demand parameters. The second computation method allows for more detailed computations, suitable for a wider range of airport design and planning applications, and takes into account information such as runway utilization, taxiway exits, and peaking characteristics of demand. Both of these methods were used to compute HST's annual capacity based on the updated activity forecasts. The calculated annual capacity of aircraft operations for both methods are as follows:

	Annual Aircraft Operations	
Method	**2005**	**2015**
Capacity Calculation for Long Range Planning (Simplified Calculation)	195,000	210,000
Detailed Capacity Calculation	239,000	235,000

The two methods generate slightly different results that are considered to provide an adequate range of capacity. Based on the updated forecast, the calculated annual capacity in 2005 ranges from 195,000 to 239,000 aircraft operations. In 2015, the calculated capacity is 210,000 to 235,000 aircraft operations (an aircraft operation is either a landing or a takeoff. One aircraft landing at HST and subsequently taking off is counted as two operations.) By 2015, the 150,735 projected annual aircraft operations results in the airport operating at 64 to 72 percent of capacity, which is less than the airfield's maximum. Therefore, the existing airfield with its 11,200-foot runway is sufficient to accommodate the projected demand for the 2000 to 2015 time frame.

The updated airfield capacity estimate is greater than the 1994 Master Plan's estimated capacity which was 173,000 aircraft operations in 2015. The main reason for the increase in capacity over the master plan lie in the lower level of general aviation operations which result in a more homogenous aircraft fleet mix.

- Terminal Building - The CDMP allows 95,000 Square Feet (S.F.) of new terminal building construction. The 1994 Master Plan estimated that this amount of space would be required between 2000 and 2005 to accommodate terminal and various interim aviation-related uses. Dade County Aviation Department's passenger terminal building reports and drawings were reviewed to determine if the areas planned for each use would be adequate to meet demand; they were found to be sufficient. Due to the five-year delay in projected initial demand, it currently appears that the CDMP's terminal size would meet space requirements through 2005 to 2010. It is anticipated that a smaller initial phase of this building would be in place by 2002, and that the building would be expanded to 95,000 S.F. by 2005. The volume of passengers projected for 2015 would require approximately 386,000 S.F. of terminal building, as calculated in the 1994 Master Plan and assumed in the SEIS. This is substantially more than the terminal area included in the CDMP, and the terminal proposed by HABDI. The CDMP would need to be amended and State approval would be required prior to the construction of these development levels.

- General Aviation - General aviation facility requirements were developed for HST based on projected general aviation operational demand. The updated forecast of aviation demand for general aviation operations are significantly lower than the projections prepared as part of the 1994 Master Plan. Therefore, the updated projections of general aviation facility requirements are also significantly lower than the 1994 Master Plan projections. The updated general aviation facility requirements are based on the assumptions used in the 1994 Master Plan, which were presented in the preceding Section 2.1 of this report. A total of 132,600 S.F. will be required for general aviation facilities by 2015. A breakdown of the major functional areas within the general aviation development area is provided in the following paragraphs.

  FBO terminal area at general aviation airports relates directly to the space required to accommodate pilots and passengers. The facilities needed to accommodate pilots and passengers usually include a lounge, flight planning room, restrooms, business offices, and food/beverage concessions. The 1994 Master Plan utilized typical planning ratios to determine approximate FBO terminal building area, therefore these ratios will serve for the updated requirements as well. These ratios indicate that the FBO terminal area will require 940 S.F. by 2005, 1,054 S.F. by 2010, and 1,183 S.F. by 2015.

  General aviation hangar area requirements were determined by multiplying the amount of hangar area required by aircraft type to the number of hangar spaces required by that type of aircraft. The following hangar storage ratios were used: 1,200 square feet per single-engine aircraft, 2,000 square feet per multi-engine aircraft, 3,600 square feet per jet aircraft, and 3,600 square feet per helicopter. These ratios result in a general aviation hangar area requirement of 43,600 S.F. by 2000, 50,800 S.F. by 2005, 54,000 S.F. by 2010, and 61,200 S.F. by 2015.

Similar to the general aviation hangar area requirements, general aviation ramp area requirements were determined by multiplying the amount of ramp area required by aircraft type to the number of hangar spaces required by that type of aircraft. The following hangar storage ratios were used: 2,700 square feet per single-engine aircraft, 2,700 square feet per multi-engine aircraft, 0 square feet per jet aircraft, and 0 square feet per helicopter. These ratios result in general aviation ramp area requirements of approximately 43,200 S.F. by 2000, 54,000 S.F. by 2005, 59,400 S.F. by 2010, and 70,200 S.F. by 2015.

- <u>Cargo Buildings</u> - The CDMP's 126,000 S.F. area for cargo development met the master plan cargo requirements through 2000 to 2005. Again, because of the initial five-year delay in air cargo activity projections, the CDMP development now meets the requirements through 2005 to 2010. The 1994 Master Plan estimated that in 2015 a total of 550,000 S.F. of cargo building space would be required. This estimate is reasonable in relation to the forecast of cargo activity. It exceeds the CDMP’s 126,000 S.F., as well as the 295,500 S.F. expected by HABDI. The CDMP would need to be amended and State approval would be required prior to the construction of these development levels.

- <u>Aircraft Maintenance</u> - For the most part, the quantity of air carrier aircraft maintenance hangars are determined by the airlines and/or third party maintenance operators. The number and size of large air carrier aircraft maintenance hangars are not based solely on changes in activity levels. These facilities are often tied to the airline headquarter’s location, hubbing system, fleet size, maintenance scheduling climate, or location of terminating flights. Therefore, the demand for these types of hangars will be driven by the air carrier and air cargo operators projected to serve HST. Although it is difficult to predict the specific air carrier and air cargo operators at HST, requirements presented in the 1994 Master Plan were determined by analyzing aircraft maintenance facilities at airports similar in size and type to HST as well as professional experience. Since the updated air carrier and air cargo operational levels do not change from the 1994 Master Plan forecast (except for the five-year delay in projected initial demand) the updated aircraft maintenance facility requirements have been maintained to reflect the 1994 Master Plan facility requirements (with a five-year shift). A total of 1,600,000 S.F. will be required for aircraft maintenance facilities by 2015.

2.3 Maximum Single-Runway Scenario

The facilities required to accommodate the maximum level of activity projected for HST are presented in this section. As presented earlier, this long-term forecast for maximum use of a single runway at HST includes approximately 3.9 million annual enplaned passengers and 231,000 annual operations.

- Airfield - The maximum activity level that could be accommodated by HST's single runway is assumed to be 100 percent of annual airport capacity, which is also the upper limit of the calculated capacity range. The year in which the calculated airport capacity equals or approximates total demand represents the single-runway airport's maximum use. Capacity in the post-2015 time frame varies slightly from that previously calculated for 2015 because of the changes in the composition of activity at HST, as passenger and air cargo operations increase, while other types of activity remain stable. The calculated capacity range post-2015 is 205,000 to 231,000 operations. The projected demand exceeds 231,000 operations in 2038, meaning that the capacity of the single-runway airport is reached by 2038.

- Terminal - Based on the master plan's terminal requirement of .3 S.F. per annual enplaned passenger, the 2038 projected 3,933,230 passengers would need a terminal of 1,178,000 square feet.

- Cargo - Using the same cargo building relationship of cargo to operations there will be a need for 691,000 S.F. of cargo building by 2038.

General aviation and aircraft maintenance operations are not projected to increase beyond the 2015 level. Therefore, the 2015 general aviation and aircraft maintenance facilities are sufficient to serve demand through 2038.

(3) Airspace

The location of aircraft, within and around Homestead airspace, is a function of the geographic origin and destination of flights, the air traffic control procedures and routes in the Miami airspace, and aircraft performance characteristics. The number and type of aircraft operations is dependent on the demand for air traffic service at HST, which is reflected in the updated aviation forecast presented earlier. HST is forecast to become a commercial airport serving operations by a large number of civil aircraft that historically have not operated at this facility. Future flights at HST are assumed to arrive and depart to destinations throughout the U.S. as well as potentially some international locations.

This section describes HST's airspace operating environment as it exists today, and as envisioned by the FAA for future operations. In order to support the SEIS's noise analysis, this description concentrates on the definition of existing and future flight tracks for HST arrivals and departures, including the volume and type of activity likely to operate on each flight track. The discussion begins with a review of the existing Miami airspace, followed by a comparison of current and historical conditions at HST, and a definition of future HST airspace routes (flight tracks).

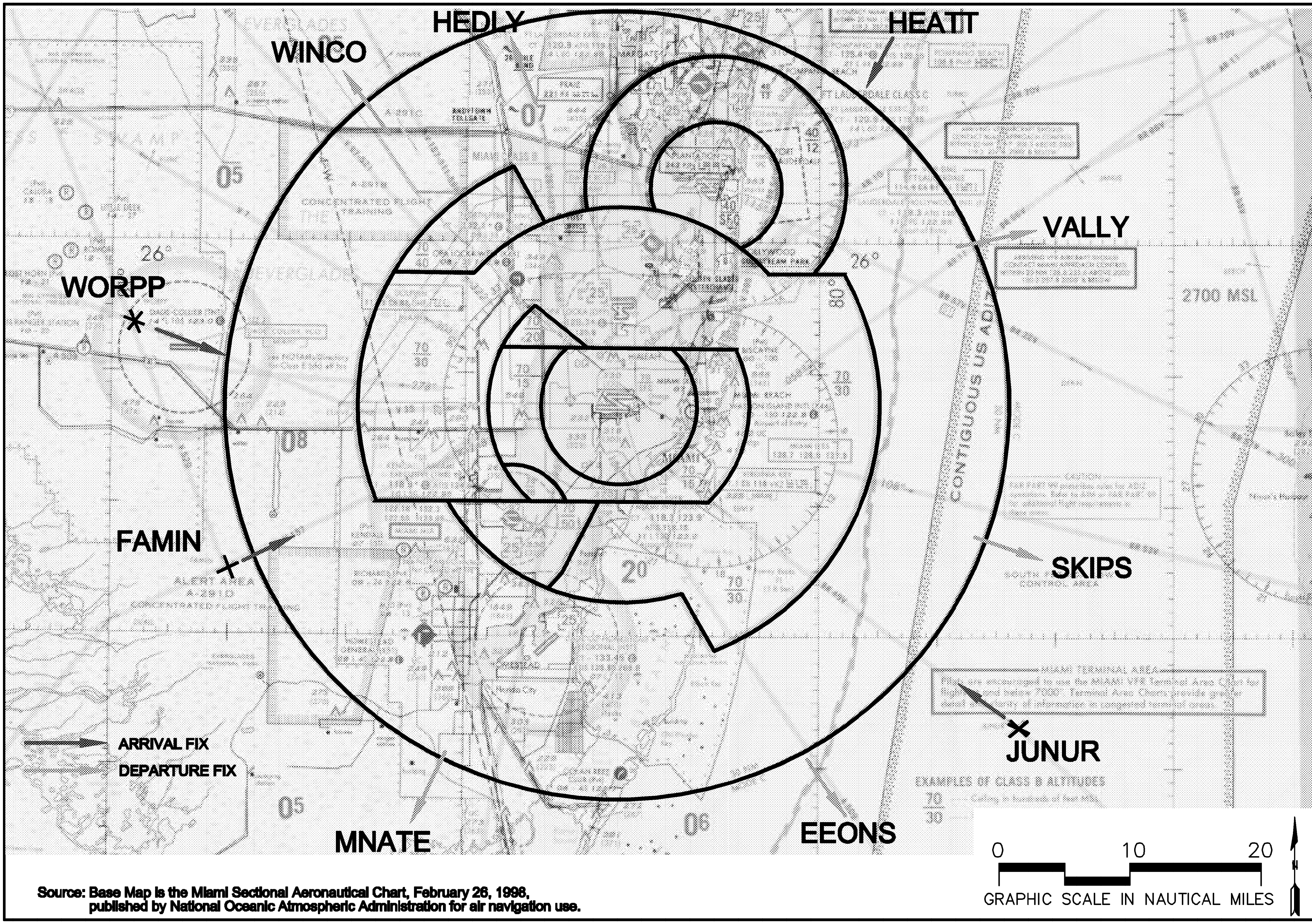
3.1 Existing Miami-Dade County Airspace

The airspace above the U.S. has been categorized by the FAA into different classes, with different operating rules, to provide maximum flexibility and safety. The airspace is classified so that maximum separation and active control of flights is provided in areas of dense operations, while allowing pilots to provide much of the needed separation themselves in light traffic areas, weather permitting. Most of the airspace over the U.S. is designated as "controlled airspace", where the FAA provides Air Traffic Control (ATC) services to separate aircraft flying under Instrument Flight Rules (IFR). Aircraft flying in controlled airspace under Visual Flight Rules (VFR) are responsible for separating themselves from other IFR or VFR aircraft. Most of the "uncontrolled airspace" above the U.S., where FAA does not provide ATC aircraft separation services, is at very low altitudes of under 1,200 feet above ground level (AGL), and away from busy airports. Compared to other areas with fewer aviation facilities, relatively little uncontrolled airspace exists above Miami-Dade County.

Air traffic in the national "controlled airspace" is managed by 22 FAA Air Route Air Traffic Control Centers (ARTCC). The ARTCC is responsible for separating aircraft flying between airports. In areas of dense air traffic, the ARTCC delegates air traffic control responsibility to the local Terminal Radar Approach Control (TRACON) or Air Traffic Control Tower (ATCT) facility. TRACON facilities are located at or near major commercial airports and usually provide ATC services to multiple airports located within the area assigned to the facility. The ARTCC and TRACON facilities responsible for HST are located in Miami, Florida.

The airspace encompassing Miami-Dade County is depicted in **Exhibit 1-2**. This airspace has been designed by the FAA to accommodate the area's high level of air traffic, and the varied characteristics of individual airports in the region. The airspace is essentially structured according to a classification system established by the Federal Aviation Administration as follows:

- Class A Airspace - Encompassing the airspace between 18,000 feet Mean Sea Level (MSL) and 60,000 feet MSL, Class A airspace overlies all other classes of airspace above the entire County. All traffic at these altitudes operate under instrument flight rules and under positive control. Most of the traffic at the higher altitudes consists of jet aircraft that are either transitioning the County's airspace, or are destined for a County or



Source: Base Map is the Miami Sectional Aeronautical Chart, February 26, 1998, published by National Oceanic Atmospheric Administration for air navigation use.

HOMESTEAD SEIS	Landrum&Brown	EXISTING MIAMI TRACON AIRSPACE	EXHIBIT 1-2

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nearby airport and have not yet descended to an arrival fix (located at 16,000 feet). Departing traffic consists of traffic climbing to an assigned enroute altitude.

- Class B Airspace - Class B airspace, formerly known as a Terminal Control Area (TCA) exists to provide a high degree of control over the air traffic associated with high density airports, such as Miami International Airport, to reduce the potential of midair collisions. Accordingly, pilot skill level and aircraft equipment are subject to certain minima, and permission must be obtained to enter Class B airspace. While operating within Class B airspace, every pilot is required to follow the instructions issued by air traffic controllers. Controllers are responsible for the separation of every aircraft in the Class B airspace, whether the aircraft is operating under IFR or VFR.

- Class C Airspace - Class C airspace, formerly known as an Airport Radar Service Area (ARSA) was designed to provide separation for medium-sized airports that did not qualify for Class B designation. The inner circle of a "standard" Class C airspace area extends from the surface to 4,000 feet above the airport elevation in a radius of 5 nautical miles from the primary Class C airspace airport. The outer circle extends from 1,200 feet above the surface to 4,000 feet above the primary airport elevation between 5 and 10 nautical miles from the primary airport. Class C airspace does not exist above Dade County. The nearest area of Class C airspace is located at Fort Lauderdale-Hollywood International Airport.

- Class D Airspace - Class D airspace exists above Opa-Locka and Kendall-Tamiami Airports as well as Homestead Air Reserve Base. Air traffic in the vicinity of these airports is under the control of the air traffic control tower. Centered on the airport, these areas generally include the airspace from the surface to 2,500 feet, with a radius of 5 nautical miles. High performance aircraft conduct training activities at HST within the Class D airspace at 2,000 feet and below, as well as 10 nautical miles southwest.

- Class E Airspace - All the remaining airspace above 1,200 feet Above Ground Level (AGL) and up to the base of the next level of controlled airspace is categorized as Class E. This airspace is considered general controlled airspace.

In addition to the above airspace classifications special-use airspace consisting of Alert Areas, A-291 B, C, and D has been designated over the County. Established to alert traffic unfamiliar with the area to high levels of flight activities, this airspace is in use during visual meteorological conditions and ranges from the surface to 3,900 feet MSL. These alert areas were established to accommodate and separate the County's high level of civilian flight training from other traffic. Because these areas do not include military operations (unlike most alert areas), no air-to-ground communication frequency or controlling agency is designated. The alert areas do not have special requirements, nor do they affect transitioning traffic.

The Miami TRACON has responsibility for air traffic within a 30 nautical mile (or approximately 35 statute mile) radius of Miami International Airport, and up to 16,000 feet AGL. In addition to HST, the following public air carrier and general aviation airports are located within the airspace controlled by the Miami TRACON:

- Miami International (MIA)
- Fort Lauderdale-Hollywood International (FLL)
- Palm Beach International (PBI)
- Kendall-Tamiami Executive (TMB)
- Homestead General Aviation (X51)
- Opa-Locka (OPF)
- Opa-Locka West (X46)
- Dade Collier Training & Transition (TNT)

Flights are transferred between the Miami ARTCC and the Miami TRACON (across the boundary of the two facilities) according to specific procedures defined in a Letter of Agreement (LOA) between these two facilities. The LOA designates transition areas, altitudes, and separations for conducting the transition of aircraft from the Miami ARTCC to the Miami TRACON. These main transition areas are referred to as fixes for arrivals and departures. Fixes are fixed points in space located along federal airways and are generally defined by the signal of one or more navigational aids. The primary Miami TRACON fixes are:

Arrival Outer Fixes	**Departure Outer Fixes**
Famin/Wever-Southwest	Winco – Northwest
Worpp – Northwest	Hedly – North
Heatt – Northeast	Vally – Northeast
Junur – Southeast	Skips – East
	Eeons – Southeast
	Mnate – South

The existing fixes are used to direct flights in and out of the Miami TRACON airspace and to the various airports. Current, as well as future, HST flights will have to be sequenced in with air traffic from other local airports including Miami International and Fort Lauderdale. Proposed changes to the airspace routes (flight tracks) were designed to reflect Miami TRACON input and to accommodate future HST traffic.

3.2 Current and Historical HST Operations

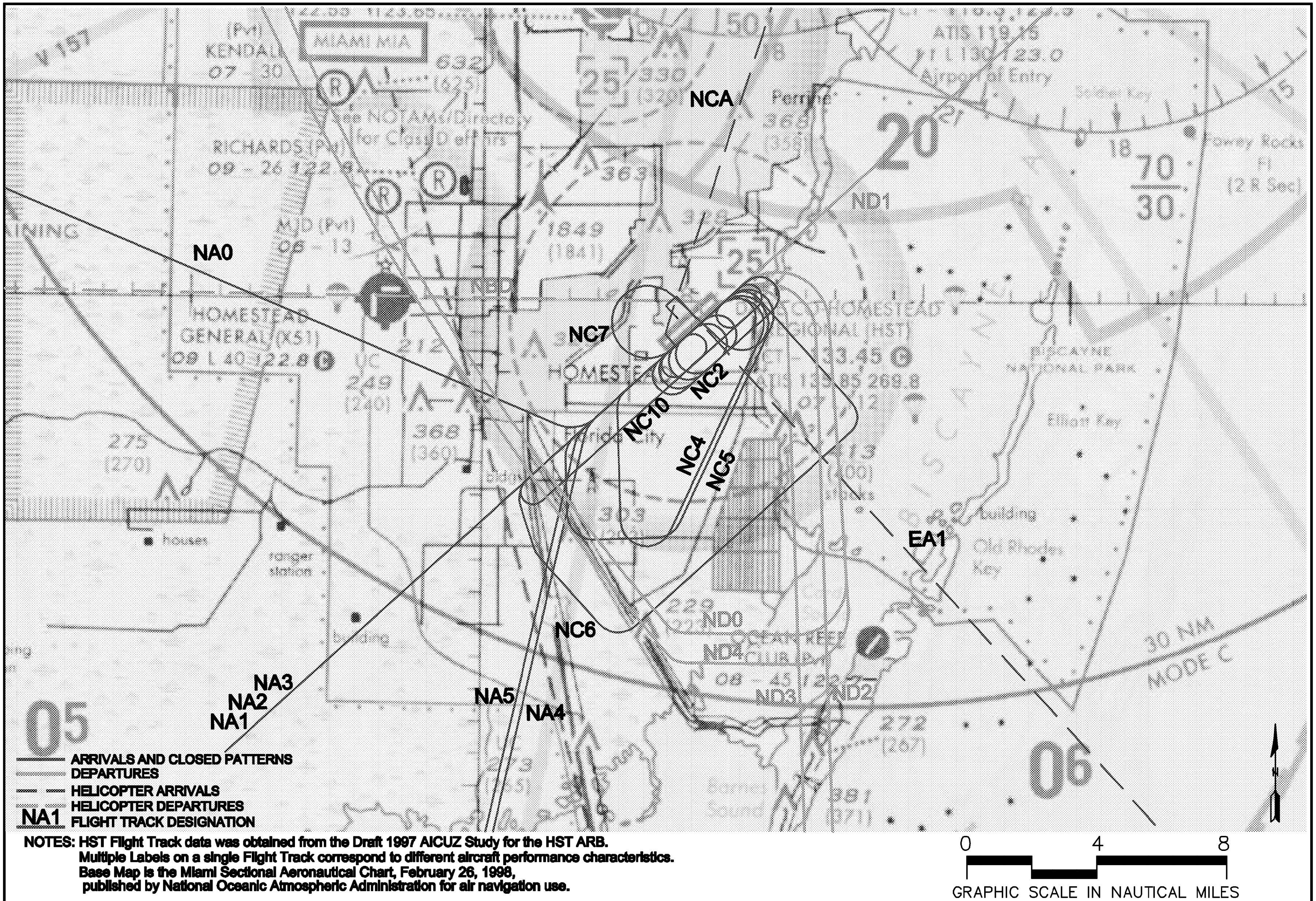
The projected level of federal operations at HST is presented in Table 1-10 of the updated forecast and consists of a total of approximately 20,000 annual federal aircraft operations. The majority of these operations (66%) are conducted by F-16 and F-15 jet aircraft based at HST. The U.S. Customs Service currently conducts about 3,600 operations annually with a mix of helicopters, turboprop and general aviation jet type aircraft. Most flight operations occur during daytime hours and consist of landings, takeoffs and "closed pattern" (or touch-and-go) movements. Closed pattern operations are performed as part of training activities and include "rectangular" patterns at 1,000, and 2,000 feet, and overhead patterns at 1,500 feet. At 1,000 feet, pattern operations are visual operations while at 2,000 feet operations are radar controlled. Overhead patterns at 1,500 feet are conducted by military fighter aircraft during initial approach to the base. A closed pattern operation includes two flight operations, approach (arrival) and takeoff (departure), as the aircraft overflies the runway without touching down.

The most recent HST Air Installation Compatible Use Zone (AICUZ) study, a draft AICUZ study conducted for the USAF in 1997, documents flight track location and utilization assumptions that are representative of current conditions. Primary flight tracks are defined for arrival, departure and closed pattern movements in an east (Runway 5) and west (Runway 23) direction. The airport operates in east flow approximately 90-95 percent of the time; west flow operations are conducted the remaining 5-10 percent. HST ground flight tracks obtained from the Draft 1997 AICUZ study are illustrated in **Exhibits 1-3 and 1-4** for east and west flow operations, respectively. As shown, current operations are conducted primarily to the west and south sides of the airport. Northbound departures on Runway 5, turn south, then west and north, to climb above MIA traffic arriving from the west. However, some departures on a northeast heading are conducted by U.S. Customs aircraft maintaining a low altitude of 2,000 feet along the coastline.

Current flight track utilization by aircraft type are presented in **Table 1-14**, based on the Draft 1997 AICUZ assumptions, with the following adjustments:

- Under current conditions, all aircraft types operate on Runway 23 (west flow), as dictated by wind. By contrast the 1997 draft AICUZ runway use assumptions only include F-16 and F-15 operations on Runway 23, as the U.S. Customs Services was not operational at HST at the time of the AICUZ study.

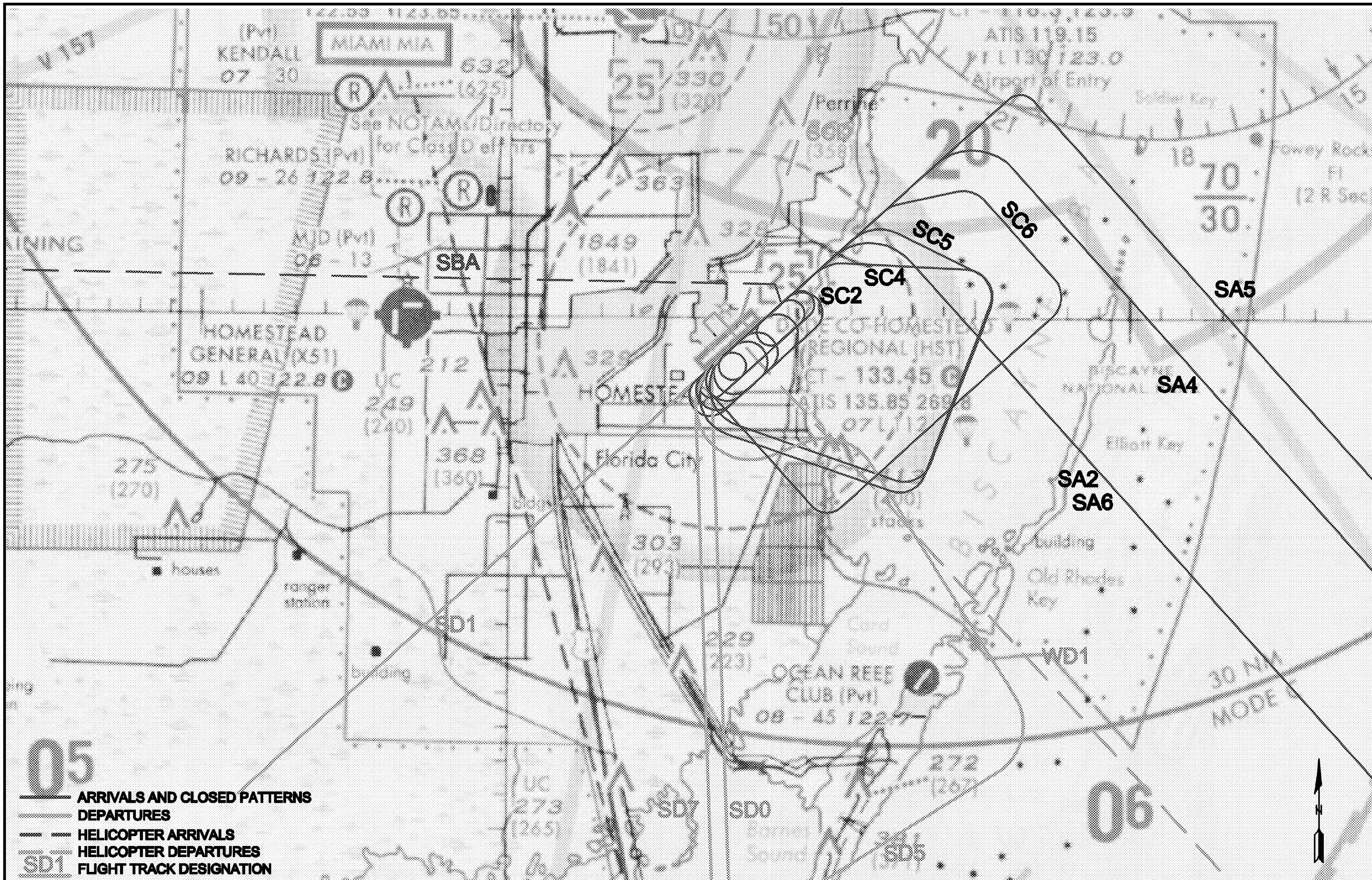
- Current flight track utilization reflect closed pattern operations by U.S. Customs and transient military aircraft, with the exception of C-5s and C-141s who do their pattern work elsewhere. The Draft 1997 AICUZ includes closed pattern operations by F-16 and F-15 aircraft only.



NOTES: HST Flight Track data was obtained from the Draft 1997 AICUZ Study for the HST ARB.
Multiple Labels on a single Flight Track correspond to different aircraft performance characteristics.
Base Map is the Miami Sectional Aeronautical Chart, February 26, 1998,
published by National Oceanic Atmospheric Administration for air navigation use.

HOMESTEAD SEIS	Landrum&Brown	EXISTING HOMESTEAD ARB EAST FLOW FLIGHT TRACKS	EXHIBIT 1-3

FileName: W:\HST\Flight Trax\July99\East_arr_compare-NEW.dwg Date: 07/21/99 @ 15:37:11



NOTES: HST Flight Track data was obtained from the Draft 1997 AICUZ Study for the HST ARB.
Multiple Labels on a single Flight Track correspond to different aircraft performance characteristics.
Base Map is the Miami Sectional Aeronautical Chart, February 26, 1998,
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GRAPHIC SCALE IN NAUTICAL MILES

HOMESTEAD SEIS	Landrum&Brown	EXISTING HOMESTEAD ARB WEST FLOW FLIGHT TRACKS	EXHIBIT 1-4

FileName: W:\HST\Flight Trax\July99\West_arr_compare-NEW.dwg Date: 07/23/99 @ 08:19:28

Table 1-14
Existing Baseline Percent of Operations By Flight Track
Distribution of Operations By Flight Track [2/]

Arrivals	Current Operations [1/]	NA0	NA1	NA2	NA3	NA4	NA5	NCA	SA2	SA4	SA5	SA6	SBA	EA1	Total
F-15	500			16.4	74.0				8.1			1.5			100.0
F-16	3,600	20.0	8.9		21.1	20.0	20.0		6.8	2.2	1.0				100.0
C-141	52		94.4								5.6				100.0
C-5	10		92.8								7.2				100.0
P-3	500		94.0								6.0				100.0
H65	500												7.9	92.1	100.0
PA31	200		93.8								6.2				100.0
C206	200		93.8								6.2				100.0
H60	200							7.8						92.2	100.0
C550	200		93.8								6.2				100.0

Departures		ND0	ND1	ND2	ND3	ND4	NBD	SD0	SD1	SD5	SD7	SCD	WD1	Total
F-15	500	70.2		10.0				10.9		8.9				100.0
F-16	3,600	33.6	0.5	3.8	1.7	50.4			0.1	9.5	0.5			100.0
C-141	52				94.4				5.6					100.0
C-5	10				92.8				7.2					100.0
P-3	500				94.0				6.0					100.0
H65	500											6.0	94.0	100.0
PA31	200		93.8						6.2					100.0
C206	200				93.8				6.2					100.0
H60	200						94.0					6.0		100.0
C550	200		93.8						6.2					100.0

Closed Pattern		NC2	NC4	NC5	NC6	NC7	NC10	SC2	SC4	SC5	SC6	Total
F-15	100	73.5						26.5				100.0
F-16	4,800	46.0	7.8	7.3	15.0	15.4	0.1	5.0	0.9	0.8	1.7	100.0
P-3	500				94.0						6.0	100.0
H65	500	94.0						6.0				100.0
PA31	500	94.0						6.0				100.0
C206	500	94.0						6.0				100.0
H60	500	94.0						6.0				100.0
C550	500				94.0						6.0	100.0

1/ Current operations are estimated based on anticipated annual activity by military and U.S. Customs Service at HST.

2/ Flight tracks are identified in Exhibits 1-3 and 1-4.

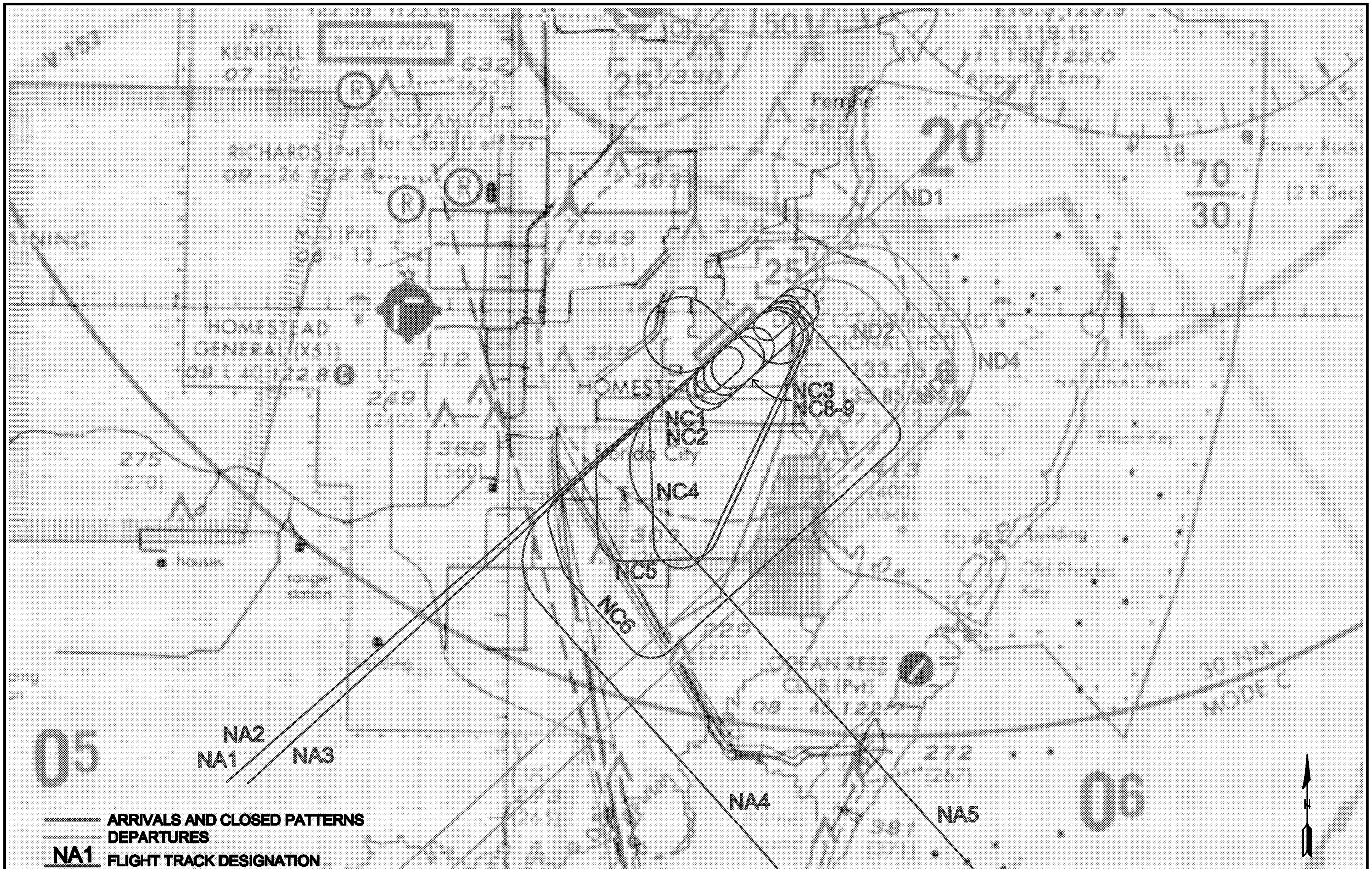
Data obtained from the earlier 1988 AICUZ study on 1987 flight track locations and utilization when Homestead was a fully active Air Force Base is presented in **Exhibits 1-5 and 1-6** and **Table 1-15** for comparison against existing conditions. According to the 1988 AICUZ study, over 500 average daily operations were conducted at HST in 1987, including 66 nighttime operations. At that time, the principal aircraft at the base were F-16s, F-4s, and C-130s. The volume of activity at the base has decreased significantly from levels experienced in 1987 as a result of the decision to close Homestead Air Force Base under the Defense Base Closure and Realignment Act of 1990. The 1987 flight tracks are similar in many respects to current patterns, with most activity concentrating on the south side of the base.

3.3 Future HST Airspace Routes

Future airspace routes for HST are defined in this section in order to represent how future civilian and military air traffic would be accommodated. The routes were developed by Landrum & Brown in consultation with the FAA's Miami TRACON and ARTCC staff according to existing FAA air traffic control procedures and in consideration of:

- Existing airspace routings for other airports in the Miami airspace including two major commercial airports - MIA and FLL.
- Performance characteristics of potential future commercial aircraft, which will differ significantly from the high performance military jets currently operating at the base.
- Increased air traffic volume, which will necessitate development of new flight tracks to/from HST to prevent potential conflicts with nearby airport traffic and to ensure safety of flight operations.

Existing HST flight tracks are depicted with generalized airspace routes for MIA arrivals and departures in **Exhibits 1-7 and 1-8**. Future airspace routes for HST were defined to allow aircraft to enter and exit the Miami TRACON airspace through each of the main outer fixes currently used for Miami air traffic. The results are illustrated in **Exhibits 1-9 through 1-12** for east and west flow, respectively. HST arrivals from the west fixes of Famin and Worpp are consolidated to enter the Miami TRACON airspace through Famin because of its location with respect to HST. Arrivals from the northwest would approach to the Famin fix while outside of the Miami TRACON airspace. The proposed generalized airspace routes for HST represent the primary or "backbone" ground flight tracks. Actual flights were distributed along, and to either side of these backbone tracks in the noise modeling process to represent the dispersion of air traffic flying between each airport and the various arrival and departure fixes.



NOTES: HST Flight Track data was obtained from the 1988 AICUZ Study for the HST ARB.
Multiple Labels on a single Flight Track correspond to different aircraft performance characteristics.
Base Map is the Miami Sectional Aeronautical Chart, February 26, 1998, published by National Oceanic Atmospheric Administration for air navigation use.

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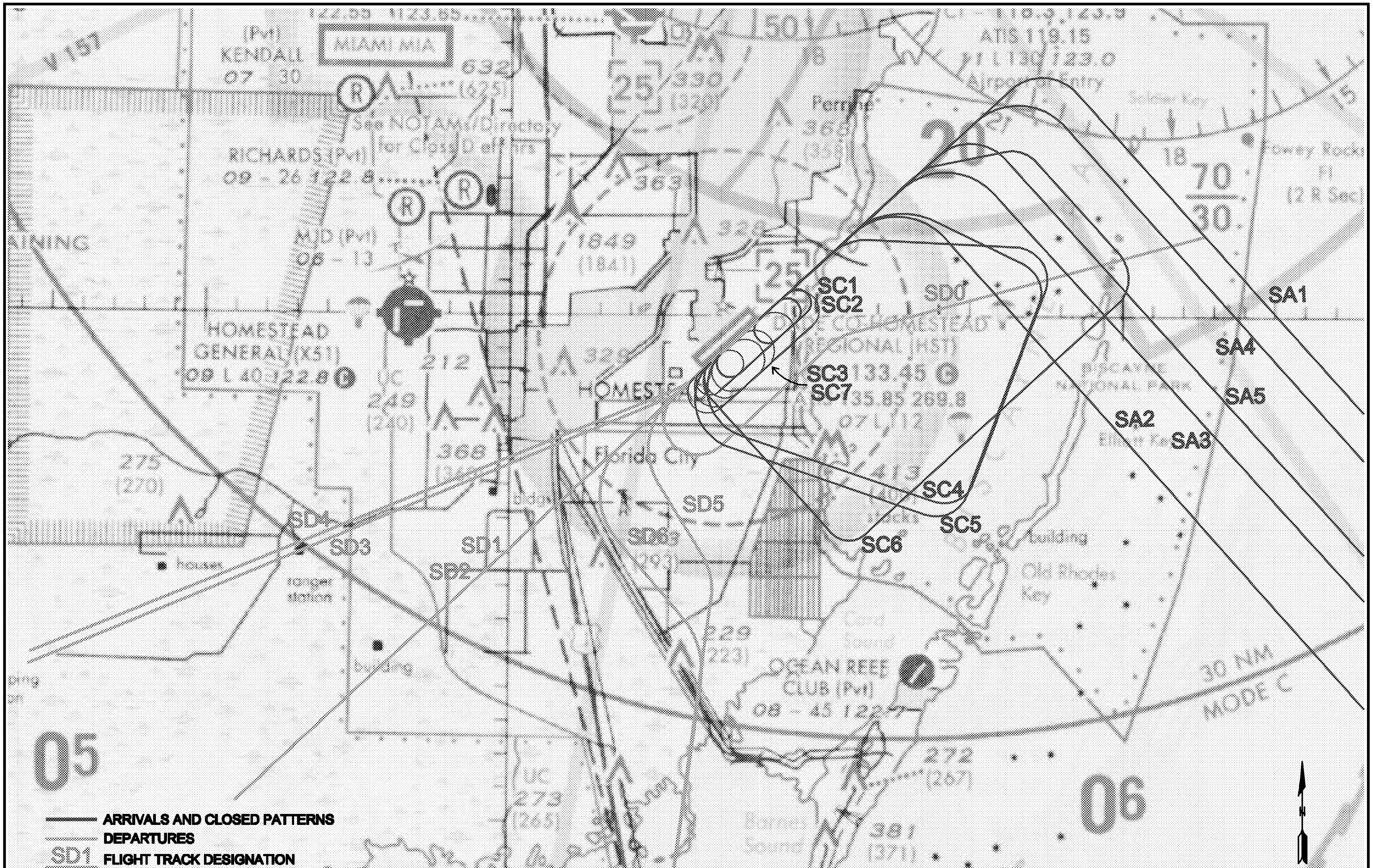
GRAPHIC SCALE IN NAUTICAL MILES

HOMESTEAD SEIS	Landrum&Brown	1988 HOMESTEAD ARB EAST FLOW FLIGHT TRACKS	EXHIBIT 1-5

FileName: W:\HST\Flight Trax\July99\East_arr_compare1988.dwg Date: 07/21/99 @ 15:44:09



NOTES: HST Flight Track data was obtained from the 1988 AICUZ Study for the HST ARB.
Multiple Labels on a single Flight Track correspond to different aircraft performance characteristics.
Base Map is the Miami Sectional Aeronautical Chart, February 26, 1998,
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GRAPHIC SCALE IN NAUTICAL MILES

HOMESTEAD SEIS	Landrum&Brown	1998 HOMESTEAD ARB WEST FLOW FLIGHT TRACKS	EXHIBIT 1-6

FileName: W:\HST\Flight Trax\July99\West_arr_compare1988.dwg Date: 07/23/99 @ 13:09:09

Table 1-15 (1 of 3)

1988 AICUZ Study – Percent of Operations By Flight Track
Arrivals

Aircraft	Total Daily Operations	Distribution of Operations By Flight Track [1/]										Total
		NA1	NA2	NA3	NA4	NA5	SA1	SA2	SA3	SA4	SA5	
A-4	0.53			100.0%								100.0%
A-7	0.10			100.0%								100.0%
B-52	0.10	100.0%										100.0%
BEC-58	0.79	100.0%										100.0%
C130	1.69	85.2%									14.8%	100.0%
C135	1.50	100.0%										100.0%
C141	0.32	100.0%										100.0%
C-5A	0.06	100.0%										100.0%
DC-9	0.37	100.0%										100.0%
E-2	0.63	100.0%										100.0%
E-3A	0.10	100.0%										100.0%
F-14	0.21			100.0%								100.0%
F-15	0.40			100.0%								100.0%
F16	75.48	34.3%	14.3%	25.8%	11.5%	5.7%	1.5%	1.7%	0.8%	0.8%	3.6%	100.0%
F-18	0.27			100.0%								100.0%
F-4	29.34	34.3%	14.2%	25.8%	11.5%	5.8%	1.5%	1.7%	0.8%	0.9%	3.6%	100.0%
KC10	0.13	100.0%										100.0%
L188	0.63	100.0%										100.0%
OV10	0.20			100.0%								100.0%
P-3	0.32	100.0%										100.0%
T-34	0.16			100.0%								100.0%
T-37	0.16			100.0%								100.0%
T-38	0.36			100.0%								100.0%
T-39	0.11	100.0%										100.0%

1/ See Exhibits 1-5 and 1-6 for flight track identification.

Table 1-15 (2 of 3)

1988 AICUZ Study – Percent of Operations By Flight Track
Departures

Aircraft	Total Daily Operations	Distribution of Operations By Flight Track [1/]											
		ND1	ND2	ND3	ND4	SD0	SD1	SD2	SD3	SD4	SD5	SD6	Total
A-4	0.53		100.0%										100.0%
A-7	0.10		100.0%										100.0%
B-52	0.10				100.0%								100.0%
BEC-58	0.79		100.0%										100.0%
C130	0.14		100.0%										100.0%
C135	1.50				100.0%								100.0%
C141	0.32				100.0%								100.0%
C-5A	0.06				100.0%								100.0%
DC-9	0.37		100.0%										100.0%
E-2	0.63		100.0%										100.0%
E-3A	0.10				100.0%								100.0%
F-14	0.21		100.0%										100.0%
F-15	0.40		100.0%										100.0%
F16	72.93	1.2%	62.5%	25.4%	5.6%	0.2%	0.1%	0.1%	0.1%	0.1%	4.3%	0.5%	100.0%
F-18	0.27		100.0%										100.0%
F-4	28.32	1.2%	62.6%	25.5%	5.6%		0.1%	0.1%	0.0%	0.0%	4.3%	0.5%	100.0%
KC10	0.13				100.0%								100.0%
L188	0.63		100.0%										100.0%
OV10	0.20		100.0%										100.0%
P-3	0.32		100.0%										100.0%
T-34	0.16		100.0%										100.0%
T-37	0.16		100.0%										100.0%
T-38	0.36		100.0%										100.0%
T-39	0.11		100.0%										100.0%

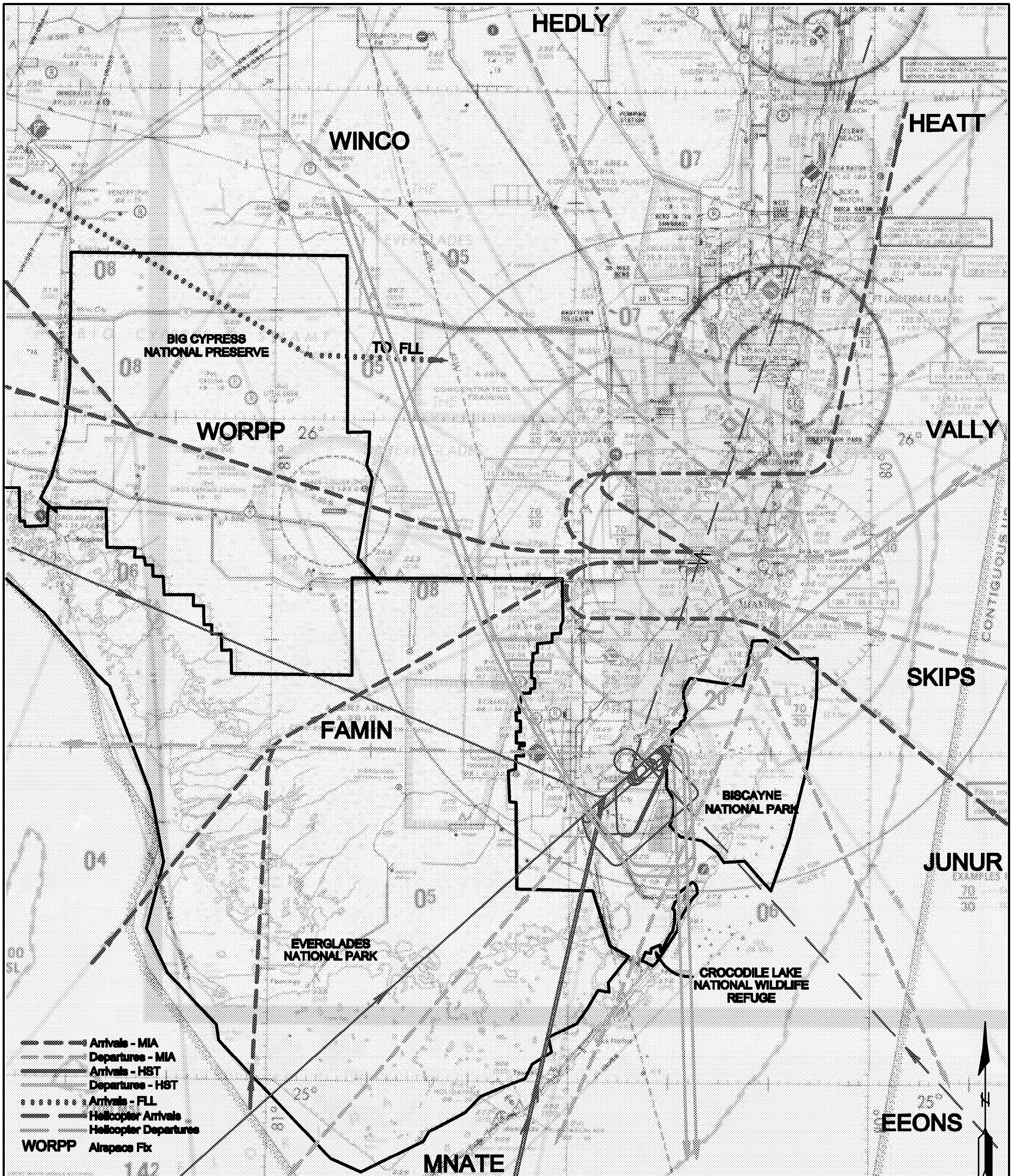
1/ See Exhibits 1-5 and 1-6 for flight track identification.

Table 1-15 (3 of 3)

1988 AICUZ Study - Percent of Operations By Flight Track
Closed Pattern Operations

Aircraft	Total Daily Operations	NC1	NC2	NC3	NC4	NC5	NC6	NC7	NC8	NC9	SC1	SC2	SC3	SC4	SC5	SC6	SC7	Total
		Distribution of Operations By Flight Track [1/]																
A-4	3.16								100.0%									100.0%
C130	19.90	18.1%					33.7%		22.6%	18.1%						2.5%	5.0%	100.0%
C135	2.72						100.0%											100.0%
F16	197.38	27.0%	2.9%	1.8%	20.7%	13.5%	11.3%	19.1%			0.7%	0.7%	0.1%	1.1%	0.4%	0.9%		100.0%
F-4	77.16	29.9%	2.6%	1.8%	39.5%	13.5%	8.5%				0.7%	0.7%	0.1%	1.1%	0.4%	1.3%		100.0%
L188	5.04						100.0%											100.0%
T-34	0.64								100.0%									100.0%

1/ See Exhibits 1-5 and 1-6 for flight track identification.



NOTES: MIA Airspace routes were developed from actual MIA RADAR Data from 5/31/98 - 6/7/98
Future Proposed HST Airspace Routes were developed in consultation with Miami TRACON.
Base Map is the Miami Sectional Aeronautical Chart, February 26, 1998,
published by National Oceanic Atmospheric Administration for air navigation use.

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GRAPHIC SCALE IN NAUTICAL MILES

HOMESTEAD SEIS	Landrum&Brown	EXISTING MIA AIRSPACE ROUTES & FUTURE HST MILITARY / GOVERNMENT FLIGHT TRACKS - EAST FLOW	EXHIBIT 1-7

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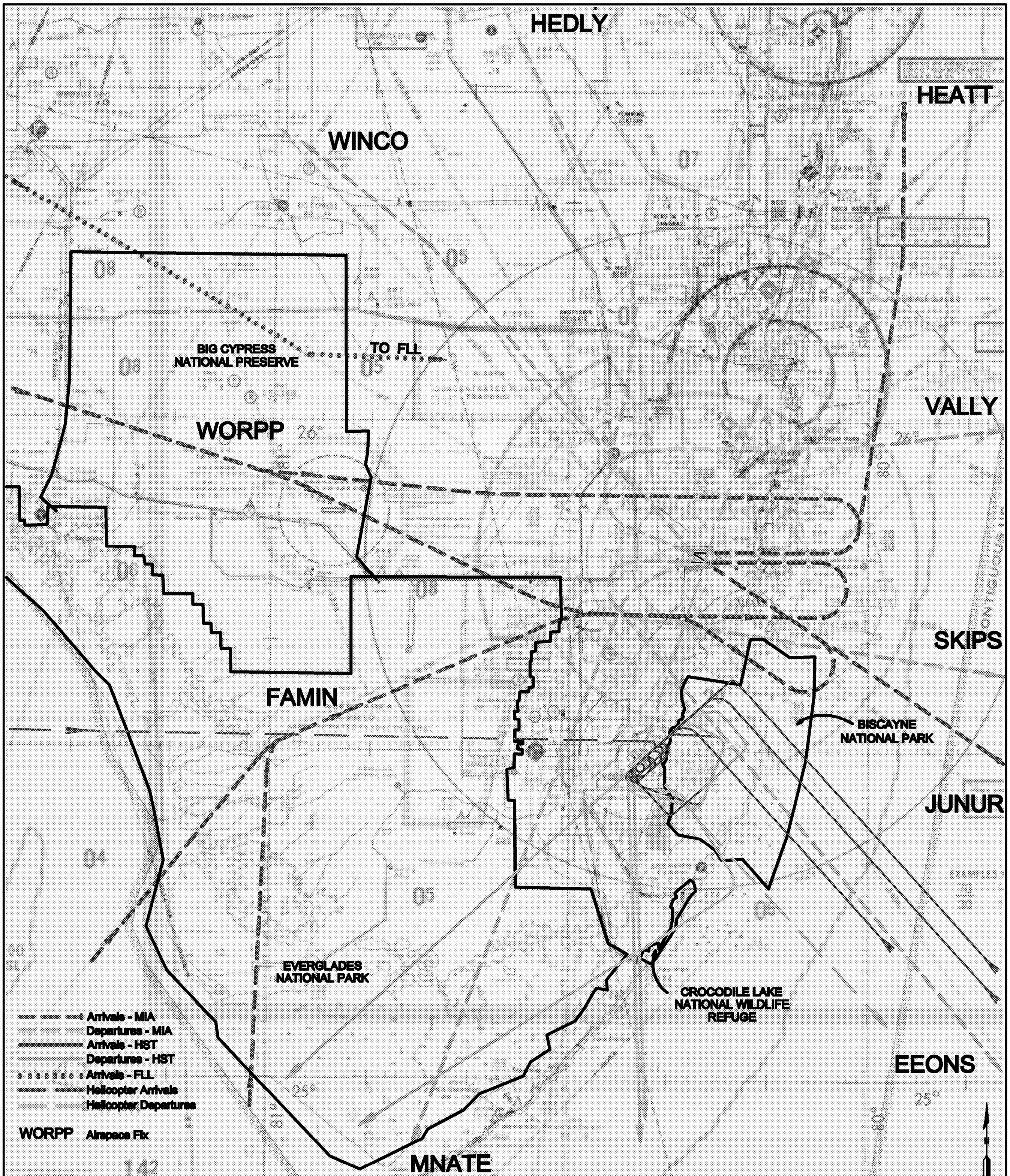

NOTES: MIA Airspace routes were developed from actual MIA RADAR Data from 5/31/98 - 6/7/98
Future Proposed HST Airspace Routes were developed in consultation with Miami TRACON.
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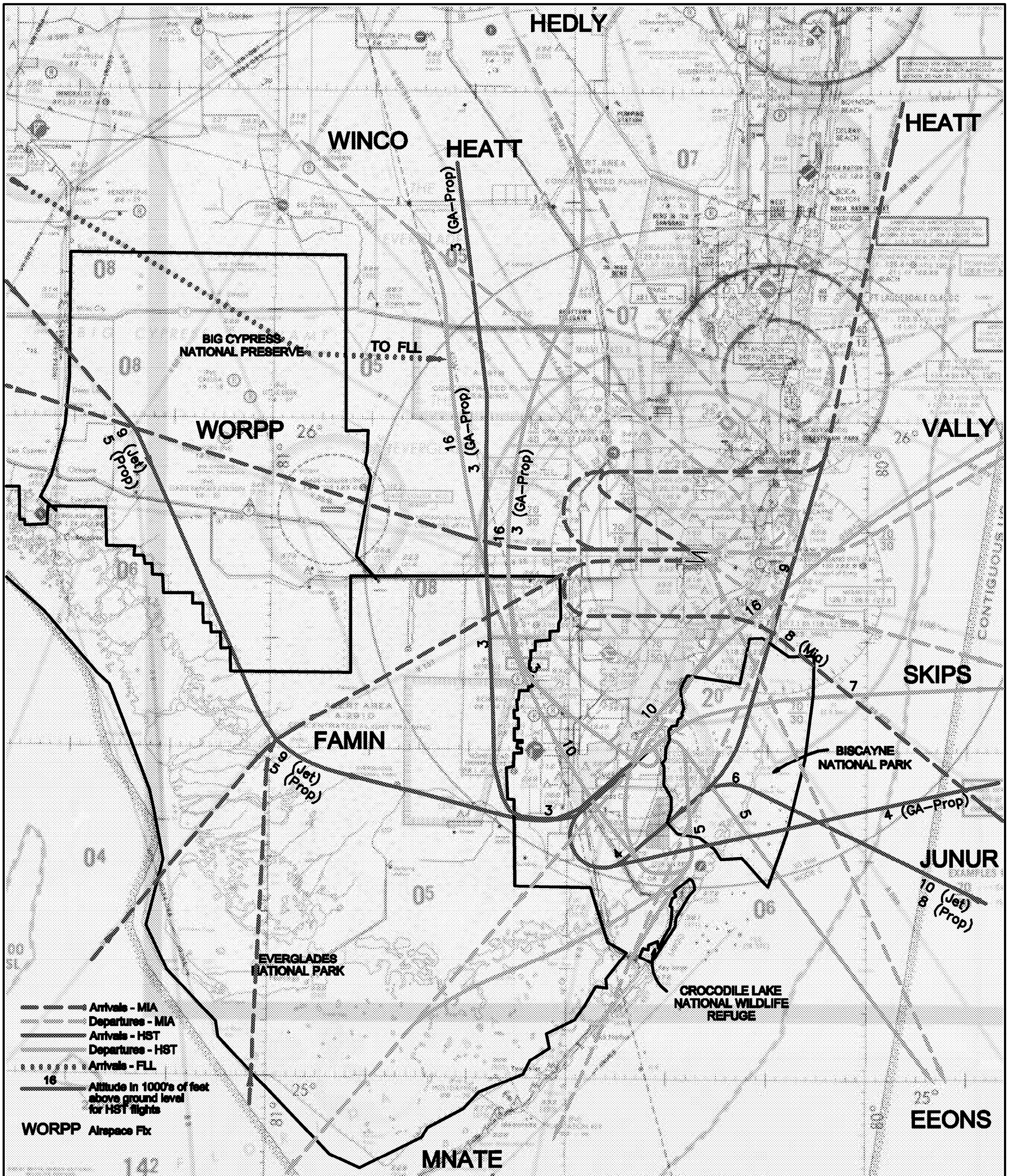
HOMESTEAD SEIS	Landrum&Brown	EXISTING MIA AIRSPACE ROUTES & FUTURE HST MILITARY / GOVERNMENT FLIGHT TRACKS - WEST FLOW	EXHIBIT 1-8

FileName: W:\HST\Flight Trax\July99\West_arr_mia.dwg Date: 07/23/99 @ 08:27:16



NOTES: MIA Airspace routes were developed from actual MIA RADAR Data from 5/31/98 - 6/7/98
Future Proposed HST Airspace Routes were developed in consultation with Miami TRACON.
Base Map is the Miami Sectional Aeronautical Chart, February 26, 1998, published by National Oceanic Atmospheric Administration for air navigation use.

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GRAPHIC SCALE IN NAUTICAL MILES

HOMESTEAD SEIS	Landrum&Brown	EXISTING MIA & FUTURE PROPOSED HST CIVIL ITINERANT AIRSPACE ROUTES – EAST FLOW	EXHIBIT 1–9

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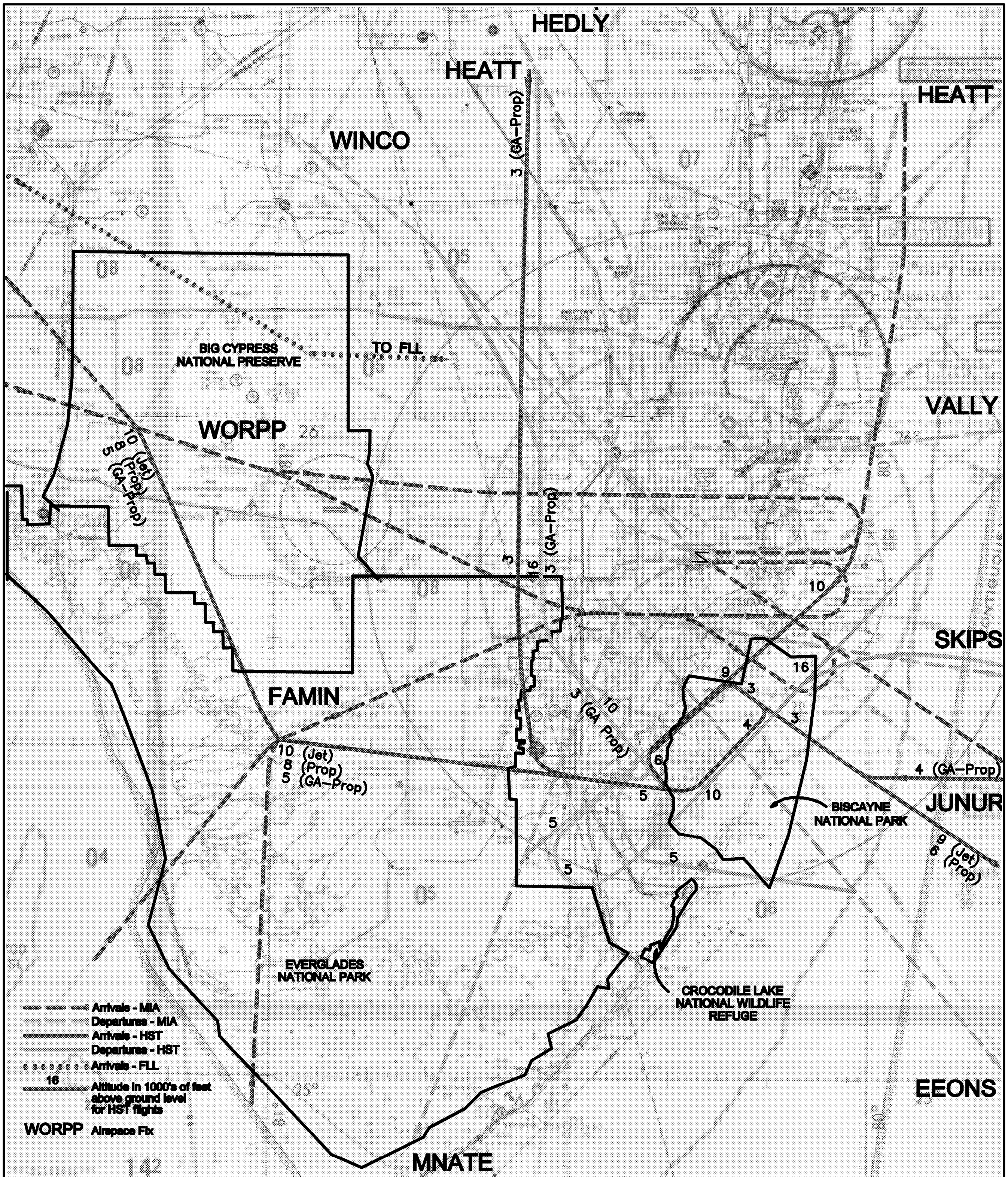

NOTES: MIA Airspace routes were developed from actual MIA RADAR Data from 5/31/98 - 6/7/98
Future Proposed HST Airspace Routes were developed in consultation with Miami TRACON.
Base Map is the Miami Sectional Aeronautical Chart, February 26, 1998,
published by National Oceanic Atmospheric Administration for air navigation use.

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GRAPHIC SCALE IN NAUTICAL MILES

HOMESTEAD SEIS	Landrum&Brown	EXISTING MIA & FUTURE PROPOSED HST CIVIL ITINERANT AIRSPACE ROUTES – WEST FLOW	EXHIBIT 1–10

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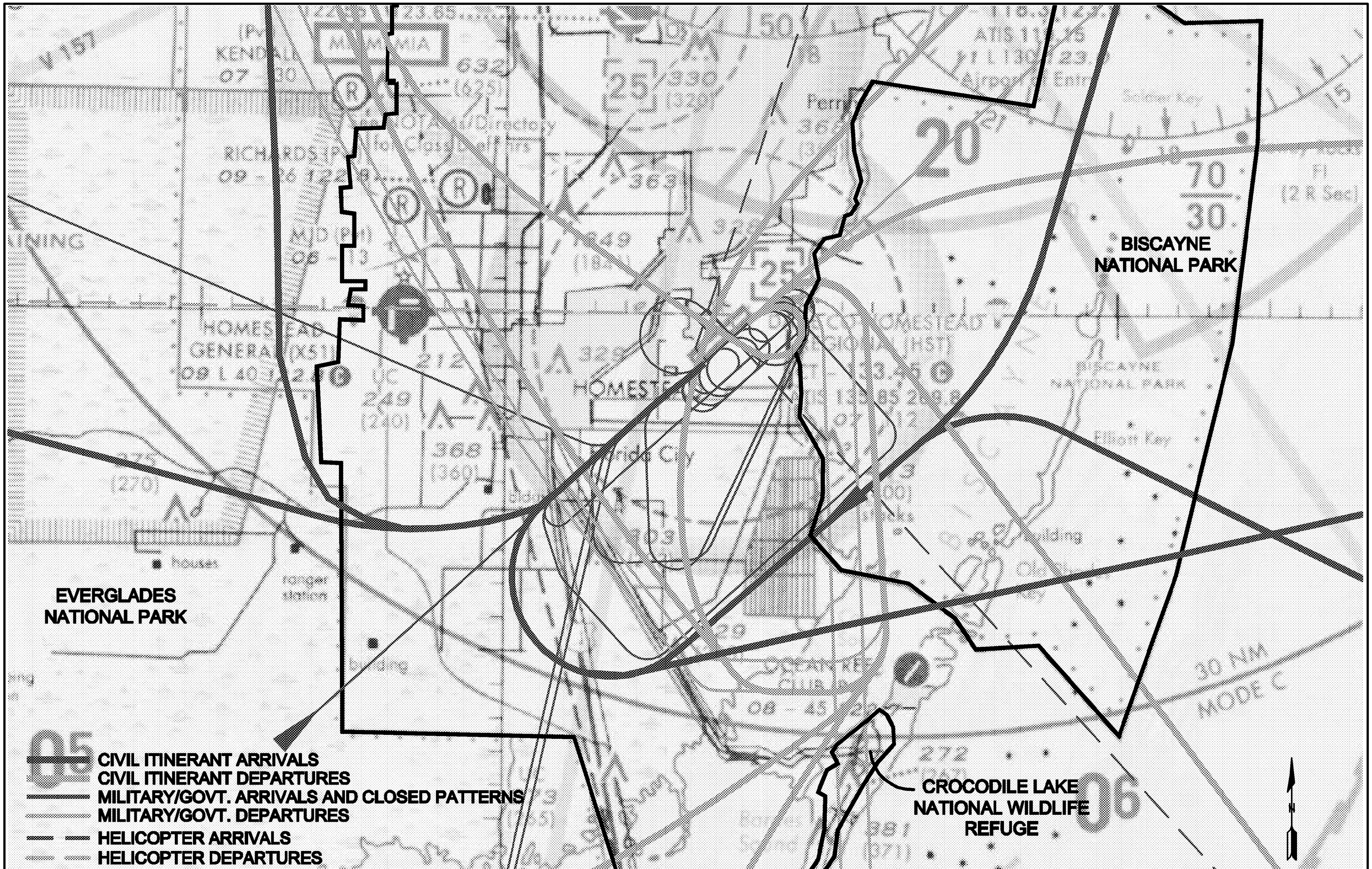

NOTES: Future Proposed HST Airspace Routes were developed in consultation with Miami TRACON
HST Flight Track data was obtained from the Draft 1997 AICUZ Study for the HST ARB.
Base Map is the Miami Sectional Aeronautical Chart, February 26, 1998,
published by National Oceanic Atmospheric Administration for air navigation use.

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GRAPHIC SCALE IN NAUTICAL MILES

HOMESTEAD SEIS	Landrum&Brown	FUTURE PROPOSED HST EAST FLOW FLIGHT TRACKS/AIRSPACE ROUTES	EXHIBIT 1-11

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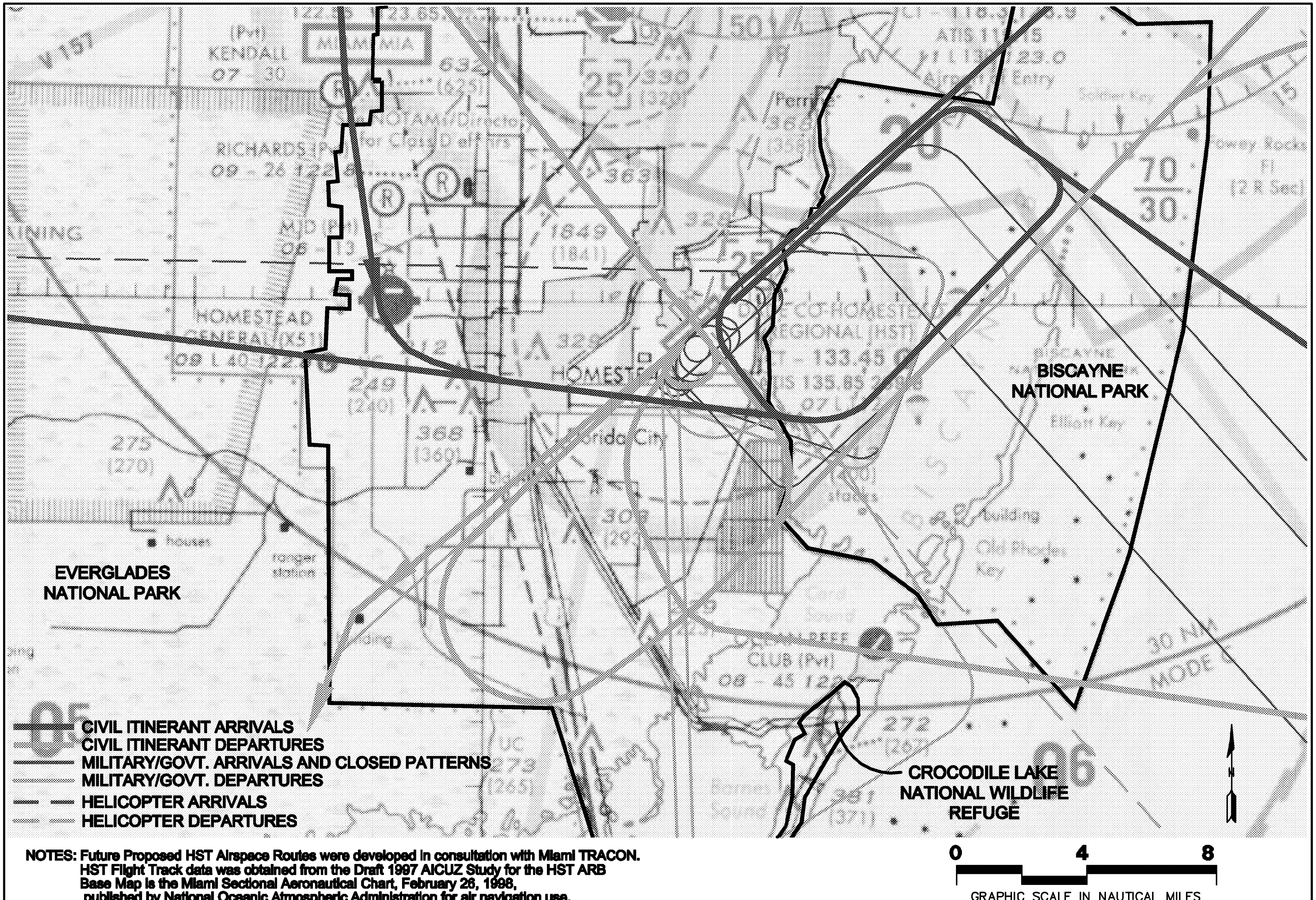

NOTES: Future Proposed HST Airspace Routes were developed in consultation with Miami TRACON.
HST Flight Track data was obtained from the Draft 1997 AICUZ Study for the HST ARB
Base Map is the Miami Sectional Aeronautical Chart, February 26, 1998,
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HOMESTEAD SEIS	Landrum&Brown	FUTURE PROPOSED HST WEST FLOW FLIGHT TRACKS/AIRSPACE ROUTES	EXHIBIT 1-12

FileName: W:\HST\Flight Trax\July99\West_flow-NEW.dwg Date: 07/22/99 @ 09:54:47

The altitudes expected along the departure and approach airspace routes are assumed to reflect, except as noted, unrestricted climbs to 18,000 feet and above or descents from above 18,000 feet. The unconstrained rates of climb are dependent upon the type of aircraft used. Generally, small single and twin-engine general aviation piston propeller aircraft are expected to fly at low altitudes between 2,000 and 5,000 feet, except when landing or taking off from the airport. Helicopter aircraft are expected to climb to and maintain 1,000 feet of altitude during their courses through the area. Except where indicated below, the typical departure clearance structure would provide initial clearances to 3,000 feet, followed by unrestricted climbs to 16,000 feet and above, except where a mid-altitude clearance is needed for air traffic coordination.

The projected departure climbs, as noted in Exhibits 1-9 and 1-10, are:

East Flow:

- Winco and Hedly departures climb to 5,000 feet and maintain altitude until crossing under the downwind approach from Junur and Heatt to HST, then unrestricted to cross over MIA approaches from Worpp and Famin at 10,000 feet or above.

- Vally departures climb to 5,000 feet and maintain altitude until crossing under the downwind approach from Junur and Heatt to HST, then unrestricted to cross over Junur approach to MIA and Heatt approach to HST at or above 10,000 feet.

- Skips departures climb to 7,000 feet and maintain altitude until crossing under Junur approach course to MIA, then unrestricted to enroute altitude.

- Eeons and Mnate departures climb to 5,000 feet and maintain altitude to cross under the downwind approach from Junur and Heatt to HST, then unrestricted to enroute altitude.

West Flow:

- Winco and Hedly departures climb unrestricted, crossing over the airport at or above 10,000 feet and crossing over the MIA approaches from Worpp and Famin at or above 16,000 feet.

- Vally and Skips departures climb unrestricted, passing abeam HST at 10,000 feet then unrestricted to 16,000 feet and above.

- Eeons departures climb and maintain 5,000 feet to cross under Vally/Skips departures from HST then unrestricted to 16,000 feet and above.

- Mnate departures climb unrestricted to 16,000 feet or above.

The projected altitudes for approaching traffic are:

East Flow:

- Worpp jets and props cross the fix at 9,000 feet and 5,000 feet, respectively and maintain altitude to Famin, thence descend and enter final approach course at 3,000 feet.

- Famin jets and props cross the fix at 9,000 feet and 5,000 feet, respectively, and descend to intercept final approach course at 3,000 feet.

- Heatt arrivals cross approaches from Junur to MIA at 9,000 feet, descend to intercept downwind segment of HST approach at 6,000 feet, descend and intercept final approach course at 3,000 feet.

- Junur jets and large props cross fix at 10,000 feet and 8,000 feet, respectively, descend to intercept downwind segment of HST approach at 6,000 feet, descend and intercept final approach course at 3,000 feet.

West Flow:

- Worpp jets, large prop and light general aviation props cross fix at 10,000 feet, 8,000 feet and 5,000 feet, respectively and maintain altitude to Famin, thence descend and enter left downwind approach course at 5,000 feet, descent and intercept final approach course at 3,000 feet.

- Famin jets, large props and light general aviation props cross fix at 10,000 feet, 8,000 feet and 5,000 feet, respectively, thence descend and enter left downwind approach course at 5,000 feet, descent and intercept final approach course at 3,000 feet.

- Heatt jet and large prop aircraft cross approaches from Junur to MIA at 10,000 feet, descend and cross the airport at 9,000 feet to intercept downwind segment of HST approach at 6,000 feet, descend and intercept final approach course at 3,000 feet.

- Junur jets and props cross fix at 9,000 feet and 6,000 feet, respectively, descend to intercept a left base approach at 3,000 feet, turn to intercept final approach course at 3,000 feet.

3.4 Comparison with 1994 HST Master Plan Flight Tracks

The proposed flight tracks, developed in consultation with the Miami TRACON and ARTCC, in some cases differ substantially from routes proposed in the 1994 HST Master Plan. The Master Plan's east and west flow airspace routes are illustrated in

Exhibits 1-13 and 1-14. Modifications to the Master Plan's proposed routes were required due to potential air traffic conflicts with MIA, as identified by the Miami TRACON. These conflicts include:

- HST northbound departures must overfly arrivals to MIA from the Famin and Worpp fixes. At the point at which HST northbound departures need to cross over MIA west arrivals, MIA arrivals are at altitudes as high as 12,000 to 14,000 ft. As a result, HST northbound departures need to climb to altitudes of 14,000 to 16,000 ft. in order to cross over MIA arrivals from Famin. The climb performance of the future commercial aircraft fleet forecast for HST indicates that aircraft may need to fly distances of between 25 and 35 nautical miles in order to reach 14,000 to 16,000 feet of altitude. These distances, place aircraft at the edge (possibly outside) of the Miami TRACON airspace if they were to make a left turn from Runway 5 which is not a desirable situation for Air Traffic Control. Instead, departures should first head south and later turn northbound to gain sufficient altitude to clear MIA traffic while within the Miami TRACON control. Northeasterly departures would also conduct a similar operation to climb over MIA traffic.

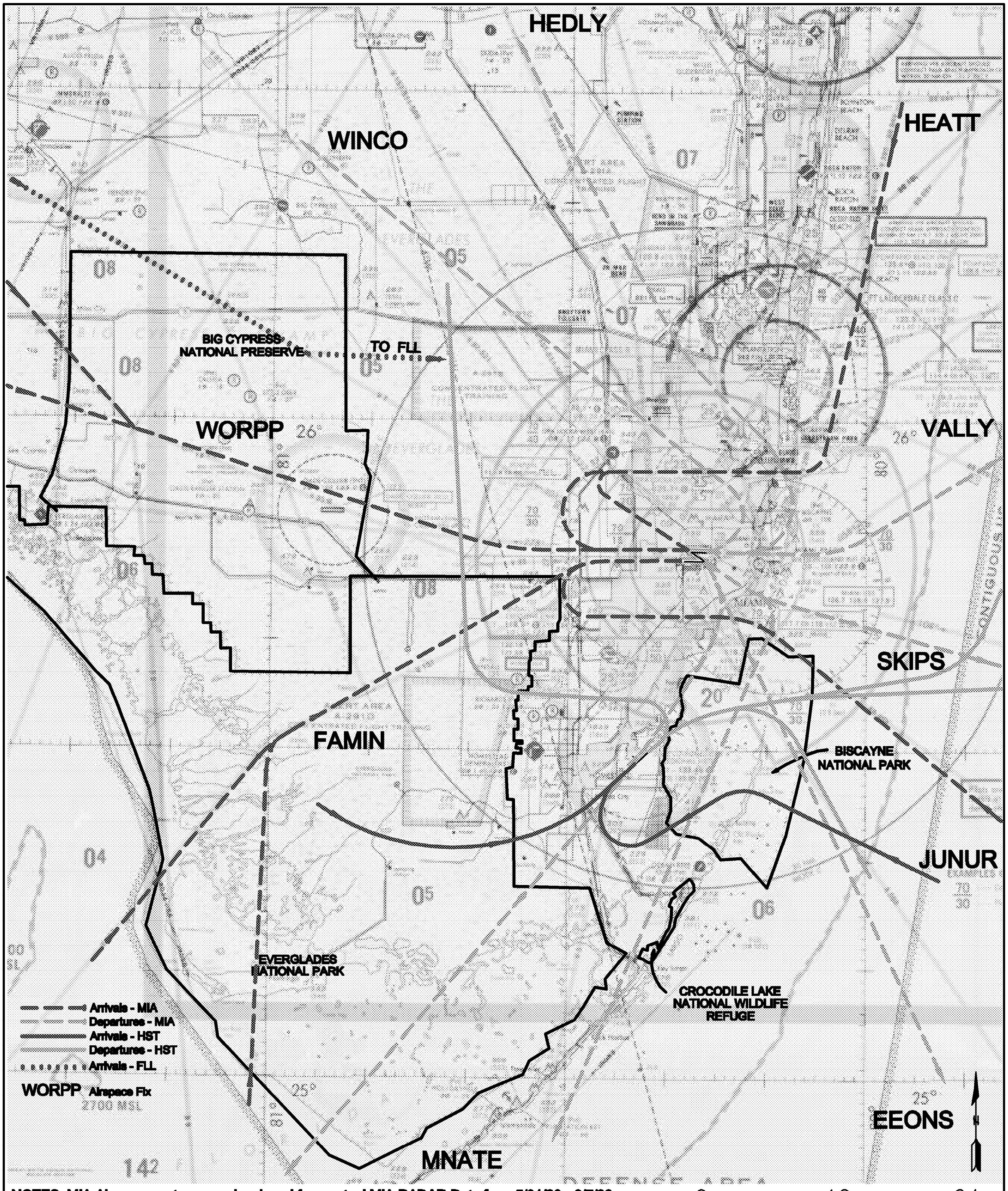
- Runway 5 departures climbing in an easterly direction begin to interfere with MIA southbound departures, as they move away from HST. In order to keep HST departures below MIA air traffic they would be restricted from climbing if continuing in an easterly/northeasterly direction as depicted in the Master Plan. In order to avoid undesirable climb restrictions HST southbound departures should turn south as soon as possible after takeoff.

- The MIA southeast approach boundary is approximately 10 nautical miles northeast of HST. The close proximity of HST to MIA's airspace boundary in addition to the converging geometry of Runway 30 at MIA with Runway 23 at HST do not provide sufficient distance to conduct approaches to Runway 23 from the north side of the airport.

- Historically, all traffic patterns at HST have been to the south of the airport to not interfere with MIA and other local airport traffic. Runway 5 arrivals from the north should approach from the south side of the airport due to HST's proximity to MIA's airspace boundary north of HST.

3.5 Future HST Flight Track Utilization

Utilization of arrival and departure airspace routes by future civil itinerant operations will be dependent on the origin and destination of these flights. Since these are unknown and difficult to predict, future route utilization assumptions were derived using MIA's distribution of activity by fix from the TRACON's Automated Radar Terminal System (ARTS) radar data sample collected during the week of 5/31/98 through 6/7/98, and according to the following assumptions:



NOTES: MIA Airspace routes were developed from actual MIA RADAR Data from 5/31/98 - 6/7/98
Future HST routes per 1994 Homestead Air Force Base Feasibility Study, Airport Master Plan
Base Map is the Miami Sectional Aeronautical Chart, February 26, 1998,
published by National Oceanic Atmospheric Administration for air navigation use.

0 12 24
GRAPHIC SCALE IN NAUTICAL MILES

HOMESTEAD SEIS	Landrum&Brown	EXISTING MIA & FUTURE HST MASTER PLAN CIVIL ITINERANT AIRSPACE ROUTES - EAST FLOW	EXHIBIT 1-13

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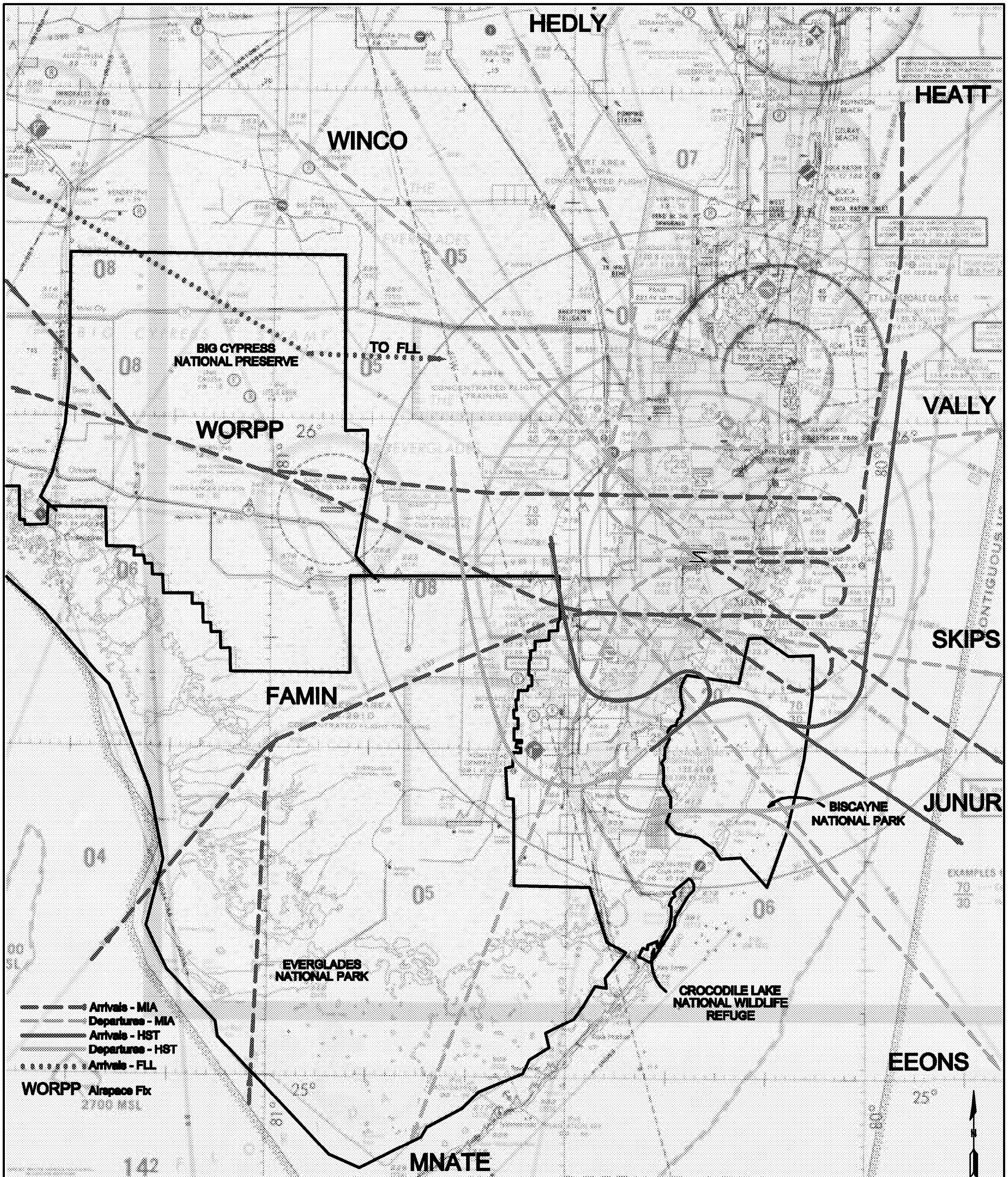

NOTES: MIA Airspace routes were developed from actual MIA RADAR Data from 5/31/98 - 6/7/98
Future HST routes per 1994 Homestead Air Force Base Feasibility Study, Airport Master Plan
Base Map is the Miami Sectional Aeronautical Chart, February 26, 1998,
published by National Oceanic Atmospheric Administration for air navigation use.

HOMESTEAD SEIS	Landrum&Brown	EXISTING MIA & FUTURE HST MASTER PLAN CIVIL ITINERANT AIRSPACE ROUTES - WEST FLOW	EXHIBIT 1-14

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- Caribbean and Latin America passenger operations were distributed among Skips, Eeons and Mnate fixes for departures and Junur and Famin fixes for arrivals.

- Domestic passenger operations were distributed among Winco, Hedly and Vally fixes for departures and Worpp and Heatt fixes for arrivals.

- Other civil operations were distributed among all fixes with exception of itinerant, prop general aviation operations.

- A limited amount of general aviation operations (5% or less) were assigned to each fix serving the Caribbean and Latin America.

The resulting percentages of itinerant civil arrivals and departures by airspace fix/route in east and west flows are presented in **Table 1-16**.

Table 1-16
Percent of Future Civil Itinerant Operations By Fix

	Latin/Caribbean Pax. Operations		Domestic Pax. Operations		Prop GA Operations		All Other Civil Operations	
Fix	**East Flow**	**West Flow**	**East Flow**	**West Flow**	**East Flow**	**West Flow**	**East Flow**	**West Flow**
Departure								
Winco	-	-	36.8	39.8	33	35	21	21
Hedly	-	-	35.1	40.7	32	37	20	22
Vally	-	-	28.1	20.4	25	18	16	11
Skips	41.9	43.5	-	-	3	3	18	20
Eeons	20.9	21.7	-	-	2	2	9	10
Mnate	37.2	34.8	-	-	5	5	16	16
Arrival								
Worpp	-	-	42.3	38.3	38	35	22	23
Heatt	-	-	57.7	61.7	52	55	30	37
Junur	62.5	65.0	-	-	5	5	30	26
Famin	37.5	35.0	-	-	5	5	18	14

The proposed new arrival and departure flight tracks for future operations do not require changes to existing arrival and departure patterns at HST. Closed pattern military operations will become more disruptive to commercial operators as commercial activity increases. However, since the projected volume of military pattern operations is relatively low (4,900 annual arrivals and departures) it is assumed that pattern operations will continue to occur in the future, although a slight adjustment to peak periods might be required. Therefore, current flight tracks and utilization for HST, presented earlier in Table 1-14, are assumed to be representative of future conditions for military and government activity. Additionally, future local general aviation (i.e. non-itinerant) operations are expected to be conducted on current "rectangular" closed pattern flight tracks (at 1,000 and 2,000 feet).

CHAPTER 2. MIAMI-DADE COUNTY'S PLANS FOR FUTURE RUNWAY DEVELOPMENT AT HOMESTEAD

1. INTRODUCTION

The maximum single-runway scenario, presented in Chapter 1, outlined the facility requirements needed to accommodate the maximum level of activity for HST assuming a single-runway facility. This chapter describes what happens at HST airport if and/or when, this maximum single-runway scenario is reached and a second runway is required to accommodate additional air traffic. Many factors influence the probability of developing a second runway at HST; these include outside circumstances such as a strong O&D (origination and destination) market, participation of willing and able airline carriers, and the financial means to fund development. There are also federal, state, and local approvals that govern development at airports. These issues, as well as Miami-Dade County's plans for the development of a second runway at HST, including alternative second runway implementation and maximum build-out schedules, are presented in the following sections. The final section of this chapter describes the proposed scenario for SEIS evaluation of future airport development impacts, assuming all non-governing (outside factors) obstacles are overcome and governing (federal, state, and local) approvals are obtained. This chapter is organized as follows:

- Miami-Dade County's Plans for Future Development of Homestead Airport
- Factors Influencing the Development of New Commercial Service Airports
- Federal, State, and Local Approvals Governing Future Development of Homestead Airport
- Scenarios for Assessment of Impacts Due to Future Development at Homestead Airport
- Selected Future Airport Development Scenario for Analysis in the Homestead Reuse SEIS

2. MIAMI-DADE COUNTY'S PLANS FOR FUTURE DEVELOPMENT OF HOMESTEAD AIRPORT

Long-term development plans for HST, are documented in the 1994 Master Plan and Airport Layout Plan, the 1996 long-term lease with developer HABDI and the 1998 CDMP. These studies document Miami-Dade County's plans for developing HST after transfer from the Military. The Master Plan presents the most detailed plans for future development at HST, including the potential long-term expansion to a two-runway airfield system.

(1) Homestead Master Plan's Proposed Development

Miami-Dade County prepared a Master Plan in order to determine future facility requirements for the Airport. A master plan's findings/recommendations are typically depicted in a "plans package," prepared at the conclusion of the study. The plans package is centered around the airport layout plan (ALP) drawing. The ALP depicts the airport as it exists today, as well as the facilities recommended to accommodate anticipated demand throughout the planning period. If successful, the master plan process culminates with Federal Aviation Administration (FAA) unconditional approval of the ALP, which is required in order for an airport development project to commence at any airport that accepts Federal funding. Development projects reflected on an ALP, however, may never be implemented as depicted. The ability of an airport sponsor to implement a planned project is dependent on many critical factors including attainment of demand projections, environmental processing and permitting, financial feasibility, and adequate funding sources.

According to the 1994 Master Plan's projections of aviation demand at HST, development of a second runway would occur around the year 2005. The study recommends that the second runway be developed in stages, as necessary, depending on demand. The first phase of the runway (5,500 feet) was planned for initial short-term development, with a 3,500-foot expansion planned for long-term development to accommodate air carrier activity. The ALP depicts an ultimate or long-term runway (5R-23L) measuring 9,000 feet in length, designed to accommodate aircraft with wingspans up to 261 feet and approach speeds up to 165 knots. Long-term plans for Runway 5R indicate that it would be a precision instrument runway, equipped with a high intensity approach lighting system with sequenced flashing lights (ALSF-2). Runway 23L is planned as a precision instrument runway as well, with a medium intensity approach lighting system with runway alignment indicator lights (MALSR). Long-term plans also call for precision approach path indicators (PAPI) for both runway ends, high intensity runway lights (HIRL) for the entire runway, and runway visual range (RVR) units and touchdown zone lighting for Runway 5R. To further enhance the capacity of the second runway, high-speed turn-offs and a full-length parallel taxiway are planned for development. Ultimately, the parallel taxiway is to be equipped with hold pads and blast pads at both Runway ends 5R and 23L. Long-term land acquisition will be necessary for the second parallel runway development and potential landside expansion because the Homestead property is not large enough for this second runway and associated development.

Based on the 1994 Master Plan recommendations, long-term terminal area development would occupy the area between the (widely spaced) parallel long-term Runways 5R-23L and 5L-23R. This area would also contain a relocated airport rescue and fire fighting facility (ARFF) and air traffic control tower (ATCT). The ATCT relocation would be required because of the line-of-sight obstructions caused by the long-term terminal area development. The long-term terminal development area would be served by an access road that extends from S.W. 112th Avenue, the main airport access road, into the midfield terminal area.

(2) <u>Future Homestead Development Under the HABDI and the CDMP Plan</u>

In general, the 1994 HST Master Plan provides greater detail regarding future long-term development at the Airport, than do the HABDI or CDMP studies. The HABDI lease allows the Homestead Air Base Developers, Inc. to develop the airfield, terminal, and aviation portion of the base for 45 years and the support areas for 55 years. Most of the HABDI requirements, with the exception of airfield recommendations, are consistent with the 1994 Master Plan, only less aggressive. The requirements discussed in the HABDI plan focus on airside and landside improvements, but exclude any descriptions of short-term or long-term airfield improvements.

The CDMP is the County's Comprehensive Development Master Plan, as amended June 16, 1998. The CDMP foresees HST as a commercial airport, used not only to fulfill the County's future aviation needs, but as a reliever for MIA as well. Short-term plans only include one runway. However, the CDMP states that, ultimately the County seeks to achieve full build-out as described by the 1994 HST Master Plan. As described earlier, the Master Plan's full build-out includes a second runway.

(3) <u>Future Airport Development Based on Updated Forecast</u>

Airport development is triggered by the volume of current and projected aviation activity. The 1994 HST Master Plan activity projections were reviewed and updated in Chapter 1. The revised activity projections resulted in updated facility requirements which were also presented in Chapter 1. The updated projections generate the same short-term (2015) facility requirements as the 1994 Master Plan, with the exception of the second runway and associated landside development. According to the updated airport capacity estimate, a second parallel runway (and associated landside development) will not be required at HST until sometime around 2038. The higher (updated) airport capacity estimate results from the lower forecast of general aviation operations and lower peak hour activity levels. Fewer general aviation operations result in a more homogeneous aircraft fleet mix, which increases the airport's capacity.

3. FACTORS INFLUENCING THE DEVELOPMENT OF NEW COMMERCIAL SERVICE AIRPORTS

New commercial service airports are difficult to establish due to the many factors that influence the dynamics of the airline industry. This section provides a brief review of those elements that affect development of "new" commercial service airports. For discussion purposes, the different types of "new commercial service airports" have been divided into two separate groups: "replacement" commercial service airports and "supplemental" commercial service airports.

As part of this analysis, some of the factors affecting the level of confidence in the ability to forecast aviation activity for a new airport are presented as well. Since the result of any forecast effort will affect the facility planning and environmental impact of an airport, the level of confidence in any forecast weighs heavily as a consideration in the planning process. Although HST is an existing airport, this discussion refers to HST as new, due to the fact that the airport's facilities are currently used almost exclusively by the Military.

(1) Replacement Commercial Airports

Within the United States and other "mature" air service markets, it is not typical for all-new commercial service airports to be developed to replace an existing facility. The last (newly built) replacement commercial service U.S. airport was Denver International, which opened in 1995. Before that, the last new major domestic airport to open was Dallas/Ft. Worth International in 1974. Both of these airports received substantial political and economic backing and each was partly built to address specific local issues. Denver's old airport was restricted from expanding by the location of the Rocky Mountain Arsenal. The greater Dallas area was one of the fastest growing regions of the 1960s and 1970s, while its old airport (Love Field) was designed for propeller aircraft and was in a downtown location. In addition, the new Denver and Dallas airports were developed to be airline hubs and international facilities with adequate air cargo capacity, rather than continuing the old domestic short-haul, passenger service orientation philosophy.

At one point, the U.S. air service market situation was in marked contrast to certain locations in Asia, where there had been a very low historic propensity for air travel.

However, this has changed dramatically over the past few decades as economic growth has led to annual double-digit increases in air passenger volumes. An example of a vitally needed all-new replacement airport was Hong Kong. Showcase all-new replacement airports were also constructed in Kuala Lumpur, Guangzhou and other places, because of increased demands for air service and, in some cases, because national honor and prestige were involved to develop showcase projects.

Outside of Asia there have been some all-new airports, such as Munich, constructed to replace hopelessly antiquated or constrained facilities. But for the most part, airport owners throughout the world are able to accommodate additional capacity by continuous facility improvements, better use of infrastructure, demand shifts, and/or other methods.

This is not to say that there will not be other "all-new" airports constructed to replace existing facilities; rather the record shows that this is very rare. In fact, in at least one case, a new replacement airport has failed. In 1975, a new state-of-the-art airport was opened in Montreal, Canada; Mirabel Airport was located on 88,000 acres and was anticipated to be the new international gateway to Canada. All commercial passenger service has now been relocated back to the old Dorval Airport. This new commercial service airport "failed" because 1) demand did not grow as projected, 2) the "old" airport could handle more capacity than envisioned and 3) the new airport was too far away from the city and too difficult to access.

The reasons why so few airports are totally replaced are numerous, but a key factor is that once so much money is invested in an existing facility, literally billions for a major airport, it is difficult to justify the financial investment required to build a new airport. Most new airports like Denver, Mirabel, Osaka or Munich were heavily subsidized and the airport they replaced was closed.

While increased passenger and cargo requirements are the principle factors that influence the need for new airports, other factors also include highway access constraints and noise/environmental issues. Highway access constraints and noise/environmental issues at times result in requests to relocate, replace, limit, and/or close the existing airport. It should be noted that in order to support any type of new commercial service airport, not only do some of the factors listed above need to be present, but adequate O&D traffic must be available, as well as participation of a willing and able airline carrier.

(2) Supplemental Commercial Airports

While very few all-new commercial service airports are built, there are airports like Providence (Rhode Island) and Manchester (New Hampshire) that are expanding and off-loading capacity from an existing airport (in this case Boston Logan International Airport). While Providence and Manchester have had (and are predicted to have) success in attracting business from Boston Logan, this "sharing of demand" is not always automatic. Several of the largest U.S. cities such as New York, Chicago, and Los Angeles have multiple airports; however, most metropolitan areas cannot support more than one airport. This is true worldwide also, with London and Paris having more than one airport, but most other cities having only one principal airfield. In most cases where several airports exist to support aviation needs in a large metropolitan area, one of these airports "stands out" as the primary facility serving the bulk of the activity, with other airports being smaller and serving in a support role. This is a prime example of economies of scale since an airport is very expensive to build and operate, plus passengers seeking to connect find it very difficult if the other airport is across town.

In addition, airlines seek to serve only one airport since it is very expensive to establish and staff more than one airport station per city. The result is that commercial air service is generally limited to one airport per city. While airport owners/operators have often tried to have an airline initiate service at more than one airport, governments have proved themselves largely ineffective to shift demand to alternative airports since market forces favor one consolidated airport.

Because the airlines, air passenger, and other users are likely to remain at the existing airport, it is very difficult to force relocation of air traffic from an existing airport. This, coupled with all the normal variable issues of a forecast, make predicting the success or failure of an airport attempting to off-load traffic from, or supplement, an existing airport even more difficult.

Regardless of the difficulties, a much stronger case can be made for an airport attempting to provide supplemental service, rather than replacing an existing airport. For example, a second (or other additional) airport in a region can:

- Serve as a service point for low fare or charter carriers (examples are Love Field in Dallas and Midway in Chicago).
- Become niche market airports for cargo (Willow Run in Detroit) or passengers (Stewart in New York).
- Serve as supplemental airports awaiting the growth of a market and serving specialized users (such as Ontario in Los Angeles).

In Southeast Florida there already is some local competition for the commercial service airports between Miami International, Fort Lauderdale, and West Palm Beach. The fact that these airports can exist in addition to Miami International means that they are a separate market from Miami, and provide some alternative service options for Miami area passengers and cargo. The Miami area should be large and dynamic enough to support a supplemental airport within Southeast Florida, such as Homestead. There are many uncertainties, however, in estimating realistic future levels of demand at new supplemental airports.

(3) <u>Estimating Demand at Replacement or Supplemental Airports</u>

As previously discussed, a realistic level of future demand must first be determined in order to evaluate the level of aviation activity and environmental impact of a replacement or supplemental commercial service airport. Furthermore, air traffic to supplemental airports often grows in unusual patterns as carriers either add substantial amounts of service or only utilize an airport for short-term demands. Therefore, because it is difficult to judge the potential of a new airport, optimistic air traffic forecasts were developed for Homestead Airport (Chapter 1), so as to ensure that potential environmental impacts are not underestimated.

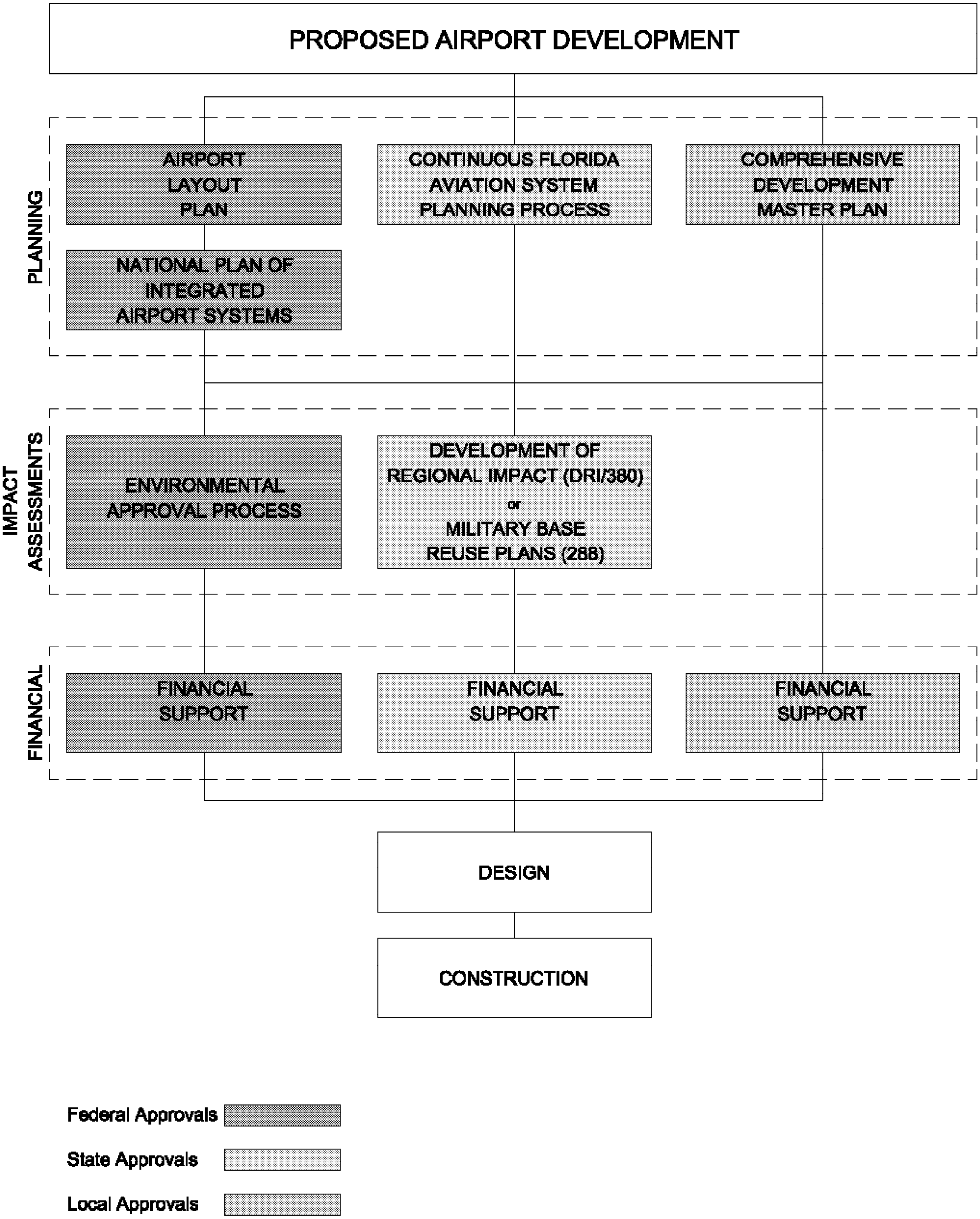
The development of replacement commercial service airports is rare. However, while not impossible, there are usually specific considerations that cause a new airport to be constructed or modified for commercial use. When compared to all-new replacement commercial service airports, supplemental airports do often occur, but they have difficulty competing against established airports to generate substantial aviation activity, so they often attract start-up and specialized niche carriers. In all cases, it is difficult to make traffic forecasts for multiple airports in one region because air traffic is totally mobile between the airports and air traffic is subject to the overall impacts of the national and local air markets. Connecting and international traffic is even more difficult to forecast because every airport in the United States is competing for this business.

4. FEDERAL, STATE, AND LOCAL APPROVALS GOVERNING FUTURE DEVELOPMENT OF HOMESTEAD AIRPORT

In addition to the factors previously discussed on the difficulties of developing a new airport, any new airport or proposed airport development project must obtain necessary approvals before actual construction can begin. Following is a brief description of the aviation related approvals and permitting procedures that would be necessary for any future runway development to occur at Homestead Airport. For discussion purposes, the aviation portion of the approval and permitting process HST would have to satisfy (for the approval of a new runway) has been divided into five steps: planning, impact assessment, financing, design, and construction. At each step a set of federal, state, and local approvals must be met, as illustrated in **Exhibit 2-1**.

(1) Planning

A proposed airport development project must first meet established criteria and be adopted by federal, state, and local agencies. One of the first steps in the federal approval process is to obtain an approved Airport Layout Plan (ALP) from the Federal Aviation Administration (FAA). The ALP depicts proposed airport development projects. The FAA would at some point need to incorporate the project into their National Plan of Integrated Airport Systems (NPIAS). The FAA's NPIAS identifies existing and proposed airports that are important to national transportation and includes estimates of the type and cost of development that is forecast at each airport through the next five years. The NPIAS includes only development eligible for federal aid under the Airport Improvement Program (AIP). In addition, the proposed airport development must also be approved by the state and included in the Continuous Florida Aviation System Planning Process (CFASPP). In general, the main goal of an aviation state system plan is to develop and plan for future growth of an aviation system consistent with national, state, and local air transportation needs. Likewise, Miami-Dade County must agree with the proposed development and adopt it into their Comprehensive Development Master Plan (CDMP). The CDMP is the County's comprehensive planning document, which includes a draft aviation plan. Once the "planning" portion of the approval process is fulfilled, the assessment of related impacts can begin.



HOMESTEAD SEIS

Landrum&Brown

APPROVAL AND PERMITTING PROCEDURES

EXHIBIT 2-1

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(2) <u>Impact Assessment</u>

The federal assessment of potential impacts regarding proposed airport development focuses on environmental issues. The Environmental Impact Statement (EIS) process is required by the National Environmental Protection Act (NEPA) and, in general, is required for any major airport improvement project.

The State of Florida uses the "DRI" (Development of Regional Impact as per Chapter 380 of the Florida Statutes) and "288" (Military Base Reuse Plan as per Chapter 288.975 of the Florida Statutes) processes to evaluate the potential impacts of airport development projects. In general, the DRI establishes the procedures to deal with any development proposal impacts that are deemed to be regional or affect more than one county. Once a development proposal is determined to have regional impact, the development is no longer subject to local approval only, but to regional and State approval as well. The regional approval comes from the executive board of the respective regional planning council, while the State approval comes from the State's land management agency, the Florida Department of Community Affairs. The 288 process provides an optional "expeditious" planning tool for the approval of a military base reuse plan that supersedes the provisions of the DRI and Part II of Chapter 163 of the Florida Statutes. Part II of Chapter 163 of the Florida Statutes is basically the State of Florida's growth management bill. Chapter 163 (Part II) establishes all the procedures related to local comprehensive planning, including those related to changes or amendments to the local comprehensive plans. The 288 process is attractive because it allows development of regional significance and also amends the local government's comprehensive plan.

(2) <u>Financial</u>

Once the planning and impact assessment approval and permitting procedures have been successfully accomplished, the process of obtaining financial support from federal, state and local sources can begin. As part of this step the proposed project must demonstrate to be financially feasible. In order to support an airport project, airlines, who ultimately contribute to the financing of such projects through increased airport fees, require that the benefits generated by the proposed project outweigh its cost. The FAA also requires a positive benefit/cost ratio on airport capacity enhancement projects in order to be eligible for funding.

(3) Design and Construction

With the approval, permitting, and financial backing required for the proposed airport development project, design and construction can begin.

The future development of a second runway at Homestead would require following each of the steps outlined in this section. If a second runway becomes a real proposition for HST in the future, it would be re-evaluated at that time from an aviation planning, environmental, financial and design perspective. Alternatives to the current layout depicted in the ALP, including possible different runway orientation and length, would be examined to identify that which best meets the future needs of the facility and surrounding environments. The result could be different from the runway shown for future planning purposes on the current ALP. The following section discusses alternatives regarding the "timing" for a possible second runway at Homestead.

5. SCENARIOS FOR ASSESSMENT OF IMPACTS DUE TO FUTURE DEVELOPMENT AT HOMESTEAD AIRPORT

Based on the estimated capacity of Homestead's current runway and the demand projections presented in Chapter 1, a second runway at Homestead will not be required for more than 30 years. However, if aviation demand at Homestead increases faster than projected, then a second runway could be required earlier. In order to properly assess the impacts of long-term development at Homestead, several scenarios regarding the most likely timing for a second runway (and associated development) are discussed in this section and a most likely scenario is recommended for evaluation in the SEIS.

(1) Alternative Scenarios

Technically speaking, as long as airport demand (as measured by aircraft operations) remains below the capacity of a single runway, then HST will operate with minimum delay. However, if demand approaches and exceeds the single runway capacity, then delays will occur with more frequency and the level of delay (the average time that each aircraft is delayed) will increase. Such delay increases operating costs for users (airlines, private pilots, the Air Force, etc.) and inconveniences air passengers and air cargo operators, etc. Note that airports can and do operate with high delays, so exceeding theoretical capacity does not shut the airport down, only makes it more costly and inconvenient to use. Such airport delay often drives users to reduce operations, shift activity to less busy periods, or relocate to other airports. In order to avoid substantial airport delays and "pro-actively" plan Homestead's future a second runway was shown on Dade County's 1994 ALP for Homestead.

The new runway depicted on the ALP is shown in a parallel configuration with a 3,500-foot lateral centerline separation. The primary purpose for including the second runway on the ALP is to reserve land for its future development if, and only if, demand approaches or exceeds the capacity of the current runway. The 1994 Master Plan estimated that the existing runway had a capacity of 173,000 annual aircraft operations based on the master plan's forecast fleet mix, and other assumptions. The master plan recommended that planning for the second runway start when demand reaches 60 percent of capacity and that construction begin when demand is 80 percent of capacity, so that the new runway would be ready when, and if, maximum capacity is reached. Therefore, according to the master plan's forecast, a second runway was planned for construction around 2005 (short-term). In 2005, the master plan indicated that the second runway would be 5,500 feet long, which is essentially the length used by smaller aircraft (general aviation, including business jets), rather than larger commercial, cargo, or military aircraft. Ultimately (2015) the 1994 Master Plan proposed extending the new runway to 9,000 feet for commercial service.

The capacity of HST's existing runway was updated by Landrum & Brown based on the updated forecast presented in Chapter 1. The revised capacity of HST's existing runway is expected to reach 231,000 annual operations by the year 2038. The revised capacity number reflects revisions made to civil and military aviation forecasts since the previous Master Plan, completed in 1994 by Miami-Dade County. According to the 60 percent planning ratio and 80 percent construction ratio (used in the 1994 Master Plan), planning of the second runway could begin somewhere between the years 2014 and 2015 (approximately 139,000 annual operations), and construction could be initiated about the year 2027 (approximately 185,000 annual operations). Using these criteria, construction could be completed by 2030. The second runway is assumed to be constructed in a single stage (9,000-foot length), given the air carrier nature of the airport reflected in the updated forecast.

The FAA is finding in recent years that new runways are being constructed closer to the time that an airport is at 100 percent of its existing capacity, rather than at 80 percent. Airlines, when depended on to provide substantial private capital to fund runway development, defer incurring infrastructure costs until operating costs at existing facilities become quite high. Based on these updated trends, the estimated timeframe for the existing single runway at Homestead to reach maximum capacity is the year 2038.

Beyond 2030 or 2038, air traffic demand could continue to increase until the capacity of the two runway system is reached. If Homestead in the future (roughly the year 2057 or later) were to reach the capacity of a two runway system, it would still be substantially below the level of activity of a major airport such as Miami International.

Three potential stages for evaluating a future second runway alternative were examined with respect to the volume of air traffic activity, the character of the aircraft fleet, and the requirement for airport related development. These stages or scenarios are:

- When the second runway could first be operational using Master Plan planning criteria – 2030.
- When the single runway is forecast to reach maximum capacity – 2038.
- When the two-runway airport is forecast to reach capacity – 2057 or later.

(2) <u>Comparison of Alternative Scenarios</u>

The three scenarios suggested for analysis of a second runway are compared in **Table 2-1** in terms of the volume and character of activity at Homestead.

Scenario 3 reflects the largest volume of activity at Homestead. This scenario has the greatest requirements for airport development to support large numbers of passengers and aircraft operations. On the other hand, this scenario would occur so far into the future, that it is very speculative. What we know today about aircraft impacts and about the nature of airport processing functions for passengers, cargo and maintenance is not expected to be applicable 60 years from now (under Scenario 3).

Scenarios 1 and 2 are closer in time and reflect a lower level of activity and facility requirements than Scenario 3. However, although closer in time than Scenario 3, Scenarios 1 and 2 still project a future that is roughly 30 and 40 years away, respectively, and also still speculative.

Table 2-1

Alternative Second Runway Assessment Scenarios

	Scenario 1 **2nd Rwy First Operational**	**Scenario 2** **Single Rwy at Capacity**	**Scenario 3** **Two Rwy Capacity**
Year	2030	2038	2057 or later 1/
Air Traffic Activity			
- Annual Aircraft Operations	195,000	231,000	370,000 2/
- Annual Enplaned Passengers	2.7 million	3.9 million	8 - 10 million
Airport Facilities 3/			
- Runways	2nd Parallel Rwy 3,500 ft. separation	2nd Parallel Rwy 3,500 ft. separation	2nd Parallel Rwy 3,500 ft. separation
- Passenger Terminal	800,000 S.F.	1,200,000 S.F.	2,900,000 S.F.
- Cargo/Maintenance Area	150 acres	150 acres	180 acres
- Airport Access	Direct access to primary 4-6 lane highway	Direct access to primary 4-6 lane highway	Alternative direct access to 6-lane highway

1/ Extrapolation from 2015 forecast based on 4.9% annual passenger growth rate and 4% annual passenger operations growth rate.
2/ Advisory Circular 150/5060-6, Figure 2.1-Capacity and ASV for long range planning.
3/ Airport facility requirements are approximations for major components that would require additional development.

All three scenarios represent a very distant point in the future, ranging from approximately 30 years out under Scenario 1 (2030) to roughly 60 years under Scenario 3 (2057). The further out in time, the more speculative the scenario becomes, not only in terms of whether the demand will ever materialize, but also in terms of the potential changes in the aviation industry (carriers, aircraft, airports, etc…). Major, unanticipated events in the last 40 years have transformed aviation into what it is today. It is reasonable to expect that future events, whether known or unknown, will change aviation in the future. Relevant past events include:

- Jet service (40 yrs. ago)
- Integrated cargo carriers such as UPS, Federal Express (30 yrs. ago)
- Deregulation (20 yrs. ago)
- Airline hubbing practices (20 yrs. ago)
- New commuter industry through air carrier partnerships (20 yrs. ago)
- Phase-out of Stage 1 aircraft (15 yrs. ago)
- Change in bilaterals (10 yrs. ago)
- Airline code-sharing (5 yrs. ago)

- Phase-out of Stage 2 aircraft (end of 1999)
- Changes in aircraft operations in airport environs based on new technology and changes in aircraft and air traffic operating procedures (continuous)

By the year 2001, NASA and FAA have undertaken a program to identify noise reduction technology to reduce the community noise impact of future subsonic jet transport airplanes by 7 to 10 decibels (relative to 1992 technology). Based on program results and the degree to which the identified technologies can be economically and practicably included in future airplane designs, the FAA will amend appropriate aircraft noise standards and regulations to ensure that feasible noise reduction technologies are incorporated during the first decade of the next century. The FAA is also supporting NASA research to achieve technology readiness to reduce the perceived noise levels of future aircraft by a factor of two by 2007 and by a factor of four by 2022 (based on 1995 technology). Based on anticipated technological advances, long-term aircraft noise will be significantly less than the noise emitted by the current fleet.

In addition to noise reduction programs, FAA also supports NASA research to reduce future aircraft engine exhaust emissions. The goals of this research are to develop engine combustion technologies to reduce emissions of oxides of nitrogen by 60 percent and unburned hydrocarbons by 40 percent relative to 1996 International Civil Aviation Organization (ICAO) standards, and to reduce specific fuel consumption, and therefore carbon dioxide and water vapor emission, by 20 percent.

Programs such as these indicate that the trend is to decrease aircraft generated impacts in the future so as to respond to environmental and community concerns. The challenge for the SEIS analysis is how to account for anticipated reduced impacts in a currently quantifiable way.

Due to these long-term uncertainties, and so as not to underestimate or overestimate impacts due to future development at Homestead Airport, Scenario 2 is selected for qualitative assessment of impacts with regards to a second runway.

6. SELECTED FUTURE AIRPORT DEVELOPMENT SCENARIO FOR ANALYSIS IN THE HOMESTEAD RESUSE SEIS

Scenario 2 represents a future point in time when air traffic demand at Homestead Airport will be equal to the maximum capacity of the existing, single runway. While the second runway could be developed earlier, in anticipation of increased future demand, the scenario selected for assessment is at maximum use of the single runway.

The facilities required at this demand level are described in Chapter 1 under the maximum single runway use scenario and are summarized in **Table 2-2**.

Table 2-2
Forecasts Of Aviation Demand & Facility Requirements For Maximum Single-Runway Scenario (Year 2038)

Annual Enplaned Passengers	3,900,000
Annual Aircraft Operations	231,000
Passenger Terminal Building	1,200,000 square feet
Aircraft Gate Requirements	25 gates
FBO Terminal Area	1,183 square feet
General Aviation Auto Parking	64 spaces (414,050 square feet)
General Aviation Hangar Spaces	27 spaces
General Aviation Hangar Area	61,200 square feet
General Aviation Ramp Spaces	26 spaces
General Aviation Ramp Area	70,200 square feet
Air Cargo Building Area	700,000 square feet
Air Cargo Site Requirements	98.6 acres (4,295,016 square feet)
Aircraft Maintenance Hangar Spaces	10 spaces
Aircraft Maintenance Apron Area	800,000 square feet
Aircraft Maintenance Hangar Area	800,000 square feet
On-Site Auto Parking Spaces	10,600 spaces (85.2 acres/3,710,000 square feet)
Total (Approximate) Area Required for Development Described Above	11,637,599 square feet (267.2 acres)
Approximate Airport Property Available for Development (North of Runway 5-23)	13,503,600 square feet (310 acres)

The existing airport property should be capable of accommodating the facility requirements (listed above) for a "maxed-out" one-runway scenario in 2038. Any increases in aircraft maintenance should be developed and located on the existing flight line. In general, there are two types of air cargo; all-cargo and belly-cargo. Depending on future operating costs and the availability of nearby facilities, approximately 80 percent of all-cargo operations will most likely remain on-airport property, while 20 percent might locate off-airport property. All-cargo operations will require ramp and building area, preferably on the flight line, however, it can be located adjacent to the flight line, as long as there is clear and direct access to the airfield. Belly cargo can be divided into several sub-categories; domestic, freight forwarder, and international. Again, depending on future operating costs, all (100 percent) domestic type belly cargo will most likely be located on-airport property. Although freight forwarder and international type belly cargo operations sometimes locate off-airport property, they usually remain on-airport at airport's similar to HST. If possible, belly cargo operations should be located on the flight line, however, it is not unusual to see belly cargo operations located off the flight line, with direct terminal ramp access for tug operations. In summary, there should be adequate room to accommodate all air cargo and aircraft maintenance requirements within the existing airport boundary.

As previously discussed, Scenario 2 assumes the second runway will be built around 2038, when the capacity of the single runway reaches 100 percent. Up until 2038 all landside and airside facilities can be accommodated north of existing Runway 5-23. Therefore, the second runway is assumed to be built to accommodate operational capacity, with no additional landside or airside facilities required. Following the construction of a new parallel runway and taxiway a new terminal, ARFF, and ATCT facility would most likely be required by 2057 if the aviation activity forecast is achieved.

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CHAPTER 3. AVIATION ACTIVITY RELATED TO COMMERCIAL SPACEPORT ALTERNATIVE

1. INTRODUCTION

According to reports from the telecommunications industry, a large number of satellites will be needed shortly after the turn of the century. In response to this need, as well as the desire to reduce launch cost and improve reliability, several companies are preparing to provide satellite launching services for hire. Two commercial space transport operators in particular have shown an interest in HST: Space Access, LLC (Space Access) and Kelly Space & Technology, Inc. (KST). These firms propose to use HST to assemble and launch satellites with reusable space vehicles, which are being designed for these purposes. They would also develop the necessary support facilities at HST to meet the growing need for affordable and reliable satellite launch systems.

The following sections describe the aviation component of a commercial spaceport alternative, in which one or more commercial space transport companies are licensed to conduct operations at HST. Because of the special facility and operational requirements of spaceport users, the alternative was defined by accommodating spaceport needs first, and then assessing the ability of other commercial, general aviation and military users to operate concurrently. Spaceport opportunities were evaluated within the airfield and beachfront boundaries. Potential needs and advantages from expansion outside the existing boundary are noted, as appropriate.

Although several potential spaceport users, with varied requirements and different operating characteristics, have expressed interest in this facility, the analysis performed is largely based on the information provided by Space Access, which is more detailed than that provided by other potential operators and generates greater land/facility requirements (due to the additional building and safety area associated with the payload mating site). The technology proposed by Space Access and other companies is still in a developmental stage. However sufficient information was gathered from the operators and regulatory agencies to make reasonable assumptions for the purposes of the SEIS.

The concept of a commercial spaceport for reusable spacecraft is new, and there are no existing commercial spaceports for horizontally launched reusable launch vehicles, although some are being planned. Also, there are no conventional airports that currently support spaceport activities, so there is no history that indicates whether or not this concept is feasible.

Accordingly, rules and regulations for the operation of these types of space vehicles have not been fully developed and in some cases are not available. The Federal Aviation Administration will ultimately have to provide planning standards and ultimate approval of any type of spaceport operation at HST. Since there is currently no precedent or existing regulations for the FAA to base a decision on, adequate time will have to be given for the formulation of an advisory policy; how much time will be required is not known at this time.

2. COMMERCIAL SPACEPORT OPERATIONAL ASSUMPTIONS

In order to determine the requirements of commercial spaceport users and the impact on other aviation activity at HST, the spaceport operational assumptions were defined. The following paragraphs describe the aircraft characteristics, activities, and operations expected to occur if HST were developed as a commercial spaceport.

(1) Aerospace Vehicle Characteristics

A brief explanation of the "space vehicles" and their missions/operations proposed by Space Access and KST is presented below.

Space Access is developing a self-powered, unmanned reusable satellite launch and deployment system. The system will most likely include two to three reusable launch vehicles that work together to deploy the satellites. The hypersonic "Aerospacecraft" (ASC) serves as the main vehicle. Everything, including the payload and other vehicle(s), are loaded into the ASC for departure. Once a predetermined altitude is reached, the other vehicle(s) is deployed to deliver the payload(s). After the other vehicle(s) is deployed, the ASC returns to the original launch site unpowered, similar to a glider. Immediately following the delivery of the payload, the other vehicle(s) returns to the launch site as an unmanned, unpowered glider type aircraft as well. The complete system is being developed to be reused once it has been serviced and refueled.

The ASC resembles the Concorde and is comparable to the Boeing 747 in weight. It will be capable of taking off and landing horizontally on the existing runway. The vehicle can also vary its speed and flight trajectory and can enter into a holding pattern. Therefore, within controlled airspace, it can operate similar to a conventional aircraft. The ASC will be launched using hydrogen as its primary fuel. In addition, highly volatile mixtures of liquid oxygen, nitrogen, helium, and several other fluids and gases are required in various amounts for the entire system to operate. The noise impact should be less than a traditional space launch due to its horizontal take-off capability.

KST is developing a number of "Eclipse" Reusable Launch Vehicles (RLV). The RLV will differ in size and mission. According to KST, using a conventional runway, the Eclipse launch technology utilizes a Boeing 747 to tow a manned Eclipse "Astroliner" (winged launch vehicle) to an altitude of approximately 20,000 feet. At 20,000 feet, the Eclipse Astroliner's rocket engine is ignited, the towline is released, and the Astroliner climbs to the payload separation altitude of approximately 400,000 feet. Once deployed from the Astroliner, the upper stages deliver the payload to the specific destination while the Eclipse Astroliner descends as a glider. The Astroliner acts as a glider until it reaches final descent. At final descent (30,000 feet) the Astroliner uses conventional air-breathing engines to support powered approach and landing. Both the Astroliner and tow vehicle will return to HST. Information regarding the return of the upper stage (following payload delivery) is not available. Every Eclipse vehicle version will be towed aloft by commercial or military tow planes, ranging from a C-130 to a Boeing 747.

(2) <u>Commercial Spaceport User Activities</u>

As a commercial spaceport, HST would serve as a primary location to assemble and launch satellites. In general, the satellite launch and deployment system includes two to three reusable launch vehicles that operate similar to aircraft, as opposed to rockets. The vehicles would be housed, maintained, and operated from HST. The aerospacecraft assembly would occur at HST, while other components would most likely be built at another location and would either be assembled at HST or would be transported in by air or ground. Although HST would be used as the test site as much as possible, testing could be conducted at other locations in the U.S. (primarily government test ranges), if necessary. While the fabrication of parts for the vehicles would not be done at HST, airframe repair would be.

In general, spaceport activities include assembling (processing) the payload (satellites in most instances) for flight and mating it to the upper stage(s). Following this assembly, the payload and upper stage(s) are mounted on the first stage trolley and inserted into the payload bay. The doors are then closed and sealed. Finally, the entire assembly is loaded with propellants, towed to the end of the runway, and launched. It is estimated that one launch would occur approximately once a week by one operator, increasing to possibly three a week by one or more operators after 2005.

(3) Airfield and Airspace Operations (Pre-Launch/Return)

Launch schedules should be known from 45 days to six or eight months in advance. Once exact orbital conditions are known, favorable launch windows can be identified. Since the ASC is a maneuverable vehicle (as opposed to a conventional rocket) there is more flexibility in selecting the best launch window to meet weather conditions, vehicle preparation, and community noise concerns. Most launches will occur during the daytime or early evening to mitigate noise impacts as much as possible. However, some launch windows will have to occur at very specific dates and times which, if missed, may not occur again for hours, days, weeks, months or even years in some cases.

Once the launch window has been selected and the spacecraft has been loaded, the ensemble will be towed from the integration facility to the fuel farm where it will be fueled. The fueling of the ASC will take approximately six hours. It should be noted that if, at any time, the ensemble is taxiing or towed through an airport FAA safety area (i.e. taxiway/runway safety area and/or runway object free area), that part of the airfield will have to be restricted/off limits to other operations. Once fueled, the ensemble will be immediately towed to the end of the runway for take-off. At this point, all airport-related operations will cease for approximately one hour. However, if the launch should slip for any reason, HST could be closed for several hours.

The new generation of reusable space vehicles will not be as demanding as the NASA shuttle in regards to airspace corridors and procedures; however, it will be more demanding than today's commercial aircraft. The FAA has not yet defined air traffic procedures and requirements for the new commercial space vehicles. Established airspace procedures would have to be developed and maintained from the time the vehicle enters the runway safety area (HST would be closed to other traffic at that time) until it leaves the Earth's atmosphere. Similar procedures would have to be followed for each vehicle's return to the Earth's atmosphere, landing, and departure from the airport's FAA safety areas. Since the space access vehicle acts as a glider (similar to the shuttle) upon return to HST (i.e. cannot hold), the airport would most likely be closed to other traffic for ASC arrivals, as well.

3. COMMERCIAL SPACEPORT FACILITY REQUIREMENTS

The type, size, and layout of facilities that could be required to support a "Space Access type" spaceport at HST are described in this section. As previously mentioned, it is unlikely "KST type" spaceport support facilities will require as much area for development as "Space Access type" spaceport support facilities based on the information provided by each operator. The difference between the two spaceport support facility requirements centers on the aerospacecraft maintenance and assembly facility. KST does not use an aerospacecraft for its operation, therefore, they will not need this type of facility. All other spaceport facility requirements for the two types of spaceport operators should be similar, with the exception of the aerospacecraft maintenance and assembly facility. Therefore, this analysis is based on information provided by Space Access, the slightly more demanding of the two spaceport operators in regards to support facilities. Safety requirements are also presented because of their potential impact on the layout of the spaceport facilities and other airport operations. These safety requirements will likely apply to any kind of spaceport operation because similar types of explosive fuels are used for each type of spaceport operation.

(1) Support Facility Requirements

"Space Access type" spaceport facilities could include a mission management center, ASC maintenance and assembly/payload integration facility, propellant fueling area/fuel farm, ejector ramjet run-up area, aerospacecraft run-up area, storage, and utilities. These facilities are described below.

As previously mentioned KST will require facilities similar to those for Space Access, with the exception of the aerospacecraft maintenance and assembly facility portion of the ASC maintenance and assembly/payload integration facility.

- The Mission Management Center will include launch control and possibly telemetry, auto landing, the avionics lab, and office space. If an existing building large enough to house all these activities is not available, it might be more feasible to split them up and use several smaller buildings instead. Estimated space requirements are as follows: launch control – 1,300 S.F.; telemetry – 1,350 S.F.; auto landing – 900 S.F.; avionics lab – 1,900 S.F.; and office space – 3,000 S.F. If all these activities are co-located it will require an 8,450 S.F. building.

- The ASC Maintenance and Assembly/Payload Integration Facility will include, at a minimum, a payload (satellite) processing room, an upper-stage preparation and payload integration room, an upper-stage and satellite installation room, and an aerospacecraft maintenance and preparation room. These rooms will be designed to abut one another in a linear sequence. An estimated 417,600 S.F. will be required to accommodate the functional areas described above.

- The Propellant Fueling Area/Fuel Farm requirements will be dependent on the number and frequency of spaceport launches. Prospective spaceport operators indicate that they could conduct 40 to 60 launches a year (approximately one launch a week) and that each launch would use 400,000 liquid pounds (lbm) of liquid hydrogen, 450,000 lbm of liquid oxygen, 110,000 lbm of liquid air, 56,000 lbm of liquid nitrogen, and 20,000 lbm of gas helium. The fuel will have to be trucked to the fuel farm. The DOT currently regulates the transportation and storage of any of the above referenced fuels. HST should be able to accommodate the anticipated fuel requirements unless the new spaceport experiences a dominant market capture which would call for massive transport and storage requirements. If this market capture becomes reality, liquid hydrogen could possibly be produced on-site.

  Storage tank requirements for liquid hydrogen are between 500,000 and 1,000,000 lbm. The liquid hydrogen tank will be spherical in shape and measure 72 feet in diameter. A 150-foot by 150-foot area should be reserved for the placement of this tank. This 22,500 S.F. area will allow for space to maneuver between and around the tank. The liquid hydrogen tank will be located above ground.

  Storage tank requirements for liquid oxygen are between 500,00 and 1,000,000 lbm. It will require two 12-foot x 70-foot tanks to store the liquid oxygen. An area 40-foot by 100-foot should be reserved for the placement of these tanks. This 4,000 S.F. area will allow for space to maneuver between and around the tanks. The liquid oxygen tanks will be located above ground.

  Storage tank requirements for liquid air are between 200,000 and 400,000 lbm. An area the same size as the liquid oxygen (4,000 S.F.) area should be reserve for the liquid air. The liquid air tank will be located above ground as well.

  Liquid nitrogen and gas helium will most likely be trucked-in. Therefore, no area will be required for this type of storage.

  A total area of 30,500 S.F. will be needed to locate the fuel farm based on the above requirements. This area will include room for the tanks, as well as space to maneuver between and around the tanks. However, additional safety area requirements will be required. These safety separations are presented in the following section.

- The Ejector RamJet Run-up Area will most likely require a hush house similar in design to those used for F-16 engine runs, due to anticipated noise levels. However, the ejector ramjet hush house will not have to be as large as the F-16 hush house because the run-ups will involve engine tests only, as opposed to the space required for an entire aircraft run-up. A hush house of this type will allow engine tests at night and in inclement weather. A 75-foot by 75-foot (approximately 5,000 S.F.) hush house should be large enough for the ASC ejector ramjet run-up (engine only) tests.

- The Aerospacecraft Run-up Area will accommodate engine tests on the spacecraft and should be infrequently used, compared to the ejector ramjet run-up area. The ASC run-up area will need to be sized to accommodate the aerospacecraft (292 feet by 124 feet and gross weight of more than 700,000 pounds). It is possible that the Military and a spaceport tenant could share the existing HST run-up area. This will be further analyzed later on in this section. One important consideration will be that the existing HST run-up and hush house facilities are within a military cantonment area, which is not part of the property being "disposed of". Therefore, if would be necessary to negotiate with the airforce for any possibility of joint use facilities.

- Storage could consume an estimated 80,000 square feet of warehouse space.

- Utilities demand for electricity should not be too extensive. If liquid hydrogen is produced locally, high electricity and natural gas would be required. Water consumption will be limited to the workforce and airframe business needs. Constant refurbishment of the vehicle is not anticipated, therefore the water consumption for the airframe business should be relatively low.

(2) Safety Area Requirements

In order to provide protection for people and property surrounding the ASC maintenance and assembly/payload integration facility, the fuel farm, and the fully-fueled aerospacecraft, preliminary safety distances were determined based on the volatility of the required propellants and anticipated payload. As discussed earlier, these safety areas will most likely apply to any kind of spaceport tenant because similar types of explosive fuels are used for each type of spaceport operation/mission.

According to the Department of Defense (DOD) Standard 6055.9-STD, Ammunition and Explosives Safety Standards (August 1997), the safe distance from a satellite fully loaded with hypergolic fuel and an inhabited building or aircraft is estimated at 1,250 feet. This calculation is based on the assumption that a satellite may carry between 500 and 800 lbs. of hypergolic propellant. The safe distance from a fully-fueled aerospacecraft vehicle and an inhabited building or aircraft is estimated at 1,800 feet. The safety area "bubble" for a fully-fueled aerospacecraft remains with the vehicle regardless if it is stationary or mobile.

Since the aerospacecraft will not be fully-fueled until just before takeoff, the safety area for the payload processing/integration facility will be based on fully-fueled satellites, which is estimated at 1,250 feet; however, this assumes an unprotected condition. Although the fully-fueled satellite safety area is estimated at 1,250 feet, space transport developers have indicated that an integration building can be engineered to contain as much of the potential blast as needed to allow for a 1,000-foot safety area. Therefore, the safety area around the ASC maintenance and assembly/payload integration facility should be maintained at 1,000 feet; this will provide sufficient safety for fully-fueled satellite (payload) integration.

It is assumed that all the tanks required to store the propellants necessary for the departure of the ASC will be co-located in a fuel farm or tank farm. Since all the required propellants will be stored together, the fuel farm safety area will measure 1,800 feet. This distance is based on the fully-fueled aerospacecraft safety area. The 1,800-foot distance is driven mostly by the potential explosiveness of the co-located liquid hydrogen and liquid oxygen.

The ejector ramjet run-up area and aerospacecraft run-up area will each require a safety area of 1,800 feet as well. This is also based on the safety area required for a fully-fueled aerospacecraft, since the run-up areas will be used to test equipment loaded to varying degrees with the same propellants as the fully-fueled aerospacecraft.

According to FAA airport planning standards (AC 150/5300-13, Change IV), an airport typically has several safety areas located at each runway end for added protection during takeoff and landing. Two of the larger, more restrictive, safety areas are the Runway Protection Zone (RPZ) and Runway Object Free Area (OFA). An RPZ is trapezoidal in shape, centered on the runway centerline, and begins 200 feet out from the runway threshold. A typical precision RPZ measures 1,000 feet (inner width) x 1,750 feet (outer width) x 2,500 feet (length). The OFA is rectangular, centered on the runway centerline, and begins at the runway threshold. A typical precision OFA measures 800 feet wide and 1,000 feet long. It is assumed that the same safety area dimensions will be required for the aerospacecraft. However, the final decision on the size and shape of the PRZ and OFA for a spaceport operation will have to be made by the FAA. It is assumed that these safety areas can be accommodated.

(3) Facility Layout

A possible spaceport layout, designed to accommodate one of the aforementioned commercial space transport operations and meet its safety requirements, is described below. As discussed earlier, the KST operation will likely require slightly less area for support facilities than the Space Access operation. Therefore, for purposes of this discussion, the Space Access operation is used as the reference facility.

The ASC maintenance and assembly/payload integration facility could be located in existing building 741. However, a modest expansion to the southeast side of the building (runway side) would be needed to meet the 500-foot long integration set-up requirement. Building 741 is located northeast of the existing runway. The distance between the northwest side of the building (non-runway side) and the south side of St. Lo Boulevard is approximately 1,000 feet. Therefore, there would be adequate room for the 1,000-foot integration facility safety area. In addition, this site would ensure clearance of any possible obstructions to the Job Corps dormitories to the north, and the proposed use of buildings 775 and 779 by the Dade County Public Schools. The better that the refurbishment and building expansion is engineered (to contain any potential blast), the smaller the safety area would have to be. Any accompanying space requirements for launch control, telemetry, automated landing control, avionics lab, office space, and/or storage could be located to the northeast and/or southwest sides of building 741, as long as they are outside of the integration facility safety area.

Once the integration is complete, the ASC will be towed to the fuel farm to load the propellants required for the mission. The ASC will maintain a 1,250-foot safety area bubble while being towed to the fuel farm due to the assembled satellites on-board the ASC. The entire fuel farm area will measure approximately 230 feet x 150 feet and have a safety area of 1,800 feet from its perimeter. Analysis indicates that the safest (on-airport property) location for the fuel farm would be south of the runway, on the triangular shaped piece of airport property southeast of existing Taxiway "D". Compared to any other on-airport site, a fuel farm in this location would have the least impact to the "beachfront" area (beachfront refers to development located adjacent to the north side of existing airport facilities); however, the safety area for this site will extend into off-airport property. Therefore, easements from adjacent property owners will be required for that portion of the safety area that extends outside of the existing airport property boundary. The ASC would most likely use Taxiway "D" to access the fuel farm. There are no anticipated compatibility issues for aerospacecraft taxiing along Taxiway "D".

After the fueling process, which could last for as many as six hours, the fully-fueled ASC is towed to the designated runway end in preparation for departure. During the tow, the ASC has to maintain a 1,800-foot distance from any inhabited aircraft or building. In order for this activity to occur without affecting airport operations, a parallel taxiway would have to be built 1,800 feet south of existing Runway 5/23. Since this would require property acquisition (an expensive and time-consuming endeavor, considering the amount of time it would be used), it is assumed that all airport operations will cease for several minutes to allow the ASC to use the existing runway as a taxiway. Once the aerospacecraft enters the runway object free area, the tower would have to close access to the airfield by any other aircraft.

As previously mentioned, the ejector ramjet run-up area and the aerospacecraft run-up area will most likely require a safety area of 1,800 feet, since the run-ups will be tests of fully-fueled engines and aircraft. Since all the Military run-up and hush house facilities are within 1,800 feet of the runway centerline, use of these military facilities by the ASC will require closure of the runway. Alternatively, spaceport ejector ramjet run-up and aerospacecraft run-up areas could be built to the south of the existing military cantonment area by Runway 5. However, in order to stay on airport property, the facilities would have to be within 1,800 feet of the Military facilities. Therefore, an agreement would still have to be reached with the Military regarding testing/run-up times; the Military site would have to be vacated during spaceport run-up activities. The runway would double as a taxiway for access to the proposed run-up/hush house area. Access to the airfield would be limited during the movement of the ASC to and from the run-up areas.

The analysis of safety area requirements, given the assumptions presented above, suggests that whenever the aerospacecraft is mobile, the airfield will have to be closed.

4. OTHER POSSIBLE COMMERCIAL AND GENERAL AVIATION COMPONENTS

The opportunity for development of facilities by other commercial and general aviation airport users and their operational compatibility with spaceport tenants is discussed in this section of the report. The analysis and comparisons presented in this section refer to the Space Access type spaceport operational requirements. As previously mentioned, because Space Access requires a building to assemble their aerospacecraft, it is likely that the Space Access operation will require slightly more developable area than the KST operation. However, large safety area requirements, imposed by the use of volatile fuels, will affect both type of spaceport operators because of their similar payloads. The safety area requirements portion of the spaceport operator similar payloads. The safety area requirements portion of the spaceport operator facility requirements are by far the most demanding with regards to total area required for development (see **Table 3-1**). Therefore, it is assumed that support facility requirements north of Runway 5-23 will be similar for both Space Access and KST type operations.

Table 3-1
Airport/Spaceport Facility Requirements

Airport Property North of Runway 5-23 Available For Development	13,490,000	Sq.Ft.	=	310	Acres
Requirements for One Spaceport Operator					
Mission Management Center	8,450	Sq.Ft.			
ASC Maint. and Assembly/Payload Integration Facility	417,000	Sq.Ft.			
Integration Facility Safety Area	6,982,393	Sq.Ft.			
Total	7,407,843	Sq.Ft.	=	170	Acres
Requirements for Two Spaceport Operators					
Two Mission Management Centers	16,900	Sq.Ft.			
Two ASC Maint. and Assembly/Payload Integration Facilities	834,000	Sq.Ft.			
Safety Area for both Integration Facilities	11,065,784	Sq.Ft.			
Total	11,916,684	Sq.Ft.	=	274	Acres
Additional Space Required for Second Spaceport Operator	4,508,841	Sq.Ft.	=	104	Acres
Airport Property Available for Development with One Spaceport Operator	6,082,157	Sq.Ft.	=	140	Acres
Airport Property Available for Development with Two Spaceport Operators	1,573,316	Sq.Ft.	=	36	Acres
2005 – Aviation Related Facility Requirements					
General Aviation Facilities	121,490	Sq.Ft.			
Cargo Facilities	95,293	Sq.Ft.			
Aircraft Maintenance Facilities	640,000	Sq.Ft.			
Passenger Terminal Facility	24,000	Sq.Ft.			
Auto Parking Facilities	446,950	Sq.Ft.			
Total	1,327,733	Sq.Ft.	=	30	Acres
2015 – Aviation Related Facility Requirements					
General Aviation Facilities	154,983	Sq.Ft.			
Cargo Facilities	3,969,185	Sq.Ft.			
Aircraft Maintenance Facilities	1,600,000	Sq.Ft.			
Passenger Terminal Facility	386,000	Sq.Ft.			
Auto Parking Facilities	1,997,100	Sq.Ft.			
Total	8,107,268	Sq.Ft.	=	186	Acres

(1) Facilities

One spaceport maintenance/integration facility will consume approximately 30 percent of the total linear feet available for development north of Runway 5/23. This will leave 2,000 linear feet remaining for development between the northeast side of the proposed maintenance/integration facility and the Military cantonment area north of Runway End 23, and approximately 2,850 linear feet southwest of the proposed ASC maintenance and assembly/payload integration facility. If a location were required to accommodate a second spaceport maintenance/integration facility, it would most likely be built directly adjacent to the original operation. This type of arrangement will allow the two operators to conserve space by sharing their safety area. Since the safety area would be jointly shared on one side, 1,250 additional linear feet would be required to accommodate a second spaceport tenant. Therefore, two spaceport maintenance/integration facilities will consume approximately 50 percent of the total linear feet available for development north of Runway 5/23.

In general, there are approximately 310 acres available for development within the Beachfront basin, located north of Runway 5-23. The spaceport facilities proposed for development within this area include the mission management center, ASC maintenance and assembly/payload integration facility, and integration facility safety area. These facilities will encompass approximately 170 acres. If a second spaceport tenant expressed interest in basing their facilities at HST an estimated 104 additional acres would be required. The second spaceport operator is assumed to require less area than the original spaceport facility since they could share their required safety area. Therefore, approximately 140 acres would remain for development in a single spaceport tenant scenario and an estimated 36 acres would be available for development in a dual spaceport operator scenario (see Table 3-1). According to Table 3-1, anticipated 2005 requirements for aviation related facility development (approximately 30 acres) can be realized regardless of whether a single spaceport tenant, or two spaceport tenants, begin operating at HST. However, because one spaceport operator will encompass approximately 170 acres (leaving 140 acres available for development) and estimated aviation related facility requirements could possibly reach approximately 186 acres by 2015, the assumption can be made that any spaceport activity will preclude the airport from reaching anticipated requirements for aviation related development well before 2015.

(2) Operations

As indicated in the previous discussion, there will be operational implications regarding the activities leading up to launch day, as well as the actual launch day activities. All of these implications result from the safety areas required by the aerospacecraft's payload and type of propellants. Due to size of the safety areas and the fact that the safety areas remain with the vehicle while it is mobile, whenever the aerospacecraft is in motion the airfield will be closed to other users. Therefore, depending on the mission, the airport will have to close from three to four times for each launch, for several hours. These times are as follows:

- When the ASC is towed to the fuel farm (approximately 5-10 minutes).
- When the ASC is towed to the end of the runway for departure and the departure itself (approximately 15 minutes to 2 hours).
- When the ASC returns to the airfield (approximately 30-40 minutes).
- When the second vehicle returns to the airfield (approximately 30-40 minutes).
- When the third vehicle returns to the airfield (approximately 30-40 minutes).

Although the Space Access vehicle(s) return to the airport like gliders, without fuel or payload, it is assumed that the airport will still need to be closed due to the unmanned nature and cost of replacement of the vehicles themselves. Other than launch day, the airport would also have to be closed to transport the ASC to the fuel farm and then to the run-up area for testing. In total, these two activities would close the airport twice for approximately 20 minutes. The KST vehicle, although manned and under power during landing, will most likely require the airfield to close as well, due to vehicle replacement costs.

There will also be an operational impact related to taxiing around the maintenance/integration facility. If the building is not designed for maximum cantonment, it is possible that the safety area for the building will preclude any movement on the taxiway south of building 741. If this is the case, the parallel access taxiway proposed by the HST 1994 Master Plan might have to be developed.

Because of the operational impact of spaceport operations, it is reasonable to conclude that spaceport operations are generally incompatible with scheduled commercial passenger service. General aviation would also likely be limited by operational restrictions, particularly if capacity exists at other nearby local airports. Charter service by cargo and passenger carriers may be compatible in low volumes. Therefore, due to operational conflicts/incompatibilities, spaceport operations are not likely to co-exist with more than limited general aviation, chartered cargo services, and unscheduled/charter passenger services. There is a high degree of uncertainty in any assumptions regarding the potential for a combined commercial spaceport/airport because such a combined facility does not exist today and may prove not to be feasible in the future.

5. MILITARY/GOVERNMENT COMPONENT

As discussed earlier, the spaceport launch scenario requires the airport to be closed for a few hours before the actual launch and during the arrival window. However, U.S. Customs and FANG must be able to takeoff and land on demand; immediate departure is essential for these two operators. The problem is that priority for military and other government operations could conflict with space launch windows and vice versa. It is unknown whether arrangements for priority of use of the Homestead runway could be achieved that would be consistent with the operational needs of all users.

As previously mentioned, the spaceport operator and military personnel could possibly jointly operate a run-up and hush house facility.

6. SUMMARY OF AIRPORT OPERATIONS AND FACILITIES

The possible mix of commercial space launch activities and other aviation activity at Homestead is described in the following paragraphs. Since the type, level, and safety/security issues of the spaceport are speculative at this point, it is difficult to predict what type and volume of activity may be able to co-exist with spaceport operations.

At best, space launches are assumed to limit the opportunity for other aviation activity to grow at HST. General aviation operations are assumed to increase by a nominal amount, then level off at approximately 10,000 annual operations. This decrease in projected general aviation operations is due to the requirements imposed on the airport by the commercial spaceport and the hesitancy of general aviation users to co-exist with space launch activities. The projected limitations on passenger and cargo operations are also based on commercial spaceport requirements including limited access to the airfield on launch day, which could occur almost daily by 2015. Unscheduled passenger, cargo, aircraft maintenance, and general aviation operations are projected to level off after 2015 and remain constant at 12,160 operations, 2,600 operations, 1,470 operations, and 10,000 operations, respectively. HST must also remain a base for military operations. Military and other government operations are projected to remain at a level of 19,284 annual operations.

Total annual operations (with a spaceport operator) are summarized in **Table 3-2** for years 2000, 2005, and 2015 by major user. Forecasts of total annual operations of the Proposed Action (i.e. without a spaceport operator), presented in Chapter 1, are included for comparison.

Table 3-2
Airport Operations Forecast
(With Spaceport Operator)

Operations by User	2000	2005	2015
Passenger	0	7,610	12,160
Cargo	0	1,560	2,600
Aircraft Maintenance	0	570	1,470
General Aviation	10,000	10,000	10,000
Military/Government	19,824	19,824	19,824
Spaceport	0*	160*	480**
TOTAL	29,824	39,724	46,534

Airport Operations Forecast
(Without Spaceport Operator)

Operations by User	2000	2005	2015
Passenger	0	7,610	51,200
Cargo	0	1,560	21,450
Aircraft Maintenance	0	570	1,470
General Aviation	40,834	45,133	56,771
Military/Government	19,824	19,824	19,824
TOTAL	60,658	74,697	150,735

* One spaceport operation equals one launch plus two to three vehicle recoveries depending on the spaceport scenario
** Assumes about two to three launches per week by one or two operators.

The facilities required for spaceport operations are described in previous sections of this report. Facilities required to support passenger, cargo, aircraft maintenance, and military operations are the same as defined in Chapter 1 for the commercial airport alternative (without spaceport operations) for 2000 and 2005. General aviation facilities would require an estimated 38,500 S.F. of space to support 10,000 operations by the year 2000. Since general aviation operations are not predicted to grow beyond this level in a spaceport scenario, 38,000 S.F. should be sufficient area for all general aviation development.

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CHAPTER 4. SOUTH FLORIDA AVIATION DEMAND AND AIRPORT CAPACITY

The following discussion summarizes South Florida's forecast of aviation demand and the ability of existing airports to adequately serve this demand. In addition, a review of the County's 30 year attempt to secure a new commercial service airport site (known as the Jetport/Dade-Collier Airport story) and subsequent replacement Jetport Site (known as Site 14) is provided. The failure of converting either of these two sites into a commercial service airport has left the County without a supplemental full-service commercial airport alternative. The Draft 1996 Aviation System Plan, recommended the development of Homestead Air Reserve Base (HST) as a supplemental airport based on the assumption that MIA would reach capacity prior to 2015 and that incremental growth in demand could best be met by HST.

This chapter is organized as follows:

- Aviation System Forecast
- Ability to Meet Forecasts with Existing Airports
- Search for New Commercial Airport and Current Prospects

1. AVIATION SYSTEM FORECAST

In 1996 Miami-Dade County completed a Draft Aviation System Plan. Although the plan has not been adopted by the County, it provides the most recent system-wide forecast of aviation activity for South Florida. The Draft 1996 Aviation System Plan forecasting effort included a review of Miami International Airport (MIA), as well as other airports in the system. The airports in Miami-Dade County include:

- Miami International Airport (MIA)
- Dade-Collier Training and Transition Airport (TNT)
- Homestead Air Reserve Base (HST)
- Homestead General Aviation Airport (X51)
- Kendall-Tamiami Executive Airport (TMB)
- Opa-Locka Airport (OPF)
- Opa-Locka West (X46)

The forecasts for these airports are summarized in the following sections.

(1) Miami International Airport Aviation Forecast

The Draft 1996 Aviation System Plan prepared forecasts for the years 1995 through 2015 for aviation passengers, aircraft operations, fleet mix and cargo. **Table 4-1** presents a summary of MIA's forecast enplaned domestic and international passengers. Total passengers (domestic and international) are forecast to grow from 29,774,000 in 1994 to 62,640,000 in 2015. For comparison, the compounded annual growth rate for domestic passengers during the period 1989-1994 was 3.7 percent, while the forecast compounded annual growth rate is 2.7 percent for the period 1994-2015. **Table 4-2** summarizes MIA's aircraft operations forecast broken down by domestic air carrier, international air carrier, general aviation, military, all-cargo, and air taxi operations. The Draft 1996 Aviation System Plan forecast anticipates that total aircraft operations will increase from an estimated total 555,000 in 1994 to 780,940 in 2015. This represents a compounded annual growth rate of 1.6 percent for the period 1994-2015 compared to a compounded annual growth rate of 7.6 percent for the period 1989-1994.

(2) Aviation Projections for Southern Florida's General Aviation Airports

Dade County's general aviation activity has been very significant compared to other metropolitan areas, although widely variable over the years. This variation in general aviation activity levels was due to external events, such as the oil embargo (in the early 1970's), loss of the G.I. Bill for pilot training, the general recession (in the early 1980's), and Hurricane Andrew (in the 1990's). Hurricane Andrew suppressed demand because of the facilities that were destroyed at both Homestead General and Kendall-Tamiami Airports. In the past, general aviation activity usually rebounded after events that suppressed activity, however, due to the increased cost of acquiring and operating general aviation aircraft over the past three decades, the level of activity associated with a typical rebound has been less than previously experienced.

In addition, the lack of single-engine aircraft production has limited the replacement of aircraft that have been taken out of service. However, it is possible that the recent legislation designed to limit general aviation aircraft liability could have a positive impact of the cost and production/supply of single-engine aircraft. The increase of single-engine aircraft would theoretically place downward pressure on the price of new and used aircraft and, more importantly, would provide a source of replacement aircraft for those that are taken out of service.

Table 4-1
HOMESTEAD REUSE SEIS
AIRPORT PLANNING DATA TECHNICAL REPORT

Draft 1996 Dade County Aviation System Plan -
Miami International Airport Passenger Forecast

Year	Domestic Passengers	International Passengers	Total Passengers	Annual Growth
Historical				
1989	14,081,149	9,303,861	23,385,010	
1990	15,828,665	10,008,780	25,837,445	10.487%
1991	15,696,783	10,894,632	26,591,415	2.918%
1992	14,970,138	11,513,579	26,483,717	-0.405%
1993	16,287,173	12,373,223	28,660,396	8.219%
1994 est.	16,874,000	12,900,000	29,774,000	3.886%
Projected				
1995	17,840,000	14,950,000	32,790,000	10.130%
1996	18,490,000	15,870,000	34,360,000	4.788%
1997	19,110,000	16,770,000	35,880,000	4.424%
1998	19,710,000	17,670,000	37,380,000	4.181%
1999	20,300,000	18,550,000	38,850,000	3.933%
2000	20,850,000	19,400,000	40,250,000	3.604%
2001	21,490,000	20,450,000	41,940,000	4.199%
2002	22,090,000	21,460,000	43,550,000	3.839%
2003	22,640,000	22,250,000	44,890,000	3.077%
2004	23,220,000	23,150,000	46,370,000	3.297%
2005	23,790,000	24,080,000	47,870,000	3.235%
2006	24,350,000	24,980,000	49,330,000	3.050%
2007	24,920,000	25,910,000	50,830,000	3.041%
2008	25,490,000	26,820,000	52,310,000	2.912%
2009	26,040,000	27,740,000	53,780,000	2.810%
2010	26,590,000	28,650,000	55,240,000	2.715%
2011	27,180,000	29,550,000	56,730,000	2.697%
2012	27,750,000	30,470,000	58,220,000	2.626%
2013	28,310,000	31,370,000	59,680,000	2.508%
2014	28,890,000	32,300,000	61,190,000	2.530%
2015	29,440,000	33,200,000	62,640,000	2.370%
Compounded Annual Growth Rate				
1989-1994	3.7%	6.8%		
1994-2015	2.7%	4.6%		

Prepared by Landrum & Brown

Source: Airport Records, FAA Aviation Forecasts FY 1994-2005
1993-94 MIA Master Plan, Draft 1996 Dade County Aviation System Plan

Table 4-2
HOMESTEAD REUSE SEIS
AIRPORT PLANNING DATA TECHNICAL REPORT

Draft 1996 Dade County Aviation System Plan-
Miami International Airport Aircraft Operations Forecast

Year	Domestic Air Carrier	International	General Aviation	Military	All-Cargo	Air Taxi	Total Operations
Historical							
1989	149,535	79,044	68,112	5,238	21,676	61,530	385,135
1990	173,818	84,718	79,415	7,246	22,644	113,146	480,987
1991	166,690	88,952	70,768	5,524	22,335	120,915	475,184
1992	153,086	99,086	80,934	10,333	29,363	124,020	496,822
1993	158,228	117,048	71,199	5,336	39,740	142,003	533,554
1994 est.	161,778	117,010	71,100	5,100	38,912	161,100	555,000
Projected							
1995	168,835	127,195	74,700	7,000	40,500	163,800	582,030
1996	173,307	131,380	75,100	7,000	42,240	164,900	593,927
1997	177,403	135,094	75,500	7,000	43,980	166,000	604,977
1998	181,223	138,523	75,900	7,000	45,720	167,100	615,466
1999	184,866	141,553	76,300	7,000	47,460	168,200	625,379
2000	188,065	144,111	76,700	7,000	49,200	169,300	634,376
2001	191,994	148,514	77,300	7,000	50,800	170,700	646,308
2002	195,480	152,374	77,900	7,000	52,400	172,100	657,254
2003	198,448	154,469	78,500	7,000	54,000	173,500	665,917
2004	201,606	157,152	79,100	7,000	55,600	174,900	675,358
2005	204,603	160,639	79,700	7,000	57,200	176,300	685,442
2006	207,444	164,993	80,160	7,000	58,760	177,180	695,537
2007	210,301	169,441	80,620	7,000	60,320	178,060	705,742
2008	213,089	173,655	81,080	7,000	61,800	178,940	715,564
2009	215,644	177,834	81,540	7,000	63,440	179,820	725,278
2010	218,135	181,849	82,000	7,000	65,000	180,700	734,684
2011	220,890	185,705	82,463	7,000	66,603	181,584	744,245
2012	223,416	189,590	82,928	7,000	68,251	182,473	753,658
2013	225,799	193,258	83,396	7,000	69,944	183,366	762,763
2014	228,280	197,017	83,866	7,000	71,683	184,263	772,109
2015	230,463	200,502	84,339	7,000	73,471	185,165	780,940
Compounded Annual Growth Rate							
1989-1994	1.6%	8.2%	0.9%	-0.5%	12.4%	21.2%	7.6%
1994-2015	1.7%	2.6%	0.8%	1.5%	3.1%	0.7%	1.6%

Prepared by Landrum & Brown
Source: Airport Records
1993-94 MIA Master Plan, Draft 1996 Dade County Aviation System Plan

The possibility that some of Miami-Dade County's general aviation traffic relocated to one or more Broward County airports was investigated as part of the Draft 1996 Aviation System Plan. Review of the data, however, indicates that there has been very little shift in historical based aircraft storage patterns.

General aviation activity is commonly forecast in system plans using a Planning Activity Level (PAL). PAL is a planning tool used as a basis for facility and airspace planning when the activity being measured proves to be difficult to forecast on a yearly basis. The Draft 1996 Aviation System Plan used PAL's to forecast general aviation operational levels for the County, where growth patterns had been consistently unpredictable from year to year. **Table 4-3** presents the resulting general aviation activity level forecasts.

Table 4-3
Draft 1996 Dade County Aviation System Plan General Aviation Forecast

Planning Activity Level	Most Optimistic (Year Attained)	Most Likely (Year Attained)
750,000	1995	1997
875,000	2011	2028
1,000,000	2024	>2030

Source: Draft 1996 Dade County Aviation System Plan

Using a one percent per year growth rate, a level of approximately 1,000,000 annual general aviation operations would be obtained about the year 2024. The 1,000,000 annual operational level was selected by the Draft 1996 Aviation System Plan as the upper PAL forecast. Intermediate planning levels of 750,000 and 875,000 annual general aviation operations were selected as activity horizons for planning purposes. The most likely growth rate was set at 0.5 percent, halfway between the national no-growth forecast (at that time) and the most optimistic growth rate of one percent.

The total general aviation forecast was then broken down by individual airport. **Table 4-4** presents the resulting forecasts for each of the identified planning activity levels (750,000 operations, 875,000 operations, and 1,000,000 operations). These forecasts were based on system issues and airport-specific trends. Current development and operational policies do

Table 4-4
HOMESTEAD REUSE SEIS
AIRPORT PLANNING DATA TECHNICAL REPORT
Draft 1996 Dade County Aviation System Plan-
General Aviation Forecast by Airport
(750,000 PAL, 875,000 PAL, 1,000,000 PAL)

750,000 PAL

Airport	Itinerant Operations	Local Operations	Total Operations	Based SE	Based ME	Based Turbine	Total Based	Instrument Operations	Military Operations
MIA	65,810	0	65,810	5	26	20	51	65,810	820
OPF	141,310	107,470	248,780	150	154	53	357	32,340	16,170
TMB	113,850	140,540	254,390	265	99	11	375	14,600	380
X46	21,420	43,460	64,880	0	0	0	0	0	120
X51	7,810	25,780	33,590	64	24	0	88	0	510
TNT	3,570	0	3,570	0	0	0	0	0	1,760
HST	43,730	35,250	78,980	58	24	10	92	10,270	39,310

875,000 PAL

Airport	Itinerant Operations	Local Operations	Total Operations	Based SE	Based ME	Based Turbine	Total Based	Instrument Operations	Military Operations
MIA	76,780	0	76,780	6	29	23	58	76,780	950
OPF	164,870	125,380	290,250	175	176	56	407	37,730	18,870
TMB	132,830	163,960	296,790	264	92	9	365	15,430	4
X46	24,990	50,700	75,690	0	0	0	0	0	140
X51	9,110	30,080	39,190	52	8	0	60	0	590
TNT	4,160	0	4,160	0	0	0	0	0	2,060
HST	51,010	41,130	92,140	68	54	12	134	11,980	39,310

1,000,000 PAL

Airport	Itinerant Operations	Local Operations	Total Operations	Based SE	Based ME	Based Turbine	Total Based	Instrument Operations	Military Operations
MIA	87,750	0	87,750	6	34	27	67	87,750	1,090
OPF	188,420	143,290	331,710	202	202	64	468	43,120	21,560
TMB	151,800	187,390	339,190	303	106	9	418	17,640	510
X46	28,560	57,940	86,500	0	0	0	0	0	160
X51	10,420	34,370	44,790	59	9	0	68	0	680
TNT	4,750	0	4,750	0	0	0	0	0	2,350
HST	58,300	47,010	105,310	78	62	14	154	13,690	39,310

Prepared by Landrum & Brown

Source: Draft 1996 Dade County Aviation System Plan

Note: Forecasts for Homestead Air Reserve Base taken directly from the Homestead Air Reserve Base Master Plan.

not encourage or discourage the use of any airport except general aviation use of MIA. Finally, the forecasts assume that all necessary facilities are currently available at Homestead Air Reserve Base to accommodate demand.

2. ABILITY TO MEET FORECAST WITH EXISTING AIRPORTS

The Draft 1996 Aviation System Plan defined and evaluated potential alternatives to meet the County's forecasts of aviation demand presented in the previous section. Alternatives ranged from maintaining the current roles of existing airports (i.e. commercial, general aviation, etc.) to developing existing general aviation airports into commercial service airports as well as developing new supplemental commercial service airports. The capacity of each of the County's existing airports was calculated in accordance with guidelines contained in FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay* and capacity deficiencies or excess capacity at each airport were identified. The results of this analysis of capacity versus demand, presented in **Tables 4-5 and 4-6,** show that the County has a need for additional future commercial service capacity while excess capacity exists at the County's general aviation airports and at Homestead Air Reserve Base. The following paragraphs provide a brief summary of key findings about the capacity of Miami-Dade County's airports, as well as Homestead Air Reserve Base, and their ability to meet South Florida's excess commercial service demand.

- *Miami International Airport* serves as the primary commercial service airport in Miami-Dade County. Based on the airport's existing airfield configuration, the Draft 1996 Aviation System Plan projects MIA's annual service volume (capacity) to decrease from 550,000 annual operations to 540,000 annual operations. This decrease in the airport's capacity is a result of the projected increase in the percentage of heavy aircraft operating at the airport. The airport's operational demand levels currently meet or exceed MIA's annual and peak hour capacity. In order to alleviate the problems associated with excess demand (i.e., unacceptable delay) the construction of an additional parallel runway has been recommended. It is estimated that this new runway will increase the airport's capacity from 550,000 annual operations to approximately 648,000 to 680,000 annual operations. However, despite the improvements in airport capacity and aircraft delay resulting from the construction of a new parallel runway, the airport's capacity is projected to be exceeded by 2010.

- *Dade-Collier Training and Transition Airport* currently serves as a low-activity flight training facility. Based on the airport's airfield configuration, aircraft fleet mix, and weather conditions, the Draft 1996 Aviation System Plan estimates an annual service volume (ASV) of approximately 210,000 annual operations. Given the airport's low demand (approximately 19,000 to 26,700 annual operations), a substantial amount of excess airfield capacity is available to accommodate future

Table 4-5
HOMESTEAD REUSE SEIS
AIRPORT PLANNING DATA TECHNICAL REPORT

Draft 1996 Dade County Aviation System Plan-
Annual Demand/Capacity Estimates

Airport	Annual Capacity 1995	Annual Capacity 2001	Annual Capacity 2008	Annual Demand 1995	Annual Demand 2001	Annual Demand 2008	Annual Demand vs. Capacity Ratio 1995	Annual Demand vs. Capacity Ratio 2001	Annual Demand vs. Capacity Ratio 2008
Miami International Airport									
- w/ Existing Runway System	550,000	550,000	550,000	570,000	639,000	711,111	1.0	1.2	1.3
- w/ Future Runway System	680,000	680,000	680,000	570,000	639,000	711,111	N/A	0.9	1.0

Airport	Annual Capacity 1997	Annual Capacity 2028	Annual Capacity >2030	Annual Demand 1997	Annual Demand 2028	Annual Demand >2030	Annual Demand vs. Capacity Ratio 1997	Annual Demand vs. Capacity Ratio 2028	Annual Demand vs. Capacity Ratio >2030
Dade-Collier Training and Transition	210,000	210,000	210,000	19,000	25,900	26,700	0.1	0.1	0.1
Homestead Air Reserve Base	185,000	185,000	185,000	118,290	131,450	144,620	0.6	0.7	0.8
Homestead General Aviation	195,000	195,000	195,000	34,100	39,780	45,470	0.2	0.2	0.2
Kendall-Tamiami Executive	530,000	530,000	530,000	254,770	297,240	339,700	0.5	0.6	0.6
Opa-Locka	550,000	550,000	550,000	264,950	309,120	353,270	0.5	0.6	0.6
Opa-Locka West	195,000	195,000	195,000	65,000	75,830	86,600	0.0	0.4	0.4

Prepared by Landrum & Brown
Source: Miami International Airport Master Plan Update, 1994
FAA Advisory Circular 150/5060-5, Airport Capacity and Delay
Draft 1996 Dade County Aviation System Plan

Table 4-6
HOMESTEAD REUSE SEIS
AIRPORT PLANNING DATA TECHNICAL REPORT

Draft 1996 Dade County Aviation System Plan -
Peak Hour Demand/Capacity Estimates

Airport	Peak Hour Capacity 1995	Peak Hour Capacity 2001	Peak Hour Capacity 2008	Peak Hour Demand 1995	Peak Hour Demand 2001	Peak Hour Demand 2008	Peak Hour Demand vs. Capacity Ratio 1995	Peak Hour Demand vs. Capacity Ratio 2001	Peak Hour Demand vs. Capacity Ratio 2008
Miami International Airport									
- w/ Existing Runway System	123	117	113	128	137	149	1.0	1.2	1.3
- w/ Future Runway System	145	142	138	128	137	149	N/A	1.0	1.1

Airport	Peak Hour Capacity 1997	Peak Hour Capacity 2028	Peak Hour Capacity >2030	Peak Hour Demand 1997	Peak Hour Demand 2028	Peak Hour Demand >2030	Peak Hour Demand vs. Capacity Ratio 1997	Peak Hour Demand vs. Capacity Ratio 2028	Peak Hour Demand vs. Capacity Ratio >2030
Dade-Collier Training and Transition	65	65	65	2	2	2	0.0	0.0	0.0
Homestead Air Reserve Base	66	66	66	39	46	53	0.6	0.7	0.8
Homestead General Aviation	55	55	55	17	20	22	0.3	0.4	0.4
Kendall-Tamiami Executive	148	148	148	127	148	170	0.9	1.0	1.1
Opa-Locka	144	144	144	124	145	166	0.9	1.0	1.2
Opa-Locka West	55	55	55	32	38	43	0.6	0.7	0.8

Prepared by Landrum & Brown
Source: Miami International Airport Master Plan Update, 1994
FAA Advisory Circular 150/5060-5, Airport Capacity and Delay
Draft 1996 Dade County Aviation System Plan

growth or a systemwide shift in operational demand. However, current policies (Jetport Pact) dictate that this airport is to be maintained as a dedicated training facility, with no further development.

- Homestead Air Reserve Base serves both military and traditional general aviation activity in Miami-Dade County. The Draft 1996 Aviation System Plan estimated the airport to have an ASV of approximately 185,000 annual operations. Military and general aviation activity at HST was projected by the Draft 1996 Aviation System Plan to increase from approximately 118,290 in 1997 to 144,620 annual operations beyond 2030. The airport would therefore reach 80 percent of its ASV in the year 2030. The Draft 1996 Aviation System Plan evaluated the concept of Homestead Air Reserve Base serving as a supplemental commercial service airport to MIA. This concept was recommended by the Draft 1996 Aviation System Plan as the preferred alternative to supplement commercial service capacity in South Florida.

- Homestead General Aviation Airport currently serves both traditional general aviation and sport/recreation activity of Miami-Dade County. Taking into consideration the airport's airfield configuration, aircraft fleet mix, and weather conditions, Homestead General is estimated to have an ASV of approximately 195,000 annual operations. The Draft 1996 Aviation System Plan projected activity (by traditional general aviation aircraft) to increase from approximately 34,100 in 1997 to 45,470 annual operations beyond 2030. A substantial amount of excess airfield capacity is available at Homestead General Aviation Airport to accommodate future general aviation growth. However, this excess capacity cannot be utilized for commercial air service because current facilities at Homestead General are not adequate to serve large propeller and jet commercial aircraft. The airport's runways, terminals, aviation support and navigational aid facilities are only adequate for general aviation use. The longest runway is only 4,000 feet. The Draft 1996 Aviation System Plan indicates that further development of existing facilities to meet commercial service demands is constrained by wetlands and a proposed Everglades buffer zone west of the airport, plus the airport has poor market accessibility. It is not considered to be a viable choice for a supplemental commercial airport.

- Kendall-Tamiami Executive Airport currently serves general aviation activity in the County and is a designated reliever to Miami International Airport. On the basis of the airport's airfield configuration, aircraft fleet mix, and weather conditions, the Draft 1996 Aviation System Plan estimates an ASV of approximately 530,000 annual operations. Activity at the airport is projected to increase from approximately 254,770 in 1997 to 339,700 annual operations by 2030. Sufficient capacity currently exists at Kendall-Tamiami Executive Airport to accommodate forecast general aviation demand. But additional runway length, as well as terminal and support facilities would be needed in order for Kendall-Tamiami to serve as a supplemental commercial service airport. The primary runway's usable length is under 5,000 feet, inadequate for larger propeller and jet aircraft operations. Airfield capacity is currently considered to be maximized except for possible slight increases if additional runway exits and dual parallel taxiways were constructed. Community encroachment limits the ability to expand this airport, and community objections have prohibited an extension to the airport's runways in the past.

- *Opa-Locka Airport* currently serves general aviation activity and is designated as a reliever to Miami International Airport. The Draft 1996 Aviation System Plan estimates that the airport has an ASV of approximately 550,000 annual operations. Activity at Opa-Locka is projected to increase from approximately 264,950 in 1997 to 353,270 annual operations in 2030. Based on these demand levels the airport could reach 60 percent of its ASV in the year 2030. Opa-Locka is not underutilized; however, some excess airfield capacity is available. The airport could accommodate some future growth in, or shifting of, systemwide aviation demand. A slight increase in the airport's airfield capacity could be realized with the construction of additional runway exits and dual parallel taxiways. The accommodation of substantial commercial service at Opa-Locka Airport raises concerns about impacts on the region's airspace due to the central location of Opa-Locka airport between Miami International and Fort Lauderdale airports. Recent County planning efforts preliminarily indicate that potential airspace conflicts appear to be manageable so that they would not be a limiting factor on commercial use of Opa-Locka. The County has not completed its planning, and FAA has not yet re-studied the airspace. Opa-Locka's primary runway is 8,002 feet long, and nonstop long-haul service would require a longer runway than may be feasible to develop. There is close-in surrounding residential and business development and other environmental concerns. Nevertheless, it still appears possible to achieve some amount of commercial service at Opa-Locka, with or without airfield expansion. While Opa-Locka can be regarded as a candidate for limited commercial service, which would provide some near term capacity gain for Miami-Dade County, it will not be able to satisfy the overall long-term need for full-service commercial airport capacity by itself.

- *Opa-Locka West Airport* currently serves general aviation activity in Miami-Dade County and South Broward County. The airport is estimated to have an ASV of approximately 195,000 annual operations. Activity at Opa-Locka is projected to increase from approximately 65,000 in 1997 to 86,660 annual operations beyond 2030. This airport has excess airfield capacity to accommodate additional future general aviation growth. However, the airport does not have landside facilities; nearly all aircraft operations are touch and go. Opa-Locka West could not accommodate commercial service or corporate activity without extending the existing runways as well as developing terminal and support facilities for larger commercial aircraft. Expansion would result in severe environmental impacts since the airport is surrounded by wetlands. Expansion to a commercial service airport is not considered feasible.

In summary, Miami-Dade County's aviation capacity problem is a shortfall of commercial service airport capacity, not general aviation capacity. MIA is currently near capacity and additional capacity for commercial service is needed within the County. As for the County's general aviation airports, they are projected to have adequate capacity to accommodate projected general aviation growth. Overall, the development of existing general aviation airports to accommodate commercial service is affected to varying degrees by environmental, community and operational constraints and in some cases is further restricted by policy. The only exception is Opa-Locka; Opa-Locka Airport may be viewed as the only existing general aviation airport that is viable for commercial service. Miami-Dade County is currently pursuing opportunities for limited commercial service at Opa-Locka, however this will not satisfy the long-term full service commercial airport capacity needs of the County.

Considering the forecast aviation growth in South Florida, future capacity limits at MIA and FLL, population growth expectations and distribution, and environmental issues surrounding both Homestead and Opa-Locka (which appear to limit either airport's ability to serve as the sole reliever for MIA), Miami-Dade County foresees the development of HST and Opa-Locka as complementary efforts that together will allow them to meet South Florida's future commercial service demands.

3. SEARCH FOR NEW COMMERCIAL AIRPORT AND CURRENT PROSPECTS

As early as the 1950's and 1960's, Miami-Dade County realized the demands the future would place on its existing system of airports. Of particular concern by the late 1960's were the capacity constraints at Miami International Airport (MIA) posed by air carrier training demands. In an attempt to alleviate some of these overflow demands and lessen noise problems, the County purchased 39 square miles in south central Florida and constructed a training facility officially named "Dade-Collier Training and Transition Airport," often referred to as the "Everglades Jetport." A total of 39 square miles of property was acquired to allow the Dade-Collier training airstrip to ultimately expand into a commercial service airport.

The County followed procedures required at that time to select the Dade-Collier Training and Transition Airport Site, and the parties consulted (appropriate State and Federal agencies and officials of the Everglades National Park) agreed with the decision. However, in late 1968, the Central and Southern Florida Flood Control District objected to the construction of a limited access highway (I-75) through Water Conservation Area 3A for airport property access. From this objection, the project gained national attention, which focused on potential environmental damage to the Everglades National Park and to the cypress lands near the training runway. The major concerns focused on possible water pollution, air pollution, noise pollution, and most of all urban development that was expected to occur around the airport. From these environmental concerns the "Jetport Pact" was born. The Jetport Pact was signed and Everglades Jetport development was halted in January of 1970.

The Jetport Pact had two goals: 1) To protect the Everglades National Park from potential harm and 2) To compensate the County for the land it was relinquishing by securing a replacement airport to meet the area's continuing aviation needs. The pact further stated that the replacement site selected be acquired and airport facilities comparable to those at Dade-Collier be constructed without any cost to the County. The first major step toward compliance with the pact was the selection of a replacement site. To this end, a location known as Site 14 was unanimously recommended and approved by representatives of the signatories to the Pact. A chronology of events regarding the Jetport Pact follows:

- January 1970 – Jetport Pact signed/Everglades Jetport development halted
- July 1970 – Site selection criteria established
- November 1970 – All parties concur with site selection plan
- December 1970 – Review team holds first meeting
- April 1971 – Team of consultants begins search for site
- November 1971 – Number of prime sites reduced to three
- July 1972 – Review team recommends Site 14 to County Commission; County Commission approves site subject to public hearing on Environmental Impact Statement (EIS)
- October 1972 – Preliminary EIS completed
- December 1972 – Public hearings on Preliminary EIS
- January 1973 – New County Commission requests further evaluation of Site 14, Preliminary EIS, and recommendations from County Manager establishing stricter operational and environmental controls on use of site for training and commercial purposes, including moving runways as far to the west as possible
- July 1973 – County Commission re-approves Site 14 subject to the conditions and use restrictions recommended by Resolution R-1154-73, which is a part of the Federal EIS
- September 1973 – Opponents of Site 14 petition County Commission for anti-airport referendum
- October 1973 – At the end of the 30-day period, only 5,458 qualified signatures had been obtained, of the 10,000 required to place the issue before the electorate

- November 1973 – The County Commissioners agree to grant an extra 30 days for the petitioners to gather the remaining signatures

- December 1973 – The petitioners again fail to obtain the necessary signatures. The Anti-Airport Referendum attempt therefore fails, with less than 10,000 out of 610,000 registered voters in Dade County having signed

- July 1974 – Pre-application submitted for acquisition of site and construction of runway

- August 1975 – Revised Pre-application submitted

- December 1975 – Draft EIS for the replacement airport issued by the FAA for comment

- March 1976 – Comments on Draft EIS received by FAA

- November 1981 – Final EIS approved

Site 14 was never developed as an airport because of concerns at the State level with locating an airport in a Water Conservation District. Consequently, Miami-Dade County is still facing the need for commercial airport facilities to supplement MIA. The problem for several decades has been finding an environmentally acceptable area of land. During the airport site search that culminated in the Site 14 proposal, Miami-Dade County and the Federal government were urged by many parties to pursue joint use of Homestead with the military because the area had already been subjected to airfield construction, aircraft overflights, and noise, and would not require the disturbance of an entirely new population or natural area. The Air Force was unable to accommodate civil operations under the circumstances at the time because Homestead was used so intensively by the military. Base closure and realignment have provided a unique opportunity for Miami-Dade County to address the need for additional commercial airport capacity.

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APPENDIX A

PROPOSED PROJECT – DETAILED FACILITY REQUIREMENTS

1. INTRODUCTION

This appendix identifies, in detail, updated airside and landside facility requirements for HST through the year 2015. Updated facility requirements were determined by reviewing and comparing the updated operational projections to the forecasts of aviation demand and subsequent facility requirements completed as part of the Dade County 1994 Master Plan and Airport Layout Plan (ALP) for HST. When applicable, the 1996 HABDI long-term lease agreement and the County's 1998 Comprehensive Development Master Plan (CDMP) are referenced as well. As previously mentioned, the 1994 Master Plan recommendations regarding the 2000 HST infrastructure improvements (to accommodate commercial passenger traffic) have not been started. Therefore, the demand that was predicted for the year 2000 is assumed to occur in 2005, while the demand levels originally forecast (in the 1994 Master Plan) for 2015 are still expected to occur within the same time-frame. The updated airport facility requirements, along with a review of the airport facilities proposed by the 1994 Master Plan, HABDI (when applicable), and CDMP (when applicable), are presented in the following sections:

- Airfield Facility Requirements
- Terminal Area Facilities
- General Aviation Facilities
- Cargo Facilities
- Aircraft Maintenance
- Airport Support Facilities

2. AIRFIELD FACILITY REQUIREMENTS

Updated airfield facility requirements are presented for each of the following functional areas at the airport:

- Runway(s)
- Taxiway(s)
- Navigational Aids (NAVAIDs)

(1) Runway(s)

HST has one existing runway; it measures 11,200' x 300'. The need for additional runway length can be determined by analyzing the runway length requirements for the design aircraft at the airport. The recommended length for the primary runway is determined by considering either a family of airplanes having similar performance characteristics or a specific airplane which is forecast to use the runway on a regular basis (at least 500 operations a year). Both landings and departures are considered in the primary runway length analysis, however, departures normally require more runway length.

The Dade County 1994 Master Plan does not recommend additional runway length for primary Runway 5-23 over the 20-year planning period. The master plan does however recommend the development of a second runway for general aviation and commuter use by 2005 (5,500' x 150') and development of this new runway for air carrier use by 2015 (9,000' x 200'). HABDI does not have any recommendations regarding additional runways or additional runway length. The County's Comprehensive Development Master Plan (CDMP) limits development at the airport until 2005 to the existing runway, although the two-runway ALP remains part of the plan. The county indicates in the CDMP that it will continue to monitor the need for an additional runway, and ultimately seeks to achieve full build-out of the ALP.

The width and strength of the existing runway are sufficient to serve future demand. Runway width could be reduced in the future to 200 feet, as appropriate, to reduce environment and financial impacts.

An airport's airfield capacity determines if additional runways are required. FAA planning guidelines suggest that new runway(s) should be planned when airfield capacity reaches 60 percent of annual service volume, and construction of a new runway should begin when airfield capacity reaches 80 percent. Airfield Capacity is defined as the maximum number of aircraft operations that an airfield configuration can accommodate during a specific interval of time, when there is continuous demand (i.e. an aircraft is always waiting to depart or land). This is referred to as the ultimate capacity, or the maximum throughput rate. Capacity can be expressed hourly and annually. Annual capacity is also referred to as annual service volume (ASV) and is a function of the hourly capacity as well as the daily, weekly, and seasonal demand patterns at an airport. Measures of airport capacity and aircraft delay are needed to design and evaluate airport development and improvement projects.

The 1994 Master Plan calculated airfield capacity using the methodology documented in U.S. Department of Transportation (USDOT), Federal Aviation Administration (FAA), Advisory Circular (AC) 150/5060-5, *Airport Capacity and Delay*. This document provides two methods to compute capacity, as described in Chapters 2 and 3 of AC 150/5060-5. The first method calculates capacity based on the number and configuration of runways and the aircraft fleet mix, relying on standard assumptions about other airfield configuration and demand parameters. The second computation method allows for more detailed computations, suitable for a wider range of airport design and planning applications, and takes into account information such as runway utilization, taxiway exits, and peaking characteristics of demand. Both of these methods were used to compute HST's annual capacity based on the updated activity forecasts. The calculated annual capacity of aircraft operations for both methods are as follows:

	Annual Aircraft Operations	
	2005	**2015**
Method		
Capacity Calculation for Long Range Planning (Simplified Calculation)	195,000	210,000
Detailed Capacity Calculation	239,000	235,000

The two methods generate slightly different results that are considered to provide an adequate range of capacity. Based on the updated forecast, the calculated annual capacity in 2005 ranges from 195,000 to 239,000 aircraft operations. In 2015, the calculated capacity is 210,000 to 235,000. By 2015, the 150,735 projected annual aircraft operations results in the airport operating at 64 to 72 percent of capacity, which is less than the airfield's maximum. Therefore, the existing airfield with its 11,200-foot runway is sufficient to accommodate the projected demand for the 2000 to 2015 time frame.

The updated airfield capacity estimate is greater than the 1994 Master Plan's estimated capacity which is 173,000 in 2015. The main reasons for the increase in capacity over the master plan lie in the lower level of general aviation operations which result in a more homogenous aircraft fleet mix, and the assumption of typical peak hour activity levels.

The updated runway(s) requirements are compared to the 1994 Master Plan, HABDI, and CDMP runway requirements below.

	2005	2010	2015
Updated Facility Requirements	Existing RWY	Existing RWY	Existing RWY
1994 Master Plan	2nd RWY 5,500'	None	2nd RWY 9,000'
HABDI	N/A	N/A	N/A
CDMP	One runway, but the two-runway ALP is part of the CDMP, and the County will continue to monitor the need for it. Ultimately, the County seeks to achieve full build-out of the ALP (2 runways).		

N/A – Not Available

(2) Taxiway(s)

Runway 5-23 is provided with a full-length parallel taxiway with apron taxiways and taxilanes for taxiing around the apron area. The existing parallel taxiway is separated from the centerline of Runway 5-23 by 1,085 feet to 1,175 feet. According to FAA criteria, taxiway/runway clearance requirements (taxiway centerline to runway centerline) are 600 feet for Design Group VI aircraft. Therefore, based on Group VI design criteria, this runway centerline to taxiway centerline distance is considered more than adequate.

In general taxiways improve the flow of aircraft on the ground by decreasing the amount of time aircraft spend waiting to move to and from a runway. Therefore, parallel taxiways, as well as the design and number of taxiway exits, increase the capacity of runways by allowing landing aircraft to exit the runway at the first turn-off opportunity. For these reasons a new taxiway parallel to apron edge Taxiway A, extending from Taxiway C to Taxiway D, is proposed for construction. Constructing a new inner taxiway will improve aircraft ground traffic safety and efficiency by providing for two-way traffic taxiing to and from the existing runway. For example the taxiway system would operate in a counter-clockwise direction during "easterly" airport operations and clockwise during "westerly" airport operations. In addition, this taxiway system will reduce the need for two way traffic on any taxiway, except at the intersections; this will improve the capacity of existing Runway 5-23 during times of heavy use. Because of the enhancements to taxi time and improved capacity possibilities the new partial parallel taxiway is recommended for construction by the year 2010. Enlarged pavement fillets at existing intersections and a new high speed taxiway exit (6x000 feet from Runway 5 threshold) are recommended for construction by the year 2010 as well.

The 1994 Master Plan recommended the same parallel taxiway, enlarged fillets, and high speed taxiway exit for 2005, instead of 2010. The primary reason for recommending these taxiway system improvements at a later date is capacity threshold differences. The updated airfield capacity estimate is greater than the 1994 Master Plan's estimated capacity which is 173,000 in 2015. The main reasons for the increase in capacity over the master plan lie in the lower level of general aviation operations which result in a more homogenous aircraft fleet mix, and the assumption of typical peak hour activity levels. Therefore, capacity enhancement projects will not be needed as early in the planning period.

The HABDI and CDMP documents do not contain any proposed taxiway system improvements. The 1994 Master Plan and updated taxiway facility requirements are presented below.

	2005	2010	2015
Updated Facility Requirements	Existing	1. TWY parallel to apron edge, from TWY C to TWY D 4,500' x 100' 2. Enlarge TWY fillets 3. New High Speed Exit TWY	None
1994 Master Plan	1. TWY parallel to apron edge, from TWY C to TWY D 4,500' x 100' 2. Enlarge TWY fillets 3. New High Speed Exit TWY	None	None
HABDI	N/A	N/A	N/A
CDMP	N/A	N/A	N/A

N/A – Not Available

(3) Navigational Aids (NAVAIDs)

NAVAID requirements are usually based on recommendations as contained in the U.S. Department of Transportation (USDOT)/FAA Handbook, "Airway Planning Standard Number One," and FAA Advisory Circular 150-5300, "Airport Design Standards, Site Requirements for Terminal Navigational Facilities." NAVAIDs provide services related to airport operations, precision guidance to a specific runway end, and nonprecision guidance to a runway or an airport itself.

The distinction between a precision and a nonprecision NAVAID is that the former provides electronic descent and alignment guidance, while the latter provides only alignment information. An airport is equipped with either precision or nonprecision capacity in accordance with design standards that are based on safety considerations and airport operational needs. The type, mission, and volume of aeronautical activity used in association with meteorological airspace and capacity data determine an airport's eligibility and need for various NAVAIDs.

To support general aviation, air carrier, air cargo, and aircraft maintenance activity, a variety of NAVAIDs should be provided. Precision instrument approach equipment should be installed for each runway end to allow operational flexibility for both military and civilian operations during IFR weather and improve the attractiveness of the airport to potential tenants. At least one runway end precision instrument approach should be upgraded to allow Category II or III IFR flight operations once scheduled passenger or air cargo service is offered at HST. It is recommended that by 2005, Runway 5 be equipped with an ALSF-II (CAT II/III) approach lighting system and Runway 23 have a standard ILS installed. It is possible that by 2005 the FAA will have GPS capabilities fully operational, which would offer similar capabilities and would eliminate the need for the ILS.

The updated facility requirements described above are equivalent to the 1994 Master Plan requirements. The HABDI and CDMP documents do not have any recommendations regarding NAVAID improvements. The 1994 Master Plan and updated NAVAID facility recommendations are presented below.

	2005	2010	2015
Updated Facility Requirements	RWY 5 – ALSF II RWY 23 – ILS/GPS	None	None
1994 Master Plan	RWY 5 – ALSF II RWY 23 – ILS	None	None
HABDI	N/A	N/A	N/A
CDMP	N/A	N/A	N/A

N/A – Not Available

3. TERMINAL AREA FACILITIES

Updated terminal area facility requirements are presented for each of the following functional areas:

- Terminal Building
- Aircraft Gate Requirements

(1) Terminal Building

The 1994 Master Plan's methodology for determining HST's future facility requirements for terminal building area are based on DOT FAA Advisory Circular 150/5360-13, Planning and Design Guidelines for Airport Terminal Facilities. This document provides industry standard recommendations for calculating building size based on the volume and mix of aircraft operations and passengers projected to occur at the airport. This methodology, used in the 1994 Master Plan, resulted in ratios of square foot per passenger (terminal square feet divided by annual passenger projections). These ratios (0.3 terminal square feet per annual enplaned passenger) were computed and found to be acceptable; therefore they were used to help calculate the updated terminal building requirements. The 2015 requirement of 386,000 SF will remain the same, however the interim years will be slightly different due to the initial five-year delay in projected demand.

The CDMP allows for a total of 95,000 Square Feet (SF) of new terminal building construction. The 1994 Master Plan estimated that this amount of space would be required between 2000 and 2005 to accommodate terminal and various interim aviation-related uses. Due to the five-year delay in projected initial demand, it currently appears that the CDMP's terminal size would meet space requirements through 2005 to 2010. The CDMP anticipated that a smaller initial phase of this building would be in place by 2002, and that the building would be expanded to 95,000 SF by 2005. The volume of passengers projected for 2015 would require approximately 386,000 SF of terminal building, as calculated in the 1994 Master Plan and validated. This is substantially more than the level of 95,000 SF included in the CDMP, and more than 100,000 SF in excess of the terminal proposed by HABDI. The CDMP would need to be amended and State approval would be required prior to the construction of these development levels.

The Dade County Aviation Department evaluated a consolidated interim terminal to satisfy start-up demand. This interim terminal would allow cross-utilization by cargo, general aviation, and fixed base operators (FBO's) until such time forecast commercial service activity levels were realized. The interim terminal would require 99,900 SF to accommodate 2000-2003 "interim demand".

Updated terminal building area requirements, as well as the 1994 Master Plan, HABDI, and CDMP facility recommendations are presented below.

	2000	2005	2010	2015
Updated Facility Requirements (sq.ft.)	0	24,000[1/]	137,000	386,000
1994 Master Plan (sq.ft.)	22,000[1/]	N/A	152,000	386,000
HABDI (sq.ft.)	28,000	126,000	N/A	284,000
CDMP (sq.ft.)	0	95,000	95,000	95,000
DCAD/PB-Project #B139A	99,900	152,000	N/A	386,000

1/ The required terminal area was reduced by 50 percent to provide a basic "start-up" facility.
N/A – Not Available

(2) Aircraft Gate Requirements

The 1994 Master Plan calculated aircraft gate requirements for HST using methodologies presented in DOT FAA Advisory Circular 150/5360-13, Planning and Design Guidelines for Airport Terminal Facilities. Two methodologies, the annual utilization method and the daily utilization method, were used to determine future gate requirements. The annual utilization method determines future aircraft gate requirements by dividing the airport's projected enplanements by the enplanement-per-gate ratio derived from the FAA nomograph found in the FAA AC mentioned above. Without any historical data, the daily utilization method assumed that by the year 2000 there would be three departures a day at each gate. The 1994 Master Plan based this assumption on similar non-hub airports and consultant experience. This assumption is considered sound and remains relevant, therefore it was used for the updated gate facility requirements. Due to the five-year delay in projected initial demand, the only difference between the master plan projections and the updated facility requirements will be the timing of anticipated demand.

The two methodologies present similar results for the airport's future needs. These results were further studied in regards to peak-hour enplaned passengers and projected aircraft types anticipated to serve HST. Based on this analysis, the 1994 Master Plan total recommended number of gates were as follows: three (3) in 2000, seven (7) in 2005, and 10 in 2015. The HABDI and CDMP documents do not have any recommendations regarding gate requirements. The gate requirements presented by all the studies, are depicted in the following table.

	2000	2005	2010	2015
Updated Facility Requirements	0	3	7	10
1994 Master Plan	3	7	N/A	10
(interim terminal requirement)	4			
HABDI	N/A	N/A	N/A	N/A
CDMP	N/A	N/A	N/A	N/A
DCAD/PB-Project #B139A	4	N/A	N/A	N/A

N/A – Not Available

4. GENERAL AVIATION FACILITIES

General aviation facility requirements were developed for HST based on projected general aviation demand. While passenger aircraft, air cargo, and aircraft maintenance operations for the 1994 Master Plan and updated facility requirements are similar except for the five-year delay in projected initial demand, the updated general aviation and military operations are significantly lower than the 1994 Master Plan forecast. Therefore, the difference in anticipated general aviation operations is reflected in the updated general aviation facility requirements. The projections of updated general aviation facility requirements are based on the assumptions used in the 1994 Master Plan and are presented below for each functional area.

Updated general aviation facility requirements are presented for each of the following functional areas:

- Fixed Base Operator (FBO) Terminal Area
- General Aviation Auto Parking Spaces
- General Aviation Hangar Spaces
- General Aviation Hangar Area
- General Aviation Ramp Spaces
- General Aviation Ramp Area

(1) FBO Terminal Area

FBO terminal area at general aviation airports relates directly to the space required to accommodate pilots and passengers. The facilities needed to accommodate pilots and passengers usually include a lounge, flight planning room, restrooms, business offices, and food/beverage concessions. The 1994 Master Plan utilized typical planning ratios to determine approximate FBO terminal building area, therefore these ratios will serve for the updated requirements as well. Although the HABDI document does not attach specific square foot requirements to FBO terminal area development, the illustrations included in the study indicate the location and size of the proposed FBO terminal area facility will be similar to the County's 1994 Master Plan. The CDMP does not have specific recommendations regarding FBO terminal area requirements. The 1994 Master Plan and updated FBO terminal area requirements are presented in the following table.

	2000	2005	2010	2015
Updated Facility Requirements (sq.ft.)	0	940	1,054	1,183
1994 Master Plan (sq.ft.)	1,816	2,042	N/A	2,566
HABDI (sq.ft.)	N/A	N/A	N/A	N/A
CDMP (sq.ft.)	N/A	N/A	N/A	N/A

N/A – Not Available

(2) General Aviation Auto Parking Spaces

Auto parking for general aviation facilities should be provided in proximity to the general aviation hangars and FBO areas. For projections purposes, it was assumed that the required number of general aviation parking spaces will grow at the rate as total general aviation activity at the airport. The 1994 Master Plan projections were based on the same methodology. The updated general aviation auto parking requirements are less than the auto parking requirements proposed by the 1994 Master Plan. The differences in the projections can be attributed to the contrast in the general aviation operational forecast.

Similar to the previous section, the HABDI document does not attach specific requirements to general aviation auto parking facilities either. The illustrations included in the HABDI study indicate the location and allocation of general aviation auto parking facilities will be similar to the County's 1994 Master Plan. The CDMP does not have specific recommendations regarding general aviation auto parking requirements. The 1994 Master Plan and updated general aviation auto parking space requirements are presented in the following table.

	2000	2005	2010	2015
Updated Facility Requirements	0	45	52	64
1994 Master Plan	91	102	N/A	128
HABDI	N/A	N/A	N/A	N/A
CDMP	N/A	N/A	N/A	N/A

N/A – Not Available

(3) General Aviation Hangar Spaces

To project future general aviation hangar space requirements, the following assumptions were made:

- For years 2000-2015, all based jet aircraft will require hangar space
- For years 2000-2015, all based helicopters will require hangar space
- For year 2000, 47 percent of the based single- and multi-engine aircraft will require hangar space
- For year 2005, 45 percent of the based single- and multi-engine aircraft will require hangar space
- For year 2010, 42.5 percent of the based single- and multi-engine aircraft will require hangar space
- For year 2015), 40 percent of the based single- and multi-engine aircraft will require hangar space

These assumptions were based on the same methodology used in the Dade County 1994 Master Plan for HST.

As mentioned at the beginning of the general aviation facility requirements section, due to the difference between the 1994 Master Plan forecast of general aviation operations and the updated forecast of general aviation operations, the 1994 Master Plan projections for general aviation facilities are significantly higher than the updated requirements. Although the HABDI document does not attach specific requirements to general aviation hangar development, the illustrations included in the study indicate the location and size of the general aviation hangar development will be similar to the County's 1994 Master Plan. The CDMP does not have specific recommendations regarding general aviation hangar requirements. The 1994 Master Plan and updated general aviation hangar space requirements are presented in the following table.

	2000	2005	2010	2015
Updated Facility Requirements				
single-engine aircraft	10	10	11	11
multi-engine aircraft	5	5	6	6
jet	2	3	3	4
helicopter	4	5	5	6
total hangar spaces	*21*	*23*	*25*	*27*
1994 Master Plan				
single-engine aircraft	23	26	N/A	32
multi-engine aircraft	8	10	N/A	13
jet	2	3	N/A	4
helicopter	4	5	N/A	6
total hangar spaces	*37*	*44*	*N/A*	*55*
HABDI	N/A	N/A	N/A	N/A
CDMP	N/A	N/A	N/A	N/A

N/A – Not Available

(4) General Aviation Hangar Area

In addition to the hangar space requirements presented above, the following hangar storage ratio's were used:

- 1,200 square feet per single-engine aircraft
- 2,000 square feet per multi-engine aircraft
- 3,600 square feet per jet aircraft
- 3,600 square feet per helicopter

These assumptions were based on the same methodology used in the Dade County 1994 Master Plan for HST.

Similar to the previous section, the HABDI document does not attach specific requirements to general aviation hangar area either. However, the illustrations included in the HABDI study indicate the location and size of the general aviation hangar area(s) will be similar to the County's 1994 Master Plan. The CDMP estimates that HST will require 122,000 SF for general aviation hangar development through 2015. Updated general aviation hangar area requirements are presented in the following table.

	2000	**2005**	**2010**	**2015**
Updated Facility Requirements				
single-engine aircraft (sq.ft.)	12,000	12,000	13,200	13,200
multi-engine aircraft (sq.ft.)	10,000	10,000	12,000	12,000
jet (sq.ft.)	7,200	10,800	10,800	14,400
helicopter (sq.ft.)	14,400	18,000	18,000	21,600
total hangar area (sq.ft.)	*43,600*	*50,800*	*54,000*	*61,200*
1994 Master Plan				
single-engine aircraft (sq.ft.)	27,600	31,200	N/A	38,400
multi-engine aircraft (sq.ft.)	16,000	20,000	N/A	26,000
jet (sq.ft.)	7,200	10,800	N/A	14,400
helicopter (sq.ft.)	14,400	18,000	N/A	21,600
total hangar area (sq,ft.)	*65,200*	*80,000*	*N/A*	*100,400*
HABDI	N/A	N/A	N/A	N/A
CDMP (sq.ft.)	0	122,000	122,000	122,000

N/A – Not Available

(5) General Aviation Ramp Spaces

To project future general aviation ramp space, the following assumptions were made:

- For years 2000-2015, based jet aircraft will not require ramp space
- For years 2000-2015, based helicopters will not require ramp space
- For year 2000, 53 percent of the based single- and multi-engine aircraft will require ramp space
- For year 2005, 55 percent of the based single- and multi-engine aircraft will require ramp space
- For year 2010, 57.5 percent of the based single- and multi-engine aircraft will require ramp space
- For year 2015), 60 percent of the based single- and multi-engine aircraft will require ramp space

These assumptions were based on the same methodology used in the Dade County 1994 Master Plan for HST.

As mentioned at the beginning of the general aviation facility requirements section, due to the difference between the 1994 Master Plan forecast of general aviation operations and the updated forecast of general aviation operations, the 1994 Master Plan projections for general aviation facilities are significantly higher than the updated requirements. Although the HABDI document does not attach specific requirements to general aviation ramp space development, the illustrations included in the study indicate the location and allocation of the general aviation ramp space development will be similar to the County's 1994 Master Plan. The CDMP does not have specific recommendations regarding general aviation ramp space developments. The 1994 Master Plan and updated general aviation ramp space requirements are presented in the following table.

	2000	2005	2010	2015
Updated Facility Requirements				
single-engine aircraft	11	13	14	16
multi-engine aircraft	5	7	8	10
jet	0	0	0	0
helicopter	0	0	0	0
total ramp spaces	*16*	*20*	*22*	*26*
1994 Master Plan				
single-engine aircraft	35	39	N/A	48
multi-engine aircraft	2	2	N/A	3
jet	0	0	N/A	0
helicopter	0	0	N/A	0
total ramp spaces	*37*	*41*	*N/A*	*51*
HABDI	N/A	N/A	N/A	N/A
CDMP	N/A	N/A	N/A	N/A

N/A – Not Available

(6) General Aviation Ramp Area

In addition to the ramp space requirements presented above, the following hangar storage ratio's were used:

- 2,700 square feet per single-engine aircraft
- 2,700 square feet per multi-engine aircraft
- 0 square feet per jet aircraft
- 0 square feet per helicopter

These assumptions were based on the same methodology used in the Dade County 1994 Master Plan for HST.

Similar to the previous section, the HABDI document does not attach specific square foot requirements to general aviation ramp area either. The illustrations included in the HABDI study indicate the location and allocation of general aviation ramp area will be similar to the County's 1994 Master Plan. The CDMP does not have specific recommendations regarding general aviation ramp area requirements. The 1994 Master Plan and updated general aviation ramp area requirements are presented in the following table.

	2000	2005	2010	2015
Updated Facility Requirements				
single-engine aircraft (sq.ft.)	29,700	35,100	37,800	43,200
multi-engine aircraft (sq.ft.)	13,500	18,900	21,600	27,000
jet (sq.ft.)	0	0	0	0
helicopter (sq.ft.)	0	0	0	0
total ramp area (sq.ft.)	*43,200*	*54,000*	*59,400*	*70,200*
1994 Master Plan				
single-engine aircraft (sq.ft.)	94,500	105,300	N/A	129,600
multi-engine aircraft (sq.ft.)	5,400	5,400	N/A	8,100
jet (sq.ft.)	0	0	N/A	0
helicopter (sq.ft.)	0	0	N/A	0
total ramp area (sq,ft.)	*99,900*	*110,700*	*N/A*	*137,700*
HABDI	N/A	N/A	N/A	N/A
CDMP	N/A	N/A	N/A	N/A

N/A – Not Available

5. AIR CARGO FACILITIES

Updated air cargo facility requirements are presented for each of the following functional areas:

- Air Cargo Building Requirements
- Air Cargo Site Requirements

(1) Air Cargo Building Requirements

For this analysis, cargo operations are grouped into three categories, they are as follows: cargo facilities operated by miscellaneous independent cargo operators, cargo facilities operated by scheduled air passenger carriers (belly cargo), and cargo facilities operated for an all-cargo carrier and small-package carriers (all-cargo). The methodology used in the 1994 Master plan was based on local experience and industry standards. The 1994 Master Plan determined that 0.6 average annual tons of cargo could be processed for each square foot of warehouse and office space. This average is considered reasonable, therefore it was used as the calculation for the updated cargo building requirements. Since the updated cargo forecast numbers mirror the 1994 Master Plan projections, with the exception of the five-year delay in projected demand, the cargo building requirements for 2015 are the same for the two studies as well.

Although the HABDI cargo building area ultimate build-out is only expected to reach half (50 percent) of the 1994 Master Plan projection by 2015, the HABDI forecast is projected to initially grow substantially faster, reaching 120,000 SF by the first phase. The 1994 Master Plan only forecasts a requirement of 13,400 SF by the year 2000. Please note that the HABDI cargo requirements are not divided out by cargo type and are described by phase, not year. The HABDI document indicated the three phases of development described would occur over a 12 to 15 year time frame. The CDMP estimates that HST will require 126,000 SF for air cargo processing and transfer activity through 2015.

According to the Dade County Aviation Department, Interim Passenger Terminal Building Study the near-term air cargo requirements for enplaned flights and express cargo would grow from 0 tons in 2000 to 13,230 tons in 2003. The study indicated that this initial requirement for specialty cargo (such as express packages) could be accommodated in a 5,000 SF area set aside in the interim consolidated use terminal discussed earlier. Air cargo building area recommendations are presented below.

	2000	2005	2010	2015
Updated Facility Requirements				
belly cargo bldg. area (sq.ft.)	0	1,267	2,667	85,367
all-cargo/small pkg. bldg. area (sq.ft.)	0	0	236,835	412,358
miscellaneous cargo bldg. area (sq.ft.)	0	12,133	21,667	52,000
total cargo bldg. area (sq.ft.)	*0*	*13,400*	*261,169*	*549,725*
1994 Master Plan				
belly cargo bldg. area (sq.ft.)	1,267	2,667	N/A	85,367
all-cargo/small pkg. bldg. area (sq.ft.)	0	236,835	N/A	412,358
miscellaneous cargo bldg. area (sq.ft.)	12,133	21,667	N/A	52,000
total cargo bldg. area (sq.ft.)	*13,400*	*261,169*	*N/A*	*549,725*
HABDI				
total cargo bldg. area (sq.ft.)	*120,000 (phase 1)*	*202,500 (phase 2)*	*295,500 (phase 3)*	*N/A*
CDMP				
total cargo bldg. area (sq.ft.)	*0*	*126,000*	*126,000*	*126,000*
DCAD/PB-Project #B139A (sq.ft.)	13,230	N/A	N/A	N/A

N/A – Not Available

(2) Air Cargo Site Requirements

The methodology used for the air cargo building requirements was also used for the air cargo site requirements. The air cargo site includes aircraft parking apron, as appropriate, by excludes taxiway access. Air cargo site requirements are presented below.

	2000	**2005**	**2010**	**2015**
Updated Facility Requirements				
belly cargo site area (acres)	0	0.18	0.38	12.20
all-cargo/small pkg. site area (acres)	0	0.00	33.80	58.90
miscellaneous cargo site area (acres)	0	1.70	3.10	7.40
total cargo site area (acres)	*0*	*1.88*	*37.28*	*78.50*
1994 Master Plan				
belly cargo site area (acres)	0.18	0.38	N/A	12.20
all-cargo/small pkg. site area (acres)	0.00	33.80	N/A	58.90
miscellaneous cargo site area (acres)	1.70	3.10	N/A	7.40
total cargo site area (acres)	*1.88*	*37.28*	*N/A*	*78.50*
HABDI				
total cargo site area (acres)	*N/A (phase 1)*	*N/A (phase 2)*	*N/A (phase 3)*	*N/A*
CDMP				
total cargo site area (acres)	N/A	N/A	N/A	N/A

N/A – Not Available

6. AIRCRAFT MAINTENANCE

For the most part, the quantity of air carrier aircraft maintenance hangars are determined by the airlines and/or third party maintenance operators. The number and size of large air carrier aircraft maintenance hangars are not based solely on changes in activity levels. These facilities are often tied to the airline headquarter's location, hubbing system, fleet size, maintenance scheduling climate, or location of terminating flights. Therefore, the demand for these types of hangars will be driven by the air carrier and air cargo operators projected to serve HST. Although it is difficult to predict what specific air carrier and air cargo operators might require maintenance facilities at HST, requirements presented in the 1994 Master Plan were determined by analyzing aircraft maintenance facilities at airport's similar in size and type to HST and relying on professional experience. Since the updated air carrier and air cargo operational levels do not change from the 1994 Master Plan forecast (except for the five-year delay in projected initial demand) the updated aircraft maintenance facility requirements have been maintained to reflect the 1994 Master Plan facility requirements (with a five-year shift). Although the HABDI document does not attach specific requirements to aircraft maintenance facility development, the illustrations included in the study indicate the location and allocation of aircraft maintenance facilities will be similar to the County's 1994 Master Plan. Updated aircraft maintenance and operational support area facility requirements are presented for each of the following functional areas:

- Aircraft Maintenance Hangar Spaces
- Aircraft Maintenance Apron Area
- Aircraft Maintenance Hangar Area

(1) Aircraft Maintenance Hangar Spaces

The 1994 Master Plan and updated aircraft maintenance hangar space recommendations are presented below. The CDMP does not have specific recommendations regarding aircraft maintenance hangar space requirements.

	2000	2005	2010	2015
Updated Facility Requirements	0	4	8	10
1994 Master Plan	4	8	N/A	10
HABDI	N/A	N/A	N/A	N/A
CDMP	N/A	N/A	N/A	N/A

N/A – Not Available

(2) Aircraft Maintenance Apron Area

To project future aircraft maintenance apron area it was assumed that each aircraft maintenance hangar space (presented above) would require 80,000 square feet of apron area. This assumption was based on the same methodology used in the 1994 Master Plan for HST and is exclusive of taxilane requirements. The CDMP does not have specific recommendations regarding aircraft maintenance apron area requirements. The 1994 Master Plan and updated aircraft maintenance apron area requirements are presented below.

	2000	2005	2010	2015
Updated Facility Requirements	0	320,000	640,000	800,000
1994 Master Plan	320,000	640,000	N/A	800,000
HABDI	N/A	N/A	N/A	N/A
CDMP	N/A	N/A	N/A	N/A

N/A – Not Available

(3) Aircraft Maintenance Hangar Area

To project future aircraft maintenance hangar area it was assumed that each aircraft maintenance hangar space (presented above) would require 80,000 square feet of hangar area. This assumption was based on the same methodology used in the 1994 Master Plan for HST and would include any space needed for aircraft and shops. The CDMP estimates that HST will require 181,000 SF for aircraft maintenance hangar area and directly associated shops through 2015. The 1994 Master Plan and updated aircraft maintenance hangar area requirements are presented below.

	2000	2005	2010	2015
Updated Facility Requirements	0	320,000	640,000	800,000
1994 Master Plan	320,000	640,000	N/A	800,000
HABDI	N/A	N/A	N/A	N/A
CDMP (sq.ft.)	0	181,000	181,000	181,000

N/A – Not Available

7. AIRPORT SUPPORT FACILITIES

Ancillary facilities needed to support the operation of the airport were identified. Since the updated air carrier, air cargo, and aircraft maintenance operational levels do not change from the

1994 Master Plan forecast (except for the five-year delay in projected initial demand) the updated airport support facility requirements reflect the 1994 Master Plan airport support facility requirements as well. Although the HABDI document does not attach specific requirements to airport support facility(s) development, the illustrations included in the study indicate the location and allocation of airport support facilities will be similar to the County's 1994 Master Plan. The CDMP does not have specific recommendations regarding airport support facility requirements. Updated airport support facility requirements are presented for each of the following functional areas:

- Air Traffic Control Tower (ATCT)
- Airport Rescue and Fire Fighting Facility (ARFF)
- Auto Parking/Vehicle Storage Requirements
- Airport Administration and Maintenance Facilities
- Aircraft Fuel Requirements

(1) Air Traffic Control Tower (ATCT)

The 1994 Master Plan recognized the need for a new ATCT for military, as well as U.S. Customs use. The master plan indicated that the U.S. Air Force was planning on constructing and equipping the new ATCT. The existing tower had been severely damaged by the hurricane. The master plan also indicated that the tower would be staffed by the Department of Defense civilian personnel, until HST operations were high enough to qualify for FAA support. The U.S. Air Force would most likely ask the Aviation Department to share the cost of the tower operation until the FAA assumed responsibility. The tower design was coordinated with the FAA so it would meet their standards.

The 1994 Master Plan used FAA Order 7031.2C, "Airway Planning Standard Number One", to conclude that HST would be a candidate for an FAA tower by the Year 2000. There are two phases to the qualification process. A site becomes a candidate for a Phase II analysis if the Phase I Establishment Ratio Sum equals or exceeds 1.0. For HST, the Phase I Establishment Ratio Sum was estimated to be 1.20 in 2000, 1.80 in 2005, and 2.60 in 2015. It should be noted that the FAA Tower Program is currently being restructured.

The new criteria for FAA Tower funding is expected to be available by fall of 1998. Since the tower will already be in place and meet FAA criteria, it should have a good chance at qualifying by 2005. The HABDI and CDMP documents do not address the airport's ATCT facility requirements.

(2) <u>Airport Rescue and Fire Fighting Facility (ARFF)</u>

Requirements for ARFF facilities at airports with scheduled commercial air service are established in Federal Aviation Regulation (FAR) Part 139. Airports are indexed according to the length of the longest aircraft that operates at the airport on a regular basis. HST would be rated an Index B through the year 2010. Index B can service aircraft up to 126 feet long (but 90 feet or more) that depart from an airport five or more times a day. HST would be rated an Index C by the year 2015. Index C can service aircraft up to 159 feet long (but 126 feet or more) that depart from an airport five or more times a day. The existing HARB ARFF equipment and 24-hour fire station (with 55 assigned firefighters) exceed the requirements for an Index C facility. Therefore, the existing ARFF facilities will meet and exceed requirements for the present airfield.

The 1994 Master Plan indicated HST would reach Index B ranking by 2000, as opposed to the updated forecast of 2005. This adjustment is due to the five-year delay in projected initial operational demand. The HABDI and CDMP documents do not address the airport's ARFF requirements.

(3) <u>Auto Parking/Vehicle Storage Requirements</u>

The 1994 Master Plan made the following assumptions regarding auto parking/vehicle storage requirements:

<u>Parking Demand Rate</u>:

- Air Passenger Parking – 1 parking space per 600 O&D Passengers
- General Aviation – 1.2 parking spaces per based aircraft
- Air Cargo – 1 parking space per 400 annual tons
- Aircraft Maintenance – 1 parking space per employee
- Terminal Area Employee – 0.50 parking space per employee

Taxi Hold Lot:

- 20% of O&D air passengers use taxis.
- Average taxi occupancy is 2.5 air passengers per taxi.
- Taxi Hold Lot should be sized to accommodate 2 hours of taxi activity.

Rental Car Ready-Lot, Parking, and Storage:

- 15 % of O&D air passengers use rental cars.
- Average rental car occupancy is 1.2 air passengers.
- Rental Car Ready-Lot, Parking, and Storage should be sized to accommodate 1.5 times the daily demand.

Charter Bus Parking:

- 10% of O&D air passengers use charter buses.
- Average charter bus occupancy is 40 air passengers.
- Charter Bus Parking should be sized to accommodate 2 hours of charter bus activity.

Limousine Hold Lot:

- 10% of O&D air passengers use limousines.
- Average limousine occupancy is 5.6 air passengers.
- Limousine Hold Lot should accommodate 1 hour of limousine activity.

With the exception of general aviation parking requirements and the "five-year delay", the updated auto parking and vehicle storage requirements mirror the 1994 Master Plan projections. Updated auto parking/vehicle storage requirements, as well as the 1994 Master Plan recommendations are presented below. The HABDI and CDMP documents do not address the airport's auto parking/vehicle storage requirements.

	2000	**2005**	**2010**	**2015**
Updated Facility Requirements				
air passenger parking (spaces)[1/]	0	248	701	1,788
misc. air cargo parking (spaces)[2/]	0	18	32	78
airline belly cargo parking (spaces)[2/]	0	2	4	128
all-cargo & small pkg. parking (spaces)[2/]	0	0	310	619
general aviation parking (spaces)[3/]	0	45	52	64
aircraft maintenance parking (spaces)[4/]	0	640	1,120	1,440
terminal area/airport employee parking (sp)	0	256	335	852
total on-site parking needs	*0*	*1,209*	2,554	4,969
taxi hold lot	0	16	44	114
rental car ready-lot	0	93	262	670
charter bus lot	0	2	2	4
limousine hold lot	0	2	5	13
1994 Master Plan				
air passenger parking (spaces)[1/]	248	701	N/A	1,788
misc. air cargo parking (spaces)[2/]	18	32	N/A	78
airline belly cargo parking (spaces)[2/]	2	4	N/A	128
all-cargo & small pkg. parking (spaces)[2/]	0	310	N/A	619
general aviation parking (spaces)[3/]	91	102	N/A	128
aircraft maintenance parking (spaces)[4/]	640	1,120	N/A	1,440
terminal area/airport employee parking (sp)	256	335	N/A	852
total on-site parking needs	*1,255*	2,604	N/A	5,033
taxi hold lot	16	44	N/A	114
rental car ready-lot	93	262	N/A	670
charter bus lot	2	2	N/A	4
limousine hold lot	2	5	N/A	13
HABDI	N/A	N/A	N/A	N/A
CDMP	N/A	N/A	N/A	N/A

1/ Air Passenger Parking includes air passenger and visitor parking.
2/ Air Cargo Parking includes employee and visitor parking.
3/ General Aviation Parking includes aircraft owner, employee, visitor and business parking.
4/ Aircraft Maintenance Parking includes employee and visitor parking.

N/A – Not Available

(4) Airport Administration and Maintenance Facilities

Airport administration and maintenance building area is related to activity levels, paved areas, and climate. Increases in runway, taxiway, and apron pavement, in addition to increased activity levels, will result in the need to provide additional administration and maintenance building space.

Once civil aviation becomes fully operational at HST, the Dade County Aviation Department will require a facility(s) and equipment for airport management and maintenance. The 1994 Master Plan estimated that the combined facility would require a 10,000 square foot building, plus two acres of land for an equipment yard and auto parking. By 2015, it was estimated that a 20,000 square foot building, plus an additional one acre of land would be required. These estimates were based on the airfield and civil portion of the airport; if the Air Force operation and cantonment area should change, the administration and maintenance facility would need to be re-evaluated.

With the exception of the five-year shift, due to the initial delay in demand projected by the updated operational forecast, the updated airport administration and maintenance facility requirements should mirror the 1994 Master Plan recommendations. The HABDI and CDMP documents do not address the airport's administration and maintenance facility requirements.

(5) Aircraft Fuel Requirements

To project future fuel requirements, existing fuel capacity was compared to projections of general aviation and commercial aircraft operations. Future fuel storage requirements were estimated based on a minimum supply of five days of average peak day usage. The minimum fuel storage capacity recommended by the 1994 Master Plan is presented in the table below.

	2000	2005	2010	2015
1994 Master Plan				
jet fuel (gallons)	45,000	163,000	N/A	321,000
aviation gasoline (gallons)	19,500	24,500	N/A	30,500

N/A – Not Available

Due to the drop in projected general aviation operations, aviation gasoline requirements will be less demanding. HST currently has two 55,000 barrel tanks in the tank farm that are more than sufficient to handle long term fuel storage needs as described in the 1994 Master Plan as well as the updated fuel requirements. The HABDI and CDMP documents do not address the airport's aircraft fuel requirements.

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