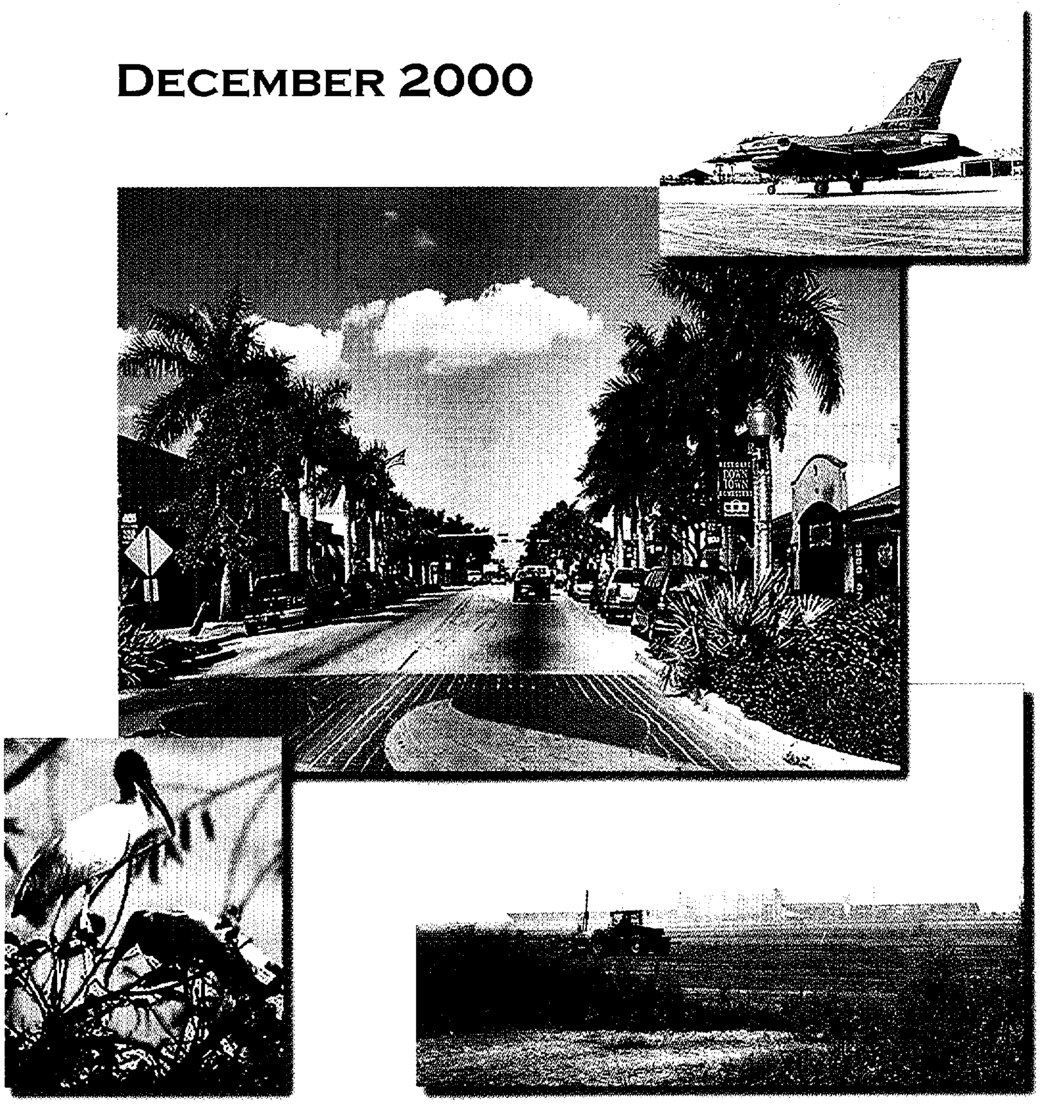
Final
Supplemental Environmental Impact Statement

Disposal of Portions of the Former Homestead Air Force Base, Florida

December 2000



Volume II: Appendices

FINAL
SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

DISPOSAL OF PORTIONS OF THE FORMER HOMESTEAD AIR FORCE BASE, FLORIDA

Volume II: Appendices

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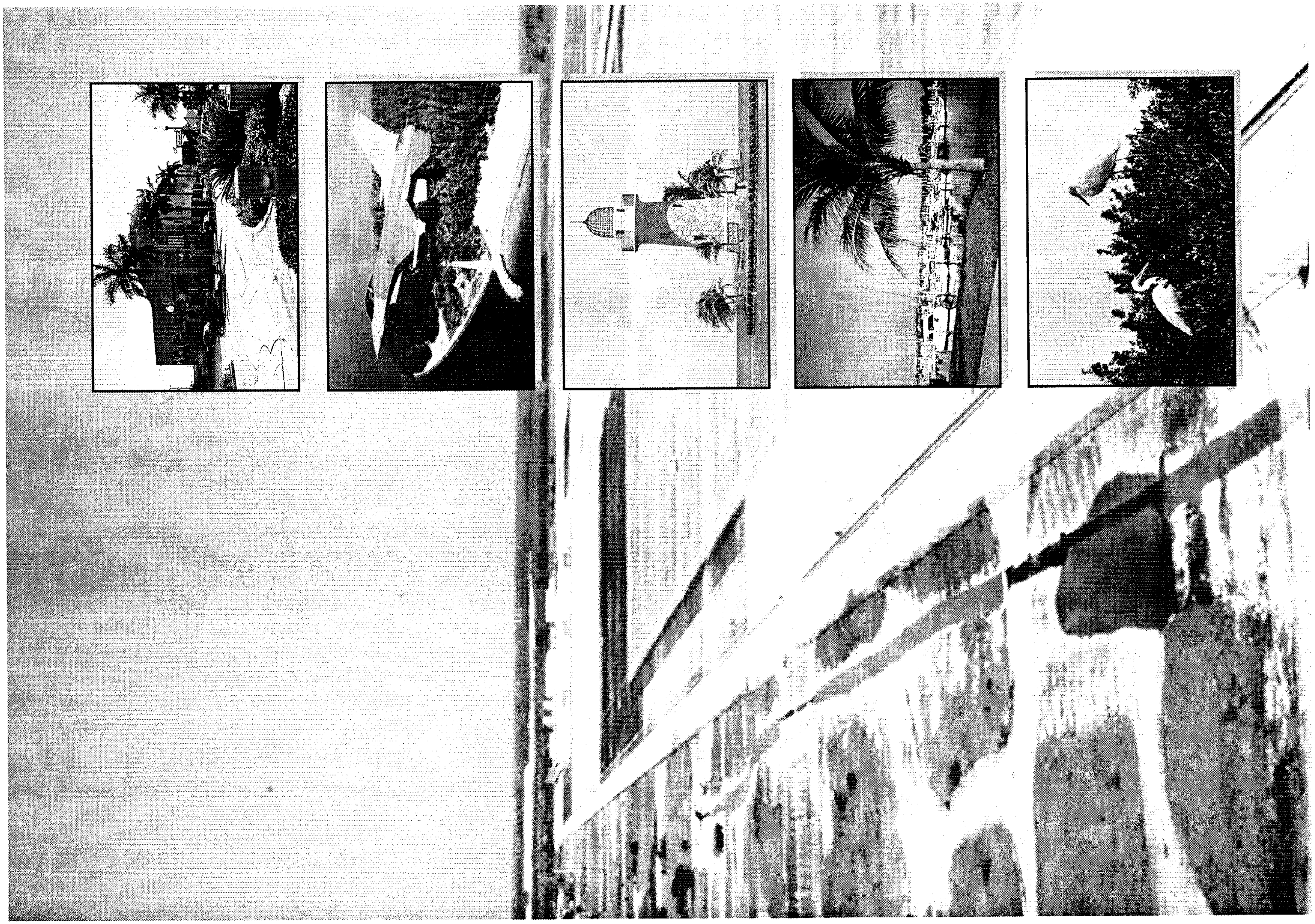


ADDENDUM TO APPENDIX A

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

<u>National Importance</u>: 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.

<u>Size and growth of the air transportation industry</u>: 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.

<u>National economic significance</u>: 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.

<u>Concentration of traffic</u>: 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.

<u>Specialized roles in multi-airport systems</u>: 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.

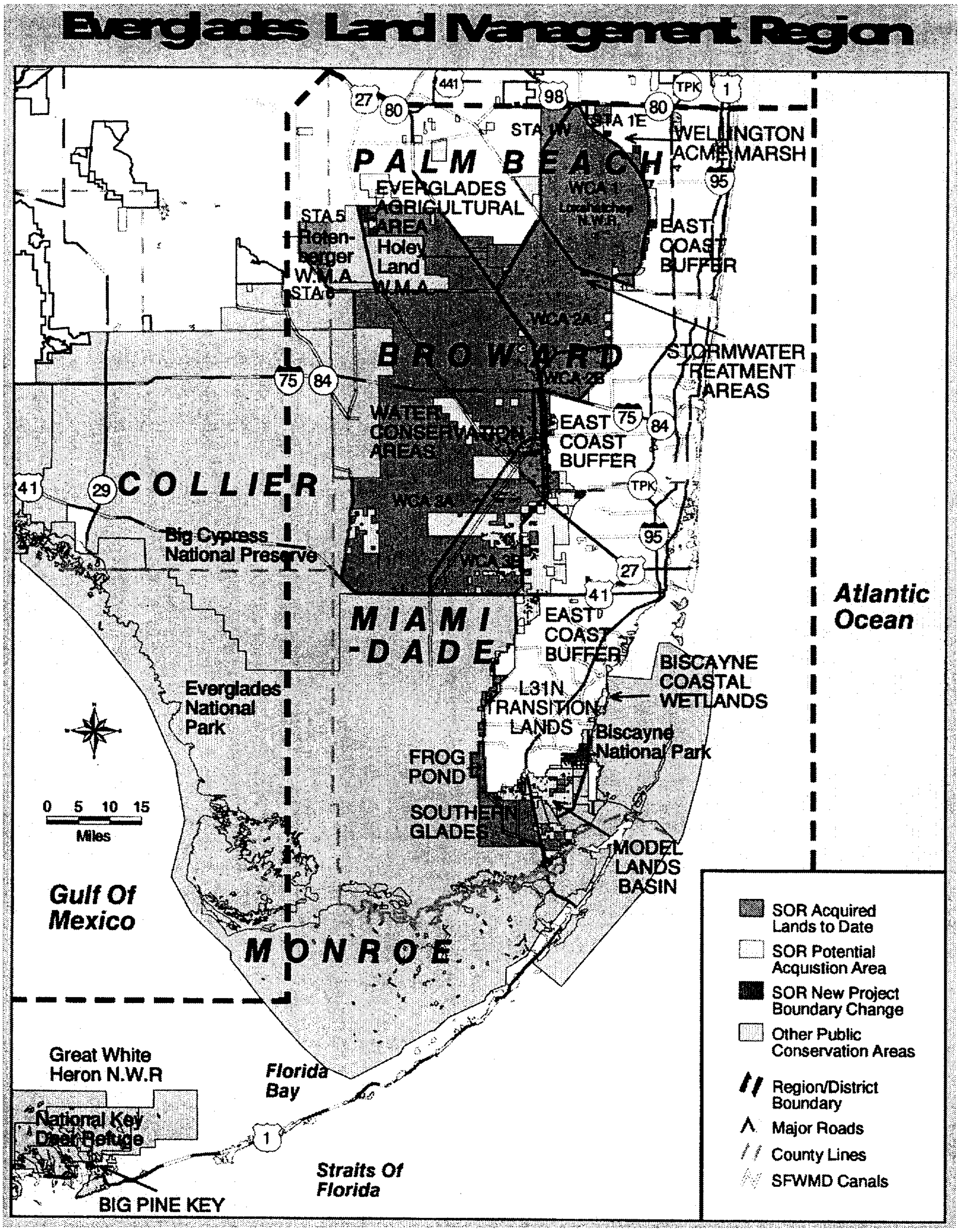
Homestead General Aviation Airport (X51):

- 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 **OPF**	Kendall-Tamiami **TMB**	Homestead GA **X51**	Opa-Locka West **X46**	Dade-Collier Training **TNT**	Homestead Regional **HST**	Miami Int'l **MIA**	**TOTAL**
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 (1997)	FORECAST 2000	FORECAST 2005	FORECAST 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.
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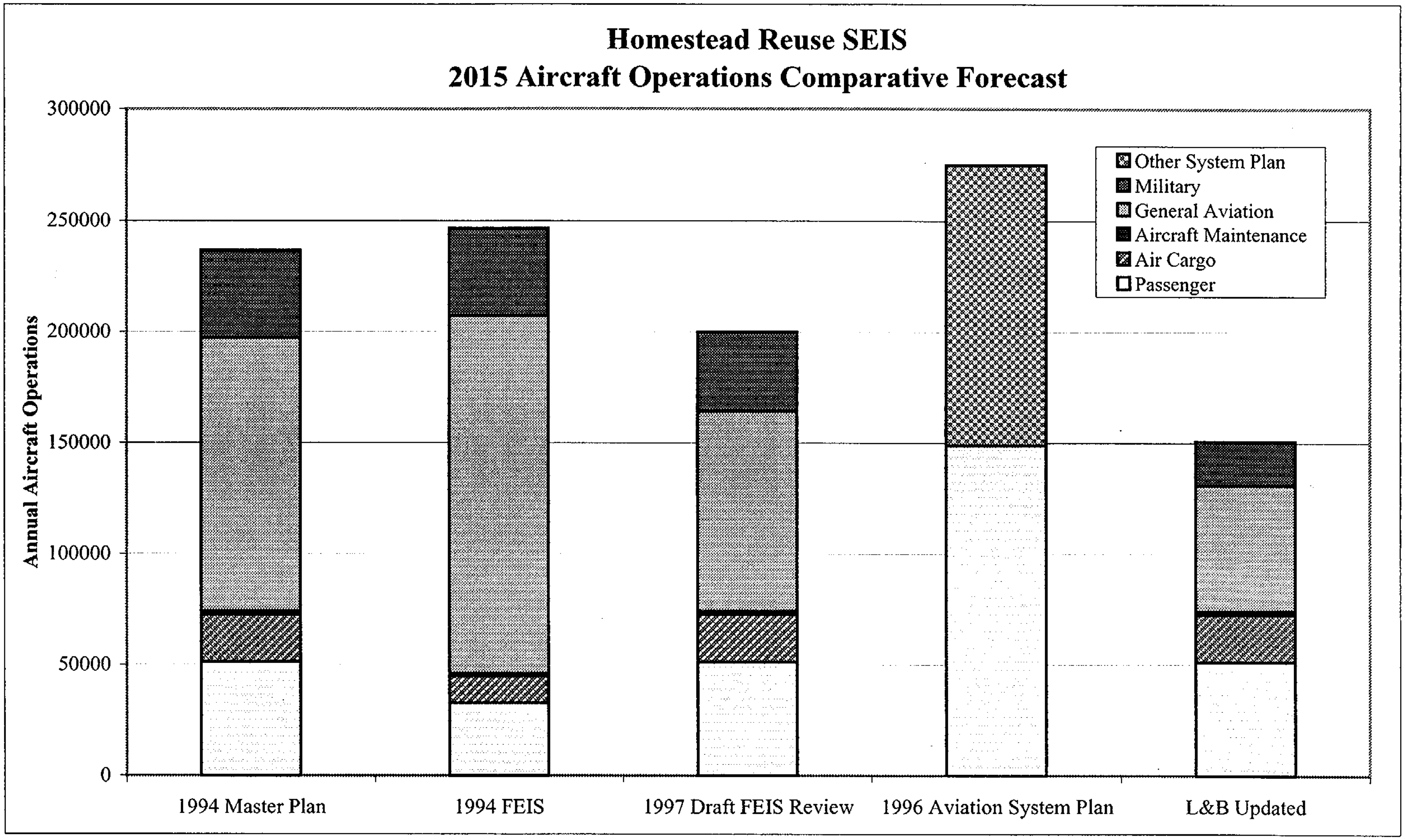

Note: Other System Plan is the sum of Air Cargo, Maintenance, General Aviation and Military

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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 (1997)	—FORECAST— 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.

- Cargo Buildings - 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.

- 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 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).

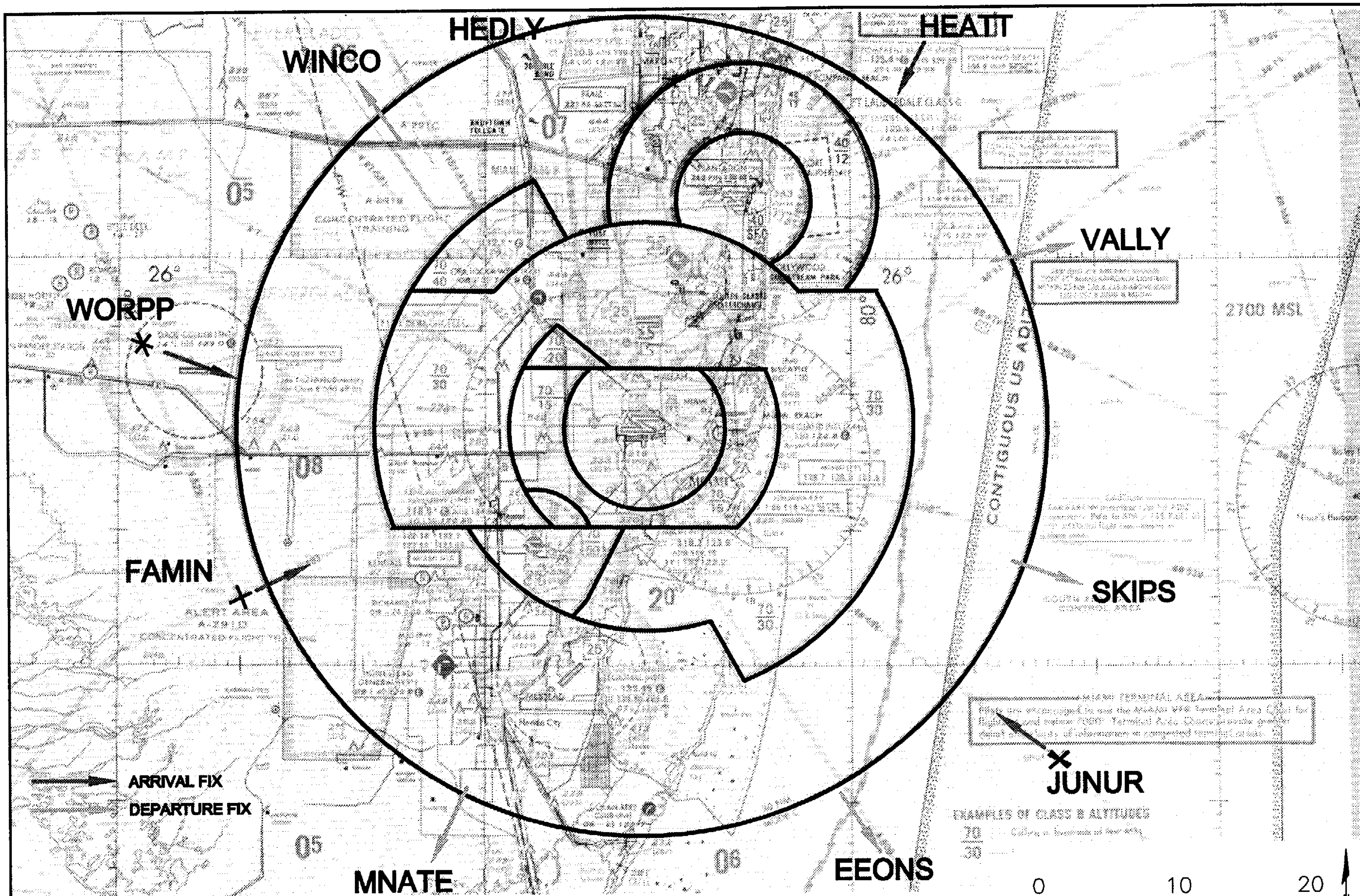
3.1 Existing Miami-Dade County Airspace

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

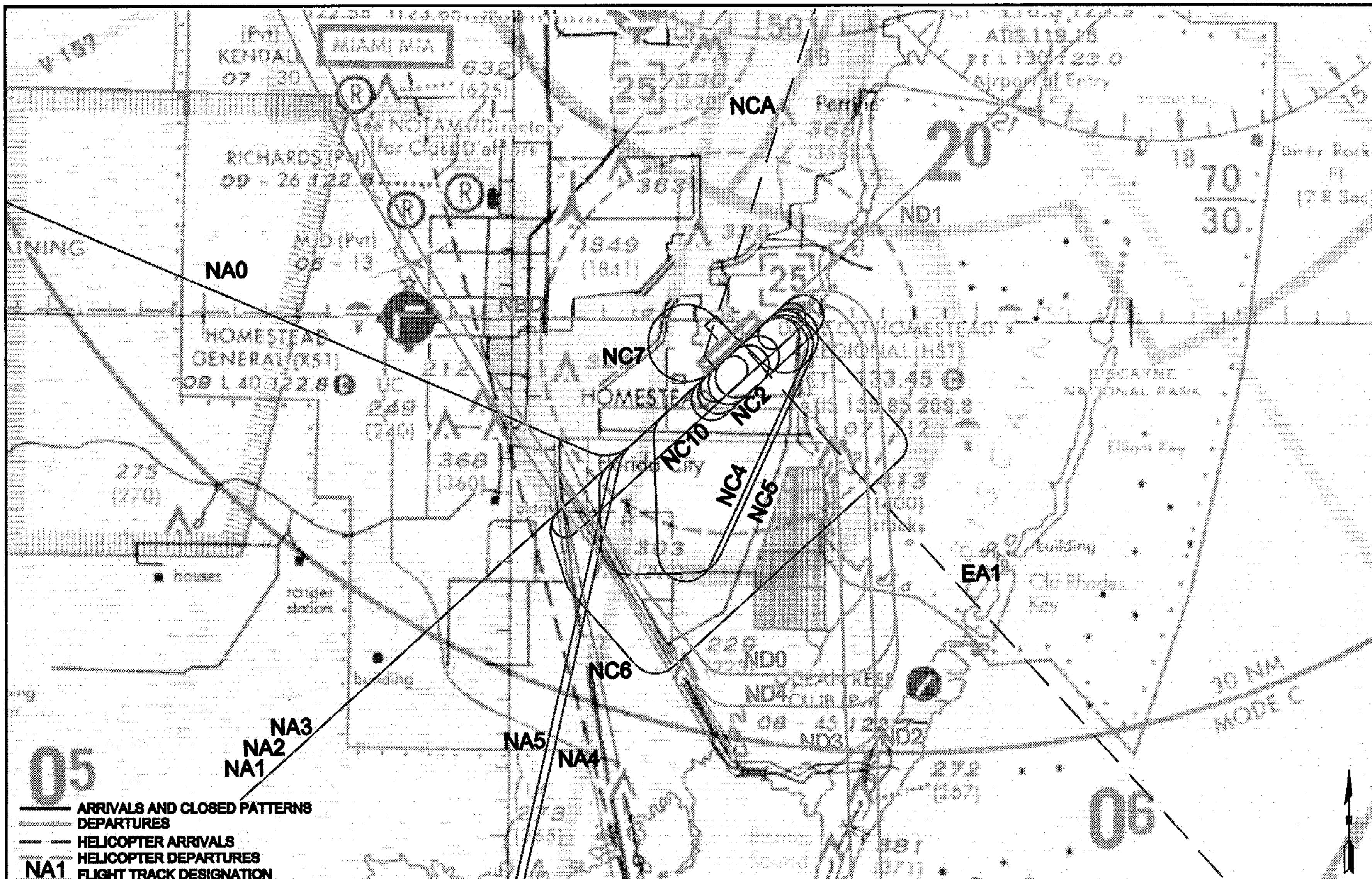
The projected level of federal operations at HST is presented in Table 1-10 of the updated forecast and consists of a total of approximately 20,000 annual federal aircraft operations. The majority of these operations (66%) are conducted by F-16 and F-15 jet aircraft based at HST. The U.S. Customs Service 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

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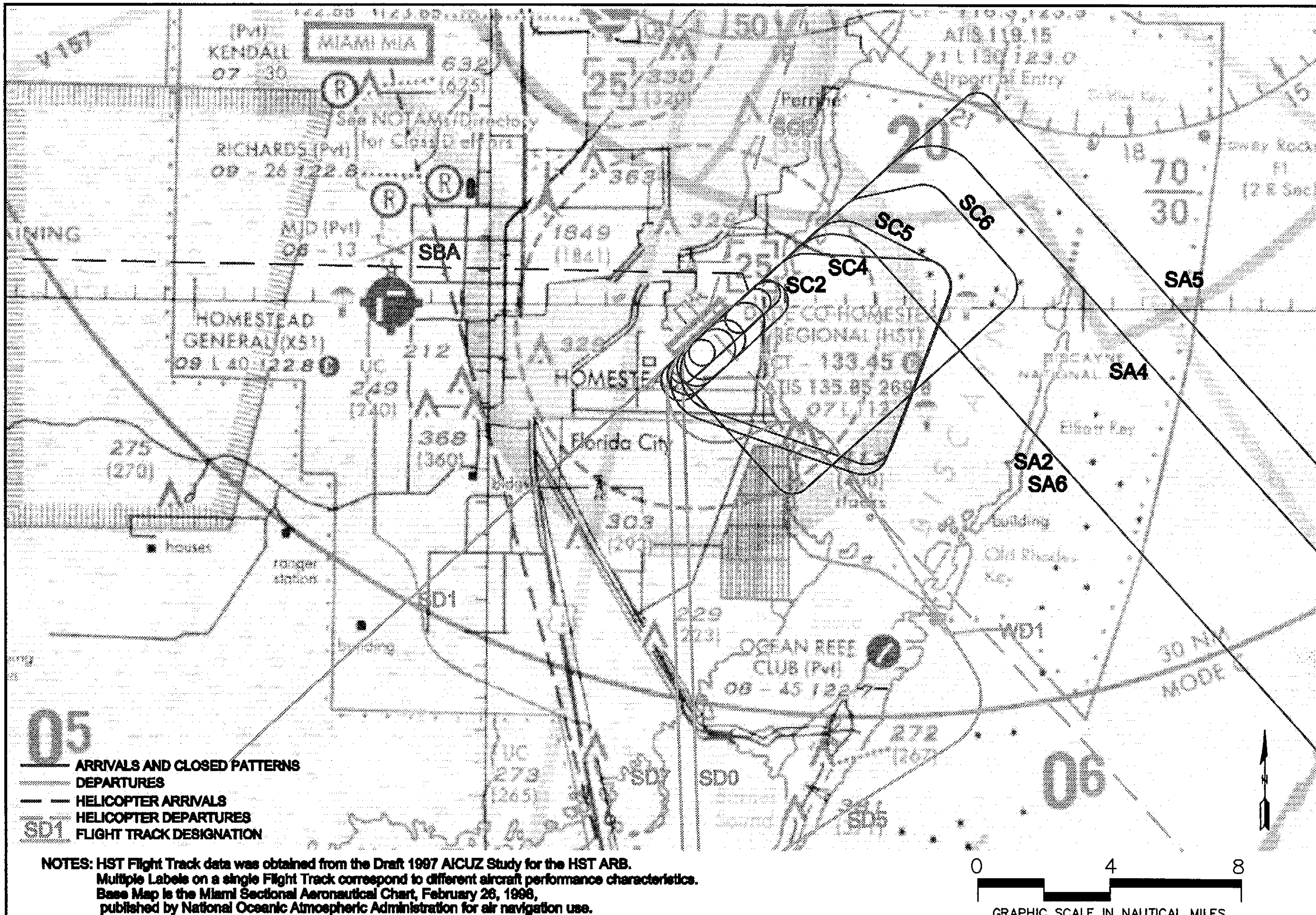


HOMESTEAD SEIS | Landrum&Brown

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/]

	Current Operations [1/]																
Arrivals		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.

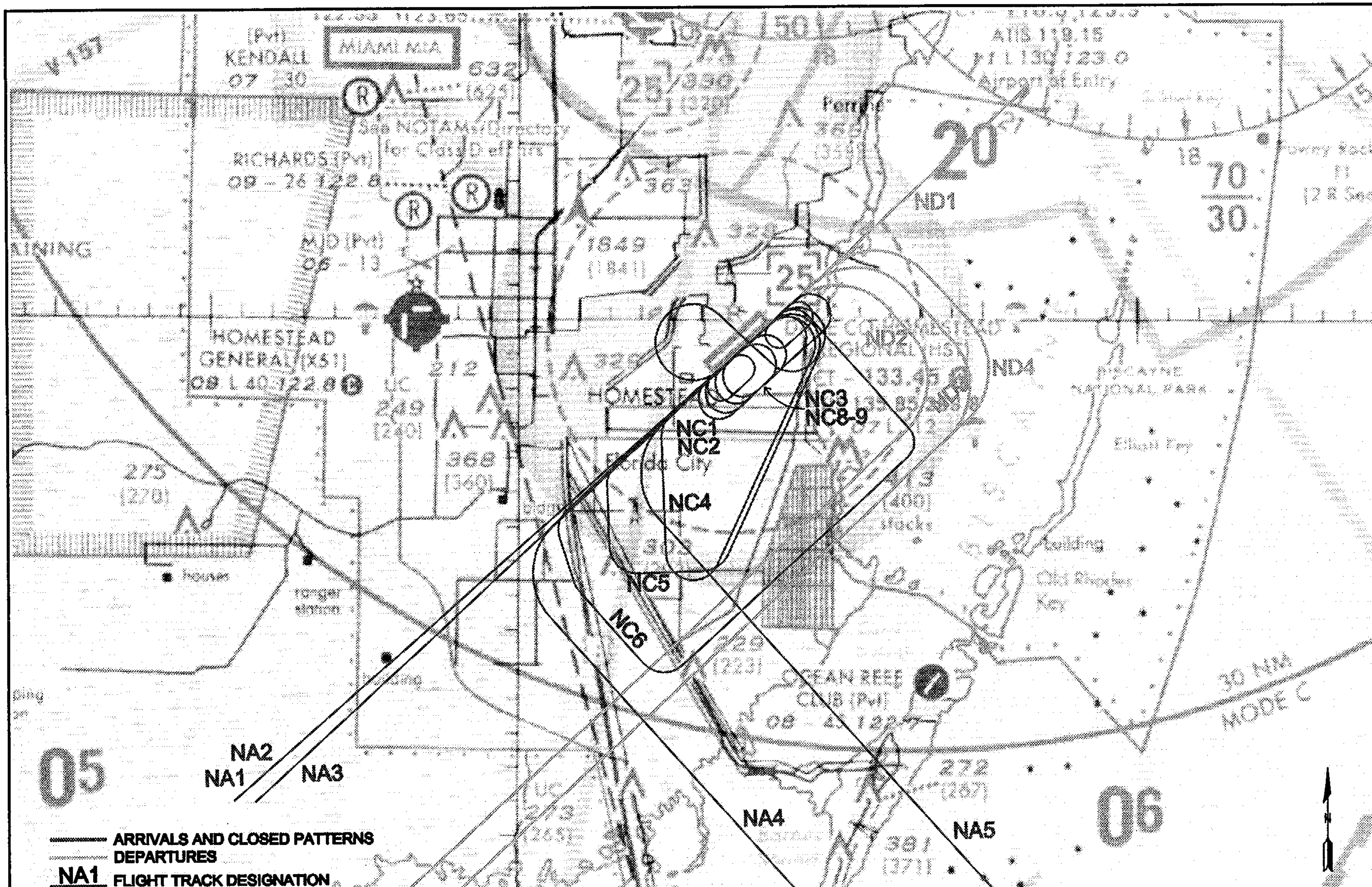
Data obtained from the earlier 1988 AICUZ study on 1987 flight track locations and utilization when Homestead was a fully active Air Force Base is presented in **Exhibits 1-5 and 1-6** and **Table 1-15** for comparison against existing conditions. According to the 1988 AICUZ study, over 500 average daily 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.

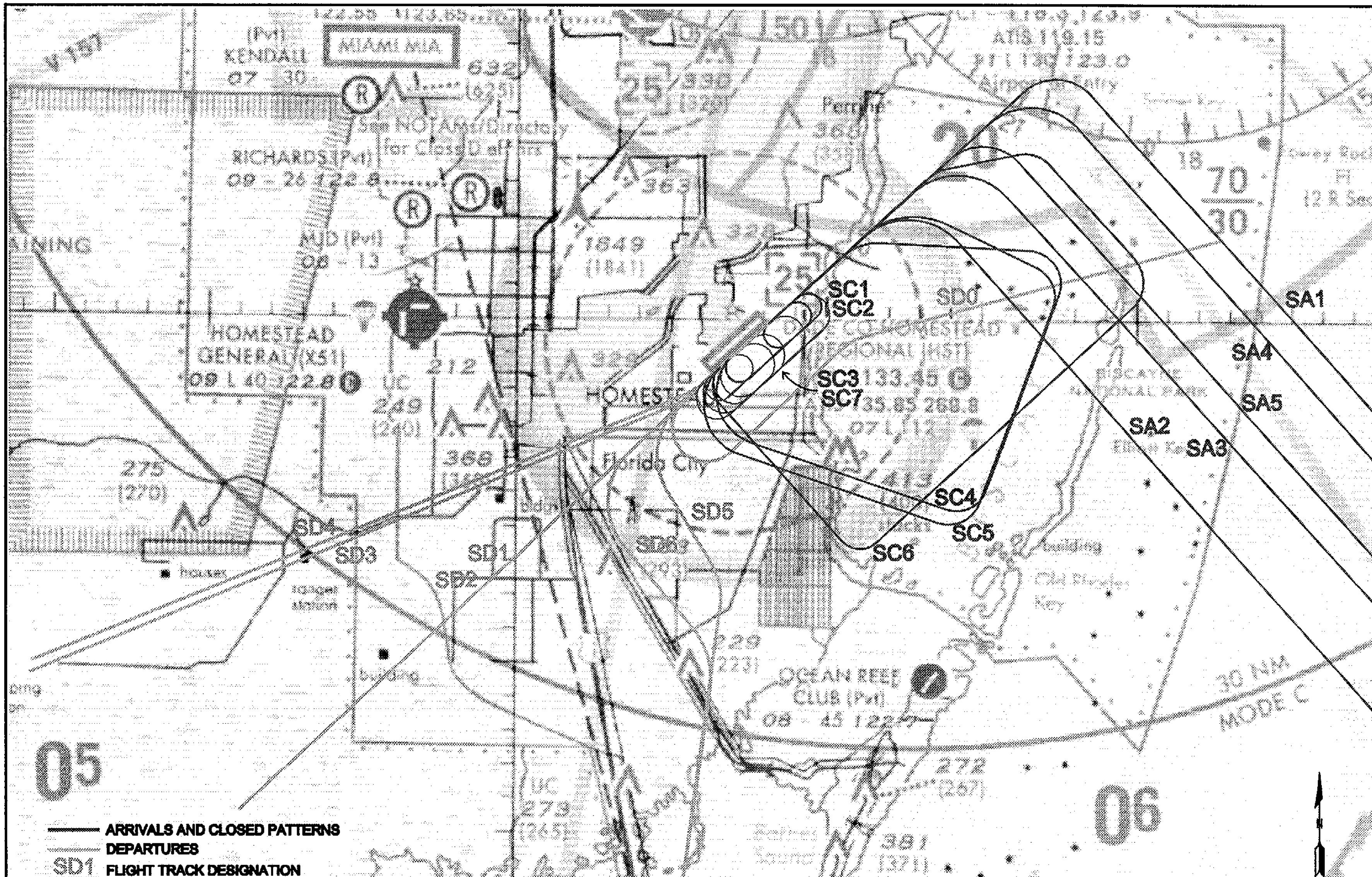


ARRIVALS AND CLOSED PATTERNS
DEPARTURES
NA1 FLIGHT TRACK DESIGNATION

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.

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



— ARRIVALS AND CLOSED PATTERNS

— DEPARTURES

SD1 FLIGHT TRACK DESIGNATION

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.

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/										
		NA1	NA2	NA3	NA4	NA5	SA1	SA2	SA3	SA4	SA5	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	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	ND1	ND2	ND3	ND4	SD0	SD1	SD2	SD3	SD4	SD5	SD6	Total
		Distribution of Operations By Flight Track [1/]											
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%

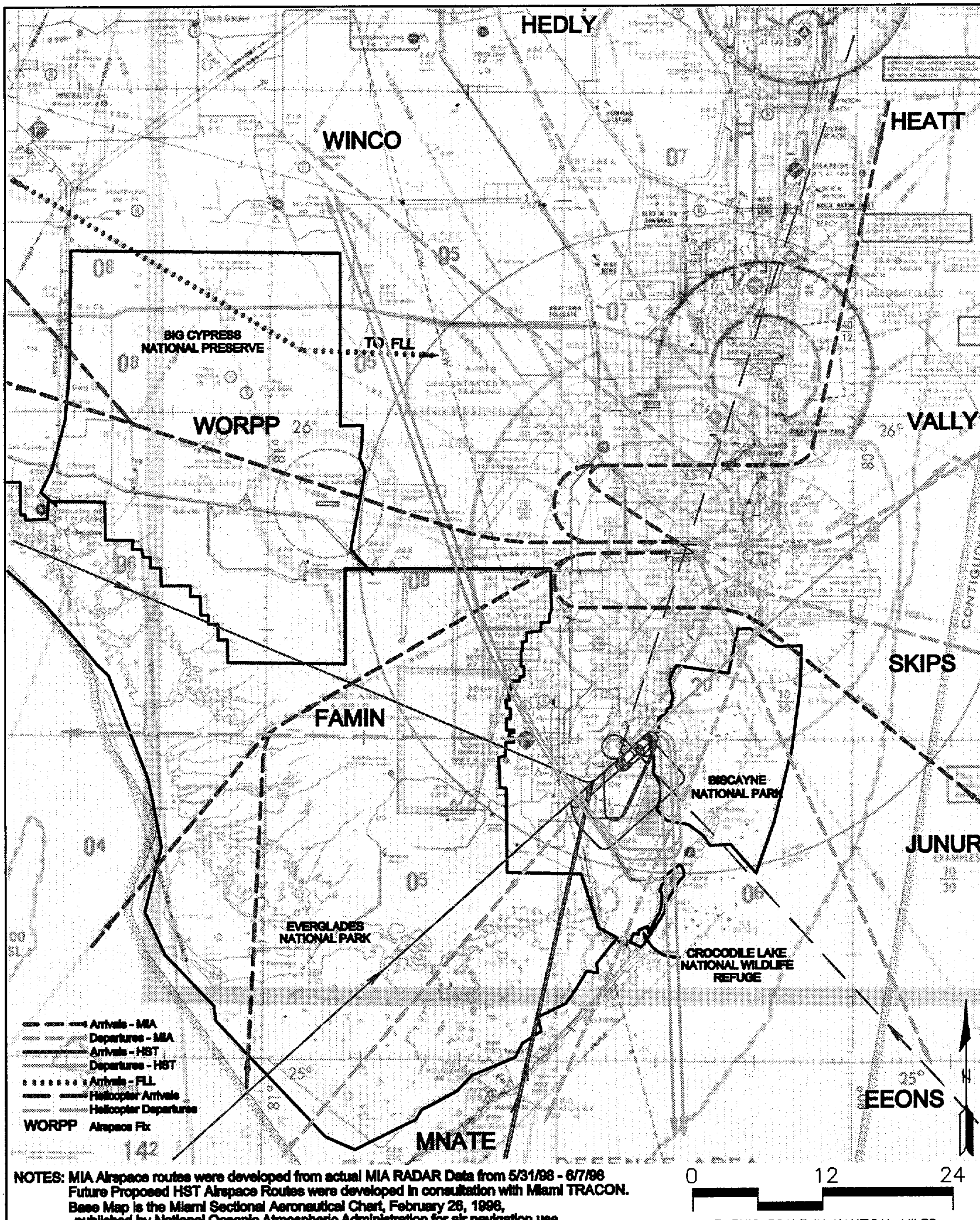
1/ See Exhibits 1-5 and 1-6 for flight track identification.

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.

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

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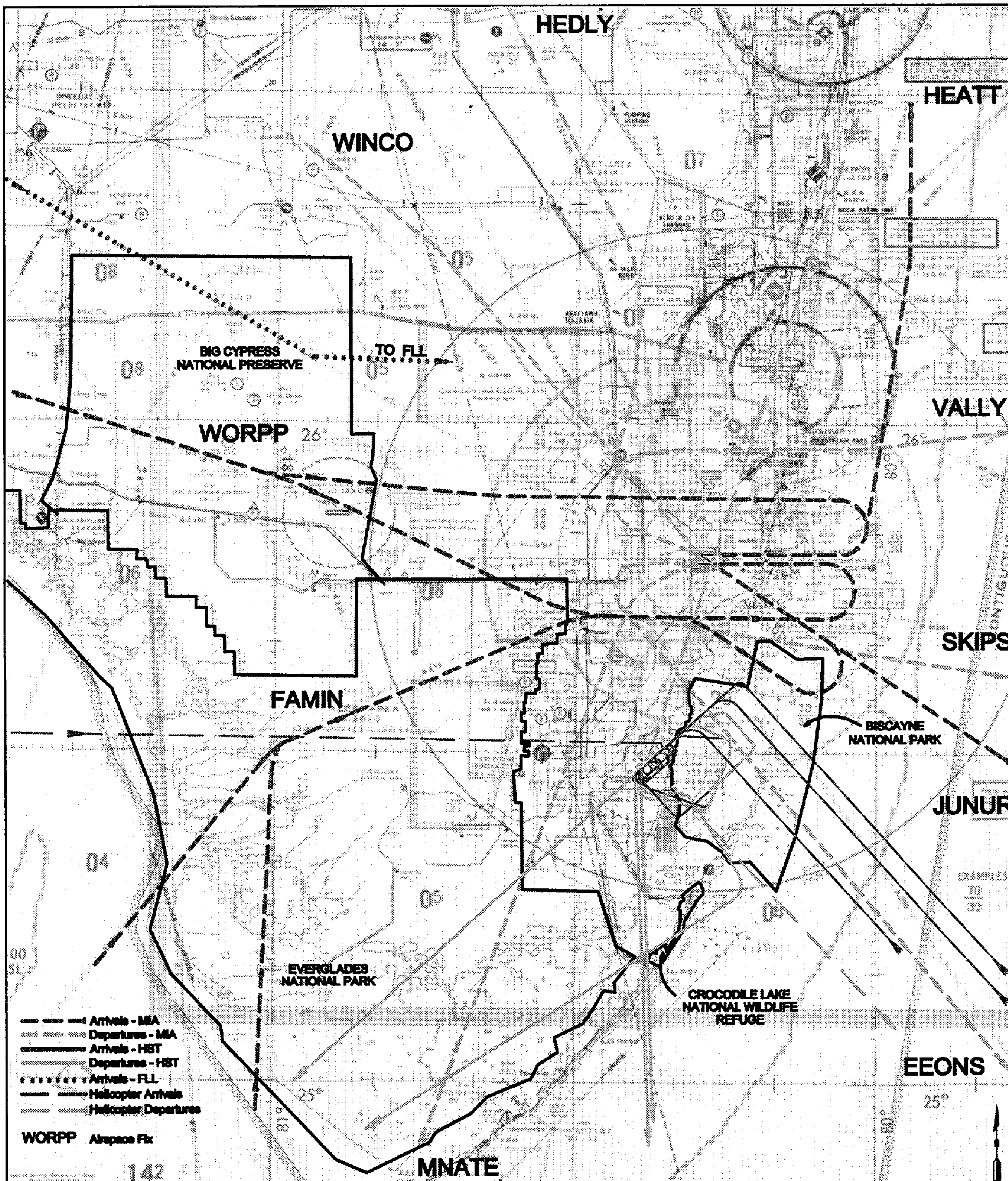
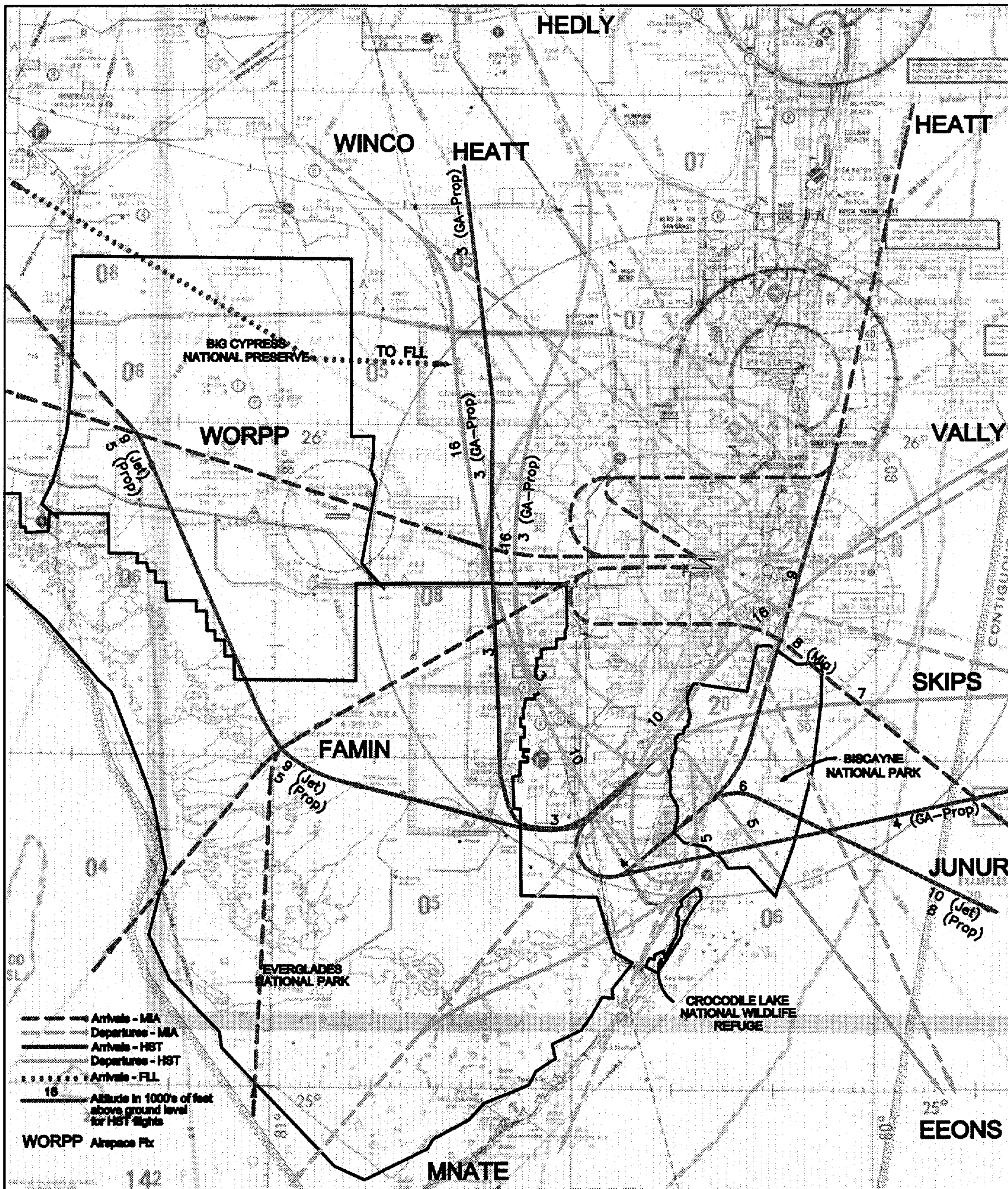


NOTES: MIA Airspace routes were developed from actual MIA RADAR Data from 5/31/98 - 6/7/98
Future Proposed HST Airspace Routes were developed in consultation with Miami TRACON.
Base Map is the Miami Sectional Aeronautical Chart, February 26, 1998,
published by National Oceanic Atmospheric Administration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

HOMESTEAD SEIS	Landrum&Brown	EXISTING MIA 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.

0 12 24
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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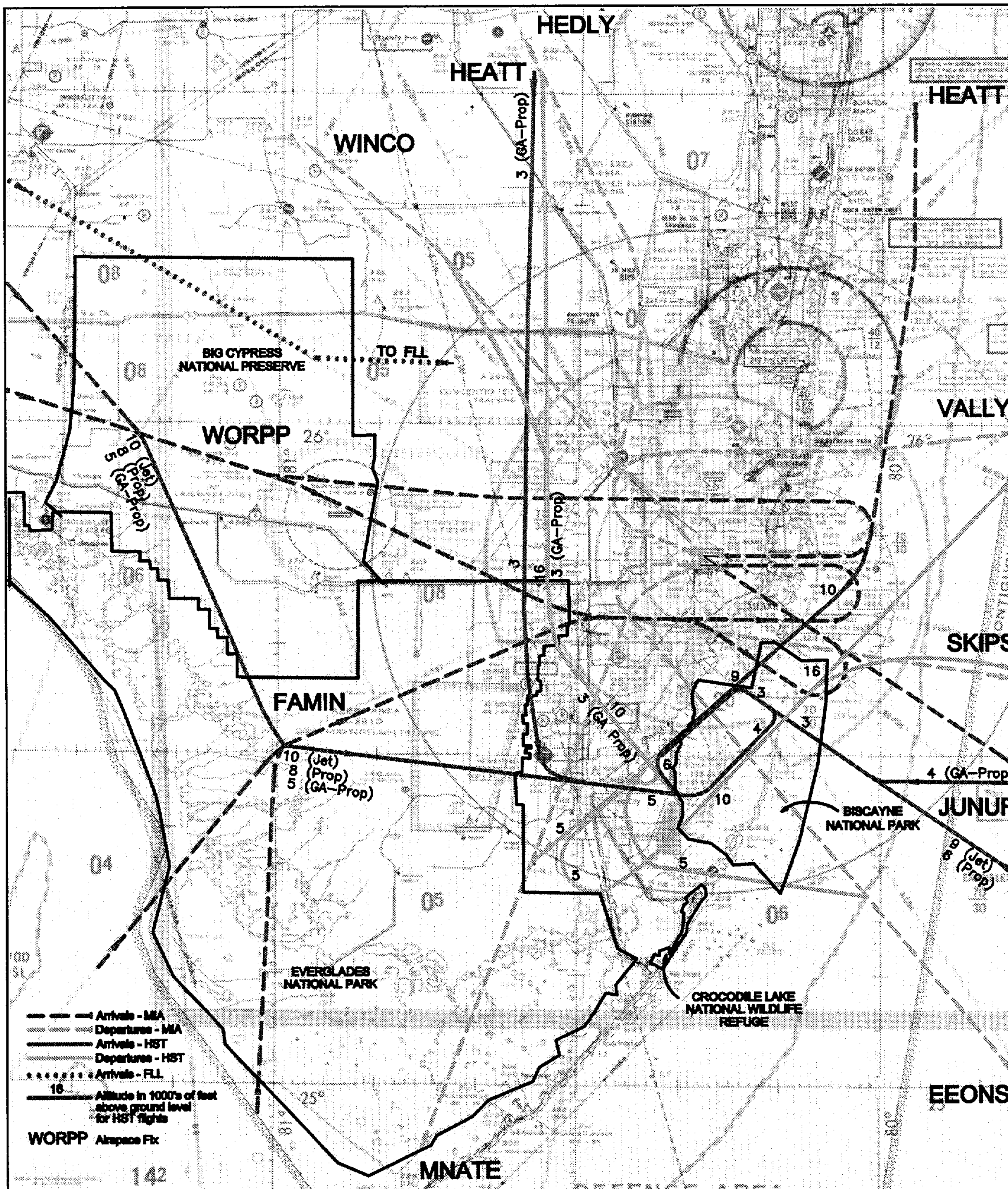

NOTES: MIA Airspace routes were developed from actual MIA RADAR Data from 5/31/98 - 6/7/98
Future Proposed HST Airspace Routes were developed in consultation with Miami TRACON.
Base Map is the Miami Sectional Aeronautical Chart, February 26, 1998,
published by National Oceanic Atmospheric Administration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

0 12 24
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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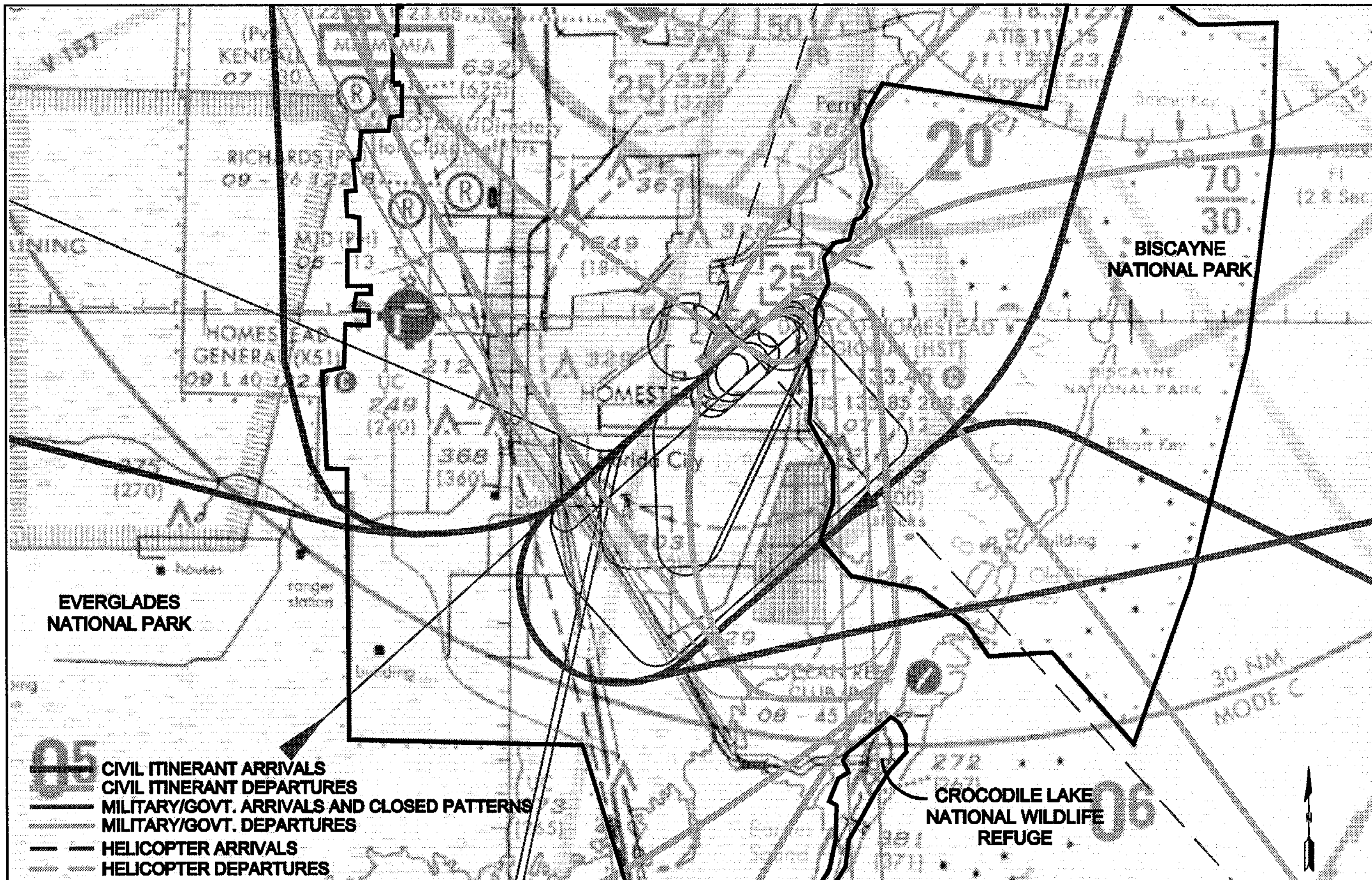

NOTES: Future Proposed HST Airspace Routes were developed in consultation with Miami TRACON
HST Flight Track data was obtained from the Draft 1997 AICUZ Study for the HST ARB.
Base Map is the Miami Sectional Aeronautical Chart, February 26, 1998,
published by National Oceanic Atmospheric Administration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

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

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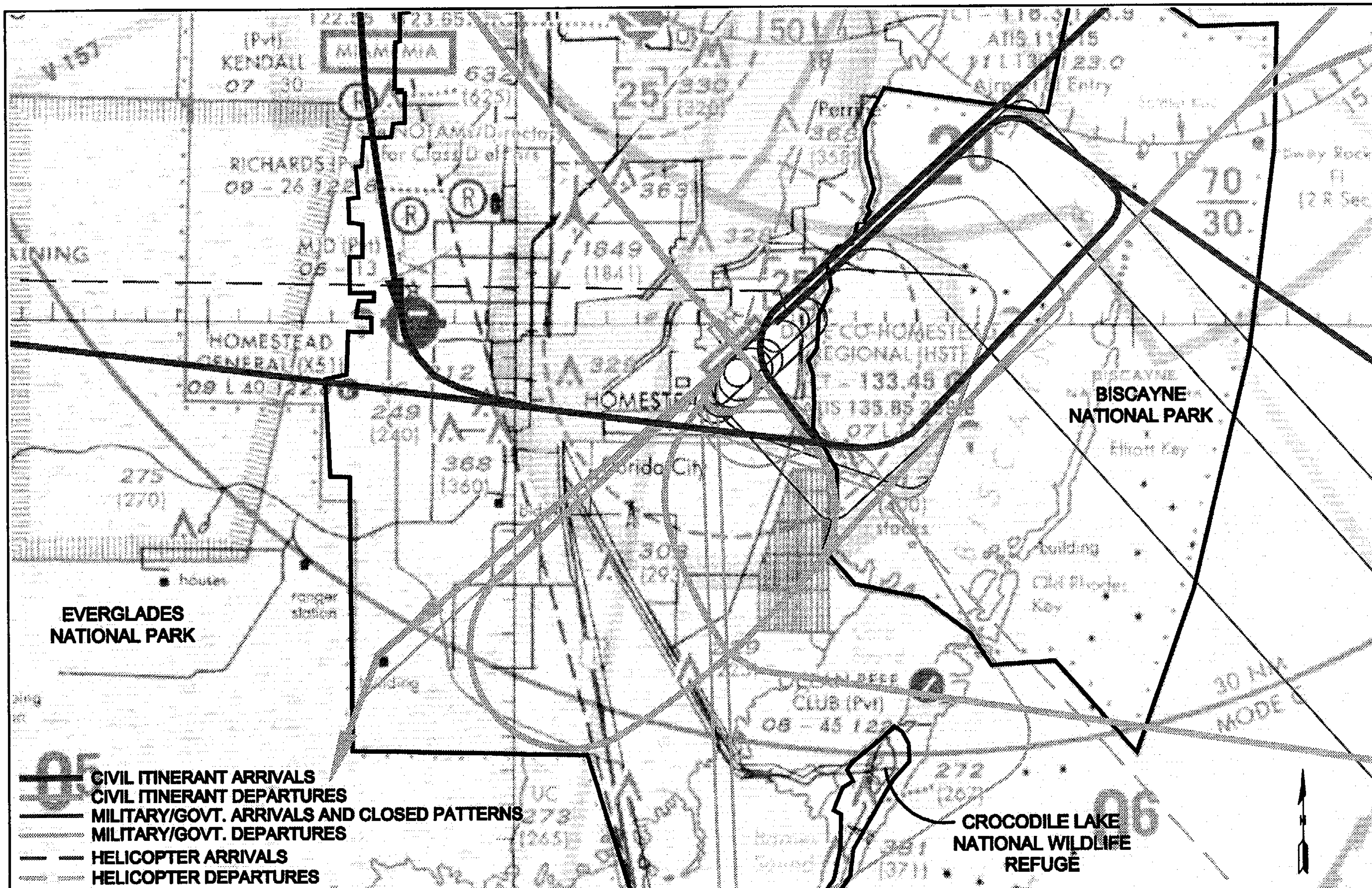


NOTES: Future Proposed HST Airspace Routes were developed in consultation with Miami TRACON.
HST Flight Track data was obtained from the Draft 1997 AICUZ Study for the HST ARB
Base Map is the Miami Sectional Aeronautical Chart, February 26, 1998,
published by National Oceanic Atmospheric Administration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

0 4 8
GRAPHIC SCALE IN NAUTICAL MILES

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:

<u>East Flow:</u>

- 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.

<u>West Flow:</u>

- 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.

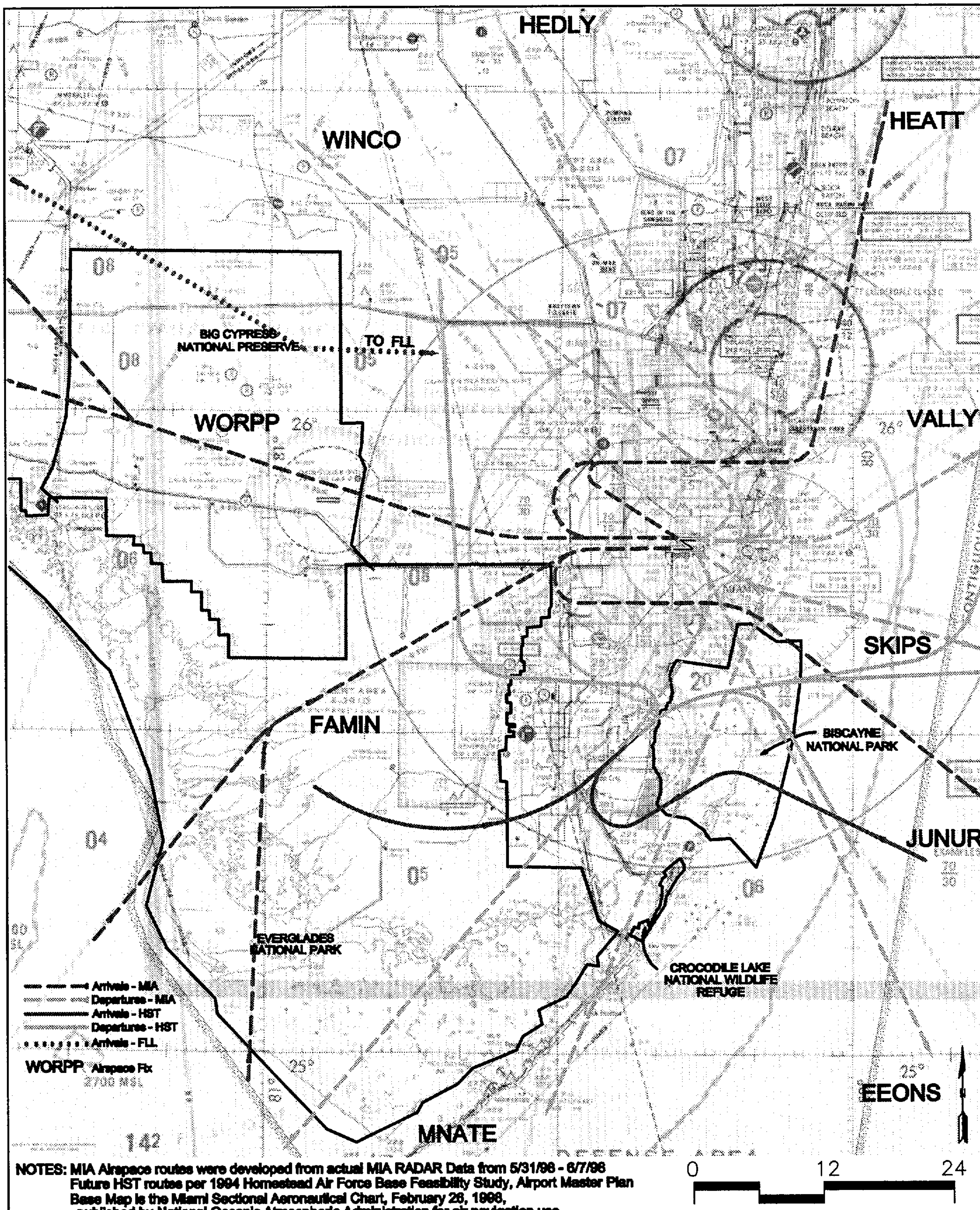
- Runway 5 departures climbing in an easterly direction begin to interfere with MIA southbound departures, as they move away from HST. In order to keep HST departures below MIA air traffic they would be restricted from climbing if continuing in an easterly/northeasterly direction as depicted in the Master 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 <u>Future HST Flight Track Utilization</u>

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 5/31/96 - 6/7/96
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 - EAST FLOW	EXHIBIT 1-13

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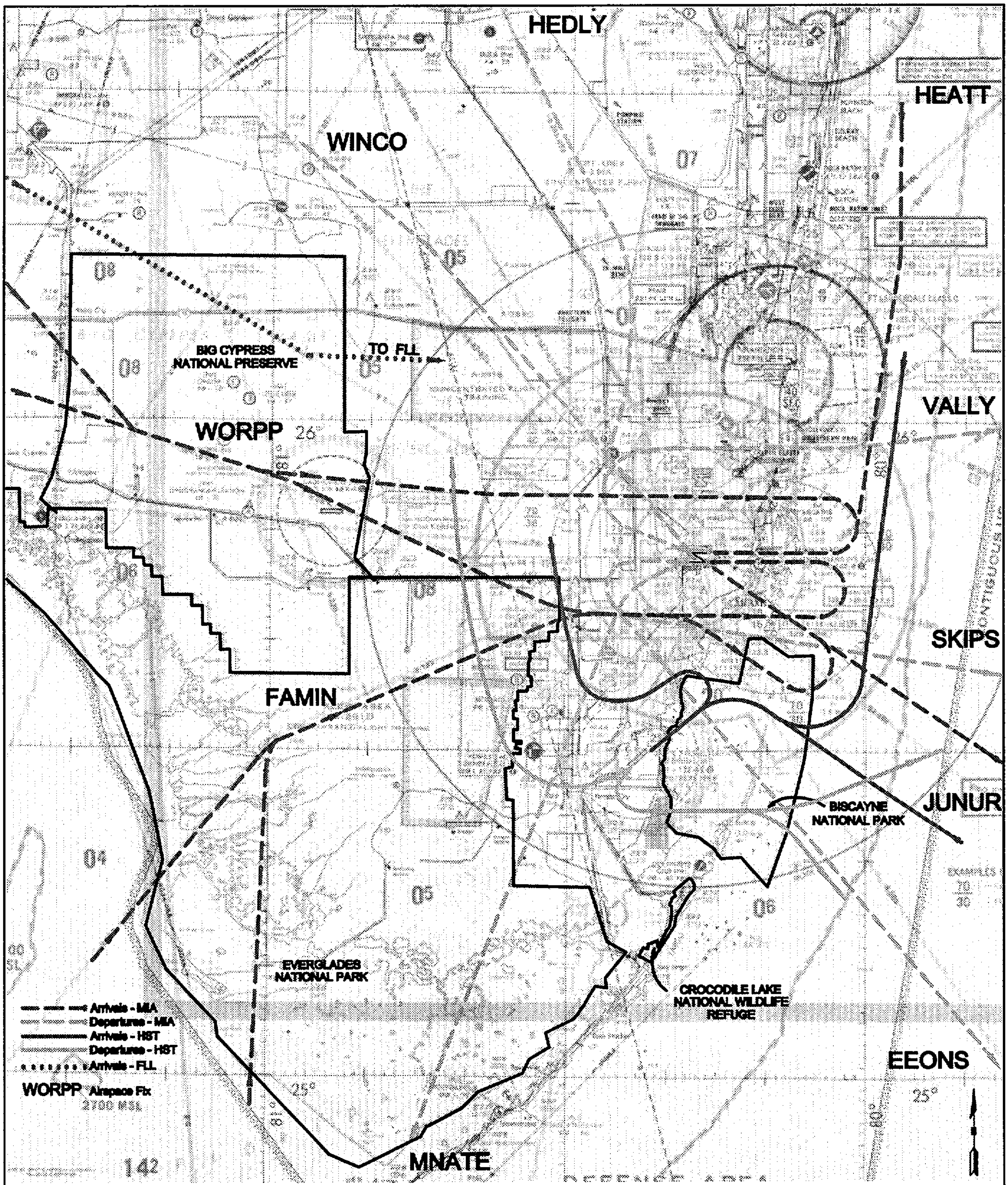

NOTES: MIA Airspace routes were developed from actual MIA RADAR Data from 5/31/98 - 6/7/98
Future HST routes per 1994 Homestead Air Force Base Feasibility Study, Airport Master Plan
Base Map is the Miami Sectional Aeronautical Chart, February 26, 1998,
published by National Oceanic Atmospheric Administration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

0 12 24
GRAPHIC SCALE IN NAUTICAL MILES

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

Fix	Latin/Caribbean Pax. Operations		Domestic Pax. Operations		Prop GA Operations		All Other Civil Operations	
	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) Future Homestead Development Under the HABDI and the CDMP Plan

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) Future Airport Development Based on Updated Forecast

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) Estimating Demand at Replacement or Supplemental Airports

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.

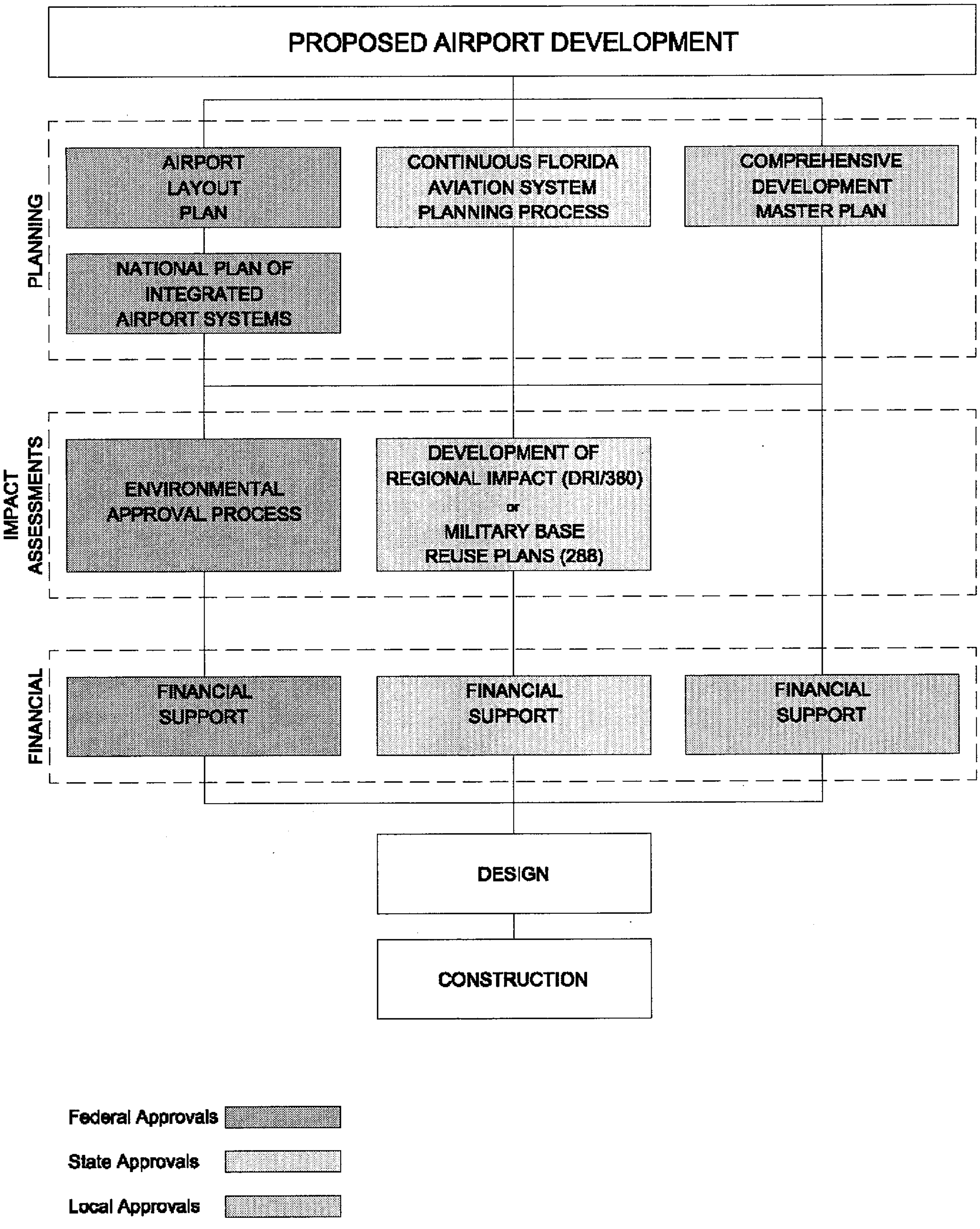
The development of replacement commercial service airports is rare. However, while not impossible, there are usually specific considerations that cause a new airport to be constructed or modified for commercial use. When compared to all-new replacement commercial service airports, supplemental airports 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) Impact Assessment

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) Financial

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) Comparison of Alternative Scenarios

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			Annual Demand			Annual Demand vs. Capacity Ratio		
	1995	2001	2008	1995	2001	2008	1995	2001	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			Annual Demand			Annual Demand vs. Capacity Ratio		
	1997	2028	>2030	1997	2028	>2030	1997	2028	>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 (interim terminal requirement)	3 4	7	N/A	10
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) Airport Rescue and Fire Fighting Facility (ARFF)

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) Auto Parking/Vehicle Storage Requirements

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

Parking Demand Rate:

- 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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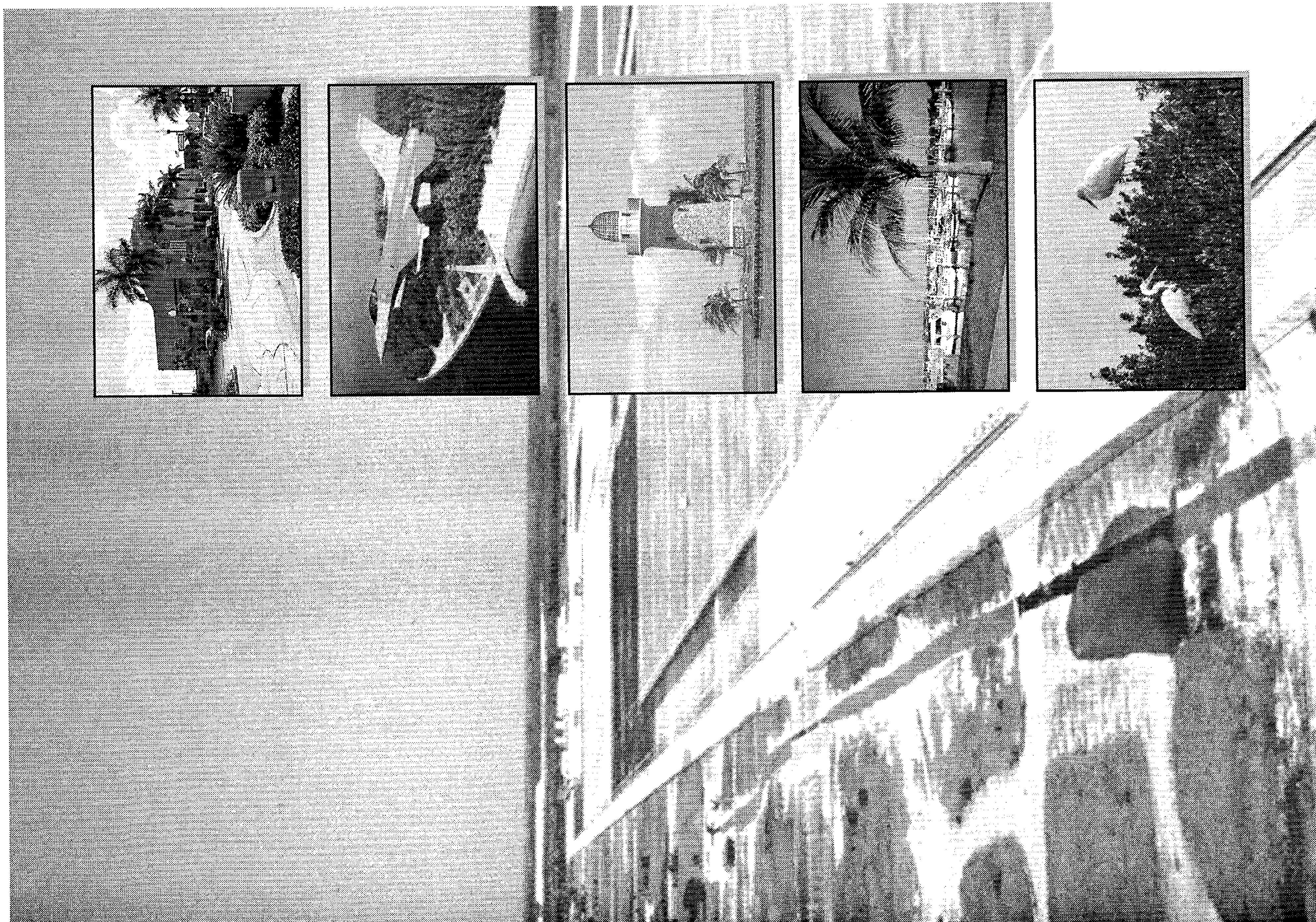
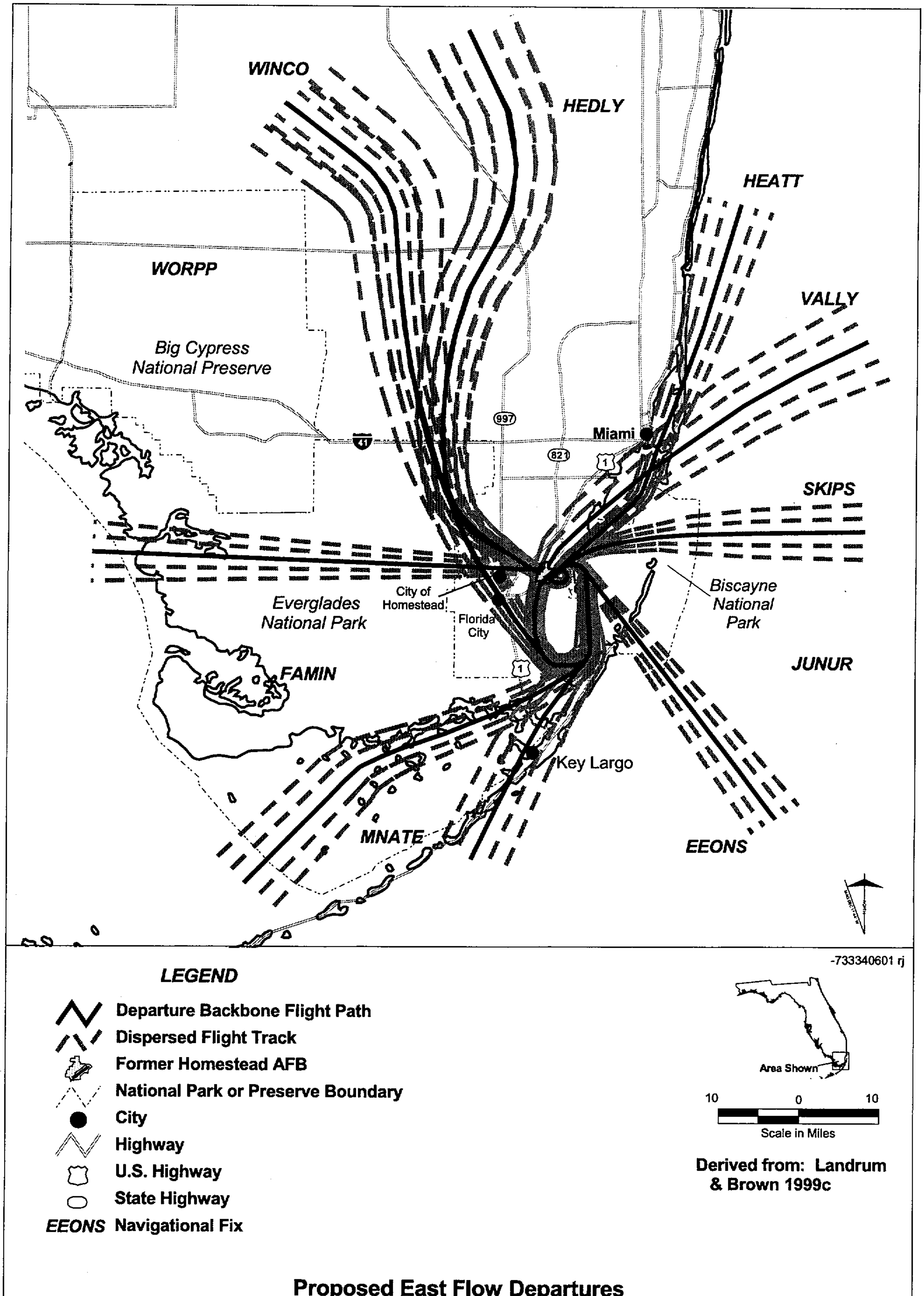
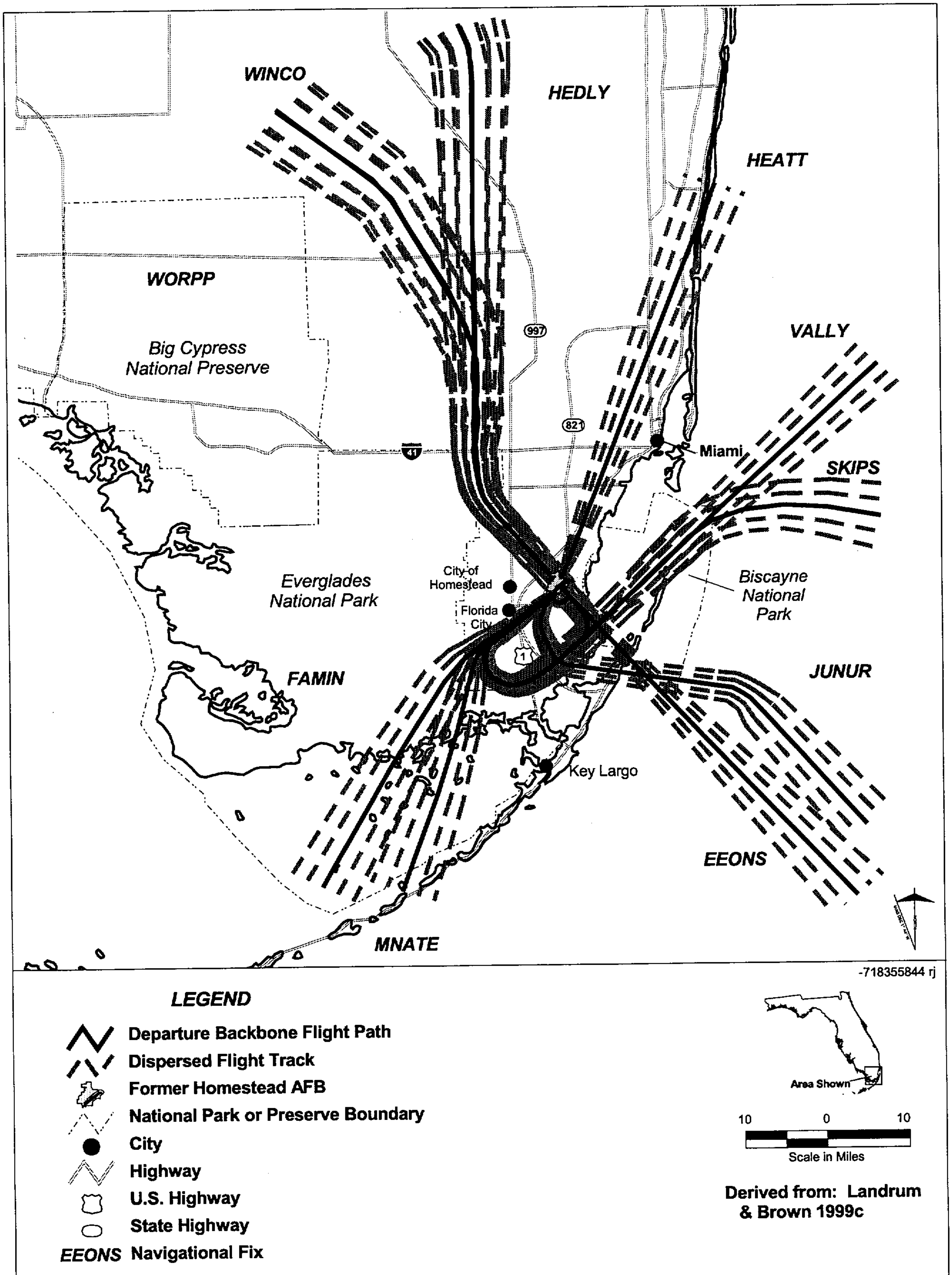
B Proposed Flight Tracks



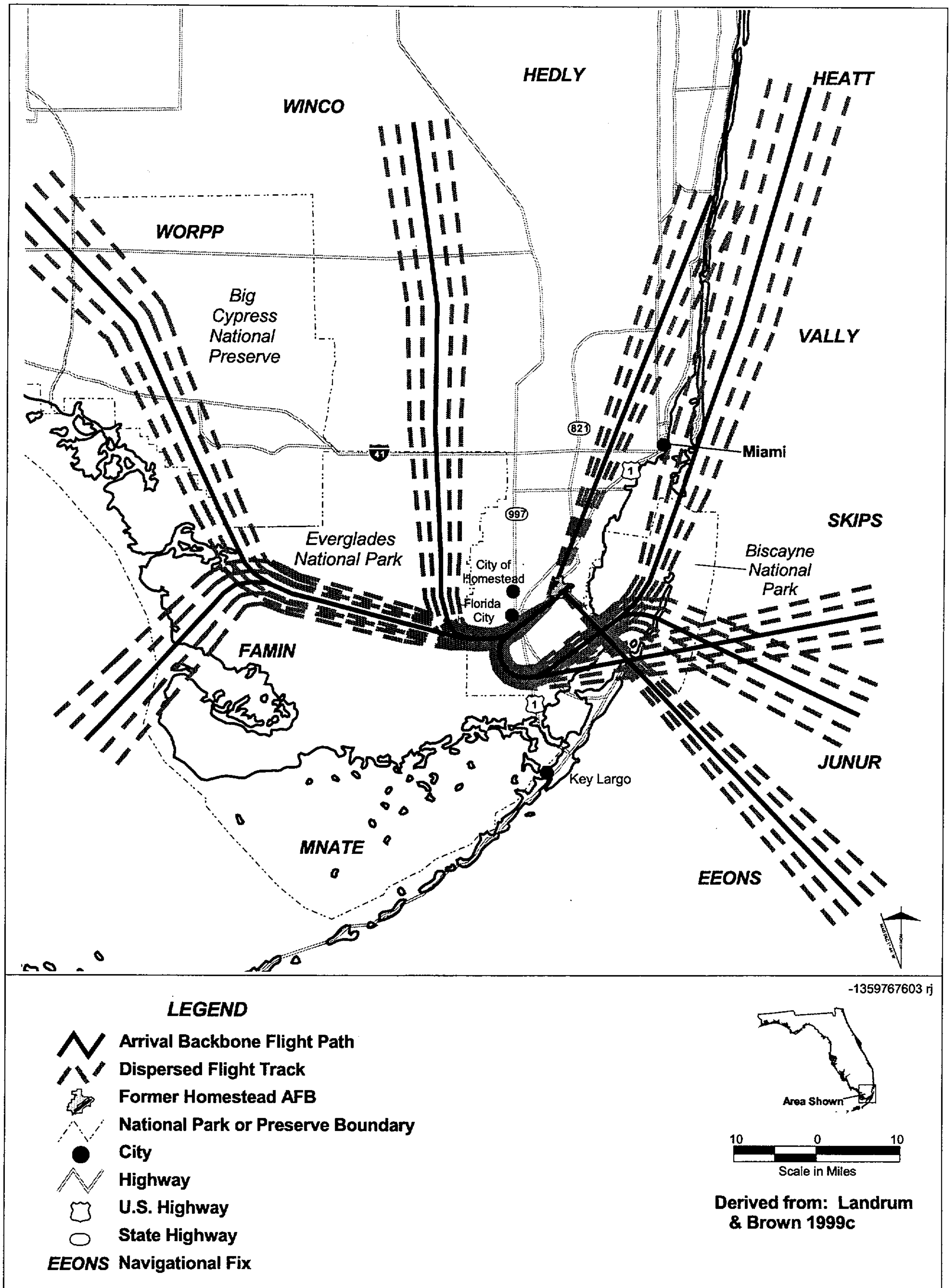


Proposed East Flow Departures

APPENDIX B

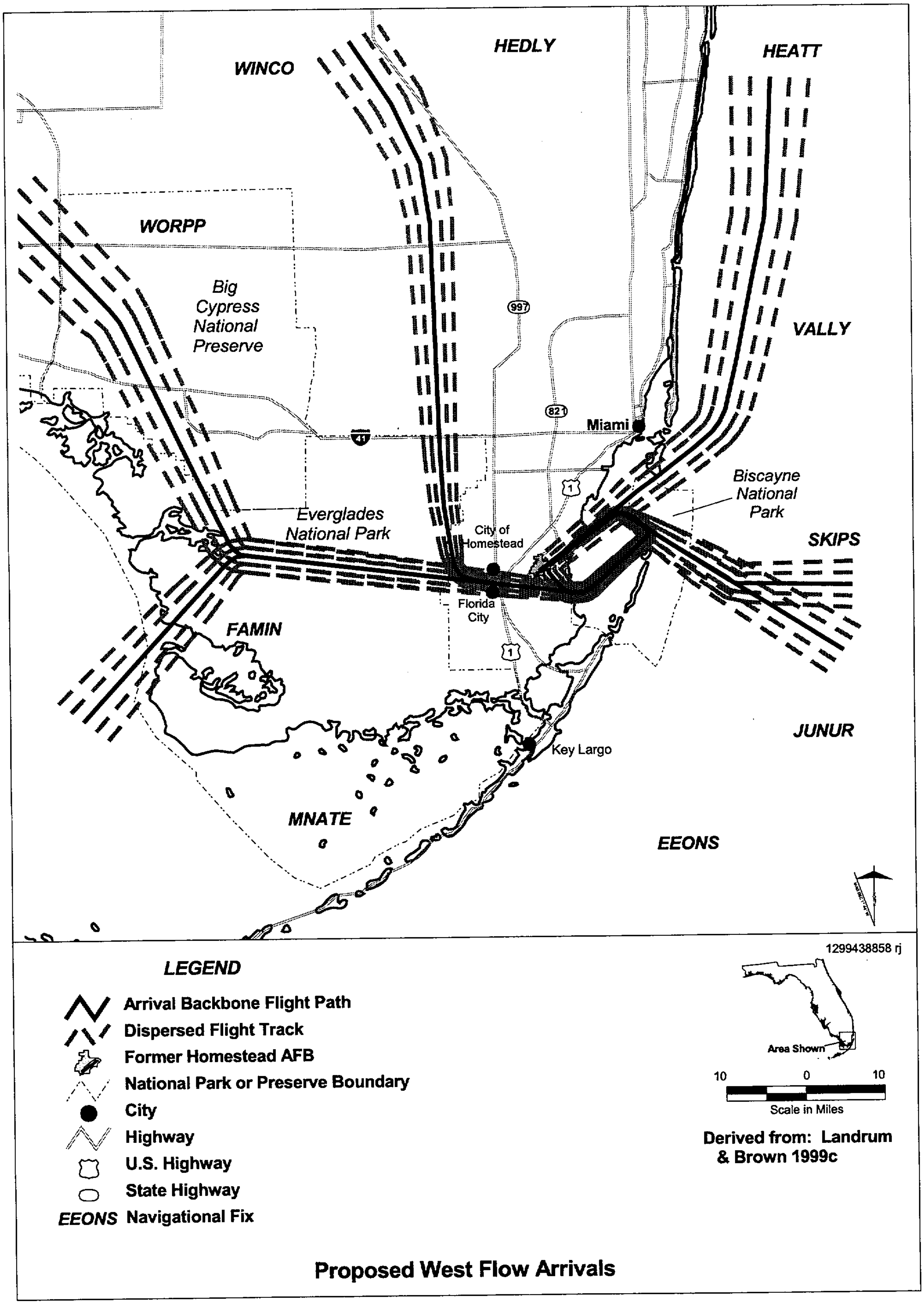


Proposed West Flow Departures

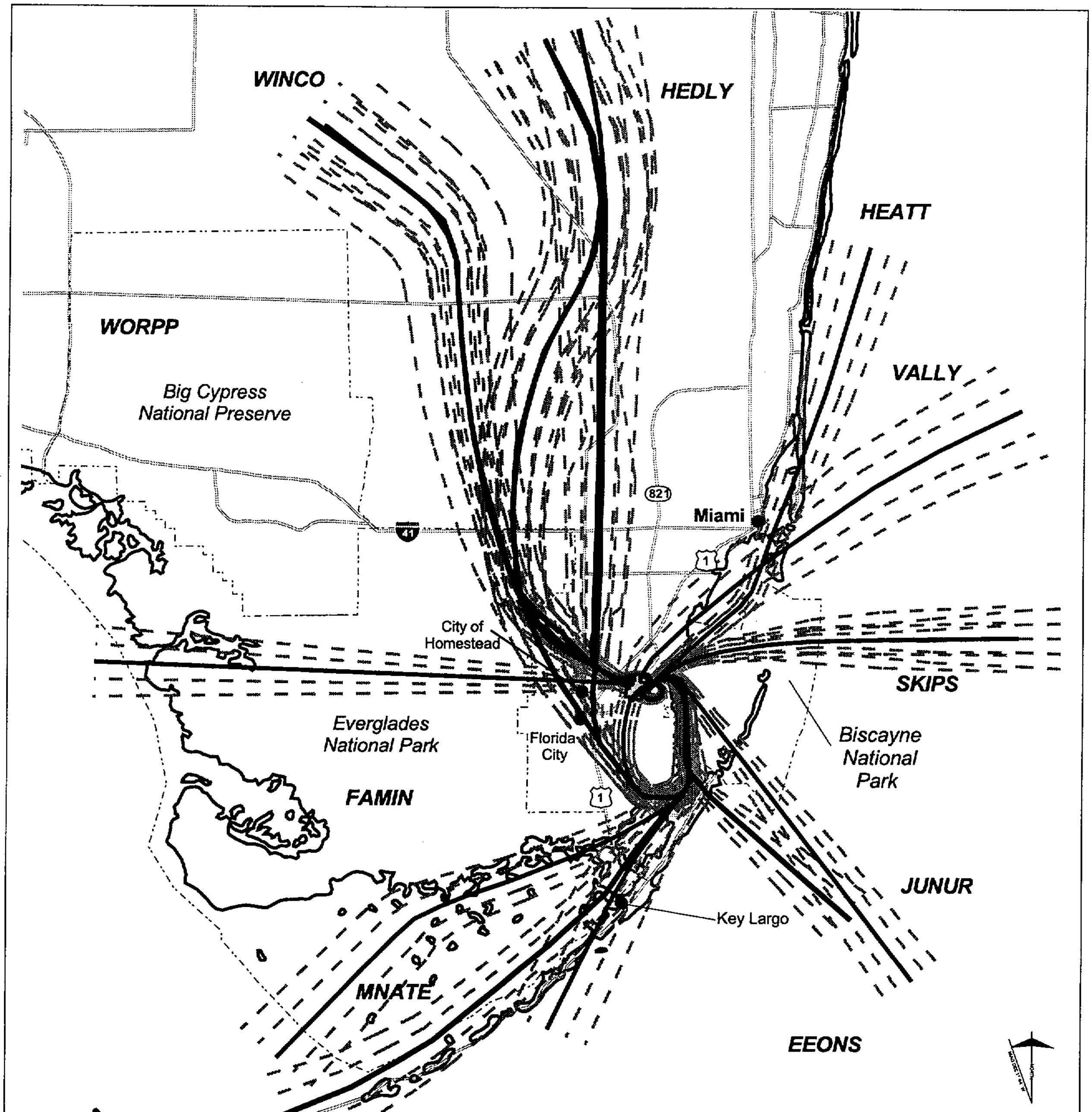


Proposed East Flow Arrivals

APPENDIX B



Proposed West Flow Arrivals



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LEGEND

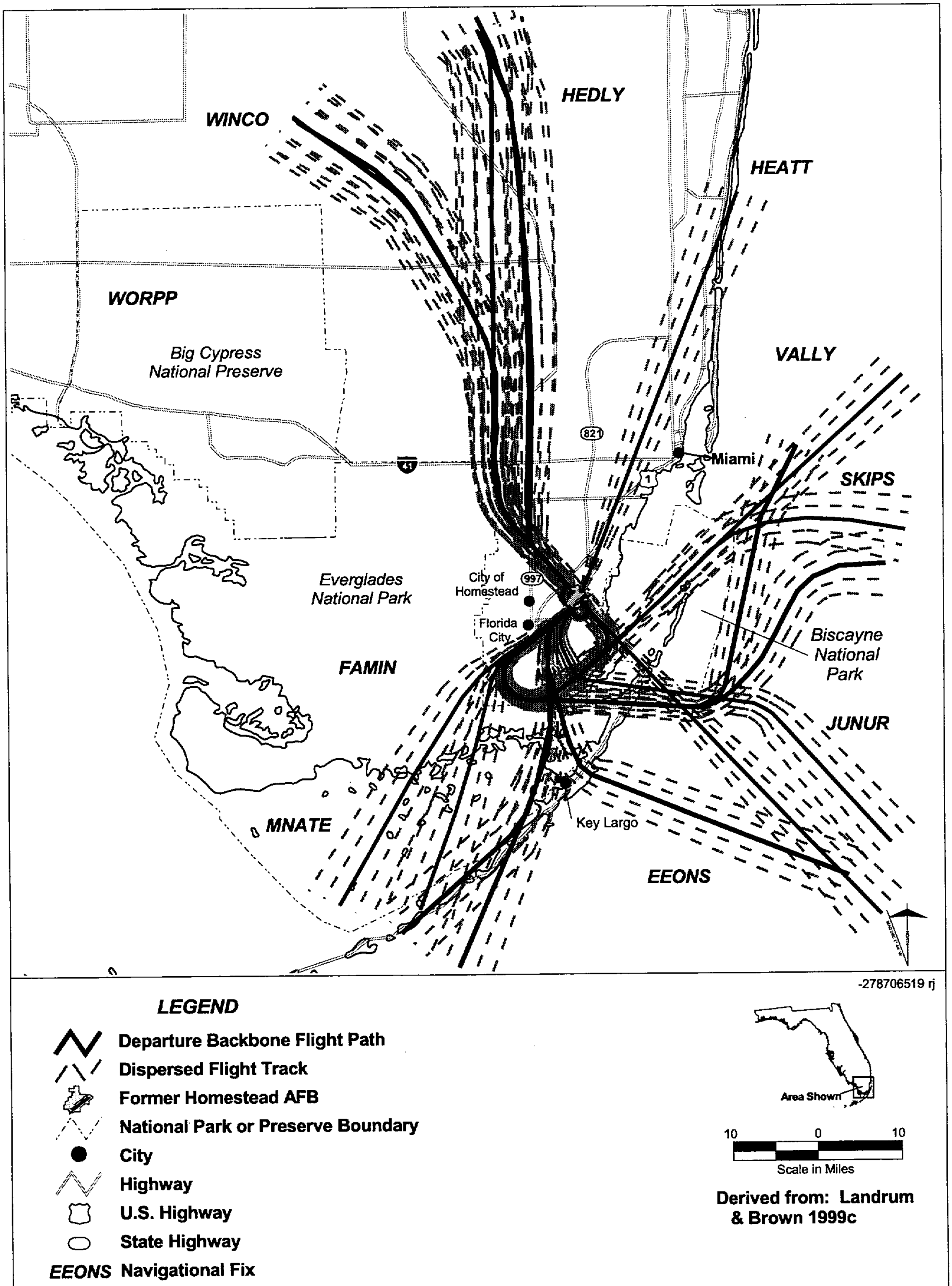
- Departure Backbone Flight Path
- Dispersed Flight Track
- Former Homestead AFB
- National Park or Preserve Boundary
- City
- Highway
- U.S. Highway
- State Highway
- *EEONS* Navigational Fix

Area Shown

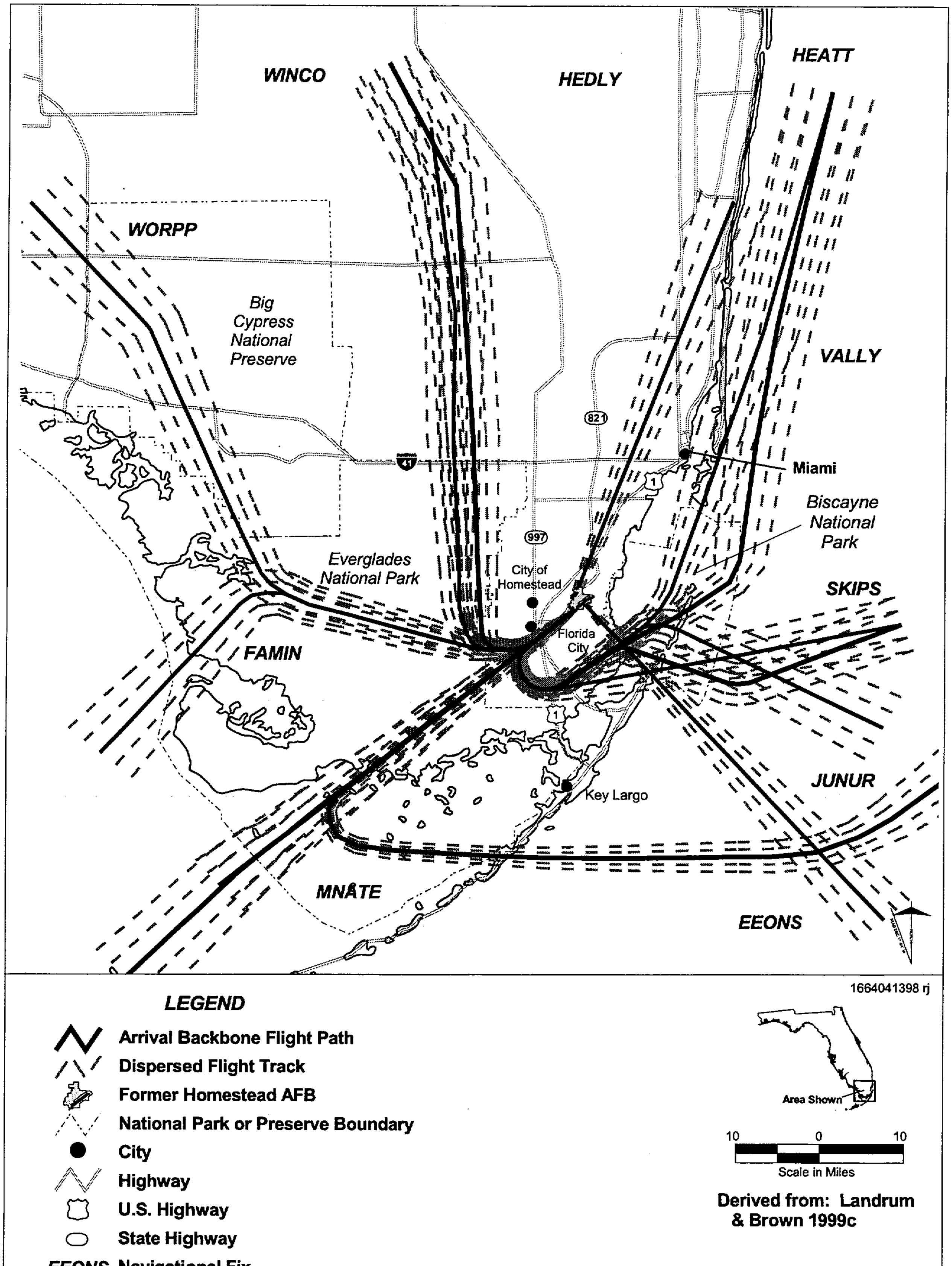
10 0 10
Scale in Miles

Derived from: Landrum & Brown 1999c

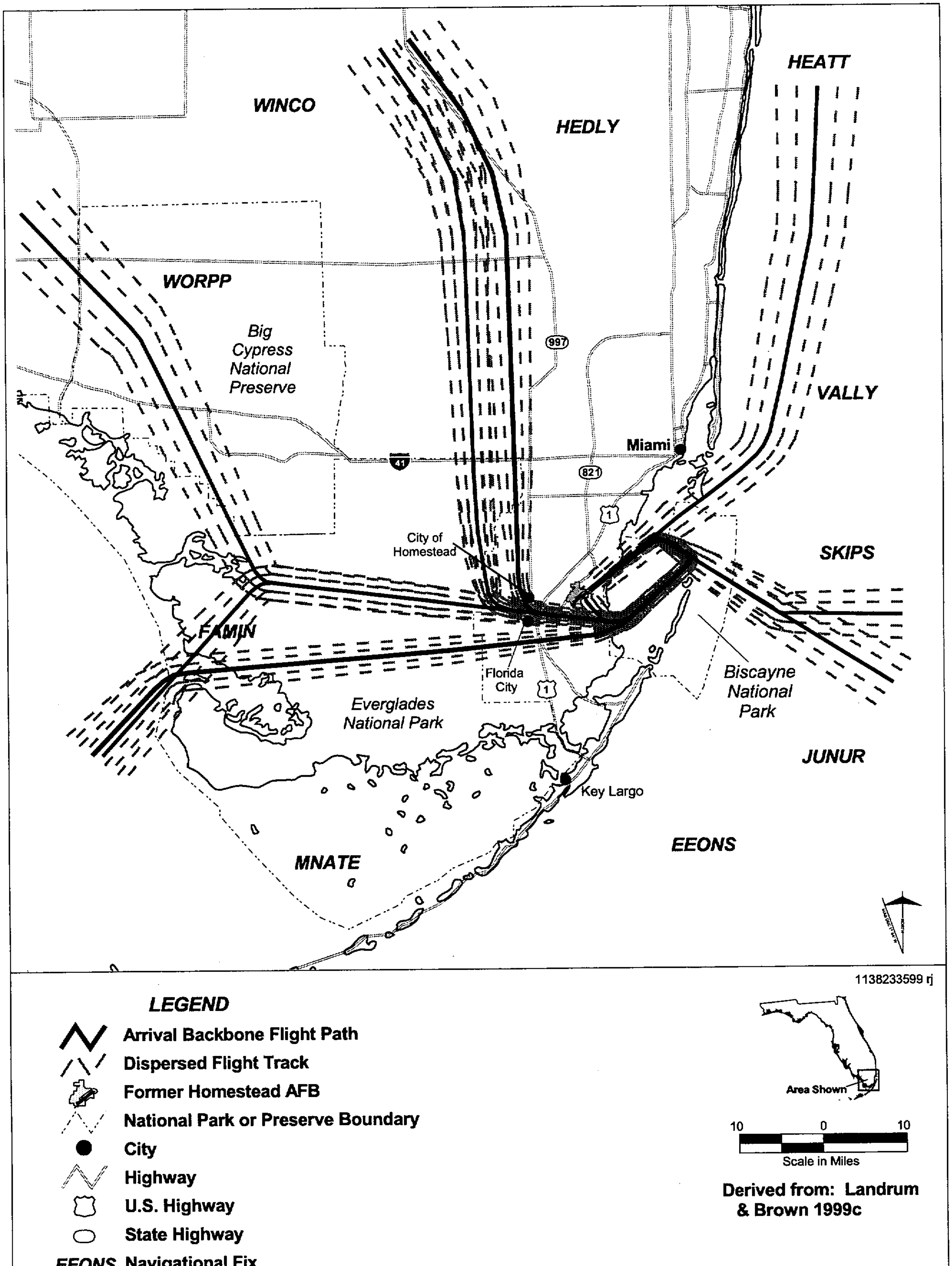
Noise Abatement Flight Path Alternative No. 1
East Flow Departures



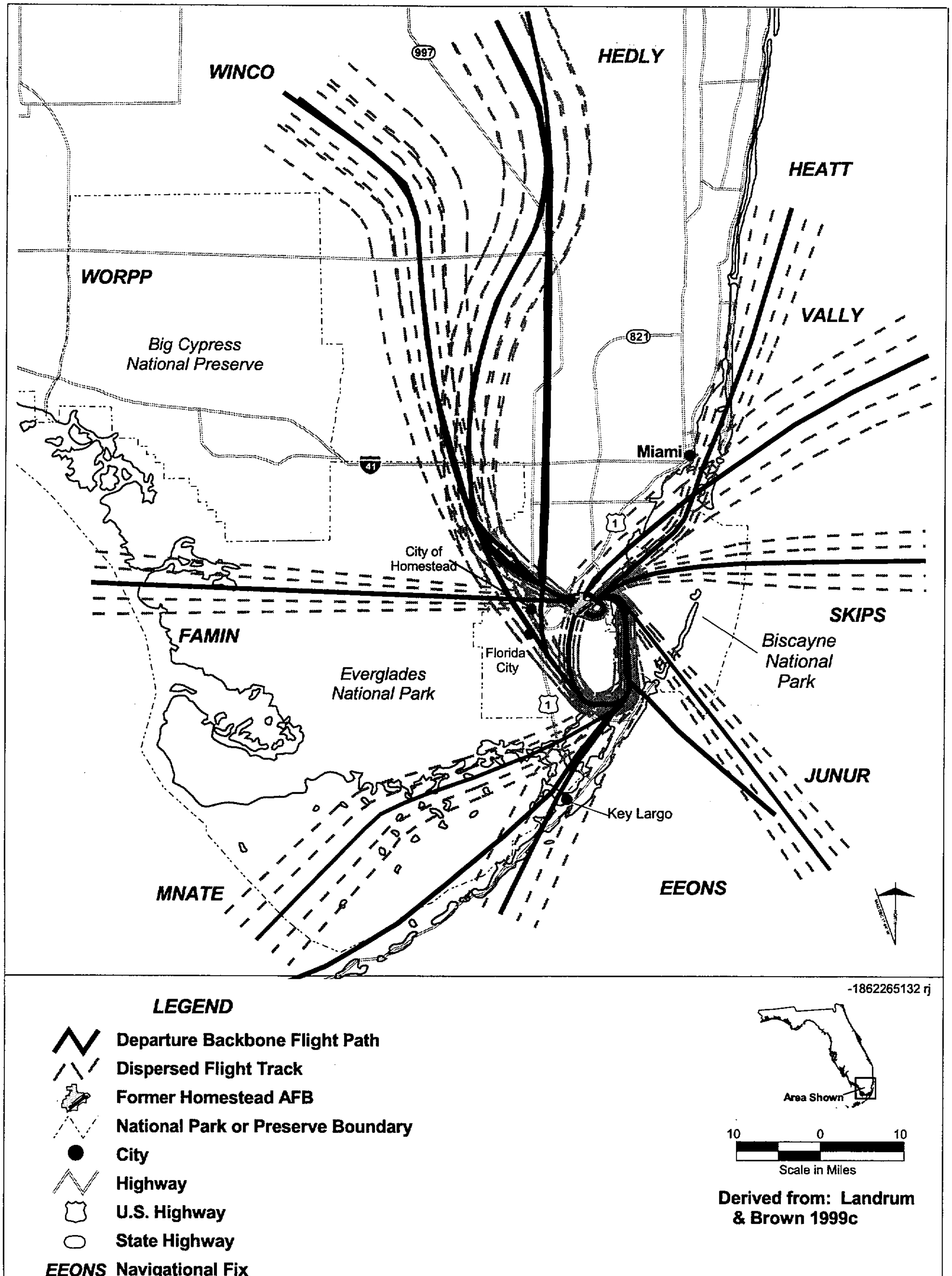
Noise Abatement Flight Path Alternative No. 1
West Flow Departures



Noise Abatement Flight Path Alternative No. 1
East Flow Arrivals

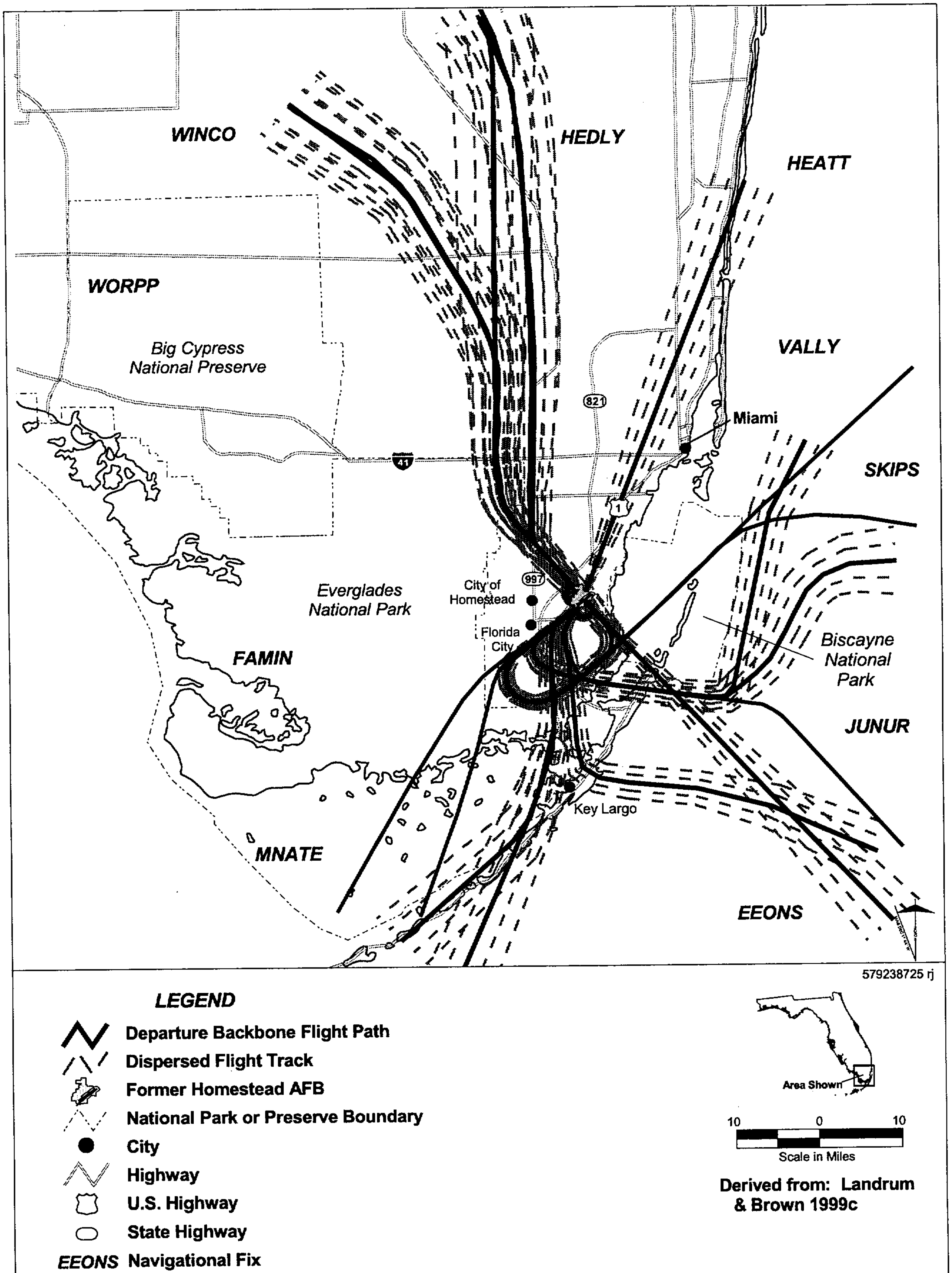


Noise Abatement Flight Path Alternative No. 1
West Flow Arrivals

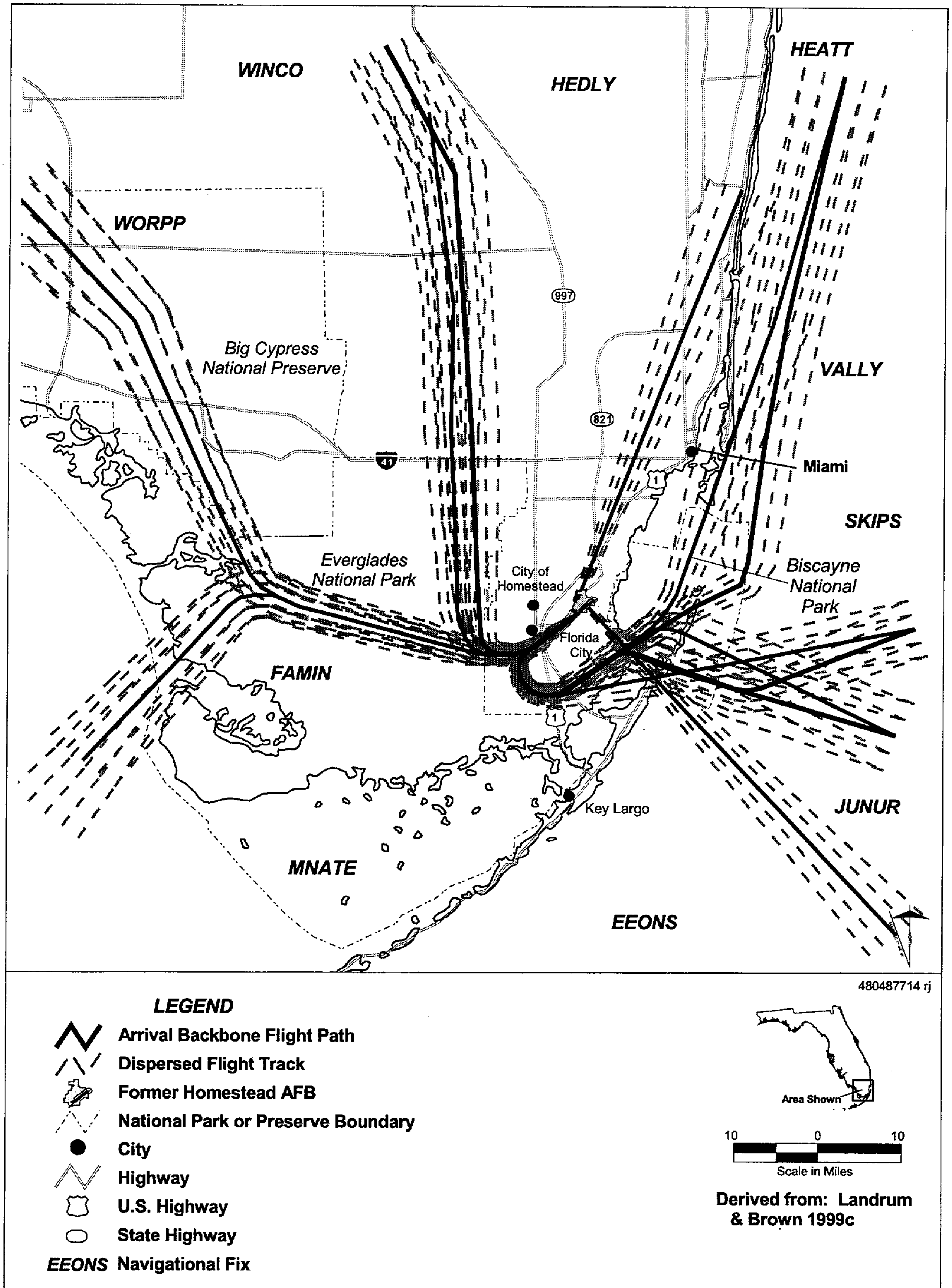


Noise Abatement Flight Path Alternative No. 2
East Flow Departures

APPENDIX B

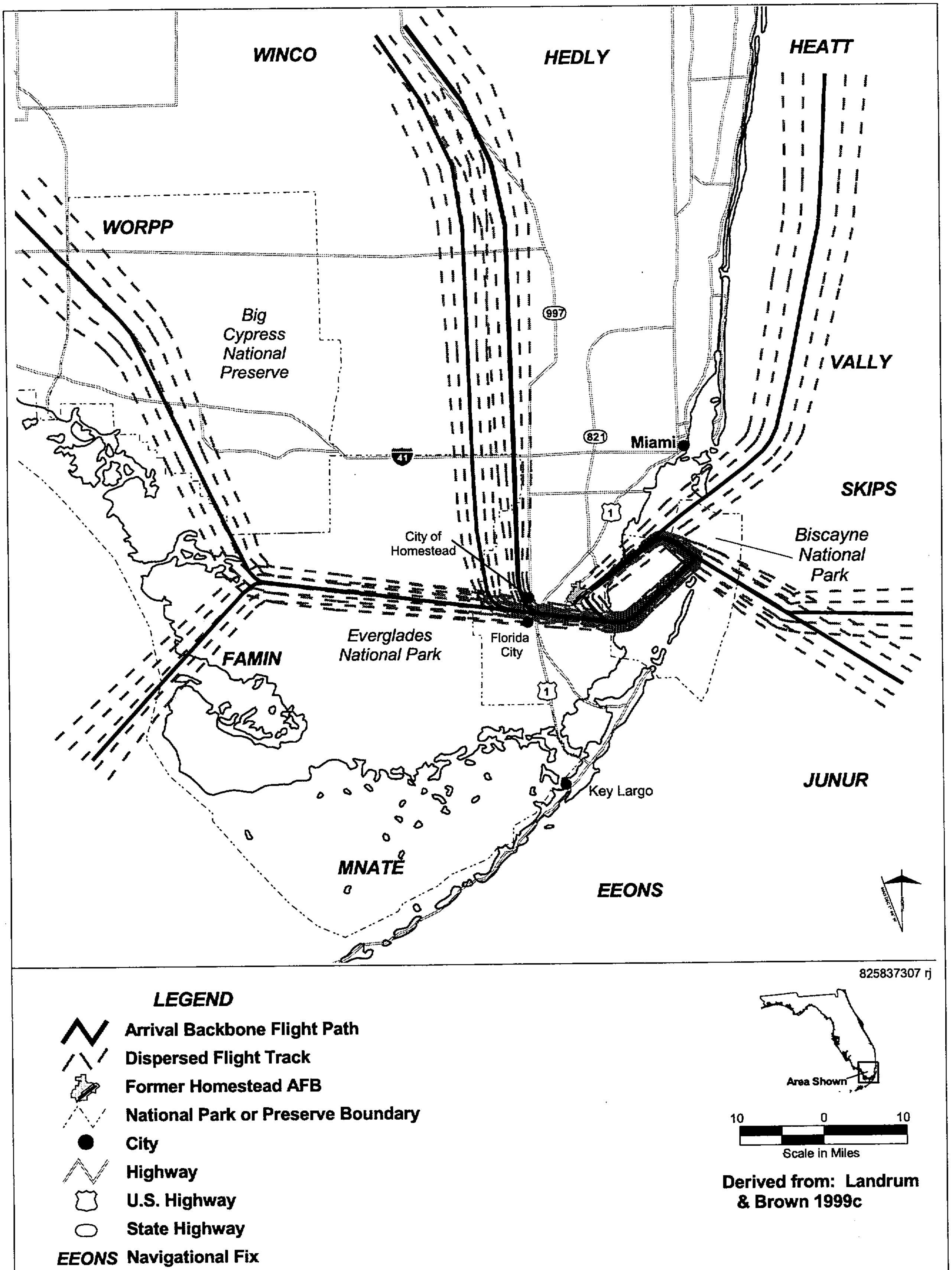


Noise Abatement Flight Path Alternative No. 2
West Flow Departures

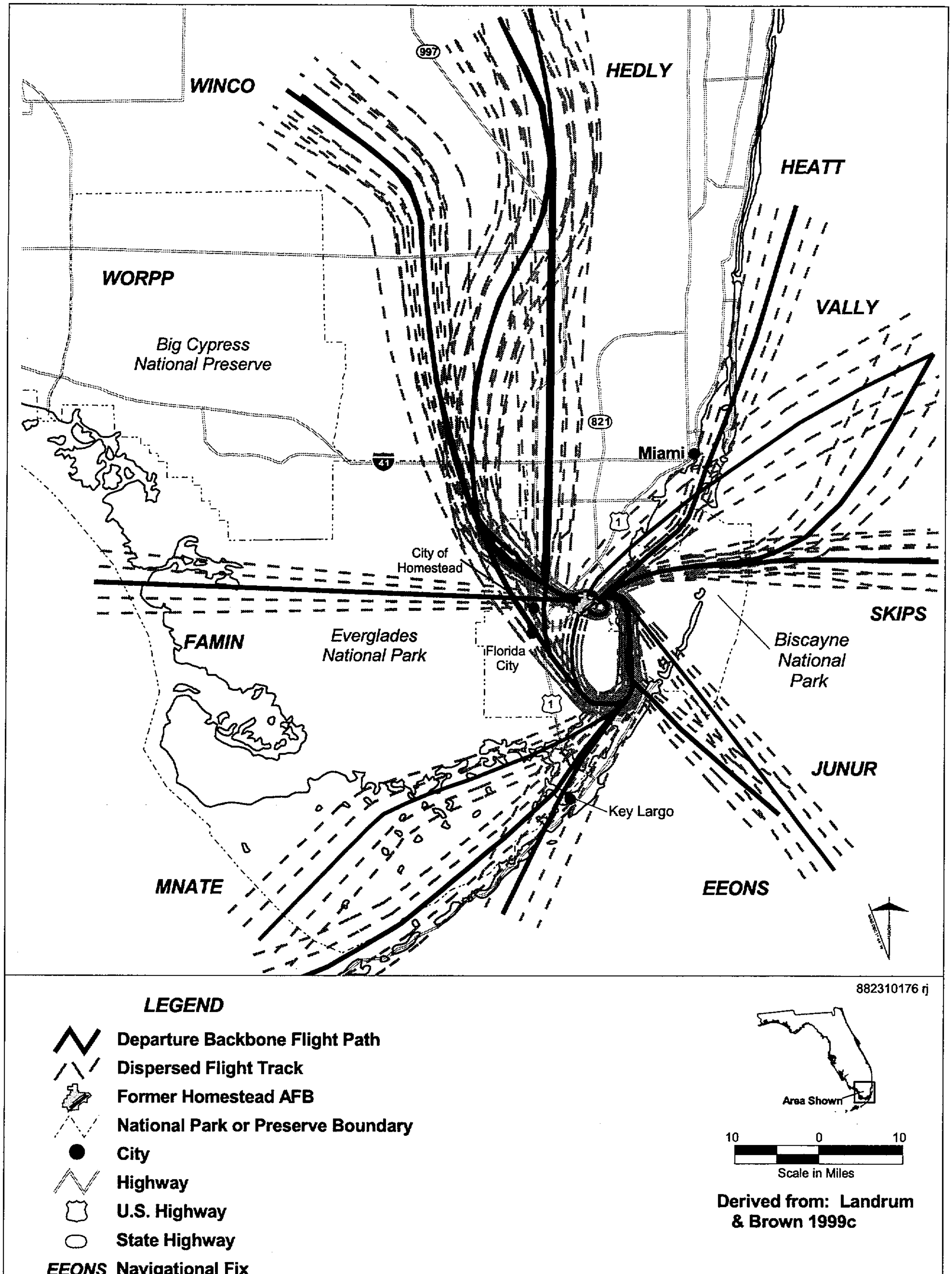


Derived from: Landrum & Brown 1999c

Noise Abatement Flight Path Alternative No. 2
East Flow Arrivals

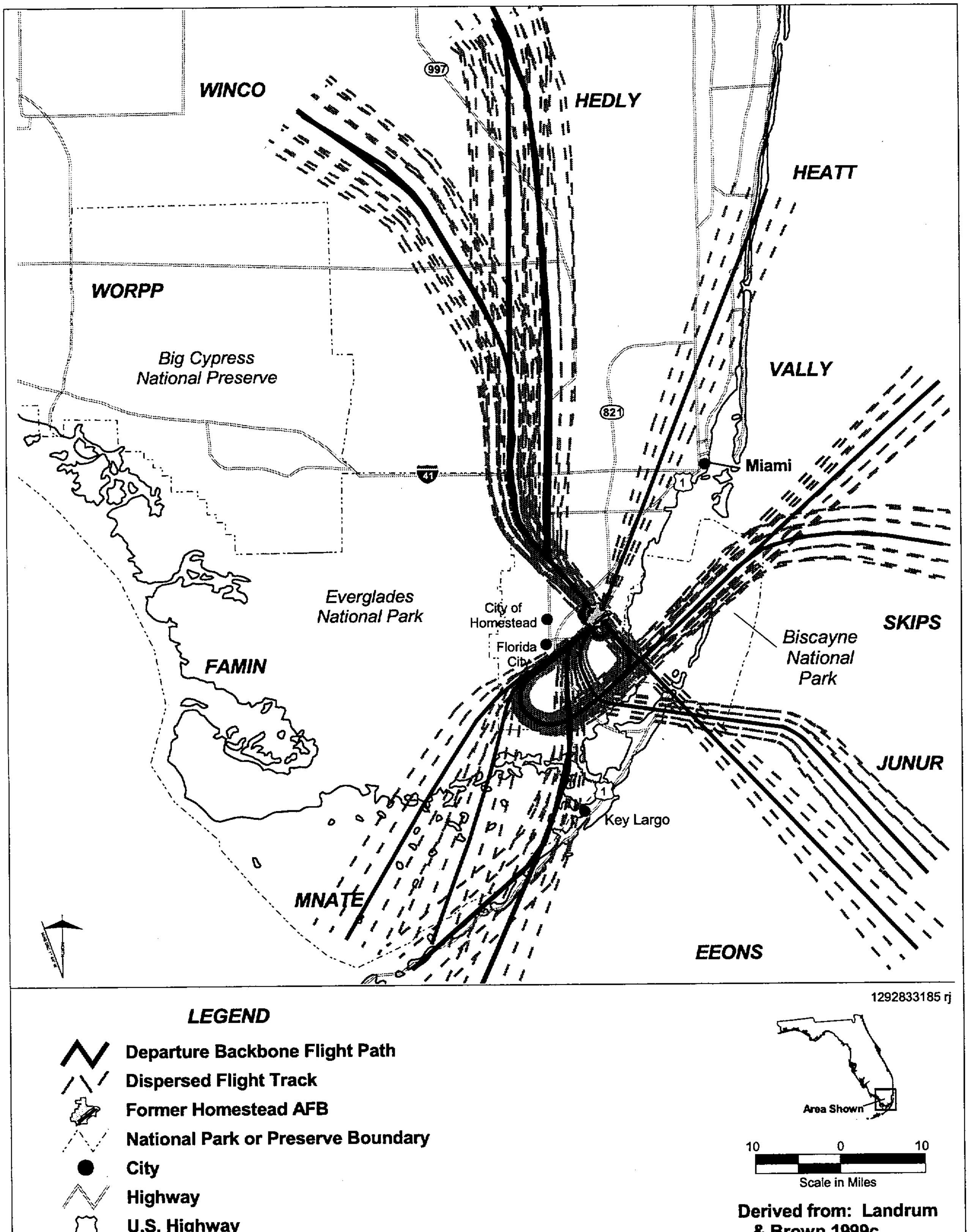


Noise Abatement Flight Path Alternative No. 2
West Flow Arrivals



Noise Abatement Flight Path Alternative No. 3
East Flow Departures

APPENDIX B



LEGEND

- Departure Backbone Flight Path
- Dispersed Flight Track
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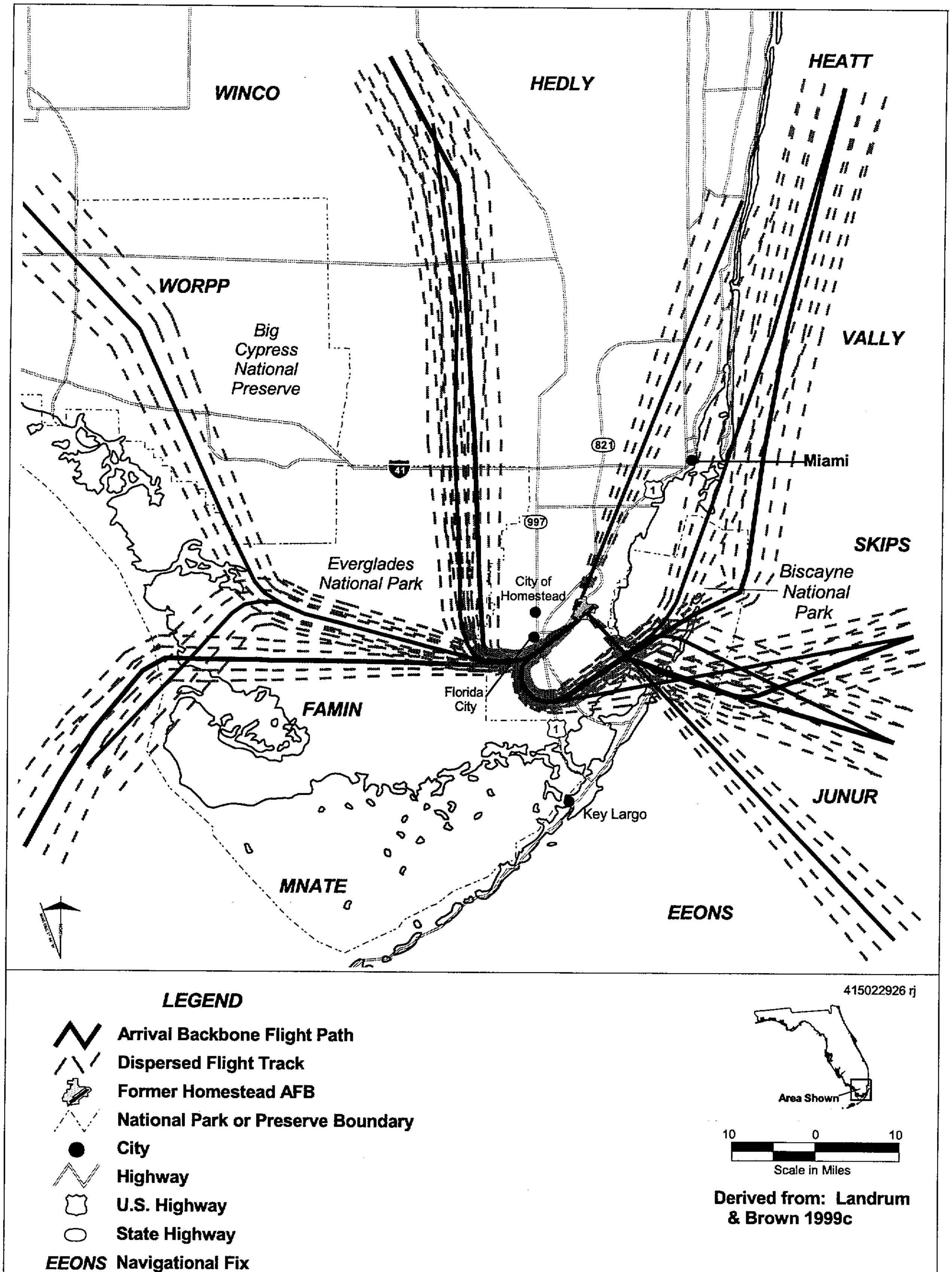
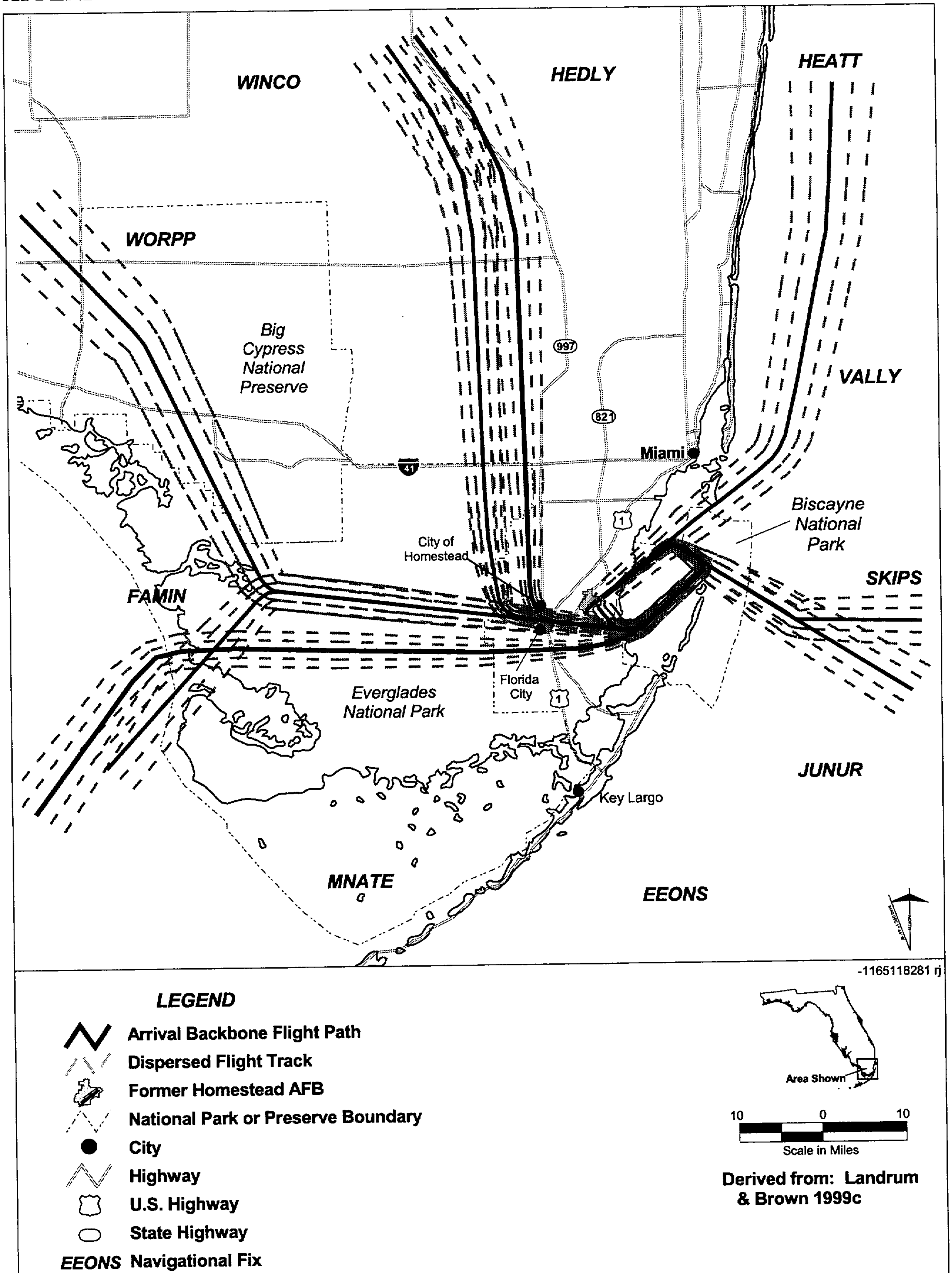
Noise Abatement Flight Path Alternative No. 3
West Flow Departures



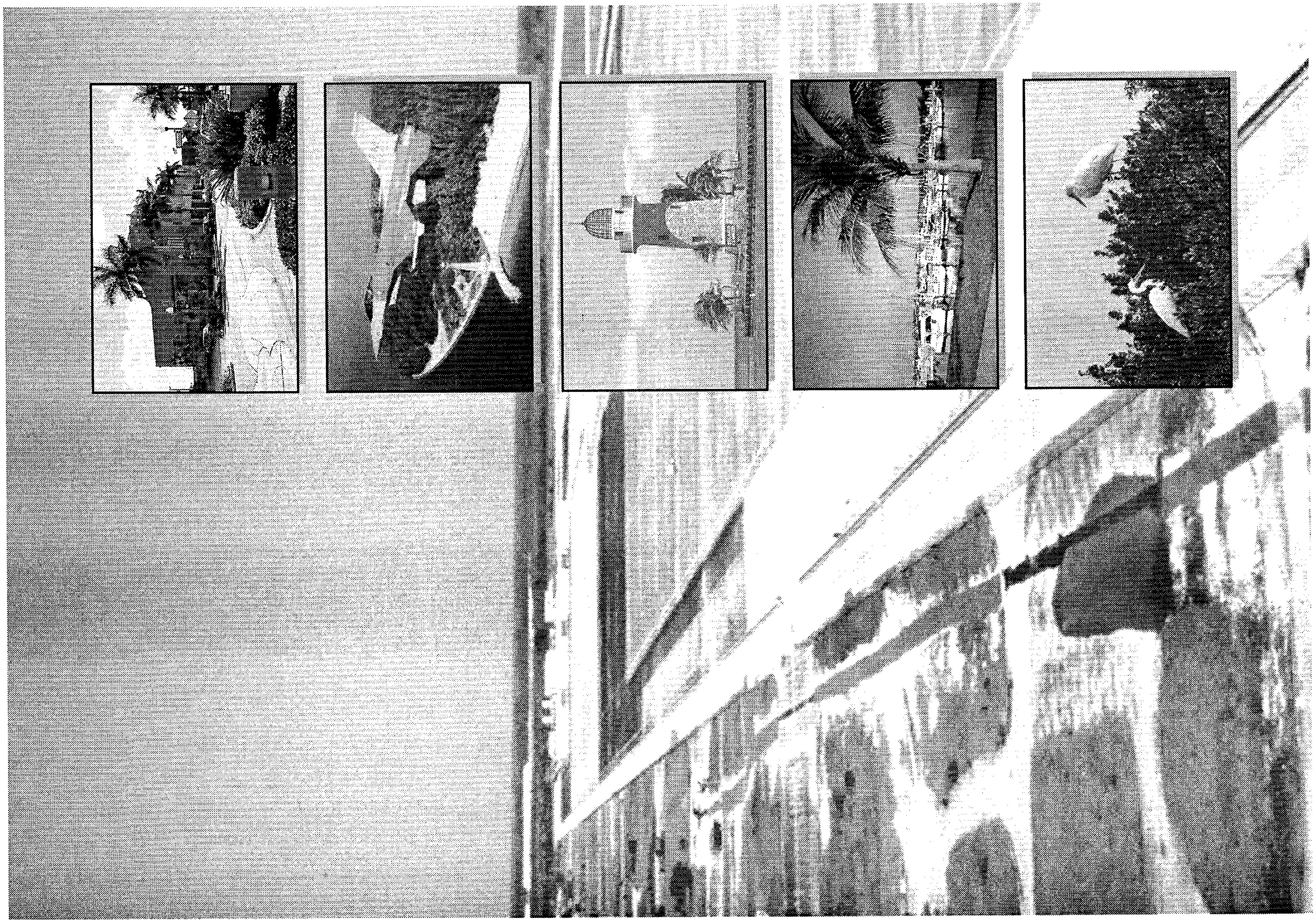
Noise Abatement Flight Path Alternative No. 3
East Flow Arrivals

APPENDIX B



Noise Abatement Flight Path Alternative No. 3
West Flow Arrivals

C POTENTIAL FOR INDUCED GROWTH



Summary of Business Developments Within and Around Airports

State	City and/or County	Airport	Development Description	Estimated Cost	Funding Agency/ Company	Expected Additional Invest/ Expend.	Induced Employment	Expectations	Special Features	Reference
AZ	Goodyear	Phoenix-Goodyear Airport	McDonnell Douglas selected Phoenix-Goodyear Airport as site for a multimillion-dollar program to convert DC-10 airliners and others into freighters for FedEx.	$60 million for the first contract	McDonnell Douglas		475 initially, growing to over 600	Annual payroll from the new jobs is expected to total $29 million. Goodyear hopes the new modification center will be a magnet for other aerospace companies.	Goodyear is a city of 11,000 located 17 miles west of Phoenix.	Western 1997
AZ	Phoenix	Sky Harbor International Airport	Trammell Crow Co. is building Phoenix I-10 Business Park. It is a 540,000 square foot project on 39 acres. It will have six buildings.	$23 million	Trammell Crow Co.	NR	NR	Apria Healthcare, the nation's largest home health care firm, is the first tenant. Part of the growth in Sky Harbor/I-10 corridor is from companies looking for less expensive office space, with lower rents and more parking.	The area surrounding the airport has been attracting technology and customer service companies in droves because of its proximity to freeways.	Reagor 1997
CA	Atwater	Castle Airport Aviation & Development Center	Pacific Bell is the second largest military base reuse tenant in the country. Castle Air Force Base closed in September 1995; unemployment in the area increased to more than 20%.	$16 million in renovation expenditures	Pacific Bell Customer Care Center	Annual payroll of $20 million; impact of $30–$40 million.	400 now; another 450 by end of 1998	Most of the jobs at the new center are customer care advisors who field calls from customers about the company's telecommunications products.	Development occurred because of joint effort by the Castle Joint Powers Authority, Merced County, the state Trade & Commerce Agency, and others.	Pietrucha 1997
CA	Bakersfield	NA	The ecotourism committee of Kern River Valley Revitalization Inc. has developed a 5-year "Valley Wils" campaign plan to market Kern River Valley's different natural, recreational, and cultural opportunities.	NR	Kern River Valley Revitali-zation Inc.	NR	NR	Studies show that the desire to get in touch with nature drove over 835 million people to national forests in 1994, up 15% from 1993.	NR	Hoffmann 1997
CA	Los Angeles	Los Angeles International Airport	Located next to Beverly Hills and within 20 minutes driving distance to LAX, Century City is LA's entertainment capital. It covers 178 acres of mixed-use residential, business, and commercial property.	NR	Original developer was Alcoa Aluminum	NR	NR	Century Center caters to both leisure and corporate travelers. Lodging, shopping, dining, entertainment, and meeting facilities are all combined at a single location.	Century Center consists of 30 buildings, each from 20 to 44 stories high.	Gould 1997

NR Not Reported; NA Not Applicable

Summary of Business Developments Within and Around Airports

State	City and/or County	Airport	Development Description	Estimated Cost	Funding Agency/ Company	Expected Additional Invest/ Expend.	Induced Employment	Expectations	Special Features	Reference
CA	Riverside	March Air Reserve Base	A business group is looking to interest a cargo integrator into basing operations at the closed March AFB. These are large companies (like FedEx and UPS) that deliver goods and packages door-to-door with their own trucks, planes, and terminals.	NR	March Inland CargoPort LLC	NR	NR	This location has proximity to freeways and a rail line. It is located away from the air traffic at Los Angeles International Airport. The group plans to spend $100,000 to market March to cargo carriers.	Air cargo demand in Southern California is expected to exceed supply in the next 20 years according to a study by the Southern California Association of Governments.	Soto 1996
CA	San Bernardino	NA	8th Annual Route 66 Rendezvous, a classic car special event, bringing 315,000 people and 2,400 classic cars for the street festival held September 18 to 21.	$380,000	Statler Bros. Markets & San Bernardino Convention & Visitors Bureau	Between $10 and $15 million	142 vendors sold products, food, and drinks	The event has not broken even yet. Business sponsors donated $115,000. Vendors were charged $400 to $460 for 142 booths; the SBCVB spends $15,000 for the sound system and disc jockey. The city's Main Street downtown association paid for singing groups.	These are the kinds of special events that are used to generate tourism dollars.	Zoltak 1997
CA	San Francisco	San Francisco International Airport	The Airport started its 5-year expansion plan in 10/95. It is building a new 5-story rental car facility and a light-rail transit system to replace the buses currently in use.	$2.4 billion	San Francisco Inter-national Airport	NR	NR	The new rental facility will house eight rental car companies (up from the five now).	On-site car rental companies pay a minimum of 10% of their revenue to the airport. With the new facility, the car rental companies may have to pay higher rents, which will translate into increased rates.	Lucas 1997
CO	Colorado Springs	Colorado Springs Airport	A flood of new hotel rooms (as many as 1,140 over the 1996 inventory of 8,700) threatens to inundate Colorado Springs in 1997, jeopardizing smaller motes and eroding high occupancy levels and room rates.	NR	Hotel/ Motel Industry	NR	NR	Most of the rooms coming in 1997 are economy-priced facilities from national chains, which compete for business travelers on tighter expense accounts and leisure travelers looking for a bargain.	The airport has helped diversify the market a great deal by making it much more accessible to groups and meetings, but it's still a very seasonal market.	Anonymous *(Hotel & Motel Manage-ment)* 1997

NR Not Reported; NA Not Applicable

Summary of Business Developments Within and Around Airports

State	City and/or County	Airport	Development Description	Estimated Cost	Funding Agency/ Company	Expected Additional Invest/ Expend.	Induced Employment	Expectations	Special Features	Reference
CO	Colorado Springs	Colorado Springs Airport	Shepard's, a legal publisher, is selling both of its buildings in Colorado Springs, including a 62,000 square foot 14-year-old printing plant near the airport. After its merger with Lexis/Nexis, Shepard's will move to leased space in the Springs.	$25 million (for both buildings)	Shepard's	NR	–222	NA	NA	Heilman 1997
CO	Denver	Denver International Airport	Construction of Denver International Business Center, a 450-acre project to include office buildings, stores, apartments, and hotels. 8.6 million square feet of commercial space (14 hotels and numerous office buildings).	$1 billion	Denver Developer L.C. Fulenwider Inc.	NR	NR	Also expects to build 1,300 single-family homes and apartments. Site is approximately 6 miles SW of DIA terminal and is the first real estate development project surrounding the airport.	Fulenwider formed a metropolitan district to fund construction of roads, sewers, and water lines for 196 acres of commercial zoning. The district issued $400,000 in tax exempt bonds to finance infrastructure costs for the Fairfield Inn.	Raabe 1995
CO	Denver	Denver International Airport	In addition to DIA, Denver has built a number of other expensive civic projects, including new baseball stadium, new central library, major highway renovations, and new convention center.	NR	City of Denver	NR	NR	NA	NA	Charlier 1995
CO	Denver	Stapleton International Airport	Redevelopment project for 4,700-acre site, closed February 1995. Plan is for 8 mixed-use villages, 20 million square feet of commercial space, 10,000 homes, and 1,600 acres of parks and open space.	$5.8 billion	Stapleton Development Corp., non-profit created by city	NR	35,000	Corp. has leased ~1.3 million square feet, 1/3 of space in existing buildings. Three projects underway: a pilot training center for United Airlines, a business park owned by Union Pacific RR, and a regional distribution center for a supermarket chain.	Development officials have been discussing various strategies since 1989. The city and development corp. are still working on details of the 30-year project, focusing on planning, zoning, and infrastructure needs.	Holt 1997

NR Not Reported; NA Not Applicable

Summary of Business Developments Within and Around Airports

State	City and/or County	Airport	Development Description	Estimated Cost	Funding Agency/ Company	Expected Additional Invest/ Expend.	Induced Employment	Expectations	Special Features	Reference
CO	Denver	Stapleton International Airport	Continental Airlines pulled 5,000 jobs out of Denver when it closed a maintenance facility and reduced its daily flights from 159 to a handful in anticipation of DIA's higher costs.	NR	Continental Airlines	NR	–5,000	NA	Continental Airlines moved its hub out of Denver in response to Chapter 11 reorganization. When both Continental and United served Denver, fares were low; with only United left, fares are much higher.	Charlier 1995; Uhland 1995
FL	all	all	Florida ranks No. 1 of U.S. states in terms of dollars spent and jobs generated by international tourism during 1991-1994.	$11.2 billion spent in FL by foreign vacationers and visitors in 1994	Tourism Industry in FL	NR	194,000 jobs supported by international tourism in 1994	Florida's popularity with foreign visitors is expected to continue due to plentiful airline flights, strong world economy, aggressive marketing by FL tourism industry, and improved packaging of travel services.	Jobs generated from international tourism include positions in airports, rental car agencies, taxi companies, hotels, restaurants, theme parks, and retail shops.	Hutt 1997
FL	all	all	Tourism is Florida's biggest industry, representing 1/5 of the state's general revenues. Tourism is picking up again because of all the new attractions ranging from new bed and breakfasts, restaurants, and hotels to grand new show theaters, museums, etc.	$35 billion	As reported by Florida Tourism Industry Marketing Corp. (FTIMC)	NR	775,000	Florida draws more than 42 million tourists, 15% of them from outside the U.S. Conventioneers will find an expanded convention center in Orlando, expanded airports in Orlando and St. Petersburg/ Clearwater.	Tourism industry in Florida generates more than $2 billion in tax revenue. FTIMC combines the state's former tourism agency with private-sector corporate involvement and funding.	Hobbs 1997
FL	Dade Co.	Miami International Airport	International Corporate Park, a 300-acre warehouse park with four times the space of neighboring Miami International Mall, a shopping area.	$150 million	Broker-investor Ed Easton Jr. of Miami, FL	NR	NR	The West Dade Airport area leads county in lease rates and has 8% vacancy rate for warehouse/ manufacturing space. Space is priced $1.00–$1.50/foot more than other parts of country (at $6.25 to $7).	NA	Goodman 1995

NR Not Reported; NA Not Applicable

Summary of Business Developments Within and Around Airports										
State	**City and/or County**	**Airport**	**Development Description**	**Estimated Cost**	**Funding Agency/ Company**	**Expected Additional Invest/ Expend.**	**Induced Employment**	**Expectations**	**Special Features**	**Reference**
FL	Everglades	Miami International Airport	Everglades National Park is the third largest non-Alaskan U.S. park, with nearly 985,000 visitors in 1996. Some people visit to the park before embarking on a cruise.	$119.2 million annual economic impact	Tourism Industry in S. FL	NR	4,930	Tourist dollars go to hotels and restaurants and park spending to buy supplies. 45 boat captains operate in park, 25 specialize in back-country fishing. Also canoe tours and other recreational tours. Essentially a five-month season (November to April).	Parks are engines of economic development, but are engines of a specific kind, because they provide ecosystem services.	Dupont 1997
FL	Jacksonville	NAS Cecil Field	NAS Cecil Field, which is slated for closure by the U.S. Navy, is wanted by Jacksonville for possible development as a commercial airport in the next 20 years.	NR	City of Jacksonville	NR	NR	Jacksonville wants to use the NAS facilities to service air cargo operators, general aviation aircraft, and aircraft component manufacturers.	NA	Anonymous *(Aviation Week & Space Technology)* 1997
FL	Miami	Miami International Airport	Fine Air had a crash of one of its DC-8s after takeoff from MIA on 8/7/97; the accident killed five people. Fine Air announced it would voluntarily halt flights for 30 days.	NR	Fine Air Services (cargo carrier)	NR	800 employees at Fine Air	Many of Fine Air's flights ferry material and finished garments between Miami and Caribbean Basin countries. The competitive Columbia-Miami routes carrying flowers were also expected to feel some effects.	NR	Bussey 1997; Cordle & Bussey 1997
FL	Miami	Miami International Airport	Global trade has skyrocketed, growing more than 9% annually for more than 10 years. Air cargo companies are in a very competitive market, with lots of pressures to keep prices low.	Revenues of $94.2 million in 1996; profits of $13.02 million	Fine Air Services (cargo carrier)	NR	NR	ACMI firms are virtual airlines, leasing aircraft, crew, maintenance, and insurance. Before 1980, cargo haulers from Miami typically brought back empty planes from Latin America. Now they bring Colombian and Ecuadorian flowers.	Because commercial airlines already have a rich revenue stream from passenger tickets, they can offer cargo space at bargain rates because it's virtually all profit.	Bussey 1997; Bussey & Fields 1997

NR Not Reported; NA Not Applicable

Summary of Business Developments Within and Around Airports

State	City and/or County	Airport	Development Description	Estimated Cost	Funding Agency/ Company	Expected Additional Invest/ Expend.	Induced Employment	Expectations	Special Features	Reference
FL	Miami	Miami International Airport	Dade County is expanding and upgrading the airport, with $2.8 billion going toward terminal expansion; $1.2 billion for ground transportation improvements, new cargo facilities, and airfield projects (with $175 million for a fourth runway).	$4 billion	Miami International Airport	NR	NR	Miami served nearly 34 million passengers last year, with about 40% using the airport for connecting flights. FAA projects that the passenger count will rise to nearly 70 million by 2010. The expansion is scheduled to be completed by 2006.	FAA forecasts that travel between U.S. and Latin America will grow by 6.2%/year over the next 13 years. More than 70% of all passengers going between U.S. and Latin America pass through Miami.	Cordle 1997
FL	Miami	Miami International Airport	Financial incentives from Dade County have prompted Airbus to retain its North American training headquarters in Miami for the next 30 years. It will build an 80,000 square foot center in Miami Springs near MIA.	$8.5 million	Airbus Industries (Toulouse, France)	$30 million total impact; Dade Co. incentives of $3.5 million	77 to 97 people full time; 3,000 trainees visit	Airbus will add two flight simulators to the six it operates now and expand employment 10 to 20%. Airbus is allowed to break its lease at its current facility, which was scheduled until 2000 (value of $2.4 million).	Location at the Miami airport made sense; 19 airlines that use planes from Airbus fly into the Miami airport. Airlines pay up to $60,000 to send two-person pilot crews for five-week training sessions.	Stieghorst 1997
FL	Miami	Miami International Airport	The Miami market is underretailed, with about 11.5 square feet in retail space per capita versus a state average of 21. International tourism is drawing more people to the city. The Dolphin, a value megamall located near MIA, will open at the end of 1999.	NR	NR	NR	NR	The Dolphin will feature an entertainment zone in the center of its racetrack design, an arcade, and a Regal Cinema. Aventura Mall near Miami has started a $90 million expansion.	The problem with building in Miami is that there isn't much room for new construction, despite a great deal of retailer interest. With little available space, retailers are building upward.	Anonymous *(Chain Store Executive)* 1997
FL	Miami	Miami International Airport	Cunard is moving headquarters from NYC to 36,000 square foot office space near MIA. Cunard is a cruise ship operator and will use the Miami port for travel itineraries start and end.	NR	Cunard (trying to sell the company for $600 million)	NR	Article does not report number of employees; says Cunard will only move about 1/3 of NY staff.	Cunard currently operates five cruise ships; it plans to build or acquire another three in the next four years.	Dade County will give Cunard $10.6 million incentive package.	Myers 1997

NR Not Reported; NA Not Applicable

Summary of Business Developments Within and Around Airports

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FL	Miami	Miami International Airport	Samsung Electronics moved its Latin American headquarters from Panama to Miami last year; Hanjin Shipping opened a Miami office in September; and Korean Air plans 747 cargo service to MIA next year.	NR	Korean companies	NR	NR	South Florida is looking to improve trade relationships with booming Asian economies. Korean firms are beginning to see South Florida not only as a resort, but also as a gateway to trade with Latin America.	Korea is diversifying its traditional markets in Asia and North America and targeting Latin America.	Hemlock 1997
FL	Orlando	Orlando International Airport	The expansion will construct a fourth satellite terminal, tram connection, improvements and upgrades of terminals and roads, and a new traffic control tower.	$240 million for addition now ongoing	Greater Orlando Aviation Authority	$965 million for next expansion, completed in 10 years.	NR	NR	Last year, Orlando had the world's fastest growing airport; it expects to handle 33 million passengers annually within three years.	Roy 1997
FL	Orlando	Orlando International Airport	The four-county Orlando metro area had 37 million visitors in 1995. Forecasts show 46 million visitors by the year 2000.	NR	Orlando Convention & Visitors Bureau	$15 billion	NR	There were 85,400 hotel rooms in the Orlando area in 1996 with an occupancy rate of 80%.	Article describes the retail stores being built in the Orlando area.	Troy 1997
GA	Atlanta	Hartsfield International Airport	Conference center hotel segment of the overall travel and lodging industry is growing fast. Emory facility opened in 1995 with 198 rooms. It is booked on a Complete Meeting Package basis.	NR	Emory Conference Center Hotel	NR	NR	CPM covers dinner the night of arrival, overnight accommodations, breakfast and lunch, continuous breaks, meeting space, basic audiovisual equipment, and service charges.	Typically, a community will help subsidize a conference center's development because of the tourism-related impact it can have.	Wolff (Carlo) 1997
GA	Atlanta	Hartsfield International Airport	The Operation Control Center, created by TransQuest Information Solutions, Delta's IT organization, uses a graphical user interface and integrated systems based on object technology to manage Delta's more than 2,700 flights a day.	NR	TransQuest	$300 million/ year	1,800	TransQuest is also generating commercial revenue from application development efforts.	NA	Caldwell 1997

NR Not Reported; NA Not Applicable

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GA	Atlanta	Hartsfield International Airport	In preparation for the 1996 Summer Olympics, Hartsfield undertook a major expansion in 1995-96. Over 150 new shops and restaurants were added, in addition to new meeting facilities and infrastructure improvements.	$250 million	Airline companies, municipal bonds	NR	NR	The expansion was needed to accommodate the huge influx of visitors to the Olympics. Increased security needs were also addressed.	The Hartsfield Improvement Program consisted of 250 individual construction projects. Work was conducted 24 hours a day, 7 days a week.	Nelms 1997 (April)
HI	all	all	Although the annual number of visitors to Hawaii has stalled at less than 9 million since 1990, helicopter tours are moving record numbers and did $100 million of business in 1996, with room for further growth.	NR	Helitour operators	NR	NR	Helitours target mainland visitors and are popular with both first-time and repeat customers. Wholesalers are getting involved in the booking distribution channel, indicating that helitouring is becoming a mainstream activity, in spite of its cost.	Helitours are attractive for travel agents, since commissions are high. Tours have high pre-booking rates, with frequent sellouts several days prior to the tours. Many passengers define their helitour as the highlight of their trip.	Selden 1997
HI	all	NR	The Hawaii Visitors and Convention Bureau has been given an increased marketing budget to counteract declining visitor counts. Visitor count dropped 3.9% in February, marking the fourth consecutive monthly decline.	$10 million	Hawaii Visitors & Convention Bureau	NR	NR	The additional money will be spent on TV and newspaper ads through August, targeting key cities of New York, Chicago, Los Angeles, San Francisco, Sacramento, and San Diego.	NA	Anonymous *(Travel Agent Hawaii Supple-ment*) 1997
IA	Cedar Rapids/Linn County	Cedar Rapids Municipal Airport	A new campaign called "Time to Tour: Be a Visitor in Your Own Town" was launched by the Cedar Rapids Area Convention and Visitors Bureau. 177 new hotel rooms were opened in Cedar Rapids in 1996, with 149 more to be added soon.	NR	City of Cedar Rapids (for tourism campaign); hotel owners and operators (for increased hotel capacity)	NR	NR	Many Cedar Rapids residents haven't visited local attractions despite having lived in the area for many years. CRACVB is targeting tourists traveling along the "Avenue of Saints" between Branson, MO and Mall of America. Hotel inventory is increasing.	Tourism is the third-largest industry in Iowa. It provides 4,900 jobs in Linn County, with an annual payroll in excess of $52 million. In 1994, tourists spent $314.1 million in Linn County, accounting for $4 million in local sales tax receipts and $16.7	Ford 1997

NR Not Reported; NA Not Applicable

Summary of Business Developments Within and Around Airports

State	City and/or County	Airport	Development Description	Estimated Cost	Funding Agency/ Company	Expected Additional Invest/ Expend.	Induced Employment	Expectations	Special Features	Reference
IL	Bedford Park	Chicago's Midway Airport	Growth in the North American and European chemical distribution industry has varied widely. The key driver is a trend among chemical producers to farm out their products to independent sales agents.	$22 million	Van Waters & Rogers	NR	NR	They are moving three locations into Bedford Park, which will be the single largest distribution center in the country.	NR	Anonymous *(Chemical Week)* 1997
IL	Chicago	O'Hare International Airport	O'Hare misses out on 9,000 to 22,500 passengers annually due to restrictions in direct international flights resulting from the 1952 U.S.-Japan Civil Air Services Agreement, even though it completed an expanded $600 million international terminal in 1991.	NR	Midwest-Asia Aviation Committee	Loss of $47 million in expenditures	Loss of $36 million in salaries	Estimates of economic impacts are from Arthur Anderson LLP, commissioned by the coalition of business, labor, trade, and business organizations, including the Chicagoland Chamber & the Illinois Chamber of Commerce.	NA	Waters 1997
IL	Elk Grove Village	O'Hare International Airport	Elk Grove Village is paying for a study to consider enhancements to its industrial park, which includes 3,600 companies employing 90,000 workers.	$250,000	Trustees of Elk Grove Village	NR	NR	The village and park tenants must make investments or risk losing ground to a new generation of attractive industrial parks.	The park represents Illinois' third largest concentration of industrial real estate after Chicago and Rockford.	Crown 1997
IL	Peotone	New Airport	State of Illinois released plans for a privately funded and managed airport at Peotone, 65 km south of the Chicago 'loop' to open in 2001 with two runways. Peotone has not signed up any tenants.	$2.3–$4.9 billion	IL plans to have airport be privately funded and managed	NR	NR	The state's DOT says that O'Hare and Midway are close to saturation and that 7 million Chicago-area passengers a year will not be able to find a seat by 2001, and 31 million by 2020 if a third major airport is not built.	The east-west parallel runways proposed for Peotone would not interfere with traffic at O'Hare and Midway, but would clash with traffic flows at small Sanger Airport, which might have to close.	Anonymous *(Airports International)* 1996; Crown 1996
IL	Schaumburg	Schaumburg Regional Airport	Schaumburg is a prosperous Chicago suburb. The facility lacks a control tower and equipment that would allow instrument landings in bad weather.	$9 million	Schaumburg municipal government	NR	NR	Turnberry Lakes International Business Center, on 370 acres just west of the airport, is 85% occupied after eight years of development.	About one-third of Schaumburg Airport's traffic is business related.	Murphy 1997

NR Not Reported; NA Not Applicable

Summary of Business Developments Within and Around Airports

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IL	St. Louis	Lambert-St. Louis International Airport	FAA released its EIS on the W-1W plan, which will add a 9,000-foot runway and more terminal space to Lambert-St. Louis airport.	$2.5 billion	Lambert-St. Louis Inter-national Airport	Est. $8–12 billion to local economy	NR	The airport will need to buy 1,937 homes in Bridgeton to complete the expansion. W–1W would allow Lambert to handle simultaneous landings in bad weather, which it cannot do now.	Lambert officials project an increase from 513,000 takeoffs and landings in 1996 to 630,000 by 2015. Lambert also expects to board 21 million passengers in 2015, up from 13 million last year.	Marson 1997
IL	St. Louis	MidAmerica Airport	MidAmerica Airport is scheduled to open in January 1998. It is initially seeking cargo flights, vacation charters, and air carriers offering regional service.	$218 million	MidAmerica Airport	NR	NR	MidAmerica in combination with Scott AFB will provide for two runways that allow for simultaneous landings in bad weather. TWA would land planes at MidAmerica when bad weather limits landings at Lambert.	NA	Marson 1997
IN	Indianapolis	Indianapolis International Airport	New retailers and restaurants in downtown Indianapolis have boosted tourism-related revenue 35% from 1993 to 1996. The opening of downtown's Circle Center mall in 1995 was a major contributing factor.	$1.63 billion in tourism-related revenues generated in 1996	Retailers, restaurants, and other service-oriented businesses	NR	NR	NA	The biggest growth was seen in shopping and food purchases. Shopping purchases went from $421 million in 1993 to $468.5 million in 1996, an increase of 11.3%. Food purchases went from $335 million in 1993 to $438.3 million in 1996, up 30.8%.	Edelhart 1997
MI	Detroit	Detroit Metropolitan Airport	Upgrading 16 miles of roads, mainly around the eastern and southern perimeter of Detroit Metro, from Class B to Class A, to allow heavy truck traffic.	$125 million	Wayne County	$2.5 billion	90,000	The county's vision is to position land around Detroit Metro as major commercial and industrial mall with airport as major anchor tenant.	NA	Stopa 1997 (November 3)
MI	Detroit	Detroit Metropolitan Airport	Expansion of Detroit Metro, including new midfield terminal.	$1.6 billion	NR	NR	80,000	NR	NA	Stopa 1997 (November 3)

NR Not Reported; NA Not Applicable

Summary of Business Developments Within and Around Airports

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MI	Detroit	Detroit Metropolitan Airport	A Hilton Garden Inn and a yet-to-be-determined limited-service hotel are planned for the area near Detroit Metro Airport. The two hotels are expected to add 258 rooms to the market.	NR	Hotel/Motel Industry	NR	NR	Hotel developers believe that the Detroit area has recovered from a recession that occurred in the early 1990s.	At the end of 1991, hotel occupancy was only 52% in Detroit. Some analysts fear that recent development will outrun demand and create a situation similar to that in 1991.	Garago 1997 (May 5)
MI	Detroit	Detroit Metropolitan Airport	First Industrial is building a 268,000 square foot warehouse building to be used to store and ship engines for GM by Grand Rapids-based RTS Transportation Inc.	$8 million	First Industrial Realty Trust	NR	45 employees	The distribution terminal will feature 30-foot ceilings and multiple loading docks. It will include an interior rail system running the length of the building and connected to the CSX rail line on the east side of the property.	Local industrial land values are estimated at about $20,000 an acre. Construction costs for similar distribution buildings are about $30–$35 square feet. This deal contributes to the fast-developing corridor around Detroit Metropolitan Airport.	Gargaro 1997 (December 1)
MI	Detroit	Detroit Metropolitan Airport	Industrial building construction, particularly build-to-suit, is already active in metro Detroit. Analysts credit continual demand created by the booming automotive industry, not to mention low inflation and low interest.	NR	NR	NR	NR	Real estate analysts are looking for continued growth around Detroit Metropolitan Airport in Romulus, as well as in Wixom, Canton, and Van Buren townships.	NA	Gargaro 1997 (November 24)
MI	Detroit	Detroit Metropolitan Airport	The New York-based warehousing and distribution company has announced it will build 1 million square feet of new space at two sites near the airport.	NR	Ashley Capital Inc.	NR	NR	Expansion at Detroit Metropolitan Airport, which began last year and is expected to be completed in 2000, has led to new projects along the I-275 corridor, particularly in Brownstown and Van Buren townships.	NA	Ott 1997
MI	Hayes & Macomb Township	Berz Airport	Macomb Township has set aside 2 square miles around Berz Airport for industrial development.	NR	NR	NR	NR	St. John Medical Center is undergoing a $10 million expansion; Progressive Tool & Industries will build $8 million factory.	NA	Anonymous *(Crain's Detroit Business)* 1996

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MI	Livonia	Detroit Metropolitan Airport	A 112-room Residence Inn is being built on the corner of Six Mile Road and I-275. Developers are also hoping to include a Fairfield Inn, a restaurant, and an office building on the 10-acre site.	An estimated $20 million in value for the multi-phase project	Marriott Corp. owns Residence Inn	NR	NR	The site is in the heart of one of the busiest commercial corridors in metro Detroit. It has proximity to the expressways and the airport.	Oakland Co. (north of Livonia) "is really getting built out."	Garago 1997 (June 9)
MI	Romulus	Detroit Metropolitan Airport, Willow Run Airport	The Hayes Wheels factory and headquarters in Romulus is being sold to The Farbman Group in Southfield.	$13 million to $14 million	The Farbman Group	NR	NR	The site will be reconfigured for multitenant use and additional industrial development.	The Romulus factory is currently idle.	Garago 1997 (October 27)
NC	Charlotte	Charlotte-Douglas International Airport	Coltec Industries moved its headquarters from New York City to Charlotte, NC because of airport location, easy access to divisions scattered nationwide, operating costs, and because it felt right.	NR	Coltec Industries	NR	NR	Coltec's new corporate vision, Coltec 2000, calls for doubling sales to $2 billion. It expects new growth potential in aerospace sales when Boeing, Coltec's largest customer, acquires McDonnell Douglas.	Coltec divested its automotive units and narrowed its focus on aerospace and industrial products.	Hopkins 1997
NC	Durham	Raleigh-Durham International Airport	Midway Airlines relocated from Chicago to Durham in 1995. Following several years of losses, it has returned to profitability. Midway revised its fleet and destinations and has built a loyal following among local business travelers.	NR	NR	NR	NR	Some investment analysts expect Midway's stock value to rise from its current $19.75 price to at least $24, as a result of Midway's earnings success and overall business strategy.	Raleigh-Durham is a fast-growing market, whose metro population increased nearly 20% between 1990 and 1996.	Rich 1998
NJ	Atlantic City	Atlantic City International Airport	New convention center opening in May 1997. Plans for five new casinos to be built (Mirage, MGM Grand, Circus-Circus, Boyd Gaming, and Caesar's).	$3.3 billion	Hotel/ Motel Industry	NR	NR	City has also been investing in roadway infrastructure and expansion of airport. Problem achieving status as primary gaming destination because of higher air fare prices and limited number of daily nonstop flights.	The price-conscious convention planner may still opt for Las Vegas as factors like room rates, taxes, and facility prices still position Las Vegas as a destination that is 35% cheaper than Atlantic City.	Repa 1997

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NV	Las Vegas	McCarran International Airport	Las Vegas is starting a new round of resort construction: the Venetian, Bellagio, Caesar's Palace Tower, Paris Casino Resort, and Project Paradise. McCarran Airport is being expanded; new city highways are being built.	$2 million for the Venetian; $1.4 million for Bellagio; $800 million for Project Paradise; $500 million for McCarran expansion	Las Vegas hotel/casino owners; City of Las Vegas	NR	NR	Wall Street has soured on the gaming industry as a growth investment, but LV operators are embarking on a fourth round of modern development. Exciting new room capacity, plus highway/airport improvements, are expected to increase tourism.	In 1997, the Strip has seen a 12% increase in market supply, but only a 5% increase in visitor volume.	Copulsky 1997
NV	Las Vegas	NA	Las Vegas convention attendance in 1996 exceeded 3.3 million delegates. The number of conventions and trade shows totaled 3,827.	NR	Hotel/ Motel Industry	Est. non-gaming economic impact of $3.9 billion	NR	Las Vegas has 101,106 hotel guest rooms with an average daily room rate of $54.	NA	Beckley 1997
OH	Cincinnati	Cincinnati Airport	FSI operates an Airline Training Center near the Cincinnati airport, with simulator training for Regional Jets. Ground school training is held there as well.	one CAE full-flight simulator costs $12–$15 million	FlightSafety International	NR	NR	The Canadair Regional Jet simulator is operating between 16 and 20 hours/day, every day. Nine CRJ crews per month are trained in Cincinnati. Most regional airlines prefer to farm out training needs because of simulator prices.	The new regional jets that are expected to enter service will require hundreds of flight crew members, and currently many of the full-flight trainers are being used around the clock to meet the anticipated demand.	Moorman 1997
OH	Cleveland	Cleveland Hopkins International Airport	Hopkins is preparing to launch an expansion project which will extend one runway and add another. However, Greater Cleveland Growth Association believes that there should be planning for a new international airport in Northeast Ohio.	$500 million	Cleveland Hopkins International Airport	NR	NR	FAA still needs to complete EIS for airport expansion plan, which includes settlement of complaints by those living in neighboring Brook Park.	NA	Cook 1997

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OH	Cleveland	Cleveland Hopkins International Airport	Forest City Enterprises Inc. (Cleveland) has joined Amsdell Cos. (Middleburg Heights) as a development partner in Emerald Corporate Park office project near Cleveland Hopkins International Airport. The first building will soon be started, with 83,000 square feet.	$10 million for first building	Forest City Enterprises Inc. and Amsdell Cos.	NR	NR	The 78-acre project will have 10 to 14 office buildings, 2 hotels, and 2 restaurants when completed in 7 years.	The financial partnership is called Emerald Corporate Park Ltd. The first building will be for multiple tenants. Building will begin when the office space is about half pre-leased.	Anonymous (Plain Dealer) 1997 (November 25)
OH	Cleveland	Cleveland-Hopkins International Airport	Tourism industry officials want to maintain momentum of recent revenue-generating successes: the Medic Grand Prix, attracting 150,000 people, and the NBA All-Star Game, bringing 45,000 people, and the associated Fan Fest, which attracted 95,000.	Total revenue generated by all three events was $58 million	City of Cleveland	NR	NR	Convention bureau officials are working hard to bring new conventions, trade shows, and regional tourists to Cleveland. The next large convention event to be held is the Cleveland National Air Show in September 1997.	Revenue generated from conventions and other forms of tourism supports Cleveland area hotels, restaurants, taxicabs, and shopping centers.	Anonymous (Plain Dealer) 1997 (July 15)
OH	Cleveland	Cleveland-Hopkins International Airport	Advertising in the form of television spots which tout Cleveland's attractions as a leisure tourist destination. Spots are aired in Toronto, Pittsburgh, Cincinnati, Columbus, Detroit, and Indianapolis.	More than $1 million annually	Convention and Visitors Bureau of Greater Cleveland	NR	NR	Cleveland has invested tens of millions of dollars to promote itself as a tourist destination, and the investment seems to be paying off. The city expects over 203,000 visitors to attend 156 conventions slated for May through September 1997.	The number of requests for visitor information rose from 29,017 in 1992 to 307,578 in 1996.	Hardin 1997 (April 28)
OH	Cleveland	NA	Convention bookings for 1998 have declined to less than half the level of 1997.	NR	Convention and Visitors Bureau of Greater Cleveland	NR	NR	In 1997, Cleveland attracted 357,000 people to conventions, which required ~206,000 room nights. Conventions had an economic impact of $343.2 million in 1997.	NR	Hardin 1997 (December 15)

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OH	Detroit	Detroit Metropolitan Airport	Ashley plans to develop 230 acres into the Canton Business Center industrial park. The parcel is currently zoned rural residential and rural agricultural; Ashley is asking it to be rezoned to research park.	$50 million	Ashley Capital Inc.	NR	NR	The plan is that the center would be used for office space, distribution centers, and light assembly. The Canton buildings will probably rent for $4.75/foot; it is expected to have 2.5 million square feet total.	The site is close to Detroit and Ann Arbor and has ready access to highways and to Detroit Metropolitan Airport in Romulus and nearby Willow Run Airport.	Gargaro 1997 (July 14)
SC	all	all	SC will promote its first travel agent sales guide in late 1997 and has revamped a travel planner. It plans to install welcome center computer kiosks in later 1997.	$6.1 billion	SC Department of Parks, Recreation & Tourism	NR	Tourism-related jobs accounted for $4.1 billion in wages.	South Carolina logged 32 million visitors in 1996. Total economic impact generated by tourists was $13.1 billion, down slightly from $13.2 billion in 1995.	NR	Anonymous 1997 (Travel Agent Travel South Supplement)
SC	Rock Hill	Charlotte-Douglas International Airport	Kings Electronics will bring its headquarters and manufacturing plant from Tuckahoe, NY to Rock Hill's Waterford Park.	NR	Kings Electronics Co. Inc.	NR	300	Kings Electronics wanted to leave NY because its building is inefficient and outmoded, property taxes and utility costs are high, and skilled workers and the programs to train them are in short supply.	The presence of Charlotte-Douglas airport was the deciding factor; it allows for commercial air transport between New York and Columbia.	Milstead 1997
TN	Memphis	Memphis International Airport	The Memphis TradeCenter is a 50-acre industrial park in southeast Shelby County. It has been designated as a foreign trade zone. An existing building has 300,000 square feet.	NR	Memphis TradeCenter	NR	175,000 jobs from 1993 to 1995 from export activity	The area is focusing not just on recruiting distribution, but also high-tech firms such as biomedical research.	Other foreign trade zone sites in Memphis include Meritex Logistics, Port of Memphis on Presidents Island, FedEx, Brother Industries USA Inc., and Sharp Manufacturing.	Wolff (Cindy) 1997
TN	Memphis	Memphis International Airport	United Parcel Service is going to lease 82.8 acres of land on the NE side of the airport to build a 630,000 square foot cargo sorting facility.	$65 million	United Parcel Service	Rate of $.1541/square foot or $555,803/ year to airport	1,800 (adding to existing UPS workforce of 1,400 in Memphis)	UPS air operations are centered in Louisville, KY. The company has regional hubs in Dallas; Philadelphia; Rockford, IL; Ontario, CA; and Columbia, SC.	The agreement is a departure for UPS. Normally, UPS buys land adjacent to airports where it operates.	Hirschman 1997 (January 16)

NR Not Reported; NA Not Applicable

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TN	Memphis	Memphis International Airport	LMI is in the market for overnight service of computers and other electronic equipment. LMI needs a warehouse to do the service, move computers in and out, maintain a centralized parts inventory, and a computer system to find and track the parts and units.	1996 sales of $22.43 million	Logistics Management Inc.	NR	275 in Memphis; 100 in Germany	LMI came to Memphis to be near FedEx, allowing LMI employees to work late into the night on repair jobs so the hardware can be in the owner's hands the next day. LMI is in the top 500 fastest growing firms, with sales up 641% in 1992–1996.	LMI is expanding into the refurbishing and handling of used computers, using telemarketing and the Internet to sell the machines. They are thinking of expanding into Louisville (UPS hub) or Wilmington, NC.	Flaum 1997
TN	Memphis	Memphis International Airport	FedEx is to beginning to fly nonstop from Japan to Memphis. Also, Memphis Airport is planning an overhaul of three runways to allow nonstop widebody plane flights in the other direction, from Memphis to Asia.	NR	Federal Express; Memphis/ Shelby County Airport Authority	NR	NR	With nonstop flights from Japan to Memphis, FedEx hopes to attract large numbers of small, premium-priced international priority shipments. Memphis airport expansion anticipates future freight and passenger service to Asia.	Fully loaded widebody planes are incapable of flying nonstop from Memphis to Asia due, in part, to the lack of a long enough runway at MIA. A planned overhaul and extension of the center of three parallel runways will allow such flights in three years.	Hirschman 1997 (July 31)
TN	Memphis	Memphis International Airport	The U.S. Commerce Department is designating a 50-acre industrial park near Memphis Airport as a foreign trade zone. It will have customs and tax breaks to attract international and domestic firms involved in exports and international trading.	NR	City of Memphis, private developers	NR	Export activities in the Mid-South region created 175,000+ jobs between 1993 and 1995	The focus will be on attracting high-tech firms with high-paying jobs.	The site will be known as the Memphis TradeCenter. A 300,000 square foot speculative building is on the property.	Wolff 1997

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TN	Millington	Millington Municipal Airport	West Tennessee Regional Development Center, located near the Millington Municipal Airport fashioned from the old Navy airfield, is looking for new tenants	NR	NR	NR	NR	Aramark Uniform Services had planned to build a $7.5 million high-tech plant to employ about 150 and pay an average of $9.50/hour, but they pulled out because they did not feel the technology was available to allow them to pay those wages.	Millington didn't want Aramark if they paid $6.50/hour (which was what they first offered). Aramark has hired Cushman & Wakefield, a national commercial real estate firm based in Chicago, to help Millington locate another industry for the site.	Bailey 1997
TN	Nashville	Nashville International Airport	Nashville hosted 1,195 groups in 1996, up from 955 in 1995; 4,000 new hotel rooms have been added in the metro area in the past 2½ years and more are being built; Nashville Arena opened last year.	NR	Hotel/Motel Industry and City of Nashville	NR	NR	Nashville Convention & Visitors Bureau hopes to lure groups usually meeting in "first-tier" cities to a "second-tier" city (Nashville) based upon increased capacity from the Arena and recent Opryland Hotel expansion.	Downtown is being revitalized with new clubs and restaurants. Courtyard by Marriott is building a new downtown hotel. Opryland Hotel is working with city and state officials to market its facility.	Sherborne 1997
TX	all	all	Of the top 12 U.S. birding sites, 4 are in TX. Many birding festivals are brand new, and some older festivals have exploded in popularity.	$1.3 billion in revenues generated by TX residents in 1991 for nature tourism	Tourism Industry in TX	NR	NR	In U.S., nature tourism industry has averaged a 30% growth yearly since 1987. Birding festivals are the fastest growing part of nature tourism.	Birding festivals are usually produced by local chambers of commerce.	Guier 1997
TX	Dallas/Fort Worth	DFW International Airport	Grapevine Mills, a 1.5 million square foot outlet mall between Dallas and Fort Worth (2 miles from DFW International Airport) is about to open. There are 200 outlets, including Saks Fifth Avenue, Off Rodeo Drive Beverly Hills, J. C. Penney, Marshalls, and Burlington.	Sales of estimated $4.5 billion in 10 years	The Mills Corp., Simon DeBartolo Group, and Kan Am	$7 million/ year in taxes (sales and property)	4000	The mall contains parking for 8,500 autos to handle an anticipated 14–16 million visitors/year. There are 4.2 million people living within a 40-mile radius of Grapevine with average family income of $50,000.	Grapevine Mills will offer "shoppertainment" or the next best thing to a theme park. There's the Rainforest Cafe, a live-action tropical setting, virtual reality GameWorks, American Wilderness Experience (with animals), and a 30-screen movie theater.	Vargo 1997

NR Not Reported; NA Not Applicable

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TX	Dallas/Fort Worth	Dallas-Fort Worth International Airport	Construction projects over the next 10 years have been developed, increasing gates from 117 to more than 200, upgrading the people mover train, extending three runways, building a new parking garage.	$2.5 billion airport expansion plan	Dallas-Fort Worth International Airport	1996 operating revenues of $214.2 million	NR	DFWIA handled 58 million passengers in 1996. It is exploring whether there is a demand for a major manufacturing site on the airport. DFW has 9,000 acres available for this kind of project.	DFWIA is the second busiest with 848,048 movements, behind Chicago O'Hare's 909,593. Opened seventh runway in 1996. DFW is the only airport in the world with three active control towers.	Nelms 1997 (September)
TX	Dallas/Fort Worth	Dallas-Fort Worth International Airport	DFW is the 11th largest airport rental car market in the U.S. There are four on-airport rental companies (with 85% of market) and five off-airport. Expansion plans for the airport include consolidation of its rental car operations.	$13.5 million in fees to airport from nine rental companies	Rental Car Agencies	NR	NR	DFWIA handled 58 million passengers in 1996.	NR	Nelms 1997 (January)
TX	Grapevine	Dallas-Fort Worth International Airport	Grapevine Mills, a 1.5 million square foot outlet mall, is now opening, with more than 200 stores. It is located 2 miles from DFW airport.	NR	The Mills Corp., Simon DeBartolo Group, and Kan Am	NR	4,000 jobs	At 10 years, $4.5 billion in sales is expected. Annual real estate tax revenue will be about $7 million annually. 14–16 million annual visitors to the mall are expected.	The metroplex area has 4.2 million people living within a 40-mile radius of Grapevine.	Vargo 1997
VA	Norfolk	NR	The Southeast Virginia area is interested in increasing its share of tourism business.	NR	Southeastern Virginia Tourism Summitt	$2.5 billion	NR	The number of foreign tourists continues to rise. From 1986–1996, domestic travel increased by 40%; the number of international visitors went up 73%.	For visitors who fly here, their first and last impressions about the region will be made at the airport. When they walk through the jetway, they want to be greeted by a well-lit facility, good food, and friendly faces.	Parker 1997

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VA	Virginia Beach	NR	Raytheon won a 5-year, $300 million contract to build satellite terminals for the Army. Located in the beach's Airport Industrial Park, Raytheon recently leased 56,000 square feet of additional manufacturing space with the option to lease another 36,000 square feet.	NR	Raytheon	NR	500	The Virginia Beach Department of Economic Development expects more high-tech work to be done in Virginia Beach in close proximity to military bases.	Defense Department contractors in the area are benefiting from the consolidation of military units in Hampton Roads. The region's labor pool has many retiring or exiting military personnel with the electronic and computer skills necessary.	Manga-lindan 1996
WV	Weirton	Pittsburgh International Airport	The Three Springs Industrial & Business Park is being built on a 137-acre site in Weirton, WV. The land was transferred from Weirton Steel Corp.	$3.3 million	West Virginia Economic Development Authority	NR	NR	The land is being readied for potential tenants. One unidentified steel-consuming company has expressed a desire to become the first tenant.	NA	Anonymous (American Metal Market) 1997
US	all	all	In late 1996, the FAA ordered the installation of 54 upgraded CTX 5000SP scanners (from InVision Technologies) at unidentified U.S. airports, for explosives detection.	$52.2 million	Federal Aviation Administra-tion	$58.7 million for additional installations in 1998	NR	Effective explosives detection is necessary for airport security. Airlines hope that the U.S. government will bear most, if not all, of the cost of installing and operating the latest technology.	Out of four explosives-detection systems for checked baggage currently offered commercially, InVision's CTX 5000 is the only one certified by the FAA.	Nelms 1997 (February)
British Colum-bia	Vancouver	Vancouver International Airport	Vancouver Airport recently added a 17-gate terminal and a 3,000-meter runway. A seven-gate expansion to the Canada-U.S. concourse has begun. A new 14-story, 400-room hotel is being planned. The domestic terminal will be refurbished.	$500 million (Canadian) on new terminal and runway	City of Vancouver/ Vancouver Airport Authority	$14–18 million (Canadian) for the hotel	NR	Vancouver International is among the top 10 airports in the world in passenger growth. Services to Asia and Latin America are focuses for new growth.	Open Skies Agreement with U.S. has led to more Canada-U.S. direct routes.	Rowe 1997 (July)

NR Not Reported; NA Not Applicable

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Malay-sia	Kuala Lumpur	Kuala Lumpur Airport	A new Multimedia Super Corridor (MSC), including the cities of Putrajaya, Cyberjaya, and the Kuala Lumpur Airport, is being heavily promoted by Malay PM Mahathir Mohamad. 1,000 Malay and international firms have signed up to take part in the corridor.	$200 for a state-of-the-art all-digital broadcasting station in Kuala Lumpur	All Asia Satellite Television and Radio Org. (ASTRO)	$30 million/ year on locally produced programs and $10 million/ year on new Malay movies	NR	The MSC is designed to propel Malaysia into the info-technology age, make it Asia's broadcasting hub, and help it become an industrial society.	The MSC will be connected and served by a 2.5–10 gigabyte fully digitized fiberoptic network, linking it to similar systems in the rest of the world.	Seneviratne 1997
Mexico	all	all	The flow of tourists to Mexico set records in 1996, both in relation to the number of visitors and the volume of foreign exchange they generated.	$6.4 billion	As reported by Secretariat of Tourism	NR	2.2 million workers	Mexico received almost 15.9 million international tourists in the first three quarters of 1996.	In relation to the alliances with airlines, these often lead to identifying market niches that have been overlooked and result in a publicity campaign that is jointly funded, and can diversify the tourist flow.	Levin 1997
No. Ireland	Belfast	Belfast International Airport	TBI, a property investment company, has applied for planning permission to carry out a 1.6 million square foot development project at Belfast International Airport.	£100 million	TBI	NR	NR	Developed property could be used for warehousing, shops, and other commercial purposes, as well as aircraft maintenance. Also planned is a new railway station.	TBI acquired the airport in 1996.	Anonymous (Investors Chronicle) 1997 (November 21)
Philip-pines	Manila	Clark Field	Clark Field, once the largest American air base outside the U.S., is being converted into a mega-airport that will supercede Manila's Ninoy Acquino International Airport.	$4.8 billion for airport and connecting rail system, plus $1.6 billion for a multi-use area	Philippine government	NR	NR	International passenger growth is expected to rise by 5.5% per year. Clark will ultimately become the country's premier airport, and NAIA will be used as a commuter airport.	NAIA has only one runway, giving it limited capacity. It currently handles 11 million passengers/year.	Rowe 1997 (October)

NR Not Reported; NA Not Applicable

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South Korea	Seoul	Seoul Kimpo Airport	Korean Air (KAL) has completed its new 135,960 square meter headquarters at Kimpo. KAL plans to replace or increase its current air fleet from 115 to 200 planes by year 2005.	$250 million for head-quarters	KAL	$10 billion to upgrade air fleet	NR	KAL's new headquarters increases maintenance capability for new aircraft that will be added to KAL's fleet. It also creates more room for KAL's manufacturing operations.	KAL's Aerospace Division repairs planes for the U.S. military and manufactures the UH-60P helicopter for the ROK military.	Nelms 1997 (August)
Thai-land	Nong Ngu Hoa	proposed	Two major contracts for the financing & design of a proposed major airport construction project were awarded.	$4 billion	NAPA Airport Development	NR	NR	Airport will be a new hub of southeast Asia.	Proposed airport will be located 18.6 miles east of Bangkok at a place known as Cobra's Swamp.	Anonymous (Airports International) 1997 (September)

NR Not Reported; NA Not Applicable

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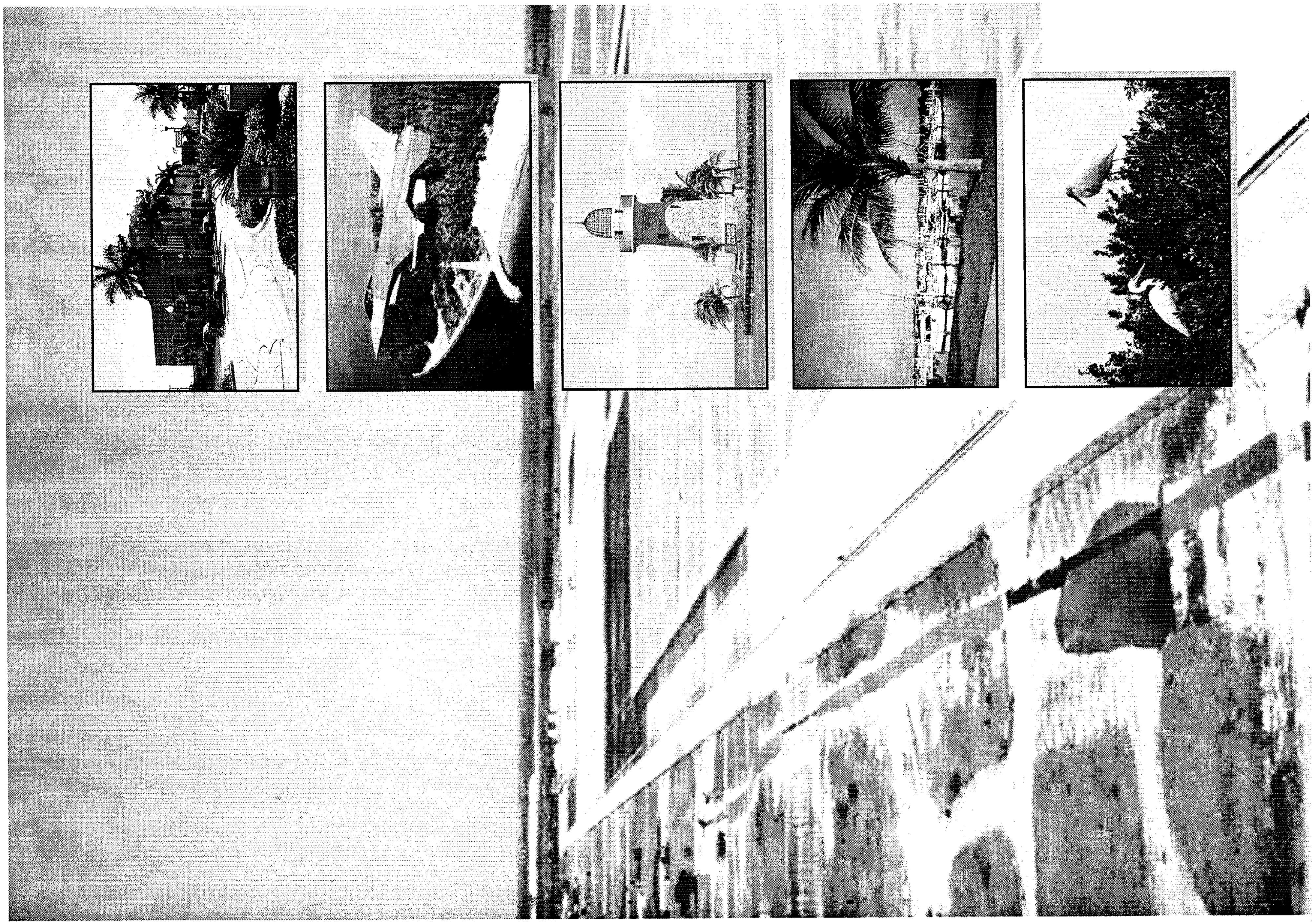
D Analysis of Market Absorption Potential



ANALYSIS OF MARKET ABSORPTION POTENTIAL OF LAND AT FORMER HOMESTEAD AIR FORCE BASE October 1998

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this analysis is to estimate the type and extent of land development that is likely to occur on available property at former Homestead Air Force Base (AFB) if the property is not conveyed as part of a public use airport. Specifically, of the 1,632 acres identified for disposal, approximately 717 acres are available for industrial or other use. The remaining 915 acres comprise the runway and associated airfield facilities.

This study was conducted to identify potential land uses associated with the Mixed-Use Alternative analyzed in the Supplemental Environmental Impact Statement (SEIS) for the Disposal of Portions of Former Homestead AFB. Under that alternative, the airfield portion of the installation would continue to operate as a military airfield, but there would be no additional economic activity attributable to public or private sector use of the airfield. The highest and best use of the subject 717 acres under these conditions would depend on the supply and demand conditions in south Miami-Dade County under the influence of growth in the existing economy. Consequently, existing market forces and public policy will be the primary influences on the rate of absorption of various land uses, and the continued military use of the airfield could encumber rather than enhance land value.

1.2 LIMITATIONS

This analysis is primarily intended to support the completion of the SEIS and does not adhere the customary and usual practices of the appraisal industry to estimate highest and best use and absorption rates. This is primarily due to the fact that appraisals typically focus on current market conditions and support legal determinations of real property value, while the SEIS process addresses long-term effects that are too uncertain to be used for the estimation of value. The analysis covers the time period from 2000 through 2015.

Demand for land for residential and commercial development is related to population growth. For this analysis, that demand is based on population forecasts for Miami-Dade County in general and the "South Dade" area in particular over the 2000 to 2015 study period. Population forecasts are developed by various entities, including the federal Bureau of Economic Analysis (BEA), the University of Florida's Bureau of Economic and Business Research (BEBR), and Miami-Dade County. BEA and BEBR have projected a moderate level of future growth that is used as the baseline for this analysis. Miami-Dade County forecasts are for a substantially higher level of growth, also addressed in this analysis as the upper boundary of the rate and extent of development that could be supported by the market.

Unlike residential and commercial land uses, which are highly dependent on population growth, industrial absorption is not significantly affected by growth projections. Consequently, the moderate and high-growth scenarios are not applicable to the industrial absorption projections.

2.0 METHODOLOGY

2.1 FACTORS INFLUENCING METHODOLOGY

A number of factors, some of which are unique to the subject property and regional economy, have been taken into consideration in developing the methodology used in this analysis. These factors and their influence on methodology are summarized as follows.

- *Term of the Analysis.* As discussed above, the time horizon covered by the analysis makes the use of standard appraisal practices impractical. Instead, potential for development is based on estimates of demand derived from established economic growth forecasts.
- *Existing Land Use.* Existing land use is important in the immediate vicinity of the former base and within the South Dade region. In the vicinity of the former base, the existing land uses provide an indication of probable future adjacent uses and land use compatibility constraints likely to be present in the future. Within south Miami-Dade County, the existing land use reflects the evolution of development patterns under the influence of local economic and accessibility factors over the years. The relative proportions of land uses are likely to persist well into the future as additional land is developed.
- *Land Use Planning and Control Mechanisms.* The surplus property has not been subjected to traditional local land use planning and control measures in the past. Consequently, there is no existing adopted zoning for the site, and land use planning has been focused on the development of the site as a public use airport. The Miami-Dade County Comprehensive Development Master Plan currently prohibits residential development on former Homestead AFB and permits up to 139 acres of commercial and 111 acres of industrial land use (**CITE 1**).
- *Financial Risk.* In addition to the traditional market forces that influence real estate demand and supply relationships, there are a number of factors related to the perception of risk in the South Dade market, particularly in the wake of the recent and persistent real estate recession. Although such factors are qualitative, they are nonetheless real and impede the restoration of investor confidence.
- *Physical and Compatibility Constraints.* The continued operation of government aircraft from the airfield is likely to constrain portions of the site closest to the airfield to industrial and commercial uses due to land use compatibility considerations.
- *Existing Economy and Growth Forecasts.* The current stagnation of the South Dade economy may be traced in large part to the effects of Hurricane Andrew and the closure of Homestead AFB. Although there are a number of initiatives that have been planned and are in the process of being implemented to stimulate this local economy, it is likely that diversification and growth in the job market will not become measurable for several, and possibly many, years. At the same time there are a number of growth forecasts for the South Dade area that indicate rapid growth in population over the next 15 to 20 years. This implies that there is an emerging demand for commuter housing, supported by jobs in the Miami area, an influx of retirees, or both.
- *Location and Accessibility of Site.* As a result of its proximity to Florida's Turnpike, former Homestead AFB is only 25 to 30 minutes from Miami International Airport (MIA) and downtown Miami. Because of the dominance of north Miami-Dade County in the production and maintenance of employment opportunities, this accessibility has resulted in and will continue to support a dependent relationship between southern and northern portions of the county. This dependency is strongest for the home-based work trip, and there is little reason to expect that the introduction of jobs in north Miami-Dade County will create less demand for local housing than the introduction of jobs in South

Dade. In both cases, it is the availability of land suitable for residential development that is driving the demand for housing in southern Miami-Dade County, not South Dade employment opportunities.

- *Park of Commerce Absorption.* The Homestead Park of Commerce is south of former Homestead AFB and has been specifically designed to capture commercial and industrial land uses within a Free Trade Zone. The park comprises about 280 gross acres, with 191 net acres for sale or lease at this time (**CITE 2**). Leasing activity has recently included a total of 61 acres for long-term use and 60 acres for short-term use. This level of leasing activity was not anticipated and resulted in a revised analysis and addendum to the 1997 Park of Commerce appraisal (**CITE 3**). Given the historical absorption of industrial land in the Homestead area over the last 25 years at 3 to 4 acres per year, it is apparent that much of the current market captured by the Park of Commerce development is the result of demand inducement and not the aggregation of latent demand. This induced demand is attributable in part to the Free Trade Zone status of the property. It is therefore unlikely that the Park of Commerce experience is directly applicable to the potential rate of absorption for commercial or industrial land uses on the subject property over the period of analysis.
- *Disposition Mechanism.* The sale of the subject property for fair market value has an important implication for the attraction of all types of development: discounted land costs are not likely to be used to influence location decisions in the market place. In other words, the site would be in full competition with all other available developable land in south Miami-Dade County, and would not enjoy the benefits associated with below market land costs. Alternatively, conveyance to a qualified public entity for economic development purposes could provide some discount to offer incentives to potential developers.

2.2 LONG-RANGE ABSORPTION METHODOLOGY

Based on these factors, it was determined that the absorption forecasting methodology should emphasize long-range, proportional growth and market aggregation principles. The methodology stresses the importance of site development in the out years of the period of analysis, when most impacts are likely to occur; assumes that long-term demand distribution is strongly influenced by existing development patterns; and defers almost exclusively to growth and absorption forecasts prepared by the Miami-Dade County Department of Planning, Development and Regulation. These county forecasts cover the period from 1994 through 2020 and specifically address the South Dade area (**CITE 2**).

In order to assign an appropriate part of the forecasted growth to the subject property, a three-step process was used. First, the property was characterized for general development suitability, using access parcel configuration and land use compatibility criteria. Second, applicable land use planning and control designations were considered. Third, a portion of the Miami-Dade County absorption forecasted for each land use was assigned to the site on a proportional basis.

Proportional absorption identifies the growth segment of the local real estate market and assigns gross development demand, by land use, to the available land in the jurisdiction that is zoned and/or plan-designated for that use ("developable land"). It is assumed that former base property in individual land use categories is absorbed in proportion to its share of developable land in the south county area. For example, if there are 100 acres of developable land within a Minor Statistical Area (MSA), and a single development site in that MSA has 10 suitable undeveloped acres available, gross demand may be characterized by approximately 10 percent of the annual absorption. Thus, if 20 acres of absorption were anticipated for the MSA, the site would be assigned a demand of 2 acres per year. Following this initial estimate of gross demand, adjustments can be made for unique site conditions, risks, and uncertainties.

In the case of the subject property, it is important to note that there is considerable uncertainty concerning the extent to which governmental intervention can create "induced demand" for industrial development that is not evident under a sale for fair market value. As a matter of public policy, it may be determined that it is appropriate to use favorable disposition terms that are designed to induce employment rather than to achieve a maximum return on the value of the property. For example, in an extreme case, the property could be made available through a public entity at no cost to the private sector on the basis of employment opportunities. Under these conditions, the rate of absorption would be much higher than if the land were sold at fair market value.

For this reason, this analysis first considers industrial absorption under conditions where the land is in full competition with other sites in the region, on the basis of price. Subsequently, industrial absorption is evaluated where development incentives are provided which, in effect, give the site an advantage that is not available in the market in the absence of governmental intervention. The resulting site absorption projections are characterized as responding to "latent" and "induced" demand and are addressed in Sections 4.0 and 5.0, respectively. This distinction is not necessary when addressing residential or commercial absorption, because long-term demand is sufficient for these uses without special incentives.

3.0 MIAMI-DADE COUNTY FORECASTS

Within the region of influence, residential land use is addressed by Miami-Dade County forecasts in two subareas, east and west of U.S. Highway 1 **(CITE 2)**. For commercial and industrial uses, the region of influence is more finely divided into the six MSAs that make up the area south of Eureka Drive (numbered from MSA 7.1 through 7.6). The subject property is centrally located in MSA number 7.4.

3.1 RESIDENTIAL

The Miami-Dade County absorption projections itemize residential capacity in 1994, 2000, 2005, 2010, and 2015. For intervening years, housing demand is deduced on an annual basis, leaving residual capacity. All of the projections are made on the basis of housing units, rather than areas of development, and single- and multi-family structures are differentiated.

Figure 1 depicts the housing unit capacity projected by the county in 1994 (actual), 2000, 2005, 2010, and 2015. It shows a decline in capacity for all housing types from 79,300 units in 1994 to zero units by 2015. Demand is expected to be about 2,800 units per year for the period from 1994 to 2000 and between 2000 and 2005; 5,000 units per year from 2005 to 2010; and 7,900 units per year from 2010 to 2015. **Figure 2** provides this projection on an annual basis and reveals that residential capacity is expected to be fully depleted in 2013. Adjusting to a more moderate-growth rate, housing demand would be expected to increase at an average of about 1,400 units per year over the planning period.

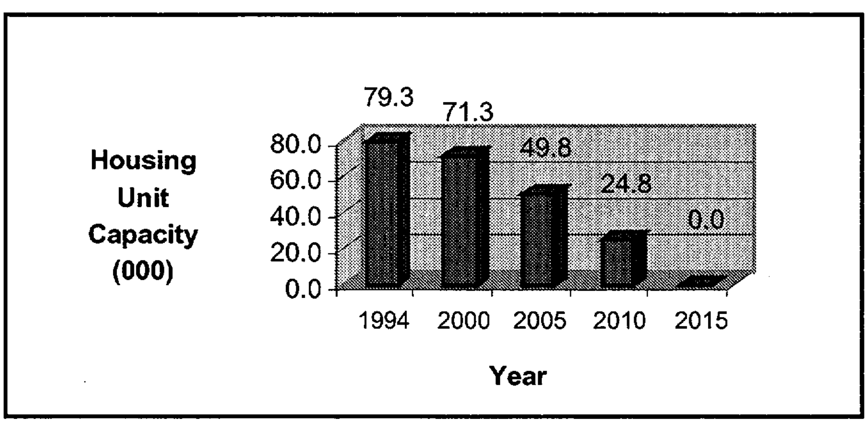


Figure 1. Residential Capacity in South Miami-Dade County

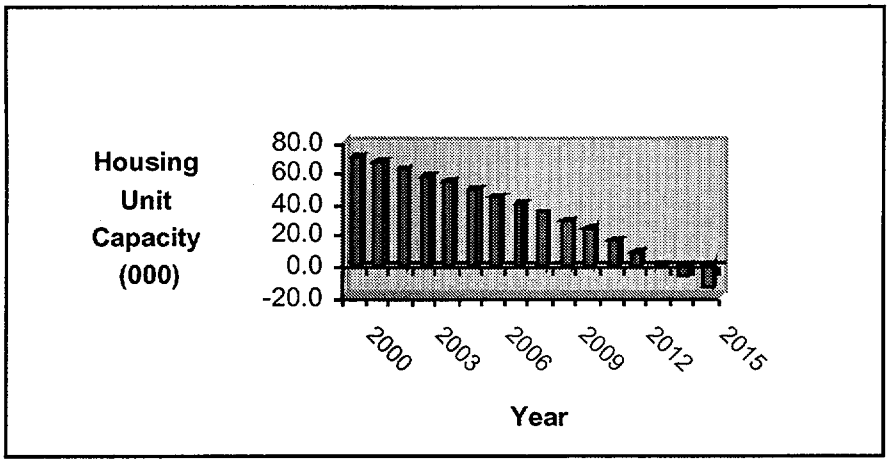


Figure 2. Annual Residential Capacity in South Miami-Dade County: 2000–2015

The implications for the subject property are that the portion of the site that is suitable for residential development is likely to be absorbed at a rate proportional to the decline in capacity for south Miami-Dade County. At the county's high-growth projection rate, all of this suitable residential area would be absorbed by 2013. At the more moderate-growth rate, only about 28,000 units would be absorbed by 2015, leaving approximately 51,000 units of capacity to absorb future growth.

3.2 COMMERCIAL

Figure 3 shows the disposition of commercial land in Miami-Dade County in 1994. The "In Use" category refers to land that has been developed and is being used for commercial purposes. Vacant commercial land is land that either is zoned for commercial use or has been designated for commercial use by the county but not yet zoned.

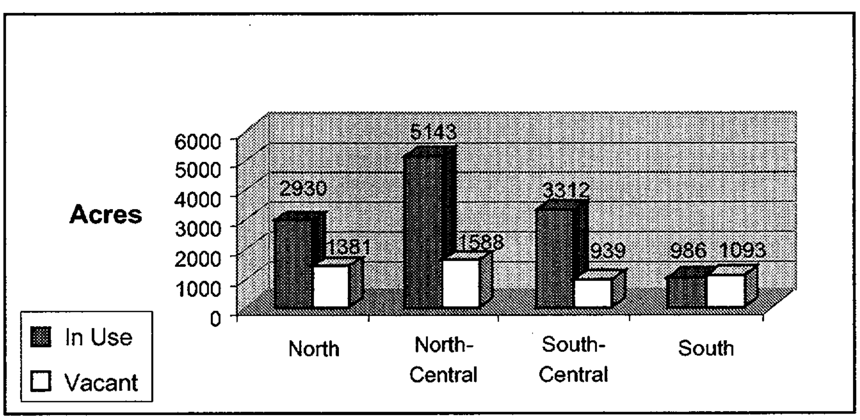


Figure 3. Commercial Land In Use and Vacant in Miami-Dade County (1994)

It is evident that the South tier, which contains the subject property, has the smallest amount of land devoted to commercial use and is the only tier with more vacant than developed commercial land. On a countywide basis, the South tier has about 22 percent of the available vacant commercial land and only about 8 percent of the existing developed commercial land in Miami-Dade County.

Figure 4 provides more detail on the MSAs within the South tier. The subject property is centrally located in MSA number 7.4, which had 312 acres of commercial land available in 1994.

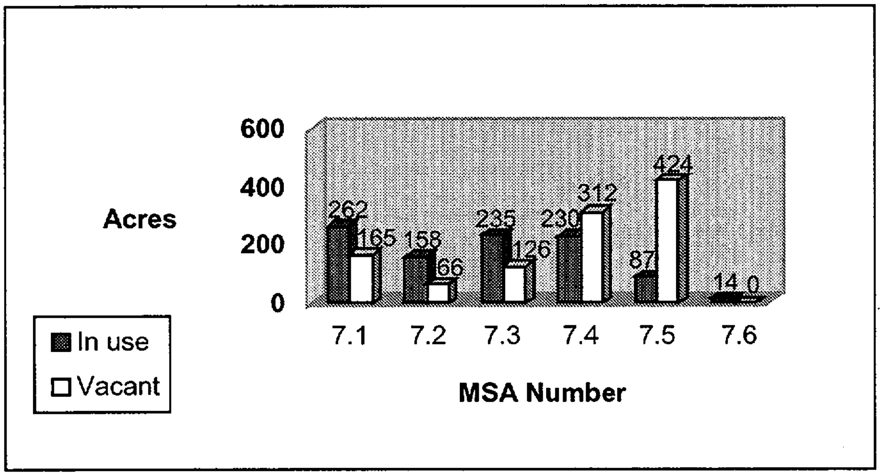


Figure 4. Commercial Land In Use and Vacant in South Dade (1994)

Figure 5 presents the Miami-Dade County forecast for commercial absorption for the same set of MSAs. It is noteworthy that MSA 7.4 is expected to average 22.7 acres of commercial absorption per year over the time period, and that this is the highest rate projected for the seven MSAs. In fact, MSA 7.4 is predicted to have the second highest commercial absorption rate among the 32 MSAs in Miami-Dade County. The average MSA commercial absorption rate in Miami-Dade County is 8.2 acres per year.

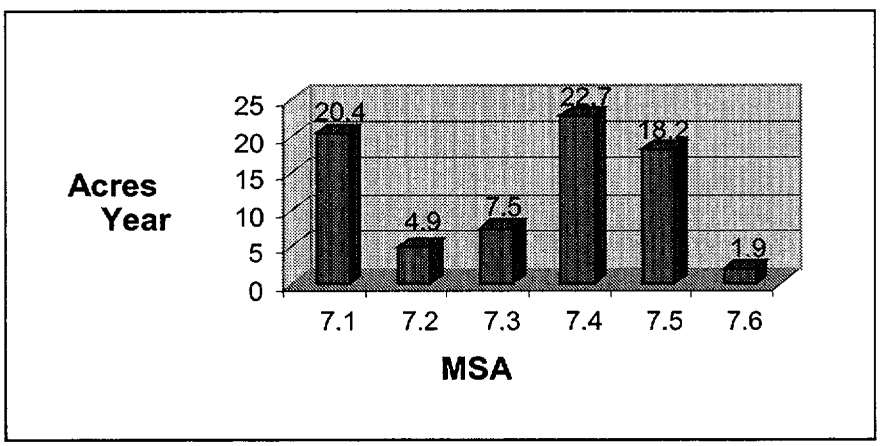


Figure 5. Average Commercial Absorption Rate for South Dade MSAs: 1990–2015

This growth is likely driven by the residential development anticipated in the area. MSAs 7.1, 7.4, and 7.5 are all east of U.S. Highway 1, where 76 percent of the residential growth in South Dade is expected.

The implication of absorbing commercial land at a rate of 22.7 acres per year is that all of the vacant commercial land in MSA 7.4 is likely be consumed by 2008 if no new supply is added. By 2000, the supply of undeveloped commercial land in MSA 7.4 will have been reduced to 176 acres. Adjusting for a more moderate baseline growth rate of 12 acres per year, the supply of available land for commercial development in MSA 7.4 will be approximately 241 acres in 2000.

3.3 INDUSTRIAL

Figure 6 depicts the industrial land that was either in use or vacant in Miami-Dade County in 1994. As with the commercial inventory, the vacant category refers to undeveloped land that is either zoned or plan designated for industrial use. The dominance of the North-Central tier is attributable to the presence of Miami International Airport and the large volume of freight related industry in that area. The South tier, where former Homestead AFB is located, has only about 5 percent of the industrial land in use in the county and 12 percent of the vacant industrial land.

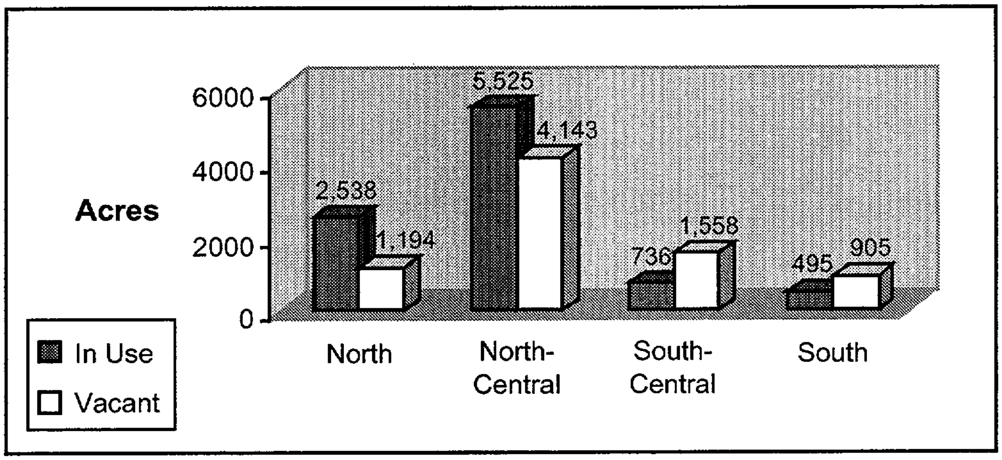


Figure 6. Industrial Land In Use and Vacant in Miami-Dade County (1994)

Figure 7 provides more detail on the MSAs within the South tier. The subject property is centrally located in MSA 7.4, which had 99 acres of industrial land available in 1994.

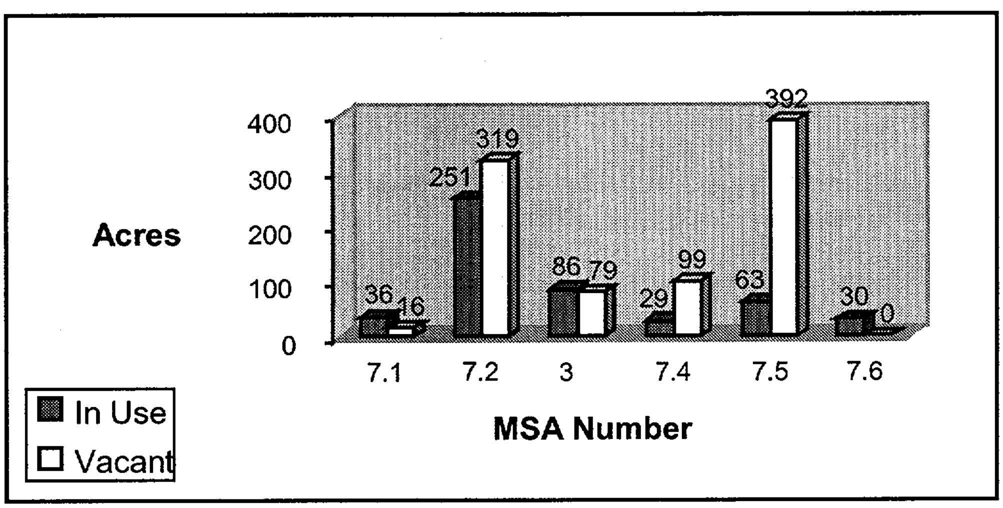


Figure 7. Industrial Land In Use and Vacant in South Dade

Figure 8 shows the Miami-Dade County forecast for industrial absorption rates for the above MSAs. In terms of industrial absorption rate, South Dade is expected to contribute only about 6 percent of the annual absorption for the county as a whole over the 1994 to 2015 time period. Only 0.5 percent of the county absorption is expected to occur in MSA 7.4. It is noteworthy that MSA 7.5, which contains the

Park of Commerce, is expected to absorb about 2.8 acres of industrial development per year, compared to only 1 acre for MSA 7.4. The county average industrial absorption rate is 5.9 acres per MSA per year. At a rate of absorption of 1 acre per year, the available supply of undeveloped industrial land in MSA 7.4 will be 93 acres in 2000.

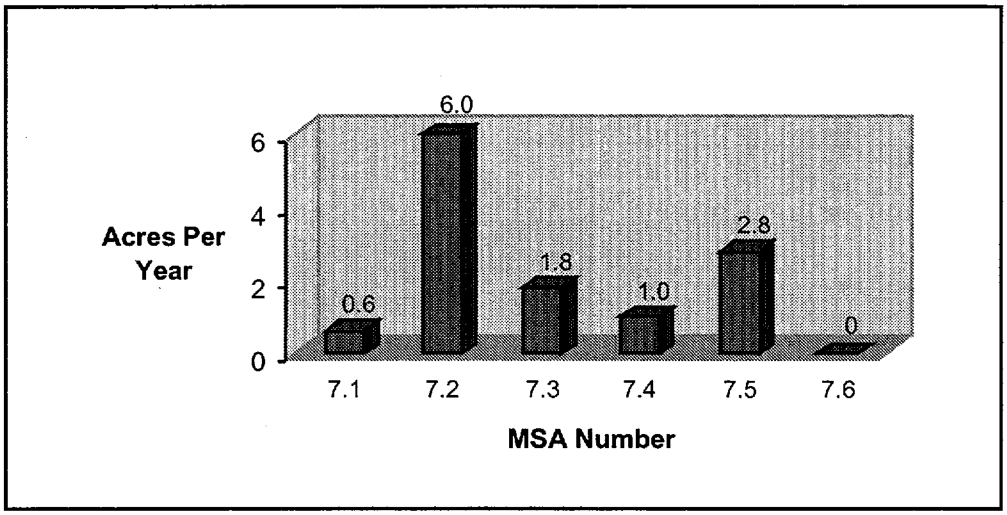


Figure 8. Average Industrial Absorption Rate for South Dade MSAs: 1990–2015

In recent years, the Park of Commerce development has grown more rapidly than the indicated 2.8 acres per year, due to marketing efforts and favorable tenant terms. The effects of this type of "induced" demand on absorption are addressed in more detail in Section 5.0.

4.0 SITE-SPECIFIC ABSORPTION WITHOUT INDUCED DEMAND

The specific absorption of the subject property at former Homestead AFB relies on the suitability of different parcels for specific types of development, as well as additional information drawn from recent appraisals and market studies that amplify the Miami-Dade County absorption forecasts.

In general, in the absence of a commercial airfield at this location, there are no unique attributes of the site that would serve to attract and aggregate demand above the latent demand associated with the general growth of south Miami-Dade County discussed above. However, there is the potential for some of the negative attributes of the site to adversely affect specific types of development from a land use compatibility perspective. These negative attributes limit the use of land contiguous to the airfield for industrial purposes, due to the industrial nature of the activities associated with the aircraft operations.

As a result of this limitation, long-term development of the available land on former Homestead AFB would probably be limited to approximately 239 acres of residential development, with more intensive industrial and commercial uses being suitable for the 450 acres adjacent to and near the airfield. Commercial demand is likely to be moderately strong in South Dade, particularly east of U.S. Highway 1. It is unlikely that industrial demand, however, will develop to a sufficient level over the same time period to absorb a significant portion of the 450 acres that are suitable for those land uses.

Absorption rates in this section are designated as resulting from moderate or high population growth projections. Moderate growth absorption is consistent with the forecasts selected for the baseline years in the SEIS. High growth absorption is consistent with Miami-Dade County forecasts.

4.1 RESIDENTIAL

There are a number of statistics which support the contention that the housing market in south Miami-Dade County continues to be stagnant, but one of the more meaningful ones is the comparison of the number of homes sold with the number for sale on a monthly basis. For all of Miami-Dade County over the period from April 1997 through March 1998, there was an average of 12.8 homes for sale for every home sold. For South Dade County, there were 20.8 homes for sale for every home sold (Esslinger, Wooten and Maxwell, *Realtors Facts and Trends* Report #1, April 1998). The for-sale to sales ratio is 63 percent higher in South Dade than in Miami-Dade County as a whole (**CITE 3**).

On the other hand, there are some indications that the market for new homes is somewhat better than for existing homes in the Homestead area. For the three months ending on June 30, 1997, the southwest Dade/Homestead submarket supported the sale of 347 new single-family homes over 28 separate projects, for an average sales rate of 4.1 units per project per month. This was very good performance compared to Miami-Dade County as a whole, which averaged 2.3 units per project per month. At the 4.1 units per month rate, the average project in the area would sell out in less than 2.5 years. The same study indicates that the short-term market in MSA 7.4 is likely to absorb 378 new single-family homes per year, or over 750 new units between 1998 and 2000. Affordability considerations in the $70,000 to $90,000 price range would reduce this market to approximately 150 new homes over the 2 year period (**CITE 4**).

Only about 239 of the available acres at former Homestead AFB may be suitable for residential development, due to the continued presence of the airfield and associated operations. This land was previously used for residential related purposes, is adjacent to existing residential land, and has separate access from other parcels that are contiguous to the airfield. In addition, the 28 acres comprising Mystic Lake would be accessible to this area as well as to adjoining neighborhoods. If the airfield is only used for government aircraft operations, it is assumed that a residential area on former base property would receive plan designation and zoning for residential use, notwithstanding the current prohibition on residential development at the site (**CITE 1**).

Figure 9 shows the projected net absorption of residential land in South Dade between 2000 and 2015. The high-growth absorption is directly derived from the changes in residential land capacity predicted by Miami-Dade County shown previously in Figure 1.

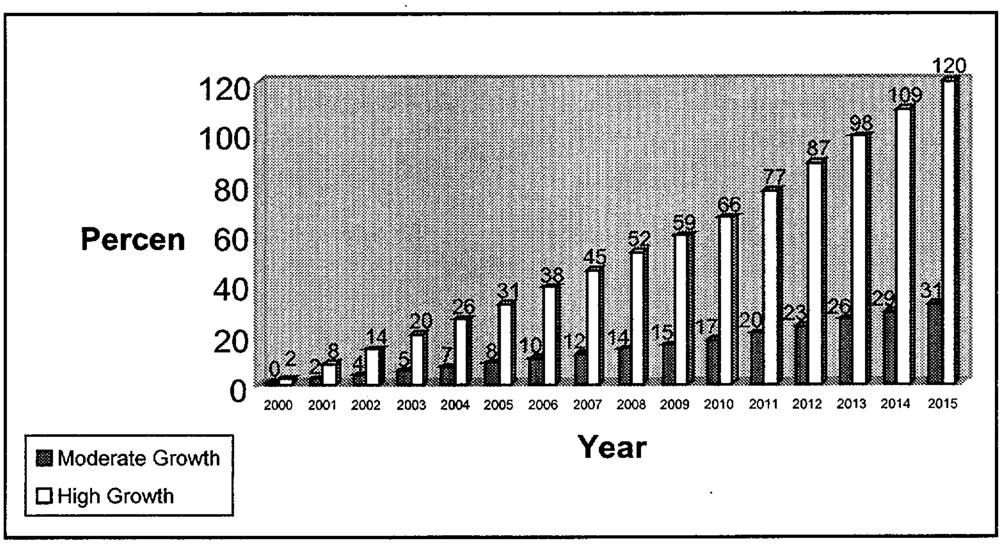


Figure 9. Residential Land Absorption in South Dade: 2000–2015

For purposes of estimating the absorption at the subject property over the same time period, it is assumed that the suitable land on the site would be absorbed at the same rate as other land in South Dade. Given 239 acres of suitable residential land on the site, the estimate for absorption becomes a simple matter of multiplying the percentages in Figure 9 by 239 acres to obtain the absorption demand in each of the years in the time period. The resulting estimate of residential absorption is shown in **Figure 10**.

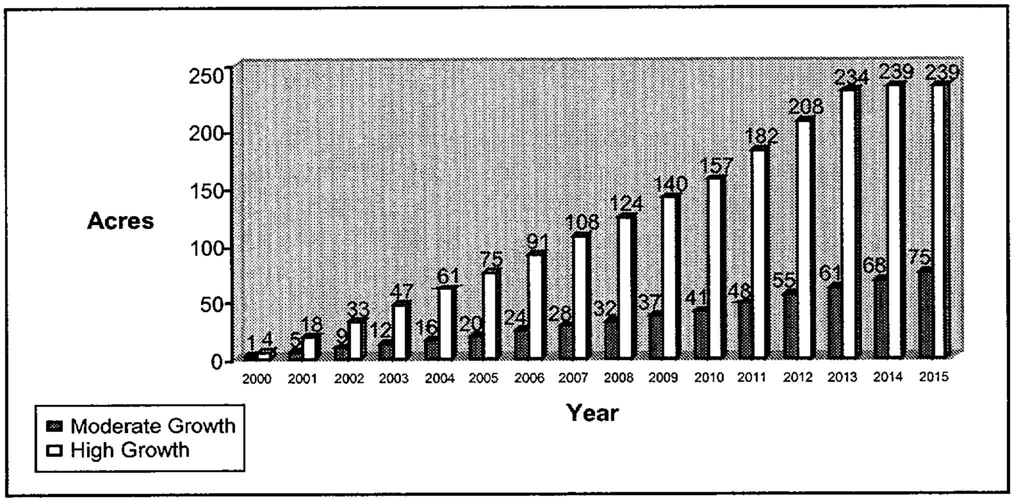


Figure 10. Residential Absorption at Former Homestead AFB: 2000–2015

Under the moderate-growth baseline forecasts, approximately 75 of the 239 acres would be expected to be absorbed by 2015. Under the high-growth forecasts, absorption would reach 75 acres in 2005, increasing to total absorption of 239 acres in 2014. Based on Miami-Dade County absorption projections, it is likely that about 37 percent of the indicated absorption would be for multi-family units and 63 percent for single-family units.

4.2 COMMERCIAL AND INDUSTRIAL

The remainder of the available property at former Homestead AFB could be used for either commercial or industrial use, depending on demand. Therefore, its absorption for either use is addressed together. With the addition of 450 acres to the supply of land for commercial and industrial development in MSA 7.4 in 2000, a total of 787 acres would be available for absorption (commercial uses are permitted in industrial zones) under the moderate-growth forecasts. This addition to the supply would more than double the combined commercial and industrial land expected to be available at that time.

As shown in **Figure 11**, this would result in the absorption of about 21 percent of the land in the MSA for commercial use by 2015. Under the county's high-growth forecasts, about 56 percent of the available land would be absorbed by 2015.

Given this rate of absorption, approximately 95 of the 450 acres available at former Homestead AFB could be absorbed under the moderate-growth forecasts and 252 acres under the high-growth forecasts by 2015, as shown in **Figure 12**.

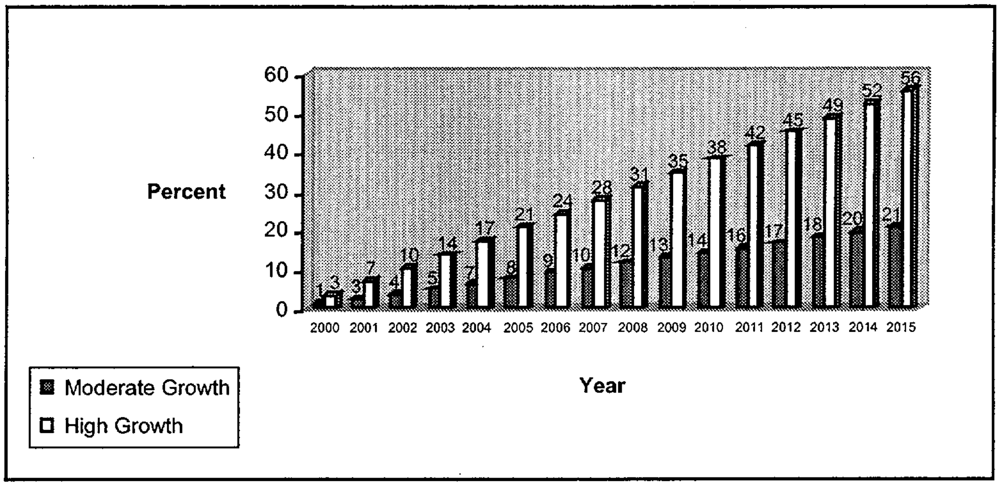


Figure 11. Commercial Absorption in MSA 7.4: 2000–2015

Unlike commercial land uses in industrial zones, industrial uses are not permitted in commercial zones. Consequently the market is restricted to land that is zoned or plan designated for industrial uses only. This is a different situation from the previous commercial analysis where there is a fairly free flow of high value commercial uses into industrial zones. In south Miami-Dade County, this results in a relatively small supply of industrial land. South Dade had 905 acres available in 1994, and MSA 7.4 had only 99 acres in the same year. This is projected to decrease to 93 acres by 2000. The addition of 450 acres of commercial/industrial land in 2000 would effectively increase the supply more than fourfold. Only about 3 percent of the available land would likely be absorbed for industrial use by 2015.

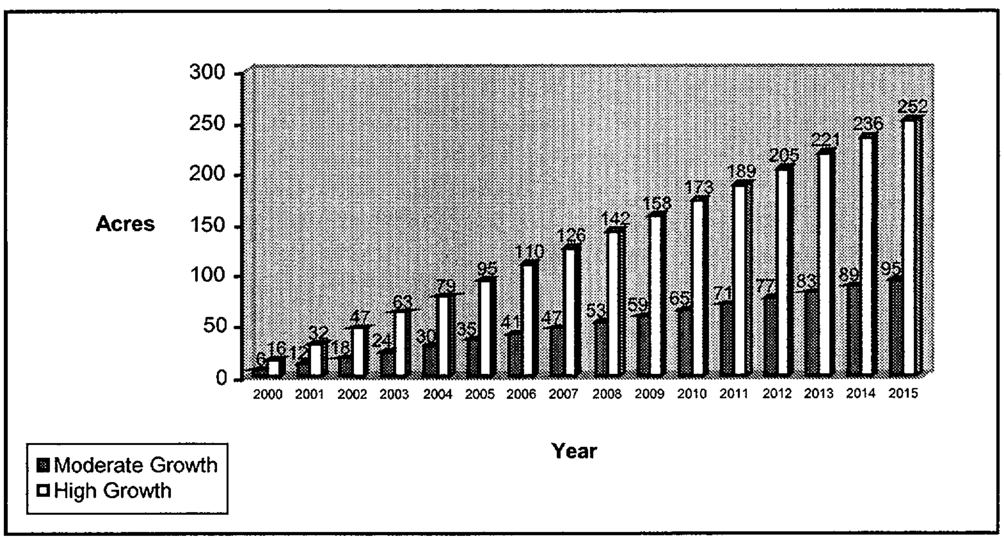


Figure 12. Commercial Absorption at Former Homestead AFB: 2000–2015

At a rate of absorption of 1 acre per year, the proportional allocation of demand to the site, based on 450 acres of industrial land being available in 2000, is shown in **Figure 13**.

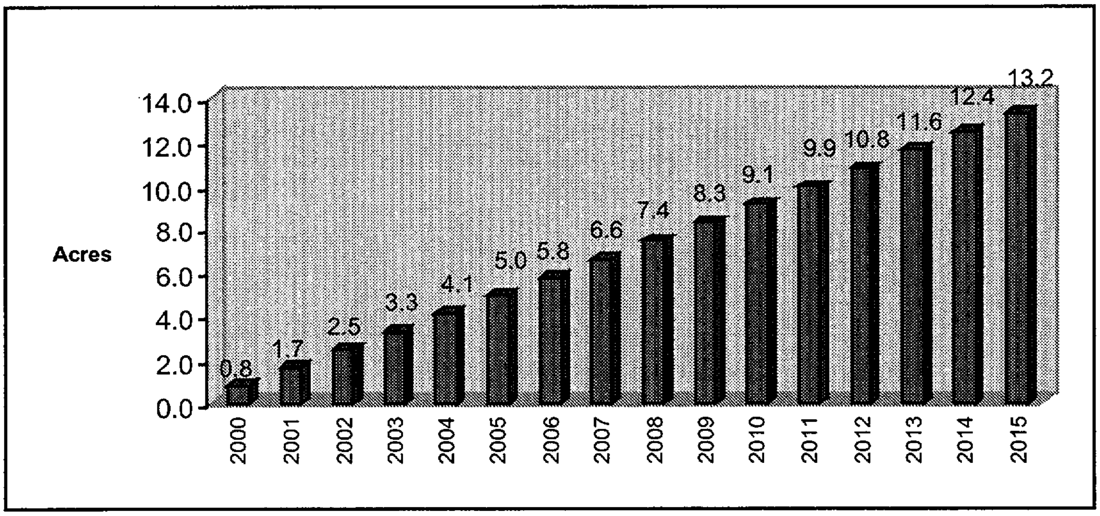


Figure 13. Industrial Absorption at Former Homestead AFB: 2000–2015

Primarily because of the low absorption rate allocated to MSA 7.4, only a small portion of the available acres would be absorbed by 2015. However, these 13.2 acres amount to a 45 percent increase in the amount of land currently in industrial use in the MSA. The MSA as a whole may be viewed as growing in industrial use at a rate of 3.4 percent per year between 1994 and 2015, a rate which would double the 1994 industrial use in MSA 7.4 by 2014.

Without incentives, this projection is an upper limit of the level of absorption of industrial land likely to occur over the study period. At first, such a projection might appear to be inconsistent with the strength of the industrial market in Miami-Dade County as a whole. The industrial market in Miami-Dade County has been strong for over four years. The overall vacancy rate at the end of the first quarter in 1997 was 7.3 percent, with a total inventory of 126.8 million square feet according to a Cushman and Wakefield survey. Over 6.7 million square feet of warehouses were leased in 1996 and over 2 million in the first quarter of 1997.

However, the industrial market in South Dade is markedly different from other areas in the county. The bulk of the activity has been in central and north areas of the county, centering around MIA, where international business is booming. Less than 15 percent of the total market is in areas outside of central and north Miami-Dade County, which includes South Dade and the easterly areas. The South Dade industrial market has been slow to develop over the past 25 years. In the Homestead area there has been industrial absorption of 3 to 4 acres per year.

Higher rates of industrial absorption have been observed in recent months, primarily in association with the strong marketing of the Park of Commerce in MSA 7.5. However, this analysis has to this point only been concerned with industrial development demand assuming the subject property is sold at fair market value and no special financial incentives are offered to induce and/or aggregate demand. The effects of such incentives on industrial absorption are discussed in Section 5.0.

5.0 SITE-SPECIFIC ABSORPTION WITH INDUCED DEMAND

5.1 CASH FLOW, LAND VALUE, AND ABSORPTION RATES

The concept of induced demand implies the introduction of factors into real estate transactions and business agreements that result in financial advantages to the buyer/lessee that are not available in the normal course of business. One example of such a factor would be the offering of land at 50 percent of fair market value. The reduced cost of land would induce a higher portion of the market to find a site desirable, in some cases offsetting risk, location, or aesthetic impediments. Reduced land costs can effectively induce absorption because land costs are incurred in the early stages of development and often constitute owner equity in a project that may take many years to build out and establish positive cash flows.

For example, a 100 acre industrial tract selling at a fair market value of $4.00 per square foot would cost $17.4 million. A 50 percent discount would save the buyer $8.7 million in "up front" costs. Since these costs are equity in the project, the opportunity costs of investment in another project would be at a rate of return of at least 15 percent. Absorption might take 15 years, with no positive cash flow for 5 years. Over the period of positive cash flow from the 6th to the 15th year, the $2.00 discount in land cost would be the equivalent of over $3 million per year in revenue—worth $45 million in undiscounted cash flow to the project.

There are many other types of incentives that apply to the marketing and sale of industrial and commercial property. Any factor that provides a business with a competitive advantage by either reducing costs or increasing revenues will make the property more attractive and will increase the rate of absorption. A good example of a factor that positively affects operating costs in south Miami-Dade County is the existence of a Free Trade Zone at the Park of Commerce. Within the Free Trade Zone, qualified businesses can import materials and components from foreign nations and not pay import duty. This greatly reduces the cost for some fabrication and assembly operations and makes property within the Free Trade Zone more attractive. If the cost of the land in the Free Trade Zone is held to market rates in the area (or even discounted), it can be a powerful stimulus to industrial growth and overcome significant disadvantages associated with location and risk. This has been demonstrated at the Park of Commerce, which is within 3 miles of former Homestead AFB.

5.2 METHOD OF CONVEYANCE

Generally speaking, the infusion of value into a development project for the purpose of stimulating the local economy and improving employment opportunity is a governmental rather than private sector activity. This is because the infusion requires governmental authority to legally create the value (Free Trade Zone or tax incentives), or the required investment would result in a loss for a private sector owner (selling land for $2.00 per square foot that is worth $4.00).

The involvement of a governmental entity or non-profit organization is necessary to induce industrial demand, as the favorable terms that attract industry and jobs actually reduce the positive cash flow in the out years of the development, reducing current land value. This loss in current value is a form of investment that local government makes to increase employment opportunity in the area.

Following are examples of land values from the recent sale of industrial land in the South Dade region:

- A 1996 appraisal of the MCR Lumber property in Homestead evaluated six land sales of comparable property in the area. Comparable land ranged in sales price from $1.34 to $3.31 per square foot, with an adjusted average of $2.50 to $3.00 per square foot, amounting to between $108,900 and $130,680 per acre.

- A 1997 appraisal of the Booker Lumber property in Homestead considered four comparable land sales in the area. Comparable land ranged in sales price from $1.91 to $3.33 per square foot, with an adjusted average of $1.91 to $2.16 per square foot, amounting to between $83,200 and $94,900 per acre.
- The 1998 Park of Commerce appraisal considered 10 comparable land sales in the Homestead area, as well as three in north Miami-Dade County and one in Broward County. The Homestead area properties were $2.69 to $4.90 per square foot, and the appraiser concluded that small finished lots would need to be sold for $3.00 per square foot, amounting to $130,680 per acre.

These values contrasted sharply with the land value estimated for the Park of Commerce on the basis of discounted cash flow analysis. An initial finding of less than $1 per square foot was subsequently updated to about $1.25 per square foot, amounting to $54,450 per acre. The difference in value is attributable in large part to the favorable terms provided to prospective tenants in order to increase absorption rates.

An appraisal of the Park of Commerce property noted that there is no shortage of industrial land in Miami-Dade County, although the Airport West area is using up land quickly. There is however, more than ample supply for at least the next 25 years or more. The Park of Commerce will have to be aggressive in pricing to maintain an absorption level of 10 acres per year.

In order to achieve the 10 acre per year absorption rate, an investment had to be made. The difference between the value of comparable land and the $1.25 value resulting from the appraisal easily amounts to $75,000 per acre—the cost of inducing demand.

In order for the governmental infusion of value to be considered as a factor in the rate of absorption of industrial land at former Homestead AFB, it would be necessary for the property to be conveyed to a governmental entity as the initial owner. The receiving entity could then establish favorable terms for subsequent sale or lease and other incentives that are financially advantageous to desired industries. The goal becomes one of job creation and economic growth, rather than profitability for the initial property owner. Under this type of property transfer, induced demand becomes a possibility. The extent to which the demand for industrial land can be successfully induced in MSA 7.4 is discussed in the next section.

5.3 INDUCED INDUSTRIAL ABSORPTION OF FORMER HOMESTEAD AFB PROPERTY

The Park of Commerce is a good example of the effectiveness of incentives in inducing industrial demand. The Park of Commerce is an industrial park development that comprises about 70 percent of the available industrial land in MSA 7.5. Although the Miami-Dade County forecast for industrial absorption in MSA 7.5 was for 2.8 acres per year, it is evident that the Park of Commerce could achieve rates of 10 acres per year or more over the next 15 years. In fact, the most recent appraisal of the property estimated an average rate of absorption of 12.3 acres per year over the 15 year period. This is 4.4 times the rate expected by Miami-Dade County for all of MSA 7.5 and 6.3 times the rate that would apply to the Park of Commerce on a proportional basis.

It is reasonable to assume that if equivalent incentives were applied to the subject property at former Homestead AFB, an increase of over fourfold in the forecasted absorption rate for MSA 7.4 could be achieved for the industrial portion of the site. This would imply transferal of a portion of the unused Free Trade Zone at the Park of Commerce to the former base, as well as equivalent treatment in land costs and favorable lease terms. However, a different market would have to be pursued, or any gain for the former base property would be a loss for the Park of Commerce. With this caveat, it is likely that the upper limit of induced industrial absorption of the subject property could reach 84 acres by 2015, as shown in **Figure 14.**

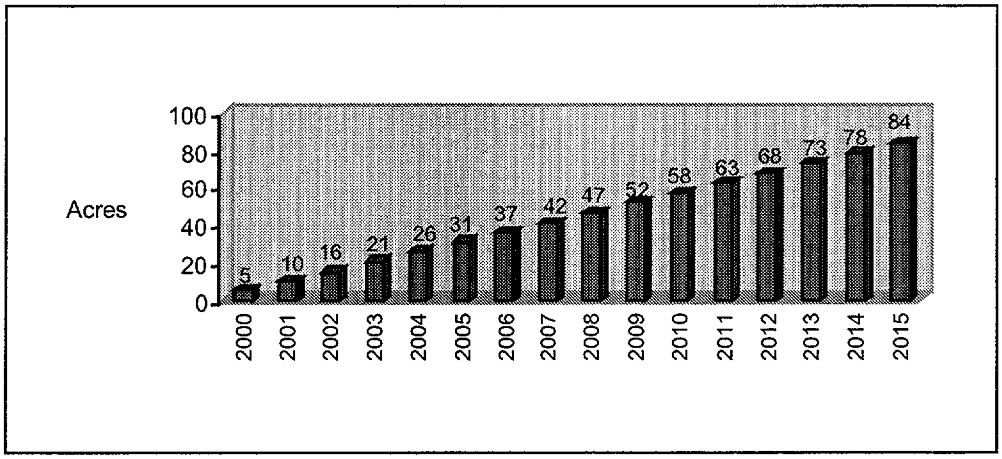


Figure 14. Induced Industrial Absorption at Former Homestead AFB: 2000–2015

This forecast includes existing latent demand in addition to the 4.4 acres per year for induced demand, totaling over 5 acres per year of industrial absorption between 2000 and 2015. With the induced demand, the absorption for industrial development would be higher by 2001 than relying only on latent demand could achieve by 2015. However, this would only be achievable with a property transfer at no or substantially discounted cost.

6.0 CONCLUSION

The combined potential absorption for all land use categories over the 2000 to 2015 time period is depicted in **Figure 15.**

Of the 717 acres available for disposal, about 28 acres include Mystic Lake, leaving 689 for residential, commercial, and industrial development. Under the moderate-growth forecasts, a total of about 183 acres would be absorbed by 2015 if industrial demand remained latent. With induced industrial demand, about 254 acres could be absorbed by 2015, leaving 435 acres undeveloped. Under Miami-Dade County's high-growth forecasts, the quantity of land absorbed could increase to 587 acres by 2015, leaving 102 acres undeveloped at that time.

CITATIONS

1. *Dade County Plan Amendment*, adopted June 16, 1998, regarding approval of designated land uses for Homestead ARB.

2. Miami-Dade Department of Planning. *Initial Recommendations October 1997 Applications to Amend the Comprehensive Development Master Plan.* February 25, 1998.

3. Esslinger, Wooten and Maxwell. *Facts and Trends Report Number 1.* March 1998.

4. Appraisal and Real Estate Economics Associates, Inc. *Market/Marketability Study: The Pioneer Village.* January 28, 1998.

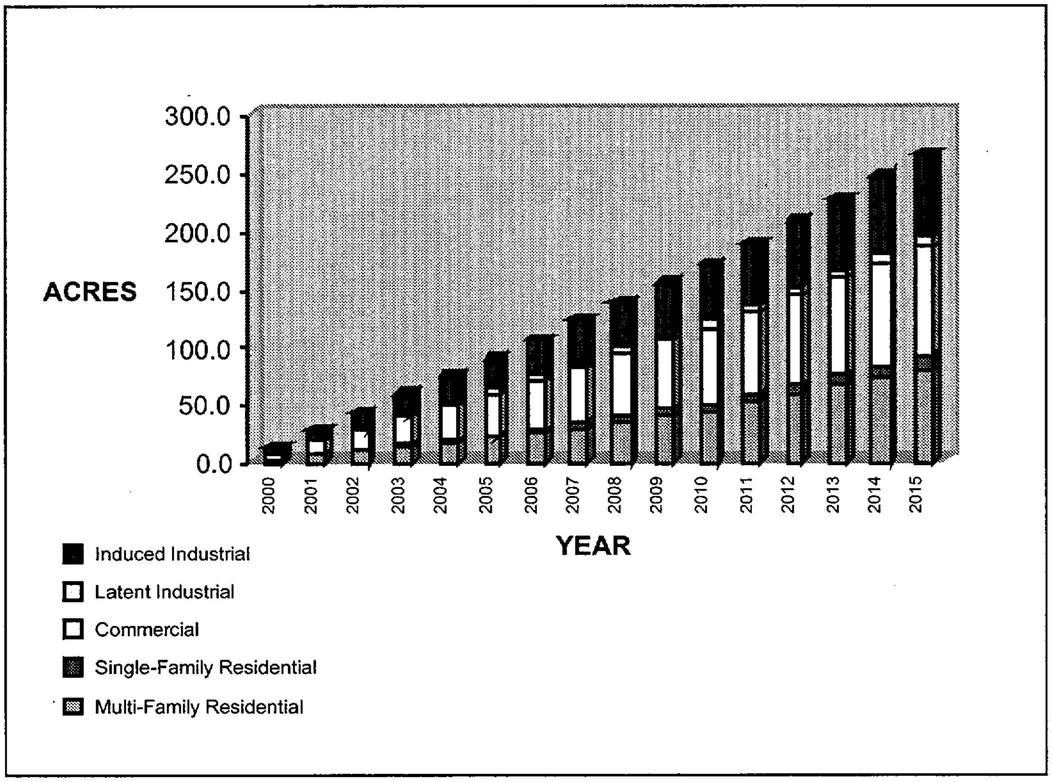


Figure 15. Summary of Combined Absorption at Former Homestead AFB: 2000–2015

E Noise

NOISE APPENDIX

Material in this appendix is excerpted from the

Technical Memorandum on Aircraft Noise Considerations in the Transfer of Ownership of Homestead Air Reserve Base, Homestead, Florida From the United States Air Force to Dade County, Florida

The entire Technical Memorandum includes the following chapters:

I. Introduction
II. Methodology
III. Aircraft Noise Exposure Contours
IV. Grid Point Assessments
V. Noise Mitigation Alternatives for National Properties Through Flight Track Modifications
VI. Noise Analysis for Commercial Spaceport Operations
VII. Qualitative Assessment of Noise Exposure Characteristics for Operations from a Two-Runway Airport Configuration
VIII. Pre-Realignment Conditions

This appendix includes Chapters II, III, IV, VI, VII, and VIII from the Technical Memorandum, with the exception of detailed tables containing the grid point analysis related to Chapters IV and VI, which are too voluminous to include in the appendix. During the public comment period for the Draft SEIS, the entire Technical Memorandum, including all detailed tables containing grid point analysis, was made available for review at the following libraries:

Dade County Library
6869 SW 8 Street
Miami, FL 33144

Florida City Public Library
101 West Flagler Street
Florida City, FL 33130

Florida International University
11200 SW 8 Street
Miami, FL 33199

Florida International University–
North Campus Library
3000 NE 151 Street
North Miami, FL 33181-3000

Homestead Branch Library
700 North Homestead Boulevard
Homestead, FL 33030

Key Biscayne Branch Library
299 Crandon Boulevard
Key Biscayne, FL 33149

Key Largo Branch Library
101485 Overseas Highway
Key Largo, FL 33037

Miami-Dade Community
College–Homestead Campus
500 College Terrace, Bldg D
Homestead, FL 33030

Miami-Dade Community
College–North Campus
11380 NW 27 Avenue
Miami, FL 33167

Opa-Locka Public Library
215 N Perviz Avenue
Opa-Locka, FL 33054

South Dade County Library
10750 SW 211 Street
Miami, FL 33189

South Miami Branch Library
6000 Sunset Drive
Miami, FL 33143

State Library of Florida
500 S Bronough
Tallahassee, FL 32399-0250

University of Miami
1252 Memorial Drive
Coral Gables, FL 33124

In response to comments received on the Draft SEIS, an Addendum has been added to the end of this appendix to address noise at Key Largo Hammocks State Botanical Site and South Florida Water Management District lands.

HOMESTEAD REUSE
SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

TECHNICAL MEMORANDUM

Aircraft Noise Considerations in the Transfer of Ownership Of Homestead Air Reserve Base, Homestead, Florida From the United States Air Force to Dade County, Florida

Public Review Draft

Prepared for FAA and USAF

Landrum & Brown
November 2, 1999

Chapter II
Methodology

The methods of analysis of the existing and forecast noise conditions in the Homestead environs are discussed in this section.

II.A. Noise Modeling

A computer model is used to determine the noise exposure patterns related to aircraft operations in the airport environs. The use of a computerized overflight noise prediction model is necessary because noise impacts on humans are generally more closely correlated with prevailing long-term noise conditions than with occasional events and seasonal fluctuations. To attempt to measure prevailing noise levels directly would require months of measurement at numerous noise monitor sites -- an impractical, more expensive and potentially less accurate method of determination, particularly when estimating noise levels that will not occur for several years into the future.

A modified version of the Integrated Noise Model (INM) Version 5.2a, was used in this study. The INM is specified by the FAA for the prediction of aircraft noise at civilian airports. It is a computer model which, during an average 24-hour period at an airport, accounts for each aircraft flight along flight paths leading to or from the facility, or overflying it. Flight path definitions are coupled with separate tables in the program database relating to noise levels at varying distances and engine power settings for each distinct type of aircraft selected.

For this study, modifications to the INM were made by the FAA, with technical assistance from the John A. Volpe National Transportation Systems Center Acoustics Facility (Volpe Center), to enhance the model's noise assessment capabilities.\[i] These enhancements include:

- Modification of the over ground noise propagation equations to incorporate spectral data better representative of current aircraft
- Incorporation of different attenuation rates for hard and soft surfaces (water vs. grass)
- Inclusion of traditional ambient noise level mapping for areas under the jurisdiction of the Department of the Interior (NPS, FWS) for use in Time Above assessments

Briefly, this is how the model computes contours. At regular grid locations on ground level around the airport, the distance to each aircraft in flight is computed, and the associated noise exposure of each aircraft flying along each flight path within the vicinity of the grid location is determined. Additional corrections are applied for excess air-to-ground attenuation, acoustical shielding of aircraft engines by the aircraft body, and speed variations. The logarithmic acoustical energy levels for each individual aircraft are then summed for each grid location. For the DNL metric, a penalty for nighttime operations is applied. The cumulative values of noise exposure at each grid location are then used to interpolate contours of equal noise exposure for reference DNL levels (i.e., 65 DNL, 70 DNL, etc.) For this study, contour analysis will be used to describe DNL dispersion patterns in excess of 60 DNL and SEL patterns associated with principal aircraft types forecast for use at Homestead.

For grid analyses, the model computes the acoustic data only at locations selected by the user (at grid points). Data on acoustic energy and peak noise levels requested by the user are computed for each aircraft overflight in the vicinity of the grid point. This data is reported for each desired metric. For this study, grid point noise level data include DNL, LAmax, SEL, and Time Above ambient levels for the average annual day. Additionally, Hourly Leq levels are presented for the peak hour of operation.

To activate the INM, a variety of user-supplied input data is required. These include a mathematical definition of the airport(s) runways relative to a base reference point, the mathematical description of ground tracks above which aircraft fly, and the assignment of specific aircraft with specific engine types to individual flight paths from each runway end. Optionally, the user may adjust standard database information to reflect the vertical profiles used by aircraft as they fly to or from the airport(s) through the adjacent airspace or may modify the default noise-power-distance curves in the model.

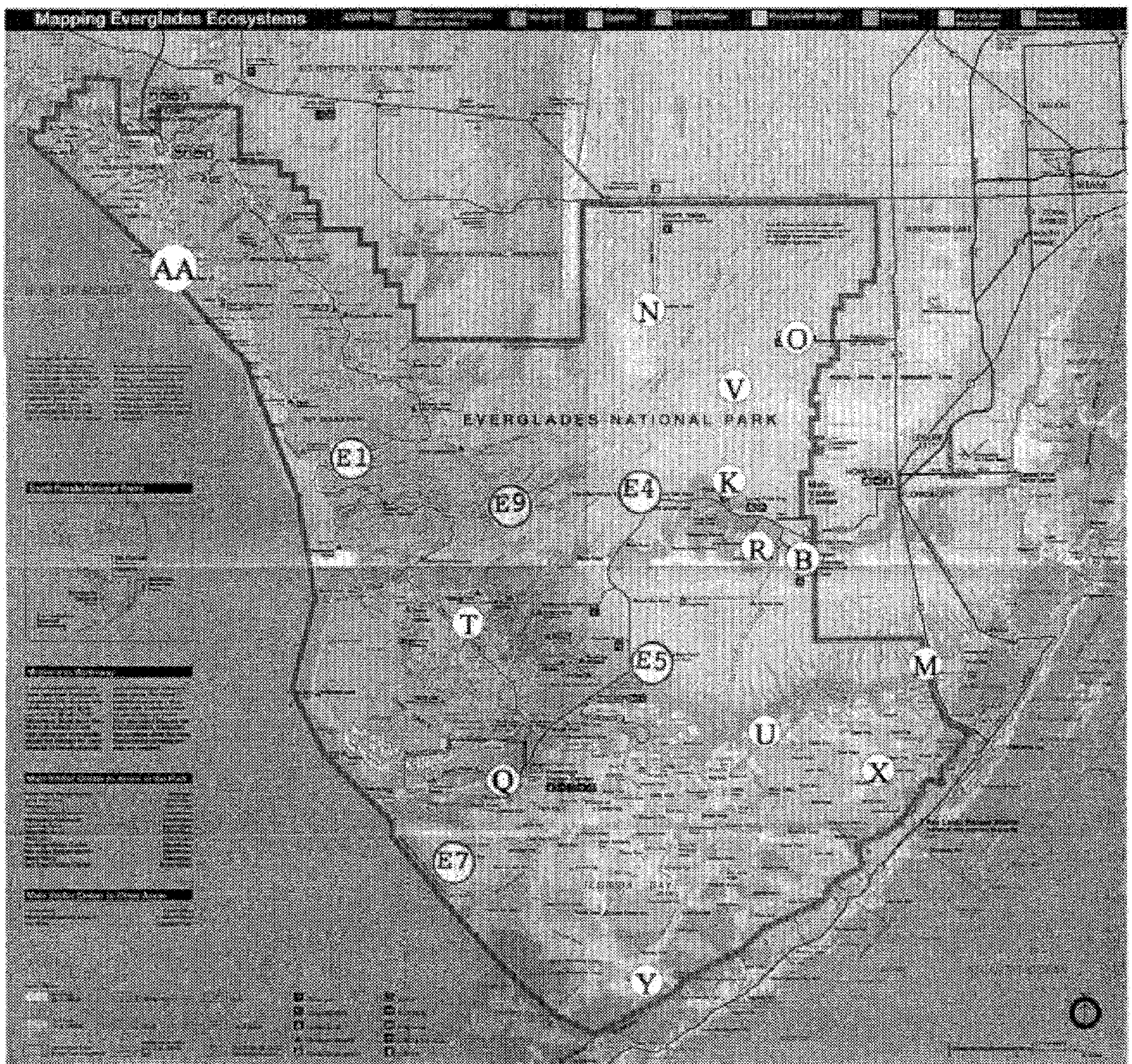
Additionally, aircraft not included in the model's data base may be defined for modeling. A discussion of the input data used to prepare the noise exposure contours and grid point data for the study is provided in the following sections.

II.B. Noise Measurement

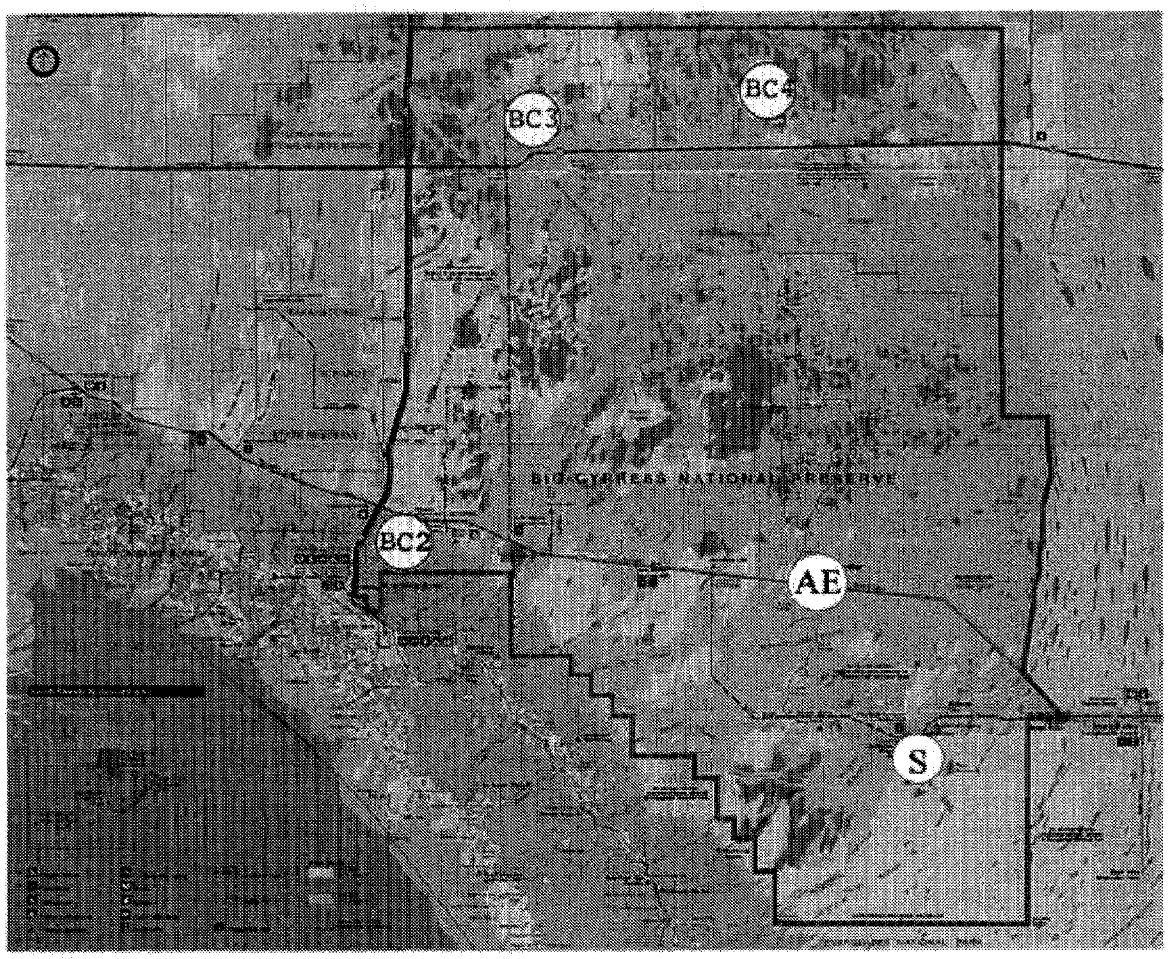
Noise measurements were conducted for the FAA by the Volpe Center at 29 sites in the national properties between August 10 and August 20, 1998.\[ii] Additionally, the National Park Service (NPS) contracted with Sanchez Industrial Design Inc. (SID) to conduct ambient noise level measurements at 16 sites in the area between September 18 and October 5, 1997, and at an additional 4 sites between November 17 and 20, 1998. All measurements were used in the development of mapping of traditional ambient sound levels within the boundaries of Everglades and Biscayne National Parks and Crocodile Lakes National Wildlife Preserve. Ambient mapping was prepared by applying measured noise levels at the various sites to locations of like character that had not been measured. Ambient maps were not prepared for Big Cypress National Preserve due to the small number of measurements. Traditional ambient noise levels were used for comparison with noise levels generated by aircraft during this study. Traditional ambient noise is used to describe the existing environment of all human and natural sounds, excluding aircraft noise. The traditional ambient (exclusive of aircraft noise) sound levels measured at the sites range from 31.2 decibels at a remote site (Eastern Sparrow) in the Everglades NP to 58.7 decibels on Soldier Key in Biscayne NP. **Table II-1** provides the average measured traditional ambient noise levels for each site. **Exhibits II-1, II-2 II-3 and II-4** indicate the locations of the measurement sites.

II.C. INM Input Data

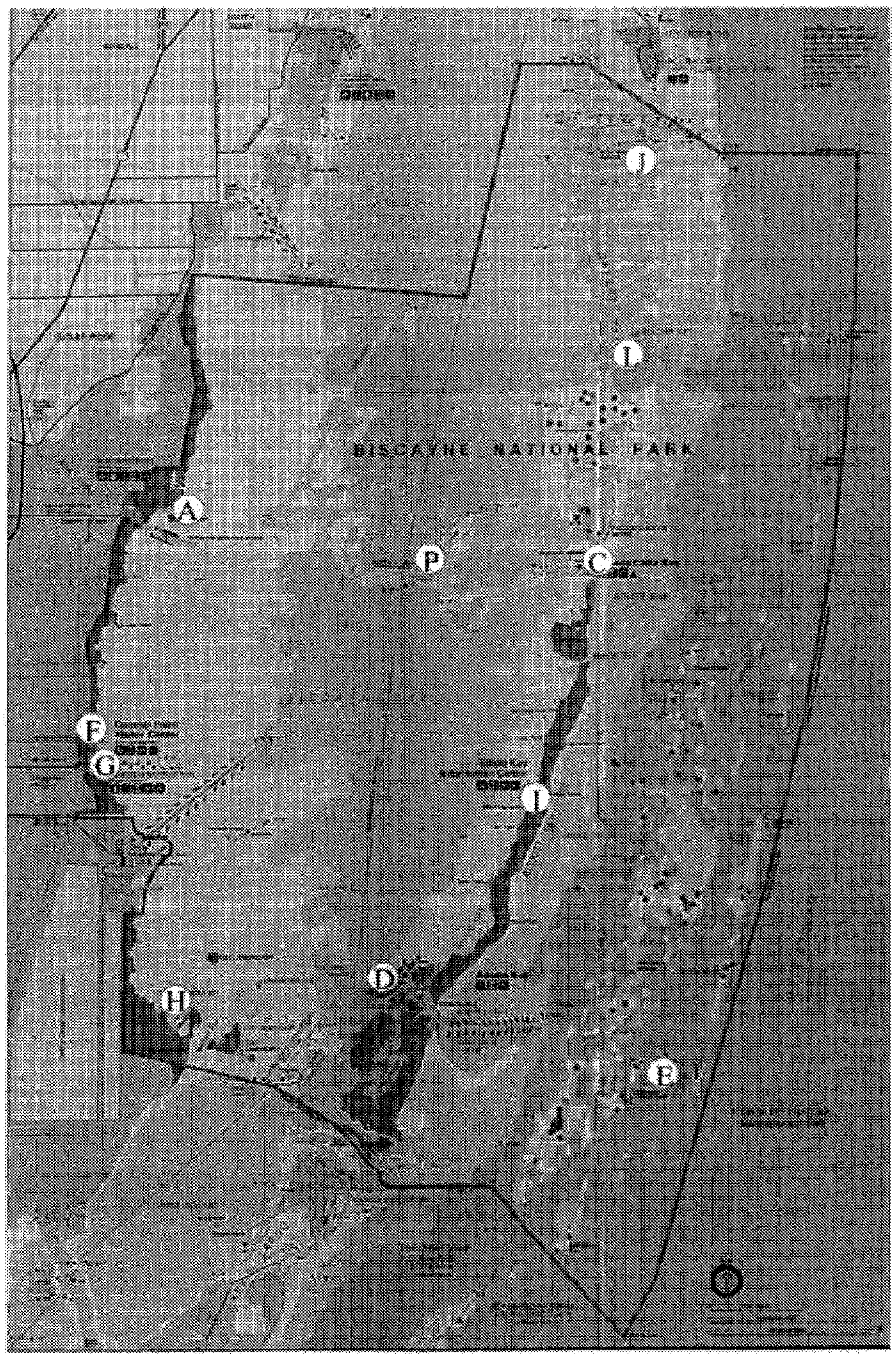
Use of the noise model requires the preparation of extensive input data for each operating scenario to be evaluated. For this study, the operations from several airports other than Homestead were included to provide a more comprehensive assessment of noise impacts and conditions to be expected in the Homestead environs, particularly within the national properties. To achieve this task, the activity in place or expected to be in place at four busy airports, from which aircraft are known to overfly the national parks and preserves, was incorporated into the analysis. These airports are Miami International (MIA), Fort Lauderdale-Hollywood International (FLL), Kendall-Tamiami Executive (TMB) and Homestead General (X51) Airports. Operations from other airports in the region are either not known to overfly the national properties or generate such small numbers of operations as to be inconsequential to aircraft noise level considerations. The principal airports generating low altitude traffic (below 5,000 feet) over the parks are Kendall-Tamiami and Homestead General, while Miami and Fort Lauderdale-Hollywood International Airports generate high altitude traffic (above 5,000 feet) over the parks.



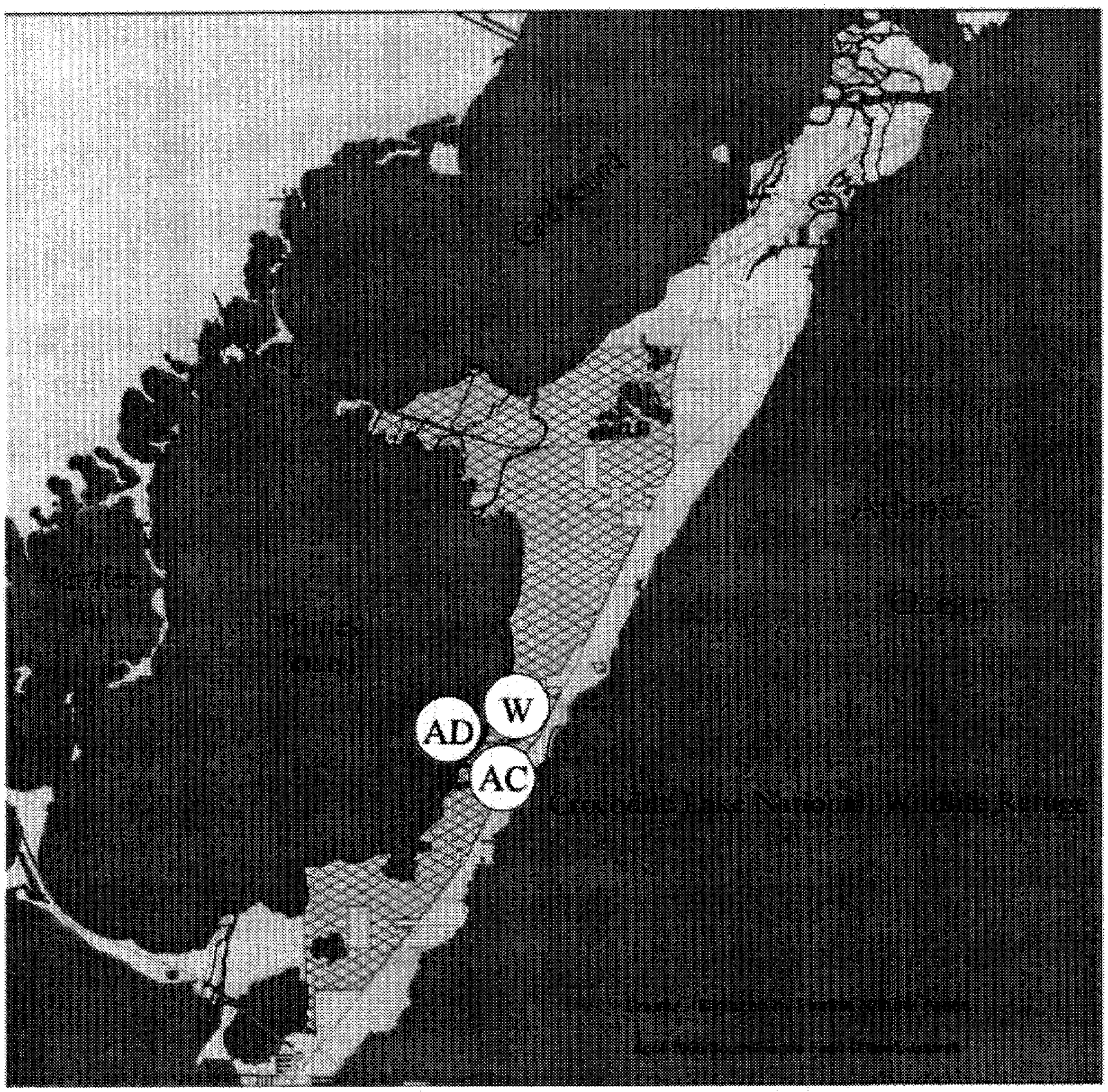
Noise Measurement Sites - Everglades National Park
Exhibit II-1



Noise Measurement Sites - Big Cypress National Preserve
Exhibit II-2



Noise Measurement Sites - Biscayne National Park
Exhibit II-3



Noise Measurement Sites - Crocodile Lake National Wildlife Refuge
Exhibit II-4

Table II-1
Average Measured Traditional Ambient Noise Level
Homestead Regional Airport SEIS

Site ID Number	Site Name and National Property	Dates of Measurement	Average Measured Traditional Ambient Noise Level (dB)
A *	Black Point - Biscayne	8/10-12/98	51.8
C * Bis2 **	Boca Chita - Biscayne	8/10,13,15/98 9/18,20/97	48.2
I * Bis8 **	Elliot Key - Biscayne	8/12,15,17/98 9/20,22/97	48.6
P * Bis5 **	Featherbed Bank – Biscayne Central to East Bay	8/12,14,15/98 9/22/97	49.6
F * Bis4 **	Fender Point - Biscayne	8/11,14/98 9/21/97	47.3
H *	Mangrove Key – Biscayne	8/11,15/98	45.1
E * Bis6 **	Pacific Reef - Biscayne Reef off Caesar Creek	8/11,15/98 9/22/97	51.6
D * Bis7 **	Rubicon Key – Biscayne	8/11,14/98 9/20,22/97	49.8
L * Bis3 **	Soldier Key - Biscayne	8/13,16/98 9/21,23/97	56.2
J *	Stiltsville - Biscayne	8/12,16,17/98	54.9
G * Bis1 **	Visitors Center – Biscayne	8/11,16/98 9/18,20/97	56.2
B * Ever2 **	Anhinga Trail – Everglades	8/10,12,15/98 10/2,5/97	54.2
Y *	Buchanan Key – Everglades	8/19/98	45.8
O *	Chekika - Everglades	8/10,17/98	41.0
M *	Eastern Panhandle – Everglades	8/13/98	54.9
V *	Eastern Sparrow – Everglades	8/18/98	31.2
Q * Ever6 **	Eco Pond - Everglades	8/14/98 10/1,3/97	47.2
R *	Hidden Lake – Everglades	8/15,17/98	36.0
U *	Little Madeira Bay – Everglades	8/18,20/98	46.7
X * Ever8 **	North Nest Key – Everglades	8/18/98 10/5/97	39.9
AA *	Pavilion Key – Everglades	8/20/98	45.4
K *	Pinelands - Everglades	8/12,13,19/98	46.5
N *	Shark Valley – Everglades	8/13,16/98	45.7
T *	Whitewater Bay – Everglades	8/17/98	42.0
AD * CL10 **	Barnes Sound – Crocodile Lakes	8/19/98 11/20/98	39.2
S *	Golightly - Big Cypress	8/16,17/98	49.3
W *	Hardwood Hammock – Crocodile Lakes	8/18/98	41.3

Table II-1 (continued)
Average Measured Traditional Ambient Noise Level
Homestead Regional Airport SEIS

Site ID Number	Site Name and National Property	Dates of Measurement	Average Measured Traditional Ambient Noise Level (dB)
AC *	Mangrove Inlet – Crocodile Lakes	8/18/98	40.8
AE *	National Scenic Trail – Big Cypress	8/20/98	43.5
Ever1 **	Broad River Campground – Everglades	10/2/97	46.2
Ever4 **	Pa-hay-okee Overlook – Everglades	9/30/97	39.7
Ever5 **	Nine Mile Pond – Everglades	10/1/97	44.6
Ever7 **	Carl Ross Key – Everglades	10/3/97	43.2
Ever9 **	Canepatch Campground - Everglades	11/19/98	39.0
BigC2 **	Halfway Creek - Big Cypress	11/17/98	64.0
BigC3 **	Bear Island - Big Cypress	11/18/98	33.7
BigC4 **	National Scenic Trail – Big Cypress	11/18/98	34.1

* Sites measured by Volpe Labs
** Sites measured by Sanchez Industrial Design, Inc.

Source: Federal Aviation Administration, Characteristics of Ambient Sound Levels at Four Southern Florida National Properties, January, 1998, Table 9, page 130 and individual site records of measurements provided by Volpe Labs and the National Park Service.

II.C.1. Homestead Regional Airport

- Operations Levels

Table II-2 provides the existing and forecast level of aircraft operations for Homestead Regional Airport used in the development of noise exposure patterns for this evaluation. In 1997, the aviation activity at the facility was by Military/Government aircraft operators at the Homestead Air Reserve Base and Customs facility. (There were also a few civil general aviation aircraft whose numbers are too inconsequential to affect the annual operational total or the noise). Based on current Air Force plans and on best estimates, the level of operations by those user groups is expected to remain largely unchanged throughout the planning period and therefore, information from 1997 was used by the Air Force to develop the SEIS operational activity baseline for the existing condition and for all future forecast conditions. The majority of operations is, and is expected to remain, by fighter jet aircraft, one of the louder types in the total aircraft fleet. Based on the most reliable available information, airport activity totals 19,824 annual aircraft operations for the existing condition.

Table II-2
Homestead Regional Airport
Annual Aircraft Operations Forecast Summay

		Current (1997)	FORECAST 2000	2005	2015	Maximum Use One Runway
Commercial Passenger						
Long Term, Market Driven						
Latin America, Caribbean, International						
Turboprop	(Dash-8,ATR-42, SWM, SF3)	0	0	0	22,130	4,500
Regional Jet	(CRJ, EM4)	0	0	0	7,260	28,500
Narrowbody Jet	(B-737/500/300/900, A320)	0	0	0	4,460	17,500
Widebody Jet	(MD-11, B-767)	0	0	0	660	660
Domestic						
Turboprop	(Dash-8,ATR-42, SWM, SF3)	0	0	0	1,490	2,500
Regional Jet	(CRJ, EM4)	0	0	0	760	11,500
Narrowbody Jet	(B-737/500/300/900, A320)	0	0	0	1,410	13,500
B-757	(B-757)	0	0	0	380	4,000
Widebody Jet	(MD-11, B-767)	0	0	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	0	4,570	7,300	25,573
Domestic						
Narrowbody Jet	(B-737/500/300/900, A320, MD-80) 1/	0	0	3,040	4,860	17,500
TOTAL Niche Market		0	0	7,610	12,160	43,073
TOTAL COMMERCIAL		0	0	7,610	51,220	126,243
General Aviation						
Single engine	(C150, C172)		26,304	27,993	33,821	29,000
Multi Engine	(PA31)		10,430	12,100	16,260	21,000
Jet	(Lear, Citation)		2,090	2,550	3,610	3,610
Helicopter			2,010	2,490	3,080	3,161
TOTAL GA			40,834	45,133	56,771	56,771
Aircraft Maintenance						
Turboprop	(Dash-8,ATR-42, SWM, SF3)	0	0	330	620	430
Narrowbody Jet	(B-737 series, A-320, MD-80, B-727)	0	0	120	410	600
Widebody Jet	(MD-11, B-767)	0	0	120	440	440
TOTAL MAINTENANCE		0	0	570	1,470	1,470
Cargo						
Express Carrier						
Narrowbody Jet	(B-727, MD-80)	0	0	0	12,570	8,500
Heavy Jet	(B-757, B-767, MD-11)	0	0	0	6,280	10,500
Miscellaneous Cargo						
Turboprop	(Cessna Caravan, King Air)	0	0	1,040	0	
Narrowbody Jet	(B-727, MD-80)	0	0	520	2,600	7,966
TOTAL CARGO		0	0	1,560	21,450	26,966
Military/Government						
U.S. Air Force	F-16C	12,000	12,000	12,000	12,000	12,000
U.S. Air Force	F-15	1,100	1,100	1,100	1,100	1,100
Transient	C-141 (C-17 in 2015) 2/	104	104	104	104	104
Transient	C-5	20	20	20	20	20
Transient	P-3	1,500	1,500	1,500	1,500	1,500
Transient	H65	1,500	1,500	1,500	1,500	1,500
U.S. Customs	PA31	900	900	900	900	900
U.S. Customs	C206	900	900	900	900	900
U.S. Customs	H60	900	900	900	900	900
U.S. Customs	C550	900	900	900	900	900
TOTAL MILITARY		19,824	19,824	19,824	19,824	19,824
TOTAL OPERATIONS		19,824	60,658	74,697	150,735	231,274

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, 1998.

The term "aircraft operations" refers to the level of traffic associated with an airport. An operation refers to either one approach or one departure (i.e., a single aircraft that lands at an airport and later departs is counted as two operations). Operations may be between the subject airport and another (called an itinerant or transient operation) or may occur solely at the airport of interest (called a local operation). Both types of operation contribute to the noise pattern around the southern Florida airports. Large air carrier airports predominantly serve itinerant operations, while smaller general aviation airports have large components of local operations for flight training. For this evaluation, detailed information on the activity characteristics of the air carrier airports was at least partially available. Information on the general aviation airports is less detailed, but still adequate to provide reasonable detail for noise modeling. For Homestead Regional Airport, the forecast activity prepared as part of the updated evaluation for the SEIS provide the airport activity input for the noise assessment.

By the year 2000, after the projected transfer of the facility, the forecast civil activity at Homestead is estimated to include nearly 41,000 operations by general aviation aircraft, mostly of the single or twin-engine propeller type. General aviation activity is expected to remain a significant component of the operating fleet through the life of the airport, reaching a potential forecast level of nearly 57,000 operations by 2015 and remaining at that level beyond that year. With the exception of business jet aircraft, general aviation aircraft do not create levels of acoustic energy that have a significant impact on noise characteristics, particularly if located in areas of jet operations. While general aviation propeller aircraft generally do not impact the overall sound levels, they can and do exceed ambient noise levels in locations where they are distanced from jet aircraft. Airport activity is estimated to total 60,658 annual aircraft operations for the forecast year 2000 condition, including civil general aviation, military, and U.S. customs aircraft.

By the year 2005, the forecast operations are projected to include activity by three additional user groups -- commercial passenger service, aircraft maintenance, and cargo. The forecast 7,610 commercial passenger service operations would be expected to serve a niche market in charter or scheduled service to the Caribbean or Latin America using turboprop airplanes, and to domestic markets using medium-sized passenger jets. The 570 forecast maintenance operations are estimated to be split between turboprop and jet aircraft and could operate within the immediate region. Cargo operations are estimated to be split between turboprop and jet aircraft on a 2:1 ratio and total 1,560 for the year. Cargo flights in 2005 might be expected to serve both domestic and international markets. Airport activity is estimated to total 74,697 annual aircraft operations for the forecast 2005 condition.

By 2015, the airport is optimistically forecast to reach status as a regional airport, serving all components of aviation. While maintaining its general aviation, maintenance and military/customs activity at moderate levels, the passenger and cargo operations are estimated to become a dominant portion of the activity at the facility. Regularly scheduled, market driven passenger service could be in place by that time to both international and domestic markets. Niche market and charter passenger service is estimated to remain a significant component of the passenger activity. Together, these user groups are forecast to have 20,300 jet and 30,920 turboprop annual operations in 2015. Of these 51,220 operations, more than 80% are estimated to be to Latin American, Caribbean or other international locations. Cargo service is estimated to grow to more than 21,000 operations by 2015, with nearly 19,000 of this total in express carrier service. Airport activity is estimated to total 150,735 annual aircraft operations for the forecast 2015 condition. Overall, the forecast estimates for 2015 reflect a high rate of aviation growth at Homestead that exceeds the national planning norms, particularly for new civilian airports, and may not materialize on this fast a schedule.

At some point beyond 2015, the airport may reach its capacity of more than 230,000 operations. The final column of the table delineates the estimated distribution of operations among the various user groups that could be present at that time. Operations by general aviation, maintenance express cargo and military/customs groups are estimated to be unchanged from 2015 levels, while passenger and miscellaneous cargo activity are estimated to grow to the service level of the one runway airport. Airport activity is estimated to total 231,274 for the forecast Maximum Use One-Runway condition. The forecast for the Maximum Use One-Runway condition is farther in the future than the forecast for 2015 and is less predictable than the estimates for earlier years. The effect of a potential second runway, shown for future planning purposes on Dade County's airport layout plan, that may be proposed for construction in the years immediately preceding the Maximum Use One-Runway condition, is addressed in Chapter 7 of this document.

Throughout the proposed transition of the facility from exclusive government use to an integrated full service airport, the noise levels generated by individual aircraft in the specific user groups of the operating mix will change. By the end of 1999, civil jet aircraft weighing more than 75,000 pounds must meet the noise level requirements of Stage 3 of Federal Aviation Regulations, Part 36. Military jets, civil jets weighing less than 75,000 pounds (business jets) and propeller aircraft are not subject to the phase-out provisions of F.A.R. Part 91. Consequently, before any large civil jet aircraft are introduced into the airport after the year 2000, they will meet the noise reduction requirements. Further, any aircraft that have been reengined or modified to reclassify them from louder Stage 2 levels to quieter Stage 3 levels may be expected to be phased out prior to 2015 since the newest of those aircraft types will be at least thirty years old. By that year, the civilian fleet is expected to be composed of aircraft originally designed to meet the Stage 3 requirements, and by the maximum use year, even the loudest (and oldest) of the originally designed Stage 3 aircraft are not expected to remain in service. Newer Stage 3 aircraft are quieter than comparably sized older Stage 3 aircraft. Therefore, while the total number of large civil aircraft operations at the airport may be expected to increase, the noise levels of individual aircraft will decrease, resulting in a balanced or potentially even reduced level of total acoustic energy.

This evaluation does not assume a Stage 4 aircraft fleet, which is the next generation of aircraft source noise reduction, because the specific noise characteristics of future types of aircraft are not currently known. However, the FAA's expectations are that quieter Stage 4 aircraft will be in service in the outer years of the Homestead forecast.

In summary, the uncertainties in both the future aviation activity forecasts and the future noise characteristics of the civil aircraft fleet are more likely to contribute to an over-estimation of civil aviation use and an over-estimation of noise impact in this analysis, than they are to result in under-estimations. However, the data is the most reasonable information currently available. The four future conditions analyzed offer a range of potential operational and noise impact conditions that could occur at Homestead under the Proposed Action.

- Flight Paths

The location where aircraft fly relative to the airport is the second primary factor in the development of noise dispersion patterns. At Homestead Regional Airport, military flight patterns were addressed in the draft 1997 Air Installation Compatible Use Zone study.\[iii] That study presented a number of flight paths used by such traffic. Civilian operations do not currently commonly occur at the airport. Therefore, a series of flight paths had to be developed for this analysis to represent the expected patterns of operation if the facility grows to include large components of commercial and private civilian traffic. For planning purposes, consultations were held with Miami Terminal Radar Approach Control (TRACON -- the agency responsible for air traffic control in the Miami area), with the Miami Enroute Air Traffic Control Center (ARTCC -- the body responsible for transitioning aircraft to and from the TRACON's airspace), and with national headquarters Airspace and Air Traffic officials of the FAA. These discussions resulted in the development of a series of projected flight paths between each runway end at Homestead Regional

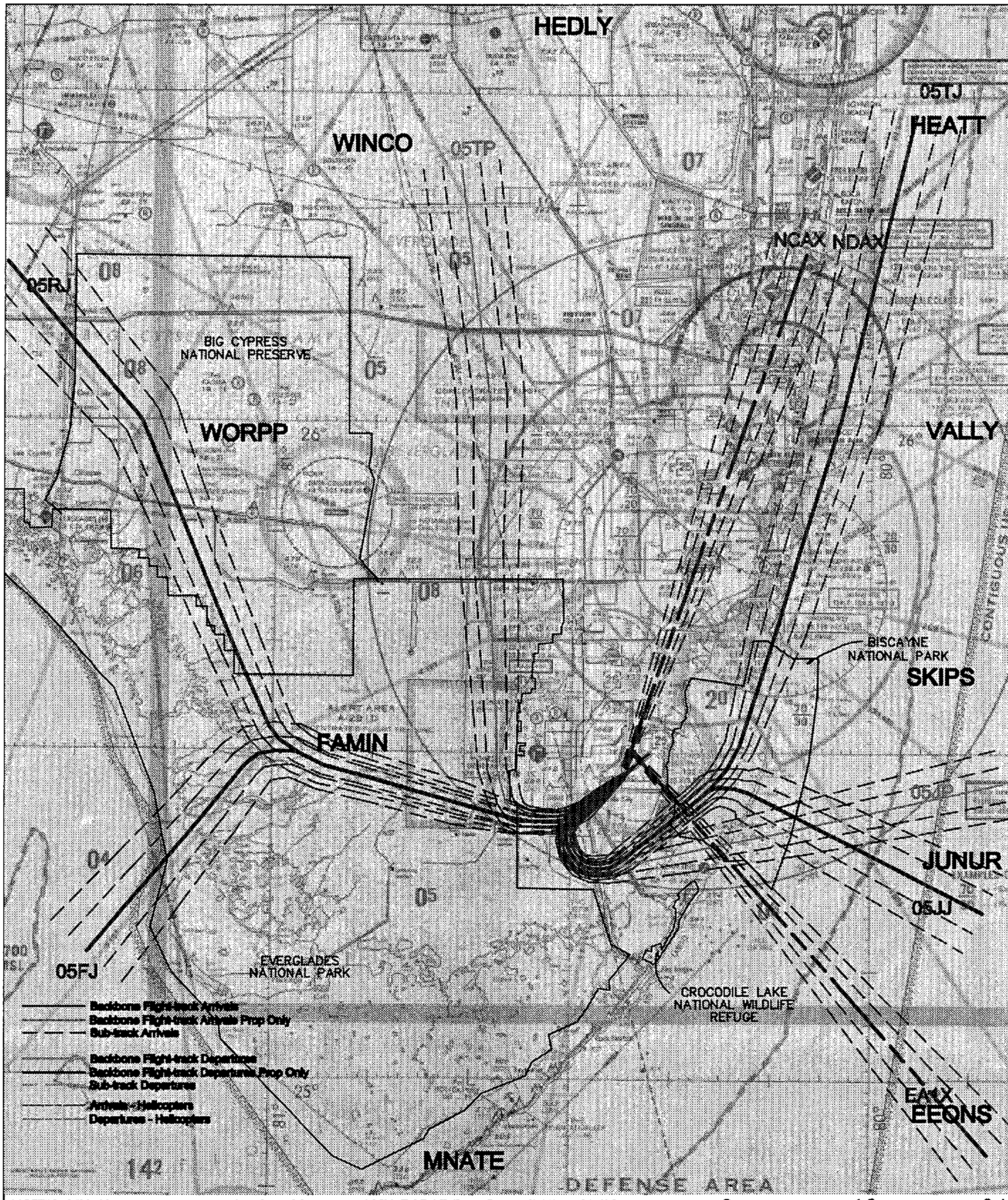
Airport and each departure or arrival fix serving the area. Each anticipated flight path was formatted for INM modeling.

The flight paths to and from Homestead Regional Airport used in this evaluation are presented on **Exhibits II-5 through II-8** for arrivals and departures in east and west traffic flows.[iv] The draft 1997 AICUZ military tracks are assumed for continued use, and the civil tracks are projections of future patterns. The Integrated Noise Model provides the user the opportunity to model flight tracks along backbone and adjacent sub-tracks to better reflect the dispersion of aircraft over a corridor centered on the nominal flight path. The degree of dispersion anticipated for Homestead is based on the traffic dispersion associated with aircraft now using Fort Lauderdale-Hollywood International Airport, as indicated by air traffic control radar. The distribution of aircraft among the backbone and sub-tracks assumes a binomial distribution around a mean represented by the backbone track. The dispersion of the modeled flight tracks is representative of the observed spread of actual flights between local airports and arrival and departure fixes in the area.

The flight paths carry unique names that follow a specific four character convention. The first two characters indicate the Homestead runway associated with the track. The third character indicates the associated airspace fix (see **Table II-3** below), and the final character indicates whether it is a jet (J) or propeller (P) track. In some cases jets and props fly along the same track, and only the jet track indicator is used. In other cases, however, the jet and prop tracks are sufficiently different to warrant a separate set of tracks. Careful evaluation of the flight path maps will indicate that there are several tracks associated with small propeller aircraft that make tight turns to the left or right near the airport and then proceed to the WINCO or HEDLY fixes along a VFR (good weather) flyway on the west side of the metropolitan area. The associated small prop approach tracks are along the same flyway from HEATT and VALLY. Only small general aviation single or twin-engine aircraft use these tracks. The turns made south of the airport are for use during instrument weather conditions (IFR), and the turns made to the north are for use during visual weather conditions (VFR). Other locations where separate prop tracks are necessary are along the departure path to MNATE, on the approach from JUNUR, and along a low level small aircraft flight path to VALLY which parallels the coast and leads to other airports in the region.

Table II-3
Flight Track To Fix Designations
Homestead Regional Airport

Approaches		Area served
F	FAMIN	From the Keys and Central America
P	WORPP	From the mid-west and western United States/Canada
T	HEATT	From the eastern United States/Canada and Europe
J	JUNUR	From the Caribbean and South America
Departures		
M	MNATE	To the Keys and Central America
W	WINCO	To the west and mid-west
H	HEDLY	To the mid-west and east
V	VALLY	To the east and Europe
S	SKIPS	To the eastern Caribbean and Bahamas
E	EEONS	To Cuba and Latin America



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	HST EAST FLOW – ARRIVALS FUTURE PROPOSED CIVIL ITINERANT BACKBONE & DISPERSED TRACKS	EXHIBIT II–5

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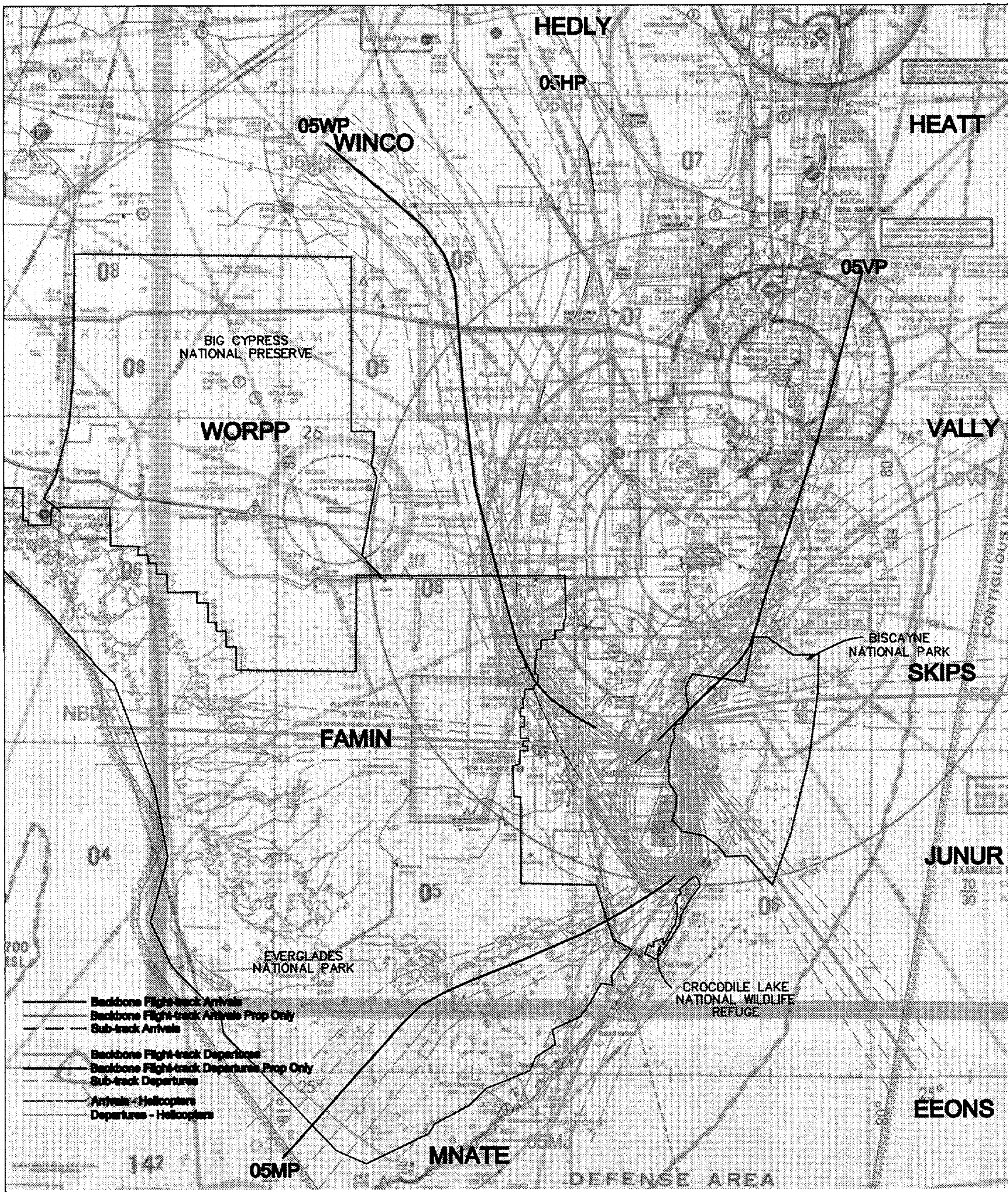

NOTES: MIA Airspace routes were developed from actual MIA RADAR Data from 5/31/98 - 6/7/98
Future Proposed HST Airspace Routes were developed in consultation with Miami TRACON.
Base Map is the Miami Sectional Aeronautical Chart, February 26, 1998,
published by National Oceanic Atmospheric Administration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

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GRAPHIC SCALE IN NAUTICAL MILES

HOMESTEAD SEIS	Landrum&Brown	HST EAST FLOW - DEPARTURES FUTURE PROPOSED CIVIL ITINERANT BACKBONE & DISPERSED TRACKS	EXHIBIT II-6

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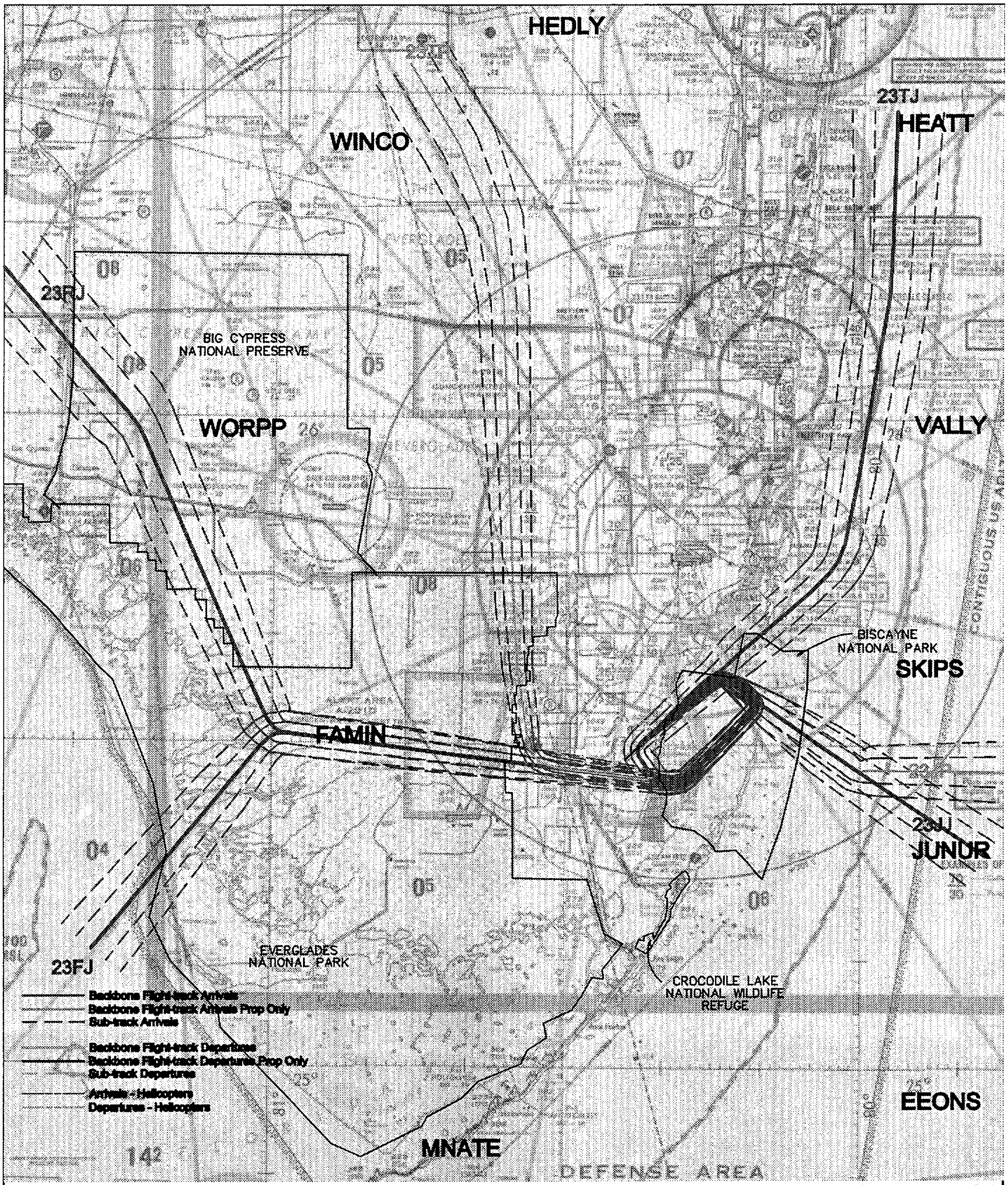

NOTES: MIA Airspace routes were developed from actual MIA RADAR Data from 5/31/98 - 6/7/98
Future Proposed HST Airspace Routes were developed in consultation with Miami TRACON.
Base Map is the Miami Sectional Aeronautical Chart, February 26, 1998,
published by National Oceanic Atmospheric Administration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

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GRAPHIC SCALE IN NAUTICAL MILES

HOMESTEAD SEIS	Landrum&Brown	HST WEST FLOW – ARRIVALS FUTURE PROPOSED CIVIL ITINERANT BACKBONE & DISPERSED TRACKS	EXHIBIT II-7

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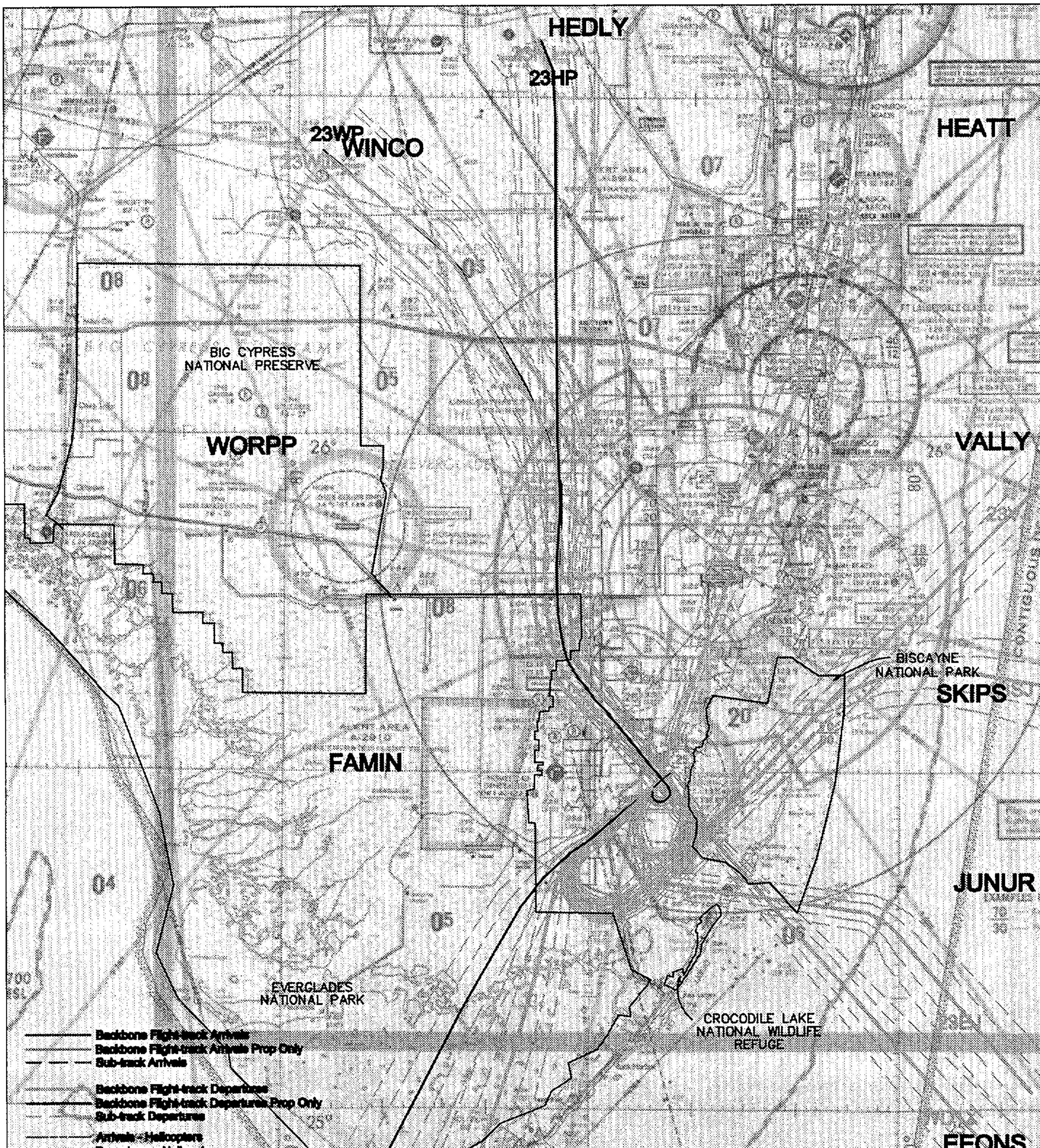

NOTES: MIA Airspace routes were developed from actual MIA RADAR Data from 5/31/98 - 6/7/98
Future Proposed HST Airspace Routes were developed in consultation with Miami TRACON.
Base Map is the Miami Sectional Aeronautical Chart, February 26, 1998,
published by National Oceanic Atmospheric Administration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

HOMESTEAD SEIS	Landrum&Brown	HST WEST FLOW - DEPARTURES FUTURE PROPOSED CIVIL ITINERANT BACKBONE & DISPERSED TRACKS	EXHIBIT II-8

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Military and customs aircraft are assigned to flight tracks developed for the Draft 1997 AICUZ study assessment of noise patterns at the facility. **Exhibits II-9 and II-10** provide illustrations of the location of the itinerant military tracks in east and west flow respectively. **Exhibit II-11** indicates the local pattern tracks used by military and civilian aircraft at the facility.

- Time of Day of Operations

The time of day when aircraft operate is the third critical component of the INM input data, particularly when the DNL, which carries a penalty for night operations, is used. There is no valid way to independently forecast the distribution of operations between the day and night hours for a new airport. One may however, assume that the day-night operational characteristics of nearby airports serving the same general purpose as the new airport would apply. The draft 1997 AICUZ study assumed no military operations between 10 p.m. and 7 a.m. Current estimates from the Air National Guard and Customs are that their combined nighttime operations average only about 12 a month. This is not a sufficient number to noticeably affect DNL calculations. For purposes of this analysis, Military/U.S. Customs nighttime operations are assumed to be zero.

A comparison of the character of the projected Homestead Regional civil aircraft operations with the operations at other regional airports indicated that its future character is more likely to be more like Fort Lauderdale-Hollywood International Airport (FLL) than either MIA or the large general aviation airports in the area. Therefore, the day-night traffic distribution forecast for FLL was assumed to be representative of the same distribution at Homestead. **Table II-4** provides the assumed day/night distribution for civil jets and props and government aircraft used in this analysis.

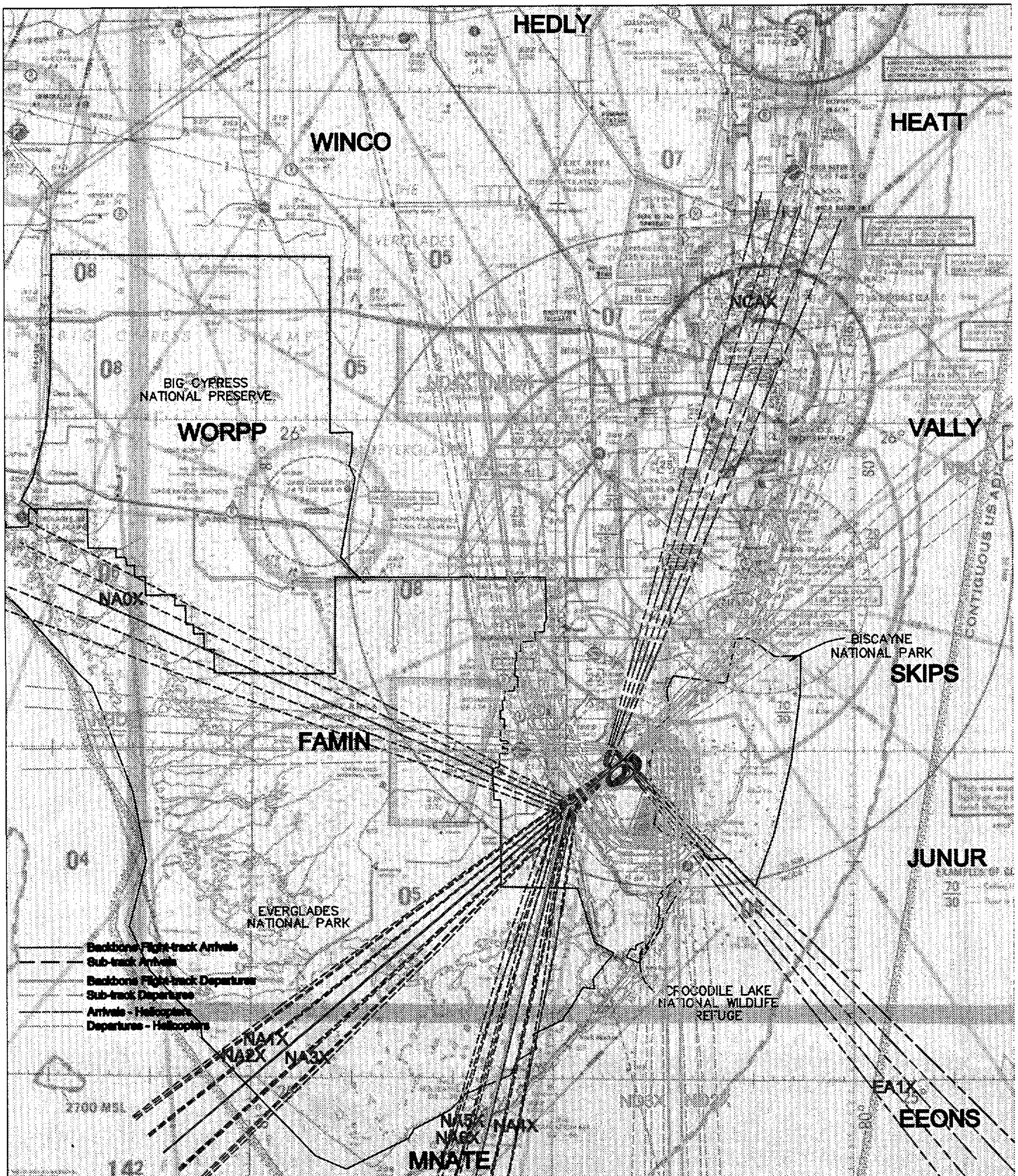
Table II-4
Assumed Day-Night Traffic Distributions
Homestead Regional Airport

Aircraft Type	Day (7 a.m. – 10 p.m.)	Night (10 p.m. - 7 a.m.)
Civil Jets	90.3%	9.7%
Civil Prop	93.8%	6.2%
Military/U.S. Customs	100%	0%

Source: 1997 INM data input files for FLL and Draft 1997 AICUZ Study for Homestead Air Reserve Base.

- Runway Utilization

The fourth critical component of the noise distribution pattern developed by the INM is the projected runway utilization at the airport. Projected use of the runways at Homestead Regional Airport can be based on an assessment of previous evaluations conducted for the facility. In southern Florida, each airport operates in east flow approximately 90% of the time. This means that aircraft primarily approach the airport from the west, landing to the east, and they depart the airport towards the east. Forecasts of operations at both MIA and FLL indicate this dominant characteristic on runway configurations that are aligned east-west. The single runway alignment at Homestead is northeast-southwest and does not have the crosswind runway that is available at other airports in the region. Consequently, the use at Homestead might be expected to differ slightly from the regional norms. The draft 1997 AICUZ Study for Homestead AFRB and its predecessor, the 1988 AICUZ study for Homestead AFB were evaluated to determine the runway usage used in each study for the facility.[v] Each indicated the use of easterly flow more frequently than 90%. It was assumed that the average annual flow used by the two AICUZ studies



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	HST EAST FLOW FUTURE PROPOSED ITINERANT MILITARY / GOVERNMENT BACKBONE & DISPERSED FLIGHT TRACKS	EXHIBIT II-9

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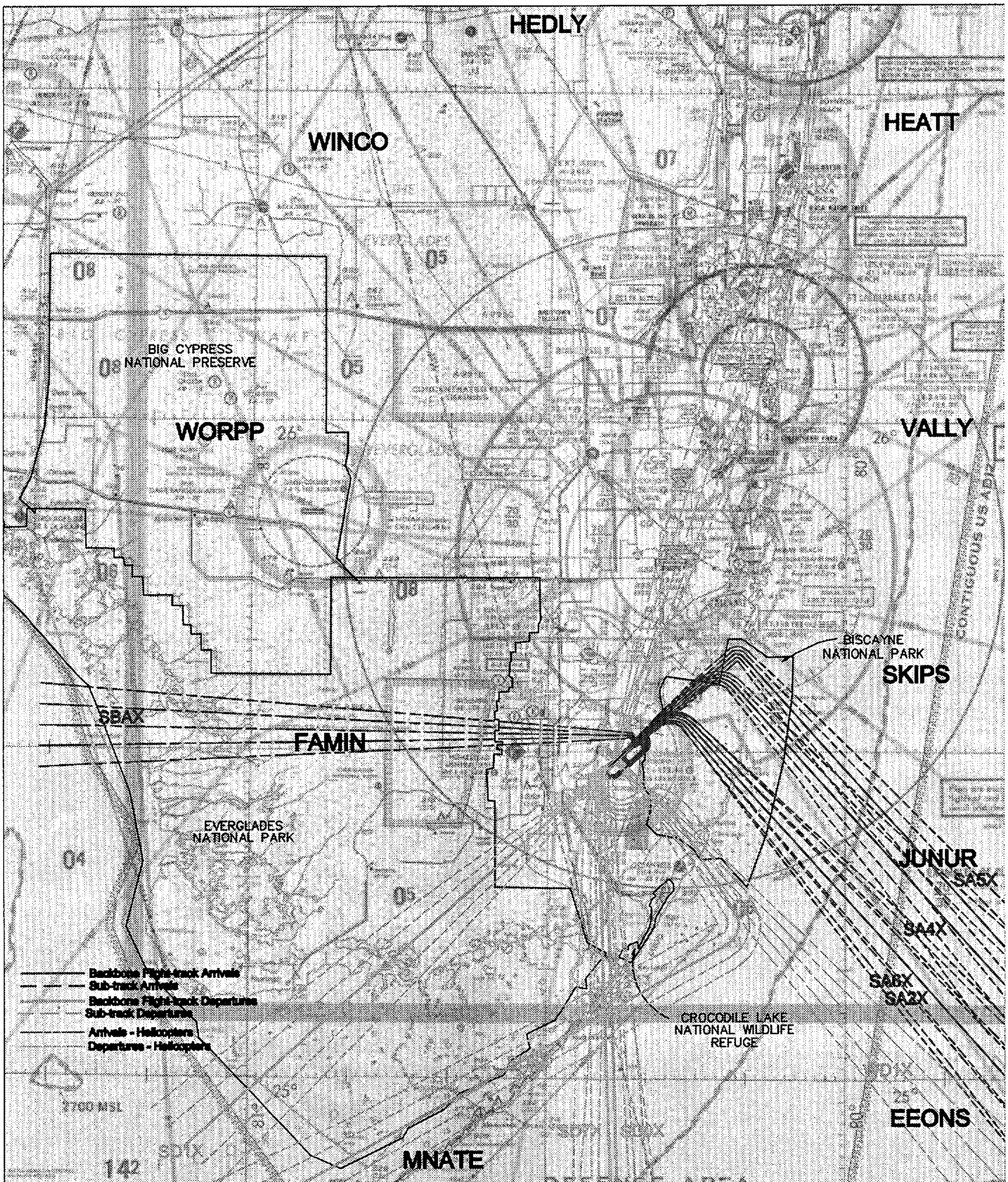

NOTES: MIA Airspace routes were developed from actual MIA RADAR Data from 5/31/98 - 6/7/98
Future Proposed HST Airspace Routes were developed in consultation with Miami TRACON.
Base Map is the Miami Sectional Aeronautical Chart, February 26, 1996,
published by National Oceanic Atmospheric Administration for air navigation use.

HOMESTEAD SEIS	LandrumBrown	HST WEST FLOW FUTURE PROPOSED ITINERANT MILITARY / GOVERNMENT BACKBONE & DISPERSED FLIGHT TRACKS	EXHIBIT II-10

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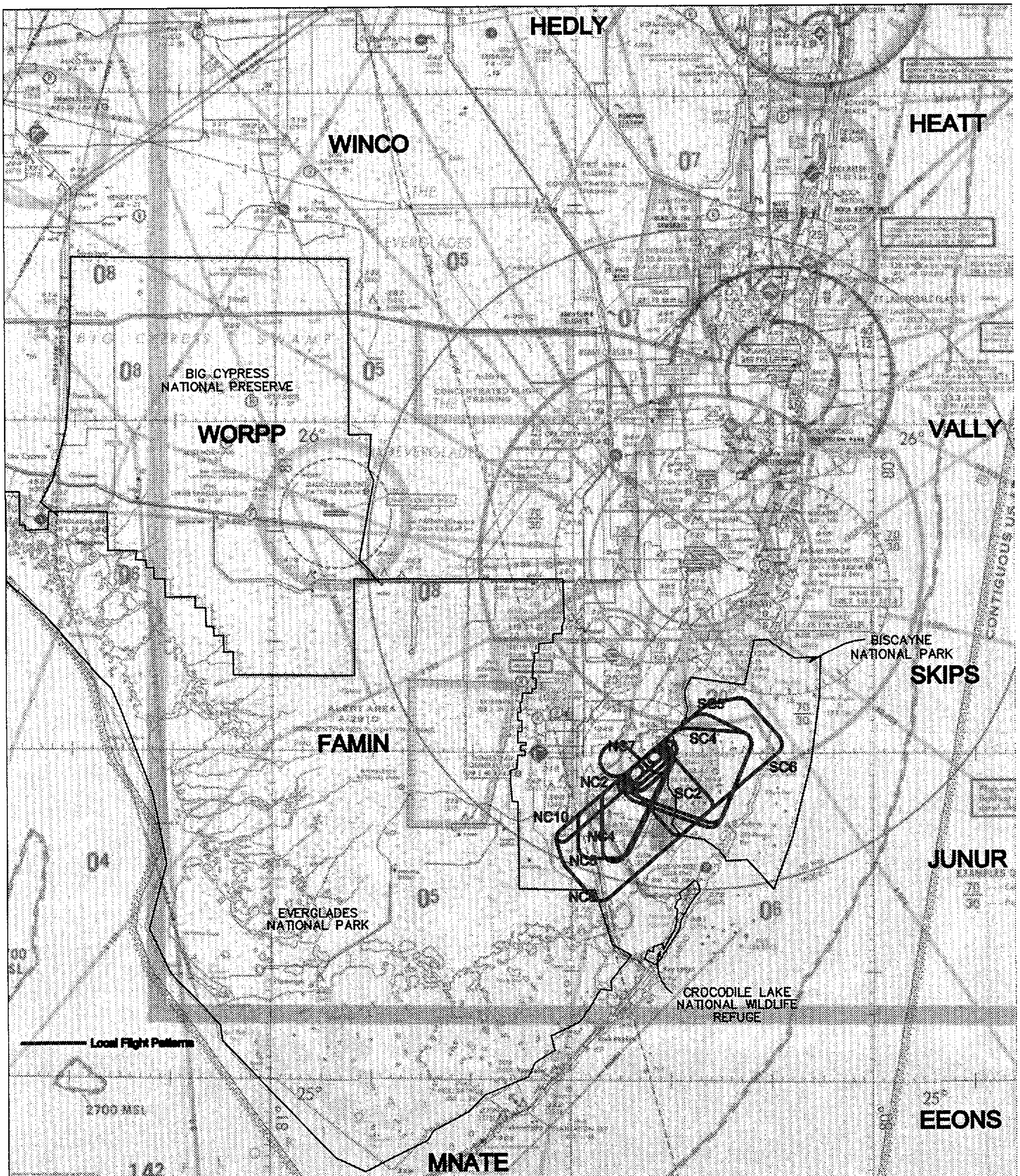

NOTES: MIA Airspace routes were developed from actual MIA RADAR Data from 5/31/98 - 6/7/98
Future Proposed HST Airspace Routes were developed in consultation with Miami TRACON.
Base Map is the Miami Sectional Aeronautical Chart, February 26, 1998,
published by National Oceanic Atmospheric Administration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

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GRAPHIC SCALE IN NAUTICAL MILES

HOMESTEAD SEIS	Landrum&Brown	HST EXISTING & FUTURE LOCAL FLIGHT PATTERN TRACKS	EXHIBIT II-11

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would represent the expected runway use conditions for the future at Homestead Regional Airport. **Table II-5** presents this distribution.

Table II-5
Assumed Runway Utilization Rate
Homestead Regional Airport

Operation Type	Runway 05 (east flow)	Runway 23 (west flow)
Take-off	94.0%	6.0%
Landing	92.1%	7.9%

Source: Average of Draft 1997 and 1988 AICUZ studies for Homestead Air Reserve Base.

- Weight-Distance Relationships for Civil Jet Departures

A special consideration of INM modeling is the use of climb rates for departing aircraft that are directly related to the weight of the aircraft. Since there is no information about anticipated distances of flight for the aircraft forecast to use Homestead, the following assumptions were made.

- General aviation, turboprop regional jet and maintenance jet aircraft would use the single default climb rate set forth by the INM, modified by the constraints of the previous section.
- Narrow-body passenger and cargo jet aircraft to domestic and international locations were assigned weights that would allow flight to destinations located 500 to 1,000 miles from Miami.
- Wide-body and Boeing 757 passenger and cargo jet aircraft to international and domestic locations were assigned weights that would accommodate flight to destinations beyond 1,500 miles.
- Military and helicopter aircraft were not assigned weight categories, but rather were programmed in accordance with the special climb rates available from the 1997 AICUZ data files.

This data is important to the modeling because the heavier an aircraft is when it departs, the more runway length is used for the takeoff roll and the slower its rate of climb. These climb rates are used in the development of the modified profiles discussed in the previous section.

- Aircraft Altitude Profiles

The rates at which aircraft descend to or climb from an airport's runways comprise the fifth component of noise evaluation by the INM. For this evaluation, climb profiles were developed for aircraft type following each departure path and each approach route. The INM's default databases include this information for conditions where the rate of climb or descent is not restricted by the use of adjacent airspace. However, in the complex airspace of southern Florida, where several airports will use the same fixes for arrivals and departures, and where flight paths to and from different airports cross, the consideration of the flight route in the vertical dimension is required. Flight track exhibits include the data necessary to discuss the altitude relationships in the area.

The NOISEMAP input data of the draft 1997 AICUZ study provided altitude-distance profiles for each aircraft in that study, along each flight track. Because the military traffic now operates within the airspace constraints of the region, no substantive changes to the military profile patterns were considered necessary, other than to bring them into conformance with INM input requirements.\[vi]

Conversely, however, civilian aircraft do not now generally operate from Homestead. They would, in the future, be required to operate within the constraints imposed by other airports, particularly MIA, when approaching or departing Homestead. Except as noted in the following paragraphs, the altitudes along departure and approach corridors are assumed to reflect unrestricted climbs or descents from 18,000 feet MSL (above sea level). The unconstrained rates of climb are dependent on the type of aircraft flown. The descent rates are assumed to be either 1) a continuous 3 degrees of descent in accordance with the INM default; or 2) reflective of step-down (stair step) procedures used to separate traffic of various types in their initial and final approaches.

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 MSL, except when landing or taking off from the airport. Helicopter aircraft are expected to climb to and maintain 1,000 feet MSL during their courses through the area. Jets operating in the closed local pattern are assumed to fly at 1,500 feet MSL until in final approach. Propeller aircraft in the local pattern are assumed to fly at a 900 feet MSL pattern altitude.

The altitudes anticipated along each departure and approach path leading from and to Homestead Regional Airport are indicated on exhibits presented in the Airport Planning Data Technical Report.

In east flow, the following altitude restrictions would apply to departures:

- Jet and turboprop departures to WINCO and HEDLY would turn right and climb along the flight path until reaching an altitude of 5,000 feet MSL. They would maintain that altitude until crossing under the downwind approach from JUNUR and HEATT to Homestead. When clear of approach traffic, they may climb unrestricted to cross over the MIA approaches from FAMIN and WORPP at 10,000 feet MSL or more. This course overflys the western portion of Biscayne NP at 5,000 feet MSL.
- Jet and turboprop departures to VALLY would turn right and climb along the flight path until reaching an altitude of 5,000 feet MSL. They would maintain that altitude until crossing under the downwind approach from JUNUR and HEATT to Homestead. When clear of approach traffic, they may climb unrestricted to cross over the MIA approaches from JUNUR and HEATT at 10,000 feet MSL or more. This course overflys the western portion of Biscayne NP at 5,000 feet MSL.
- Jet and turboprop departures to SKIPS would turn right and climb along the flight path until reaching an altitude of 7,000 feet MSL. They would maintain that altitude until crossing under the JUNUR approach course to MIA. When clear of approach traffic, they may climb unrestricted. This course overflys the center of Biscayne NP at 7,000 feet MSL.
- Jet and turboprop departures to EEONS and MNATE would turn right and climb along the flight path until reaching an altitude of 5,000 feet MSL. They would maintain that altitude until crossing under the downwind approach from JUNUR and HEATT to Homestead. When clear of approach traffic, they may climb unrestricted. This course overflys the western portion of Biscayne NP at 5,000 feet MSL.

The following altitude restrictions would apply to east flow approaches:

- Jet and turboprop approaches from WORPP would cross the fix at 9,000 feet and 5,000 feet MSL respectively, and maintain that altitude until reaching FAMIN. After passing FAMIN, they would descend and enter the final approach course at 3,000 feet MSL.
- Jet and turboprop approaches from FAMIN would cross the fix at 9,000 feet and 5,000 feet MSL respectively, join WORPP traffic and descend to enter the final approach course at 3,000 feet MSL.

- Jet and turboprop approaches from HEATT cross over the JUNUR approach to MIA at 9,000 feet MSL, then descend to intercept the downwind segment of the Homestead approach at 6,000 feet MSL. They would then descend to enter the final approach course at 3,000 feet MSL
- Jet and turboprop approaches from JUNUR would cross the fix at 10,000 feet MSL and 8,000 feet MSL respectively, and then descend to intercept the downwind approach at 6,000 feet MSL. They would then descend to enter the final approach course at 3,000 feet MSL.

When in west flow, the airspace restraints on climb and descent are slightly different than those of east flow. West flow altitude restrictions on departures are:

- Jet and turboprop departures to WINCO and HEDLY would climb unrestricted to cross over the airport at or above 10,000 feet MSL and cross the MIA approaches from WORPP and FAMIN at or above 16,000 feet MSL.
- Jet and turboprop departures to VALLY and SKIPS would climb unrestricted to pass abeam Homestead at 10,000 feet MSL and then climb unrestricted to 16,000 feet MSL and above.
- Jet and turboprop departures to EEONS would climb and maintain 5,000 feet MSL to pass under VALLY/SKIPS departures from Homestead and then climb unrestricted to 16,000 feet MSL and above.
- Jet and turboprop departures to MNATE would climb unrestricted to 16,000 feet MSL and above.

West flow constraints on approach operations are:

- Jets, turboprop and light general aviation prop aircraft would cross the WORPP fix at 10,000 feet MSL, 8,000 feet MSL, and 5,000 feet MSL respectively, and maintain that altitude until reaching the FAMIN intersection. They would then descend/fly level to intercept the left downwind approach at 5,000 feet MSL and the final approach course at 3,000 feet MSL.
- Jets, turboprop and light general aviation prop aircraft would cross the FAMIN fix at 10,000 feet MSL, 8,000 feet MSL, and 5,000 feet MSL respectively, joining the inbound traffic from the WORPP fix. They would then descend/fly level to intercept the left downwind approach at 5,000 feet MSL and the final approach course at 3,000 feet MSL.
- Jet and turboprop approaches from HEATT would cross the JUNUR approaches to MIA at 10,000 feet MSL. They would then descend and fly over the top of Homestead Regional Airport at 9,000 feet MSL, then descend to intercept the downwind portion of the Homestead approach at 6,000 feet MSL. After intercepting the downwind approach, they would descend and intercept the final approach course at 3,000 feet MSL.
- Jet and turboprop approaches from JUNUR would cross the fix at 9,000 feet MSL and 6,000 feet MSL respectively, and then intercept the left base approach at 3,000 feet MSL. They would then fly level to intercept the final approach course at 3,000 feet MSL.

Special departure and approach profiles were developed for each aircraft type projected to operate at Homestead in future years. The general rule for the development of these altitude-distance profiles was that an aircraft was assumed to climb or descend unrestricted until reaching the constraining altitude, at which point it would transition to a level flight segment until beyond the area of constraint. This generally results in a stair-step altitude-distance profile. The effect of these INM profile modifications is that aircraft are normally at lower altitudes at greater distances from the airport than would be the case with unrestricted climbs, resulting in higher noise levels at greater distances from the airport than would normally be the case. In all cases, the altitude of an aircraft along a given route may vary between way points for reasons of poor weather or airspace conflicts, as well as by pilot technique. There is no way to predict the degree of this variability.

- Flight Heading Distributions

The assignment of the aircraft using the airport to the flight paths discussed above is the synthesis of the input data preparation. Each operation that occurs during the time under consideration must be factored by the runway usage, its projected time of day, and its expected flight corridor. In general, five basic premises apply to the distribution of the projected traffic.

- Military and customs traffic would continue to operate as they do during the current condition.
- Caribbean and Latin American passenger operations would be distributed among the SKIPS, EEONS and MNATE fixes for departure and the JUNUR and FAMIN fixes for arrivals.
- Domestic passenger operations would be distributed among the WINCO, HEDLY and VALLY departure fixes and the WORPP and HEATT arrival fixes.
- All other civil operations would be distributed among all fixes in direct proportion to the distributions set forth in Table 15 of the Airport/Airspace Planning Data Technical Memorandum, Section 3 (October 7, 1998), with the exception of itinerant, prop general aviation operations.
- A limited amount of total general aviation operations (5% or less) would be assigned to each fix serving the Caribbean and Latin America.

Using these assumptions, the civilian traffic is distributed for purposes of this analysis in accordance with the fix utilization indicated in **Table II-6.**

Table II-6
Assumed Civil Traffic Distribution Percentages by Departure or Arrival Fix
Homestead Regional Airport

	Latin/Caribbean Pax. Operations		Domestic Pax. Operations		Light GA Traffic		All Other Civil Traffic	
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
Approach								
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

Source: Landrum & Brown, 1999

Tables II-7 through II-16 provide the average daily operational distribution of individual civil aircraft types to flight tracks between each runway end and each fix. **Tables II-17 and II-18** indicate the distribution of military and customs traffic to itinerant arrivals and departures by those aircraft. **Table II-19** provides the distribution of local military and government traffic onto the closed racetrack patterns on the south side of the airport. **Table II-20** provides similar local pattern information for civilian traffic. Local military/government traffic is estimated to remain constant, while the number of local civilian operations is assumed to vary with time. The data provided in these tables are formatted for INM processing and result in the various noise distribution patterns discussed in later sections of this document.

- Ground Run-up Activity

Aircraft maintenance run-up activity was also included in the noise modeling input data. As previously mentioned, the noise modeling data from the draft 1997 AICUZ study was evaluated and converted into an INM compatible format. This data also included information on run-up activity. The information indicates that virtually all of the run-up activity at Homestead is generated by the military maintenance of the F-16 aircraft.

In order to determine the expected run-up activity for the baseline and future conditions, the F-16 flight operations from the draft 1997 AICUZ study were compared to the expected level F-16 flight operations in the base year. The level of run-up activity present in the AICUZ noise modeling was then adjusted in correlation with the change in

F-16 flight activity between the AICUZ study and the baseline conditions of this analysis. These adjusted run-up operations were then included in the noise modeling for this study. In addition, the AICUZ run-up data provided information regarding the location and power setting for the F-16 run-up activity. This location and thrust information was applied to the adjusted 1997 run-up operations in the same proportions used in the AICUZ study.

The results of the analysis described in the previous paragraph reveal that there are approximately 2.5 hours of F-16 run-ups on the average day at Homestead. Generally, all of the run-up operations are conducted during the daytime hours, sometime between 7:00am to 10:00pm. The analysis indicates that about 40 minutes of the 2.5 hours of run-ups are conducted within the hush-house facility. While the remaining run-ups are typically conducted outside at various aircraft parking positions, there is generally only about 6 minutes of full power run-ups per day. The remainder of the run-up activity is conducted at moderate to low thrust settings.

Based upon the traditional relationships between run-up noise and flight noise by civilian aircraft, as well as the low number of forecast annual operations associated with aircraft maintenance, run-ups by civilian aircraft were determined not to add sufficiently to the noise level in the airport environs to affect the noise modeling.

II.C.2. Other Airports

Activity information for other airports in the region was developed from a variety of sources. These include Miami International, Fort Lauderdale-Hollywood, Kendall- Tamiami Executive and Homestead General Aviation Airports. They are addressed individually by airport. While the Dade County Aviation System Plan also projected general aviation activity at Opa-Locka Airport, Opa-Locka West Airport and Dade-Collier Training and Transition Airport, those facilities were not assessed in this analysis. Radar operations information did not indicate that flights from Opa-Locka or Opa-Locka West Airport passed

Table II-7
Homestead Regional Airport SEIS
Civilian Departure Operations by Flight Track
Average Daily Itinerant Traffic by Year
WINCO Fix

	East Traffic Flow (Runway 5) Track 05WJ or 05WP								West Traffic Flow (Runway 23) Track 23WJ or 23WP							
	2000		2005		2015		Maximum		2000		2005		2015		Maximum	
Aircraft Types	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
A320 (A320)	0.00	0.00	0.34	0.04	0.93	0.10	4.48	0.48	0.00	0.00	0.02	0.00	0.06	0.01	0.30	0.03
B-727 (727EM2)	0.00	0.00	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B-737/300 (737300)	0.00	0.00	0.34	0.04	0.93	0.10	4.48	0.48	0.00	0.00	0.02	0.00	0.06	0.01	0.30	0.03
B-737-500 (737500)	0.00	0.00	0.34	0.04	0.93	0.10	4.48	0.48	0.00	0.00	0.02	0.00	0.06	0.01	0.30	0.03
B-757 (757RR)	0.00	0.00	0.00	0.00	0.93	0.10	3.00	0.32	0.00	0.00	0.00	0.00	0.06	0.01	0.20	0.02
B-767 (767300)	0.00	0.00	0.01	0.00	0.55	0.06	0.80	0.09	0.00	0.00	0.00	0.00	0.04	0.00	0.05	0.01
CRJ, EM4 (CL601)	0.00	0.00	0.00	0.00	0.33	0.03	4.93	0.53	0.00	0.00	0.00	0.00	0.02	0.00	0.33	0.04
Lear, Citation (LEAR35)	0.27	0.03	0.33	0.03	0.55	0.06	0.83	0.09	0.02	0.00	0.02	0.00	0.04	0.00	0.05	0.01
MD-11 (MD11GE)	0.00	0.00	0.01	0.00	0.55	0.06	0.80	0.09	0.00	0.00	0.00	0.00	0.04	0.00	0.05	0.01
MD-80 (MD82)	0.00	0.00	0.39	0.04	3.90	0.40	4.02	0.43	0.00	0.00	0.03	0.00	0.24	0.02	0.26	0.03
Subtotal Jets	0.27	0.03	1.81	0.19	9.39	1.01	27.80	2.99	0.02	0.00	0.12	0.01	0.61	0.07	1.85	0.20
ATR-42 (DHC830)	0.00	0.00	0.02	0.00	0.21	0.01	0.31	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.00
C150, C172 (COMSEP)	5.53	0.37	6.13	0.41	8.05	0.53	10.82	0.71	0.38	0.02	0.41	0.03	0.54	0.04	0.73	0.05
Cessna Caravan (CNA441)	0.00	0.00	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Dash 8 (DHC8)	0.00	0.00	0.02	0.00	0.21	0.01	0.31	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.00
King Air (DHC6)	0.00	0.00	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
PA31 (BEC58P)	2.15	0.14	2.64	0.17	3.86	0.25	7.83	0.52	0.14	0.01	0.18	0.01	0.26	0.02	0.53	0.04
Rotorcraft	0.41	0.03	0.59	0.04	0.78	0.05	1.17	0.08	0.03	0.00	0.04	0.00	0.06	0.00	0.08	0.00
SF3 (SF340)	0.00	0.00	0.02	0.00	0.21	0.01	0.31	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.00
SWM (DHC6)	0.00	0.00	0.02	0.00	0.21	0.01	0.31	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.00
Subtotal Props	8.09	0.54	9.71	0.64	13.50	0.89	21.04	1.39	0.54	0.04	0.65	0.04	0.92	0.06	1.42	0.09
Total Operations	8.37	0.56	11.52	0.84	22.89	1.90	48.85	4.38	0.56	0.04	0.77	0.06	1.53	0.13	3.27	0.29

Source: Landrum & Brown traffic distributions, based on Airport/Airspace Planning Data, Technical Memorandum, Sections 1 and 3.

Table II-8
Homestead Regional Airport SEIS
Civilian Departure Operations by Flight Track
Average Daily Itinerant Traffic by Year
HEDLY Fix

	East Traffic Flow (Runway 5) Track 05HJ or 05HP								West Traffic Flow (Runway 23) Track 23HJ or 23HP							
	2000		2005		2015		Maximum		2000		2005		2015		Maximum	
Aircraft Types	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
A320 (A320)	0.00	0.00	0.32	0.03	0.88	0.10	4.26	0.46	0.00	0.00	0.02	0.00	0.07	0.01	0.32	0.03
B-727 (727EM2)	0.00	0.00	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B-737/300 (737300)	0.00	0.00	0.32	0.03	0.88	0.10	4.26	0.46	0.00	0.00	0.02	0.00	0.07	0.01	0.32	0.03
B-737-500 (737500)	0.00	0.00	0.32	0.03	0.88	0.10	4.26	0.46	0.00	0.00	0.02	0.00	0.07	0.01	0.32	0.03
B-757 (757RR)	0.00	0.00	0.00	0.00	0.89	0.10	2.85	0.31	0.00	0.00	0.00	0.00	0.06	0.01	0.21	0.02
B-767 (767300)	0.00	0.00	0.01	0.00	0.52	0.06	0.77	0.08	0.00	0.00	0.00	0.00	0.04	0.00	0.05	0.01
CRJ, EM4 (CL601)	0.00	0.00	0.00	0.00	0.31	0.03	4.69	0.50	0.00	0.00	0.00	0.00	0.02	0.00	0.35	0.04
Lear, Citation (LEAR35)	0.26	0.03	0.31	0.03	0.52	0.06	0.79	0.08	0.02	0.00	0.02	0.00	0.04	0.00	0.06	0.01
MD-11 (MD11GE)	0.00	0.00	0.01	0.00	0.52	0.06	0.77	0.08	0.00	0.00	0.00	0.00	0.04	0.00	0.05	0.01
MD-80 (MD82)	0.00	0.00	0.37	0.04	3.53	0.38	3.83	0.41	0.00	0.00	0.03	0.00	0.25	0.03	0.27	0.03
Subtotal Jets	0.26	0.03	1.73	0.19	8.94	0.96	26.48	2.84	0.02	0.00	0.13	0.01	0.64	0.07	1.93	0.21
ATR-42 (DHC830)	0.00	0.00	0.02	0.00	0.20	0.01	0.29	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.00
C150, C172 (COMSEP)	5.37	0.35	5.96	0.39	7.80	0.52	10.49	0.69	0.59	0.04	0.66	0.04	0.85	0.06	1.15	0.08
Cessna Caravan (CNA441)	0.00	0.00	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Dash 8 (DHC8)	0.00	0.00	0.02	0.00	0.20	0.01	0.29	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.00
King Air (DHC6)	0.00	0.00	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
PA31 (BEC58P)	2.08	0.14	2.56	0.17	3.74	0.25	7.59	0.50	0.23	0.01	0.28	0.02	0.41	0.03	0.83	0.06
Rotorcraft	0.40	0.03	0.57	0.04	0.75	0.05	1.13	0.08	0.05	0.00	0.07	0.00	0.08	0.01	0.12	0.01
SF3 (SF340)	0.00	0.00	0.02	0.00	0.20	0.01	0.29	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.00
SWM (DHC6)	0.00	0.00	0.02	0.00	0.20	0.01	0.29	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.00
Subtotal Props	7.85	0.52	9.42	0.62	13.08	0.86	20.37	1.35	0.86	0.06	1.03	0.07	1.41	0.09	2.20	0.15
Total Operations	8.11	0.55	11.15	0.81	22.02	1.82	46.85	4.19	0.88	0.06	1.15	0.08	2.05	0.16	4.13	0.35

Source: Landrum & Brown traffic distributions, based on Airport/Airspace Planning Data, Technical Memorandum, Sections 1 and 3.

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Table II-9
Homestead Regional Airport SEIS
Civilian Departure Operations by Flight Track
Average Daily Itinerant Traffic by Year
VALLY Fix

	East Traffic Flow (Runway 5) Track 05VJ or 05VP								West Traffic Flow (Runway 23) Track 23VJ or 23VP							
	2000		2005		2015		Maximum		2000		2005		2015		Maximum	
Aircraft Types	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
A320 (A320)	0.00	0.00	0.26	0.03	0.71	0.08	3.41	0.37	0.00	0.00	0.01	0.00	0.03	0.00	0.16	0.02
B-727 (727EM2)	0.00	0.00	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B-737/300 (737300)	0.00	0.00	0.26	0.03	0.71	0.08	3.41	0.37	0.00	0.00	0.01	0.00	0.03	0.00	0.16	0.02
B-737-500 (737500)	0.00	0.00	0.26	0.03	0.71	0.08	3.41	0.37	0.00	0.00	0.01	0.00	0.03	0.00	0.16	0.02
B-757 (757RR)	0.00	0.00	0.00	0.00	0.71	0.08	2.28	0.25	0.00	0.00	0.00	0.00	0.03	0.00	0.10	0.01
B-767 (767300)	0.00	0.00	0.01	0.00	0.42	0.04	0.61	0.07	0.00	0.00	0.00	0.00	0.02	0.00	0.03	0.00
CRJ, EM4 (CL601)	0.00	0.00	0.00	0.00	0.25	0.03	3.75	0.40	0.00	0.00	0.00	0.00	0.01	0.00	0.17	0.02
Lear, Citation (LEAR35)	0.21	0.02	0.25	0.03	0.42	0.04	0.63	0.07	0.01	0.00	0.01	0.00	0.02	0.00	0.03	0.00
MD-11 (MD11GE)	0.00	0.00	0.01	0.00	0.42	0.04	0.61	0.07	0.00	0.00	0.00	0.00	0.02	0.00	0.03	0.00
MD-80 (MD82)	0.00	0.00	0.30	0.03	2.82	0.30	3.06	0.33	0.00	0.00	0.01	0.00	0.12	0.01	0.13	0.01
Subtotal Jets	0.21	0.02	1.38	0.15	7.15	0.77	21.18	2.28	0.01	0.00	0.06	0.01	0.32	0.03	0.97	0.10
ATR-42 (DHC830)	0.00	0.00	0.02	0.00	0.16	0.01	0.23	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00
C150, C172 (COMSEP)	4.19	0.28	5.96	0.39	6.10	0.40	5.24	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cessna Caravan (CNA441)	0.00	0.00	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dash 8 (DHC8)	0.00	0.00	0.02	0.00	0.16	0.01	0.23	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00
King Air (DHC6)	0.00	0.00	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PA31 (BEC58P)	1.62	0.11	2.56	0.17	2.92	0.19	3.80	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rotorcraft	0.31	0.02	0.57	0.04	0.59	0.04	0.57	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SF3 (SF340)	0.00	0.00	0.02	0.00	0.16	0.01	0.23	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00
SWM (DHC6)	0.00	0.00	0.02	0.00	0.16	0.01	0.23	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00
Subtotal Props	6.13	0.40	9.35	0.62	10.23	0.68	10.54	0.70	0.00	0.00	0.01	0.00	0.03	0.00	0.04	0.00
Total Operations	6.33	0.43	10.74	0.77	17.38	1.44	31.72	2.97	0.01	0.00	0.07	0.01	0.35	0.04	1.01	0.11

Source: Landrum & Brown traffic distributions, based on Airport/Airspace Planning Data, Technical Memorandum, Sections 1 and 3.

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Table II-10
Homestead Regional Airport SEIS
Civilian Departure Operations by Flight Track
Average Daily Itinerant Traffic by Year
SWIMM Fix

	East Traffic Flow (Runway 5) Track 05SJ or 05SP								West Traffic Flow (Runway 23) Track 23SJ or 23SP							
	2000		2005		2015		Maximum		2000		2005		2015		Maximum	
Aircraft Types	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
A320 (A320)	0.00	0.00	0.01	0.00	0.75	0.08	2.88	0.31	0.00	0.00	0.00	0.00	0.05	0.01	0.19	0.02
B-727 (727EM2)	0.00	0.00	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B-737/300 (737300)	0.00	0.00	0.01	0.00	0.75	0.08	2.88	0.31	0.00	0.00	0.00	0.00	0.05	0.01	0.19	0.02
B-737-500 (737500)	0.00	0.00	0.01	0.00	0.75	0.08	2.88	0.31	0.00	0.00	0.00	0.00	0.05	0.01	0.19	0.02
B-757 (757RR)	0.00	0.00	0.00	0.00	0.66	0.07	1.10	0.12	0.00	0.00	0.00	0.00	0.05	0.01	0.08	0.01
B-767 (767300)	0.00	0.00	0.01	0.00	0.54	0.06	0.76	0.08	0.00	0.00	0.00	0.00	0.04	0.00	0.05	0.01
CRJ, EM4 (CL601)	0.00	0.00	0.00	0.00	3.53	0.38	13.87	1.49	0.00	0.00	0.00	0.00	0.23	0.03	0.92	0.10
Lear, Citation (LEAR35)	0.23	0.03	0.28	0.03	0.47	0.05	0.71	0.08	0.02	0.00	0.02	0.00	0.03	0.00	0.05	0.01
MD-11 (MD11GE)	0.00	0.00	0.01	0.00	0.54	0.06	0.76	0.08	0.00	0.00	0.00	0.00	0.04	0.00	0.05	0.01
MD-80 (MD82)	0.00	0.00	0.05	0.01	3.18	0.34	3.45	0.37	0.00	0.00	0.00	0.00	0.22	0.02	0.24	0.03
Subtotal Jets	0.23	0.03	0.44	0.05	11.16	1.20	29.28	3.15	0.02	0.00	0.03	0.00	0.76	0.08	1.97	0.21
ATR-42 (DHC830)	0.00	0.00	0.60	0.04	3.75	0.25	3.82	0.25	0.00	0.00	0.04	0.00	0.25	0.02	0.25	0.02
C150, C172 (COMSEP)	0.51	0.03	0.55	0.04	0.73	0.05	0.98	0.07	0.03	0.00	0.04	0.00	0.05	0.00	0.07	0.00
Cessna Caravan (CNA441)	0.00	0.00	0.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Dash 8 (DHC8)	0.00	0.00	0.60	0.04	3.75	0.25	3.83	0.25	0.00	0.00	0.04	0.00	0.25	0.02	0.25	0.02
King Air (DHC6)	0.00	0.00	0.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
PA31 (BEC58P)	0.20	0.01	0.24	0.02	0.35	0.02	0.71	0.05	0.01	0.00	0.02	0.00	0.02	0.00	0.05	0.00
Rotorcraft	0.04	0.00	0.06	0.00	0.08	0.00	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
SF3 (SF340)	0.00	0.00	0.60	0.04	3.75	0.25	3.82	0.25	0.00	0.00	0.04	0.00	0.25	0.02	0.25	0.02
SWM (DHC6)	0.00	0.00	0.60	0.04	3.75	0.25	3.82	0.25	0.00	0.00	0.04	0.00	0.25	0.02	0.25	0.02
Subtotal Props	0.74	0.05	3.46	0.23	16.17	1.07	17.10	1.13	0.04	0.00	0.23	0.02	1.06	0.07	1.14	0.08
Total Operations	0.98	0.07	3.90	0.28	27.33	2.27	46.38	4.28	0.05	0.00	0.26	0.02	1.83	0.15	3.11	0.29

Source: Landrum & Brown traffic distributions, based on Airport/Airspace Planning Data, Technical Memorandum, Sections 1 and 3.

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Table II-11
Homestead Regional Airport SEIS
Civilian Departure Operations by Flight Track
Average Daily Itinerant Traffic by Year
ELLEE Fix

	East Traffic Flow (Runway 5) Track 05EJ or 05EP								West Traffic Flow (Runway 23) Track 23EJ or 23EP							
	2000		2005		2015		Maximum		2000		2005		2015		Maximum	
Aircraft Types	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
A320 (A320)	0.00	0.00	0.00	0.00	0.38	0.04	1.44	0.15	0.00	0.00	0.00	0.00	0.03	0.00	0.10	0.01
B-727 (727EM2)	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B-737/300 (737300)	0.00	0.00	0.00	0.00	0.38	0.04	1.44	0.15	0.00	0.00	0.00	0.00	0.03	0.00	0.10	0.01
B-737-500 (737500)	0.00	0.00	0.00	0.00	0.38	0.04	1.44	0.15	0.00	0.00	0.00	0.00	0.03	0.00	0.10	0.01
B-757 (757RR)	0.00	0.00	0.00	0.00	0.33	0.04	0.55	0.06	0.00	0.00	0.00	0.00	0.02	0.00	0.04	0.00
B-767 (767300)	0.00	0.00	0.01	0.00	0.27	0.03	0.38	0.04	0.00	0.00	0.00	0.00	0.02	0.00	0.03	0.00
CRJ, EM4 (CL601)	0.00	0.00	0.00	0.00	1.77	0.19	6.94	0.75	0.00	0.00	0.00	0.00	0.12	0.01	0.46	0.05
Lear, Citation (LEAR35)	0.12	0.01	0.14	0.01	0.24	0.03	0.35	0.04	0.01	0.00	0.01	0.00	0.02	0.00	0.03	0.00
MD-11 (MD11GE)	0.00	0.00	0.01	0.00	0.27	0.03	0.38	0.04	0.00	0.00	0.00	0.00	0.02	0.00	0.03	0.00
MD-80 (MD82)	0.00	0.00	0.03	0.00	1.59	0.17	1.72	0.19	0.00	0.00	0.00	0.00	0.11	0.01	0.12	0.01
Subtotal Jets	0.12	0.01	0.22	0.02	5.58	0.60	14.64	1.57	0.01	0.00	0.02	0.00	0.38	0.04	0.99	0.11
ATR-42 (DHC830)	0.00	0.00	0.30	0.02	1.88	0.12	1.91	0.13	0.00	0.00	0.02	0.00	0.12	0.01	0.13	0.01
C150, C172 (COMSEP)	0.34	0.02	0.38	0.02	0.49	0.03	0.66	0.04	0.02	0.00	0.03	0.00	0.03	0.00	0.04	0.00
Cessna Caravan (CNA441)	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dash 8 (DHC8)	0.00	0.00	0.30	0.02	1.88	0.12	1.91	0.13	0.00	0.00	0.02	0.00	0.12	0.01	0.13	0.01
King Air (DHC6)	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PA31 (BEC58P)	0.13	0.01	0.16	0.01	0.23	0.02	0.48	0.03	0.01	0.00	0.01	0.00	0.02	0.00	0.03	0.00
Rotorcraft	0.03	0.00	0.04	0.00	0.05	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SF3 (SF340)	0.00	0.00	0.30	0.02	1.88	0.12	1.91	0.13	0.00	0.00	0.02	0.00	0.12	0.01	0.13	0.01
SWM (DHC6)	0.00	0.00	0.30	0.02	1.88	0.12	1.91	0.13	0.00	0.00	0.02	0.00	0.12	0.01	0.13	0.01
Subtotal Props	0.50	0.03	1.88	0.12	8.28	0.55	8.86	0.59	0.03	0.00	0.12	0.01	0.54	0.04	0.57	0.04
Total Operations	0.61	0.05	2.10	0.15	13.86	1.15	23.50	2.16	0.04	0.00	0.14	0.01	0.93	0.08	1.56	0.14

Source: Landrum & Brown traffic distributions, based on Airport/Airspace Planning Data, Technical Memorandum, Sections 1 and 3.

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Table II-12
Homestead Regional Airport SEIS
Civilian Departure Operations by Flight Track
Average Daily Itinerant Traffic by Year
MNATE Fix

	East Traffic Flow (Runway 5) Track 05MJ or 05MP								West Traffic Flow (Runway 23) Track 23MJ or 23MP							
	2000		2005		2015		Maximum		2000		2005		2015		Maximum	
Aircraft Types	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
A320 (A320)	0.00	0.00	0.01	0.00	0.67	0.07	2.56	0.28	0.00	0.00	0.00	0.00	0.04	0.00	0.15	0.02
B-727 (727EM2)	0.00	0.00	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B-737/300 (737300)	0.00	0.00	0.01	0.00	0.67	0.07	2.56	0.28	0.00	0.00	0.00	0.00	0.04	0.00	0.15	0.02
B-737-500 (737500)	0.00	0.00	0.01	0.00	0.67	0.07	2.56	0.28	0.00	0.00	0.00	0.00	0.04	0.00	0.15	0.02
B-757 (757RR)	0.00	0.00	0.00	0.00	0.58	0.06	0.98	0.10	0.00	0.00	0.00	0.00	0.04	0.00	0.06	0.01
B-767 (767300)	0.00	0.00	0.01	0.00	0.48	0.05	0.67	0.07	0.00	0.00	0.00	0.00	0.03	0.00	0.04	0.00
CRJ, EM4 (CL601)	0.00	0.00	0.00	0.00	3.14	0.34	12.33	1.32	0.00	0.00	0.00	0.00	0.19	0.02	0.74	0.08
Lear, Citation (LEAR35)	0.21	0.02	0.25	0.03	0.42	0.04	0.63	0.07	0.01	0.00	0.02	0.00	0.03	0.00	0.04	0.00
MD-11 (MD11GE)	0.00	0.00	0.01	0.00	0.48	0.05	0.67	0.07	0.00	0.00	0.00	0.00	0.03	0.00	0.04	0.00
MD-80 (MD82)	0.00	0.00	0.05	0.01	2.82	0.30	3.06	0.33	0.00	0.00	0.00	0.00	0.18	0.02	0.20	0.02
Subtotal Jets	0.21	0.02	0.39	0.04	9.92	1.07	26.03	2.80	0.01	0.00	0.02	0.00	0.61	0.07	1.58	0.17
ATR-42 (DHC830)	0.00	0.00	0.53	0.03	3.34	0.22	3.40	0.22	0.00	0.00	0.03	0.00	0.20	0.01	0.20	0.01
C150, C172 (COMSEP)	0.83	0.06	0.93	0.06	1.22	0.08	1.64	0.11	0.06	0.00	0.06	0.00	0.08	0.00	0.10	0.01
Cessna Caravan (CNA441)	0.00	0.00	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Dash 8 (DHC8)	0.00	0.00	0.53	0.03	3.34	0.22	3.40	0.22	0.00	0.00	0.03	0.00	0.20	0.01	0.20	0.01
King Air (DHC6)	0.00	0.00	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
PA31 (BEC58P)	0.33	0.02	0.40	0.03	0.58	0.04	1.18	0.08	0.02	0.00	0.03	0.00	0.04	0.00	0.08	0.00
Rotorcraft	0.07	0.00	0.08	0.01	0.12	0.01	0.18	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00
SF3 (SF340)	0.00	0.00	0.53	0.03	3.34	0.22	3.40	0.22	0.00	0.00	0.03	0.00	0.20	0.01	0.20	0.01
SWM (DHC6)	0.00	0.00	0.53	0.03	3.34	0.22	3.40	0.22	0.00	0.00	0.03	0.00	0.20	0.01	0.20	0.01
Subtotal Props	1.23	0.08	3.74	0.25	15.27	1.01	16.60	1.10	0.08	0.00	0.23	0.02	0.92	0.06	1.00	0.07
Total Operations	1.44	0.10	4.12	0.29	25.19	2.08	42.63	3.89	0.09	0.01	0.26	0.02	1.53	0.13	2.58	0.24

Source: Landrum & Brown traffic distributions, based on Airport/Airspace Planning Data, Technical Memorandum, Sections 1 and 3.

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Table II-13
Homestead Regional Airport SEIS
Civilian Arrival Operations by Flight Track
Average Daily Itinerant Traffic by Year
WORPP Fix

	East Traffic Flow (Runway 5) Track 05PJ or 05PP								West Traffic Flow (Runway 23) Track 23PJ or 23PP							
	2000		2005		2015		Maximum		2000		2005		2015		Maximum	
Aircraft Types	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
A320 (A320)	0.00	0.00	0.38	0.04	1.04	0.11	5.03	0.54	0.00	0.00	0.03	0.00	0.08	0.01	0.39	0.04
B-727 (727EM2)	0.00	0.00	0.07	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
B-737/300 (737300)	0.00	0.00	0.38	0.04	1.04	0.11	5.03	0.54	0.00	0.00	0.03	0.00	0.08	0.01	0.39	0.04
B-737-500 (737500)	0.00	0.00	0.38	0.04	1.04	0.11	5.03	0.54	0.00	0.00	0.03	0.00	0.08	0.01	0.39	0.04
B-757 (757RR)	0.00	0.00	0.00	0.00	0.97	0.10	3.24	0.35	0.00	0.00	0.00	0.00	0.08	0.01	0.27	0.03
B-767 (767300)	0.00	0.00	0.02	0.00	0.57	0.06	0.84	0.09	0.00	0.00	0.00	0.00	0.05	0.01	0.07	0.01
CRJ, EM4 (CL601)	0.00	0.00	0.00	0.00	0.37	0.04	5.54	0.60	0.00	0.00	0.00	0.00	0.03	0.00	0.43	0.05
Lear, Citation (LEAR35)	0.28	0.03	0.33	0.04	0.56	0.06	0.85	0.09	0.03	0.00	0.03	0.00	0.05	0.01	0.08	0.01
MD-11 (MD11GE)	0.00	0.00	0.02	0.00	0.57	0.06	0.84	0.09	0.00	0.00	0.00	0.00	0.05	0.01	0.07	0.01
MD-80 (MD82)	0.00	0.00	0.43	0.05	3.80	0.41	4.13	0.44	0.00	0.00	0.03	0.00	0.34	0.04	0.37	0.04
Subtotal Jets	0.28	0.03	1.99	0.21	9.97	1.07	30.53	3.28	0.03	0.00	0.16	0.02	0.85	0.09	2.47	0.26
ATR-42 (DHC830)	0.00	0.00	0.02	0.00	0.23	0.01	0.34	0.02	0.00	0.00	0.00	0.00	0.02	0.00	0.03	0.00
C150, C172 (COMSEP)	6.25	0.41	6.92	0.46	9.08	0.60	12.20	0.81	0.53	0.04	0.59	0.04	0.78	0.05	1.05	0.07
Cessna Caravan (CNA441)	0.00	0.00	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Dash 8 (DHC8)	0.00	0.00	0.02	0.00	0.23	0.01	0.34	0.02	0.00	0.00	0.00	0.00	0.02	0.00	0.03	0.00
King Air (DHC6)	0.00	0.00	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
PA31 (BEC58P)	2.42	0.16	2.97	0.20	4.35	0.29	8.84	0.58	0.21	0.01	0.25	0.02	0.38	0.02	0.76	0.05
Rotorcraft	0.47	0.03	0.67	0.04	0.87	0.06	1.32	0.09	0.04	0.00	0.06	0.00	0.08	0.00	0.11	0.01
SF3 (SF340)	0.00	0.00	0.02	0.00	0.23	0.01	0.34	0.02	0.00	0.00	0.00	0.00	0.02	0.00	0.03	0.00
SWM (DHC6)	0.00	0.00	0.02	0.00	0.23	0.01	0.34	0.02	0.00	0.00	0.00	0.00	0.02	0.00	0.03	0.00
Subtotal Props	9.14	0.60	10.92	0.72	15.21	1.01	23.73	1.57	0.78	0.05	0.93	0.06	1.30	0.09	2.03	0.13
Total Operations	9.42	0.63	12.91	0.94	25.18	2.08	54.25	4.85	0.80	0.05	1.09	0.08	2.15	0.18	4.50	0.40

Source: Landrum & Brown traffic distributions, based on Airport/Airspace Planning Data, Technical Memorandum, Sections 1 and 3.

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Table II-14
Homestead Regional Airport SEIS
Civilian Arrival Operations by Flight Track
Average Daily Itinerant Traffic by Year
HEATT Fix

	East Traffic Flow (Runway 5) Track 05TJ or 05TP								West Traffic Flow (Runway 23) Track 23TJ or 23TP							
	2000		2005		2015		Maximum		2000		2005		2015		Maximum	
Aircraft Types	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
A320 (A320)	0.00	0.00	0.51	0.06	1.42	0.15	6.86	0.74	0.00	0.00	0.05	0.01	0.13	0.01	0.63	0.07
B-727 (727EM2)	0.00	0.00	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
B-737/300 (737300)	0.00	0.00	0.51	0.06	1.42	0.15	6.86	0.74	0.00	0.00	0.05	0.01	0.13	0.01	0.63	0.07
B-737-500 (737500)	0.00	0.00	0.51	0.06	1.42	0.15	6.86	0.74	0.00	0.00	0.05	0.01	0.13	0.01	0.63	0.07
B-757 (757RR)	0.00	0.00	0.00	0.00	1.32	0.14	4.42	0.48	0.00	0.00	0.00	0.00	0.14	0.01	0.43	0.05
B-767 (767300)	0.00	0.00	0.02	0.00	0.78	0.08	1.14	0.12	0.00	0.00	0.00	0.00	0.08	0.01	0.12	0.01
CRJ, EM4 (CL601)	0.00	0.00	0.00	0.00	0.50	0.05	7.56	0.81	0.00	0.00	0.00	0.00	0.05	0.00	0.69	0.07
Lear, Citation (LEAR35)	0.38	0.04	0.46	0.05	0.77	0.08	1.16	0.12	0.04	0.00	0.05	0.01	0.08	0.01	0.12	0.01
MD-11 (MD11GE)	0.00	0.00	0.02	0.00	0.78	0.08	1.14	0.12	0.00	0.00	0.00	0.00	0.08	0.01	0.12	0.01
MD-80 (MD82)	0.00	0.00	0.59	0.06	5.18	0.56	5.63	0.60	0.00	0.00	0.06	0.01	0.55	0.06	0.60	0.06
Subtotal Jets	0.38	0.04	2.71	0.29	13.60	1.46	41.63	4.47	0.04	0.00	0.26	0.03	1.36	0.15	3.97	0.43
ATR-42 (DHC830)	0.00	0.00	0.03	0.00	0.31	0.02	0.47	0.03	0.00	0.00	0.00	0.00	0.03	0.00	0.04	0.00
C150, C172 (COMSEP)	8.55	0.56	9.47	0.63	12.43	0.82	16.70	1.10	0.73	0.05	0.82	0.05	1.07	0.07	1.44	0.09
Cessna Caravan (CNA441)	0.00	0.00	0.18	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
Dash 8 (DHC8)	0.00	0.00	0.03	0.00	0.31	0.02	0.47	0.03	0.00	0.00	0.00	0.00	0.03	0.00	0.04	0.00
King Air (DHC6)	0.00	0.00	0.18	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
PA31 (BEC58P)	3.31	0.22	4.07	0.27	5.96	0.39	12.09	0.80	0.28	0.02	0.35	0.02	0.51	0.03	1.04	0.07
Rotorcraft	0.64	0.04	0.91	0.06	1.20	0.08	1.81	0.12	0.06	0.00	0.08	0.00	0.10	0.01	0.16	0.01
SF3 (SF340)	0.00	0.00	0.03	0.00	0.31	0.02	0.46	0.03	0.00	0.00	0.00	0.00	0.03	0.00	0.04	0.00
SWM (DHC6)	0.00	0.00	0.03	0.00	0.31	0.02	0.46	0.03	0.00	0.00	0.00	0.00	0.03	0.00	0.04	0.00
Subtotal Props	12.49	0.83	14.94	0.99	20.82	1.38	32.46	2.15	1.07	0.07	1.29	0.09	1.80	0.12	2.81	0.19
Total Operations	12.88	0.87	17.65	1.28	34.42	2.84	74.09	6.62	1.11	0.08	1.55	0.11	3.16	0.27	6.78	0.61

Source: Landrum & Brown traffic distributions, based on Airport/Airspace Planning Data, Technical Memorandum, Sections 1 and 3.

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Table II-15
Homestead Regional Airport SEIS
Civilian Arrival Operations by Flight Track
Average Daily Itinerant Traffic by Year
JUNUR Fix

	East Traffic Flow (Runway 5) Track 05JJ or 05JP								West Traffic Flow (Runway 23) Track 23JJ or 23JP							
	2000		2005		2015		Maximum		2000		2005		2015		Maximum	
Aircraft Types	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
A320 (A320)	0.00	0.00	0.01	0.00	1.11	0.12	4.22	0.45	0.00	0.00	0.00	0.00	0.10	0.01	0.38	0.04
B-727 (727EM2)	0.00	0.00	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
B-737/300 (737300)	0.00	0.00	0.01	0.00	1.11	0.12	4.22	0.45	0.00	0.00	0.00	0.00	0.10	0.01	0.38	0.04
B-737-500 (737500)	0.00	0.00	0.01	0.00	1.11	0.12	4.22	0.45	0.00	0.00	0.00	0.00	0.10	0.01	0.38	0.04
B-757 (757RR)	0.00	0.00	0.00	0.00	1.07	0.12	1.79	0.19	0.00	0.00	0.00	0.00	0.08	0.01	0.13	0.01
B-767 (767300)	0.00	0.00	0.02	0.00	0.85	0.09	1.21	0.13	0.00	0.00	0.00	0.00	0.07	0.01	0.09	0.01
CRJ, EM4 (CL601)	0.00	0.00	0.00	0.00	5.17	0.56	20.29	2.18	0.00	0.00	0.00	0.00	0.46	0.05	1.81	0.19
Lear, Citation (LEAR35)	0.38	0.04	0.46	0.05	0.77	0.08	1.16	0.12	0.03	0.00	0.03	0.00	0.06	0.01	0.09	0.01
MD-11 (MD11GE)	0.00	0.00	0.02	0.00	0.85	0.09	1.21	0.13	0.00	0.00	0.00	0.00	0.07	0.01	0.09	0.01
MD-80 (MD82)	0.00	0.00	0.09	0.01	5.18	0.56	5.63	0.60	0.00	0.00	0.01	0.00	0.39	0.04	0.42	0.04
Subtotal Jets	0.38	0.04	0.71	0.08	17.21	1.85	43.95	4.72	0.03	0.00	0.05	0.01	1.41	0.15	3.76	0.40
ATR-42 (DHC830)	0.00	0.00	0.87	0.06	5.50	0.36	5.60	0.37	0.00	0.00	0.08	0.01	0.49	0.03	0.50	0.03
C150, C172 (COMSEP)	0.83	0.05	0.91	0.06	1.19	0.08	1.60	0.11	0.08	0.00	0.08	0.00	0.10	0.01	0.14	0.01
Cessna Caravan (CNA441)	0.00	0.00	0.18	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Dash 8 (DHC8)	0.00	0.00	0.87	0.06	5.50	0.36	5.60	0.37	0.00	0.00	0.08	0.01	0.49	0.03	0.50	0.03
King Air (DHC6)	0.00	0.00	0.18	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
PA31 (BEC58P)	0.32	0.02	0.39	0.03	0.57	0.04	1.16	0.08	0.03	0.00	0.04	0.00	0.05	0.00	0.10	0.01
Rotorcraft	0.07	0.00	0.08	0.01	0.11	0.01	0.18	0.01	0.01	0.00	0.01	0.00	0.01	0.00	0.02	0.00
SF3 (SF340)	0.00	0.00	0.87	0.06	5.50	0.36	5.60	0.37	0.00	0.00	0.08	0.01	0.49	0.03	0.50	0.03
SWM (DHC6)	0.00	0.00	0.87	0.06	5.50	0.36	5.60	0.37	0.00	0.00	0.08	0.01	0.49	0.03	0.50	0.03
Subtotal Props	1.21	0.08	5.25	0.35	23.86	1.58	25.34	1.68	0.11	0.01	0.46	0.03	2.12	0.14	2.26	0.15
Total Operations	1.59	0.12	5.97	0.42	41.07	3.43	69.29	6.40	0.14	0.01	0.51	0.04	3.53	0.29	6.02	0.55

Source: Landrum & Brown traffic distributions, based on Airport/Airspace Planning Data, Technical Memorandum, Sections 1 and 3.

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Table II-16
Homestead Regional Airport SEIS
Civilian Arrival Operations by Flight Track
Average Daily Itinerant Traffic by Year
FAMIN Fix

	East Traffic Flow (Runway 5) Track 05FJ or 05FP								West Traffic Flow (Runway 23) Track 23FJ or 23FP							
	2000		2005		2015		Maximum		2000		2005		2015		Maximum	
Aircraft Types	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
A320 (A320)	0.00	0.00	0.01	0.00	0.66	0.07	2.53	0.27	0.00	0.00	0.00	0.00	0.05	0.01	0.20	0.02
B-727 (727EM2)	0.00	0.00	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B-737/300 (737300)	0.00	0.00	0.01	0.00	0.66	0.07	2.53	0.27	0.00	0.00	0.00	0.00	0.05	0.01	0.20	0.02
B-737-500 (737500)	0.00	0.00	0.01	0.00	0.66	0.07	2.53	0.27	0.00	0.00	0.00	0.00	0.05	0.01	0.20	0.02
B-757 (757RR)	0.00	0.00	0.00	0.00	0.64	0.07	1.08	0.12	0.00	0.00	0.00	0.00	0.04	0.00	0.07	0.01
B-767 (767300)	0.00	0.00	0.01	0.00	0.51	0.05	0.72	0.08	0.00	0.00	0.00	0.00	0.04	0.00	0.05	0.01
CRJ, EM4 (CL601)	0.00	0.00	0.00	0.00	3.10	0.33	12.18	1.31	0.00	0.00	0.00	0.00	0.25	0.03	0.97	0.10
Lear, Citation (LEAR35)	0.23	0.02	0.27	0.03	0.46	0.05	0.70	0.07	0.02	0.00	0.02	0.00	0.03	0.00	0.05	0.00
MD-11 (MD11GE)	0.00	0.00	0.01	0.00	0.51	0.05	0.72	0.08	0.00	0.00	0.00	0.00	0.04	0.00	0.05	0.01
MD-80 (MD82)	0.00	0.00	0.05	0.01	3.11	0.33	3.38	0.36	0.00	0.00	0.00	0.00	0.21	0.02	0.23	0.02
Subtotal Jets	0.23	0.02	0.43	0.05	10.32	1.11	26.37	2.83	0.02	0.00	0.03	0.00	0.76	0.08	2.03	0.22
ATR-42 (DHC830)	0.00	0.00	0.52	0.03	3.30	0.22	3.36	0.22	0.00	0.00	0.04	0.00	0.26	0.02	0.27	0.02
C150, C172 (COMSEP)	0.83	0.05	0.91	0.06	1.19	0.08	1.60	0.11	0.08	0.00	0.08	0.00	0.10	0.01	0.14	0.01
Cessna Caravan (CNA441)	0.00	0.00	0.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Dash 8 (DHC8)	0.00	0.00	0.52	0.03	3.30	0.22	3.36	0.22	0.00	0.00	0.04	0.00	0.26	0.02	0.27	0.02
King Air (DHC6)	0.00	0.00	0.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
PA31 (BEC58P)	0.32	0.02	0.39	0.03	0.57	0.04	1.16	0.08	0.03	0.00	0.04	0.00	0.05	0.00	0.10	0.01
Rotorcraft	0.07	0.00	0.08	0.01	0.11	0.01	0.18	0.01	0.01	0.00	0.01	0.00	0.01	0.00	0.02	0.00
SF3 (SF340)	0.00	0.00	0.52	0.03	3.30	0.22	3.36	0.22	0.00	0.00	0.04	0.00	0.26	0.02	0.27	0.02
SWM (DHC6)	0.00	0.00	0.52	0.03	3.30	0.22	3.36	0.22	0.00	0.00	0.04	0.00	0.26	0.02	0.27	0.02
Subtotal Props	1.21	0.08	3.71	0.25	15.07	1.00	16.38	1.08	0.11	0.01	0.30	0.02	1.21	0.08	1.34	0.09
Total Operations	1.44	0.10	4.14	0.29	25.39	2.10	42.76	3.92	0.13	0.01	0.33	0.02	1.97	0.16	3.36	0.31

Source: Landrum & Brown traffic distributions, based on Airport/Airspace Planning Data, Technical Memorandum, Sections 1 and 3.

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Table II-17
Homestead Regional Airport SEIS
Military and Government Existing and Forecast Operations Distribution
Itinerant Operations - Arrivals

	Airport Totals				Daily Arrivals in East Flow (Runway 5 Operations)							Daily Arrivals in West Flow (Runway 23 Operations)							
	Annual	Landing/Takeoff Cycles			NA0X	NA1X	NA2X	NA3X	NA4X	NA5X	NCAX	SA2X	SA4X	SA5X	SA6X	SBAX	EA1X		
Aircraft Types	Activity	24-hour	Day	Night	Day	Day	Day	Day	Day	Day	Day	Day	Day	Day	Day	Day	Day		
F-15	500	1.37	1.37	0.01	0.00	0.00	0.23	1.04	0.00	0.00	0.00	0.09	0.00	0.00	0.02	0.00	0.00	0	0
F-16	3,600	9.86	9.86	0.00	2.02	0.90	0.00	2.13	2.02	2.02	0.00	0.53	0.17	0.08	0.00	0.00	0.00	0.00	0
C-141	52	0.14	0.14	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0	0
C-5	10	0.03	0.03	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0
P-3	500	1.37	1.37	0.00	0.00	1.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0	0
H65	500	1.37	1.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.37	0.00	0	0
PA31	200	0.55	0.55	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0	0
C206	200	0.55	0.55	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0	0
H60	200	0.55	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.53	0	0
C550	200	0.55	0.55	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0	0
Total Operations	5,962	16.33	16.33	0.00	2.02	3.83	0.23	3.17	2.02	2.02	0.02	0.62	0.17	0.33	0.02	1.37	0.53	0.00	0

Table II-18
Homestead Regional Airport SEIS
Military and Government Existing and Forecast Operations Distribution
Itinerant Operations - Departures

	Airport Totals				Daily Departures in East Flow (Runway 5 Operations)						Daily Departures in West Flow (Runway 23 Operations)								
	Annual	Landing/Takeoff Cycles			ND0X	ND1X	ND2X	ND3X	ND4X	NBDX	SD0X	SD1X	SD4X	SD5X	SD6X	SD7X	SD8X	SCDX	WD1X
Aircraft Types	Activity	24-hour	Day	Night	Day	Day	Day	Day	Day	Day	Day	Day	Day	Day	Day	Day	Day	Day	Day
F-15	500	1.37	1.37	0.01	0.99	0.00	0.15	0.00	0.00	0.00	0.05	0.00	0.08	0.10	0.00	0.00	0.00	0.00	0.00
F-16	3,600	9.86	9.86	0.00	3.39	0.06	0.38	0.17	5.08	0.00	0.00	0.00	0.00	0.30	0.44	0.02	0.02	0.00	0.00
C-141	52	0.14	0.14	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
C-5	10	0.03	0.03	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
P-3	500	1.37	1.37	0.00	0.00	0.00	0.00	1.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00
H65	500	1.37	1.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.37	0.00
PA31	200	0.55	0.55	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C206	200	0.55	0.55	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00
H60	200	0.55	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53
C550	200	0.55	0.55	0.00	0.00	0.05	0.00	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00
Total Operations	5,962	16.33	16.33	0.00	4.37	0.61	0.53	2.55	5.08	0.02	0.05	0.05	0.08	0.40	0.44	0.22	0.02	1.37	0.53

Table II-19
Homestead Regional Airport SEIS
Military and Government Existing and Forecast Operations Distribution
Local Operations - Closed Pattern

	Airport Totals				Daily Closed Pattern in East Flow (Runway 5 Operations)						Daily Closed Pattern in West Flow (Runway 23 Operations)			
	Annual	Landing/Takeoff Cycles			NC2	NC4	NC5	NC6	NC7	NC10	SC2	SC4	SC5	SC6
Aircraft Types	Activity	24-hour	Day	Night	Day	Day	Day	Day	Day	Day	Day	Day	Day	Day
F-15	100	0.14	0.14	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00
F-16	4,800	6.58	6.58	0.00	3.09	0.53	0.46	0.99	1.05	0.00	0.26	0.07	0.07	0.07
P-3	500	0.68	0.68	0.00	0.32	0.00	0.00	0.32	0.00	0.00	0.03	0.00	0.00	0.03
H65	500	0.68	0.68	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0.05
PA31	500	0.68	0.68	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00
C206	500	0.68	0.68	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00
H60	500	0.68	0.68	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0.05
C550	500	0.68	0.68	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00
Total Operations	7,900	10.82	10.82	0.00	5.40	0.53	0.46	2.56	1.05	0.00	0.48	0.07	0.07	0.20

Note: Each reported touch and go training or closed pattern operation in closed pattern is counted as two operations for activity counting.

Table II-20
Homestead Regional Airport SEIS
Local General Aviation Forecast Operations Distribution
Local Operations - Closed Pattern

	Daily Closed Pattern in East Flow (Runway 5 Operations)								Daily Closed Pattern in West Flow (Runway 23 Operations)							
	2000		2005		2015		Maximum Use		2000		2005		2015		Maximum Use	
Aircraft Types	NC2	NC6	NC2	NC6	NC2	NC6	NC2	NC6	SC2	SC6	SC2	SC6	SC2	SC6	SC2	SC6
COMSEP (C150, C172)	15.99		16.21		17.55		2.41		1.02		1.03		1.12		0.15	
BEC58P (PA31)	6.49		7.06		8.48		1.75		0.41		0.45		0.54		0.11	
LEAR35 (Lear, Citation)		1.25		1.57		1.75		0.28		0.08		0.10		0.11		0.02
Rotorcraft	1.25		1.31		1.46		0.28		0.08		0.08		0.09		0.02	
Total Operations	23.73	1.25	24.58	1.57	27.49	1.75	4.43	0.28	1.51	0.08	1.57	0.10	1.75	0.11	0.28	0.02

within the vicinity of Homestead or over the national properties. The location of the airports north of Miami International limits the movement of general aviation traffic from those airports to destinations south of Homestead or MIA. Insufficient data was available on the few operations (less than 4,000 annually) that occur at Dade-Collier Airport to project noise patterns there.

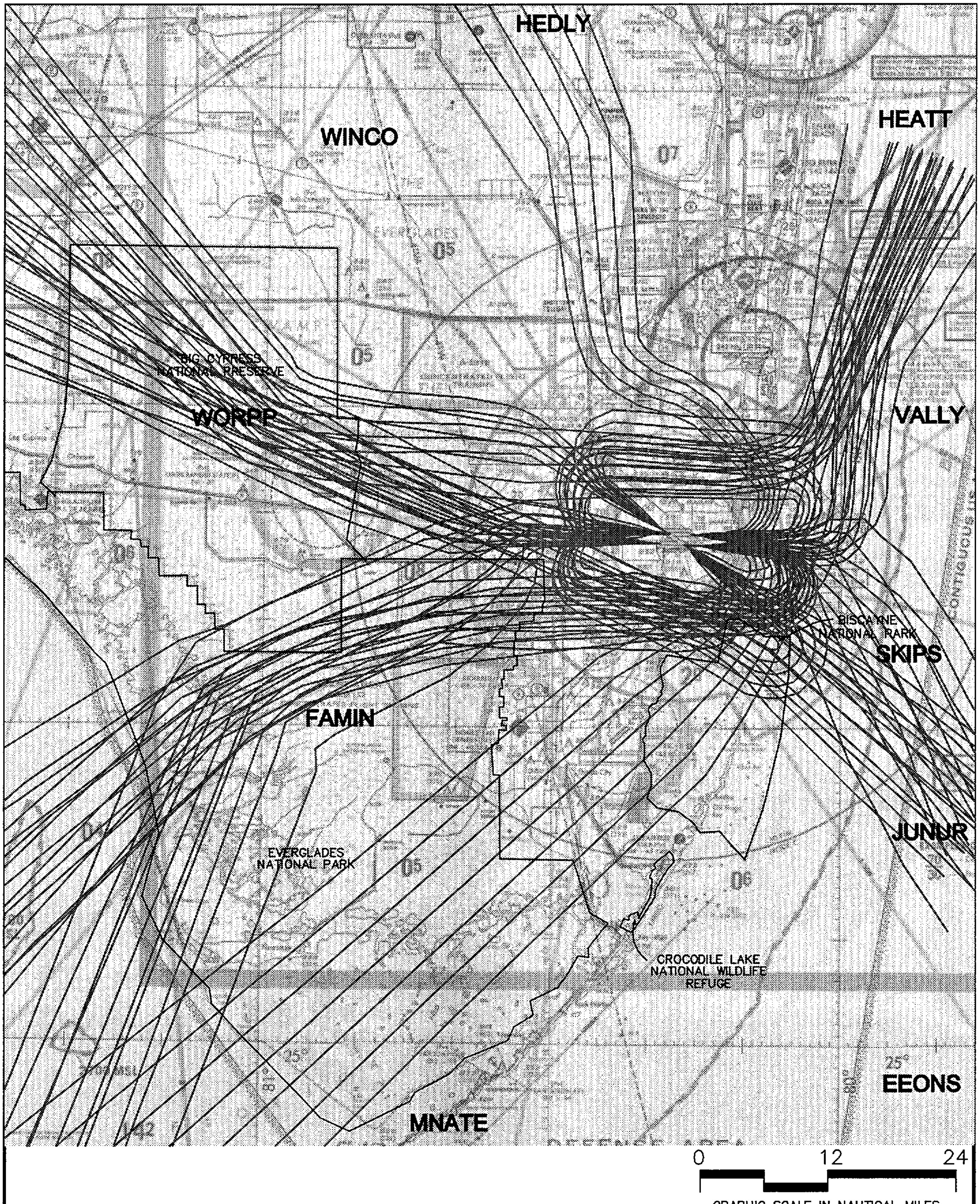
- Miami International Airport (MIA)

Miami International Airport (MIA) is located approximately 20 miles north-northeast of Homestead Regional Airport. It has two primary runways oriented in an east-west direction and a crosswind runway oriented from southeast to northwest. All runways are used by all traffic types. The orientation of the runways and the traffic to/from them sets the baseline of how air traffic is handled in the region. Like a proverbial 800 pound canary, MIA traffic is accommodated and all other traffic is handled to maximize the efficiency and flow at MIA. MIA is the principal scheduled service airport in the south Florida region, with operations totaling more than 575,000 in 1995. Its activity is projected to increase to and stabilize at approximately 735,000 annual operations. The FAA and Dade County prepared an Environmental Impact Statement in 1998 that addressed the anticipated effects of the construction of a fourth runway at MIA. As a portion of that EIS, noise exposure patterns were projected for 1995 (representing current conditions), 2000 and 2005. The INM input files for these conditions were obtained for application to this evaluation for Homestead Regional Airport.

Since the 1995 conditions were accepted as representative of current operations for the 1998 EIS, it was assumed that they would be equally acceptable for application to this evaluation of noise levels in the Homestead area and over the national properties. The year 2000 and 2005 forecast patterns for MIA are used for future activity projections for those years in this evaluation. For years beyond 2005, the MIA Master Plan was used to establish a level of operations for the year 2010 at nearly 735,000 annually. This level is considered to be the service volume for MIA with a three parallel runway configuration and was thus held constant for association with 2015 and Maximum Use One-Runway traffic levels at Homestead Regional Airport. The mix of future operations assumed for the year 2015 and beyond at MIA was consistent with the mix assumptions for the years 2005, except that all aircraft retrofit to meet Stage 3 noise standards and all discontinued lines of Stage 3 aircraft were assumed to be replaced by similar sized aircraft now in production.

Two modifications to the EIS input data were made to improve its use in this evaluation. First, the flight track locations were modified to better reflect the location of aircraft at distances of more than fifteen miles from the airport. Normally, flight paths of 15-miles length are more than adequate for the coverage of noise contour patterns of 65 DNL or more near an airport computed for EIS evaluations. For this evaluation, with its detailed assessment of noise levels over the national parks and preserves, the routes of flight were redeveloped into a simpler processing format, based on extensive radar files for the airport, and extended to pass beyond the affected properties. Operations on the MIA tracks of the EIS were associated to radar based flight tracks from the airport to and beyond the enroute fixes in the region. When this process was completed, the operations that did not pass over or near the national parks and refuges were deleted from the input files for the airport. These two modifications resulted in the evaluation of those aircraft that fly over or near the national properties and along flight routes representative of their actual locations in space. All other components of the EIS input data were maintained as prepared by that EIS consultant.

Exhibits II-12 and II-13 indicate the flight paths used for MIA during this noise analysis. **Table II-21** indicates the number of flights from MIA and other regional airports expected to overfly the various national properties during the existing and four future time frames.



HOMESTEAD SEIS	Landrum&Brown	MIA – ARRIVAL TRACKS	II–12

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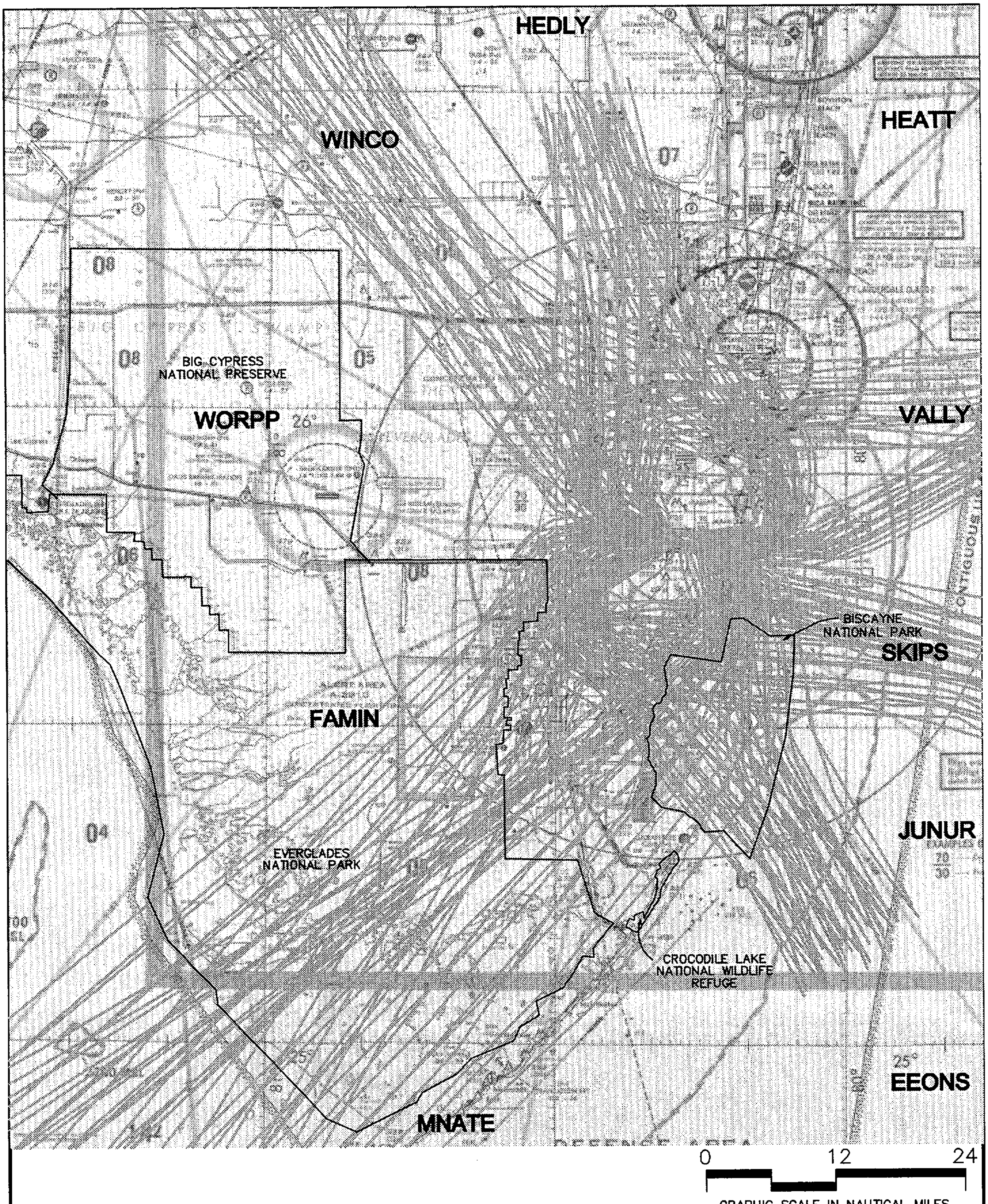

HOMESTEAD SEIS	Landrum&Brown	MIA - DEPARTURE TRACKS	II-13

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Table II-21, Part 1
Existing and Forecast Average Day Overflights
Of National Parks and Wildlife Refuges
In South Florida

BIG CYPRESS OVERFLIGHT SUMMARY

Airport/Aircraft Type	DEPARTURES 1997	2000	2005	2015	Max.	ARRIVALS 1997	2000	2005	2015	Max.
MIA						FAM, WOR				
JETS	0	0	0	0	0	203	169	187	222	222
PROPS	0	0	0	0	0	128	77	80	84	84
MIA TOTAL	0	0	0	0	0	330	246	267	306	306
FLL						FAM, WOR				
JETS	0	0	0	0	0	66	71	80	77	77
PROPS	0	0	0	0	0	50	48	51	72	72
FLL TOTAL	0	0	0	0	0	116	120	131	149	149
TMB	WIN					FAM, WOR				
JETS	1	1	1	1	0	1	1	1	1	2
PROPS	1	1	1	1	2	1	1	1	1	41
TMB TOTAL	2	2	2	3	2	2	2	2	3	43
HST - Civil - Itin	WIN					WOR				
JETS	0	0	2	11	33	0	0	2	12	37
PROPS	0	9	11	15	24	0	11	13	18	27
HST - Civil - Itin TOTAL	0	10	13	26	57	0	11	15	30	64
HST - Mil - Itin										
JETS	0	0	0	0	0	1	1	1	1	1
PROPS	0	0	0	0	0	0	0	0	0	0
HST - Mil - Itin TOTAL	0	0	0	0	0	1	1	1	1	1
HST TOTAL	0	10	13	26	57	1	12	16	31	65

BISCAYNE BAY OVERFLIGHT SUMMARY

Airport/Aircraft Type	DEPARTURES 1997	2000	2005	2015	Max.	ARRIVALS 1997	2000	2005	2015	Max.
MIA	MAN					JUN				
JETS	76	67	73	87	87	1	1	1	1	1
PROPS	20	24	24	26	26	4	4	4	4	4
MIA TOTAL	96	90	98	112	112	4	5	5	5	5
FLL	MAN									
JETS	9	10	11	0	0	0	0	0	0	0
PROPS	5	6	6	1	1	0	0	0	0	0
FLL TOTAL	14	15	17	1	1	0	0	0	0	0
TMB						JUN				
JETS	0	0	0	0	0	0	0	0	0	0
PROPS	0	0	0	0	0	0	0	0	0	0
TMB TOTAL	0	0	0	0	0	0	0	0	0	0
HST - Civil - Itin	VAL, SWM,WIN, HED, ELE					WOR, FAM,HET,JUN				
JETS	0	1	7	50	141	0	1	4	39	108
PROPS	0	8	17	39	41	0	4	9	32	36
HST - Civil - Itin TOTAL	0	9	24	88	182	0	4	13	71	144
HST - Civil - Pattern										
JETS	0	1	2	2	0	–	–	–	–	–
PROPS	0	25	26	29	5	–	–	–	–	–
HST - Civil - Pattern TOTAL	0	27	28	31	5	0	0	0	0	0
HST - Mil - Itin										
JETS	6	6	6	6	6	0	0	0	0	0
PROPS	1	1	1	1	1	0	0	0	0	0
HST - Mil - Itin TOTAL	7	7	7	7	7	1	1	1	1	1
HST - Mil - Pattern										
JETS	7	7	7	7	7	–	–	–	–	–
PROPS	3	3	3	3	3	–	–	–	–	–
HST - Mil - Pattern TOTAL	11	11	11	11	11	0	0	0	0	0
HST TOTAL	18	54	69	137	204	1	5	14	72	145

MIA = Miami International FLL = Fort Lauderdale-Hollywood International
TMB = Kendall Tamiami Airport X51 = Homestead General Airport
HST = Homestead Regional Airport

Sources: MIA and FLL extrapolated and interpolated from INM input files prepared for EIS evaluations at those airports. TMB developed from application of FLL general aviation traffic distributions to TMB traffic forecasts from the Dade County Airports Systems Plan. HST data developed by Landrum & Brown, 1999.

Table II-21, Part 2
Existing and Forecast Average Day Overflights Of National Parks and Wildlife Refuges In South Florida

CROCODILE LAKES OVERFLIGHT SUMMARY

	DEPARTURES					ARRIVALS				
Airport/Aircraft Type	1997	2000	2005	2015	Max.	1997	2000	2005	2015	Max.
MIA	MAN					MAN				
JETS	62	50	54	64	64	1	1	1	1	1
PROPS	0	0	0	0	0	4	4	4	4	4
MIA TOTAL	63	50	55	64	64	4	5	5	5	5
HST - Civil - Itin	MAN, WIN, VAL, HED, ELE									
JETS	0	1	6	42	119	0	0	0	0	0
PROPS	0	0	0	1	1	0	0	0	0	0
HST - Civil - Itin TOTAL	0	1	6	42	120	0	0	0	0	0
HST - Mil - Itin										
JETS	1	1	1	1	1	0	0	0	0	0
PROPS	1	1	1	1	1	0	0	0	0	0
HST - Mil - Itin TOTAL	2	2	2	2	2	0	0	0	0	0
HST TOTAL	2	3	8	44	122	0	0	0	0	0

EVERGLADES OVERFLIGHT SUMMARY

	DEPARTURES					ARRIVALS				
Airport/Aircraft Type	1997	2000	2005	2015	Max.	1997	2000	2005	2015	Max.
MIA	MAN					FAM,MAN				
JETS	79	71	78	92	92	44	58	64	75	75
PROPS	25	29	30	32	32	45	48	50	53	53
MIA TOTAL	104	100	109	124	124	89	106	114	128	128
FLL	MAN					FAM, WOR				
JETS	11	12	13	0	0	13	14	16	0	0
PROPS	11	11	12	7	7	13	13	12	1	1
FLL TOTAL	22	23	25	7	7	26	27	28	1	1
TMB	MAN, WOR					FAM, WOR				
JETS	0	0	0	0	0	1	1	1	2	2
PROPS	2	2	2	2	2	34	35	36	37	44
TMB TOTAL	2	2	2	2	5	35	36	37	39	46
X51	VAL, WOR					VAL, WOR				
JETS	0	0	0	0	0	0	0	0	0	0
PROPS	5	5	6	6	6	5	5	6	6	6
X51 TOTAL	5	5	6	6	6	5	5	6	6	6
HST - Civil - Itin	WIN, MAN, HED, VAL, SWM, ELE					FAM, HET, WOR				
JETS	0	1	5	35	98	0	1	3	24	68
PROPS	0	10	16	32	42	0	26	34	59	84
HST - Civil - Itin TOTAL	0	11	20	67	140	0	27	37	83	152
HST - Civil - Pattern										
JETS	0	1	2	2	0	–	–	–	–	–
PROPS	0	0	0	0	0	–	–	–	–	–
HST - Civil - Pattern TOTAL	0	1	2	2	0	0	0	0	0	0
HST - Mil - Itin										
JETS	0	0	0	0	0	6	6	6	6	6
PROPS	0	0	0	0	0	2	2	2	2	2
HST - Mil - Itin TOTAL	0	0	0	0	0	7	7	7	7	7
HST - Mil - Pattern										
JETS	1	1	1	1	1	–	–	–	–	–
PROPS	2	2	2	2	2	–	–	–	–	–
HST - Mil - Pattern TOTAL	3	3	3	3	3	0	0	0	0	0
HST TOTAL	3	15	25	72	143	7	34	44	91	159

MIA = Miami International FLL = Fort Lauderdale - Hollywood International
TMB = Kendall Tamiami Airport X51 = Homestead General Airport
HST = Homestead Regional Airport

Sources: MIA and FLL extrapolated and interpolated from INM input files prepared for EIS evaluations at those airports. TMB developed from application of FLL general aviation traffic distributions to TMB traffic forecasts from the Dade County Airports Systems Plan. HST data developed by Landrum & Brown, 1999.

- Fort Lauderdale - Hollywood International Airport (FLL)

Fort Lauderdale-Hollywood International Airport (FLL) is located approximately 30 miles north-northeast of Homestead Regional Airport. Traffic to the airport passes over the northern portion of Everglades National Park and Big Cypress National Preserve, while a portion of the outbound traffic passes over the Biscayne and Crocodile Lakes properties. It currently serves the region as a second major air carrier facility with nearly 250,000 operations annually, projected to increase over the next twenty years to 335,000 annually. An EA for a runway extension provides current (1997) and projected (2015) noise contours for the airport. The INM input for these two conditions was obtained from the airport's environmental consultant and used to represent the operations there for the two years. As was the case for MIA, flight operations were assigned to flight paths that did not extend across the national properties. Therefore, the model input was expanded to provide operations along flight corridors indicated by the air traffic radar for the region. Aircraft along varying flight tracks near the airport were consolidated onto a single track leading from each runway end to the corridor taken between that runway and the departure or approach fix serving the airport.

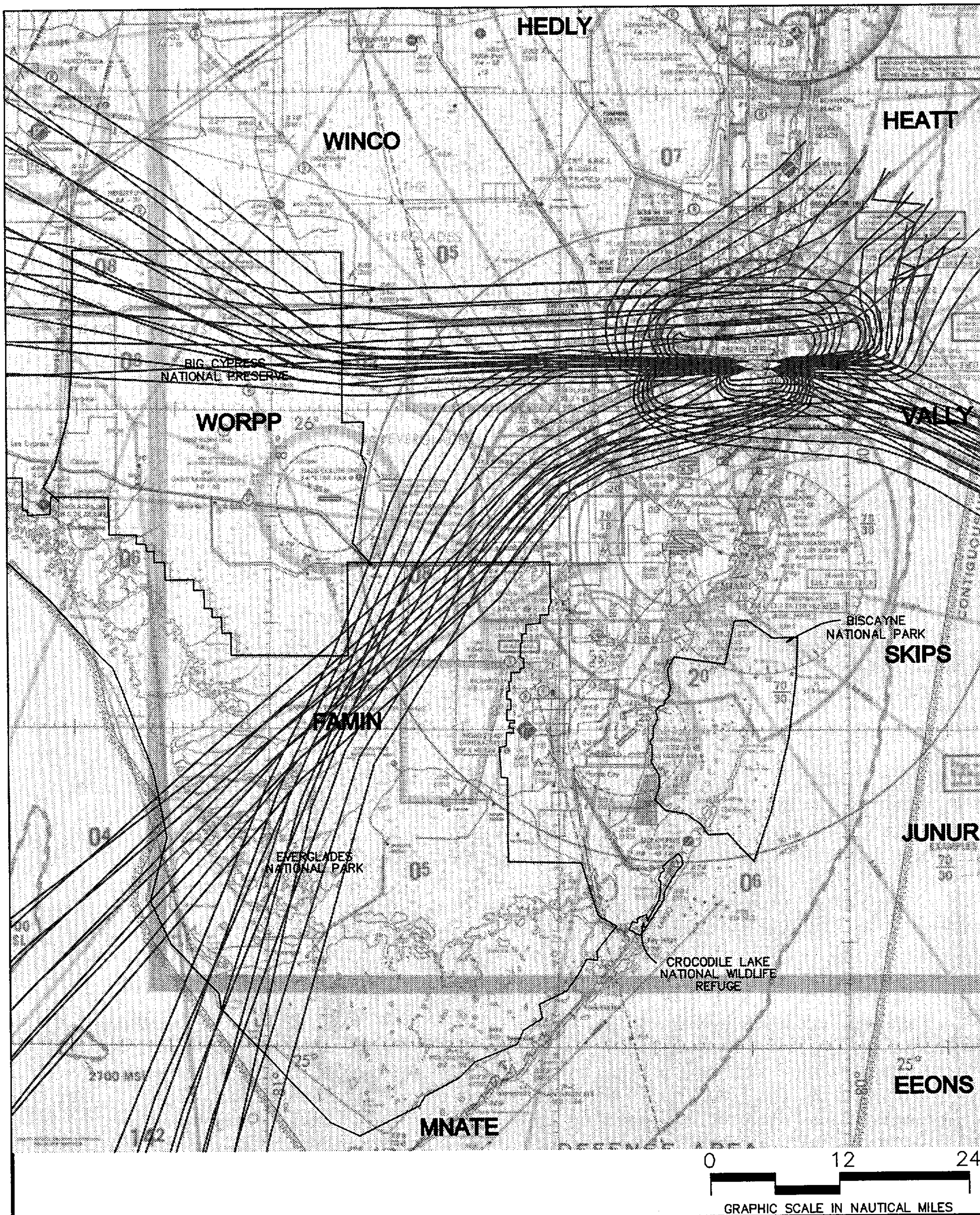
The 1997 traffic level represents the existing condition for the FAA EA, and was assumed to be representative of existing conditions for this SEIS. The future file for 2015 is representative of one of the four future target dates for file was considered. Operations for the year 2015 were assumed to be representative of the maximum use condition at the airport without additional runways, but also assuming the phase out of all retrofit and discontinued lines of Stage 3 aircraft. Operations for the years 2000 and 2005 were developed by straight-line interpolation between 1997 and 2015 activity, by aircraft type, taking into consideration the conversion of Stage 2 aircraft to meet Stage three noise compliance requirements in 2000.

Exhibits II-14 and II-15 indicate the flight paths used for FLL during this noise analysis. **Table II-21** indicates the number of flights from FLL and other regional airports expected to overfly the various national properties during the existing and four future time frames.

- Kendall-Tamiami Executive Airport (TMB)

Kendall-Tamiami Executive Airport is located approximately 10.6 miles north of Homestead Regional Airport, about three miles east of Everglades National Park. Its location near the VFR flyway for small aircraft makes it influential in the noise environment in the immediate vicinity of the eastern Everglades National Park, and affects to some extent the potential in and outbound light propeller traffic at HST. Its principal runways are oriented in an east-west direction, and being so situated, the airport operates in concert with the MIA traffic flows. Previous INM evaluations were not available for the existing time frame, nor were suitable projections of noise exposure patterns available for future activity levels. Therefore, for this SEIS, an assessment of the future noise characteristics and operational characteristics at the airport was developed, based on general operating assumptions and regional flight characteristics.

Existing and future activity levels for each planning horizon were developed based on the forecasts of operations presented in the Dade County Airport Systems Plan.[vii] That forecast presented operations and aircraft mixes based on different assumed levels of activity at the airport. The existing level was based on planning activity level (PAL) of 750,000 annual general aviation operations in the County. The PAL presented as most likely for future operations growth was for 875,000 annual general aviation operations to be attained in the year 2028, and for the level to reach 1,000,000 operations beyond the year 2030. For this study, a straight line interpolation between the level of operations and fleet mix percentages for the present case and the projected 875,000 PAL were conducted to develop activity levels for 2000, 2005 and 2015. The 1,000,000 PAL was assumed to represent the ultimate condition for this assessment. General aviation activity in the County was distributed among all the airports in the County, including MIA and



HOMESTEAD SEIS	Landrum&Brown	FLL - ARRIVAL TRACKS	II-14

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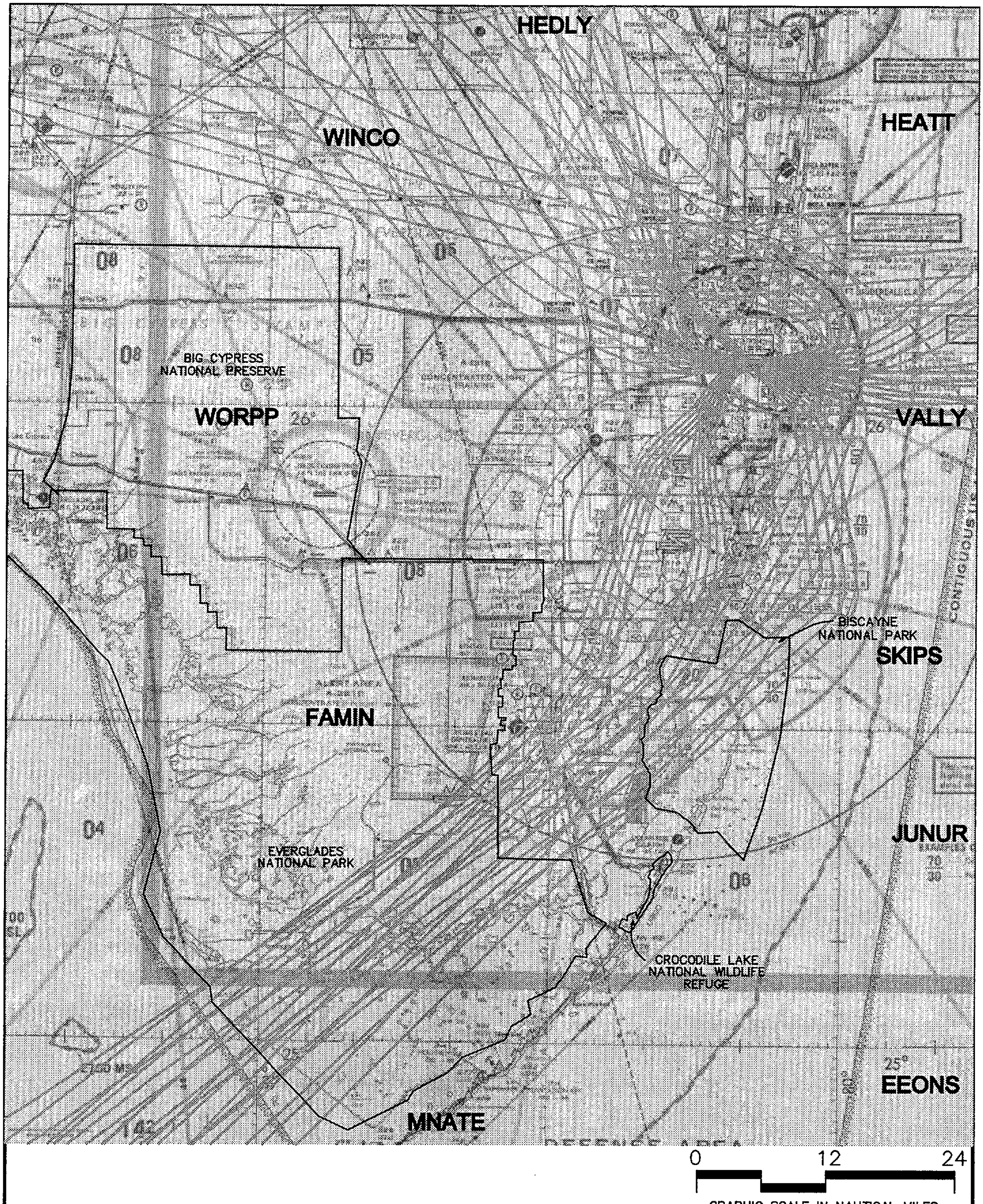

HOMESTEAD SEIS	Landrum&Brown	FLL – DEPARTURE TRACKS	II–15

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HST, and the distribution of itinerant and local operations were projected for each. The mix of aircraft types for existing and future cases were projected, to individual airport. At TMB, the existing condition distribution results in the usage indicated in **Table II-22.**

Table II-22
Existing Average Daily Operations Distribution
Kendall-Tamiami Executive Airport

Aircraft Type	Daily Itinerant Flights	Daily Local Flights	Total Flights
Single-engine Propeller	145.6	346.5	492.2
Twin-engine Propeller	145.4	38.5	183.9
Turboprop	11.4	0.0	11.4
Business jet	9.5	0.0	9.5
Total	311.9	385.0	697.0

Source: 1999 Landrum & Brown assessment of information provided by the Dade County Aviation Systems Plan, 1993.

Flight tracks were developed for the airport, based on tracks indicated on air traffic radar downloaded from Miami TRACON for aircraft using the facility. Runway utilization was assumed to be in accordance with the 90% east flow-10% west flow pattern for the region. Individual aircraft are assumed to operate between the airport and the various approach and departure fixes in accordance with the general aviation flight patterns displayed in Table II-6.

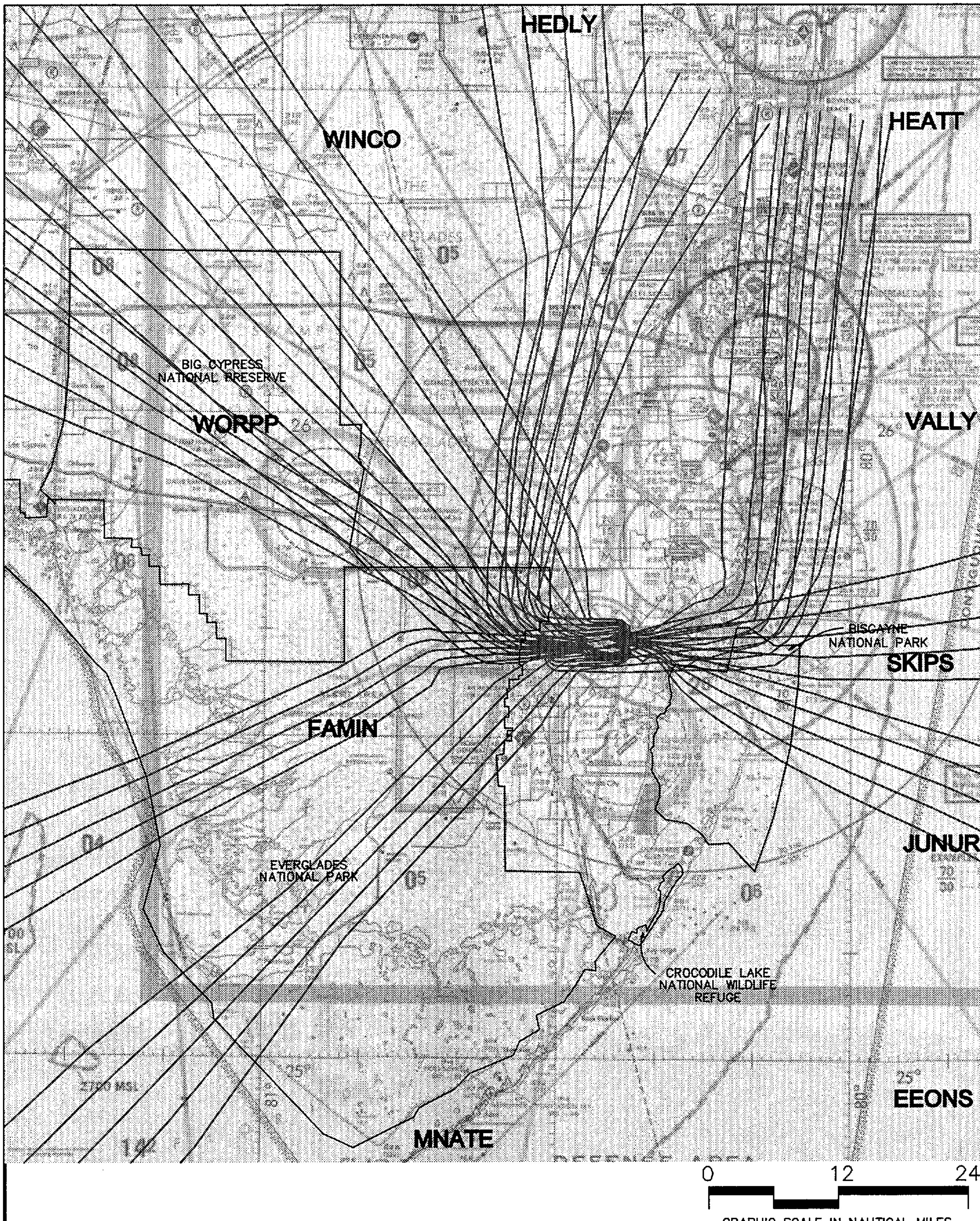
In future years, the number of operations at the facility is expected to increase in accordance with the forecasts. The projected future operations are provided in **Table II-23.** In each case, local operations within the airport traffic pattern account for more than 55% of the total operations, but none of the operations are by turboprop or jet aircraft.

Table II-23
Future Average Daily Operations Distribution
Kendall-Tamiami Executive Airport

Aircraft Type	2000	2005	2015	Ultimate
Single-engine Piston	501.5	519.1	541.2	654.0
Twin-engine Piston	185.5	188.1	192.7	228.8
Turboprop	11.6	11.9	15.3	25.8
Business Jet	9.7	9.9	15.3	20.7
Total	708.2	729.0	764.4	929.3

Source: Landrum & Brown assessment of information provided in Date County Aviation System Plan, 1993.

Exhibits II-16 and II-17 indicate the flight paths used for TMB during this noise analysis. **Table II-21** indicates the number of flights from TMB and other regional airports expected to overfly the various national properties during the existing and four future time frames.



HOMESTEAD SEIS	Landrum&Brown	TMB - ARRIVAL TRACKS	II-16

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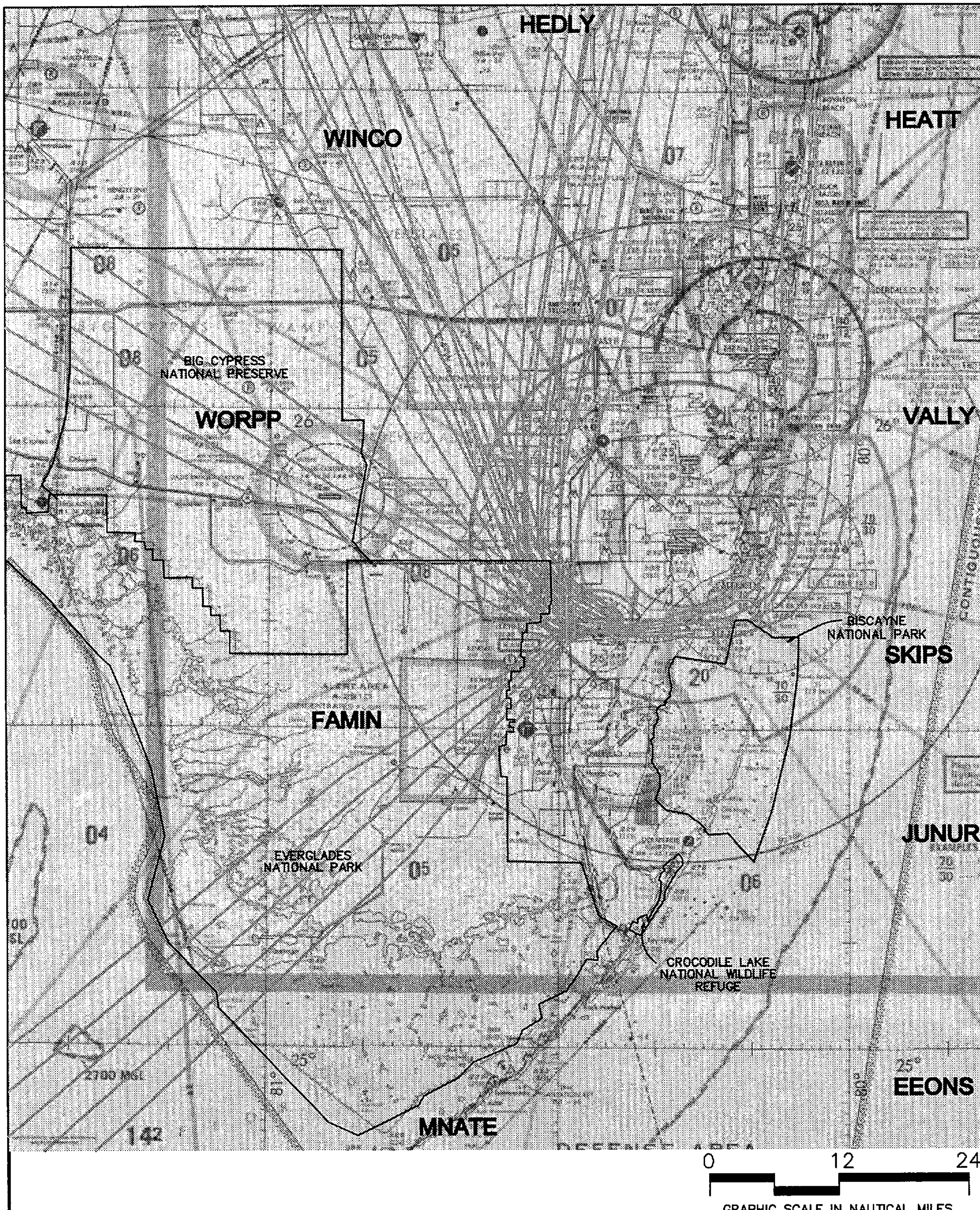

HOMESTEAD SEIS	LandrumBrown	TMB – DEPARTURE TRACKS	II–17

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- Homestead General Aviation Airport (X51)

Homestead General Aviation Airport (X51) is located 9.5 miles directly west of Homestead Regional Airport, and under the VFR flyway along the east side of Everglades National Park. While not a very busy airport in the County system, particularly since Hurricane Andrew destroyed many of the aircraft and facilities based there, the airport is the nearest to Homestead and is adjacent to Everglades National Park. Being so located, there is a potential for interaction between aircraft using the two airports. In contrast to other airports in the region, the longest runway at Homestead General is oriented in a north-south direction, indicating a greater use of that flow for normal operations by itinerant aircraft. The total number of operations at the airport are less than 34,000 annually for existing conditions, growing to approximately 45,000 in the term of the maximum use development cast at Homestead Regional Airport. The average daily operations for the existing case are presented in **Table II-24.**

Table II-24
Existing Daily Operations Distribution
Homestead General Aviation Airport

Aircraft Type	Daily Itinerant Flights	Daily Local Flights	Total Flights
Single-engine Propeller	16.28	63.57	79.85
Twin-engine Propeller	5.12	7.06	12.18
Total	21.40	70.63	92.03

Source: 1999 Landrum & Brown assessment of information provided by the Dade County Aviation Systems Plan, 1993.

Previous noise evaluations are not available for Homestead General Aviation Airport. Therefore, for this SEIS, an assessment of the future noise characteristics and operational characteristics at the airport was developed, based on general operating assumptions and regional flight characteristics. As at TMB, the distribution of general aviation operations at Homestead General was provided by the Dade County Aviation System Plan for both existing and future activity levels. Using the methodology described in the previous section, activity was developed for the four future target years of this evaluation. The average daily operations for future years are presented in **Table II-25**. In all years, the proportion of local operations approximates 77%.

Table II-25
Future Daily Operations Distribution
Homestead General Aviation Airport

Aircraft Type	2000	2005	2015	Ultimate
Single-engine Piston	82.4	86.6	95.0	101.2
Twin-engine Piston	12.6	13.2	14.5	15.4
Total	94.0	99.8	109.5	116.6

Source: Landrum & Brown assessment of information provided in Date County Aviation System Plan, 1993.

Exhibits II-18 and II-19 indicate the flight paths used for X51 during this noise analysis. **Table II-21** indicates the number of flights from X51 and other regional airports expected to overfly the various national properties during the existing and four future time frames.

II.D. Comparison of SEIS Noise Considerations to Previous EIS

This section presents a simple and brief comparison of the noise analysis conducted in this SEIS effort to the noise analysis previously conducted in the Final Environmental Impact Statement (FEIS) for the Disposal and Reuse of Homestead Air Force Base Florida, dated February of 1994. (Note: I proposed deleting Table II-26.) The discussion also presents an explanation of the meaning of the differences between the studies where applicable.

II.D.1. Area of Evaluation

The noise analysis in the previous FEIS primarily focused on the area near the airport within 10 to 15 Nautical Miles. At the request of the National Park Service, the SEIS expand the geographic area covered by the noise analysis to include the Department of Interior properties in the vicinity of Homestead. The detailed noise modeling extends from the northern boundary of Big Cypress National Preserve to the southern boundary of Everglades National Park. To the west the detailed modeling extends from the western boundary of Everglades National Park near Everglades City to beyond the eastern boundary of Biscayne National Park.

II.D.2. Other Airports

The previous FEIS noise analysis evaluated aircraft noise associated with operations at Homestead. The SEIS noise analysis includes air traffic using Miami International Airport, Ft. Lauderdale-Hollywood International Airport, Kendall-Tamiami Executive airport, and the Homestead General Airport to the extent such traffic overflys the national properties and may contribute to cumulative noise effects. This analysis has also been added at the request of the National Park Service.

II.D.3.Field Noise Measurements

The previous FEIS noise analysis included no field noise measurements in the vicinity of Homestead. The SEIS includes field measurements by FAA and NPS consultants in the national properties.

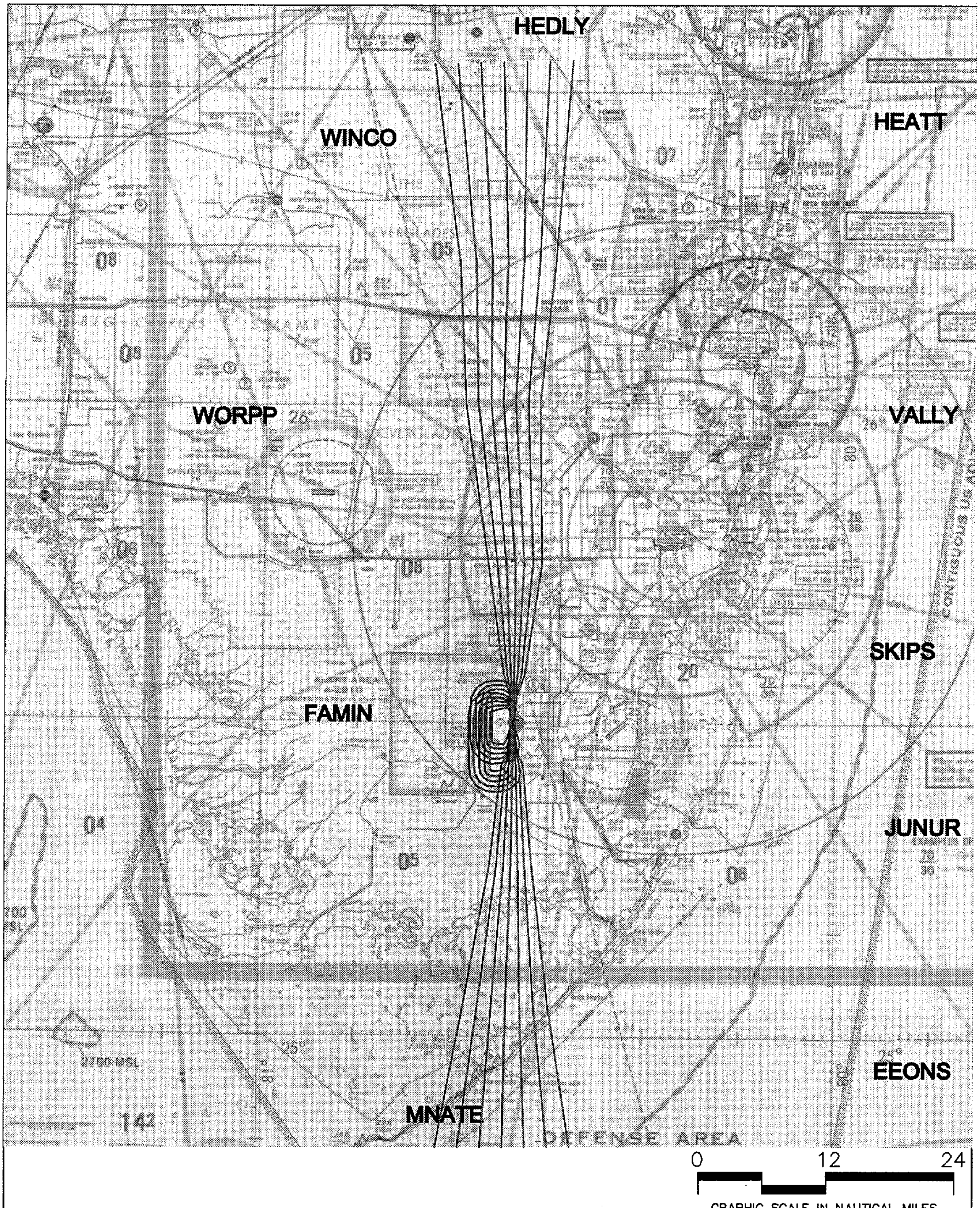
II.D.4. Noise contours

Both the previous FEIS and the current SEIS present the DNL noise contours for each of the scenarios in the respective studies. Both present the 65, 70, and 75 DNL noise contours for each case. The FEIS also presented the 80 and 85 DNL noise contours as was customary in the 1988 Air Force AICUZ study. The SEIS includes the DNL 60 contour.

The SEIS also presents typical Sound Exposure Level (SEL) contours for a single departure and single arrival of several aircraft that are forecast to use Homestead if a commercial airport is developed.

II.D.5. Additional Noise Metrics

The previous FEIS noise analysis primarily focused on the use of the DNL noise metric for the evaluation. The analysis was supplemented with some SEL evaluation at a limited number of grid points. The SEIS noise analysis includes five metrics—DNL, SEL, LAmax, Leq(h), and TA.



HOMESTEAD SEIS	LandrumBrown	X51- ARRIVAL & PATTERN TRACKS	EXHIBIT II-18

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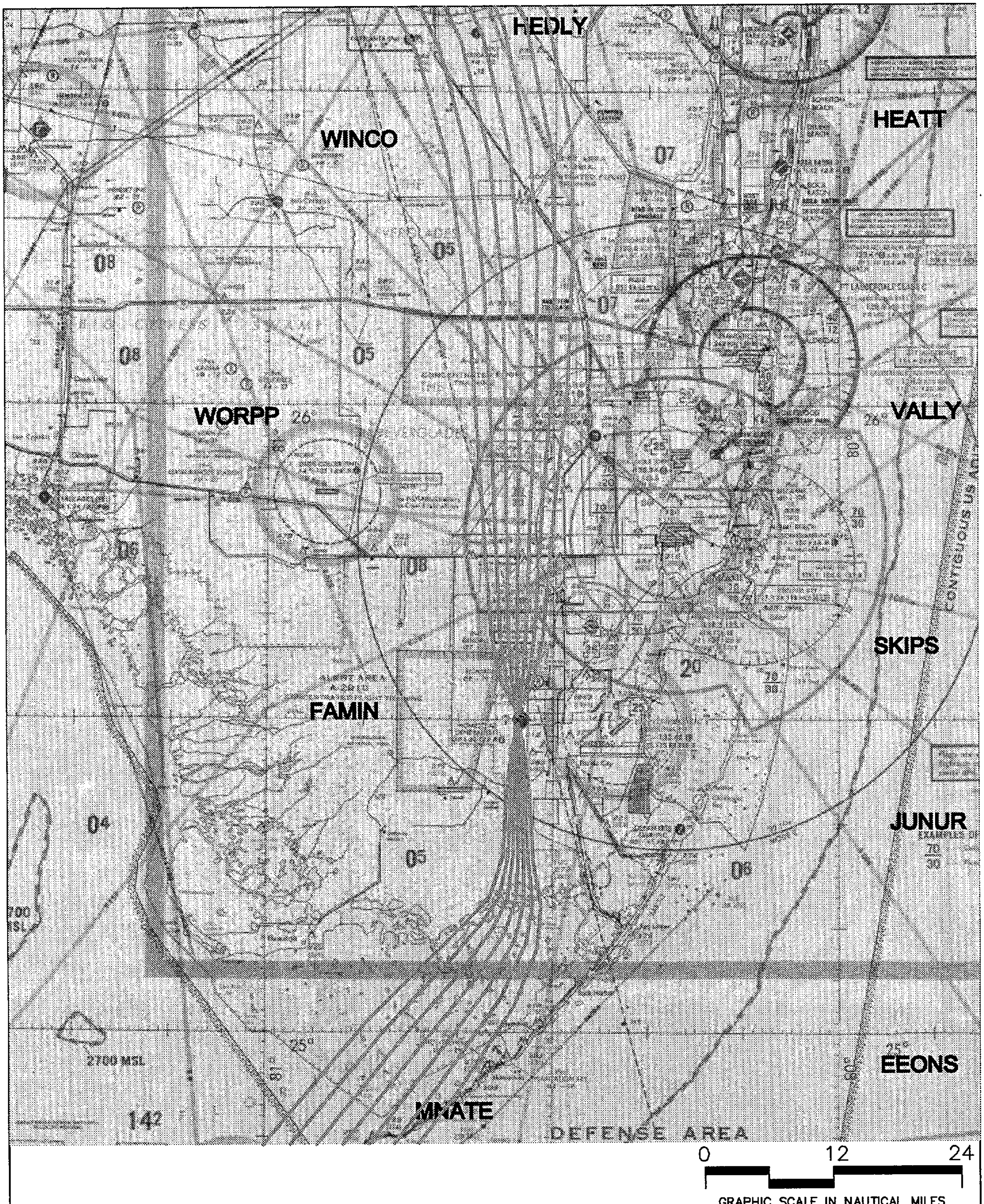

HOMESTEAD SEIS	LandrumBrown	X51- DEPARTURE TRACKS	EXHIBIT II-19

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II.D.6. Grid Point Analysis

The FEIS presented specific noise analysis at eight noise sensitive points located within approximately 5 miles of the airfield. These points were primarily existing residential locations with one school site and one planned multifamily housing site. The FEIS presented typical SEL over-flight values at each site for several of the noisiest aircraft that were typical in the Proposed Action scenario. The FEIS also presented SEL data for a point in Everglades National Park and for another point in Biscayne National Park. SEL data for the most common jet aircraft were presented for these points.

The SEIS presents extensive grid point analysis that includes community grid points as well as more than 430 individual grid points located within or adjacent to the various national properties in southern Florida, including several sites in Biscayne Bay selected for their unique biotic characteristics. The analysis evaluates four different noise metrics for each point including DNL, peak daily SEL, maximum sound level (LAmax), and peak hour average sound level (Leq(h). In addition, for all points except those in Big Cypress and fringe locations where ambient mapping data is not available, the time above the ambient noise level is evaluated. Chapter IV presents a detailed description of this analysis.

II.D.7. Computer Model

A computer noise model was the primary tool used in the noise analysis for both the FEIS study and this SEIS study. The FEIS used the NOISEMAP version 6.1 noise model for that analysis. NOISEMAP is the standard noise model used by the Air Force for the evaluation of noise impacts around air bases. It also incorporates the civilian aircraft database utilized by the FAA's INM. In the period since the completion of the FEIS, the FAA has made upgrades and enhancements to the INM software. The latest INM Version 5.2 database contains all NOISEMAP military aircraft.

Additionally, the INM V5.2a was modified with several enhancements specifically for the Homestead SEIS effort. These modifications, which were discussed in earlier sections of this chapter, include a more detailed and refined database of noise information for the aircraft in the model, the addition of the ability to consider sound propagation over hard ground (water) as well as the traditional soft ground (grassy field), and the inclusion of an underlying ambient noise level database for the National Parks and Crocodile Lakes NWR. It should be noted that these enhancements were not available in either NOISEMAP or the INM at the time of the FEIS study.

II.D.8. Baseline Operations

The previous FEIS study was conducted in 1993 and concluded in early 1994. That study used projected 1994 operations at Homestead as the baseline case. The 1994 annual operations for that analysis were estimated to be some 39,310 operations that would be conducted by the remaining military and U.S. Customs tenants at the facility. These operations numbers were developed based on actual activity in conjunction with several anticipated missions for the Homestead Air Reserve Base. The FEIS study also referenced the 1987 noise contours as part of the historic noise conditions around the airfield.

This SEIS study uses 1997 operations at Homestead as the basis for establishing a baseline current condition and future No Action conditions. These operations total some estimated 19,824 annual operations by the current military and U.S. Customs tenants at the facility. This is nearly a 50% reduction in military and government usage of the facility over what was projected in the FEIS. This reduction in military and government operational levels is a result of the fact that a number of the missions that were anticipated to move to Homestead in the FEIS never materialized. Furthermore, since the FEIS, more current and detailed information has become available for the Air Force and U.S. Customs operations at Homestead. Also, the Office of Air Force Reserve and the U.S. Customs Service are both projecting a steady level of operations at Homestead for the future, rather than the growth that was anticipated at the time of the FEIS study.

II.D.9. Future Operations

The FEIS study, completed in 1994, projected operational levels for three future conditions at Homestead. These scenarios were for the years 1999, 2004, and 2014 and were based on the analysis conducted in the Homestead Air Force Base Feasibility Study and Master Plan. (Dade County's Master Plan for Homestead was still in draft form at the time of the FEIS preparation and was completed in late 1994 after the FEIS was completed.) The analysis available at the time of the FEIS projected that operations at Homestead would increase to 160,430 by 1999. General aviation aircraft would conduct the majority of the 1999 activity, with a small number of aircraft maintenance related operations. The military and government operational levels were expected to remain constant at the 1994 levels in 1999. The addition of Air Carrier, Commuter, and Cargo service at Homestead was expected to bring annual operations up to 219,780 by 2004. While most (66%) of these operations were expected to be in the General Aviation category, the Air Carrier, Commuter, and Cargo development was expected to represent some 15% of the activity at the facility. The military and government traffic for 2004 was expected to remain constant at the 1994 levels. In 2014 the FEIS projected some 246,500 annual operations at Homestead with percentage assignments to the various categories similar to the 2004 breakdown. The military and government percentage of the 2014 estimate operations was reduced slightly, as the actual operations in this category were expected to remain constant at the 1994 levels.

The current SEIS analysis presents Homestead operations projections for the years 2000, 2005, 2015, and for a maximum single runway operational configuration in the distant future. Like the FEIS, the SEIS projects that the military and government traffic will remain constant throughout the future years of analysis, albeit at the much lower 1999 projected levels. Furthermore, the SEIS traffic projections range from 40% to 65% lower than the FEIS in similar future years. This reduction in anticipated future operations is primarily due to the delays in the development of Homestead as a commercial airport and the development of a more conservative forecast of anticipated General Aviation operations. In 2000, the SEIS projects that there could be some 60,650 annual operations at Homestead, while the FEIS originally projected some 160,000 annual operations by 1999. The primary difference in these projections is in the General Aviation category, with some differences also attributable to the different underlying military and government operations levels. The SEIS forecasts that by 2005, Homestead is estimated to accommodate some 74,600 annual operations. The FEIS, on the other hand, projected nearly three times as many operations in 2004, at 219,000 annual operations. Once again, much of the difference is in the projections for the General Aviation traffic. The SEIS also is anticipating slower (delayed) development of commercial operations. In 2015, the SEIS projects total operations at Homestead to reach nearly 150,000 annual operations. In contrast, the FEIS document projected that Homestead operations would exceed 245,000 by the year 2014. In the post-2014 cases, the SEIS projects substantially more commercial passenger and cargo traffic at Homestead than the FEIS, but less general aviation and military/government traffic.

II.D.10. Fleet Mix

Generally, the previous FEIS and this SEIS utilize a similar fleet mix for the baseline conditions which are exclusively military and U.S. Customs operations. In both cases the F-16 is the predominant aircraft from an operational standpoint, as well as from a noise generation perspective. In both studies the military and U.S. Customs fleet mix remains constant throughout the future years. While subtle differences in the military/government fleet mix are evident between the FEIS and this SEIS study, it should be noted that both fleets are similar enough that no appreciable difference noise generation would be evident. The key to the differences between the FEIS and this SEIS is the number of annual operations assigned to the military/government fleet as discussed in the previous paragraphs.

In scenarios where commercial operations are anticipated, the FEIS utilizes a relatively simple fleet mix for the future conditions noise analysis. The SEIS has built on that foundation with the development of a more detailed fleet mix based on current industry trends and the commercial traffic fleets accommodated at other commercial airports in the south Florida region. Once again, however, the additional fleet mix detail in this SEIS only provides an incremental improvement in noise prediction accuracy over the FEIS analysis. The differences in the number of operations of the various aviation components discussed in the previous paragraphs is the key factor in any notable noise output difference between the FEIS and SEIS studies. As Homestead is assumed to develop as a commercial service airport in future years, the SEIS assumes a higher percentage of larger commercial aircraft and a lower percentage of smaller general aviation aircraft at the airport than did the FEIS.

II.D.11. Flight Tracks

The FEIS noise modeling effort primarily relied on flight track definitions that were developed in the 1988 AICUZ Study for Homestead Air Force Base for the baseline military and government operations at Homestead, as well as the future commercial operations investigated in the FEIS. In general, these flight tracks were defined in detail in an area near the airport. This area of detailed flight tracks ranged to approximately 10 to 15 nautical miles from the airfield. At this point all of the flight tracks were modeled to extend straight some 50 nautical miles. The flight tracks developed for the SEIS provide considerably more detail that is retained for a large distance from Homestead. All of the flight tracks developed for this analysis extend some 30 to 50 nautical miles from Homestead along detailed routes. Additionally, the SEIS flight tracks include a nominal dispersion of air traffic around each primary flight corridor. This dispersion more realistically represents the typical usage of a given flight route as aircraft fly along a corridor in space rather than along a specific defined line of flight.

The military flight tracks used in the FEIS were used in the SEIS analysis with some modification. Generally, flight track dispersion was added to the military arrival and departure routes along with more detail at greater distances from Homestead. These details were developed through extensive coordination with the Miami TRACON staff. These refinements often resulted in changes in the military routes modeled at distances greater than 10 nautical miles from Homestead. These refinements were needed to evaluate low level noise at substantial distances from the airport to cover all national properties evaluated.

The civilian and commercial flight tracks used in this SEIS analysis were also developed through the coordination process with the Miami TRACON staff. That process included a review of a sample of actual radar flight tracks in the southern Florida airspace area in conjunction with a review of Miami TRACON procedures.

The FEIS noise modeling assumed straight-out departures to the northeast that were adjusted in the SEIS to recognize airspace constraints. These constraints are a result of established departure and arrival routes, located east of Homestead, to and from Miami International and Ft. Lauderdale-Hollywood International Airports. The flight tracks developed for the SEIS account for these constraints and assign the future civil and commercial traffic to flight routes based on the best estimations of potential destinations to be served from Homestead.

Finally, the SEIS analysis includes extensive and detailed flight tracks from four other airports in the region. These tracks were developed from a sample of actual radar data from the south Florida airspace region.

II.D.12. Aircraft Profiles

The departure and arrival profiles for military aircraft utilized in the FEIS noise analysis were based on profiles developed in the 1988 Air Force AICUZ study for Homestead. These profiles were custom developed based on the actual military flight procedures utilized at the air base in 1988 and provide a reasonable basis for noise modeling. These same profiles were converted from the NOISEMAP software format to the current INM format and used in this SEIS analysis. The use of these profiles for the SEIS analysis was coordinated with the Air Force Reserve staff at Homestead.

The FEIS noise analysis utilized the standard default INM arrival and departure profiles for the modeling of the civil and commercial aircraft. While this is adequate for the simulation of aircraft operations within 10 miles of the airport, these profiles do not reflect the air traffic control procedures that would inevitably affect the profiles of arriving or departing aircraft at greater distances (10-50 NM) from Homestead. Additionally, the INM standard profiles used in the FEIS limit aircraft to an altitude of 10,000 feet AGL, which does not extend far enough for the evaluation of the noise exposure at great distances from Homestead over the national properties requested by the National Park Service.

The noise analysis for the SEIS incorporates custom arrival and departure profiles for each civil and commercial aircraft in the future fleet mix for Homestead. These profiles were developed based on individual flight routes and identified air traffic control procedures so that any climb or descent restrictions that may be required at various distances from Homestead can be included in the modeling. In addition, the arrival and departure profiles were extended beyond the INM default altitude of 10,000 feet above ground level (AGL) to a minimum of 18,000 feet AGL. This facilitates more accurate modeling of aircraft as they traverse flight routes at some 30 to 50 Nautical Miles from Homestead.

II.D.13. Noise Mitigation Alternatives

Noise mitigation alternatives were qualitatively discussed in the FEIS. The FEIS did not undertake any quantitative analysis of noise mitigation measures

The SEIS provides a detailed evaluation of three flight track alternatives for noise mitigation in the national parks, refuge, and preserve. This analysis includes a complete quantitative noise analysis including all grid points and additional noise metrics.

\[i] U.S. Department of Transportation, John A. Volpe Transportation Systems Center, Draft Final Report, *Characterization of Ambient Sound Levels at Four Southern Florida National Properties,* January, 1999. Appendix D of this document details the modifications to the Integrated Noise Model for the Homestead SEIS project.
\[ii] The protocols and results of the noise measurement program are reported in detail in *Characterization of Ambient Sound Levels at Four Southern Florida National Properties*
\[iii] United States Air Force Reserve, *Draft Air Installation Compatible Use Zone (AICUZ) Study, Volume I & II, Homestead Air Reserve Base, Florida*, 1997
\[iv] Flight track locations and their relationship to the movement of traffic throughout the south Florida region are addressed in the Airport Planning Data Technical Report, July 1999, by Landrum & Brown.
\[v] 1988 NOISEMAP digital input files provided by Air Force Systems Command, Langley, Virginia. NOISEMAP is a computer model that is used at military facilities to produce noise contours and dispersion patterns. It is the military equivalent of the INM. NOISEMAP aircraft data is incorporated into the INM databases.
\[vi] INM runs of the No Action condition were conducted to assure that the resultant noise contours adequately matched the noise contour output for the NOISEMAP files. Where appropriate, iterative adjustments to the profile data were made to provide a better fit of the noise contours between the two models.
\[vii] PB Avplan, *Dade County Aviation System Plan*, produced for Dade County Department of Airports, 1993.

Chapter III
Aircraft Noise Exposure Contours

Based on the INM input information provided in Section II Methodology, noise exposure contours using the Day Night Average Sound Level (DNL) methodology were developed for existing, future no action and future proposed action conditions. Additionally, to assist SEIS reviewers in understanding the general composition of the noise exposure contours and to provide more information about the noise of individual aircraft expected to use Homestead, noise footprints for six aircraft types considered to be most critical to the overall noise contours are presented and discussed.

III.A. Noise Exposure (DNL) Contours - Existing Conditions

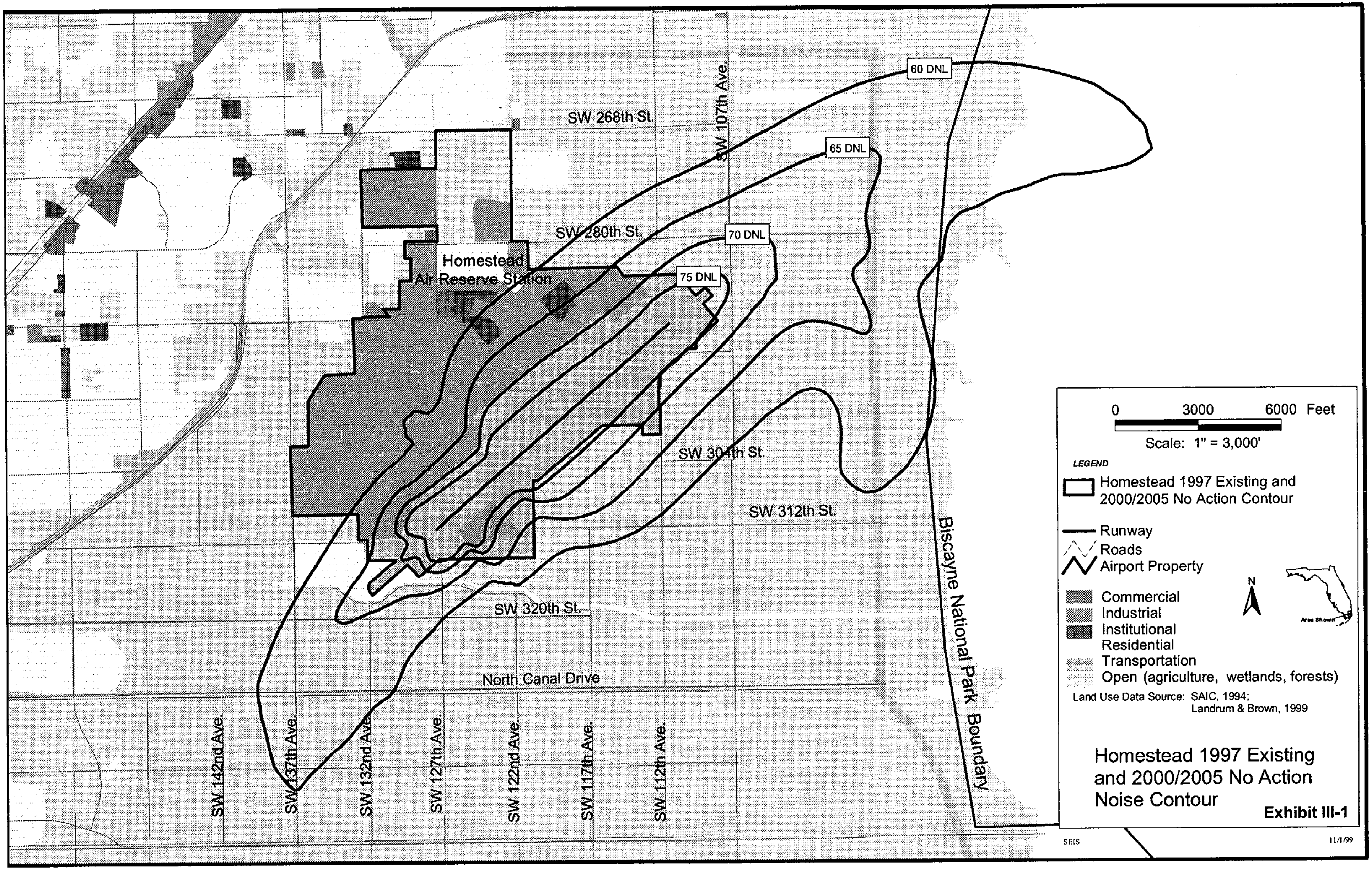
Operations present at the airport during 1997 comprise the existing condition for noise assessment purposes. Based upon the data described under Chapter II Methodology, noise contours of 60, 65, 70 and 75 DNL were computed for the existing condition. These are presented on **Exhibit III-1.** These contours include 6,458 acres within their extents. The area within each contour is presented in **Table III-1.**

Table III-1
Area of Noise Exposure in Acres
Existing Conditions

Noise Level	Off-Airport Area	On- Airport Area	Total Area
60-65 DNL	3,322	390	3,712
65-70 DNL	1,062	372	1,434
70-75 DNL	301	300	602
75+ DNL	45	666	710
Total Above 60	4,730	1,728	6,458

Source: Landrum & Brown, 1999.

The majority of the noise contour is located to the northeast of the airport, reflecting the predominant traffic flow. The 75 DNL contour remains almost entirely over airport lands, passing beyond the airport boundary by only about 1,300 feet to the northeast, reaching east to SW 107th Avenue, yet remains entirely over land uses that are compatible with high noise levels. To the south, the 75 DNL contour passes just beyond the airport boundary adjacent to the runway. The 70 DNL contour is similar in shape, but larger than the 75 DNL contour. It extends northeastward approximately 2,000 feet further than the 75 DNL contour to SW 280th Street, but remains almost entirely over airport property to the southwest. Along its southern portion, the contour includes an area adjacent to the airport that is devoted to agricultural use. The 65 DNL contour extends approximately 1.6 miles northeast of the airport, ending at SW 97th Avenue. The bulges and hook in the contour shape are indicative of the locations of turns along flight paths flown by military aircraft in either departure or closed pattern approach modes. To the southwest, the 65 DNL reaches slightly more than one-half mile off the airport along the extended centerline of the final approach, reaching SW 320th Street. The 60 DNL contour extends from beyond North Canal Drive in the southwest to over Biscayne Bay in the northeast, crossing the boundary into Biscayne National Park. It includes a southward turning hook associated with departures and pattern operations by military jets in northeast traffic flow and a southward bend at the west end of the contour associated with similar operations in southwest traffic flow.



Homestead 1997 Existing and 2000/2005 No Action Noise Contour

Exhibit III-1

III.B. Noise Exposure (DNL) Contours - Future No Action Conditions

The future noise exposure without the proposed action constitutes the basis against which the potential impacts of the proposed action are evaluated. The difference between the two noise contour patterns, for any one year, will be the result of the additional traffic associated with the development of Homestead as a civil airport. This comparison applies to the contour analyses presented here and to grid point analyses presented in a subsequent Chapter of this report.

The DNL contours of the future No Action condition at the airport for the years 2000 and 2005 are identical to the contours for the existing condition. There is no change to the way aircraft are expected to fly or to the anticipated fleet mix and number of operations of the military and government aircraft that are expected to continue to operate from Homestead under any future circumstance. Consequently, the contours in Exhibit III-2 are applicable to the Future No Action Conditions for the first two future years evaluated.

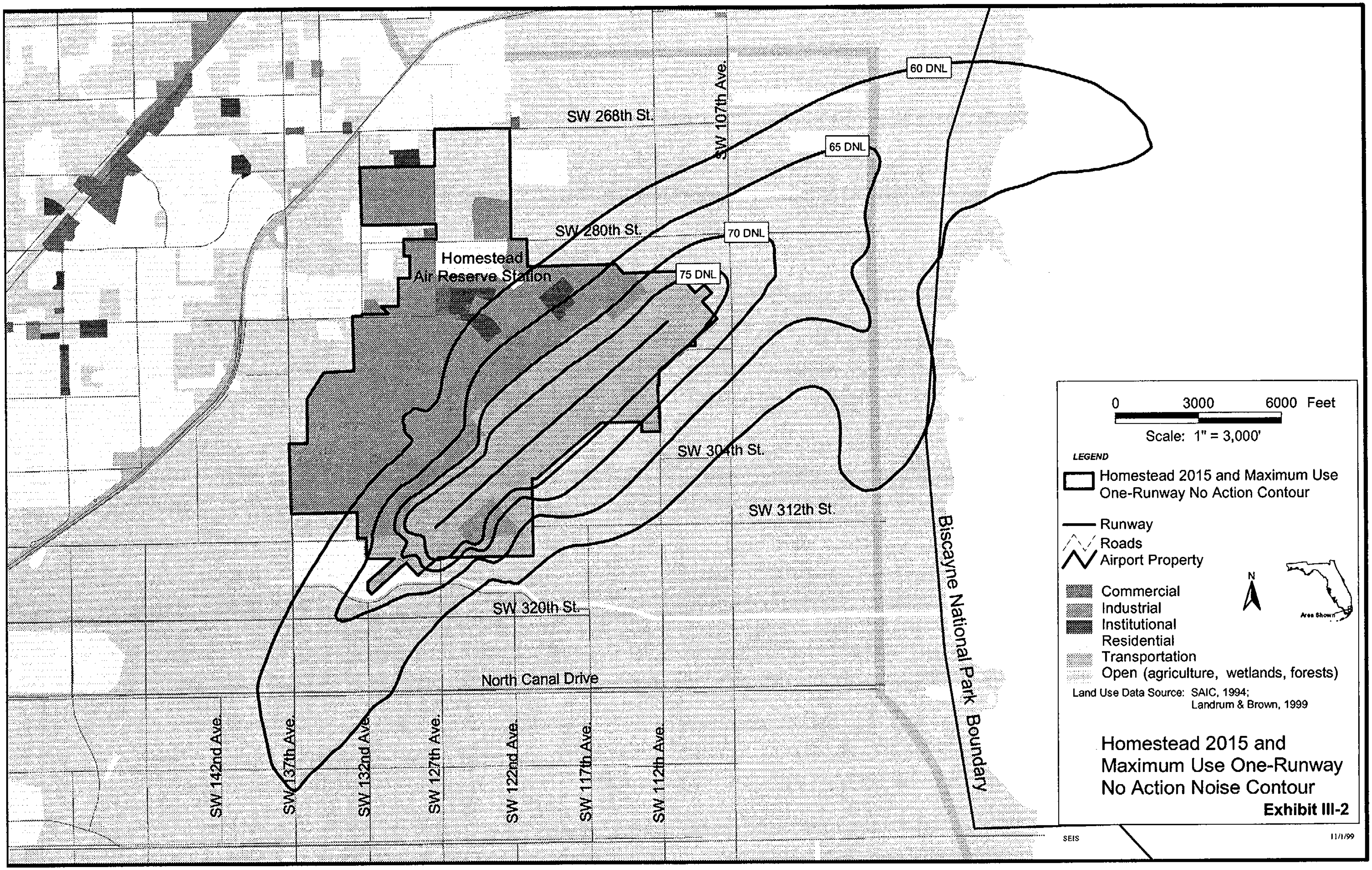
By 2015, a single change is forecast for the military fleet based at Homestead. That is the replacement of the C-141 transient transport aircraft with C-17 transport aircraft. All other conditions are currently projected to remain the same for that year. The no action condition for the year of potential maximum development of the airport as a one-runway civilian facility is the same as the 2015 no action condition. The small change in 2015 and the maximum year from the earlier years has virtually no effect on the resultant noise contours presented in **Exhibit III-2**. The areas within each contour band of the future no action conditions are virtually identical to the areas within the contours of the existing condition.

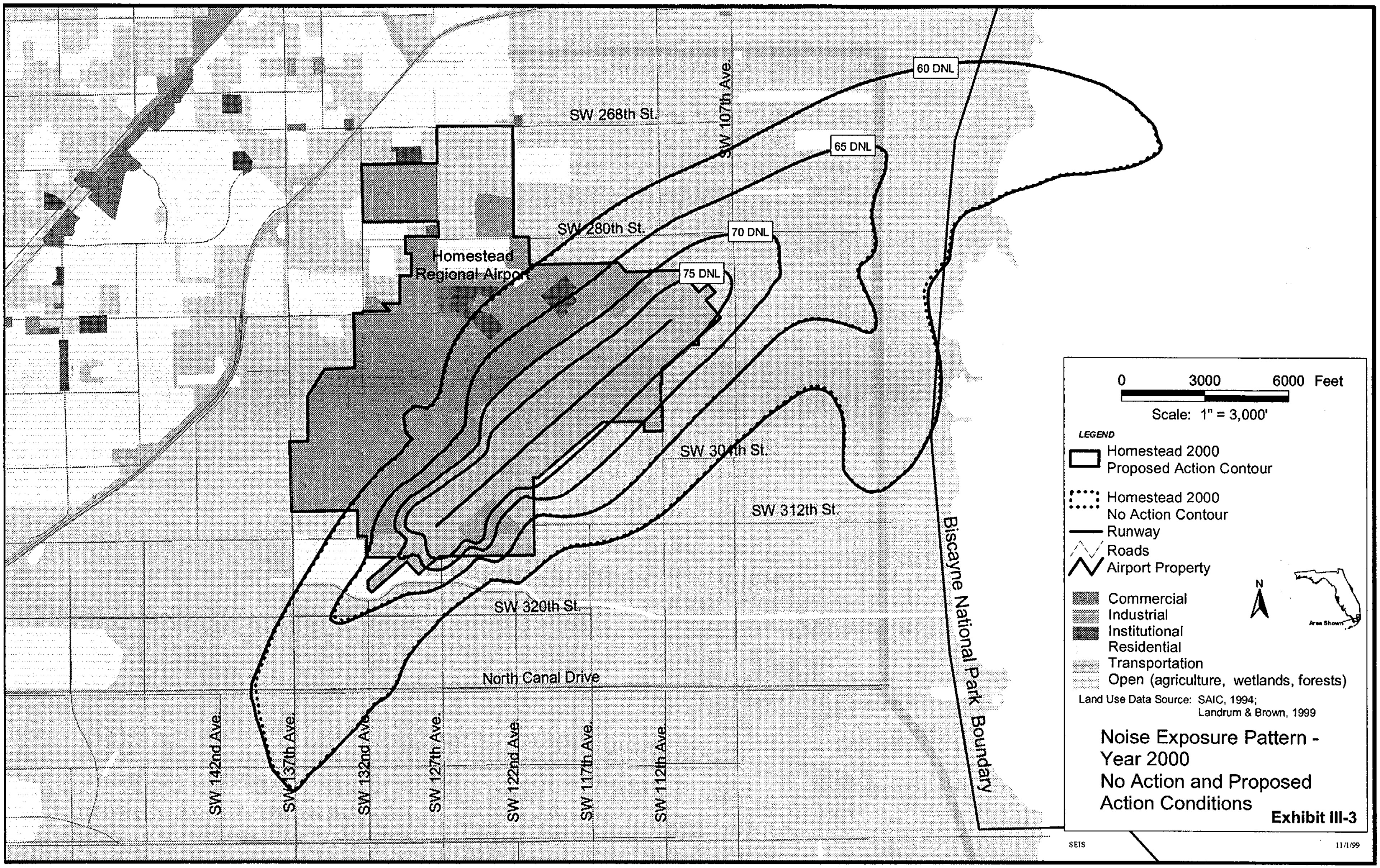
III.C. Noise Exposure (DNL) Contours - Proposed Action Conditions

The development of Homestead as a civilian airport with a continuing military and other government aircraft component to its operations would result in changes in the noise contours from the no action conditions. Noise contours are presented for each of the four future target years of civil airport development at Homestead, and are compared with the No Action conditions for the same year. The difference between the Proposed Action and No Action contours is the direct impact associated with the civil development.

III.C.1. Year 2000 Proposed Action Noise Exposure (DNL) Contours

The initial development of the airport is forecast to be limited to the addition of approximately 41,000 general aviation operations to the military/government activity now in place. This general aviation activity would be primarily conducted by light single and twin-engine piston aircraft, but is also forecast to include about 2,000 operations each by business jet and helicopter aircraft. The noise contours resulting from the total general aviation, military, and government aircraft activity are compared to the No Action condition in **Exhibit III-3**. The only difference between the two sets of contours indicated on the map is the slight lengthening of the 60, 65 and 70 DNL contours southwest of the airport, under the approach to Runway 5 and a slight widening of the 60 DNL contour east of the airport. The additional general aviation traffic, and particularly business jet aircraft, causes noise energy in that area to increase by enough to be reflected in the contour. All other areas of the contour pattern remain the same as the No Action contour for the year 2000. **Table III-2** compares the areas within the contours for the two conditions.


60 DNL
65 DNL
70 DNL
75 DNL
SW 268th St.
SW 107th Ave.
SW 280th St.
Homestead
Air Reserve Station
SW 304th St.
SW 312th St.
SW 320th St.
North Canal Drive
SW 142nd Ave.
SW 137th Ave.
SW 132nd Ave.
SW 127th Ave.
SW 122nd Ave.
SW 117th Ave.
SW 112th Ave.
Biscayne National Park Boundary
0 3000 6000 Feet
Scale: 1" = 3,000'
LEGEND
Homestead 2015 and Maximum Use One-Runway No Action Contour
Runway
Roads
Airport Property
Commercial
Industrial
Institutional
Residential
Transportation
Open (agriculture, wetlands, forests)
N
Land Use Data Source: SAIC, 1994; Landrum & Brown, 1999
Homestead 2015 and Maximum Use One-Runway No Action Noise Contour
Exhibit III-2
SEIS
11/1/99



60 DNL
65 DNL
70 DNL
75 DNL
SW 268th St.
SW 280th St.
SW 107th Ave.
Homestead Regional Airport
SW 304th St.
SW 312th St.
SW 320th St.
North Canal Drive
SW 142nd Ave.
SW 137th Ave.
SW 132nd Ave.
SW 127th Ave.
SW 122nd Ave.
SW 117th Ave.
SW 112th Ave.
Biscayne National Park Boundary
0 3000 6000 Feet
Scale: 1" = 3,000'
LEGEND
Homestead 2000 Proposed Action Contour
Homestead 2000 No Action Contour
Runway
Roads
Airport Property
Commercial
Industrial
Institutional
Residential
Transportation
Open (agriculture, wetlands, forests)
Land Use Data Source: SAIC, 1994; Landrum & Brown, 1999
N
Area Shown
Noise Exposure Pattern - Year 2000 No Action and Proposed Action Conditions
Exhibit III-3
SEIS
11/1/99

Table III-2
Comparative Areas of Noise Exposure in Acres
Year 2000 Forecast Conditions

	Off-Airport Area		On- Airport Area		Total Area	
Noise Level	No Action	Proposed Action	No Action	Proposed Action	No Action	Proposed Action
60-65 DNL	3,322	3,379	390	391	3,712	3,769
65-70 DNL	1,062	1,069	372	384	1,434	1,453
70-75 DNL	301	307	300	300	602	608
75+ DNL	45	51	666	666	710	717
Total Above 60	4,730	4,806	1,728	1,741	6,458	6,547

Source: Landrum & Brown, 1999.

III.C.2. Year 2005 Proposed Action Noise Exposure (DNL) Contours

By the year 2005, the projected introduction of passenger operations by jet and turboprop aircraft, accompanied by start ups estimated for aircraft maintenance and cargo activity, would result in a slight growth of the noise exposure contours from year 2000 conditions. The contours for the year 2005 Proposed Action condition are compared to that year's No Action contours on **Exhibit III-4**. Each contour level northeast of the airport is slightly expanded beyond the No Action condition, but to such a small degree that the cumulative DNL is virtually unchanged at any location in that direction. To the southwest, the 60, 65 and 70 DNL contours each extend off the airport a short distance further than under the No Action condition. **Table III-3** indicates the comparison of the areas within the noise contours for the 2005 No Action and Proposed Action conditions.

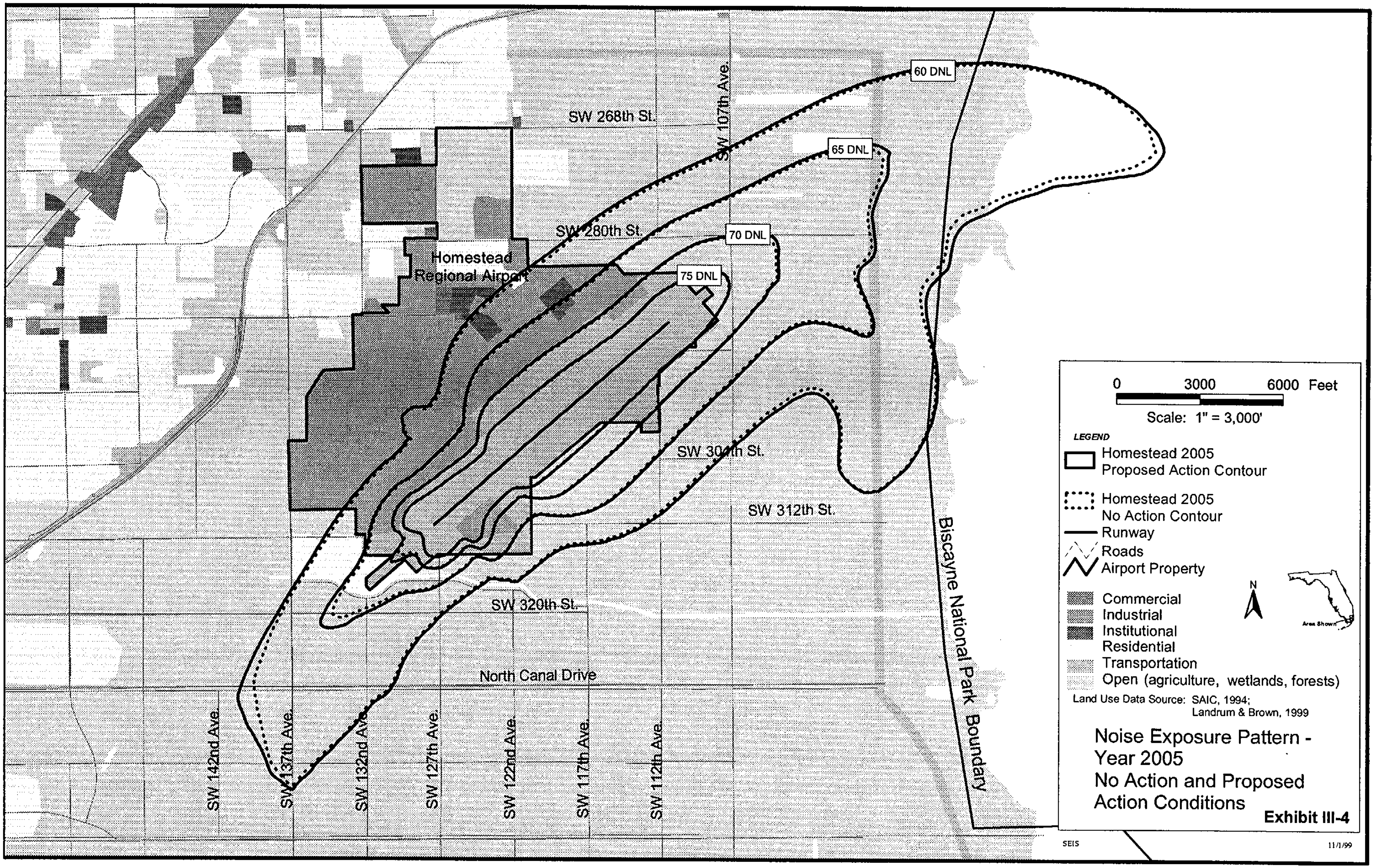
Table III-3
Comparative Areas of Noise Exposure in Acres
Year 2005 Forecast Conditions

	Off-Airport Area		On- Airport Area		Total Area	
Noise Level	No Action	Proposed Action	No Action	Proposed Action	No Action	Proposed Action
60-65 DNL	3,322	3.475	390	397	3,712	3,872
65-70 DNL	1,062	1,126	372	378	1,434	1,504
70-75 DNL	301	314	300	307	602	621
75+ DNL	45	51	666	672	710	723
Total Above 65	4,730	4,966	1,728	1,741	6,458	6,720

Source: Landrum & Brown, 1999.

III.C.3. Year 2015 Proposed Action Noise Exposure (DNL) Contours

The forecast Proposed Action noise exposure for the year 2015 is compared to the No Action condition for that same year in **Exhibit III-5**. The potential growth of the airport to include over 51,000 passenger operations and more than 21,000 cargo flights, as well as estimated activity in the maintenance, general aviation and military sectors of the fleet, would result in an increase in the noise contours. At each noise


60 DNL
65 DNL
70 DNL
75 DNL
SW 268th St.
SW 107th Ave.
SW 280th St.
Homestead Regional Airport
SW 304th St.
SW 312th St.
SW 320th St.
North Canal Drive
SW 142nd Ave.
SW 137th Ave.
SW 132nd Ave.
SW 127th Ave.
SW 122nd Ave.
SW 117th Ave.
SW 112th Ave.
Biscayne National Park Boundary
0
3000
6000 Feet
Scale: 1" = 3,000'
LEGEND
Homestead 2005 Proposed Action Contour
Homestead 2005 No Action Contour
Runway
Roads
Airport Property
Commercial
Industrial
Institutional
Residential
Transportation
Open (agriculture, wetlands, forests)
N
Area Shown
Land Use Data Source: SAIC, 1994; Landrum & Brown, 1999
Noise Exposure Pattern - Year 2005
No Action and Proposed Action Conditions
Exhibit III-4
SEIS
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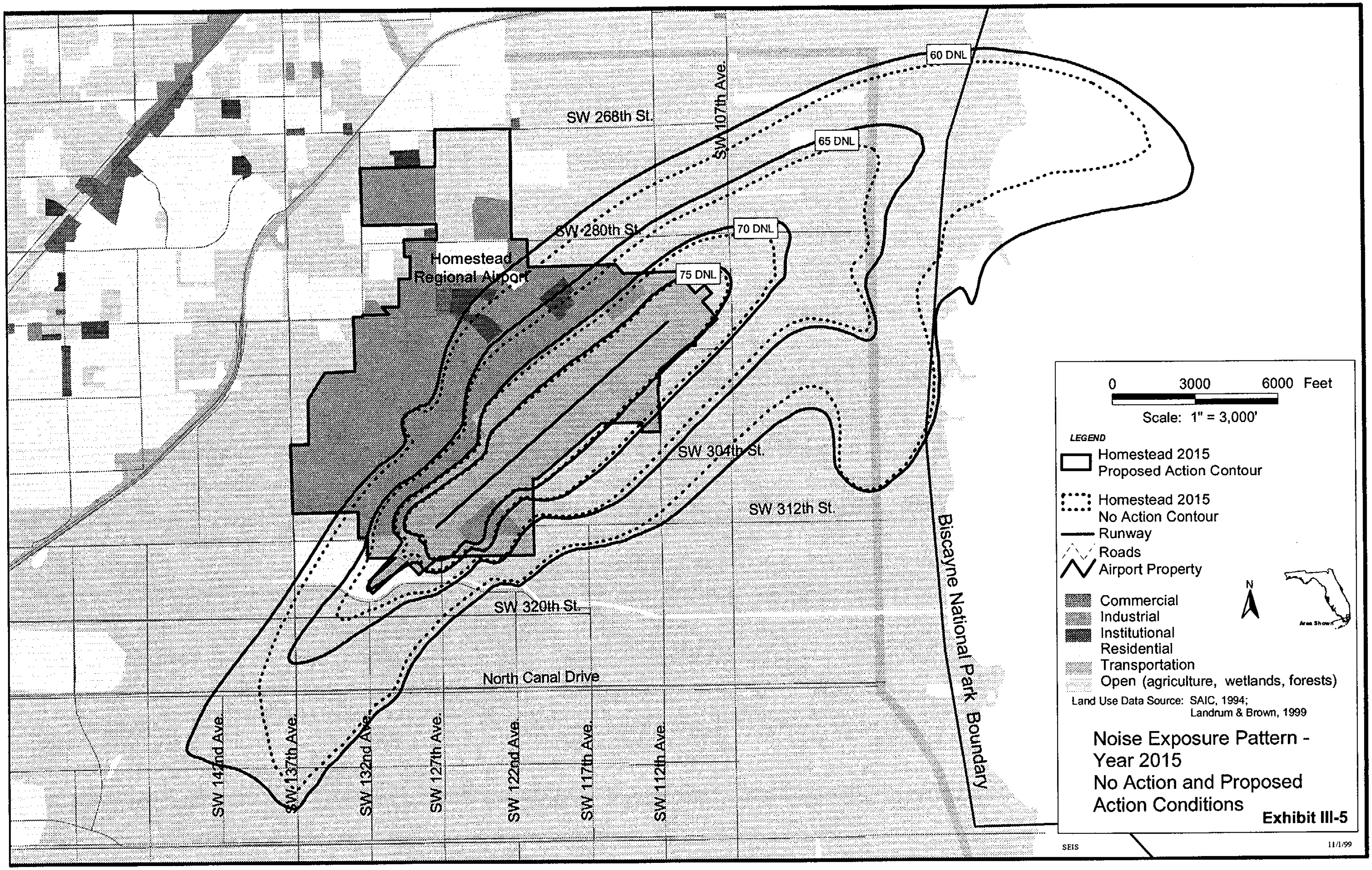


SW 268th St.
SW 107th Ave.
60 DNL
65 DNL
70 DNL
75 DNL
SW 280th St.
Homestead
Regional Airport
SW 304th St.
SW 312th St.
SW 320th St.
North Canal Drive
SW 142nd Ave.
SW 137th Ave.
SW 132nd Ave.
SW 127th Ave.
SW 122nd Ave.
SW 117th Ave.
SW 112th Ave.
Biscayne National Park Boundary
0
3000
6000
Feet
Scale: 1" = 3,000'
LEGEND
Homestead 2015
Proposed Action Contour
Homestead 2015
No Action Contour
Runway
Roads
Airport Property
Commercial
Industrial
Institutional
Residential
Transportation
Open (agriculture, wetlands, forests)
N
Land Use Data Source: SAIC, 1994;
Landrum & Brown, 1999
Noise Exposure Pattern -
Year 2015
No Action and Proposed
Action Conditions
Exhibit III-5
SEIS
11/1/99

level, the contours are generally enlarged to the northeast of the airport and to the sidelines of the runway. To the southwest, under the principal approach route, the contours expand noticeably. To the southwest, the 60 DNL contour extends across 142nd Avenue, while the 65 DNL contour grows to cross SW 137th Avenue, a lengthening of approximately one-half mile. The 70 DNL contour expands beyond the airport boundary to reach SW 132nd Street. The area within each contour for the 2015 condition is compared to the No Action condition for that year in **Table III-4.**

Table III-4
Comparative Areas of Noise Exposure in Acres
Year 2015 Forecast Conditions

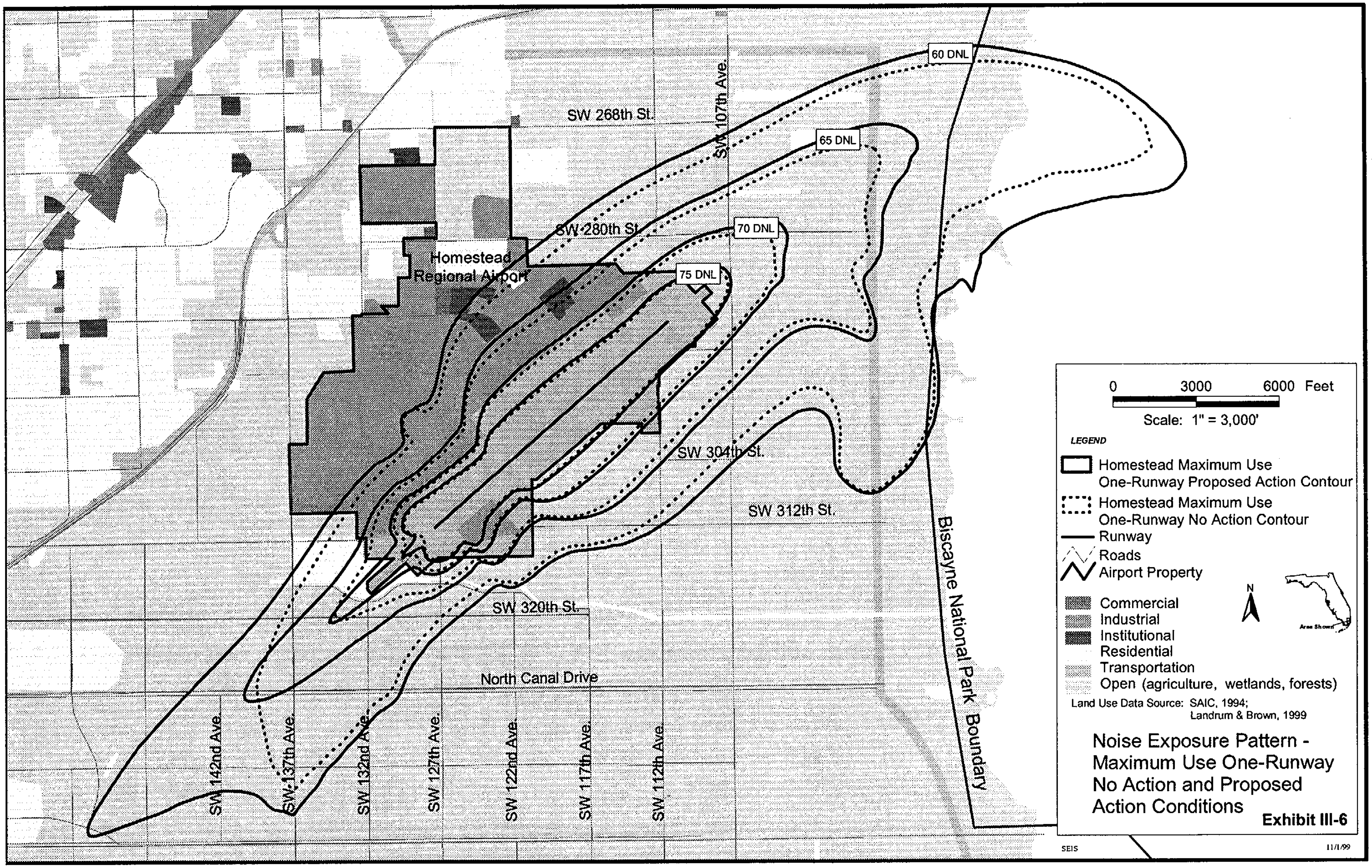
	Off-Airport Area		On- Airport Area		Total Area	
Noise Level	No Action	Proposed Action	No Action	Proposed Action	No Action	Proposed Action
	3,315	4,134	390	396	3,706	4,531
65-70 DNL	1,050	1,396	378	390	1,427	1,786
70-75 DNL	307	396	294	320	602	717
75+ DNL	45	58	666	698	710	755
Total Above 65	4,717	5,984	1,728	1,805	6,445	7,789

Source: Landrum & Brown, 1999.

III.C.4. Maximum Use One-Runway Proposed Action Noise Exposure (DNL) Contours

Sometime beyond the year 2015, the airport could reach its one-runway capacity. The forecasts for that condition project that the dominant component of the fleet mix would be passenger aircraft, with passenger jets playing the principal role in service. Additionally, the fleet mix is forecast to include turboprop passenger flights, general aviation activity, continued military operations, and increased levels of cargo activity by jet aircraft. To some extent, the noise generated by these forecast aircraft would be mitigated by the continued reduction in individual aircraft source noise levels in the future. The maximum condition assumes, as described in Chapter II, that the quietest of civilian aircraft currently operating in the fleet will be flown in the out years, while military aircraft will continue in their present fleet mix (with one exception) and numbers. **Exhibit III-6** compares the No Action and Maximum Use One-Runway Proposed Action noise exposure contours. **Table III-5** compares the areas within each of the contour bands for both conditions.

The maximum noise contour for the Proposed Action condition is larger than the No Action contour for that time frame. To the northeast, the 75 DNL extends to SW 107th Avenue and the 70 DNL crosses SW 280th Street, while the 65 DNL reaches nearly to the Biscayne National Park boundary. The 60 DNL contour extends over Biscayne Bay into Biscayne National Park, as does the No Action contour, although to a lesser extent. The growth of the contours to the northeast and along the sidelines adjacent to the runway is general in nature and indicative of the increased level of operations.



60 DNL
65 DNL
70 DNL
75 DNL
SW 268th St.
SW 107th Ave.
SW 280th St.
Homestead
Regional Airport
SW 304th St.
SW 312th St.
SW 320th St.
North Canal Drive
SW 142nd Ave.
SW 137th Ave.
SW 132nd Ave.
SW 127th Ave.
SW 122nd Ave.
SW 117th Ave.
SW 112th Ave.
Biscayne National Park Boundary
0
3000
6000
Feet
Scale: 1" = 3,000'
LEGEND
Homestead Maximum Use
One-Runway Proposed Action Contour
Homestead Maximum Use
One-Runway No Action Contour
Runway
Roads
Airport Property
Commercial
Industrial
Institutional
Residential
Transportation
Open (agriculture, wetlands, forests)
N
Area Shown
Land Use Data Source: SAIC, 1994;
Landrum & Brown, 1999
Noise Exposure Pattern -
Maximum Use One-Runway
No Action and Proposed
Action Conditions
Exhibit III-6
SEIS
11/1/99

Table III-5
Comparative Areas of Noise Exposure in Acres
Maximum Use One-Runway Forecast Conditions

	Off-Airport Area		On- Airport Area		Total Area	
Noise Level	No Action	Proposed Action	No Action	Proposed Action	No Action	Proposed Action
60-65 DNL	3,315	4,275	390	404	3,706	4,679
65-70 DNL	1,050	1,459	378	384	1,427	1,843
70-75 DNL	307	410	294	326	602	736
75+ DNL	45	64	666	704	710	768
Total Above 65	4,717	6,208	1,728	1,818	6,445	8,026

Source: Landrum & Brown, 1999.

To the southwest, the Proposed Action contours under the approach to Runway 5 are all larger than the No Action contours. Above 65 DNL, the contours stretch away from the runway end. The 75 DNL contour in the area remains on airport property, but the 70 and 65 DNL contours spike to the southwest. The 70 DNL extends to SW 320th Street in a spike approximately 3,800 feet beyond the airport boundary. The 65 DNL extends approximately 8,000 feet beyond the airport boundary, reaching across North Canal Drive. The 60 DNL of the Proposed Action also follows the extended centerline of the approach to Runway 5, but also shows a bulge to the south indicative of noise generated by military aircraft using pattern approaches on the south side of the runway.

III.C.5 Commentary on Noise Exposure Contour Comparisons

The Existing, No Action and Proposed Action noise exposure contours are very similar. This is indicative of a situation where the existing components of the noise exposure (i.e., military aircraft) contribute so much noise energy to the exposure in the airport environs that they dominate all Proposed Action conditions. Based on a comparison of the SEL footprints presented in the following section, and the similarity of the contours, we can surmise that the F-16 is the dominant aircraft in all cases. Were that aircraft not common to all cases, or were it not as individually loud as it is, the contours might vary significantly more than is projected.

The gradual increase in noise levels to the southwest of the airport with the initiation and estimated growth of civilian operations is largely associated with the noise generated by landings. In areas where landings are the dominant operation, the noise contours associated with them appear as spikes because the rate of descent is relatively constant and the course is straight. In contrast, noise from departures, although individually louder than landings, is dispersed over broad areas by variable climb rates and turning flight tracks.

While the DNL noise exposure contours are very similar for all conditions analyzed, the characteristics of the noise varies more at lower noise levels among the Proposed Action and No Action conditions at greater distances from Homestead. Chapter IV will provide information on the noise characteristics forecast for the national properties at distances of up to 80 miles from the airport.

III.D. Aircraft Noise and Community Land Uses

The assessment of significant levels of aircraft noise on communities around airports is traditionally expressed in terms of the residential areas and other noise sensitive land uses within the contours of 65

DNL or higher. Table 2 of Appendix A of Federal Aviation Regulation, Part 150 provides the guidance for the noise sensitivity of community structures and land uses used in EIS and Part 150 studies prepared for FAA approval.\[i] The table is reproduced as Table I-2 of this document.

Within the immediate environs of Homestead with noise above 65 DNL for the existing conditions, the land is generally undeveloped and used for compatible agricultural or open space uses. In future years, that land is forecast to develop into residential and other uses. Any growth of residences or other noise-sensitive uses in an area exposed to high noise levels would introduce land use incompatibilities into the area. These introduced uses establish the level of "growth risk" associated with the uncontrolled development of noise-sensitive areas.

To evaluate the existing incompatibilities within the airport environs, a field survey was conducted to determine the specific locations of any residences or other noise-sensitive facilities within an area larger than the largest 65 DNL of the Proposed Action conditions. This survey established the geographic base file against which impacts could be consistently compared among contour cases for existing incompatible uses. Additionally, the geographic base file computation program was structured to consider Dade County's forecast of residences (and associated population) within the airport environs. The numbers of persons and dwellings were computed for each operating condition. The results of this assessment are presented in the following section.

III.D.1 Community Noise Sensitive Uses Within 60 DNL Contour

When a community noise-sensitive use falls within the 65 DNL contour or higher, it is considered by the FAA to be exposed to a significant level of aircraft noise. When it falls within the 60-65 DNL range, its exposure level is considered to be moderate. **Table III-6** delineates, for each No Action and Proposed Action condition, the existing population and dwelling units (labeled "D.U.s" in the table) forecast to be within the contours in each of the years under consideration. The table assumes that additional incompatible development will not occur within the areas exposed to 60 DNL or more.

The existing condition of noise exposure at Homestead includes 95 dwellings, housing approximately 656 persons, within the 65-70 DNL contour, as well as1,148 persons in 202 dwellings within the 60-65 DNL range. All but three of the dwellings within the 65 DNL contour are located near the southwest end of the runway, in migrant labor housing. (The number 656 is an abnormally high population count for 95 dwellings. It has been estimated from signs in the area indicating there are approximately 2,200 residents located in 311 total units in the area.)

In future years, the noise contour is projected to expand to the southwest, incorporating new areas that have been developed in uses that are incompatible with airport noise. The maximum use of a single-runway airport is forecast to add 83 dwellings housing 397 persons to the area of 65 DNL or more.

While it may be desirable at local government's discretion to limit the introduction of incompatible uses within the area exposed to aircraft noise above 60 DNL, and it is certainly recommended under FAA guidelines above 65 DNL, Dade County's forecasts of future population distributions indicate that new residential development will begin to be introduced into the area, particularly after the year 2015. While the noise contours themselves would not be expected to grow significantly except to the southwest of the airport, the population within them may be increased through this growth. Consequently, the change in impacted population forecast for the various future years can be a function of both the changing size of the noise contours and the potentially increasing unrestricted population growth within the contours. **Table III-7** indicates the forecast number of dwellings and persons that would fall within the noise contours if uncontrolled growth is allowed within the airport environs.

Table III-6
Forecast Population and Dwelling Unit Impacts
Within DNL Ranges, Without Concurrent Residential Development

	60-65 DNL		65-70 DNL		70-75 DNL		75 DNL or more		Total Above 60		Total Above 65	
Year and Scenario	Pop.	D.U.s	Pop.	D.U.s	Pop.	D.U.s	Pop.	D.U.s	Pop.	D.U.s	Pop.	D.U.s
Existing Conditions	1,148	202	656	95	0	0	0	0	1,804	297	656	95
2000												
Proposed Action	1,188	212	680	98	0	0	0	0	1,868	310	680	98
No Action	1,148	202	656	95	0	0	0	0	1,804	297	656	95
Project-Related Change	40	10	24	3	0	0	0	0	64	13	24	3
2005												
Proposed Action	1,284	228	680	99	24	3	0	0	1,988	330	704	102
No Action	1,148	202	656	95	0	0	0	0	1,804	297	656	95
Project-Related Change	136	26	24	4	24	3	0	0	184	33	48	7
2015												
Proposed Action	1,429	273	642	97	166	23	0	0	2,237	393	808	120
No Action	1,148	202	656	95	0	0	0	0	1,804	297	656	95
Project-Related Change	281	71	-14	2	166	23	0	0	433	96	152	25
Maximum One-Rwy.												
Proposed Action	1,396	262	652	124	398	53	3	1	2,446	439	1,053	178
No Action	1,148	202	656	95	0	0	0	0	1,804	297	656	95
Project-Related Change	148	60	-4	29	398	53	3	1	542	142	397	83

Source: Landrum & Brown, 1999.

Table III-7
Forecast Population and Dwelling Unit Impacts
Within DNL Ranges, Assuming Unconstrained Forecast Residential Development

	60-65 DNL		65-70 DNL		70-75 DNL		75 DNL or more		Total Above 60		Total Above 65	
Year and Scenario	Pop.	D.U.s	Pop.	D.U.s	Pop.	D.U.s	Pop.	D.U.s	Pop.	D.U.s	Pop.	D.U.s
Existing Conditions	1,148	202	656	95	0	0	0	0	1,804	297	656	95
2000												
Proposed Action	1,243	234	689	101	0	0	0	0	1,932	335	689	101
No Action	1,197	222	666	98	0	0	0	0	1.863	320	666	98
Project-Related Change	46	12	23	3	0	0	0	0	69	15	23	3
2005												
Proposed Action	1,382	283	707	109	24	3	0	0	2,113	395	731	112
No Action	1,259	249	682	105	0	0	0	0	1,941	354	682	105
Project-Related Change	123	36	25	4	24	3	0	0	172	41	49	7
2015												
Proposed Action	1,812	432	737	130	171	25	0	0	2,720	587	908	155
No Action	1,394	296	717	117	0	0	0	0	2,111	413	717	117
Project-Related Change	418	136	20	13	171	25	0	0	609	174	191	38
Maximum One-Rwy.												
Proposed Action	16,441	5,790	4,122	1,202	546	79	3	1	21,112	7,070	4,671	1,280
No Action	11,365	3,751	2,783	727	18	6	0	0	14,166	4,584	2,801	733
Project-Related Change	5,076	2,039	1,339	475	528	73	3	1	6,946	2,486	1,870	549

Source: Landrum & Brown, 1999.

It is notable that the population and dwelling units exposed to significant levels of aircraft noise are projected to remain relatively constant until the end of the planning period. At that time, the development of residential uses northeast and southwest of the airport, as forecast by Dade County, could (if uncontrolled) result in the introduction of many dwellings, and their attendant population, into the area exposed to significant and moderate levels of aircraft noise. These impacts are at risk of occurring unless the County establishes appropriate growth controls in the area for the future.

While several schools and one nursing home are in the general environs of the airport, being located south of the Florida Turnpike, none fall within the 60 DNL contour for any of the conditions evaluated.

III.D.2 Significant and Moderate Community Noise Increases of Proposed Action

The FAA's environmental guidance for the determination of significant noise impacts of proposed airport development projects in FAA Order 5050.4A, Airport Environmental Handbook, defines a significant project noise impact to be an increase caused by the project over the No Action condition of 1.5 DNL or greater for noise sensitive uses within the 65 DNL contour.\ii In addition, the Federal Interagency Committee On Noise (FICON) recommended in a 1992 report that, when noise sensitive uses within the 65 DNL contour would be exposed to an increase of 1.5 DNL or more from a proposed project, noise increases of 3 DNL or more for noise sensitive uses between 60-65 DNL should be identified as affected by moderate levels of noise exposure.

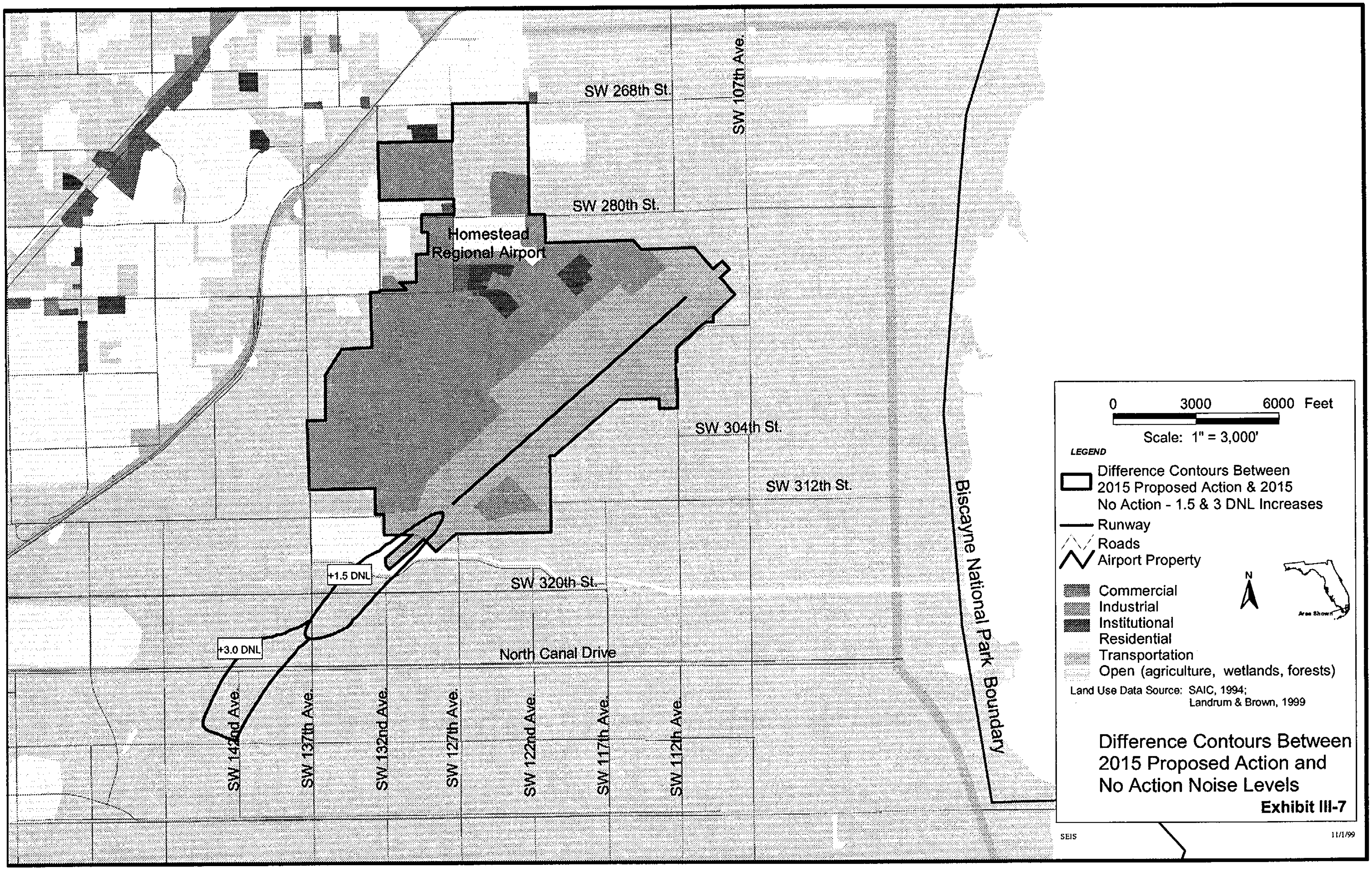
To evaluate significant and moderate increases in community noise exposure levels resulting from the proposed civil development of Homestead, a comparison of the noise levels for each Proposed Action condition is made against the No Action condition for the same year. Where differences of 1.5 DNL are found at 65 DNL and above, an assessment is made of the presence of locations where differences of 3.0 DNL are found between 60 and 65 DNL. Maps of differential noise exposure have been prepared which indicate the resulting locations, and population and dwelling unit impact computations have been made. **Exhibits III-7 and III-8** depict the areas for the two cases found to reach the criteria levels. These cases are for year 2015 and Maximum Use One-Runway conditions in which the Proposed Action condition is estimated to increase the noise levels by more than 1.5 or 3.0 DNL above the No Action condition for noise sensitive uses in certain locations.

The existing dwellings and the residents that would be exposed to noise level increases of 1.5 decibels or more of DNL within the 65 DNL contour, or of 3.0 decibels or more within the 60 to 65 DNL range provide an indication of the impact levels if residential development is controlled within the noise contours. In 2015, an estimated 68 dwelling units housing 513 persons are projected to be located within the area experiencing a 1.5 DNL increase within 65 DNL, while the area experiencing 3.0 DNL of increase between 60-65 DNL is estimated to have 127 persons in 43 dwellings. Under the Maximum Use One-Runway condition, the projections would be 967 persons in 219 dwellings within the area of 1.5 DNL increase and 219 persons in 74 dwellings in the area of 3.0 DNL increase

If the area were allowed to develop residentially in accordance with Dade County plans, the population and dwelling impacts for 2015 would be unchanged from the above data. However, under the Maximum Use One-Runway condition, the impact would be 327 dwellings with 1,608 residents in the area of 1.5 DNL increase above 65 DNL, while the 3.0 DNL increase area between 60-65 DNL would be estimated to include 1,138 dwellings with 2,783 residents

III.E. Sound Exposure Level (SEL) Footprints

To better acquaint the reader with the noise levels produced by different aircraft types that contribute to the DNL noise exposure contours and to provide additional information about the noise from individual

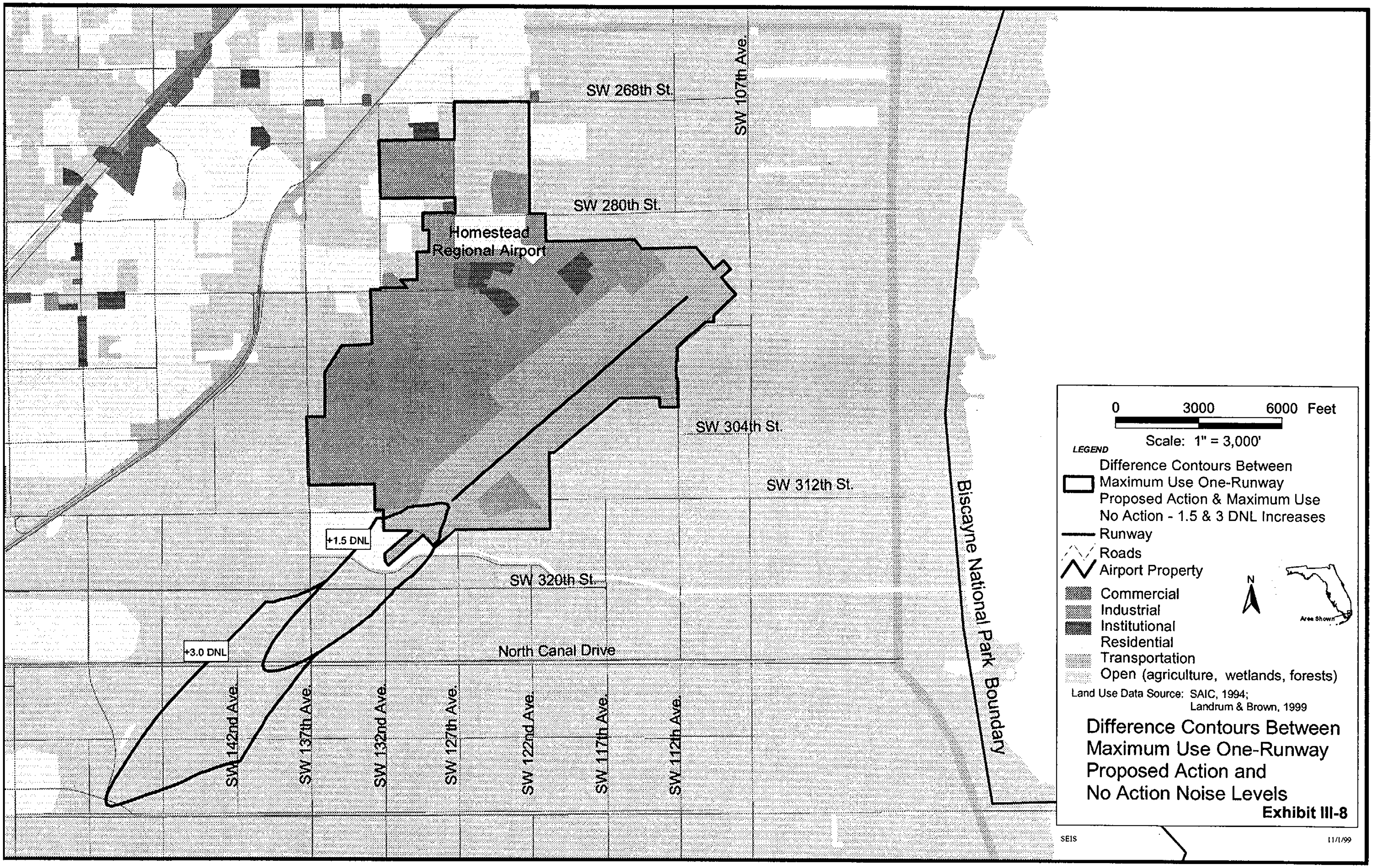


Difference Contours Between 2015 Proposed Action and No Action Noise Levels

Exhibit III-7

SEIS

11/1/99



Difference Contours Between Maximum Use One-Runway Proposed Action and No Action Noise Levels

Exhibit III-8

SEIS

11/1/99

aircraft, noise footprints in SEL were prepared for six primary aircraft expected to use the airport in the future if the Proposed Action proceeds.

The Sound Exposure Level (SEL) is a single number measure of the combination of the loudness of an event over its entire duration. If an event lasts only one second, the SEL value would approximate the peak measured decibel level. However, if the event lasts more than one second, the SEL is an expression of the acoustic energy that occurs during the event, regardless of its duration. The energy present during the event is considered to all occur during a single second for calculation purposes. Consequently, the decibels of SEL for an individual event of more than one-second duration will always be greater than its one-second average (LA_{max}). Aircraft events typically expose areas to their noise for periods of several seconds to several minutes, dependent on their level and the distance to the aircraft.

The rainfall analogy presented in Chapter One may be extended to the description of the relationship between SEL and DNL. Each SEL generated by a single aircraft overflight would be representative of the passing of a single rain shower with its varying intensity and duration related to the burst of noise energy associated with that flight. The DNL is the measure that represents the accumulation of all SEL energy that occurs during a 24-hour period, assuming a ten-fold penalty for night flights, and may be represented by the total rainfall present in the rain gauge. As a total daily rainfall of one inch may be the result of a single cloudburst or a steady gentle rain, the DNL may be the result of a single very loud overflight or a number of less intense flights -- or a mixture of loud and quiet events.

The SEL footprint represents a specific aircraft operation. The annual average DNL level considers the total noise energy associated with every operation by every type of aircraft using the airport over the period of a year and then averages it to a single day. Consequently, the DNL contours will usually be smaller than the SEL footprints of the louder aircraft using an airport and larger than the SEL footprints of the quieter aircraft using an airport.

Locations that have SEL measurements of 85, 90, 95 and 100 decibels and more are presented. The 85 SEL value represents the exterior noise level at which normal conversation is considered to be disrupted inside a well-insulated structure at distances of three feet or more. It also approximates the exterior noise level at which studies have indicated indoor sleepers may be awakened. Subsequent sections of this document provide peak SEL measurements that occur at least once each day for individual aircraft along individual flight paths for each of several hundred analytical points throughout the national properties.

Lines connecting points of equal noise exposure (contour lines) describe the outer boundaries of the SEL pattern for a combined single arrival and single departure by one aircraft along the most commonly used flight track by that aircraft to and from the airport. **Exhibits III-9 through III-14** display the SEL footprints for the following six dominant aircraft in Homestead's future fleet mix: F-16, Boeing 727-200 with retrofit engines, Boeing 737-500, Boeing 757-200, McDonnell Douglas MD-82, and Canadair Challenger 601. In each case, the modification of the lateral attenuation algorithm for the computation of noise by aircraft in flight results in a rapid widening of the footprint as the aircraft lifts off and begins to climb. These six aircraft represent the principal user groups expected to contribute to the noise levels at Homestead if the facility is used as a civilian airport.

Exhibit III-9 displays the SEL footprint for an F-16 military fighter jet aircraft taking off and landing on Runway 5. The footprint follows the departure pattern that turns to the south after takeoff and climbs to approximately the south boundary of Biscayne NP prior to turning to the west. Near the airport, the pattern bulges to the sides of the runway in the area where the aircraft would use afterburner power during takeoff. As the aircraft reaches approximately 1000 feet elevation, the shape of the highest level contour of the footprint begins to narrow and taper to closure as the aircraft climbs. The intermediate level contours also taper to closure as the aircraft continues to gain altitude and speed in leaving the airport

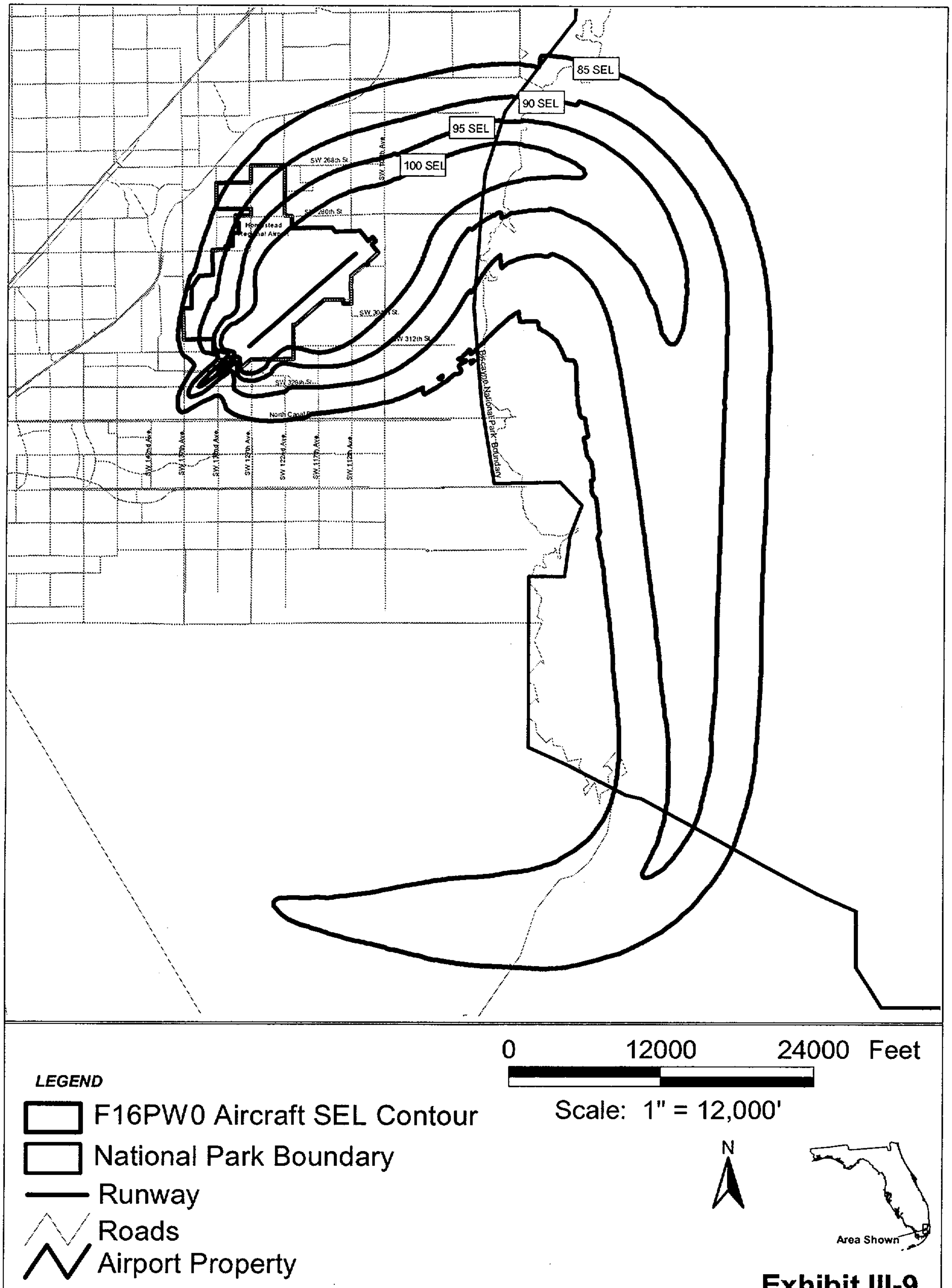


Exhibit III-9

SEL Pattern - F-16 Fighter (F16PWP)
1 Departure and 1 Arrival

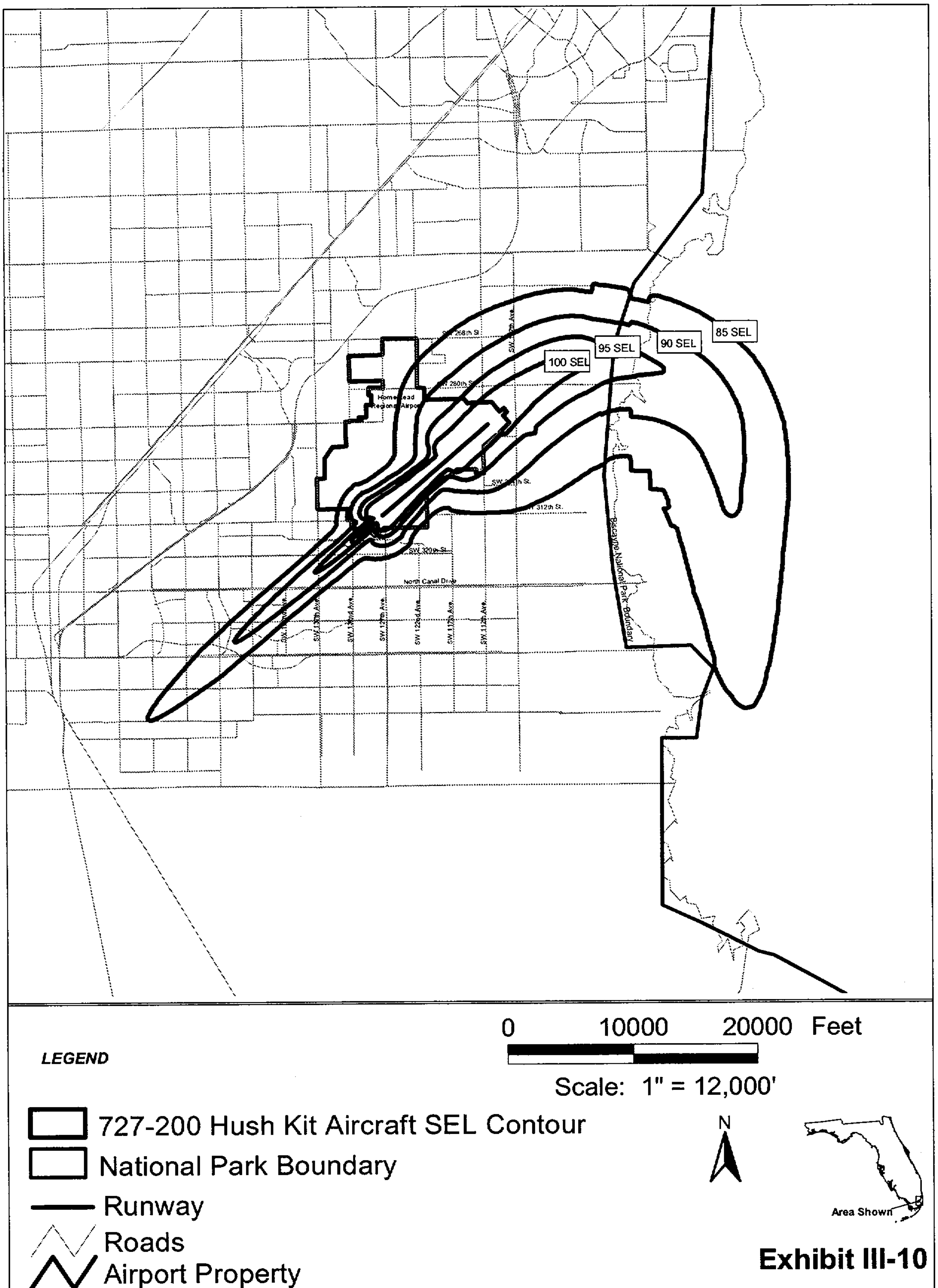


Exhibit III-10

SEL Pattern - 727-200 Hush Kit Aircraft (727EM2)
1 Departure & 1 Arrival

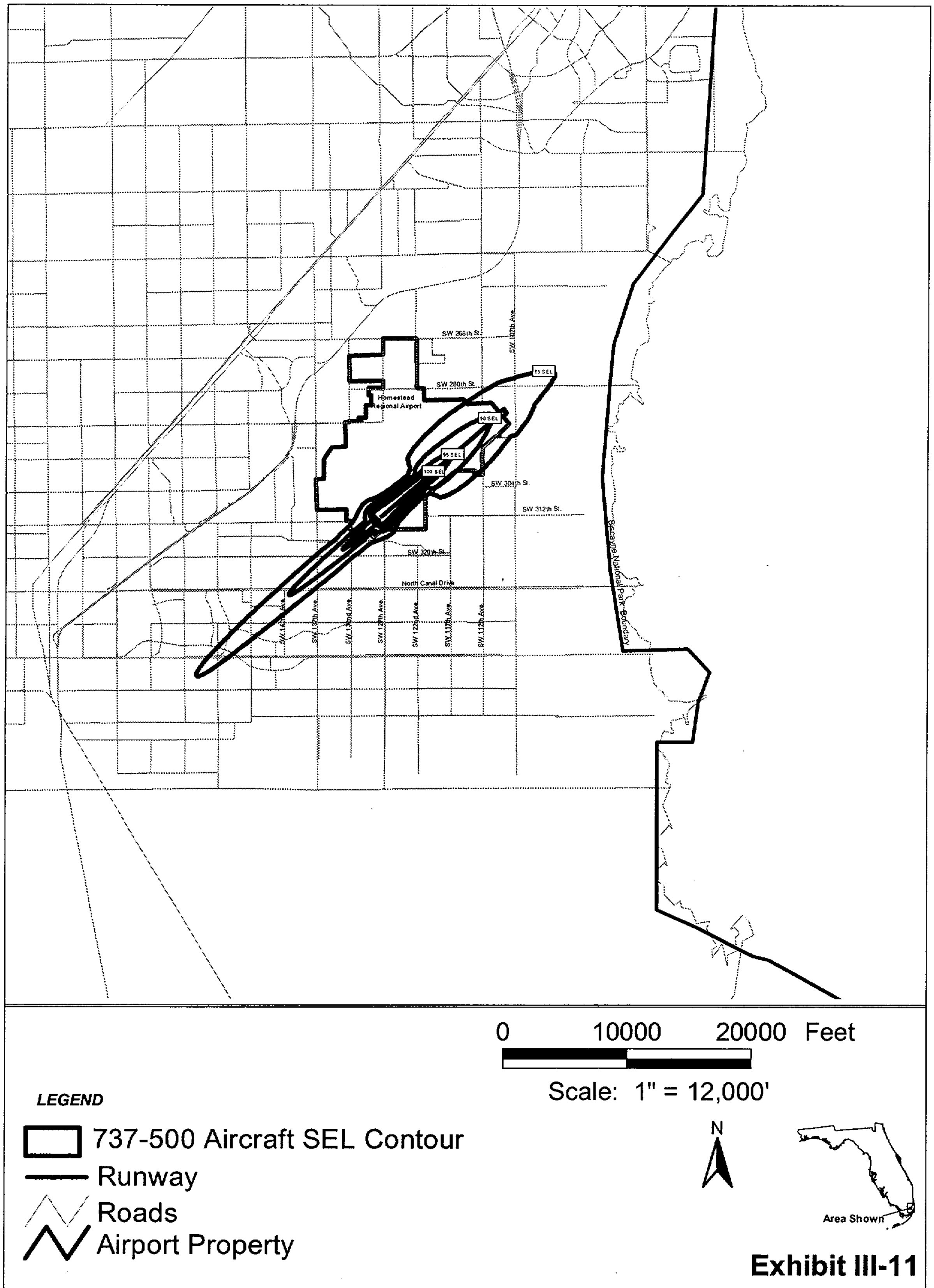
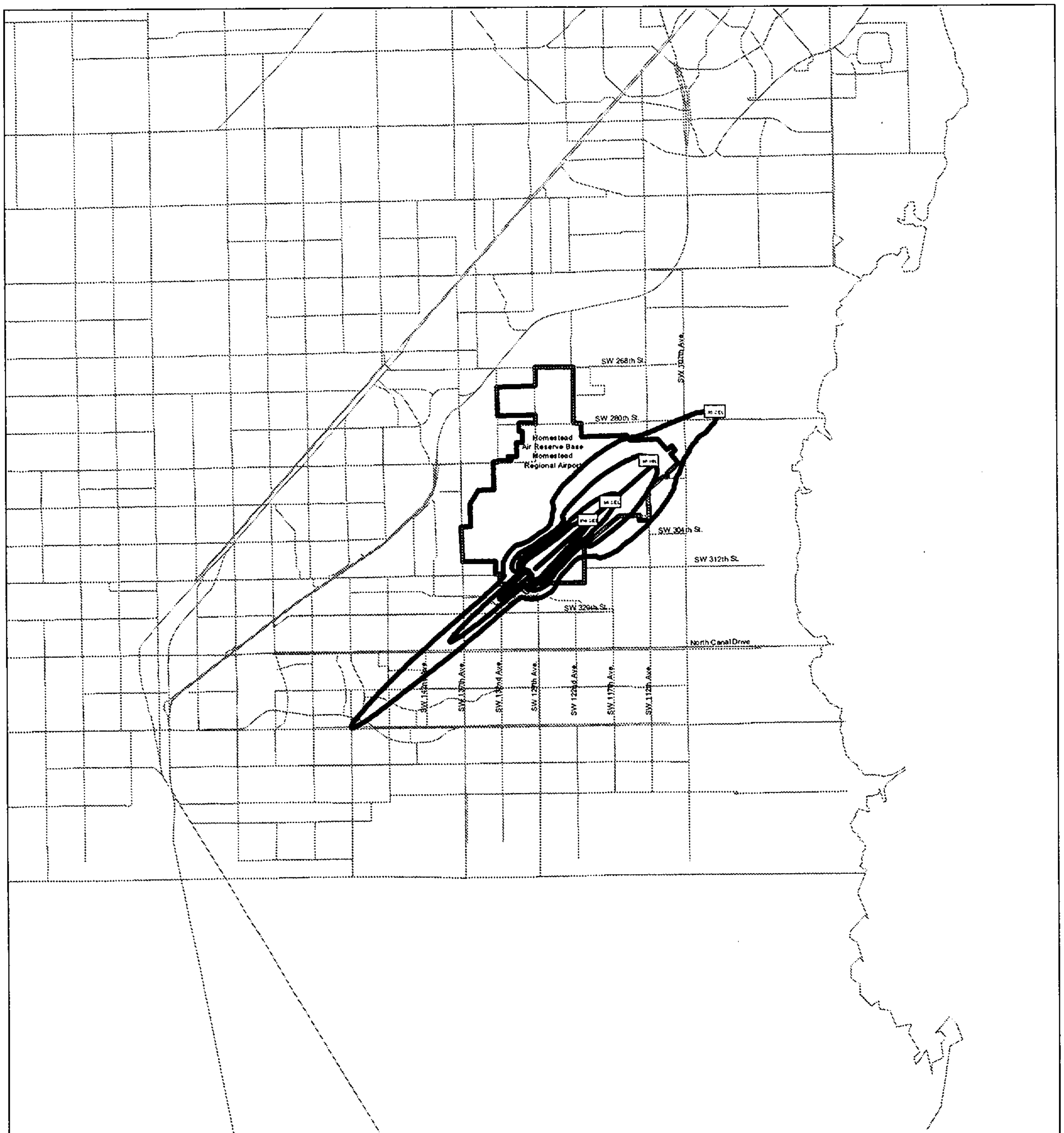


Exhibit III-11

SEL Pattern - 737-500 Aircraft
1 Departure & 1 Arrival



0 12000 24000 Feet

Scale: 1" =12,000'

LEGEND

757RR Aircraft SEL Contour

Runway

Roads

Airport Property

N

Area Shown

Exhibit III-12

SEL Pattern - 757-200 Aircraft (757RR)
1 Departure & 1 Arrival

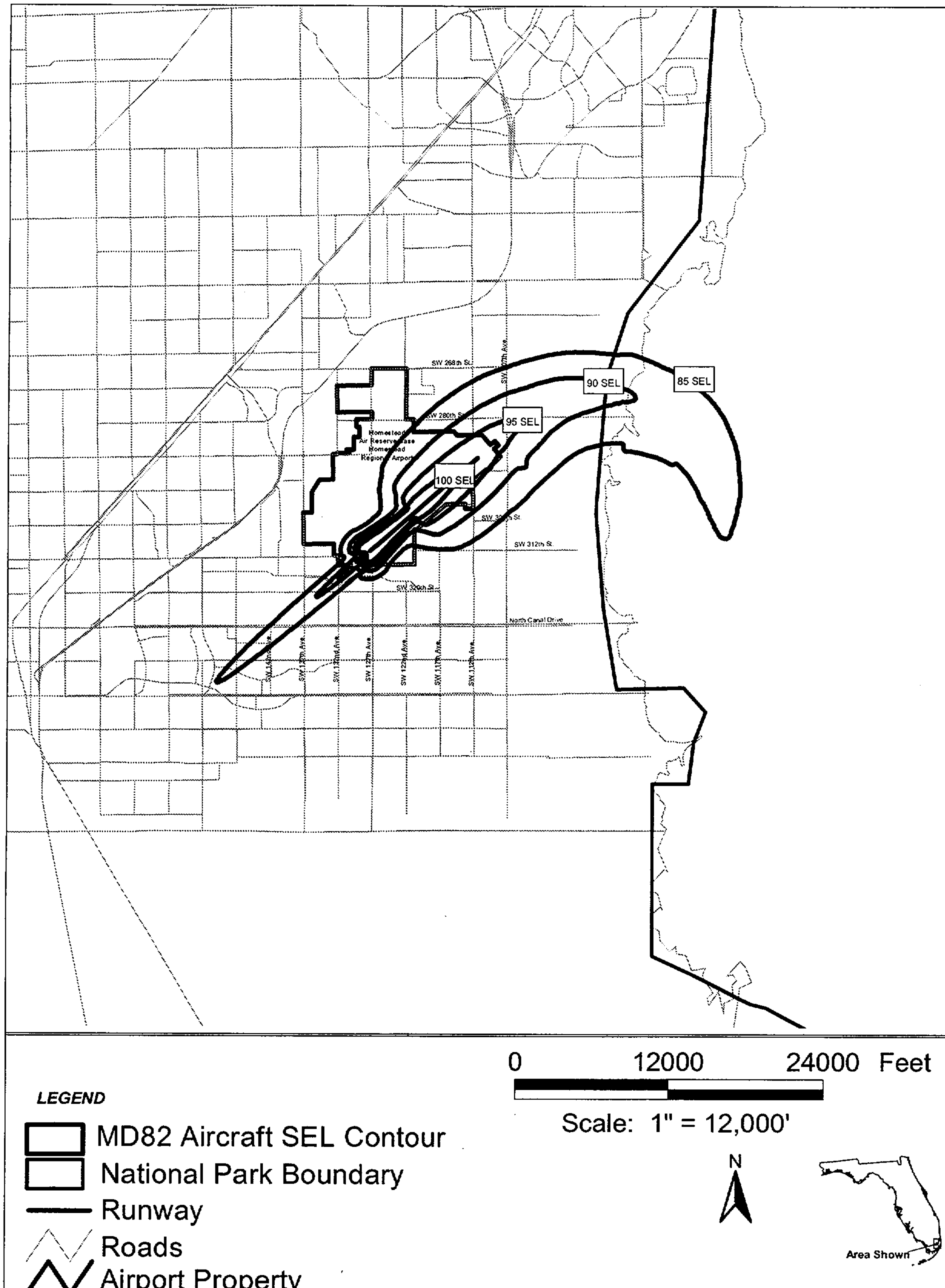
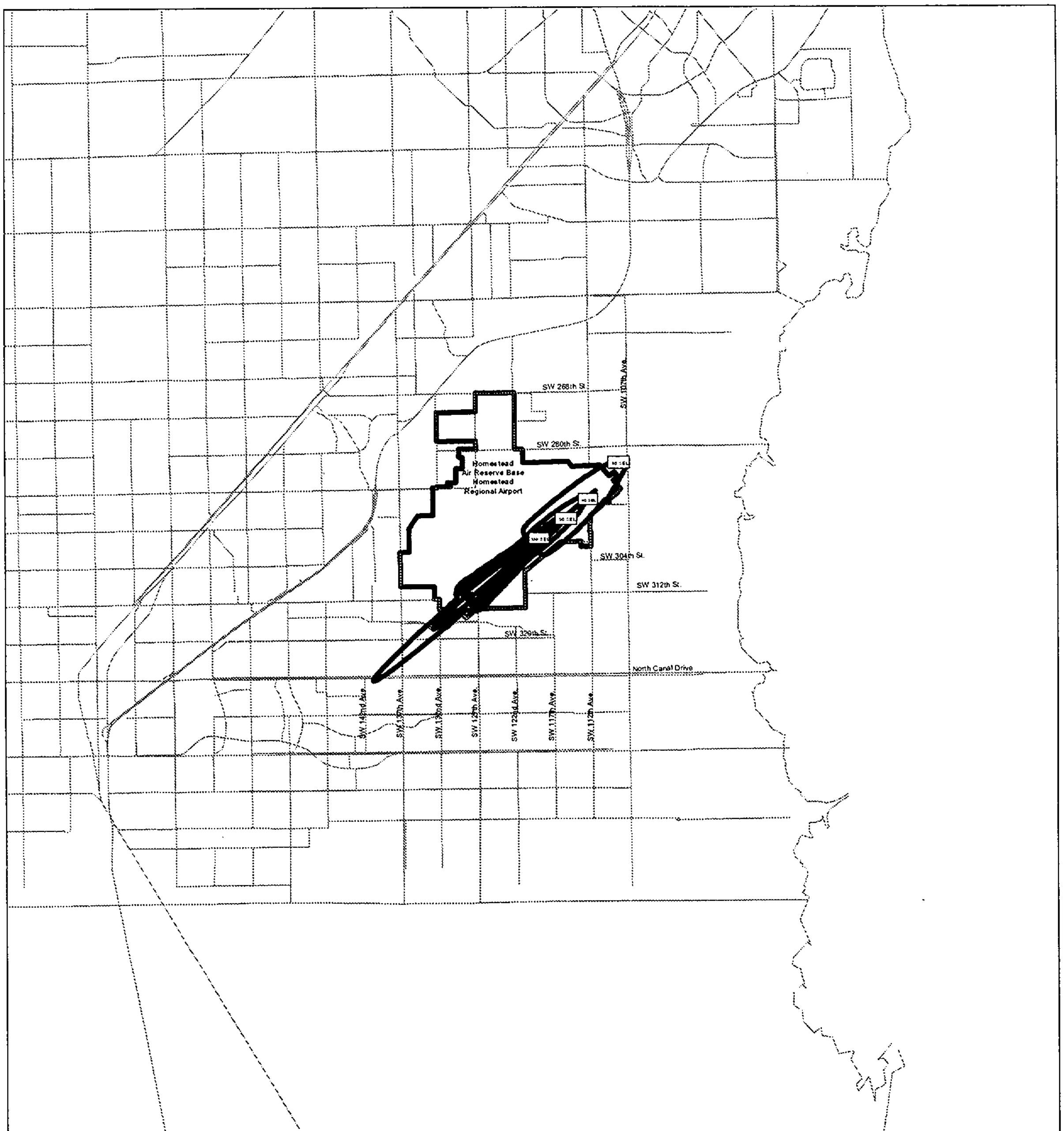


Exhibit III-13

SEL Pattern - MD80 Aircraft (MD82)
1 Departure & 1 Arrival



0 12000 24000 Feet

Scale: 1" = 12,000'

LEGEND

CL601 (CRJ) Aircraft SEL Contour
Runway
Roads
Airport Property

N

Exhibit III-14

SEL Pattern - Regional Jet Aircraft (CL601) Aircraft
1 Departure & 1 Arrival

environs. In contrast, there is an extraordinarily small footprint associated with the approach operation from the southwest. Any area within the footprint contours can expect to be exposed to noise of the indicated levels during operations by the F-16.

Exhibit III-10 indicates the SEL footprint for a Boeing 727 aircraft equipped with an engine hush kit to meet FAR Part 36 Stage 3 noise standards. The forecasts indicate that this aircraft is not expected to remain in the fleet mix in the year 2015. The shape of this footprint also turns right to follow the proposed southward departure climb out. The outer 85 SEL contour of the footprint extends southward to a point abeam the nuclear power plant southeast of the airport. The highest level contour within the footprint remains along the extended centerline of the runway and terminates at the beginning of the right turn. The intermediate contours reach closure along the flight path as the aircraft continues its climb out from the Runway 5 departure. To the southwest, the 727 footprint extends about four miles from the airport, with the intermediate contours appearing as the aircraft descends and slows to its landing.

Exhibit III-11 displays the footprint associated with an operational cycle of the Boeing 737-500 commercial jet. This aircraft is expected to be representative of the typical large jet passenger aircraft of future years. The noise footprint indicates that the departure pattern to the northeast quickly fades to levels below 85 SEL shortly after passing beyond the airport boundary. Noise at the intermediate and highest levels does not pass beyond the airport boundaries on takeoff. During the approach from the southwest, the aircraft presents a tail of the noise footprint as the jet descends to landing. At the 85-decibel level, the footprint extends about 3.5 miles from the airport along the extended centerline, but noise at the highest level (100 decibels) does not extend beyond the airport. This aircraft is forecast in use at the airport by 2005.

Exhibit III-12 presents the footprint for a landing and takeoff by the Boeing 757 commercial jet. The footprint is very similar to that of the B-737-500 presented above, although the aircraft is considerably heavier than the 737. The departure portion of the footprint extends beyond the airport boundary at the 85-decibel level, but higher noise levels remain on airport property. Under the approach from the southwest, the tail of 85 decibels extends approximately three miles from the airport. Use of this aircraft is expected through the planning period after its introduction after 2005.

Exhibit III-13 shows the noise footprint for an arrival and takeoff by a McDonnell Douglas MD-82 passenger or cargo jet. The size of the pattern falls between that of the B-727 and the B-737-500, with the lowest indicated noise level terminating over Biscayne Bay. The 90 SEL contour closes at the shoreline, while the 95 extends beyond the airport boundary to the northeast. This aircraft also has an arrival tail as exhibited by the three other commercial jets presented in the three preceding paragraphs, extending to the southwest along the centerline of the approach to a point about three miles from landing. The aircraft is expected to enter service at the airport by 2005 and, based on its age and the SEIS forecasts, be removed from the passenger fleet by 2015 and from the entire fleet by the end of the planning period.

The final footprint presented in this section is representative of the noise pattern of a typical 50-passenger regional jet. It is represented by the Challenger 601 aircraft and exhibited in **Exhibit III-14**. This aircraft is expected to enter local service after 2005 and remain there until the end of the planning period. The 85 dBA SEL noise footprint of the CL-601 barely extends beyond the airport to the northeast and reaches only about one mile from the airport under the approach from the southwest.

\[i] Federal Aviation Regulations, Part 150 (CFR-14-150) is the regulation that sets forth the requirements for preparation of Noise Compatibility Programs for airports. Table 2 of Appendix A has been used for virtually all of FAA determinations of the compatibility of various land uses with aircraft noise.

\ii FAA Order 5050.4A, Airport Environmental Handbook, is FAA's guidance for the preparation of environmental documents for proposed airport development to comply with the National Environmental Policy Act (NEPA) and the Council on Environmental Quality NEPA Regulations. The order establishes thresholds of significant impact for noise and other categories of environmental impacts.

Chapter IV
Grid Point Assessments

The development of specialized noise information for selected locations in the area of an airport supplements the standard DNL analysis. For the Homestead SEIS, noise levels have been computed using a grid cell or location point methodology with several different noise metrics. Each grid point and metric was selected to provide additional information on the noise effects of the existing and forecast Homestead aviation activity on the national properties at Everglades National Park, Biscayne National Park, Crocodile Lakes National Wildlife Refuge, and Big Cypress National Preserve. Additionally, a grid analysis was conducted on an area of potential incompatible development that is adjacent to the airport, but not within the national properties.

Grid cell or location point analysis provides for the computation of noise levels at selected individual locations or at points located on a regular grid spaced at consistent intervals apart. For this analysis, several different regular grids were defined. Two grids were defined in the Everglades National Park and Big Cypress National Preserve. One, Grid A, was designed to provide information at cells having a 4-nautical mile side across all of Big Cypress and the great majority of Everglades NP; the other, Grid B, was spaced on a 2.5-nautical mile cell side over the eastern portion of Everglades NP in the area of higher visitation and closer to Homestead. Another grid, Grid D, with cell sides of 2.5 miles, was overlaid on Biscayne National Park, and a fourth grid, Grid C, was overlaid on Crocodile Lakes with 1/2 mile cell sides (Crocodile Lakes being much smaller than the other properties). Additionally, supplemental information is available for the western portion of Biscayne National Park (Grid E) and for an area that is adjacent to the airport and not within national park boundaries (Grid F). Both supplemental grids were designed with 1/2 nautical mile cell side intervals.

The grid points are numbered and mapped on **Exhibits IV-1 through IV-6C**. Each grid cell or location point number is consistently used in every table of data presented in this section. The first four maps indicate the locations of regularly spaced grid cells, while the fifth map indicates the measurement location points designed to coincide with the locations measured by Volpe Labs and Sanchez Industrial Design. The sixth map indicates supplemental grid cells with information available for maximum use year conditions, and several location points of particular interest for biological assessment or for additional evaluations of noise sensitivity. **Table IV-1** provides a cross-reference between individual location points shown on Exhibit IV-5 and measurement locations presented in Chapter II.

Grid analyses in the four primary national property grids (Grids A, B, C and D) were conducted using five distinct noise metrics: DNL, LAmax, Peak SEL, Peak Hour Leq(h), and Time Above Ambient for the average annual 24-hour period. Information on noise levels is presented for current conditions, represented by information for the year 1997 at Homestead and comparable years for the other four airports in the region that have an influence on noise in the national properties. The tables presented in this Chapter are designed to allow the reader to compare aircraft noise effects in the national properties, by metric, between the No Action and various Proposed Action conditions at several hundred grid locations for each year evaluated. The supplemental grid analyses result in additional information that will allow the reader to evaluate the effects of the Proposed Action vis-à-vis the No Action alternative in areas adjacent to the airport for each future time frames under consideration by this analysis. The data provided in the area adjacent to the airport includes DNL, LAmax and Time Above 65 decibels. Finally, information is available over the western portion of Biscayne National Park that allows the reporting of single event and cumulative noise level information at a denser network of grids than the remainder of the park, however TA(amb) data is not available for that area.

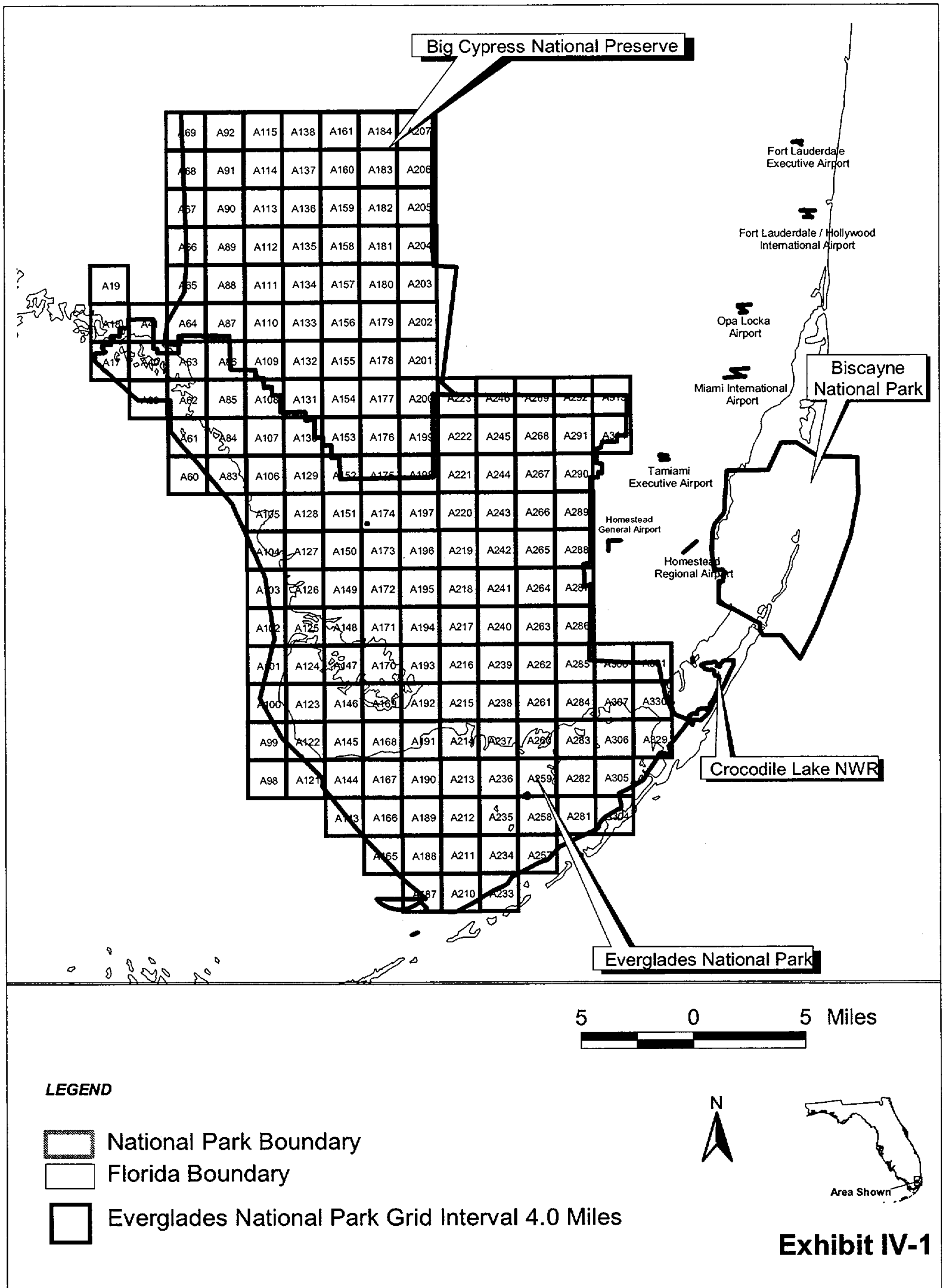


Exhibit IV-1

Everglades National Park / Big Cypress National Preserve Grid Index

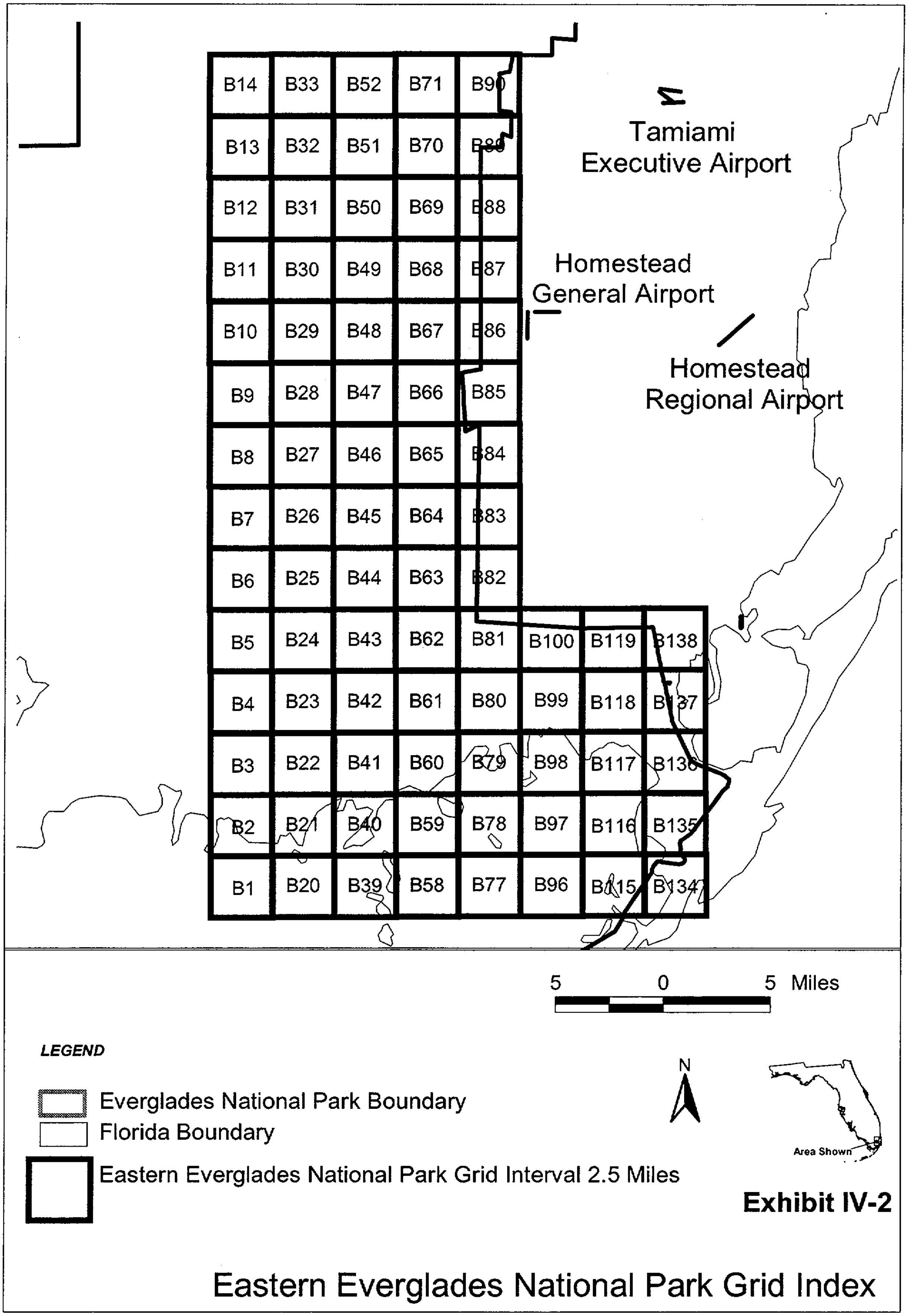
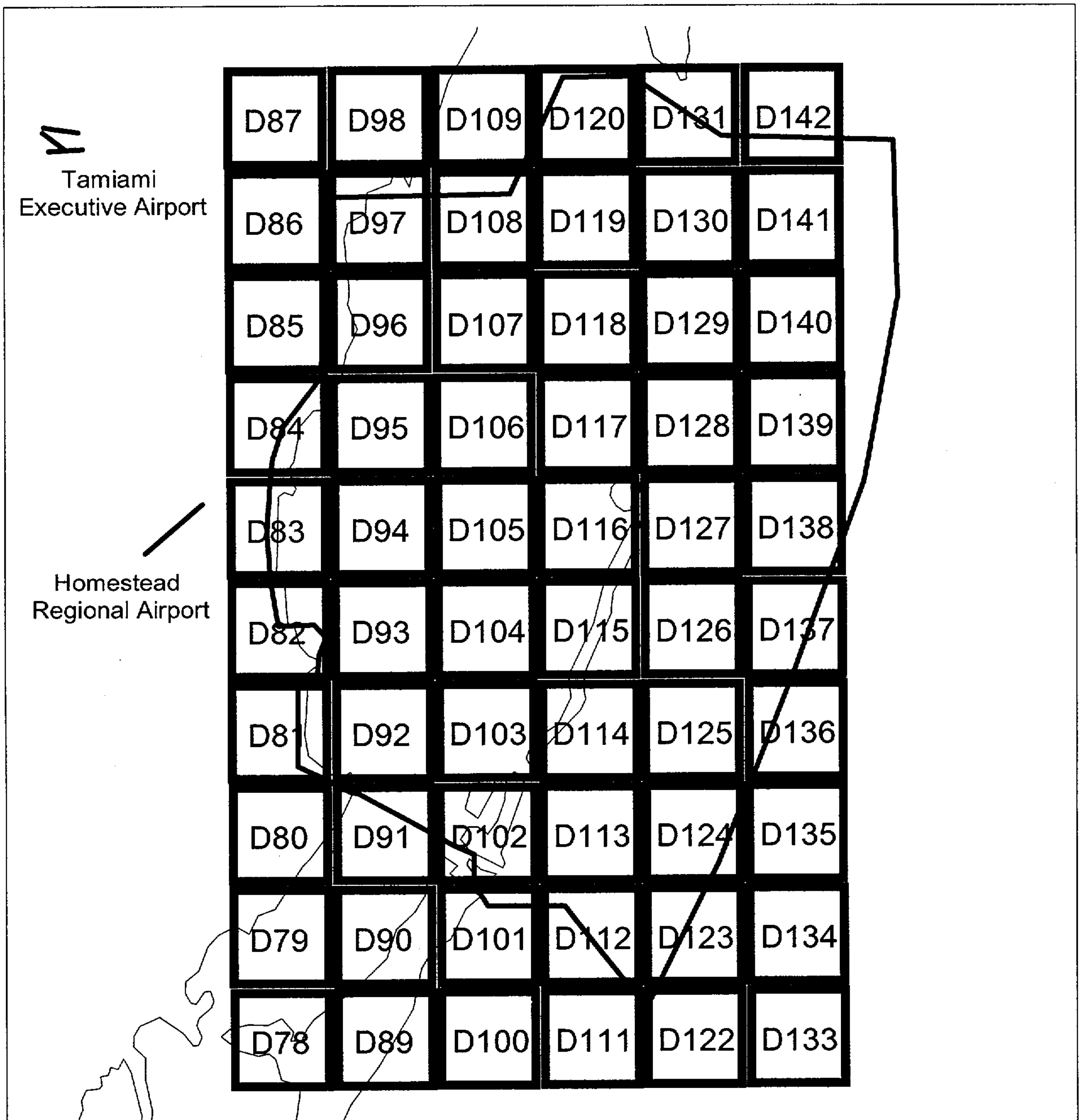


Exhibit IV-2

Eastern Everglades National Park Grid Index



4 0 4 Miles

LEGEND

Biscayne National Park Boundary

Florida Boundary

Biscayne National Park Grid Interval 2.5 Miles

N

Exhibit IV-3

Biscayne National Park Grid Index

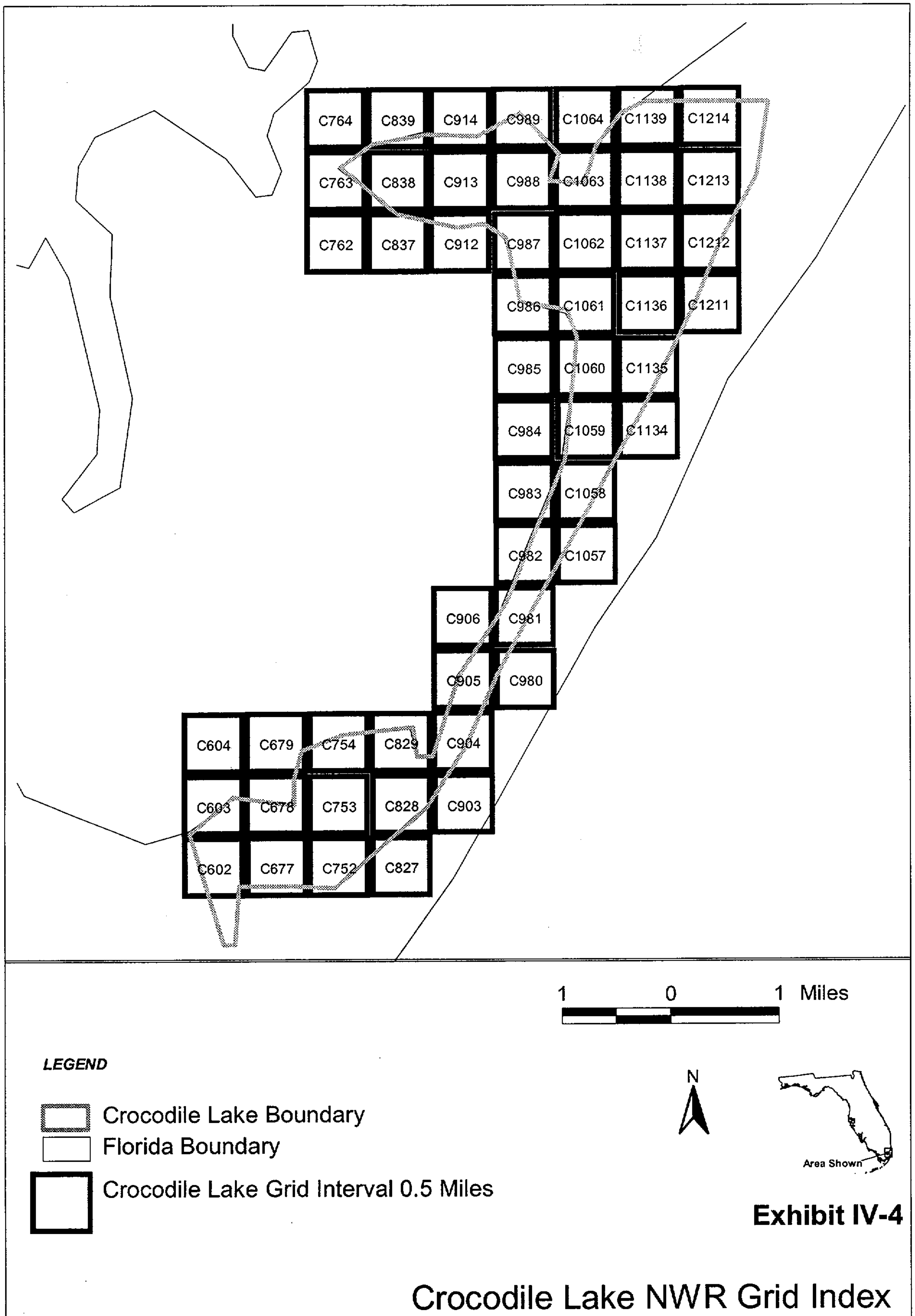


Exhibit IV-4

Crocodile Lake NWR Grid Index

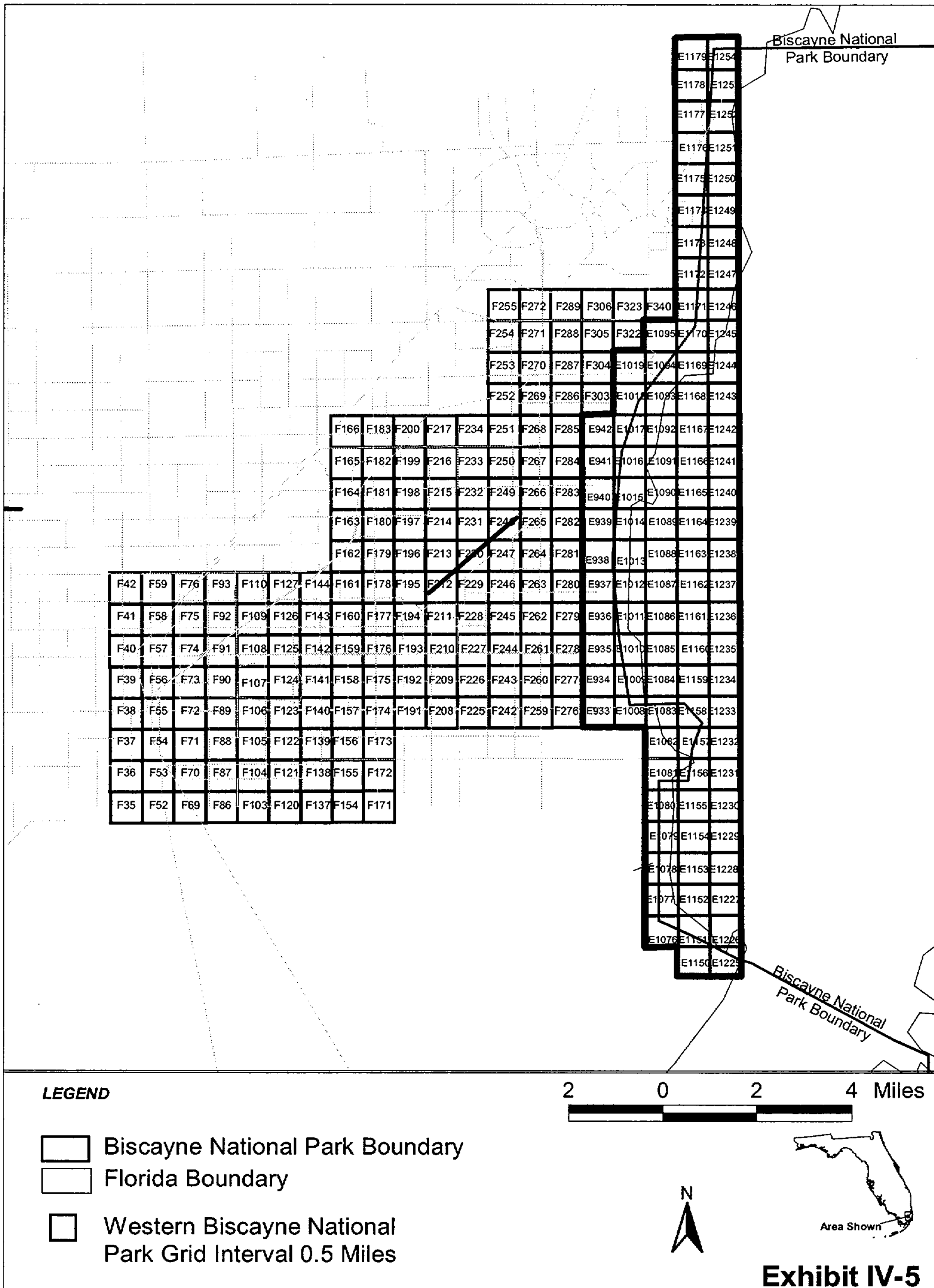


Exhibit IV-5

Homestead Supplemental Grid Indices

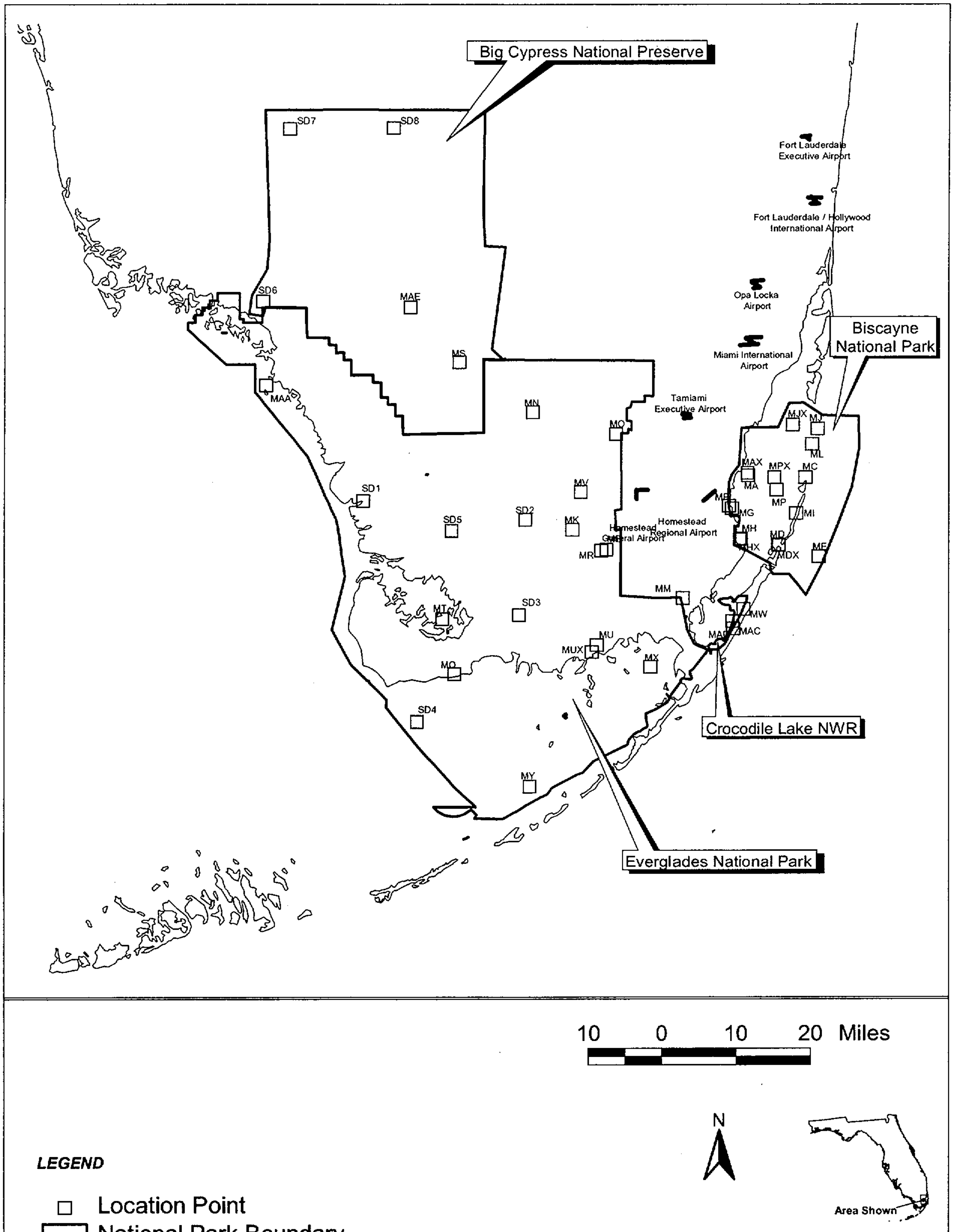


Exhibit IV-6A

Homestead Measurement Location Points

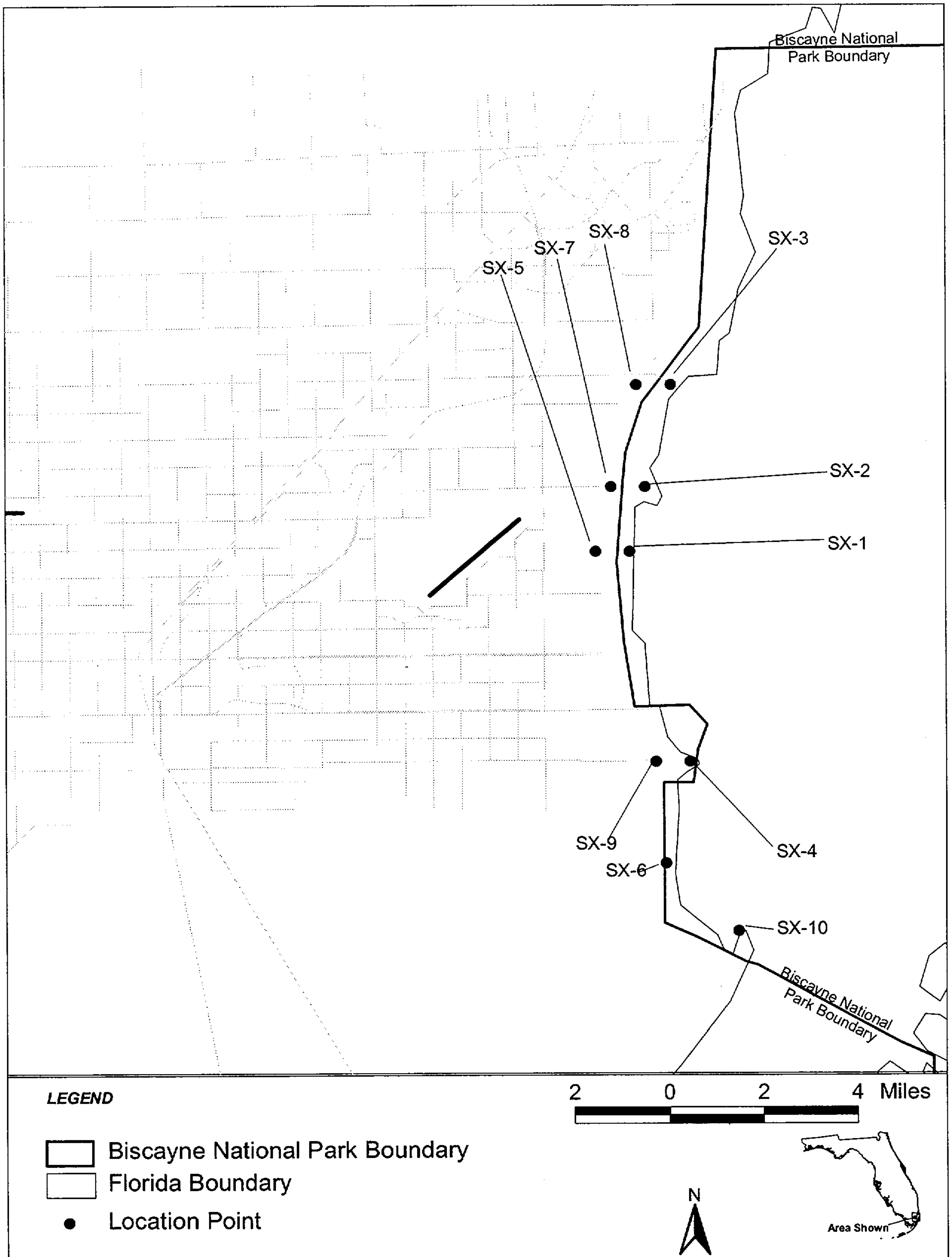


Exhibit IV-6B

Homestead Biological Assessment Locations

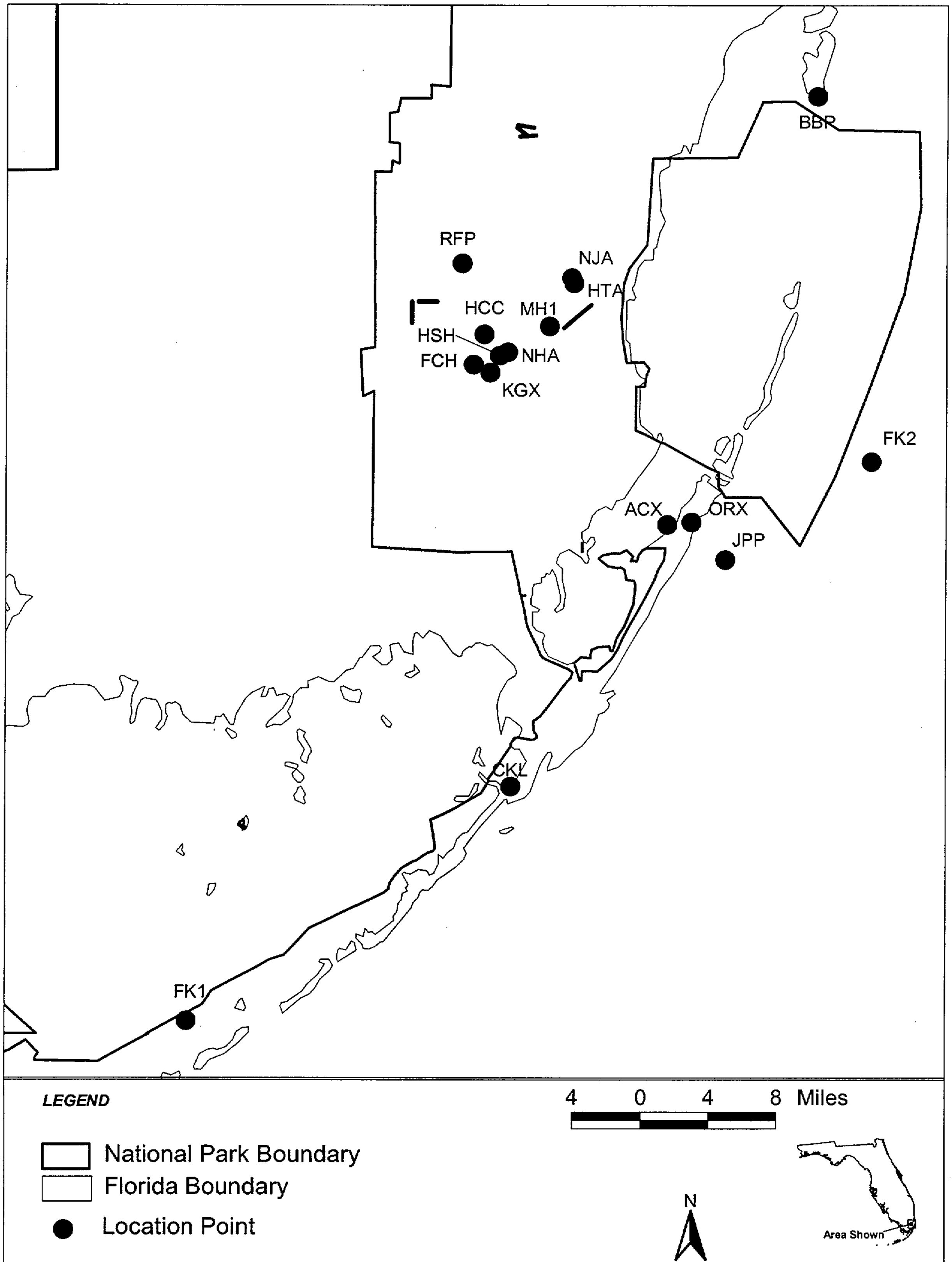


Exhibit IV-6C

Homestead Community Points and Nursing Home

Table IV-1
Homestead Regional Airport SEIS
Supplemental Grid Points and Measurement Locations
Cross-Reference Guide

Map IV-5 Index Number	Measurement Site ID	Site Name and National Property
MA	A *	Black Point - Biscayne
MC	C * Bis2 **	Boca Chita - Biscayne
MI	I * Bis8 **	Elliot Key - Biscayne
MP	P * Bis5 **	Featherbed Bank - Biscayne Central to East Bay
MF	F * Bis4 **	Fender Point - Biscayne
MH	H *	Mangrove Key - Biscayne
ME	E * Bis6 **	Pacific Reef - Biscayne Reef off Caesar Creek
MD	D * Bis7 **	Rubicon Key - Biscayne
ML	L * Bis3 **	Soldier Key - Biscayne
MJ	J *	Stiltsville - Biscayne
MG	G * Bis1 **	Visitors Center - Biscayne
MB	B * Ever2 **	Anhinga Trail - Everglades
MY	Y *	Buchanan Key - Everglades
MO	O *	Chekika - Everglades
MM	M *	Eastern Panhandle - Everglades
MV	V *	Eastern Sparrow - Everglades
MQ	Q * Ever6 **	Eco Pond - Everglades
MR	R *	Hidden Lake - Everglades
MU	U *	Little Madeira Bay - Everglades
MX	X * Ever8 **	North Nest Key - Everglades
MAA	AA *	Pavilion Key - Everglades
MK	K *	Pinelands - Everglades
MN	N *	Shark Valley - Everglades
MT	T *	Whitewater Bay - Everglades
MAD	AD * CL10 **	Barnes Sound - Crocodile Lakes
MS	S *	Golightly - Big Cypress
MW	W *	Hardwood Hammock - Crocodile Lakes
MAC	AC *	Mangrove Inlet - Crocodile Lakes
MAE	AE *	National Scenic Trail - Big Cypress

Table IV-1 (continued)
Homestead Regional Airport SEIS
Supplemental Grid Points and Measurement Locations
Cross-Reference Guide

Map IV-5 Index Number	Measurement Site ID	Site Name and National Property
SD1	Ever1 **	Broad River Campground - Everglades
SD2	Ever4 **	Pa-hay-okee Overlook - Everglades
SD3	Ever5 **	Nine Mile Pond - Everglades
SD4	Ever7 **	Carl Ross Key - Everglades
SD5	Ever9 **	Canepatch Campground - Everglades
SD6	BigC2 **	Halfway Creek - Big Cypress
SD7	BigC3 **	Bear Island - Big Cypress
SD8	BigC4 **	National Scenic Trail - Big Cypress

* Site provided by Volpe Labs.
** Site provided by National Park Service.

Two things have been done to assist SEIS reviewers to understand the noise effects reported in the massive amount of data in the detailed tables. First, grid analysis results are summarized in the following pages to explain how changes in the use of Homestead affect noise in the national properties, including a discussion of what each of the metrics tells us about future potential changes in the noise environment. Second, a series of grid cell maps are provided and referenced in the discussion of grid analysis results. These maps graphically illustrate noise patterns for Homestead and the distribution of the noise level and noise duration increases projected for the Proposed Action above the No Action conditions for 2000, 2005, 2015, and the maximum use of the single runway. Additionally, following the summary of grid analysis results, there are special assessments of twelve sites in the national properties that provide more detailed information in narrative form about the aircraft events that influence noise at these selected locations.

With regard to the detailed tables, the noise generated by other airports in the region is included in the grid cell and location point data. The national properties are currently overflown by aircraft using several other airports in southern Florida in addition to the existing Homestead traffic. The grid assessments present the noise levels associated not only with potential future Homestead traffic, but also include the noise forecast for Miami and Fort Lauderdale-Hollywood International Airports, as well as Kendall-Tamiami Executive and Homestead General Aviation Airports. These four airports currently have much higher traffic levels than Homestead, and the first three are projected to have more operations than Homestead during each of the four future time frames evaluated.

The data in the No Action column of the tables provides the estimated noise effect at each grid cell and location point, including noise from other airports, that would be expected if no additional development beyond a continuing military/government aircraft use were to occur at Homestead. In the Proposed Action column of the tables, the noise data associated with the proposed conversion of Homestead to a commercial airport, in addition to noise from other airports, is reported. The No Action and Proposed Action columns in the tables should be compared to determine the additional noise effect associated with the Proposed Action for each year, as assessed with each of the five noise metrics.

The **DNL** metric is used to form the noise contours presented in the previous chapter, but is also computed for each of the regular grid cells within the national properties, as well as at several noise sensitive locations, including noise measurement sites. The data at various locations range from nearly zero to levels slightly less than 65 decibels in the national property grids, and from less than 40 decibels to more than 70 decibels in the grid adjacent to the airport. At locations on the airport near the runway, the levels are much higher.

The **LAmax and Peak SEL** noise metrics provide data on individual aircraft overflight noise (often termed "single-event levels") expected at each grid cell and point location, as contrasted with cumulative noise exposure calculated in DNL. LAmax is the loudest noise level among individual aircraft events expected at a location. Peak SEL in the tables is the greatest single noise energy contribution expected to occur at a location from an identifiable aircraft event that occurs at least once daily during the period under study along a single flight track. The maximum LAmax level may not occur as frequently as once daily. Every location in the grid networks is exposed to at least 20 decibels of peak level noise at some point during the day. Some locations are exposed to as much as 100 decibels under one or more of the conditions. At locations in the supplemental grid adjacent to the airport, the Peak SEL levels were not computed, but the LAmax levels range from less than 70 decibels to more than 110 decibels. On the airport, the levels are even higher. The SEL values for the various locations may be either higher or lower than the LAmax levels, dependent upon the frequency of occurrence of the events causing them

The **Time Above Ambient** (TA_{amb}) metric provides the amount of time, in minutes per day, that each grid cell or location point is exposed to aircraft noise in excess of the average traditional ambient noise level. The measured traditional ambient noise level was selected to describe the existing noise environment (natural, human, mechanical) at a site, with the exception of aircraft noise. Measurements of traditional ambient noise levels for Everglades NP, Biscayne NP and Crocodile Lakes NWR are used to assess noise-sensitive locations and to develop ambient maps of entire national property areas. All of the measured ambient data for all four ambient categories, and the development of traditional ambient noise mapping, is contained in the Volpe Noise Measurement Report. Although ambient noise levels were measured at several specific locations in the Big Cypress National Preserve, general ambient noise level mapping was not prepared for this area because of its distance from Homestead and the small number of measurements. Additionally, in some areas, the regular grid spacing resulted in the definition of locations beyond park boundaries for which ambient mapping was not available.

The TA_{amb} metric is indicative of the amount of daily time that aircraft noise would be above an average level of other existing environmental noises. This does not mean that every minute of aircraft noise above the traditional ambient level would be annoying to people or considered to be an adverse impact. It should be kept in mind that the TA metric is reporting the daily duration of aircraft noise above a certain level. TA does not report how loud the aircraft events are. Other metrics are informative as to loudness. Neither does the use of the traditional ambient as a floor of measurement mean that aircraft could never be heard at other times. Under certain conditions, it is possible that aircraft could be heard below the ambient level. However, the point at which noise sources below the ambient can be detected is extremely difficult to determine for many reasons. Important variables include noise frequency characteristics of ambient sound at each location, the frequency characteristics of each aircraft type, the weather, the terrain, and the state and attentiveness of the listener.

Within the national properties, the TA values associated with aircraft operations range from no time at all to several hours above the average traditional ambient noise level. The total daily Time Above Ambient is not all consecutive minutes, but is spaced corresponding to aircraft overflights. The amount of time a site is exposed to noise above the traditional ambient level is, because it is a relative measure, a function not only of the loudness and duration of aircraft noise events, but also of the quietness or loudness of the traditional ambient noise levels.

Time above ambient levels were not computed in the grid area adjacent to the airport (Grid F), but rather, the amount of time above 65 decibels was calculated. The 65 decibel level is commonly accepted as the level at which speech is disturbed or persons are awakened by aircraft noise. Within this area, the amount of time in excess of 65 decibels from aircraft noise range from less than a minute at remote sites to more than an hour at locations on the airport or along the extended centerline of the runway. In no case did operations from other airports in the region contribute to the amount of time the area within Grid F was exposed to noise above 65 decibels.

The **Peak Hourly Equivalent Noise Level** ($Leq_{(h)}$) metric is an expression of the hourly average noise level for the period of peak hour of operations during the average day of the peak month of operations. Because information is not available on the specific hour of peak operations at a potential future civil airport at Homestead, an assessment for the peak hour of activity at the existing airports evaluated in this study was prepared for an average busy day of projected operations. While this condition may be exceeded on isolated days, the measure will generally represent a worst case condition. The number of operations assessed for the Peak Hour noise level is computed by evaluating the average busy day noise levels and applying to each operation a peaking factor. Each peaking factor represents the proportion of the total daily activity that occurs during the peak hour. Computations were prepared for each airport based on previously documented peak characteristics. Miami International factors were drawn from its latest master plan. It was assumed that Fort Lauderdale had similar peaking characteristics to Miami International Airport. Peak factors for general aviation airports were drawn from the Dade County Aviation Systems Plan. **Table IV-2** presents the peak hour operations for each airport used to compute peak hour noise levels. Peak hour $Leq_{(h)}$ data was computed within each national property grid, but was not calculated in the grid array adjacent to the airport, as the cumulative noise levels in that area are better represented by the DNL.

Table IV-2
Peak Hour Operations at Regional Airports
Homestead SEIS

Airport/Scenario	Existing	2000	2005	2015	Ultimate
HST - No Action	5	5	5	5	5
HST – Proposed Action	N/A	16	25	41	75
Miami International	120	137	143	150	150
Fort Lauderdale – Hollywood	51	50	56	66	66
Homestead General Aviation	10	10	11	12	13
Kendall- Tamiami	148	148	148	155	163

The ($Leq_{(h)}$) is calculated by computing the 24-hour Leq present at a location for only the peak hour operations and then adding 13.8 decibels to equate the energy to the peak one-hour period.\[i] The additive value represents ten times the log of 24 (hours) and is a normalizing factor to provide one-hour noise levels.

IV.A. Grid Analysis Results

This section will present the general noise trends indicated by the grid analysis, but will not attempt to describe in detail the specific results at each grid cell or location point. That information is available for review in the extensive tables following this section.

IV.A.1.Current Noise Levels

The computed noise levels for each grid cell or point location are presented in **Table IV-3** for the current condition. As discussed in Chapter Two, the fleet is comprised of military and government (Customs) aircraft that are expected to comprise the No Action operations for all future years of evaluation.

Exhibit IV-7 presents the LAmax patterns associated with operations under the existing conditions in 1997. The 1997 pattern is representative of the patterns for 1998 and 1999. The pattern of maximum decibel levels is indicative of the flight paths flown by aircraft using not only Homestead, but also those using Miami International Airport. Noise from operations at Homestead General, Kendall-Tamiami and Fort Lauderdale-Hollywood Airports appear to have little to no effect on the maximum noise levels to which areas of the national properties are exposed. Over Biscayne NP, aircraft departing Homestead to the northeast and making immediate turns to the south produce single event levels in excess of 85 dBA, while northeasterly Homestead departures not making the southerly turn or aircraft departing Miami International to the southeast produce single event levels in excess of 75 dBA. Over Everglades NP, the highest single event levels are produced under the western helicopter corridor and long straight-in approaches from Famin in the west and along the VFR flyway along the eastern side of the park; noise above 55 dBA extends along the centerline approach from the southwest. Crocodile Lakes NWR receives LAmax levels between 65 and 75 dBA.

The Peak Hour Leq pattern for existing conditions is presented on **Exhibit IV-8.** It is comparable to the LAmax pattern in that the highest levels of exposure are found over Biscayne NP, under the departure paths from Homestead. An evaluation of the information in Table IV-3 indicates that the maximum-modeled Leq(h) level achieved within the national properties from existing aircraft operations is nearly 67 decibels (Site E940). The great majority of the higher Leq(h) levels mapped for the existing condition are located in Biscayne NP (within Grid E) or along the eastern edge of Everglades NP. The locations in Biscayne NP are influenced principally by traffic from Homestead, but are affected to a lesser extent by noise from other regional airports. The east/northeast portion of Everglades NP is affected more by large volumes of general aviation traffic using Homestead General and Kendall-Tamiami Airports, as well as commercial traffic using Miami International.

Exhibit IV-9 presents the $TA_{(amb)}$ for the existing conditions. This provides an indication of the effect of other airports on the total amount of time above traditional ambient levels in the national properties. The map indicates that areas under the departure or approach paths to/from Miami International and Kendall-Tamiami Airports experience the longest duration of time above traditional ambient noise levels. The relatively low current level of traffic at Homestead contributes to the time above traditional ambient levels in the vicinity of the airport, but for much shorter periods than associated with the busier airports. If aircraft traffic at Homestead increases under the Proposed Action, that pattern would change to reflect greater Homestead influences.

Maps of noise exposure patterns are not presented for Grid F adjacent to the airport, nor are the points in the western portion of Biscayne National Park (Grid E) mapped. The noise level information at each location indicated on Exhibits IV-5 and IV-6 is included in the tables presented in this chapter.

IV.A.2. Forecast Future Noise Levels

For NEPA evaluations, the effect of the Proposed Action (transfer of Homestead to civilian ownership for use as a commercial airport) is measured against the anticipated conditions if the Proposed Action does not proceed (the No Action condition involving the continued use of Homestead for Air Reserve and other government operations). The tables summarized in this section provide the total computed noise

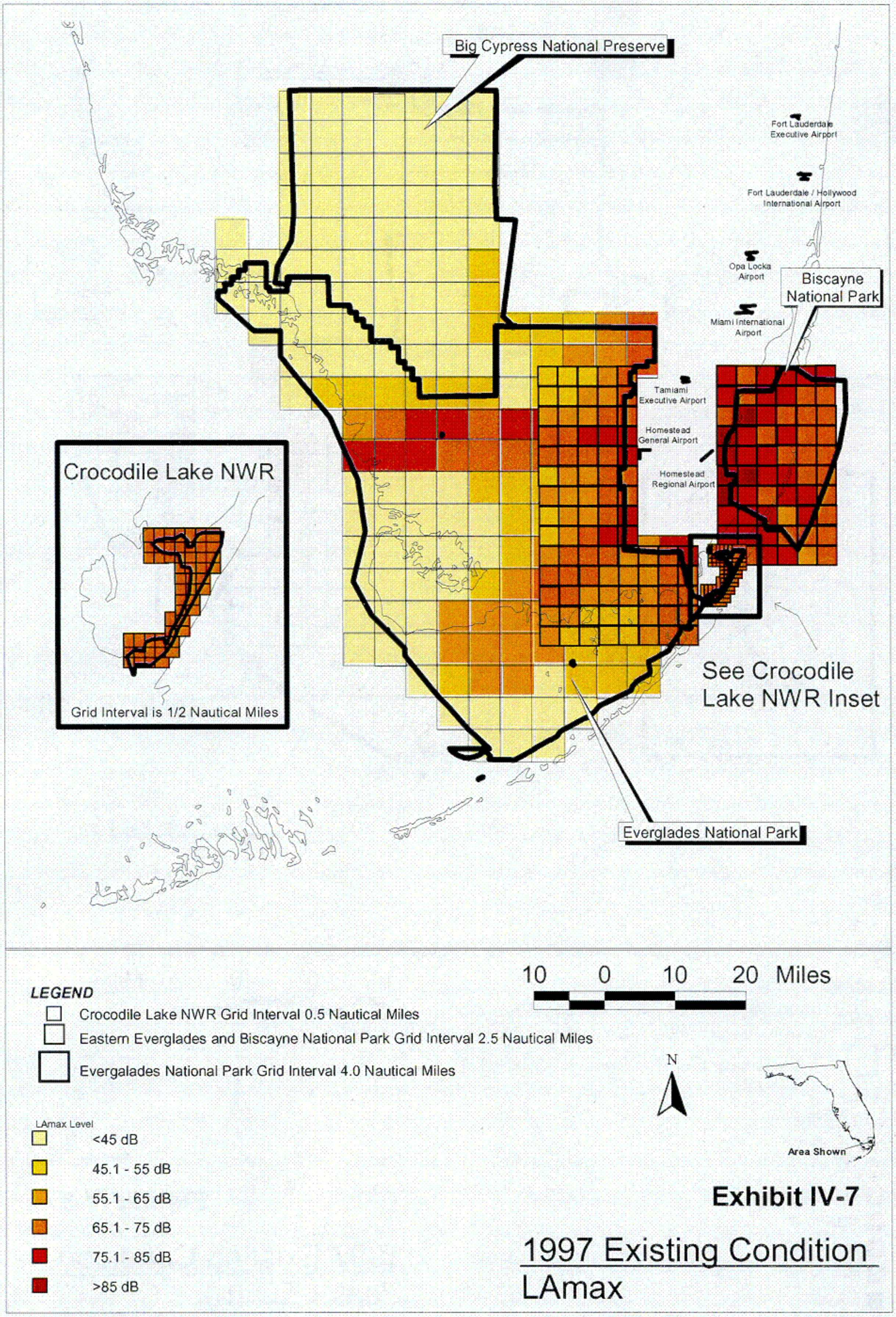


Exhibit IV-7

1997 Existing Condition
LAmax

C-1

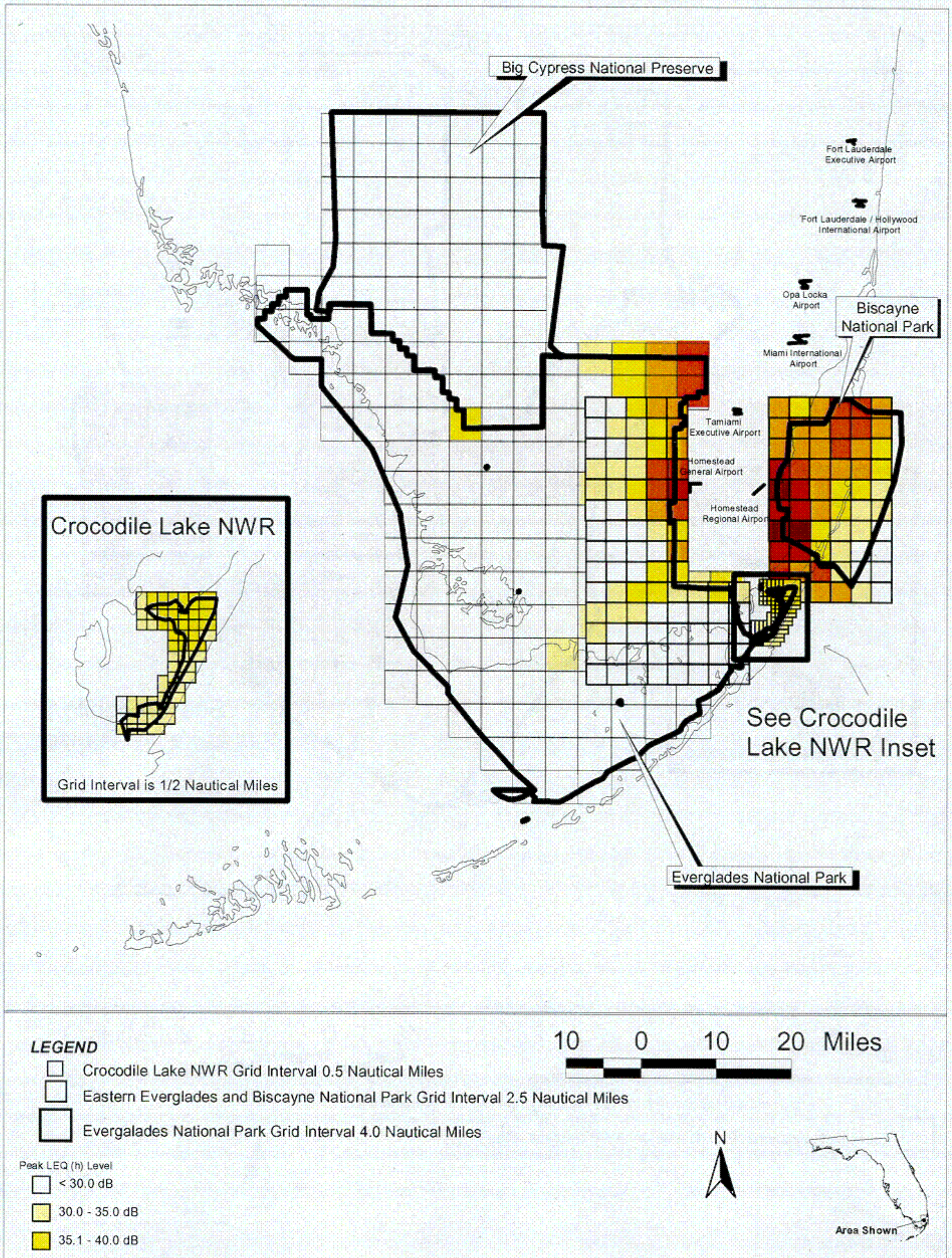


Exhibit IV-8

1997 Existing Condition
Peak LEQ (h)

C-2

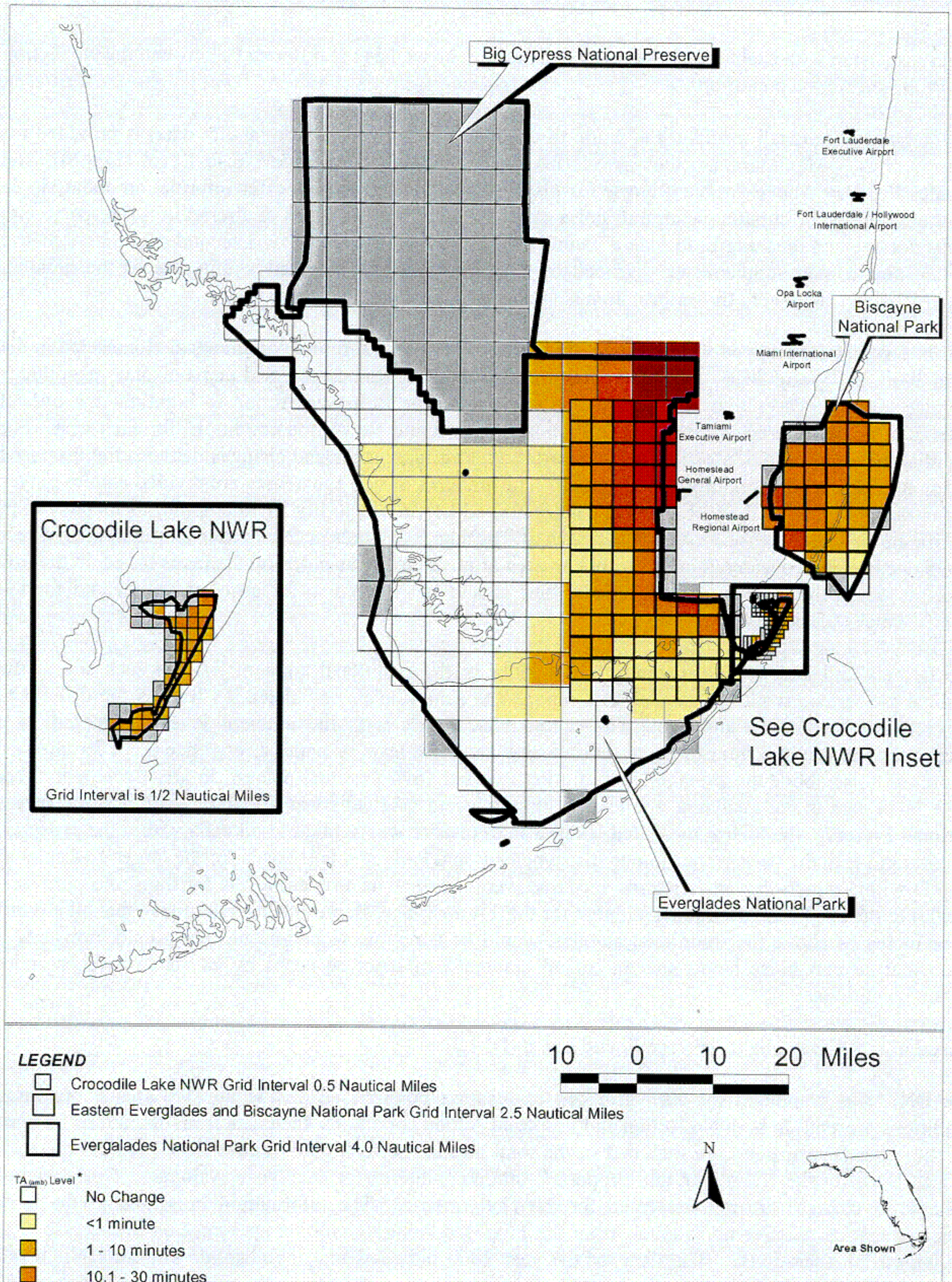


Exhibit IV-9

1997 Existing Condition
Time Above Ambient Level

C-3

levels associated with each of the five described metrics, as well as the differences between the No Action and Proposed Action condition.

Grid mapping of overall results (in addition to detailed location-by-location tabular data) is provided for three metrics - Maximum Decibel Level (LAmax), Peak Hour Average Noise Level (Leq(h)), and Minutes Per Day Above Ambient Noise Levels ($TA_{(amb)}$). These metrics offer information about single event aircraft levels, cumulative aircraft noise exposure, and time durations of aircraft noise, respectively. It was not deemed meaningful to map a second single event metric (SEL) or a second cumulative metric (DNL), nor to map supplemental grid cell or location point data that fell within one of the national property grids. However, this information is included in the detailed tables.

Absolute values are mapped for existing conditions. For potential future conditions at Homestead in the years 2000, 2005, and 2015, absolute values are not mapped. Rather, the grid maps display magnitudes of noise level increases that are projected to occur with the Proposed Action to highlight the overall patterns of noise differences between the Proposed Action and No Action conditions for each year. For potential maximum use of a one-runway airport, both absolute values and changes between the Proposed Action and No Action conditions are mapped. The amounts of noise increases are divided among ranges on the map legends so that the maps are not cluttered beyond legibility by attempting to identify each specific numerical increase. LAmax increases of less than 3 decibels or Peak Hour Leq increases of less than 5 decibels are considered to fall within an area of no change , as noted on the maps based on the low levels at which they occur. The detailed tables should be referred to for absolute values and for the specific values of increases.

The LAmax and Leq(h) data mapping uses a floor of the traditional ambient level at each site in the national properties, while the tabular data reports the actual levels calculated, as well as the difference between the No Action and Proposed Action noise levels with the ambient level considered as a threshold. The use of a floor of the traditional ambient noise level provides a reference point for changes in aircraft noise above the average level of other existing environmental noises. In areas where ambient noise level data is not available, the level within adjacent grid cells was applied. Within Big Cypress National Preserve, the lowest measured level in the Preserve was applied to all cells within the property. Within Grid E in the western portion of Biscayne National Park, ambient levels for the larger grid cells of Grid D within which the smaller grids appeared were assumed as ambient levels for threshold purposes. Similar to the use of the traditional ambient for the TA analytical floor, this does not mean that all aircraft noise increases above the traditional ambient would be annoying to people on the ground, nor does it mean that aircraft noise below the traditional ambient could not be heard by an active listener under certain conditions.

IV.A.2.a Day Night Average Sound Level (DNL)

The DNL was computed for each grid cell or location point based on the average annual operating conditions present. In both No Action and Proposed Action conditions, the noise from operations forecast for the other four airports are included in the total aircraft noise levels. **Table IV-4** presents the total aircraft DNL for the No Action and Proposed Action conditions for each year evaluated. Grid maps of noise level changes are not presented for the DNL metric. The information presented in the table indicates that cumulative noise levels from the Proposed Action condition are expected to increase with the growth of operations. The data for the year 2000 indicates that the absolute aircraft DNL levels range, within the national properties, from nearly zero many miles from the airport to as much as 62 decibels under the departure path in Biscayne NP. In the grid cells adjacent to the airport, the DNL levels range from 40 to as high as 70 decibels.

The increases in DNL noise levels between the No Action and Proposed Action conditions range from no change to increases of up to 20 decibels. Areas of increase are principally under the newly designated departure or approach paths for civilian aircraft forecast to use Homestead. The greatest increases in DNL between the No Action condition and the Proposed Action are in areas more distant from Homestead with lower noise levels where civil aircraft flight tracks would be separate and distinct from military/government flight tracks. Typically, these locations are exposed to average traditional ambient noise levels substantially greater than the No Action or Proposed Action DNLs. Locations nearest to Homestead exposed to high DNL levels from military aircraft operations would experience relatively smaller increases in cumulative noise exposure with the addition of civil operations under the Proposed Action. The same trends exhibit themselves for the years 2005, 2015 and the Maximum Use One-Runway scenarios. These trends are also apparent in the grid maps of the LAmax and Peak Hour Leq metrics.

IV.A.2.b. Maximum Noise Level (LAmax)

The LAmax was computed for each location for No Action and Proposed Action conditions for each future year evaluated. The absolute noise levels, as well as the increases expected with the Proposed Action, are presented in **Table IV-5. Exhibits IV-10 through IV-13** present maps of the increases in maximum decibel levels calculated at each grid cell in the national properties for each future forecast year. The reported increases in the table and the grid maps are subject to the traditional ambient noise level floor discussed in an earlier paragraph.

In locations nearest Homestead, the Proposed Action is not expected to increase the maximum noise level in the near term and to only a marginal degree in the longer terms because of the continued operation of loud military aircraft (refer to the F-16 SEL footprint compared to civil aircraft footprints in Chapter III). On the other hand, in areas that are farther from the airport where civil and military flight tracks diverge, such as in the western and southern Everglades NP and in Big Cypress NP, the difference between Proposed Action and No Action maximum aircraft noise levels is more pronounced, exceeding 10 decibels in several instances. At several locations in Big Cypress National Preserve with an assumed traditional ambient level of 33 decibels, the increase exceeds 20 decibels. It should be noted that in areas where the increases over the No Action condition are the greatest, the absolute LAmax values are relatively low—ranging from 40 to 60 decibels.

After 2000, as more commercial traffic is forecast to connect Homestead to locations in the Keys and Central America, the approach and departure routes to the southwest (over the southern Everglades) would cause additional increases in the maximum noise levels experienced, yet still be generally less than 60 decibels for the worst conditions. Other areas that would experience increases in maximum single event noise of more than 3 decibels are under the Worpp/Famin approach to Homestead from the west in Big Cypress NP and Everglades NP and under the VFR flyway in the northeastern portion of Everglades NP. In 2005, three locations in Biscayne NP would experience maximum single event noise increases of slightly over three decibels over No Action conditions, owing to the introduction of the retrofitted Boeing 727 into the mix in 2005. In all other conditions, Biscayne NP is not expected to receive LAmax increases of more than 5 decibels.

IV.A.2.c. Peak Sound Exposure Level (SEL)

The Peak Daily SEL was computed for each location in the national properties for No Action and Proposed Action conditions for each future year evaluated. Peak SEL was not computed in Grid F adjacent to the airport; the LAmax was selected as a representative single event metric for that area. The resulting absolute noise levels are presented in **Table IV-6.** The peak SEL level achieved by at least one aircraft operation per day varies from location to location, largely along the same trends established by

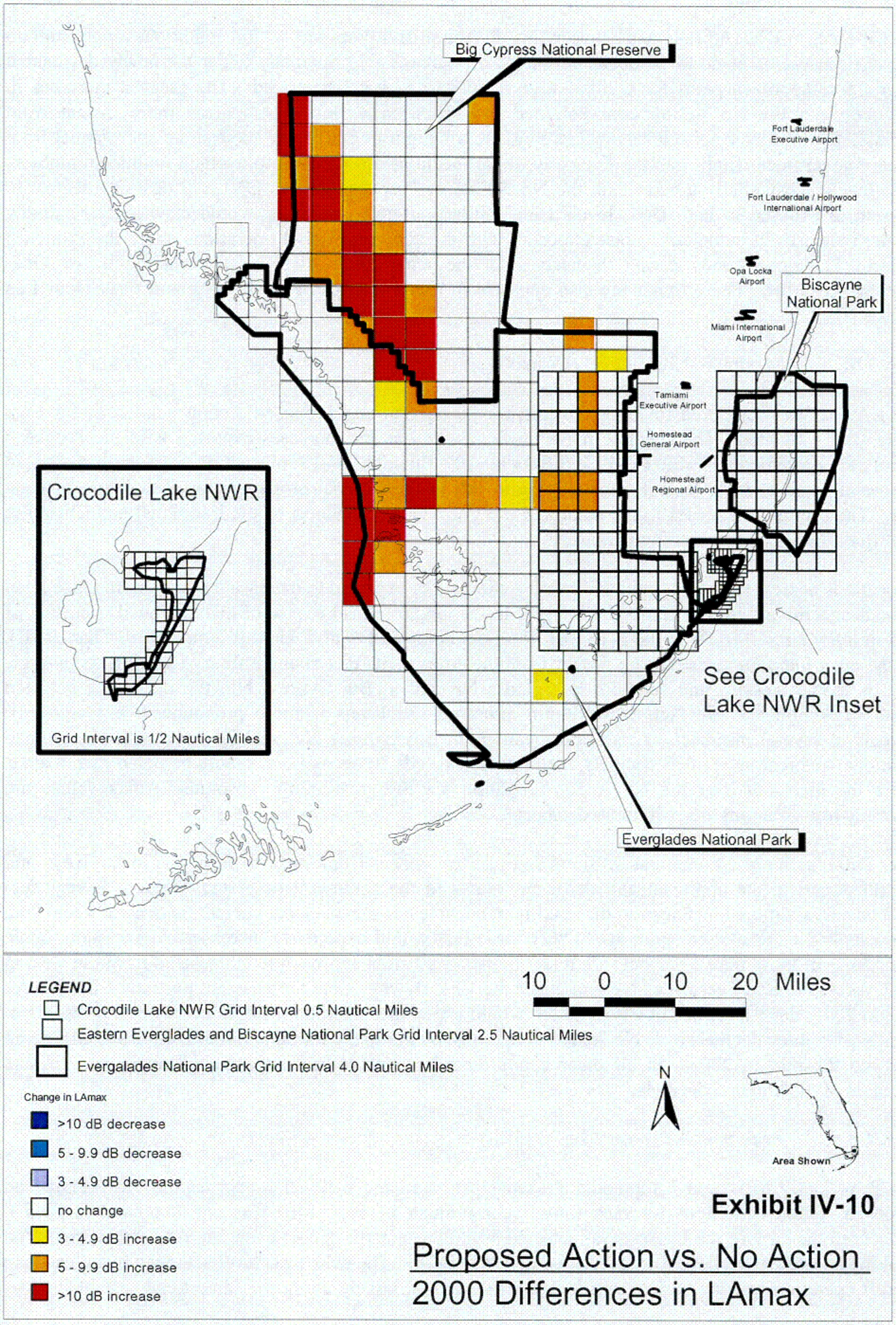


Exhibit IV-10

Proposed Action vs. No Action
2000 Differences in LAmax

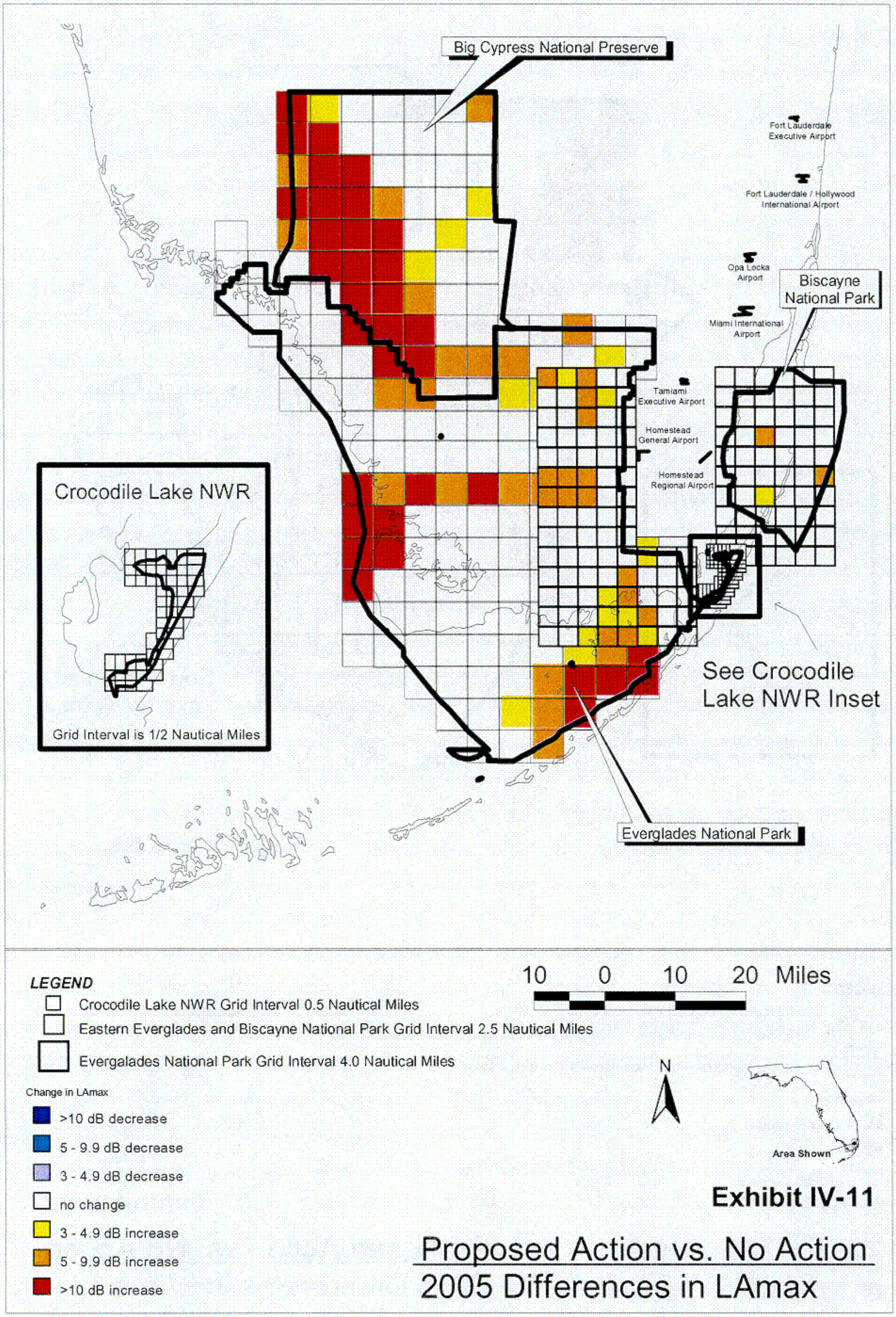


Exhibit IV-11

Proposed Action vs. No Action
2005 Differences in LAmax

C-5

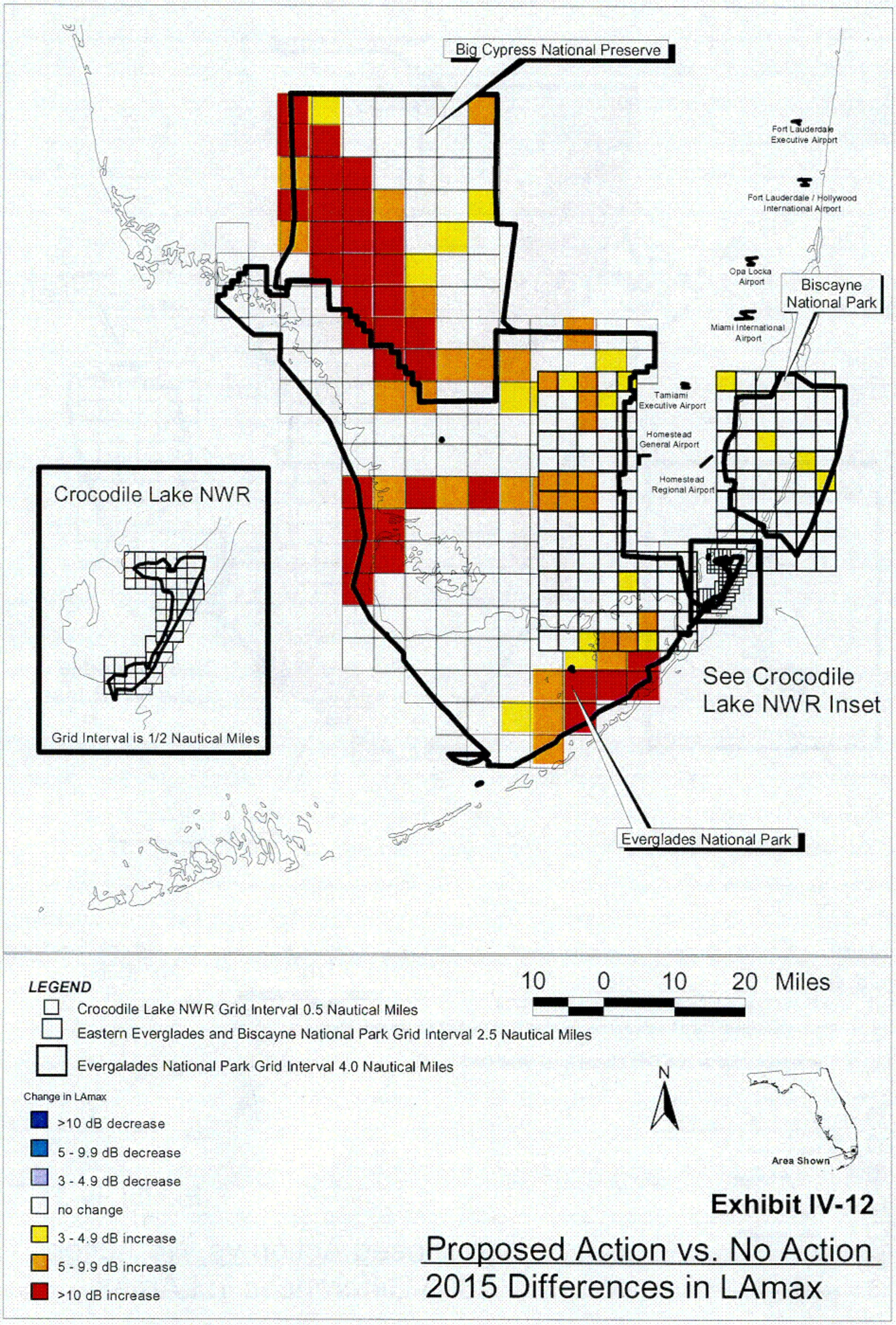


Exhibit IV-12

Proposed Action vs. No Action
2015 Differences in LAmax

L-6

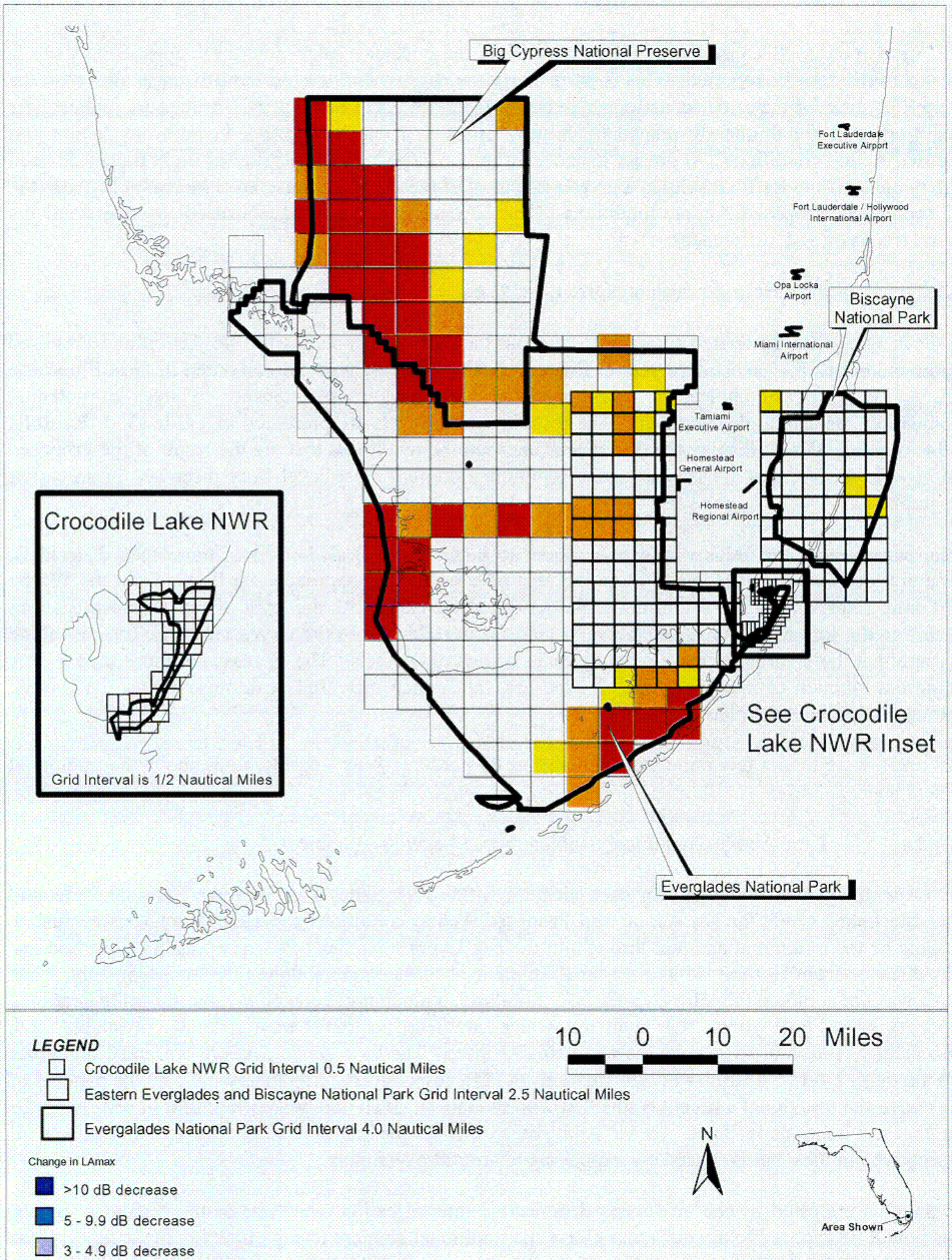


Exhibit IV-13

Proposed Action vs. No Action
Maximum Use One-Runway Differences in LAmax

C-7

the LAmax metric. Because the SEL metric requires the once/day frequency, the loudest SEL a site is exposed to may not be reported. This is particularly the case when the reported SEL is smaller than the reported LAmax for the same scenario and year. In general, the LAmax and SEL values are highest near the airport, and are frequently related to military operations that are present in both No Action and Proposed Action conditions. At greater distances from the airport, the dispersion of flight routes between military and civilian traffic results in a greater disparity of the expected noise level increases between the No Action and Proposed Action conditions. The LAmax grid maps may be used to understand the general trends of SEL differences.

IV.A.2.d. Peak Hour Equivalent Noise Level ($Leq_{(h)}$)

The Peak $Leq_{(h)}$ was computed for each location in the national properties for No Action and Proposed Action conditions for each future year evaluated. Peak Hour Leq was not computed in Grid F because DNL is the metric of choice for assessments of cumulative noise exposure in areas of potential incompatible residential development. The resulting noise levels are presented in **Table IV-7**. **Exhibits IV-14 through IV-17** display the differences between the two levels that are the result of the Proposed Action. The differences are subject to the traditional ambient noise level floor discussed in an earlier paragraph.

In the early years, few areas would be exposed to increases in Peak Leq(h) of more than 5 decibels. These are located west of Homestead, in the area of concentrated approach overflights from the Worpp and Famin fixes, and to the south, under the jet departure paths. As the level of traffic is estimated to increase in the future, the noise levels would increase in reflection of the increased traffic forecast along the route, but the level of increase would remain below 10 decibels. The increases of more than 5 dBA are more a function of increased time of exposure, rather than increased peak noise levels. This trend continues throughout the planning period.

Most areas more than a few miles from the airport do not have Peak Leq(h) values above the traditional ambient levels.

IV.A.2.e. Time Above Traditional Ambient Noise Level (TA(ambient))

The TA(ambient) was computed for each location within Everglades and Biscayne National Parks and Crocodile Lakes NWP for No Action and Proposed Action conditions for each future year evaluated. Mapping of the traditional ambient throughout the Big Cypress National Preserve was not done because of its distance from Homestead and the small number of measurements done there; consequently, Time Above was not computed for Big Cypress NP. Similarly, a number of cells on the margins of the national properties were not within the area for which ambient mapping was generally available and, consequently, TA(ambient) results are not available there. The time above data are presented in **Tables IV-8 through IV-11**. **Exhibits IV-18 through IV-21** , respectively, graphically indicate the patterns of time above the traditional ambient associated with the tables. It should be kept in mind in reviewing the data that the total daily Time Above Ambient shown in the tables and on the exhibits is not all consecutive minutes, but is spaced corresponding to aircraft overflights.

The patterns indicated by the grid maps demonstrate intensification over time of the durations various areas would be exposed to aircraft noise above the traditional ambient levels. In 2000, the areas with the longest times above the traditional ambient levels are located along the VFR flyway leading to Homestead passing Kendall-Tamiami and Homestead General Aviation Airports. Extending westward from the flyway is an area of overflights approaching both Homestead and Miami International from the Worpp/Famin fixes. To the southwest of Homestead is an area exposed to smaller increases of the length of time above traditional ambient levels under the Mnate departure corridor for propeller aircraft. Over

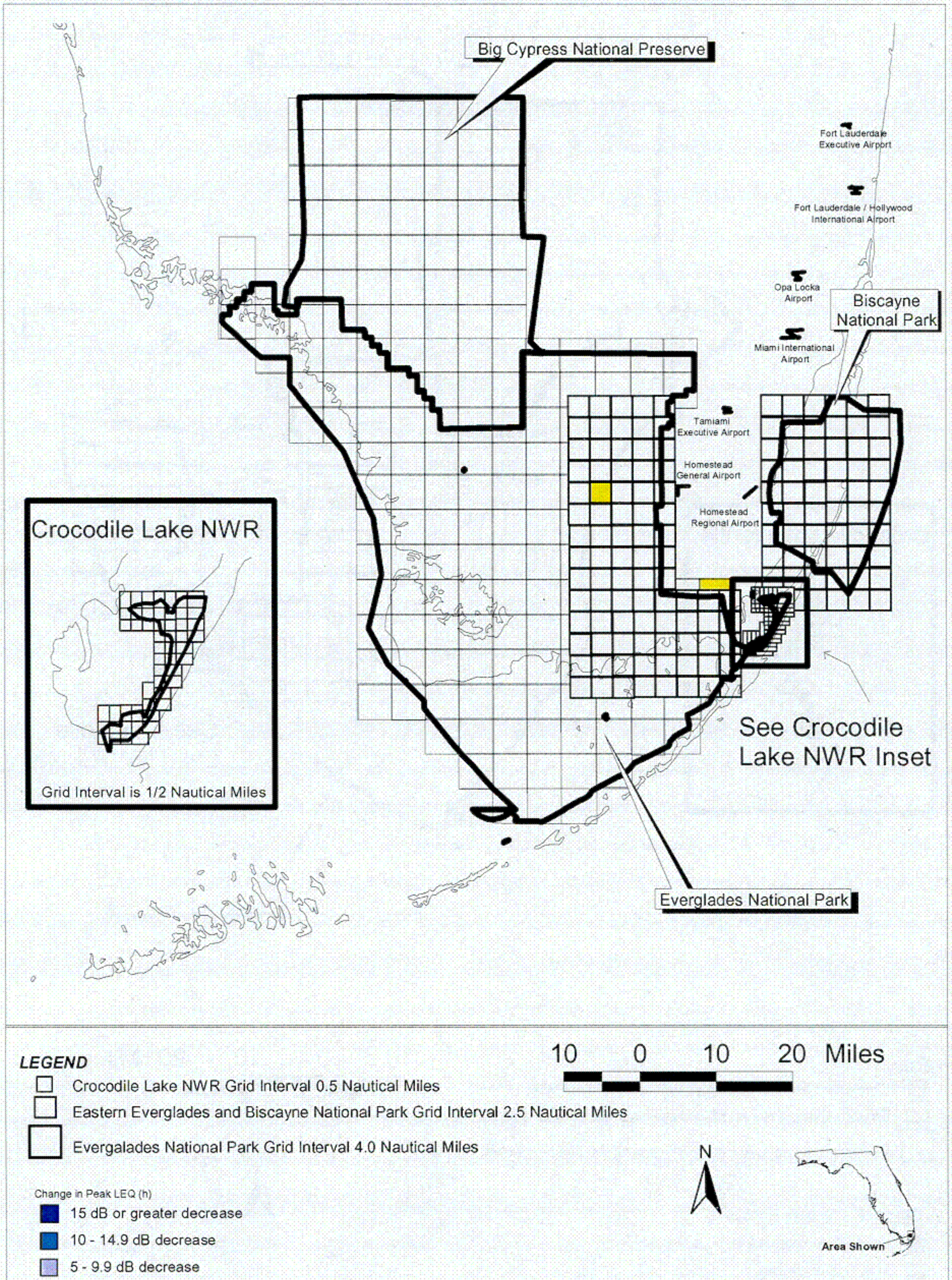


Exhibit IV-14

Proposed Action vs. No Action
2000 Differences in Peak LEQ (h)

L-8

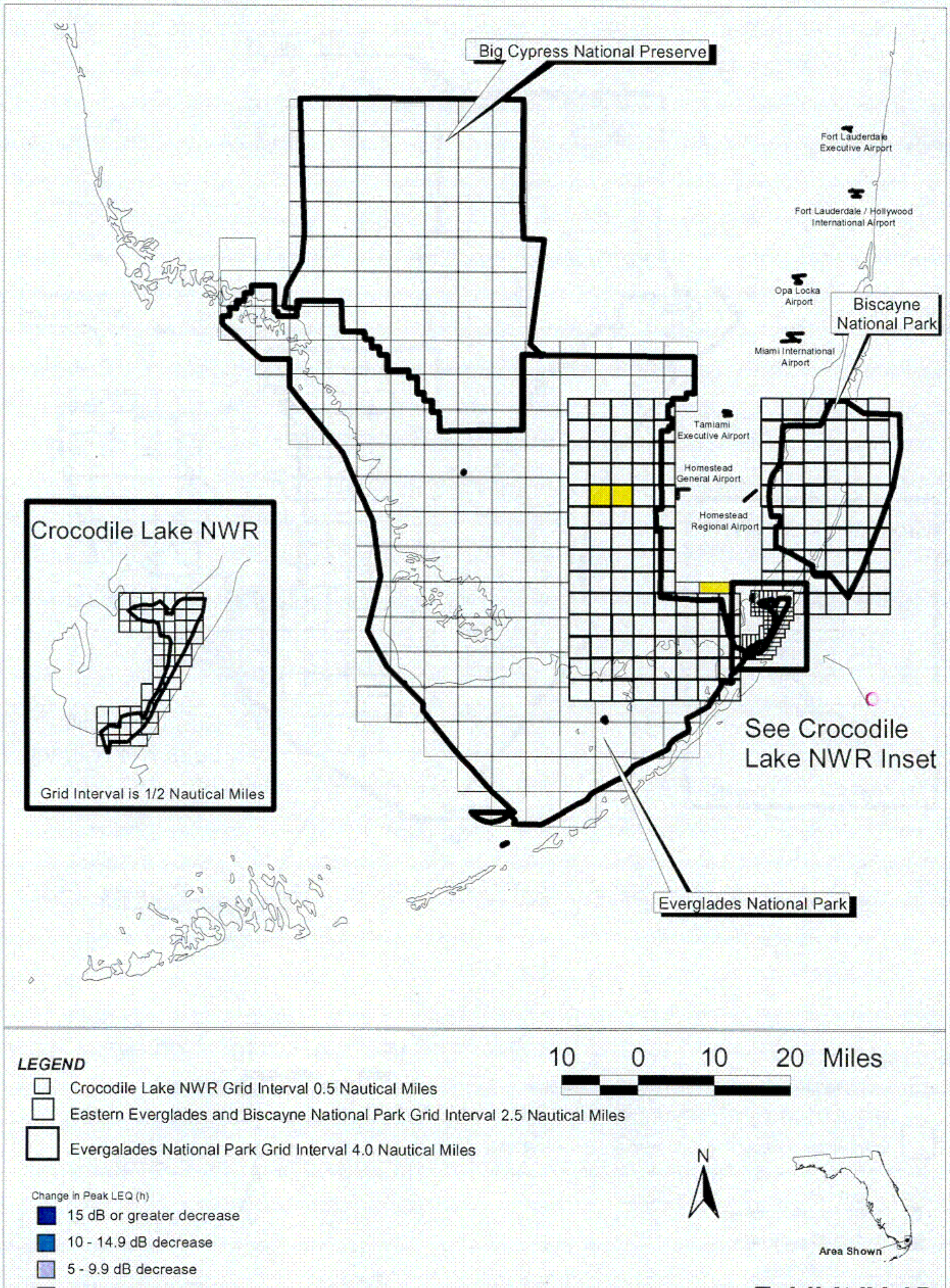
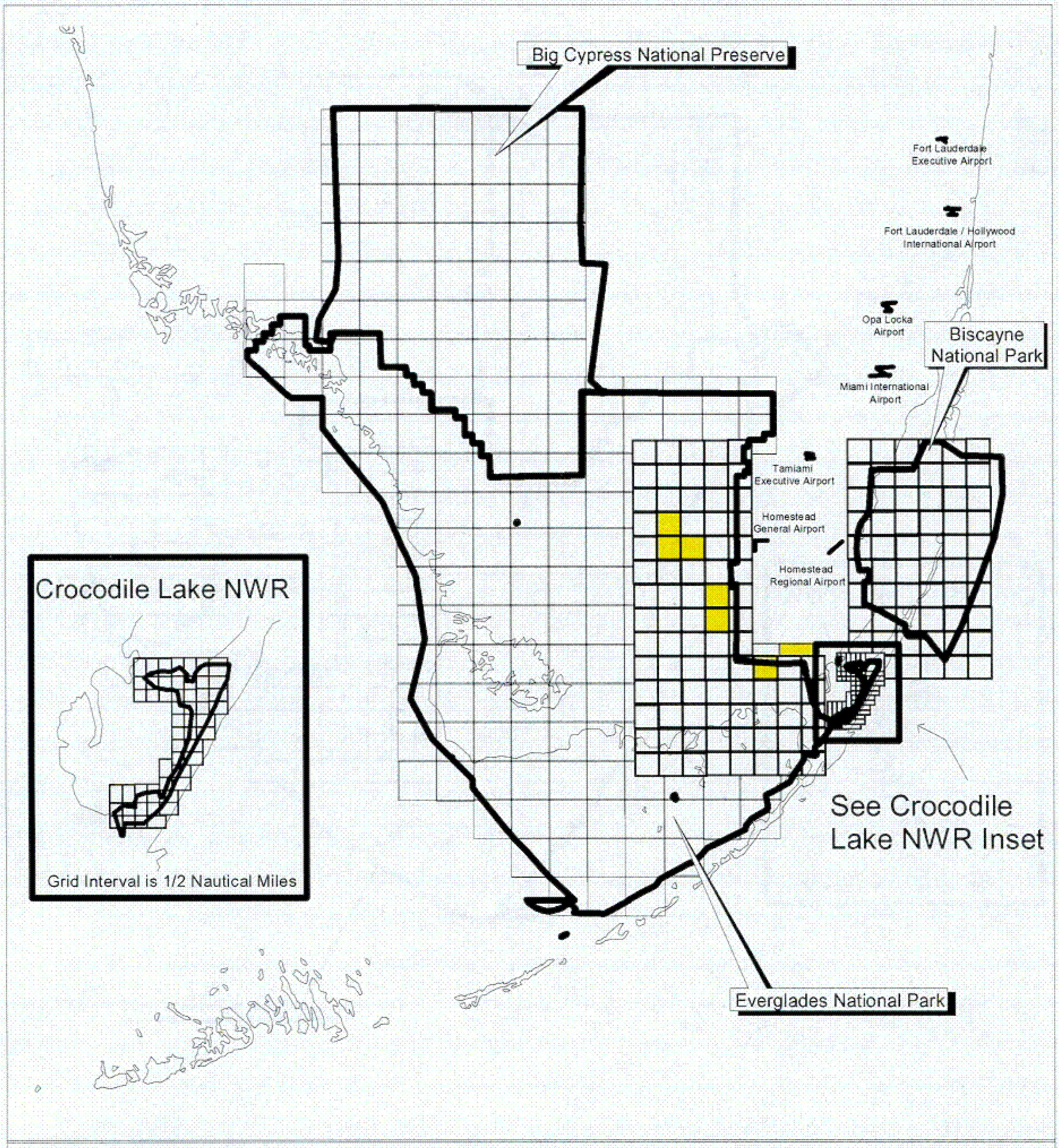


Exhibit IV-15

Proposed Action vs. No Action
2005 Differences in Peak LEQ (h)

C-9



LEGEND

- Crocodile Lake NWR Grid Interval 0.5 Nautical Miles
- Eastern Everglades and Biscayne National Park Grid Interval 2.5 Nautical Miles
- Evergalades National Park Grid Interval 4.0 Nautical Miles

Change in Peak LEQ (h)

- 15 dB or greater decrease
- 10 - 14.9 dB decrease
- 5 - 9.9 dB decrease
- no change
- 5 - 9.9 dB increase
- 10 - 14.9 dB increase
- 15 dB or greater increase

Exhibit IV-16

Proposed Action vs. No Action
2015 Differences in Peak LEQ (h)

C-10

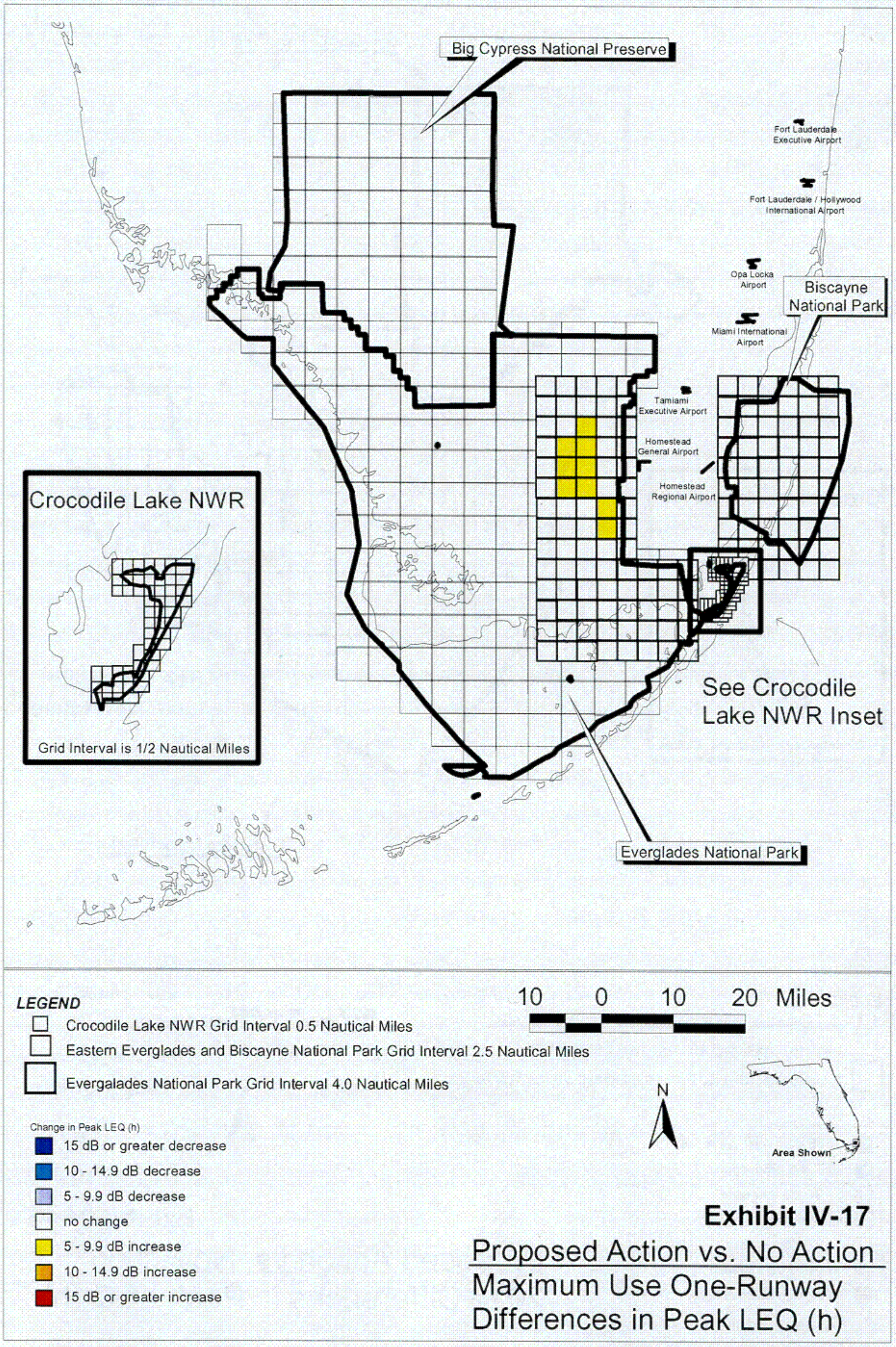


Exhibit IV-17

Proposed Action vs. No Action
Maximum Use One-Runway
Differences in Peak LEQ (h)

L-11

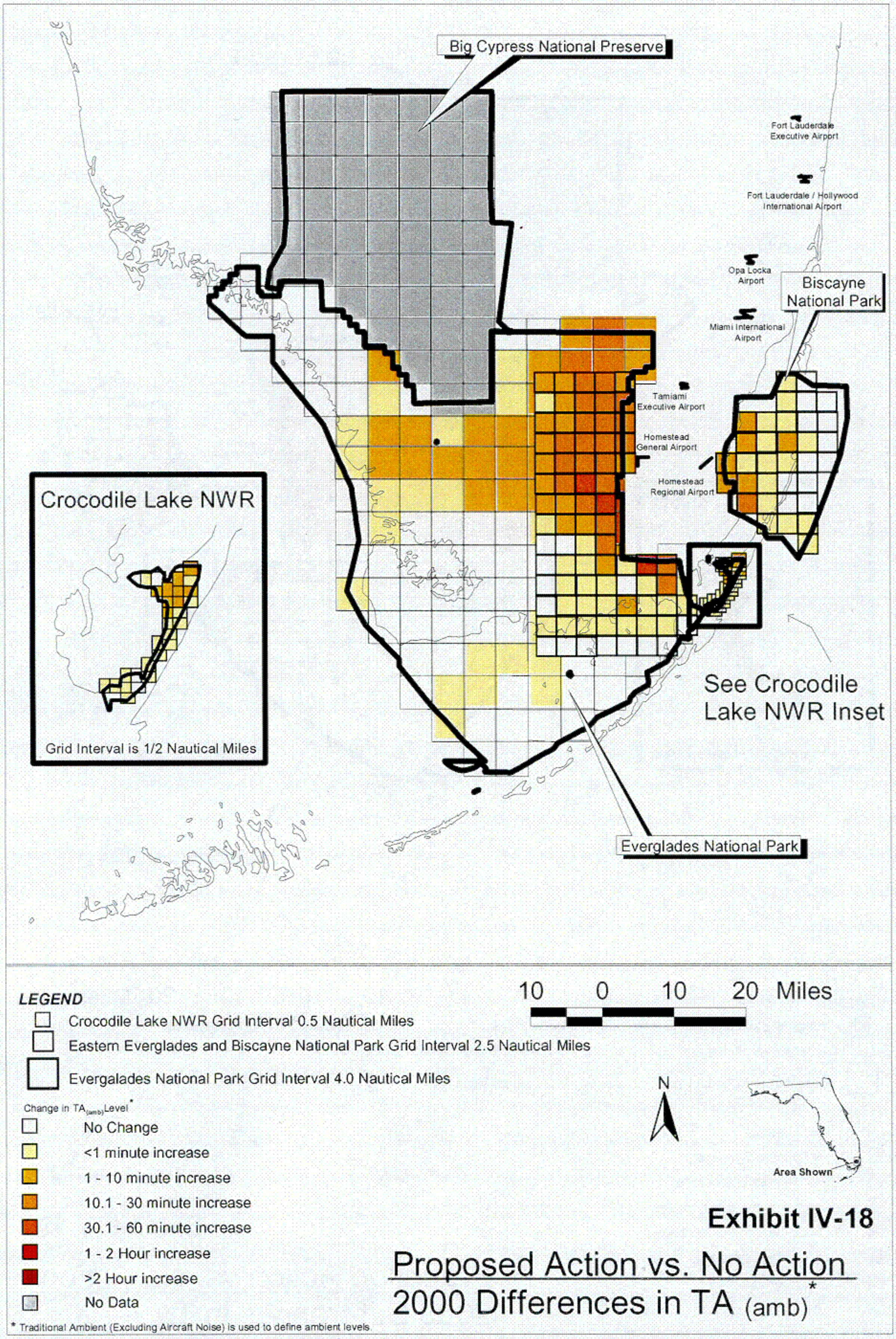


Exhibit IV-18

Proposed Action vs. No Action
2000 Differences in TA (amb)*

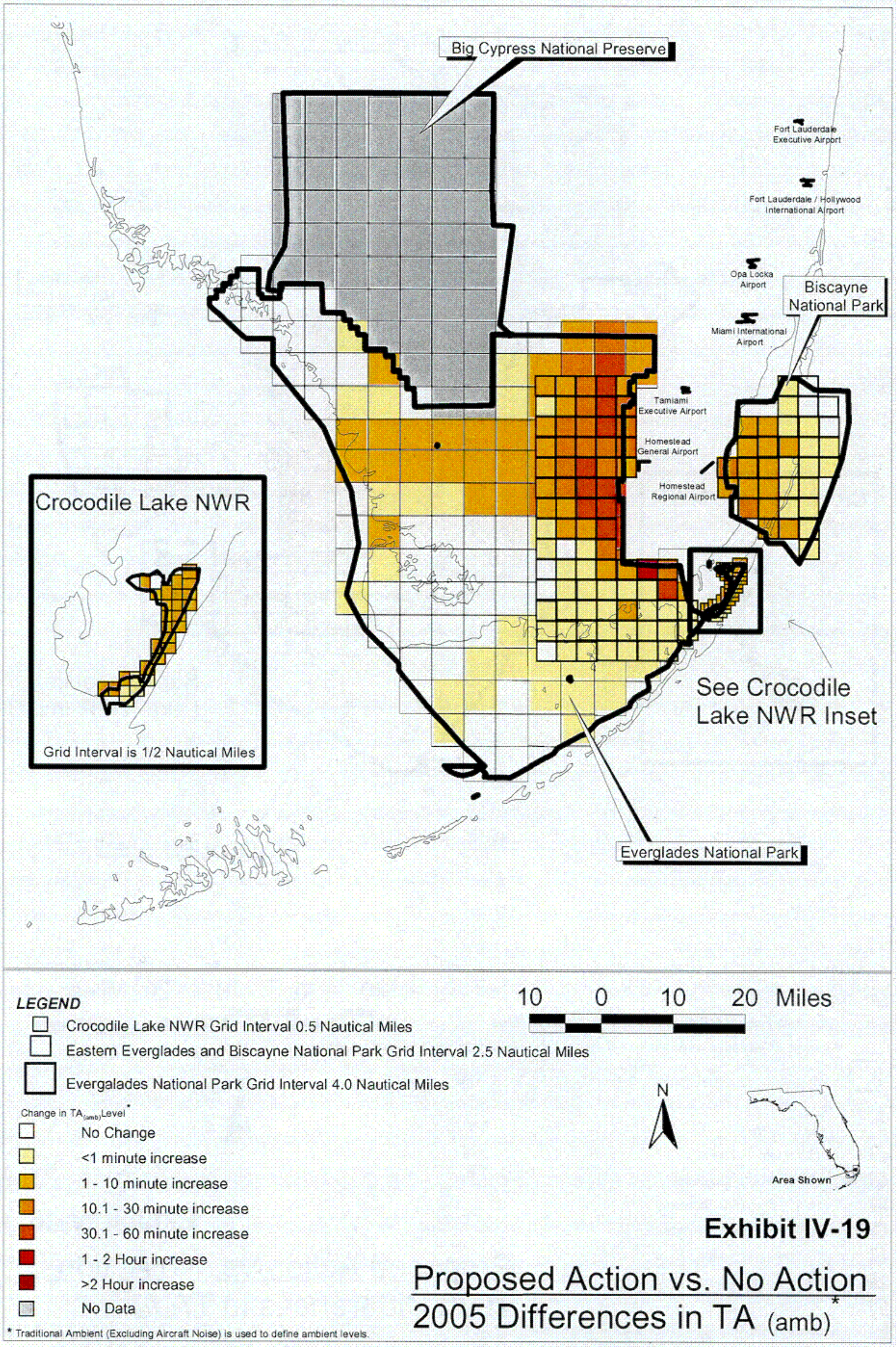


Exhibit IV-19

Proposed Action vs. No Action
2005 Differences in TA (amb)*

C-13

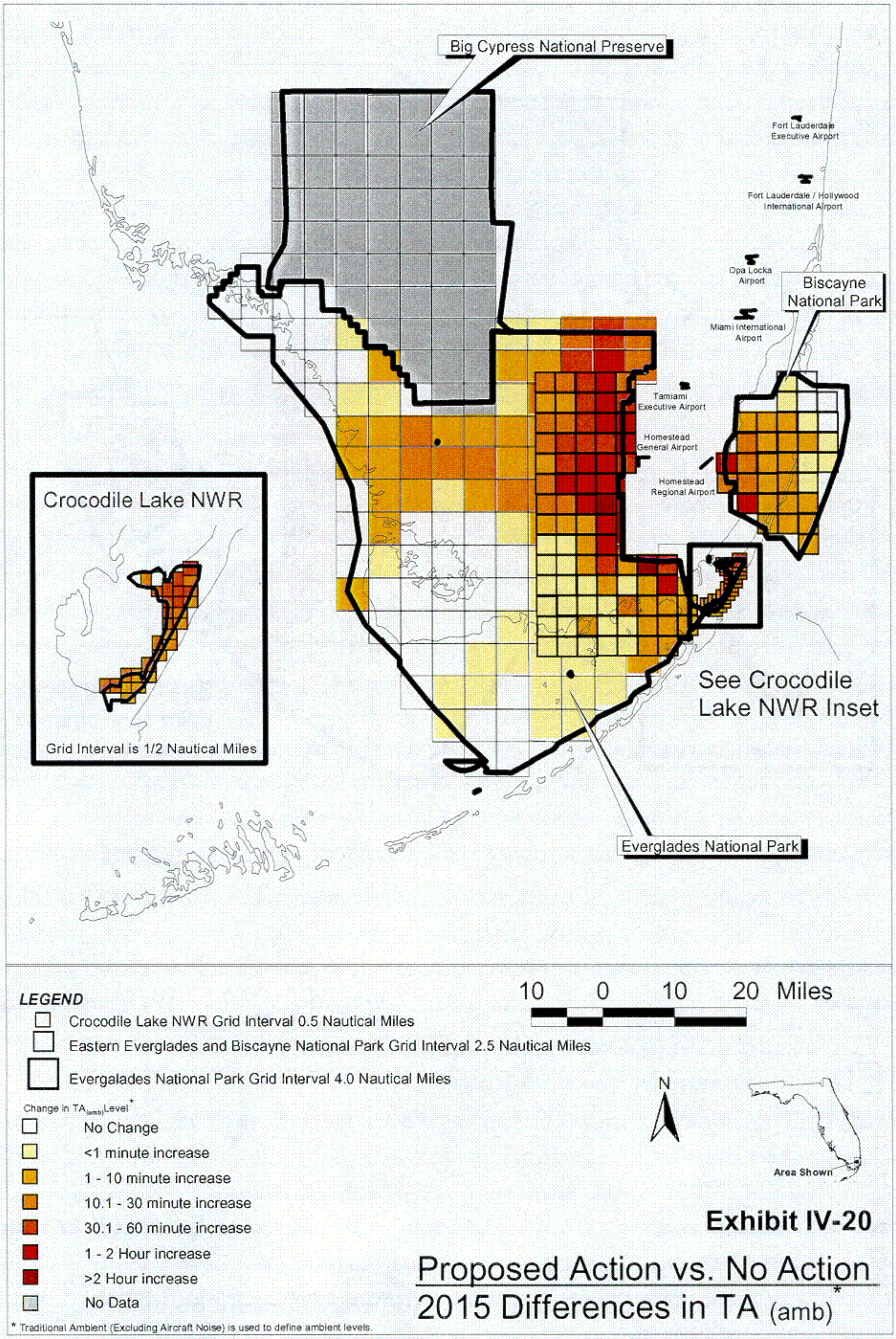
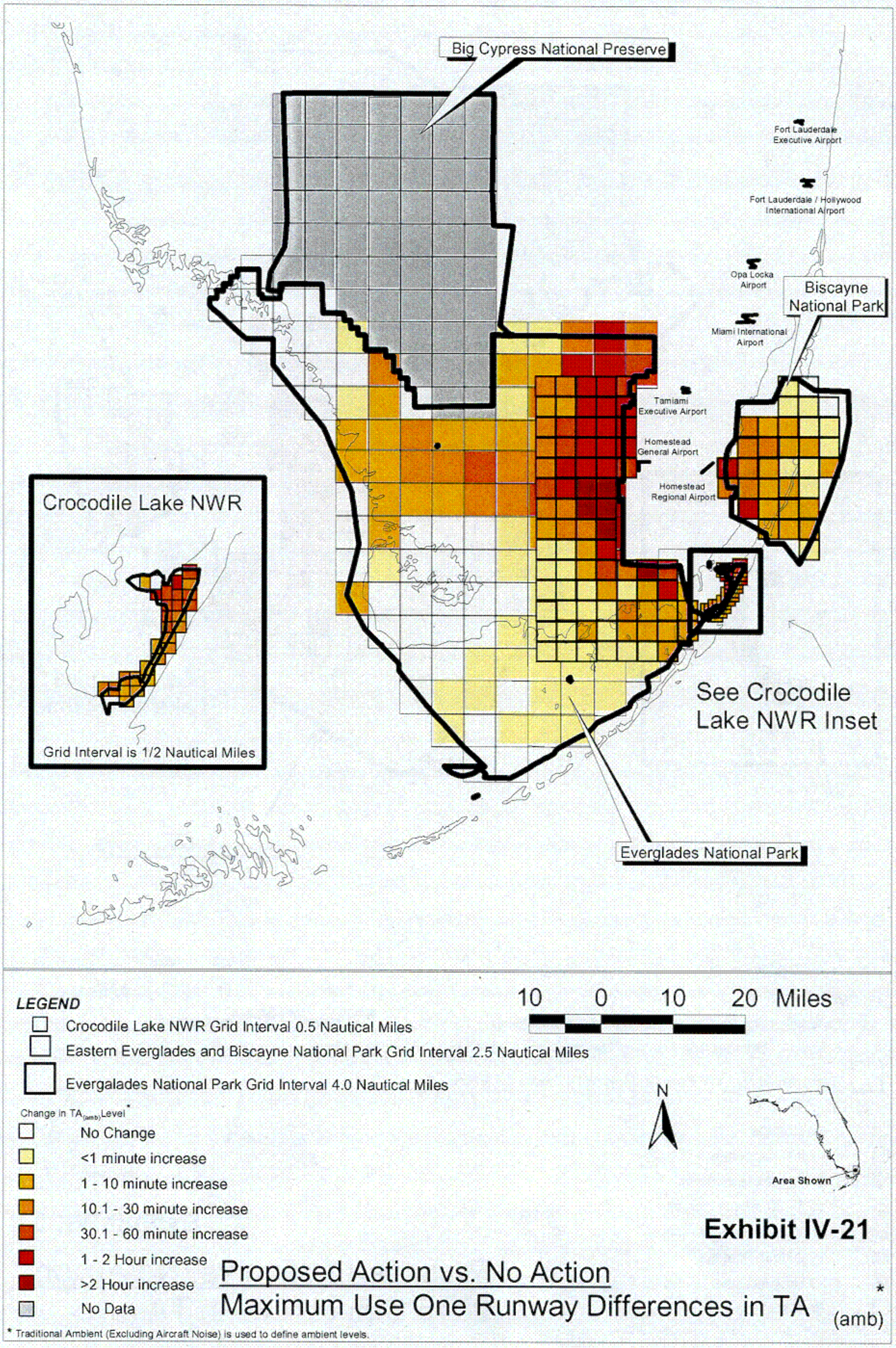


Exhibit IV-20

Proposed Action vs. No Action
2015 Differences in TA (amb)*

C-14


Big Cypress National Preserve
Fort Lauderdale Executive Airport
Fort Lauderdale / Hollywood International Airport
Opa Locka Airport
Biscayne National Park
Miami International Airport
Tamiami Executive Airport
Homestead General Airport
Homestead Regional Airport
Crocodile Lake NWR
Grid Interval is 1/2 Nautical Miles
See Crocodile Lake NWR Inset
Everglades National Park
LEGEND
10 0 10 20 Miles
Crocodile Lake NWR Grid Interval 0.5 Nautical Miles
Eastern Everglades and Biscayne National Park Grid Interval 2.5 Nautical Miles
Everglades National Park Grid Interval 4.0 Nautical Miles
N
Area Shown
Change in TA(amb) Level*
No Change
<1 minute increase
1 - 10 minute increase
10.1 - 30 minute increase
30.1 - 60 minute increase
1 - 2 Hour increase
>2 Hour increase
No Data
Exhibit IV-21
Proposed Action vs. No Action
Maximum Use One Runway Differences in TA(amb)*
* Traditional Ambient (Excluding Aircraft Noise) is used to define ambient levels.

Crocodile Lakes NWR and Biscayne NP, durations of aircraft noise above traditional ambient levels are expected to increase by up to ten minutes or more, respectively, with the introduction of commercial traffic at Homestead.

By 2005, each area indicated for 2000 would receive somewhat longer exposure to noise above the traditional ambient levels, and those areas would grow slightly as more traffic is introduced. The area under the jet departure path to Mnate would experience the introduction of more noise above the traditional ambient levels, as would more of Biscayne NP. By 2015, the growth of operations at Homestead and the regional general aviation airports would result in total exposure times along the VFR flyway along the east edge of Everglades NP increasing by an hour or more per day at several locations. This level of exposure will also be true at several other locations along the principal flight tracks leading to and from Homestead during easterly flow. Other areas previously affected would continue to experience a lengthening of the period of exposure to noise above traditional ambient levels as the number of operations is estimated to increase above No Action conditions.

By the end of the evaluation period, the patterns established in previous years would, according to forecasts used for this analysis, reach their greatest levels under the Proposed Action. The 2015 pattern would be intensified and more areas of eastern Everglades NP and of Biscayne NP, as well as Crocodile Lakes NWP, would be exposed to increases of durations of aircraft noise of between 10 minutes and an hour above traditional ambient levels above the No Action condition. In a number of cases, the Time Above ambient level is calculated to increase by more than two hours in areas of concentrated general aviation activity and commercial overflight southwest of the airport. Only some areas in the far western and southwestern portions of Everglades NP are not forecast to experience an increase in Time Above Ambient levels above the No Action conditions.

IV.A.3. Absolute Maximum Use Noise Levels

Exhibits IV-7 through IV-9 indicated, for existing conditions, the absolute noise levels that are present at the various grid cells throughout the national properties. **Exhibits IV-22 through IV-27** are presented to allow the reader to compare the forecast noise levels for the No Action and Proposed Action conditions of the maximum use year of the single runway at Homestead. Exhibits IV-22, -23 and -24, respectively, present LAmax, Leq(h) and TA(amb) levels expected if the facility retains its use as a military/government airfield closed to civilian use. Exhibits IV-25, -26 and -27 present similar data for the maximum use of the facility as a one-runway civilian airport.

The patterns presented by the future No Action condition are highly similar to those indicated for the existing condition. In Biscayne National Park, the existing condition mapping shows grid cells with higher LAmax, Leq(h) and TA(amb) values than are indicated for the future No Action condition. This reduction of effect is largely the result of the forecast removal of retrofit Stage 3 and MD-80 aircraft from the operating fleet at Miami International Airport by the maximum one runway use year. Grid cells in Everglades National Park, Big Cypress Preserve and Crocodile Lakes are virtually identical to those of the present condition.

The Proposed Action condition for the maximum use year is, for LAmax, little different from the No Action condition in the areas closest to Homestead that receive the loudest single-event noise. The LAmax increases for the Proposed Action would occur in areas farther from the airport where civilian and military flight tracks would diverge--in Big Cypress Preserve, under the WORPP approach from the northwest, and in Everglades NP, under the FAMIN approach from the southwest and under the MNATE departures in the southeast.

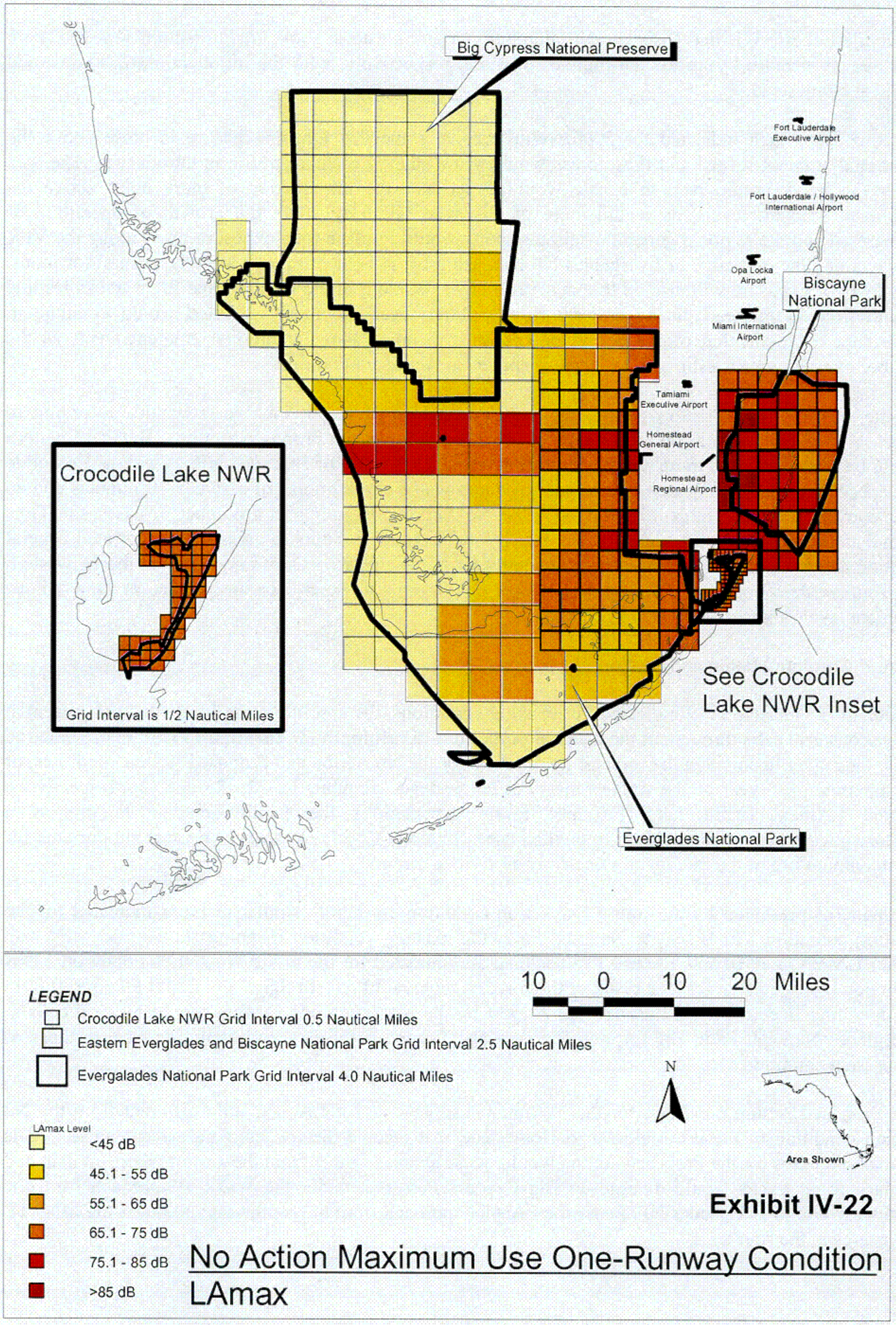


Exhibit IV-22

No Action Maximum Use One-Runway Condition LAmax

C-16

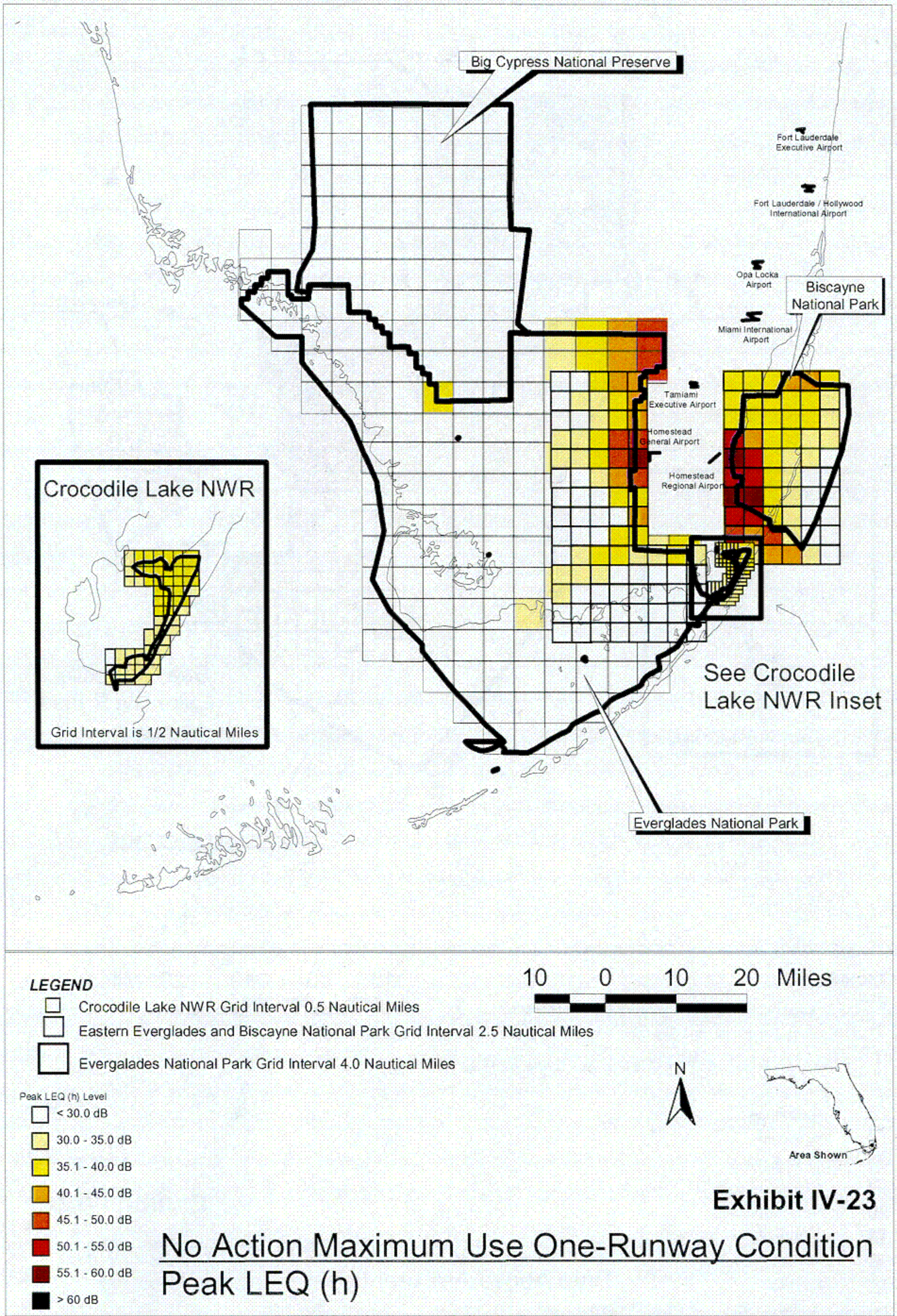


Exhibit IV-23

No Action Maximum Use One-Runway Condition
Peak LEQ (h)

C-17

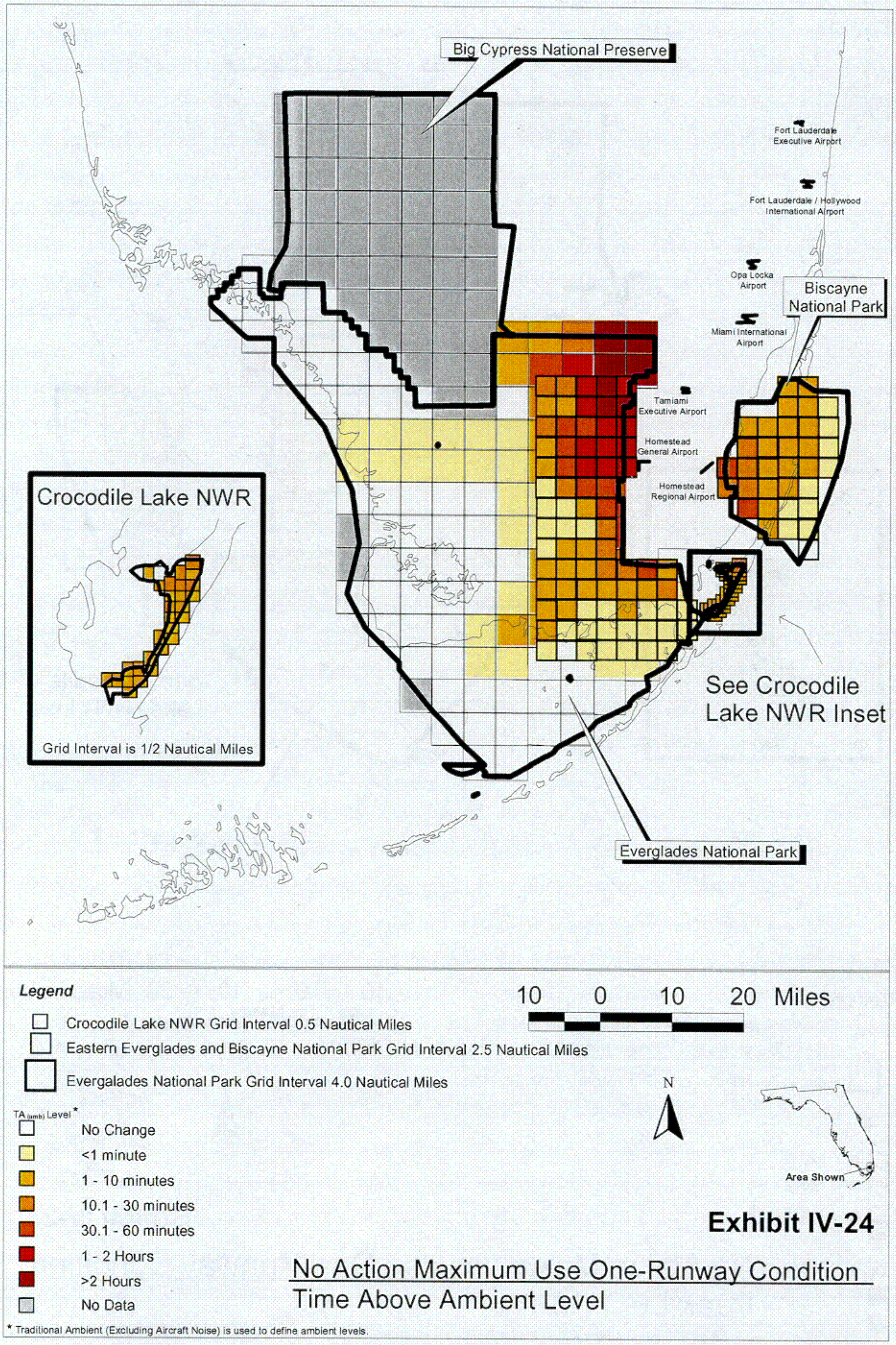
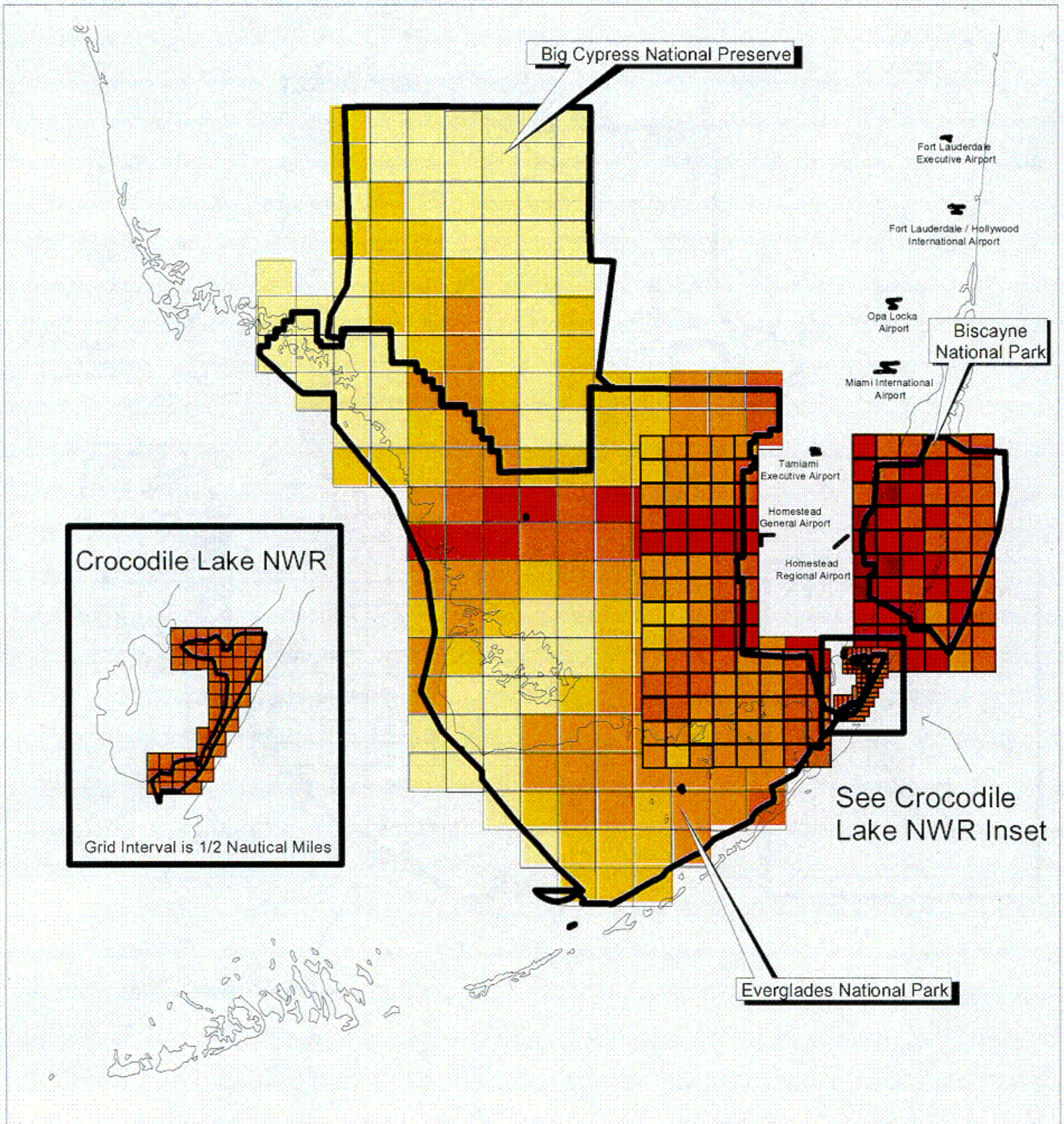


Exhibit IV-24

No Action Maximum Use One-Runway Condition
Time Above Ambient Level

* Traditional Ambient (Excluding Aircraft Noise) is used to define ambient levels.



LEGEND

- Crocodile Lake NWR Grid Interval 0.5 Nautical Miles
- Eastern Everglades and Biscayne National Park Grid Interval 2.5 Nautical Miles
- Evergalades National Park Grid Interval 4.0 Nautical Miles

10 0 10 20 Miles

N

Area Shown

LAmax Level

- <45 dB
- 45.1 - 55 dB
- 55.1 - 65 dB
- 65.1 - 75 dB
- 75.1 - 85 dB
- >85 dB

Exhibit IV-25

Proposed Action Maximum Use One-Runway Condition
LAmax

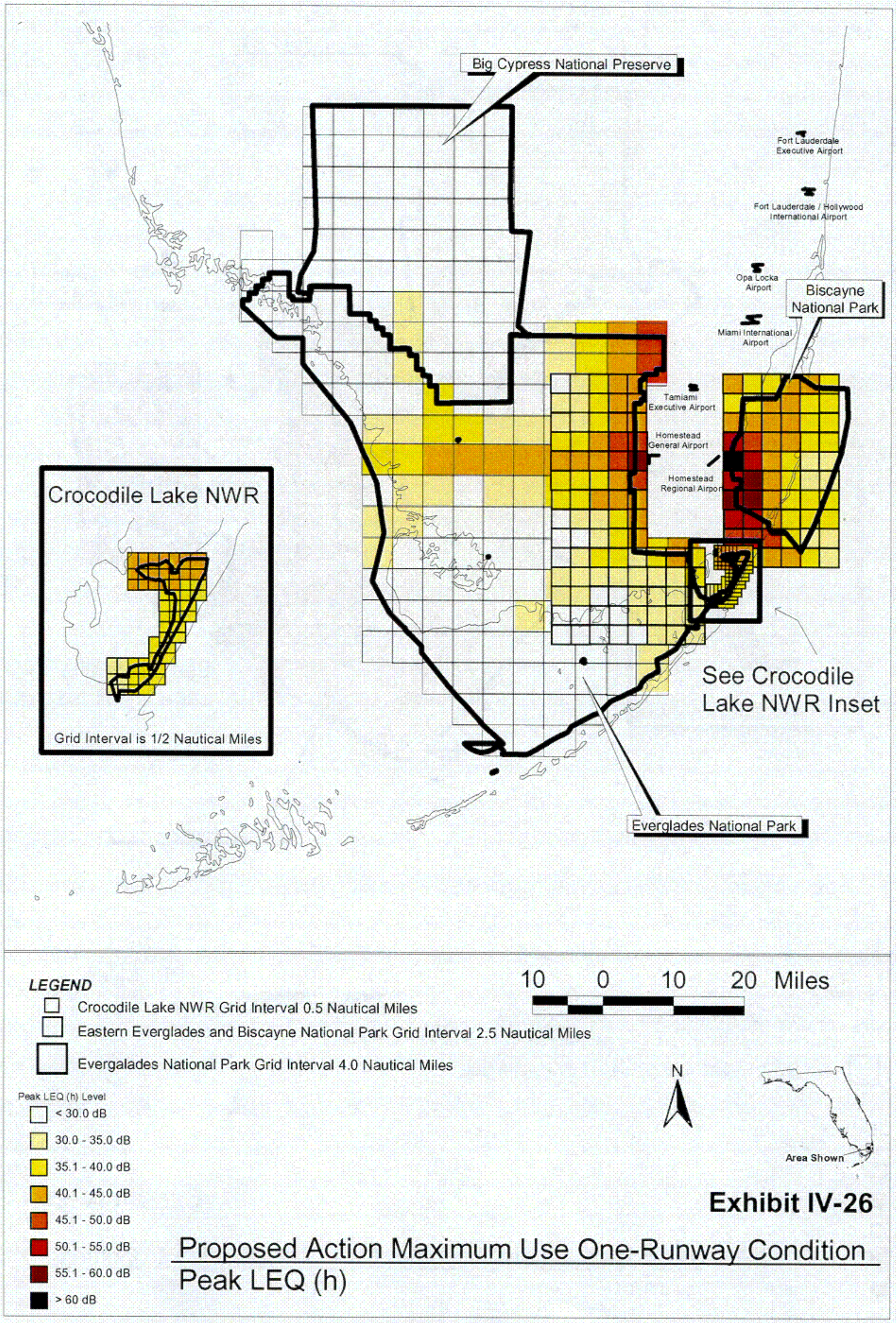


Exhibit IV-26

Proposed Action Maximum Use One-Runway Condition
Peak LEQ (h)

The Leq(h) for the No Action condition in the maximum use year shows broad areas of somewhat lower Leq(h) values in Biscayne NP than in the existing condition because of lower cumulative noise from Miami International Airport operations. Compared to the future No Action condition, the Proposed Action maximum use condition shows increases in cumulative noise levels in Everglades NP south of the airport and along a broad band across the park west of the airport. Exhibit IV-26 also depicts an expansion of cumulative levels in Biscayne NP and the northern portion of Crocodile Lakes. Several grid locations in the southern portion of Big Cypress Preserve also show increases.

The patterns of the Time Above Ambient noise levels are expected to noticeably grow when comparing future No Action conditions to future Proposed Action conditions in the maximum one-runway use year. The number of grid cells that exceed two hours of time daily above the ambient level is forecast to expand to include virtually all of the locations under the VFR flyway serving general aviation traffic at Homestead, Homestead General and Kendall-Tamiami Airports. The change from the No Action to Proposed Action condition is attributable directly to the introduction of civil aviation activity at Homestead. Times Above Ambient noise levels would be increased in each of the national properties as a result of the Proposed Action, with total times along the eastern side of the Everglades above two hours at numerous locations and above ten minutes at many others. Time Above Ambient of the Proposed Action would also increase over the No Action condition in Biscayne NP and Crocodile Lake under the departure routes for civilian jet aircraft located along the western half of Biscayne Bay and under the EEONS across Elliot Key to the southeast.

A comparison of the Time Above Ambient with the existing condition (Exhibit IV-9) indicates a reduction of the total Time Above Ambient in several locations in Biscayne National Park, largely as a result of the elimination of Stage 2, louder retrofit Stage 3 and MD-80 aircraft now using Miami International Airport. In comparing the maximum year No Action and Proposed Action graphic depictions of Time Above, it can also be noticed that there are broad similarities in Biscayne NP between the two potential future conditions, except for a few grids along the western edge of Biscayne NP. This reflects turns to the south along the west half of the park by most traffic. Noise from military operations is constant in both conditions.

In Crocodile Lake, more concentration of traffic on the south jet departure routes in the maximum use year would result in Time Above increases shown on the Proposed Action absolute value map compared to the No Action condition.

IV.B. Special Assessments in National Properties

Special noise assessments have been prepared for twelve selected locations in the national properties, identified in **Table IV-12**, that were used for noise measurements. These assessments are intended to provide more detailed information about the aircraft events that influence noise at selected locations. The selection of the sites was based on their presence in areas of natural interest, as well as being located in areas where various flight track mitigation alternatives are being assessed to mitigate noise in the national properties. The data presented for the sites include distances between the site and typical aircraft overflights, identification of the five specific aircraft/flight track combinations that dominate the daily Leq and the single-operation SELs associated with those operations, as well as typical aircraft altitudes of significant contributors to the noise pattern. (Identification of the five aircraft that contribute the most noise at particular sites does not mean that these are the only aircraft that will contribute to the noise levels at a location.) **Tables IV-13 through IV-24** contain information for current, future No Action and Proposed Action conditions for each of the sites indicated. The locations of the individual sites are shown on area maps in Exhibits IV-5 and IV-6.

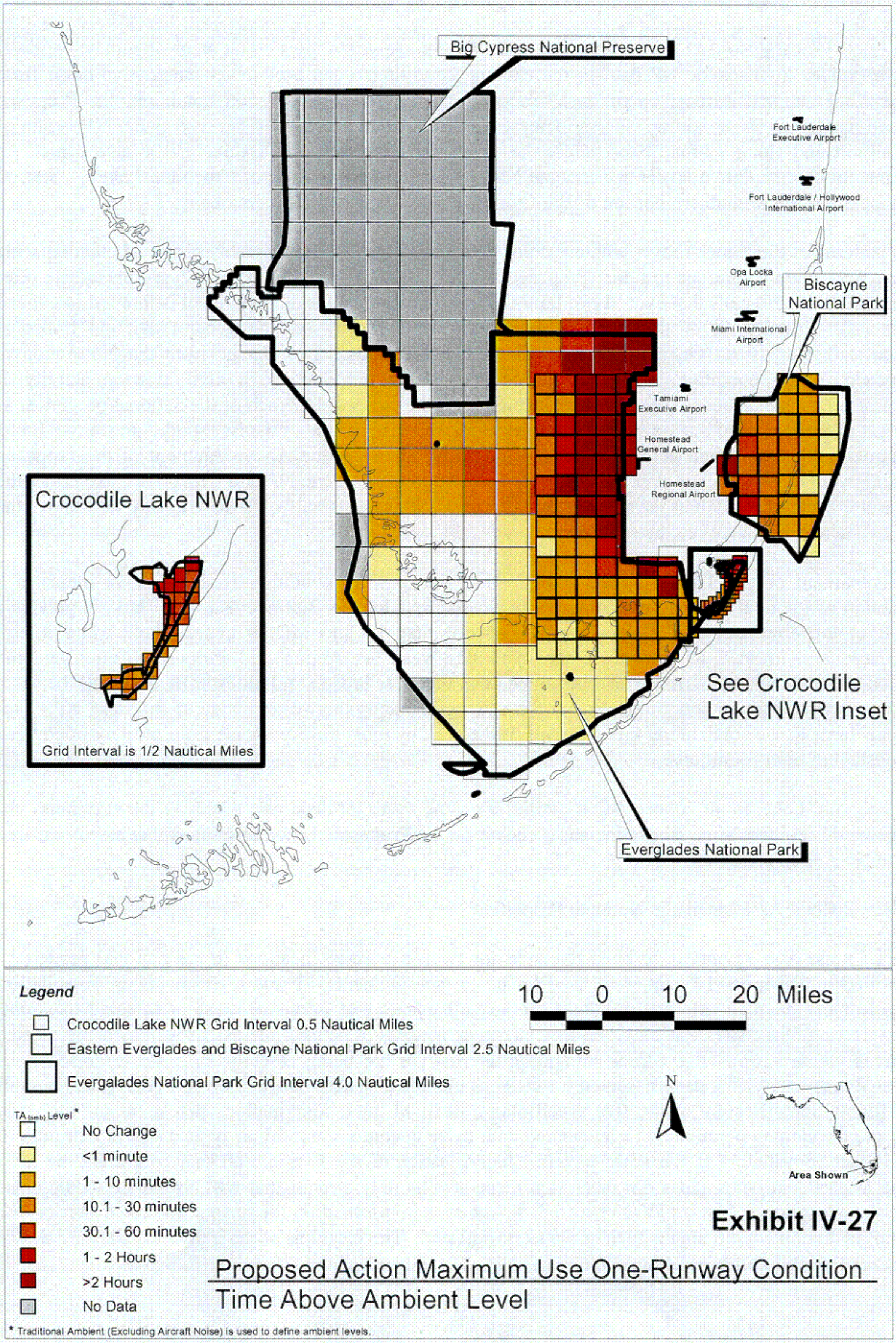


Exhibit IV-27

Proposed Action Maximum Use One-Runway Condition
Time Above Ambient Level

C-21

Table IV-12
Sites Selected for Detailed Noise Analysis

Grid Index Number	Site Name *	Site Description
MI	Elliot Key	Recreational area of Biscayne NP, having boating and visitor noise. Under the south easterly departure from HST.
ML	Soldier Key	Biscayne NP key subject to noise from boating activity. Under the easterly departure from Runway 5 and the approach to Runway 23.
MH	Mangrove Key	Biscayne NP water site under the southerly departure course from Runway 5, adjacent to a bird sanctuary
ME	Pacific Reef	Biscayne NP water site east of the keys in a protected reef area. Under the Junur approach and Ellee departure routes to/from HST.
MW	Hardwood Hammock	Crocodile Lakes NWR heavily vegetated site with dense hardwoods. Under Mnate departure and several approach routes in east flow.
MO	Chekika	Everglades NP land/water site surrounded by saw grass. Under the north/south VFR flyway and the Winco/Hedly departure routes.
MX	North Nest Key	Everglades NP island site in Florida Bay. Under departure route to Mnate fix.
MQ	Eco Pond	Everglades NP land site near Flamingo in the southwest portion of the park. Near Famin approach and Mnate departure routes.
MB	Anhinga Trail	Everglades NP land site near the Royal Palm Visitor Center. Under the Famin/Worpp approach to HST.
MAE	National Scenic Trail	Big Cypress NP site in the approximate middle of the preserve. Under Worpp approaches to HST and Easterly approaches to MIA.
MAA	Pavilion Key	Remote Everglades NP in the far west portion of the park in an area of potential alternative mitigation flight tracks from Worpp/Famin.
SD6	Halfway Creek	Big Cypress NP site in the southwest corner of the preserve. Under Worpp approaches and in an area of potential relocated mitigation flight tracks.

* Site locations are indicated on Exhibits IV-5 and IV-6.

Table IV-13
Detailed Grid Point Assessment
Homestead Regional Airport SEIS
Point: MI - Elliot Key

Traditional Ambient Noise Level = 48.6 dB

Aircraft	Type of Operation	Airport	Runway	Track	Slant Range	Altitude	Daily LEQ and SEL for One Operation
1997 No Action							Leq = 33.6
727Q9	D	MIA	9L	9LJM	9895	9881	78.0
727Q9	D	MIA	9L	9LJM	11097	11076	76.2
727Q9	D	MIA	12	12JM	13603	9215	73.7
727Q9	D	MIA	12	12JM	14371	10308	72.6
727Q15	D	MIA	12	12JM	14389	11280	73.1
2000 No Action							Leq = 29.7
74720B	D	MIA	9L	9LJM	10605	10580	75.9
F15A	A	HST	23	SA2X	3214	2475	83.8
74720B	D	MIA	12	12JM	13952	9713	72.0
F16PW0	A	HST	23	SA2X	4716	4243	72.5
F15A	A	HST	23	SA2X	5935	2027	78.4
2005 No Action							Leq = 30.3
74720B	D	MIA	9L	9LJM	10605	10580	75.9
F15A	A	HST	23	SA2X	3214	2475	83.8
74720B	D	MIA	12	12JM	13952	9713	72.0
74720B	D	MIA	9L	9LJM	22279	9666	66.3
F16PW0	A	HST	23	SA2X	4716	4243	72.5
2015 No Action							Leq = 30.0
747400	D	MIA	9L	9LJM	11614	11578	73.1
747400	D	MIA	12	12JM	14579	10581	70.6
747400	D	MIA	9L	9LJM	22672	10528	66.6
F15A	A	HST	23	SA2X	3214	2475	83.8
F16PW0	A	HST	23	SA2X	4716	4243	72.5
Maximum Use One Runway No Action							Leq = 30.0
747400	D	MIA	9L	9LJM	11614	11578	73.1
747400	D	MIA	12	12JM	14579	10581	70.6
747400	D	MIA	9L	9LJM	22672	10528	66.6
F15A	A	HST	23	SA2X	3214	2475	83.8
F16PW0	A	HST	23	SA2X	4716	4243	72.5
2000 Proposed Action							Leq = 29.9
74720B	D	MIA	9L	9LJM	10605	10580	75.9
F15A	A	HST	23	SA2X	3214	2475	83.8
74720B	D	MIA	12	12JM	13952	9713	72.0
F16PW0	A	HST	23	SA2X	4716	4243	72.5
F15A	A	HST	23	SA2X	5935	2027	78.4
2005 Proposed Action							Leq = 31.0
74720B	D	MIA	9L	9LJM	10605	10580	75.9
F15A	A	HST	23	SA2X	3214	2475	83.8
74720B	D	MIA	12	12JM	13952	9713	72.0
74720B	D	MIA	9L	9LJM	22279	9666	66.3
F16PW0	A	HST	23	SA2X	4716	4243	72.5
2015 Proposed Action							Leq = 32.5
747400	D	MIA	9L	9LJM	11614	11578	73.1
747400	D	MIA	12	12JM	14579	10581	70.6
DHC6	A	HST	05	05JJ	7315	6000	66.7
747400	D	MIA	9L	9LJM	22672	10528	66.6
F15A	A	HST	23	SA2X	3214	2475	83.8
Maximum Use One Runway Proposed Action							Leq = 33.0
747400	D	MIA	9L	9LJM	11614	11578	73.1
747400	D	MIA	12	12JM	14579	10581	70.6
DHC6	A	HST	05	05JJ	7315	6000	66.7
747400	D	MIA	9L	9LJM	22672	10528	66.6
737500	A	HST	05	05JJ	7315	6000	63.5

Table IV-14
Detailed Grid Point Assessment
Homestead Regional Airport SEIS
Point: ML - Soldier Key

Traditional Ambient Noise Level = 56.2 dB

Aircraft	Type of Operation	Airport	Runway	Track	Slant Range	Altitude	Daily LEQ and SEL for One Operation
1997 No Action							Leq = 41.0
727Q9	D	MIA	12	12JM	7632	6433	81.9
727Q15	D	MIA	12	12JM	9064	8075	81.7
727Q9	D	MIA	12	12JM	8380	7297	80.7
727Q9	D	MIA	12	12JM	11075	5851	77.2
727Q9	D	MIA	9L	9LJM	10930	6571	77.4
2000 No Action							Leq = 36.4
74720B	D	MIA	12	12JM	7483	6252	79.7
727EM2	D	MIA	12	12JM	9064	8075	77.1
74720B	D	MIA	9L	9LJM	10836	6411	75.2
727EM2	D	MIA	9L	9LJM	11992	8211	73.2
727EM2	D	MIA	12	12JM	12029	7485	73.6
2005 No Action							Leq = 37.1
74720B	D	MIA	12	12JM	7483	6252	79.7
74720B	D	MIA	9L	9LJM	10836	6411	75.2
727EM2	D	MIA	12	12JM	9064	8075	77.1
74720B	D	MIA	9L	9LJM	10414	6883	76.0
74720B	D	MIA	12	12JM	10937	5581	74.7
2015 No Action							Leq = 34.7
747400	D	MIA	12	12JM	7844	6672	76.8
747400	D	MIA	9L	9LJM	11107	6851	73.2
747400	D	MIA	9L	9LJM	10756	7382	73.8
747400	D	MIA	12	12JM	11115	5917	72.6
767JT9	D	MIA	12	12JM	12928	12663	68.7
Maximum Use One Runway No Action							Leq = 34.7
747400	D	MIA	12	12JM	7844	6672	76.8
747400	D	MIA	9L	9LJM	11107	6851	73.2
747400	D	MIA	9L	9LJM	10756	7382	73.8
747400	D	MIA	12	12JM	11115	5917	72.6
767JT9	D	MIA	12	12JM	12928	12663	68.7
2000 Proposed Action							Leq = 36.5
74720B	D	MIA	12	12JM	7483	6252	79.7
727EM2	D	MIA	12	12JM	9064	8075	77.1
74720B	D	MIA	9L	9LJM	10836	6411	75.2
727EM2	D	MIA	9L	9LJM	11992	8211	73.2
727EM2	D	MIA	12	12JM	12029	7485	73.6
2005 Proposed Action							Leq = 37.2
74720B	D	MIA	12	12JM	7483	6252	79.7
74720B	D	MIA	9L	9LJM	10836	6411	75.2
727EM2	D	MIA	12	12JM	9064	8075	77.1
74720B	D	MIA	9L	9LJM	10414	6883	76.0
74720B	D	MIA	12	12JM	10937	5581	74.7
2015 Proposed Action							Leq = 35.4
747400	D	MIA	12	12JM	7844	6672	76.8
747400	D	MIA	9L	9LJM	11107	6851	73.2
747400	D	MIA	9L	9LJM	10756	7382	73.8
747400	D	MIA	12	12JM	11115	5917	72.6
767JT9	D	MIA	12	12JM	12928	12663	68.7
Maximum Use One Runway Proposed Action							Leq = 35.7
747400	D	MIA	12	12JM	7844	6672	76.8
747400	D	MIA	9L	9LJM	11107	6851	73.2
747400	D	MIA	9L	9LJM	10756	7382	73.8
747400	D	MIA	12	12JM	11115	5917	72.6
767JT9	D	MIA	12	12JM	12928	12663	68.7

Table IV-15
Detailed Grid Point Assessment
Homestead Regional Airport SEIS
Point: MH - Mangrove Key

Traditional Ambient Noise Level = 45.1 dB

Aircraft	Type of Operation	Airport	Runway	Track	Slant Range	Altitude	Daily LEQ and SEL for One Operation
1997 No Action							Leq = 53.3
F16PW0	D	HST	23	SD5X	3699	3692	103.1
F16PW0	D	HST	05	ND2X	4015	4000	102.7
F16PW0	D	HST	05	ND4X	4221	4000	91.7
F16PW0	D	HST	05	ND4X	5397	4000	88.3
F16PW0	D	HST	23	SD5X	5292	3622	99.4
2000 No Action							Leq = 53.3
F16PW0	D	HST	23	SD5X	3699	3692	103.1
F16PW0	D	HST	05	ND2X	4015	4000	102.7
F16PW0	D	HST	05	ND4X	4221	4000	91.7
F16PW0	D	HST	05	ND4X	5397	4000	88.3
F16PW0	D	HST	23	SD5X	5292	3622	99.4
2005 No Action							Leq = 53.3
F16PW0	D	HST	23	SD5X	3699	3692	103.1
F16PW0	D	HST	05	ND2X	4015	4000	102.7
F16PW0	D	HST	05	ND4X	4221	4000	91.7
F16PW0	D	HST	05	ND4X	5397	4000	88.3
F16PW0	D	HST	23	SD5X	5292	3622	99.4
2015 No Action							Leq = 53.3
F16PW0	D	HST	23	SD5X	3699	3692	103.1
F16PW0	D	HST	05	ND2X	4015	4000	102.7
F16PW0	D	HST	05	ND4X	4221	4000	91.7
F16PW0	D	HST	05	ND4X	5397	4000	88.3
F16PW0	D	HST	23	SD5X	5292	3622	99.4
Maximum Use One Runway No Action							Leq = 53.3
F16PW0	D	HST	23	SD5X	3699	3692	103.1
F16PW0	D	HST	05	ND2X	4015	4000	102.7
F16PW0	D	HST	05	ND4X	4221	4000	91.7
F16PW0	D	HST	05	ND4X	5397	4000	88.3
F16PW0	D	HST	23	SD5X	5292	3622	99.4
2000 Proposed Action							Leq = 53.4
F16PW0	D	HST	23	SD5X	3699	3692	103.1
F16PW0	D	HST	05	ND2X	4015	4000	102.7
F16PW0	D	HST	05	ND4X	4223	4000	91.7
F16PW0	D	HST	05	ND4X	5397	4000	88.3
F16PW0	D	HST	23	SD5X	5292	3622	99.4
2005 Proposed Action							Leq = 53.5
F16PW0	D	HST	23	SD5X	3699	3692	103.1
F16PW0	D	HST	05	ND2X	4015	4000	102.7
F16PW0	D	HST	05	ND4X	4223	4000	91.7
F16PW0	D	HST	05	ND4X	5397	4000	88.3
F16PW0	D	HST	23	SD5X	5292	3622	99.4
2015 Proposed Action							Leq = 53.7
F16PW0	D	HST	23	SD5X	3699	3692	103.1
F16PW0	D	HST	05	ND2X	4015	4000	102.7
F16PW0	D	HST	05	ND4X	4223	4000	91.7
F16PW0	D	HST	05	ND4X	5397	4000	88.3
F16PW0	D	HST	23	SD5X	5292	3622	99.4
Maximum Use One Runway Proposed Action							Leq = 53.7
F16PW0	D	HST	23	SD5X	3699	3692	103.1
F16PW0	D	HST	05	ND2X	4015	4000	102.7
F16PW0	D	HST	05	ND4X	4223	4000	91.7
F16PW0	D	HST	05	ND4X	5397	4000	88.3
F16PW0	D	HST	23	SD5X	5292	3622	99.4

Table IV-16
Detailed Grid Point Assessment
Homestead Regional Airport SEIS
Point: ME - Pacific Reef

Traditional Ambient Noise Level = 51.6 dB

Aircraft	Type of Operation	Airport	Runway	Track	Slant Range	Altitude	Daily LEQ and SEL for One Operation
1997 No Action							Leq = 25.0
F15A	A	HST	23	SA2X	5829	5010	77.3
F15A	A	HST	23	SA2X	5032	4587	79.1
F16PW0	A	HST	23	SA2X	6866	6187	68.0
F15A	A	HST	23	SA6X	5345	4463	82.6
F15A	A	HST	23	SA6X	4534	4309	84.6
2000 No Action							Leq = 23.6
F15A	A	HST	23	SA2X	5829	5010	77.3
F15A	A	HST	23	SA2X	5032	4587	79.1
F16PW0	A	HST	23	SA2X	6866	6187	68.0
F15A	A	HST	23	SA6X	5345	4463	82.6
F15A	A	HST	23	SA6X	4534	4309	84.6
2005 No Action							Leq = 23.8
F15A	A	HST	23	SA2X	5829	5010	77.3
F15A	A	HST	23	SA2X	5032	4587	79.1
F16PW0	A	HST	23	SA2X	6866	6187	68.0
F15A	A	HST	23	SA6X	5345	4463	82.6
F15A	A	HST	23	SA6X	4534	4309	84.6
2015 No Action							Leq = 24.7
F15A	A	HST	23	SA2X	5829	5010	77.3
F15A	A	HST	23	SA2X	5032	4587	79.1
F16PW0	A	HST	23	SA2X	6866	6187	68.0
F15A	A	HST	23	SA6X	5345	4463	82.6
F15A	A	HST	23	SA6X	4534	4309	84.6
Maximum Use One Runway No Action							Leq = 24.6
F15A	A	HST	23	SA2X	5829	5010	77.3
F15A	A	HST	23	SA2X	5032	4587	79.1
F16PW0	A	HST	23	SA2X	6866	6187	68.0
F15A	A	HST	23	SA6X	5345	4463	82.6
F15A	A	HST	23	SA6X	4534	4309	84.6
2000 Proposed Action							Leq = 26.3
BEC58P	A	HST	05	05JP	4052	4000	70.1
GASEPF	A	HST	05	05JP	4052	4000	62.4
F15A	A	HST	23	SA2X	5829	5010	77.3
F15A	A	HST	23	SA2X	5032	4587	79.1
F16PW0	A	HST	23	SA2X	6866	6187	68.0
2005 Proposed Action							Leq = 27.7
BEC58P	A	HST	05	05JP	4052	4000	70.1
GASEPF	A	HST	05	05JP	4052	4000	62.4
F15A	A	HST	23	SA2X	5829	5010	77.3
DHC6	A	HST	05	05JJ	6008	6000	68.4
F15A	A	HST	23	SA2X	5032	4587	79.1
2015 Proposed Action							Leq = 31.7
BEC58P	A	HST	05	05JP	4052	4000	70.1
DHC6	A	HST	05	05JJ	6008	6000	68.4
MD83	A	HST	05	05JJ	6008	6000	66.8
DHC6	A	HST	05	05JJ	10527	6000	63.9
GASEPF	A	HST	05	05JP	4052	4000	62.4
Maximum Use One Runway Proposed Action							Leq = 32.9
BEC58P	A	HST	05	05JP	4052	4000	70.1
737500	A	HST	05	05JJ	6008	6000	66.1
DHC6	A	HST	05	05JJ	6008	6000	68.4
GASEPF	A	HST	05	05JP	4052	4000	62.4
DHC6	A	HST	05	05JJ	10527	6000	63.9

Table IV-17
Detailed Grid Point Assessment
Homestead Regional Airport SEIS
Point: MW - Hardwood Hammock

Traditional Ambient Noise Level = 41.3 dB

Aircraft	Type of Operation	Airport	Runway	Track	Slant Range	Altitude	Daily LEQ and SEL for One Operation
1997 No Action							Leq = 30.3
F16PW0	D	HST	05	ND2X	5579	5420	83.9
P3A	D	HST	05	ND3X	6931	6070	73.5
F16PW0	D	HST	05	ND3X	6336	5380	82.1
F16PW0	D	HST	05	ND2X	7772	5685	80.1
P3A	D	HST	05	ND3X	9901	5860	69.8
2000 No Action							Leq = 30.3
F16PW0	D	HST	05	ND2X	5579	5420	83.9
P3A	D	HST	05	ND3X	6931	6070	73.5
F16PW0	D	HST	05	ND3X	6336	5380	82.1
F16PW0	D	HST	05	ND2X	7772	5685	80.1
P3A	D	HST	05	ND3X	9901	5860	69.8
2005 No Action							Leq = 30.3
F16PW0	D	HST	05	ND2X	5579	5420	83.9
P3A	D	HST	05	ND3X	6931	6070	73.5
F16PW0	D	HST	05	ND3X	6336	5380	82.1
F16PW0	D	HST	05	ND2X	7772	5685	80.1
P3A	D	HST	05	ND3X	9901	5860	69.8
2015 No Action							Leq = 30.3
F16PW0	D	HST	05	ND2X	5579	5420	83.9
P3A	D	HST	05	ND3X	6931	6070	73.5
F16PW0	D	HST	05	ND3X	6336	5380	82.1
F16PW0	D	HST	05	ND2X	7772	5685	80.1
P3A	D	HST	05	ND3X	9901	5860	69.8
Maximum Use One Runway No Action							Leq = 30.3
F16PW0	D	HST	05	ND2X	5579	5420	83.9
P3A	D	HST	05	ND3X	6931	6070	73.5
F16PW0	D	HST	05	ND3X	6336	5380	82.1
F16PW0	D	HST	05	ND2X	7772	5685	80.1
P3A	D	HST	05	ND3X	9901	5860	69.8
2000 Proposed Action							Leq = 30.5
F16PW0	D	HST	05	ND2X	5579	5420	83.9
P3A	D	HST	05	ND3X	6931	6070	73.5
F16PW0	D	HST	05	ND3X	6336	5380	82.1
F16PW0	D	HST	05	ND2X	7772	5685	80.1
P3A	D	HST	05	ND3X	9901	5860	69.8
2005 Proposed Action							Leq = 31.1
F16PW0	D	HST	05	ND2X	5579	5420	83.9
P3A	D	HST	05	ND3X	6931	6070	73.5
F16PW0	D	HST	05	ND3X	6336	5380	82.1
F16PW0	D	HST	05	ND2X	7772	5685	80.1
P3A	D	HST	05	ND3X	9901	5860	69.8
2015 Proposed Action							Leq = 34.4
F16PW0	D	HST	05	ND2X	5579	5420	83.9
MD83	D	HST	05	05MJ	13156	11082	73.4
MD83	D	HST	05	05MJ	16930	10372	69.6
MD83	D	HST	05	05WJ	16641	10333	68.9
P3A	D	HST	05	ND3X	6931	6070	73.5
Maximum Use One Runway Proposed Action							Leq = 33.7
F16PW0	D	HST	05	ND2X	5579	5420	83.9
P3A	D	HST	05	ND3X	6931	6070	73.5
F16PW0	D	HST	05	ND3X	6336	5380	82.1
F16PW0	D	HST	05	ND2X	7772	5685	80.1
P3A	D	HST	05	ND3X	9901	5860	69.8

Table IV-18
Detailed Grid Point Assessment
Homestead Regional Airport SEIS
Point: MO - Chekika

Traditional Ambient Noise Level = 41.0 dB

Aircraft	Type of Operation	Airport	Runway	Track	Slant Range	Altitude	Daily LEQ and SEL for One Operation
1997 No Action							Leq = 32.4
GASEPV	D	X51	36A	36AD	5496	4415	72.8
F16PW0	D	HST	05	ND0X	16231	11538	70.1
GASEPV	D	X51	36A	36AD	4646	4466	74.3
F16PW0	D	HST	05	ND0X	13033	12209	70.2
GASEPV	D	X51	36A	36AD	8881	4360	68.4
2000 No Action							Leq = 32.2
GASEPV	D	X51	36A	36AD	5496	4415	72.8
F16PW0	D	HST	05	ND0X	16231	11538	70.1
GASEPV	D	X51	36A	36AD	4646	4466	74.3
F16PW0	D	HST	05	ND0X	13033	12209	70.2
GASEPV	D	X51	36A	36AD	8881	4360	68.4
2005 No Action							Leq = 32.3
GASEPV	D	X51	36A	36AD	5496	4415	72.8
F16PW0	D	HST	05	ND0X	16231	11538	70.1
GASEPV	D	X51	36A	36AD	4646	4466	74.3
F16PW0	D	HST	05	ND0X	13033	12209	70.2
GASEPV	D	X51	36A	36AD	8881	4360	68.4
2015 No Action							Leq = 32.5
GASEPV	D	X51	36A	36AD	5496	4415	72.8
F16PW0	D	HST	05	ND0X	16231	11538	70.1
GASEPV	D	X51	36A	36AD	4646	4466	74.3
GASEPV	D	X51	36A	36AD	8881	4360	68.4
F16PW0	D	HST	05	ND0X	13033	12209	70.2
Maximum Use One Runway No Action							Leq = 32.7
GASEPV	D	X51	36A	36AD	5496	4415	72.8
F16PW0	D	HST	05	ND0X	16231	11538	70.1
GASEPV	D	X51	36A	36AD	4646	4466	74.3
F16PW0	D	HST	05	ND0X	13033	12209	70.2
GASEPV	D	X51	36A	36AD	8881	4360	68.4
2000 Proposed Action							Leq = 33.2
GASEPV	D	X51	36A	36AD	5496	4415	72.8
F16PW0	D	HST	05	ND0X	16231	11538	70.1
GASEPV	D	X51	36A	36AD	4646	4466	74.3
F16PW0	D	HST	05	ND0X	13030	12209	70.2
GASEPV	D	X51	36A	36AD	8881	4360	68.4
2005 Proposed Action							Leq = 33.6
GASEPV	D	X51	36A	36AD	5496	4415	72.8
F16PW0	D	HST	05	ND0X	16231	11538	70.1
BEC58P	D	HST	05	05HP	3008	3000	71.6
GASEPV	D	X51	36A	36AD	4646	4466	74.3
F16PW0	D	HST	05	ND0X	13030	12209	70.2
2015 Proposed Action							Leq = 35.5
GASEPV	D	X51	36A	36AD	5496	4415	72.8
BEC58P	D	HST	05	05HP	3008	3000	71.6
F16PW0	D	HST	05	ND0X	16231	11538	70.1
BEC58P	D	HST	05	05WP	3399	3000	70.7
MD83	D	HST	05	05WJ	23715	23519	68.1
Maximum Use One Runway Proposed Action							Leq = 36.1
BEC58P	D	HST	05	05HP	3008	3000	71.6
BEC58P	D	HST	05	05WP	3399	3000	70.7
GASEPV	D	X51	36A	36AD	5496	4415	72.8
F16PW0	D	HST	05	ND0X	16231	11538	70.1
MD11GE	D	HST	05	05WJ	27190	26732	76.9

Table IV-19
Detailed Grid Point Assessment
Homestead Regional Airport SEIS
Point: MX - North Nest Key

Traditional Ambient Noise Level = 39.9 dB

Aircraft	Type of Operation	Airport	Runway	Track	Slant Range	Altitude	Daily LEQ and SEL for One Operation
1997 No Action							Leq = 18.5
F16PW0	A	HST	05	NA4X	10981	7872	61.5
F16PW0	A	HST	05	NA4X	7949	7685	66.5
F16PW0	A	HST	05	NA5X	11872	8491	60.3
F16PW0	A	HST	05	NA5X	8461	8265	65.7
F16PW0	A	HST	05	NA4X	15560	8067	56.9
2000 No Action							Leq = 18.4
F16PW0	A	HST	05	NA4X	10981	7872	61.5
F16PW0	A	HST	05	NA4X	7949	7685	66.5
F16PW0	A	HST	05	NA5X	11872	8491	60.3
F16PW0	A	HST	05	NA5X	8461	8265	65.7
F16PW0	A	HST	05	NA4X	15560	8067	56.9
2005 No Action							Leq = 18.4
F16PW0	A	HST	05	NA4X	10981	7872	61.5
F16PW0	A	HST	05	NA4X	7949	7685	66.5
F16PW0	A	HST	05	NA5X	11872	8491	60.3
F16PW0	A	HST	05	NA5X	8461	8265	65.7
F16PW0	A	HST	05	NA4X	15560	8067	56.9
2015 No Action							Leq = 18.7
F16PW0	A	HST	05	NA4X	10981	7872	61.5
F16PW0	A	HST	05	NA4X	7949	7685	66.5
F16PW0	A	HST	05	NA5X	11872	8491	60.3
F16PW0	A	HST	05	NA5X	8461	8265	65.7
F16PW0	A	HST	05	NA4X	15560	8067	56.9
Maximum Use One Runway No Action							Leq = 18.6
F16PW0	A	HST	05	NA4X	10981	7872	61.5
F16PW0	A	HST	05	NA4X	7949	7685	66.5
F16PW0	A	HST	05	NA5X	11872	8491	60.3
F16PW0	A	HST	05	NA5X	8461	8265	65.7
F16PW0	A	HST	05	NA4X	15560	8067	56.9
2000 Proposed Action							Leq = 19.9
F16PW0	A	HST	05	NA4X	10981	7872	61.5
BEC58P	D	HST	05	05MP	14263	10372	63.8
F16PW0	A	HST	05	NA4X	7949	7685	66.5
F16PW0	A	HST	05	NA5X	11872	8491	60.3
BEC58P	D	HST	05	05MP	19037	10077	60.5
2005 Proposed Action							Leq = 22.1
MD11GE	D	HST	05	05MJ	23376	19379	73.2
MD11GE	D	HST	05	05MJ	30687	19864	71.0
BEC58P	D	HST	05	05MP	14263	10372	63.8
F16PW0	A	HST	05	NA4X	10981	7872	61.5
BEC58P	D	HST	05	05MP	19037	10077	60.5
2015 Proposed Action							Leq = 26.9
MD83	D	HST	05	05MJ	21462	17049	67.7
MD83	D	HST	05	05MJ	16915	16632	71.6
MD83	D	HST	05	05MJ	29192	17516	63.5
MD11GE	D	HST	05	05MJ	23376	19379	73.2
MD11GE	D	HST	05	05MJ	30687	19864	71.0
Maximum Use One Runway Proposed Action							Leq = 26.9
MD11GE	D	HST	05	05MJ	23376	19379	73.2
MD11GE	D	HST	05	05MJ	30687	19864	71.0
BEC58P	D	HST	05	05MP	14263	10372	63.8
BEC58P	D	HST	05	05MP	19037	10077	60.5
MD11GE	D	HST	05	05MJ	19194	18902	75.5

Table IV-20
Detailed Grid Point Assessment
Homestead Regional Airport SEIS
Point: MQ - Eco Pond

Traditional Ambient Noise Level = 47.2 dB

Aircraft	Type of Operation	Airport	Runway	Track	Slant Range	Altitude	Daily LEQ and SEL for One Operation
1997 No Action							Leq = 9.7
F16PW0	A	HST	05	NA1X	21960	10000	58.9
F16PW0	A	HST	05	NA1X	17838	10000	62.6
F16PW0	A	HST	05	NA1X	27954	10000	54.1
P3A	A	HST	05	NA1X	21737	10532	53.5
P3A	A	HST	05	NA1X	27802	10532	50.0
2000 No Action							Leq = 9.5
F16PW0	A	HST	05	NA1X	21960	10000	58.9
F16PW0	A	HST	05	NA1X	17838	10000	62.6
F16PW0	A	HST	05	NA1X	27954	10000	54.1
P3A	A	HST	05	NA1X	21737	10532	53.5
P3A	A	HST	05	NA1X	27802	10532	50.0
2005 No Action							Leq = 9.6
F16PW0	A	HST	05	NA1X	21960	10000	58.9
F16PW0	A	HST	05	NA1X	17838	10000	62.6
F16PW0	A	HST	05	NA1X	27954	10000	54.1
P3A	A	HST	05	NA1X	21737	10532	53.5
P3A	A	HST	05	NA1X	27802	10532	50.0
2015 No Action							Leq = 9.9
F16PW0	A	HST	05	NA1X	21960	10000	58.9
F16PW0	A	HST	05	NA1X	17838	10000	62.6
F16PW0	A	HST	05	NA1X	27954	10000	54.1
P3A	A	HST	05	NA1X	21737	10532	53.5
P3A	A	HST	05	NA1X	27802	10532	50.0
Maximum Use One Runway No Action							Leq = 9.9
F16PW0	A	HST	05	NA1X	21960	10000	58.9
F16PW0	A	HST	05	NA1X	17838	10000	62.6
F16PW0	A	HST	05	NA1X	27954	10000	54.1
P3A	A	HST	05	NA1X	21737	10532	53.5
P3A	A	HST	05	NA1X	27802	10532	50.0
2000 Proposed Action							Leq = 9.8
F16PW0	A	HST	05	NA1X	21960	10000	58.9
F16PW0	A	HST	05	NA1X	17838	10000	62.6
F16PW0	A	HST	05	NA1X	27954	10000	54.1
P3A	A	HST	05	NA1X	21737	10532	53.5
P3A	A	HST	05	NA1X	27802	10532	50.0
2005 Proposed Action							Leq = 10.4
F16PW0	A	HST	05	NA1X	21960	10000	58.9
F16PW0	A	HST	05	NA1X	17838	10000	62.6
F16PW0	A	HST	05	NA1X	27954	10000	54.1
P3A	A	HST	05	NA1X	21737	10532	53.5
P3A	A	HST	05	NA1X	27802	10532	50.0
2015 Proposed Action							Leq = 12.7
F16PW0	A	HST	05	NA1X	21960	10000	58.9
F16PW0	A	HST	05	NA1X	17838	10000	62.6
F16PW0	A	HST	05	NA1X	27954	10000	54.1
P3A	A	HST	05	NA1X	21737	10532	53.5
DHC830	D	HST	05	05MP	42511	15439	48.6
Maximum Use One Runway Proposed Action							Leq = 13.1
F16PW0	A	HST	05	NA1X	21960	10000	58.9
F16PW0	A	HST	05	NA1X	17838	10000	62.6
F16PW0	A	HST	05	NA1X	27954	10000	54.1
P3A	A	HST	05	NA1X	21737	10532	53.5
DHC830	D	HST	05	05MP	42511	15439	48.6

Table IV-21
Detailed Grid Point Assessment
Homestead Regional Airport SEIS
Point: MB - Anhinga Trail

Traditional Ambient Noise Level = 54.2 dB

Aircraft	Type of Operation	Airport	Runway	Track	Slant Range	Altitude	Daily LEQ and SEL for One Operation
1997 No Action							Leq = 22.6
GASEPV	F	X51	36A	36AT	6073	900	63.3
GASEPV	F	X51	36A	36AT	3153	900	68.4
F15A	A	HST	05	NA3X	15583	1505	64.2
747200	D	MIA	27R	7RJM	10224	9990	73.5
GASEPV	A	X51	36A	36AA	12153	2172	57.6
2000 No Action							Leq = 21.8
GASEPV	F	X51	36A	36AT	6073	900	63.3
GASEPV	F	X51	36A	36AT	3153	900	68.4
F15A	A	HST	05	NA3X	15583	1505	64.2
GASEPV	A	X51	36A	36AA	12153	2172	57.6
GASEPV	F	X51	36A	36AT	9054	900	58.6
2005 No Action							Leq = 22.0
GASEPV	F	X51	36A	36AT	6073	900	63.3
GASEPV	F	X51	36A	36AT	3153	900	68.4
F15A	A	HST	05	NA3X	15583	1505	64.2
GASEPV	A	X51	36A	36AA	12153	2172	57.6
GASEPV	F	X51	36A	36AT	9054	900	58.6
2015 No Action							Leq = 22.2
GASEPV	F	X51	36A	36AT	6073	900	63.3
GASEPV	F	X51	36A	36AT	3153	900	68.4
F15A	A	HST	05	NA3X	15583	1505	64.2
GASEPV	F	X51	36A	36AT	9054	900	58.6
GASEPV	A	X51	36A	36AA	12153	2172	57.6
Maximum Use One Runway No Action							Leq = 22.3
GASEPV	F	X51	36A	36AT	6073	900	63.3
GASEPV	F	X51	36A	36AT	3153	900	68.4
GASEPV	F	X51	36A	36AT	9054	900	58.6
F15A	A	HST	05	NA3X	15583	1505	64.2
GASEPV	A	X51	36A	36AA	12153	2172	57.6
2000 Proposed Action							Leq = 30.9
BEC58P	A	HST	05	05TP	3006	3000	74.2
BEC58P	A	HST	05	05RJ	3524	3000	72.8
BEC58P	A	HST	05	05FJ	3656	3000	72.5
BEC58P	A	HST	05	05TP	4820	3000	69.8
BEC58P	A	HST	05	05RJ	3505	3000	73.1
2005 Proposed Action							Leq = 32.5
BEC58P	A	HST	05	05TP	3006	3000	74.2
BEC58P	A	HST	05	05RJ	3524	3000	72.8
BEC58P	A	HST	05	05FJ	3656	3000	72.5
BEC58P	A	HST	05	05TP	4820	3000	69.8
BEC58P	A	HST	05	05RJ	3505	3000	73.1
2015 Proposed Action							Leq = 36.0
BEC58P	A	HST	05	05TP	3006	3000	74.2
BEC58P	A	HST	05	05RJ	3524	3000	72.8
DHC6	A	HST	05	05FJ	4491	3970	70.9
BEC58P	A	HST	05	05FJ	3656	3000	72.5
BEC58P	A	HST	05	05TP	4820	3000	69.8
Maximum Use One Runway Proposed Action							Leq = 38.6
BEC58P	A	HST	05	05TP	3006	3000	74.2
BEC58P	A	HST	05	05RJ	3524	3000	72.8
BEC58P	A	HST	05	05FJ	3656	3000	72.5
BEC58P	A	HST	05	05TP	4820	3000	69.8
BEC58P	A	HST	05	05RJ	3505	3000	73.1

Table IV-22
Detailed Grid Point Assessment
Homestead Regional Airport SEIS
Point: MAE - National Scenic Trail

Traditional Ambient Noise Level = 43.5 dB

Aircraft	Type of Operation	Airport	Runway	Track	Slant Range	Altitude	Daily LEQ and SEL for One Operation
1997 No Action							Leq = 4.0
BEC58P	D	TMB	9E	9EDW	132920	11481	33.7
BEC58P	D	TMB	9E	9EDW	127255	11542	34.4
GASEPV	D	TMB	9E	9EDW	135660	12464	32.2
BEC58P	D	TMB	9E	9EDW	138569	11443	33.1
GASEPV	D	TMB	9E	9EDW	130323	12464	32.7
2000 No Action							Leq = 2.7
BEC58P	D	TMB	9E	9EDW	132920	11481	33.7
BEC58P	D	TMB	9E	9EDW	127255	11542	34.4
GASEPV	D	TMB	9E	9EDW	135660	12464	32.2
BEC58P	D	TMB	9E	9EDW	138569	11443	33.1
GASEPV	D	TMB	9E	9EDW	130323	12464	32.7
2005 No Action							Leq = 3.1
BEC58P	D	TMB	9E	9EDW	132920	11481	33.7
GASEPV	D	TMB	9E	9EDW	135660	12464	32.2
BEC58P	D	TMB	9E	9EDW	127255	11542	34.4
BEC58P	D	TMB	9E	9EDW	138569	11443	33.1
GASEPV	D	TMB	9E	9EDW	130323	12464	32.7
2015 No Action							Leq = 6.0
747400	D	MIA	9L	9LJM	251291	0	39.5
BEC58P	D	TMB	9E	9EDW	132920	11481	33.7
747400	D	MIA	12	12JM	251032	0	39.6
GASEPV	D	TMB	9E	9EDW	135660	12464	32.2
747400	D	MIA	27L	7LJM	204899	5456	40.7
Maximum Use One Runway No Action							Leq = 6.2
BEC58P	D	TMB	9E	9EDW	132920	11481	33.7
747400	D	MIA	9L	9LJM	251291	0	39.5
GASEPV	D	TMB	9E	9EDW	135660	12464	32.2
BEC58P	D	TMB	9E	9EDW	127255	11542	34.4
747400	D	MIA	12	12JM	251032	0	39.6
2000 Proposed Action							Leq = 4.9
BEC58P	A	HST	05	05RJ	34932	5000	47.2
BEC58P	A	HST	05	05RJ	43568	5000	43.8
GASEPF	A	HST	05	05RJ	34932	5000	41.4
BEC58P	A	HST	05	05RJ	26342	5000	51.1
BEC58P	D	TMB	9E	9EDW	132920	11481	33.7
2005 Proposed Action							Leq = 6.2
BEC58P	A	HST	05	05RJ	34932	5000	47.2
BEC58P	A	HST	05	05RJ	43568	5000	43.8
BEC58P	A	HST	05	05RJ	26342	5000	51.1
GASEPF	A	HST	05	05RJ	34932	5000	41.4
GASEPF	A	HST	05	05RJ	43568	5000	39.0
2015 Proposed Action							Leq = 10.4
BEC58P	A	HST	05	05RJ	34932	5000	47.2
BEC58P	A	HST	05	05RJ	43568	5000	43.8
BEC58P	A	HST	05	05RJ	26342	5000	51.1
GASEPF	A	HST	05	05RJ	34932	5000	41.4
GASEPF	A	HST	05	05RJ	43568	5000	39.0
Maximum Use One Runway Proposed Action							Leq = 12.1
A320	A	HST	05	05RJ	44156	8739	45.5
A320	A	HST	05	05RJ	35572	8359	47.4
BEC58P	A	HST	05	05RJ	34932	5000	47.2
BEC58P	A	HST	05	05RJ	43568	5000	43.8
BEC58P	A	HST	05	05RJ	26342	5000	51.1

Table IV-23
Detailed Grid Point Assessment
Homestead Regional Airport SEIS
Point: MAA - Pavilion Key

Traditional Ambient Noise Level = 45.4 dB

Aircraft	Type of Operation	Airport	Runway	Track	Slant Range	Altitude	Daily LEQ and SEL for One Operation
1997 No Action							Leq = 2.0
GASEPV	F	X51	18A	18AT	250582	900	25.5
DHC8	A	MIA	12	12AP	263482	6000	29.6
727Q15	D	MIA	12	12JM	356024	0	35.3
BEC58P	D	TMB	9E	9EDW	249907	10628	25.4
727Q15	D	MIA	9L	9LJM	356375	0	35.2
2000 No Action							Leq = -0.5
GASEPV	F	X51	18A	18AT	250582	900	25.5
BEC58P	D	TMB	9E	9EDW	249907	10628	25.4
S65	A	HST	23	SBAX	69317	1500	45.2
GASEPV	D	TMB	9E	9EDW	250301	12464	24.5
GASEPV	F	X51	18A	18AT	247550	900	25.8
2005 No Action							Leq = -0.1
GASEPV	F	X51	18A	18AT	250582	900	25.5
BEC58P	D	TMB	9E	9EDW	249907	10628	25.4
S65	A	HST	23	SBAX	69317	1500	45.2
GASEPV	D	TMB	9E	9EDW	250301	12464	24.5
GASEPV	F	X51	18A	18AT	247550	900	25.8
2015 No Action							Leq = 4.4
747400	D	MIA	9L	9LJM	356375	0	41.6
747400	D	MIA	12	12JM	353263	12376	41.5
747400	D	MIA	9L	9LJM	343243	12376	41.8
747400	D	MIA	9L	9LJM	356375	0	41.4
747400	D	MIA	12	12JM	330024	12376	41.6
Maximum Use One Runway No Action							Leq = 4.4
747400	D	MIA	9L	9LJM	356375	0	41.6
747400	D	MIA	12	12JM	353263	12376	41.5
747400	D	MIA	9L	9LJM	343243	12376	41.8
747400	D	MIA	9L	9LJM	356375	0	41.4
747400	D	MIA	12	12JM	330024	12376	41.6
2000 Proposed Action							Leq = 1.6
BEC58P	A	HST	05	05RJ	74407	5000	38.1
GASEPF	A	HST	05	05RJ	74407	5000	33.6
BEC58P	A	HST	05	05RJ	65917	5000	39.3
S65	A	HST	23	SBAX	69317	1500	45.2
S65	D	HST	05	NBDX	67463	1545	37.4
2005 Proposed Action							Leq = 3.4
BEC58P	A	HST	05	05RJ	74407	5000	38.1
S65	D	HST	05	NBDX	67463	1545	37.4
S65	D	HST	05	NBDX	56368	1551	39.4
GASEPF	A	HST	05	05RJ	74407	5000	33.6
BEC58P	A	HST	05	05RJ	65917	5000	39.3
2015 Proposed Action							Leq = 8.6
DHC8	A	HST	05	05FJ	128721	5000	42.0
747400	D	MIA	9L	9LJM	356375	0	41.6
DHC830	A	HST	05	05FJ	128721	5000	41.6
747400	D	MIA	12	12JM	353263	12376	41.5
DHC8	A	HST	05	05FJ	120229	5000	42.4
Maximum Use One Runway Proposed Action							Leq = 9.7
A320	A	HST	05	05RJ	74683	8116	40.6
DHC8	A	HST	05	05FJ	128721	5000	42.0
A320	A	HST	05	05RJ	66290	8604	42.0
747400	D	MIA	9L	9LJM	356375	0	41.6
DHC830	A	HST	05	05FJ	128721	5000	41.6

Table IV-24
Detailed Grid Point Assessment
Homestead Regional Airport SEIS
Point: SD6 - Halfway Creek

Traditional Ambient Noise Level = 64.0 dB

Aircraft	Type of Operation	Airport	Runway	Track	Slant Range	Altitude	Daily LEQ and SEL for One Operation
1997 No Action							Leq = 0.9
GASEPV	D	TMB	9E	9EDW	240271	12464	28.4
BEC58P	D	TMB	9E	9EDW	233078	11820	28.0
GASEPV	D	TMB	9E	9EDW	234986	12464	28.5
BEC58P	D	TMB	9E	9EDW	227309	11820	28.2
GASEPV	D	TMB	9E	9EDW	245697	12464	28.1
2000 No Action							Leq = -0.8
GASEPV	D	TMB	9E	9EDW	240271	12464	28.4
BEC58P	D	TMB	9E	9EDW	233078	11820	28.0
GASEPV	D	TMB	9E	9EDW	234986	12464	28.5
BEC58P	D	TMB	9E	9EDW	227309	11820	28.2
GASEPV	D	TMB	9E	9EDW	245697	12464	28.1
2005 No Action							Leq = -0.4
GASEPV	D	TMB	9E	9EDW	240271	12464	28.4
BEC58P	D	TMB	9E	9EDW	233078	11820	28.0
GASEPV	D	TMB	9E	9EDW	234986	12464	28.5
GASEPV	D	TMB	9E	9EDW	245697	12464	28.1
BEC58P	D	TMB	9E	9EDW	227309	11820	28.2
2015 No Action							Leq = 3.4
747400	D	MIA	9L	9LJM	357461	0	38.4
747400	D	MIA	12	12JM	357197	0	38.4
747400	D	MIA	9L	9LJM	357461	0	38.7
747400	D	MIA	9L	9LJM	357461	0	38.1
747400	D	MIA	27L	7LJM	307851	6177	38.5
Maximum Use One Runway No Action							Leq = 3.5
747400	D	MIA	9L	9LJM	357461	0	38.4
747400	D	MIA	12	12JM	357197	0	38.4
747400	D	MIA	9L	9LJM	357461	0	38.7
747400	D	MIA	9L	9LJM	357461	0	38.1
747400	D	MIA	27L	7LJM	307851	6177	38.5
2000 Proposed Action							Leq = 1.6
GASEPF	A	HST	05	05RJ	43800	5000	41.1
GASEPF	A	HST	05	05RJ	53456	5000	37.9
GASEPF	A	HST	05	05RJ	34147	5000	43.8
BEC58P	A	HST	05	05RJ	58370	6000	38.7
GASEPF	A	HST	05	05RJ	63082	5000	36.2
2005 Proposed Action							Leq = 3.3
GASEPF	A	HST	05	05RJ	43800	5000	41.1
GASEPF	A	HST	05	05RJ	53456	5000	37.9
GASEPF	A	HST	05	05RJ	34147	5000	43.8
BEC58P	A	HST	05	05RJ	58370	6000	38.7
A320	A	HST	05	05RJ	54361	11057	45.0
2015 Proposed Action							Leq = 8.1
GASEPF	A	HST	05	05RJ	43800	5000	41.1
A320	A	HST	05	05RJ	54361	11057	45.0
A320	A	HST	05	05RJ	45027	11560	46.9
GASEPF	A	HST	05	05RJ	53456	5000	37.9
DHC8	A	HST	05	05FJ	175540	5000	39.5
Maximum Use One Runway Proposed Action							Leq = 9.9
A320	A	HST	05	05RJ	54361	11057	45.0
A320	A	HST	05	05RJ	45027	11560	46.9
A320	A	HST	05	05RJ	63764	10547	43.1
A320	A	HST	05	05RJ	35870	12051	48.8
GASEPF	A	HST	05	05RJ	43800	5000	41.1

An examination of the information presented in the tables shows that the noise levels at several grid points are the result of aircraft operations at more than one airport. Whether the Homestead Proposed Action is approved or not, each site will be continue to be exposed to the noise levels of the No Action conditions at Homestead and other airports in the region for each future year. Pertinent information associated with each grid point is summarized below.

Rather than provide a detailed description of noise levels at each location, this section will highlight some of the pertinent factors that contribute to the noise levels at each location selected for detailed evaluation. Of particular interest is the relationship of the single event noise levels and the cumulative noise level at each location to the traditional ambient level recorded there. Each site selected for detailed analysis is a measurement site for which traditional ambient noise levels were recorded.

IV.B.1 Analysis Site MI - Elliot Key

The first site is on Elliot Key, located in Biscayne NP, directly east of Homestead. The site lies generally under the departure route from Homestead to the Skips enroute fix serving the Bahamas and the eastern Caribbean, as well as near the downwind approach route for both east and west flow traffic. It also lies under a southbound departure route from Miami International. The traditional ambient level at the site is 48.6 decibels, while the 24-hour Leq at the location ranges between 29 and 33 decibels for the various cases reported. The SEL levels for the aircraft that most influence the noise levels at the site range from 63 to 84 decibels.

Table IV-13 discloses that for the Existing condition, the Stage 2 Boeing 727 aircraft in use at Miami International dominate the noise levels at the site. After Stage 2 civil aircraft over 75,000 pounds are phased out of operation by the end of 1999, military jets operating at Homestead will play a greater role in defining the noise pattern of the location. Altitudes of aircraft departing Miami International and overflying the site are typically above 9,000 feet MSL, while those of aircraft using Homestead are between 2,000 and 6,000 feet. The lateral distance between aircraft and the site ranges from 3,000 to 23,000 feet.

IV.B.2 Analysis Site ML - Soldier Key

Site ML is on Soldier Key, located in Biscayne NP, northeast of Homestead. The site lies generally under the approach path to Runway 23 at Homestead, and under the general aviation and propeller departure route from Runway 5 to the northeast and to other south Florida airports. It also lies under a southbound departure route from Miami International from Runways 9R/L and almost directly under the extended centerline of Runway 12 departures at Miami International. The traditional ambient level at the site is 56.2 decibels, while the 24-hour Leq ranges from 34 to 41 decibels, dependent upon the case assessed. SEL levels for single operations by the aircraft that dominate the noise level at the site range from 68 to 82 decibels.

Table IV-14 discloses that, for all conditions, aircraft departing Miami International from Runways 9L or 12 are a major factor in the noise level at the site. Altitudes of principal aircraft departing Miami International and overflying the site are typically above 5,500 feet MSL, and are located from 7,500 to 13,000 feet from the site.

IV.B.3 Analysis Site MH - Mangrove Key

Site MH is at Mangrove Key, a water site located in the western part of Biscayne NP, southeast of Homestead. The site lies generally under the existing and future proposed takeoff paths for most jet aircraft departing from Runway 5 at Homestead, and under the general aviation and propeller pattern traffic south of the airport. The traditional ambient noise level measured at the site is 45.1 decibels, and the calculated 24-hour Leq at the site is projected to remain stable at approximately 53-54 decibels, regardless of No Action or Proposed Action condition assessed.

Table IV-15 discloses that, for all conditions, the principal aircraft noise factors at the site are the military F-16s takeoffs. The single operation SELs generated by these aircraft range from 88 to 103 dBA. Because the energy of noise is considered logarithmically, the high noise level associated with one military jet contributes many times the amount of noise of a quieter commercial jet operation along the same flight path. Altitudes of the F-16s departing Homestead and overflying the site are typically between 3,500 and 4,000 feet MSL, and are located between 3,500 and 5,500 feet distant. .

IV.B.4 Analysis Site ME - Pacific Reef

Site ME is at Pacific Reef, a water site over a coral reef located on the east side of Biscayne NP, southeast of Homestead. The site lies generally under the existing and future proposed takeoff paths for jet aircraft departing from Runway 5 at Homestead to the western Caribbean and South America, and under downwind and base leg military approach paths from the northeast on Runway 23. The measured traditional ambient noise level is 51.6 decibels, while 24-hour Leq levels are computed to range from 23 to 33 decibels for future conditions.

As indicated by **Table IV-16,** approaches to Runway 23 by F-15s are the principal factor in noise of the No Action condition, while civil aviation propeller aircraft join the F-15 as significant factors in the noise level there in the Proposed Action cases. Under Proposed Action conditions, the initiation of scheduled service from the Caribbean along the Junur approach path would result in arrivals to Runway 05 becoming important to the noise exposure at the site. Altitudes of principal aircraft crossing the site from the Junur fix or along the military approach routes to Homestead are between 4,000 and 6,200 feet MSL, and are located between 4,500 and 10,500 feet distant. Single operation SELs generated by the principal aircraft in future years range from 62 to 85 dBA.

IV.B.5 Analysis Site MW - Hardwood Hammock

Site MW is at Hardwood Hammock, a land site in Crocodile Lakes NWP surrounded by dense vegetation. It is located generally south of Homestead under the existing and future proposed takeoff paths for jet aircraft departing from Runway 5 at Homestead for most destinations, and under the approach paths from the Caribbean to Runway 5. The measured traditional ambient noise level at the site is 41.3 decibels, and calculated 24-hour Leq values range from 30 to 34 decibels.

Table IV-17 discloses that military aircraft will continue to be a major factor in the noise levels present at the location, although in 2015, civilian jet passenger aircraft would also become a factor. The principal aircraft crossing the site along the military departure routes from Homestead fly over the area at altitudes between 5,500 and 6,100 feet MSL, while commercial aircraft pass over at altitudes above 10,000 feet MSL. The military aircraft are located between 5,500 and 10,000 feet distant from the site, and the MD-80 aircraft are between 13,000 and 17,000 from the site. Single operation SELs generated by the principal aircraft in future years range from 69 to 84 dBA.

IV.B.6 Analysis Site MO - Chekika

Site MO is at Chekika, a remote land and water site in the northeastern portion of Everglades NP. It is located generally west of Kendall-Tamiami Airport and north of Homestead General Aviation Airport under the VFR flyway along the east side of Everglades NP. The proposed departure patterns for civil jet aircraft from Homestead would fly high above the site, while the limited-use military departure track to the north passes through the area above 11,000 feet MSL. The calculated 24-hour Leq levels at the site range from 32 to 36 decibels, while the measured ambient level there is 41 decibels.

Table IV-18 indicates that in the near term, noise at the site is dominated by military jets at high altitude and general aviation aircraft departing to the north from Homestead General Aviation Airport. After 2005, activity along the VFR corridor from Homestead would contribute substantially to the noise levels at Chekika. The principal general aviation aircraft crossing the site along the VFR flyway fly over the area at altitudes between 3,000 and 4,500 feet MSL, while military jet aircraft pass over at altitudes above 11,000 feet MSL and civil jets pass over above 20,000 feet. The general aviation aircraft are located between 3,000 and 9,000 feet distant from the site, and the military and commercial jet aircraft are between 13,000 and 27,000 from the site. Single operation SELs generated by the principal aircraft in future years are forecast to range from 68 to 77 dBA.

IV.B.7 Analysis Site MX - North Nest Key

Site MX is at North Nest Key, a remote water site in Florida Bay in the southeast portion of Everglades NP, under the military approach to Runway 5 and under the proposed departure route to the Mnate fix to the southwest. The traditional ambient noise levels at the location are 39.9 decibels, while the 24-hour Leqs computed at the site range from 18 to 27 decibels.

Table IV-19 indicates that the military arrivals dominate the existing and No Action future conditions at the site. Under the Proposed Action, civil departures from Homestead to the Keys or Latin America would become a factor in the noise exposure pattern at the site. The military aircraft crossing the site fly over the area at altitudes between 7,600 and 8,500 feet MSL on approach, while the civil departures fly over the site at 10,000 to 19,000 feet. The approaches are typically within a range of 8,000 to 16,000 feet from the site, while the departures are between 14,000 and 30,000 feet from the site. Single operation SELs generated by the principal aircraft in future years are forecast to range from 57 to 67 dBA for No Action conditions and from 60 to 75 dBA for Proposed Action conditions.

IV.B.8 Analysis Site MQ - Eco Pond

Site MQ is at Eco Pond, a remote land site in the southwest portion of Everglades NP near Flamingo, Florida. It is near the straight-in military approach to Runway 5 and under the propeller routes to the Mnate departure fix. The traditional ambient noise level measured at the site is 47.2 decibels, while the 24-hour Leq computed at the location is a very low 9 to 13 decibels.

Table IV-20 indicates that military aircraft are the primary aircraft, passing the site at altitudes of approximately 10,000 to 19,000 feet MSL. The approaches are typically within a range of 8,000 to 16,000 feet from the site, while the departures are between 14,000 and 30,000 feet from the location. Single operation SELs generated by the principal aircraft in future years are forecast to range from 48 to 63 dBA.

IV.B.9 Analysis Site MB - Anhinga Trail

Site MB is at Anhinga Trail, near the Everglades NP Visitor Center. The site is west-southwest of Homestead near the east edge of the national park, and lies near the approaches to Runway 5 at Homestead. The site is also near the training pattern track for Homestead General Aviation Airport. The traditional ambient level at the site is 54.2 decibels, while the calculated 24-hour Leq levels range from 22 to 39 decibels.

Table IV-21 indicates that the opening of Homestead to civil operations would result in the twin engine propeller and turboprop aircraft that are expected to use the VFR flyway to land at Homestead becoming the dominant factors in the noise exposure pattern in all future Proposed Action conditions. For No Action conditions, general aviation activity at Homestead General and military jets approaching Runway 5 at Homestead from the north are dominant. These aircraft pass over the site at altitudes between 900 and 3,000 feet MSL during their approach to Homestead. The No Action approaches are typically within a range of 3,000 to 16,000 feet from the site. Single operation SELs generated by the principal aircraft in future years are forecast to range from just above the ambient level at 57 to 74 dBA.

IV.B.10 Analysis Site MAE - National Scenic Trail

Site MAE is along the National Scenic Trail, near the center of Big Cypress National Preserve. The site is approximately 45 miles northwest of Homestead and has an average traditional ambient noise level of 43.5 decibels. In comparison with the traditional ambient level, the SEL values associated with the No Action and Proposed Action conditions should have little or no effect given their range from 32 to 51 decibels. The 24-hour Leq levels calculated for the site range from 2.7 to 12.1 decibels. **Table IV-22** indicates that altitudes of the five aircraft most influencing the site range from ground level to 11,000 feet, and from four to fifty miles from the site.

IV.B.11 Analysis Site MAA - Pavilion Key

Site MAE is located at Pavilion Key on the far west side of Everglades NP in an area not currently impacted by large numbers of overflights from the study airports, nor expected to be in near proximity to aircraft overflights under the Proposed Action conditions. The site is approximately 63 miles west of Homestead and is not within forty miles of the nearest flight track used by the loudest estimated aircraft noise contributors. A lightly used helicopter route lies within about 11 miles of the site. At this distance from various operations, the SEL values range from 24 to 45 decibels and are no higher than the traditional ambient noise level of 45.4 decibels. The calculated 24-hour aircraft Leq levels at the site are less than 10 decibels in all cases.

Table IV-23 indicates that from Homestead, only the military helicopter traffic is a factor in the No Action noise level. The opening of Homestead to civil operations would result in the introduction of single and twin engine propeller aircraft expected to use the Worpp approach fix from the northwest. The altitudes of the aircraft that contribute most to noise range from ground level to above 12,000 feet MSL and are at distances of more than ten to twelve nautical miles from the site as they fly by on approach to Homestead.

IV.B.12 Analysis Site SD6 - Halfway Creek

Site SD6 is located at Halfway Creek in the far southwest corner of Big Cypress National Preserve, approximately twelve miles north of the Pavilion Key site and 67 miles west of Homestead. The 24-hour aircraft Leq noise levels at the site are less than 10 decibels, while the ambient level is measured at 64 decibels. The closest flight tracks to the site for No Action and Proposed Action conditions are several miles from the location. At this distance from the various operations, the SEL values associated with aircraft are all at least 15 decibels less than the ambient level.

Table IV-24 provides the altitudes of the aircraft that contribute most to noise. These range from ground level to above 12,000 feet MSL, and are at distances of at least six miles from the location.

IV.C Community and Other Special Assessments

In addition to the twelve sites identified in the national parks and refuges for the detailed evaluation of noise levels, sixteen community and other park locations were selected for a more detailed evaluation.

Exhibit IV-6C indicates the locations of these sixteen sites. These locations are related to grids developed for the grid point noise analysis that are graphically displayed in **Exhibits IV-1, 2, 3, 4,** and **5.** The calculations of DNL, LAmax, and Time Above associated with No Action and Proposed Action conditions are presented in **Table IV-25**. Data reported in this table were extracted from the previously presented tables in this chapter and reflect estimated noise levels based on the grid values for the grid within which the selected site is located. In addition, peak hour Leq calculations for each grid point are located in Table IV-7. The community and other special locations selected for further evaluation of noise levels are:

Site ID	Site Description
BBP	Bill Baggs Cape Florida State Park
ORX	Ocean Reef residential community
ACX	Anglers Club residential community
RFP	Redlands Fruit and Spice Park residential community
HCC	Homestead Community College
KGX	Keys Gate residential community
FCH	Florida City City Hall
CKL	City of Key Largo
NHA	Nursing home
MH1	South Dade Center residential community
NJA	Naranja residential community
HTA	Homeless Trust housing area
HSH	Homestead High School
JPP	John Pennekamp Coral Reef State Park
FK1	Florida Keys National Marine Sanctuary, south site
FK2	Florida Keys National Marine Sanctuary, north site

Exhibit **IV-6B** displays locations at which noise information was computed for use in the SEIS assessment of noise effects on biotic communities. A discussion of that information is presented in Sections 3.11 and 4.11 of the SEIS.

Site BBP – Bill Baggs Cape Florida State Park

Site BBP, Bill Baggs Cape Florida State Park, is located on the south end of Key Biscayne, approximately 18 miles northeast of Homestead. The site is not far from the residential areas of Key Biscayne. The traditional ambient noise levels in the area are estimated to be 55 decibels based on the measured ambient levels in nearby areas of Biscayne National Park. The site is exposed to more noise from operations at Miami International Airport than from current or projected operations at Homestead. As indicated in Table IV-25, neither the single event maximum (LAmax) level, the cumulative noise level calculated in DNL, nor the minutes above the estimated traditional ambient noise level would be increased above No Action levels by the Proposed Action at HST in any future year analyzed. In Table IV-7, the peak hour Leq shows an increase that would not be noticeable (from 41.5 to 41.8 decibels) with the maximum use of a single runway.

Sites ORX and ACX – Ocean Reef and Angler's Club

Sites ORX and ACX are the adjacent Ocean Reef and Angler's Club residential areas, located on the north end of Key Largo, between Crocodile Lake NWR and Biscayne NP, approximately 19 miles southeast of HST. Both sites lie under the southbound departure course for most jet aircraft projected to depart HST from Runway 5. The Day-Night Average Sound Level (DNL) at both locations is projected to increase

Table IV-25
Homestead Regional Airport SEIS - Grid Point Assessment
Community Grid Points and Noise Data
DNL, LAmax and Time Above Threshold Levels for No Action and Proposed Action Cases
(DNL and LAmax in decibels, Time Above in minutes

Community Site	Site Name	Proximate Grid Point	2000 No Action	2000 Proposed Action	2000 Project Change	2005 No Action	2005 Proposed Action	2005 Project Change	2015 No Action	2015 Proposed Action	2015 Project Change	Maximum Use No Action	Maximum Use Proposed Action	Maximum Use Project Change
DNL														
BBP	Bill Baggs Cape Florida State Park	D131	44	44	0	45	45	0	42	42	0	42	42	0
ORX	Ocean Reef	D90,C1213	35	35	0	35	36	1	35	40	5	35	39	4
ACX	Angler's Club	D90,C1214	35	35	0	35	37	2	35	41	6	35	40	5
RFP	Redland Fruit and Spice Park	B125	37	37	0	38	38	0	37	39	2	37	40	3
HCC	Homestead Community College	F58,F75	39	40	1	39	40	1	39	41	2	39	42	3
KGX	Keys Gate	F71	43	44	1	43	45	2	43	49	6	43	51	8
FCH	Florida City City Hall	F38	39	39	0	39	40	1	39	42	3	39	43	4
CKL	City of Key Largo	B115,B134	22	23	1	22	25	3	23	31	8	23	31	8
NHA	Nursing Home	NHA	44	44	0	44	45	1	44	47	3	44	48	4
MH1	South Dade Center	F177,F178	70	70	0	70	70	0	69	70	1	69	71	2
NJA	Naranja Housing Area	F217	45	46	1	45	46	1	45	48	3	45	48	3
HTA	Homeless Trust Housing	F215	54	54	0	54	55	1	54	56	2	54	56	2
HSH	Homestead High School	F90	43	43	0	43	44	1	43	46	3	43	48	5
JPP	John Pennekamp Coral Reef State Park	D100	37	37	0	37	37	0	37	38	1	37	38	1
FK1	Fl. Keys National Marine Sanct. 1	A233	3	5	2	3	10	7	8	16	8	8	17	9
FK2	Fl. Keys National Marine Sanct. 2	D135	22	25	3	22	28	6	25	33	8	25	34	9
LAmax														
BBP	Bill Baggs Cape Florida State Park	D131	73	73	0	73	73	0	70	70	0	70	70	0
ORX	Ocean Reef	D90,C1213	77	77	0	77	77	0	77	77	0	77	77	0
ACX	Angler's Club	D90,C1214	77	77	0	77	77	0	77	77	0	77	77	0
RFP	Redland Fruit and Spice Park	B125	74	74	0	74	74	0	74	74	0	74	74	0
HCC	Homestead Community College	F58,F75	71	71	0	71	71	0	71	71	0	71	71	0
KGX	Keys Gate	F71	97	97	0	97	97	0	97	97	0	97	97	0
FCH	Florida City City Hall	F38	72	72	0	72	72	0	72	72	0	72	72	0
CKL	City of Key Largo	B115,B134	69	69	0	69	69	0	69	69	0	69	69	0
NHA	Nursing Home	NHA	83	83	0	83	83	0	83	83	0	83	83	0
MH1	South Dade Center	F177,F178	107	107	0	107	107	0	107	107	0	107	107	0
NJA	Naranja Housing Area	F217	78	81	3	78	81	3	78	81	3	78	81	3
HTA	Homeless Trust Housing	F215	83	83	0	83	83	0	83	83	0	83	83	0
HSH	Homestead High School	F90	80	80	0	80	80	0	80	80	0	80	80	0
JPP	John Pennekamp Coral Reef State Park	D100	79	79	0	79	79	0	79	79	0	79	79	0
FK1	Fl. Keys National Marine Sanct. 1	A233	30	35	5	30	52	22	30	52	22	30	52	22
FK2	Fl. Keys National Marine Sanct. 2	D135	65	65	0	65	65	0	65	65	0	65	65	0
Minutes Above														
BBP	55 Bill Baggs Cape Florida State Park	D131	12	12	0	13	13	0	7	7	0	7	7	0
ORX	65 Ocean Reef	D90,C1213	<1	<1	0	<1	<1	0	<1	<1	0	<1	<1	0
ACX	65 Angler's Club	D90,C1214	<1	<1	0	<1	<1	0	<1	<1	0	<1	<1	0
RFP	65 Redland Fruit and Spice Park	B125	<1	<1	0	<1	<1	0	<1	<1	0	<1	<1	0
HCC	65 Homestead Community College	F58,F75	1	1	0	1	1	0	1	1	0	1	1	0
KGX	65 Keys Gate	F71	2	2	0	2	2	0	2	4	2	2	5	3
FCH	65 Florida City City Hall	F38	1	1	0	1	1	0	1	1	0	1	1	0
CKL	65 City of Key Largo	B115,B134	0	0	0	0	0	0	0	0	0	0	0	0
NHA	65 Nursing Home	F107	2	2	0	2	3	1	2	3	1	2	3	1
MH1	65 South Dade Center	F177,F178	86	95	9	86	103	17	86	155	69	86	217	131
NJA	65 Naranja Housing Area	F217	5	5	0	5	5	0	5	6	1	5	6	1
HTA	65 Homeless Trust Housing	F215	16	16	0	16	17	1	16	24	8	16	19	3
HSH	65 Homestead High School	F90	2	2	0	2	2	0	2	2	0	2	2	0
JPP	50 John Pennekamp Coral Reef State Park	D100												
FK1	46 Fl. Keys National Marine Sanct. 1	A233												
FK2	52 Fl. Keys National Marine Sanct. 2	D135												

Time Above may be estimated from adjacent site data.

with the Proposed Action, beginning in 2005. However, projected DNL increases are not considered sizeable at the levels at which they occur (i.e., 4 to 5 dB increases at and below DNL 40 dB), and the highest projected DNL level with the Proposed Action at maximum use of the single runway is DNL 40 dB. DNL 40 dB is a very low cumulative noise exposure level. The data presented in Table IV-25 indicate that neither site is expected to experience an increase in the maximum sound level (LAmax) or the Time Above level. The Time Above 65 decibels, a level related to community speech interference, was used for all community sites where TA data is computed. Both Angler's Club and Ocean Reef are expected to receive less than 1 minute a day of aircraft noise above 65 decibels, under either the No Action condition or the Proposed Action for all years analyzed.

Site RFP – Redlands Fruit and Spice Park

The Redlands Fruit and Spice Park (Site RFP) is in a residential area located almost eight miles northwest of HST and three miles northeast of Homestead General Aviation Airport. The site is in proximity to the VFR flyway along the east side of the Everglades NP. Neither the maximum sound level (LAmax) or Time Above 65 level is expected to change from No Action levels throughout the planning period. This area is expected to receive less than 1 minute a day of aircraft noise above 65 decibels, under either the No Action condition or the Proposed Action. In 2015 and the maximum use year for the one runway condition, the DNL is projected to increase by two to three decibels. The DNL is not projected to exceed 40 decibels with the Proposed Action.

Site HCC – Homestead Community College

Site HCC, at Homestead Community College, is located about six miles west of HST and four miles southeast of Homestead General Aviation Airport. In all No Action and Proposed Action years, the maximum sound level (LAmax) to which the area would be exposed is projected to remain the same (71 decibels), and the Time Above 65 decibels is expected to remain at one minute daily. The initiation of civil aviation activity at HST is projected to result in a gradual increase in the DNL at the site from a No Action level of 39 decibels to a Proposed Action maximum use one runway level of 42 decibels. This level is well below normal ambient noise levels experienced at this type of location.

Site KGX – Keys Gate

The Keys Gate residential community, at Site KGX, is located six miles southwest of the airport, near the extended centerline of the approach to Runway 5. The site is under the principal existing and proposed approach paths to the runway during the dominant northeasterly flow. The LAmax single event peak at the location is associated with F-16 aircraft operations and is therefore not expected to change from No Action to Proposed Action conditions in any future years. The forecast growth of civil operations at Homestead under the Proposed Action is projected to increase the total amount of aircraft noise at the location, a condition reflected by the gradual growth of the DNL from a No Action level of 43 decibels to 51 decibels in the maximum use scenario. Although the eight decibel growth over the years is among the largest projected at the community sites, the level remains well below the significant and moderate levels of 65 and 60 decibels of DNL. It is also below an EPA-recommended guideline of DNL 55 dB to provide an extra margin of noise protection below DNL 60 dB. The Time Above 65 decibels is projected to be five minutes daily at maximum use of the single runway, up from a No Action level of two minutes per day.

Site FCH – City Hall at Florida City

The City Hall at Florida City (Site FCH) is located about one mile northwest of the Keys Gate neighborhood, and is subject to similar noise patterns. Since the City Hall is farther away from the extended runway centerline than Keys Gate, the LAmax at the location is much lower (72 decibels in all No Action and Proposed Action conditions), and the Time Above 65 decibels is expected to remain at one minute for each No Action and Proposed Action condition analyzed The DNL at the site is projected to increase from 39 decibels under No Action conditions to 43 decibels in the Proposed Action maximum one runway use condition.

Site CKL – City of Key Largo

The City of Key Largo (Site CKL) is located approximately 35 miles south of HST on Key Largo. The maximum sound level (LAmax) at the site is forecast to remain constant at 69 decibels for all future No Action and Proposed Action conditions. This LAmax level would not be experienced every day. The site is not projected to be exposed to noise above 65 decibels on an average day for any No Action or Proposed Action condition. The DNL is projected to grow from 22 or 23 decibels under No Action conditions to 31 decibels in 2015 and with maximum use of the single runway. Growth in DNL at the site would be the result of gradually increasing operations on routes leading to the MNATE departure fix. This level of DNL is well below ambient noise levels experienced for similar locations.

Site NHA – Nursing Home

The only nursing home that is near Homestead (Site NHA) is located about three to four miles west of the airport, north of the Keys Gate community. Noise levels at the site are influenced by its location just north of the extended centerline of the approach to Runway 5. The maximum sound level (LAmax) is projected to remain unchanged at 83 decibels for all future No Action or Proposed Action conditions analyzed. The Time Above 65 decibels is expected to be an average of three minutes or less per day throughout all future conditions. The DNL is expected to increase from 44 to 48 decibels with maximum use of the single runway.

Site MH1 – South Dade Center

The South Dade Center is a residential area adjacent to the southwest boundary of the airport at Site MH1. Among the community locations presented in this section, this site is projected to experience the greatest noise effects as a result of the Proposed Action. It is identified as receiving projected increases of significant levels of aircraft noise exposure in the community noise contour analysis. The DNL is projected to remain between 69 and 71 decibels throughout the planning period, while the LAmax would remain 107 decibels in all cases. The estimated increasing number of aircraft operations at the airport is reflected by the growth in the amount of time the site would be exposed to noise above 65 decibels. Under No Action conditions, the site would be exposed to 86 minutes above 65 decibels per average day, while under Proposed Action conditions the Time Above is projected to increase from a daily average of 95 minutes in 2000 to 217 minutes with maximum use of the single runway.

Site NJA – Naranja Neighborhood

Site NJA is the Naranja neighborhood, located north of SW 268th Street on the north side of the airport. This site would not be exposed to direct overflight, but rather would experience sideline noise from aircraft using the runway. The DNL is projected to increase from No Action levels of 45 decibels in all future years to 48 decibels in 2015 and with maximum use of the single runway. The maximum sound level (LAmax) is estimated to increase from 78 to 81 decibels under all future Proposed Action conditions. The amount of Time Above 65 decibels is expected to remain relatively constant at approximately 5 to 6 minutes in all cases.

Site HTA – Homeless Trust Housing

The Homeless Trust Housing (Site HTA) is located on the north portion of the airport property, about one mile closer to the runway than the Naranja site. As might be expected, the data indicate that the HTA site would be exposed to greater noise levels than the Naranja site as a result of this difference in proximity to the airfield. The DNL level is projected to increase by 1 dB (from DNL 54 to 55 dB) in 2005, and by 2 dB (from DNL 54 to 56 dB) in 2015 and with maximum use of the single runway. These are not considered to be sizeable DNL increases at these exposure levels. The maximum sound level of 83 decibels is expected to remain the same for all years under either No Action or Proposed Action conditions. The amount of Time Above 65 decibels is projected to remain relatively constant—varying between 16 minutes on a daily average under No Action conditions to a maximum of 24 minutes daily in 2015 with the Proposed Action.

Site HSH – Homestead High School

Homestead High School (Site HSH) is located near the nursing home (Site NHA) and would experience similar noise effects. The maximum sound level (LAmax) is projected to remain consistent at 80 decibels for all years with or without the Proposed Action, and the Time Above 65 decibels is projected to remain at two minutes per day under all future conditions. The DNL is projected to increase as the total volume of operations at HST is forecast to increase through the years -- from DNL 43 dB under No Action conditions to 48 decibels with maximum use of the single runway.

John Pennekamp Coral Reef State Park and Florida Keys National Marine Sanctuary

The final three sites are in marine parks located east and south of the national parks. Site JPP is in the John Pennekamp Coral Reef State Park about three miles east of the Ocean Reef and Angler's Club sites. Site FK1 is located in the Florida Keys National Marine Sanctuary just south of Everglades National Park near Lower Matacumbe Key, while Site FK2 is located in the Sanctuary about eight miles east of Old Rhodes Key in Biscayne National Park. In addition to data in Table IV-25, the Leq(h) levels for these park sites are found in Table IV-7. Ambient noise levels were not measured at these three locations, but reasonable estimates of the Time Above traditional ambient levels were able to be made based on traditional ambient data for nearby sites. The estimated average traditional ambient levels at Sites JPP, FK1 and FK2 are 50, 46 and 52 decibels respectively.

Site JPP – John Pennekamp Coral Reef State Park

Cumulative noise levels are not forecast to change noticeably with the Proposed Action. The DNL is projected to increase slightly from DNL 37 to 38 dB with the Proposed Action in 2015 and maximum use of the single runway. The peak hour Leq shows a similar slight increase, from 41.3 to 42.2 dB at maximum use. Cumulative noise levels are projected to remain below the estimated average traditional ambient level. With respect to single event noise, the maximum sound level is projected to remain at 79 decibels and not be increased by the Proposed Action. As the number of aircraft operations over the site is forecast to increase with the development of Homestead for commercial use, the time the site would be exposed to noise levels above 50 decibels (an estimated traditional ambient based on nearby data) would increase. Nearby sites indicate that the increase would be expected to be on the order of 4 to 7 minutes per day with maximum use of the single runway. The highest Time Above traditional ambient for the Proposed Action calculated at nearby grid points is 13 minutes daily.

Site FK1 – Florida Keys National Marine Sanctuary

At Site FK1 in the Marine Sanctuary, both the No Action and the Proposed Action calculated DNL noise levels are many decibels below the estimated traditional ambient level of 46 decibels. The No Action level will increase through the planning period as a result of growing operations at other airports. The highest projected DNL is 17 dB with maximum use of the single runway. Peak hour Leq calculations produce a similar result, indicating an increase from 8.3 to 18.6 dB with maximum use of the single runway. The projected LAmax at the site would increase from 30 decibels for No Action conditions to an estimated 52 decibels after 2005 and the introduction of jet operations along the MNATE departure route. This 52 decibel LAmax level may occur only occasionally. The Time Above data in nearby grid cells indicates that there would be virtually no expected increases of the time above the estimated traditional ambient noise level on an average day with the Proposed Action and that all Time Above durations would remain below one minute for each future condition.

Site FK2 – Florida Keys National Marine Sanctuary

Noise levels presented in the table for Site FK2 indicate no change in the maximum sound level between No Action and Proposed Action conditions in any future year. The Time Above the estimated 52 decibel traditional ambient level is not expected to be exceeded more than 3 minutes on the average day for any future condition. . The DNL is projected to increase with the growth of operations from No Action levels of 22 to 25 decibels to Proposed Action levels of as much as 34 decibels. The peak hour Leq shows a similar pattern to the DNL, with a projected increase from Leq 26.3 to 36.5 dB with the Proposed Action at maximum use of the single runway. Whether calculated in DNL or Leq(h), cumulative noise exposure with the Proposed Action is projected to remain well below the estimated traditional ambient noise level.

\[i] The normalizing factor of 13.8 decibels is ten times the log of 24. The number 24 represents the hours in the day, and the addition of 13.8 decibels to the result of the one-hour run will provide a degree of comparability between the 24-hour level associated with DNL and the one-hour level of Peak Hour $Leq_{(h)}$.

Chapter VI
Noise Analysis for Commercial Spaceport Operations

VI. A. Introduction

The development of Homestead for a Commercial Spaceport would have different noise effects than those associated with a commercial airport. This section will assess the noise associated with commercial spaceport activity, without the presence of scheduled commercial operations by passenger and other commercial operators. Details of the commercial spaceport alternative are provided in the Alternatives Section of the SEIS.

VI.B. Spaceport Operating Characteristics

The operations of a commercial spaceport would be expected to preclude operations by all other users of the airfield, with the exception of the military and government operators now in place. Because commercial space access is a new and rapid evolving field, the specific characteristics of a commercial spaceport's operational activity are largely speculative. Consequently, numerous assumptions are required for the projection of potential noise levels associated with the activity.

A fundamental consideration in the noise exposure patterns resulting from commercial spaceport activity is the definition of the launch vehicle(s). Noise characteristics and noise modeling parameters have not yet been certified for any launch aircraft. Therefore, even the description of the vehicle must be based on the best information available at the time of assessment. As indicated in **Table VI-1**, two different launch vehicles are projected for operation from the Homestead "Spaceport" -- the "Aerospacecraft" and an "Astroliner".

As described in the Alternatives section of the SEIS, Space Access, LLC is developing an unmanned system for transporting satellites into orbit. The system would include two or three stages that work together to deploy payloads into space. A hypersonic Aerospacecraft (ASC) would serve as the main launch vehicle. The second stage, a reusable spacecraft (RSC) would carry the payload. For some missions, a third stage, a reusable orbital transfer craft (ROC), would place the payload into orbit. All three stages would be launched together under power and return to the airport as controlled, but unpowered gliders. The ASC is expected to resemble the Concorde airplane and is comparable to the Boeing 747 in weight. It would be capable of taking off and landing horizontally on the existing runway. It would be expected to launch to the northeast and land from the northeast. It would not be expected to reach supersonic speeds until reaching an altitude of 18,000 feet MSL. (The typical heavy Concorde reaches that altitude about forty nautical miles into its flight.) In both takeoff and landing, its activity would require coordination with FAA Miami TRACON because the airspace may need to be closed to allow the launch and recovery.

The Eclipse "Astroliner" is a manned tow-launch system in development by Kelly Space and Technology, Inc. It would use a Boeing 747 to tow the first stage space vehicle, a winged and partially powered Astroliner launch vehicle, from the runway to an altitude of about 20,000 feet MSL. At that point, the Astroliner's rocket engines would be ignited and the tow released. The Astroliner would climb to a pre-determined altitude (about 20,000 feet MSL) where a second stage space vehicle would be ignited. The heavy B-747 would reach this altitude approximately fifty nautical miles from takeoff. This second vehicle would place the payload into orbit. Both the tow vehicle and the Astroliner would return to the airport under power. This system is expected to operate in normal runway flows, with takeoffs and landings both made on Runway 05.

Table VI-1 below shows the estimated annual spaceport operations for 2005, 2015, and Full Buildout. These operations would be in addition to the 19,824 military and government aircraft operations that currently use Homestead and are forecast to continue under No Action conditions for all future timeframes.

Table VI-1
Projected Annual Total Operations
Homestead Regional Airport SEIS

Type of Space Access System	2000	2005	2015	Full Buildout
ASC, RSC, ROC	0	160	320	320
B-747, Astroliner	0	0	160	160
Total Space Launch	0	160	480	480

Source: SEIS Alternatives, Chapter 2, Table 2.3-5

For this noise analysis, the Astroliner system was represented by two B-747 aircraft launching simultaneously (or as if one B-747 had eight engines), with two separate landings conducted some time apart. For the evaluation of LAmax and other single event metrics, as well as the effect on the Time Above Ambient exposure, the dual takeoffs were represented as a single operation by doubling the Integrated Noise Model (INM) noise levels associated with the operation. The heaviest weight categories available in the INM were used to represent the operation. Default B-747 noise curves were retained for landing operations. **Exhibit VI-1** indicates the SEL footprint for a dual launch and single recovery of the Astroliner system space access vehicle.

As can be seen, the footprint of the dual aircraft launch is long and narrow, a pattern characteristic of an aircraft maintaining its single departure course but climbing very slowly. The 85 dBA extends across Biscayne National Park to Key Biscayne to a point about 115,000 feet into its flight, or an altitude of approximately 7,000 MSL. The 90 SEL contour reaches about 45,000 feet into the park, while the highest level contours (95 and 100 SEL) extend just beyond the shoreline at Black Point. To the southwest, the 85 SEL footprint extends about 45,000 feet from the landing threshold, terminating several miles east of the east boundary of Everglades National Park.

For the Aerospacecraft (ASC) launch system, the Concorde aircraft was used for the noise analysis. It is the only readily available supersonic aircraft in the INM of comparable design to that described for the ASC vehicle. Given the heavy weight anticipated for the ASC vehicle, the heaviest Concorde available in the INM was used for noise computations. Based on the described operating characteristics, the ASC (Concorde) was assumed to depart under full power and return to the airport unpowered. For noise modeling purposes, this effectively equates to a takeoff without a landing. **Exhibit VI-2** displays the SEL footprint that would be expected for one launch and recovery operation for the ASC/RSC/ROC system.

The SEL footprint for this launch and recovery system would be located almost entirely northeast of the airport. The 100 SEL completely crosses the north half of Biscayne NP, indicating that the aircraft would not rapidly achieve altitude. However, it appears to climb rapidly once it reaches a position about 28 miles into its flight (or at about the northeast end of the 95 SEL contour), as indicated by the closer spacing of the 85, 90 and 95 SEL contours. The contour pattern is several miles wide along most of its length, a simple indication of the general loudness of the aircraft. There is no spike of noise to the southwest because arrival operations are expected to be made to Runway 23.

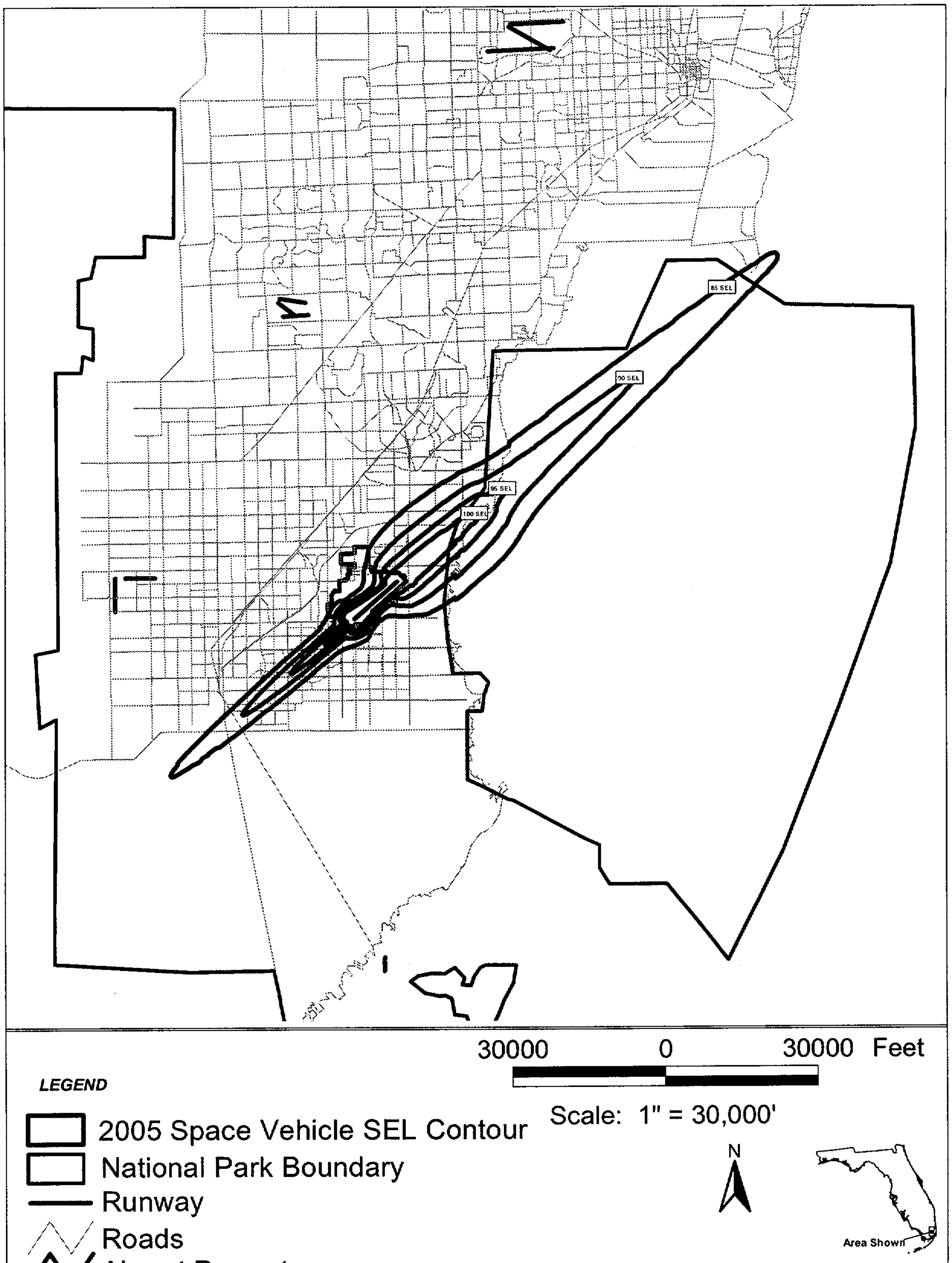


Exhibit VI-1

SEL Pattern - 2005 Space Vehicle -
Two 747 Aircraft Departure, One Aircraft Arrival

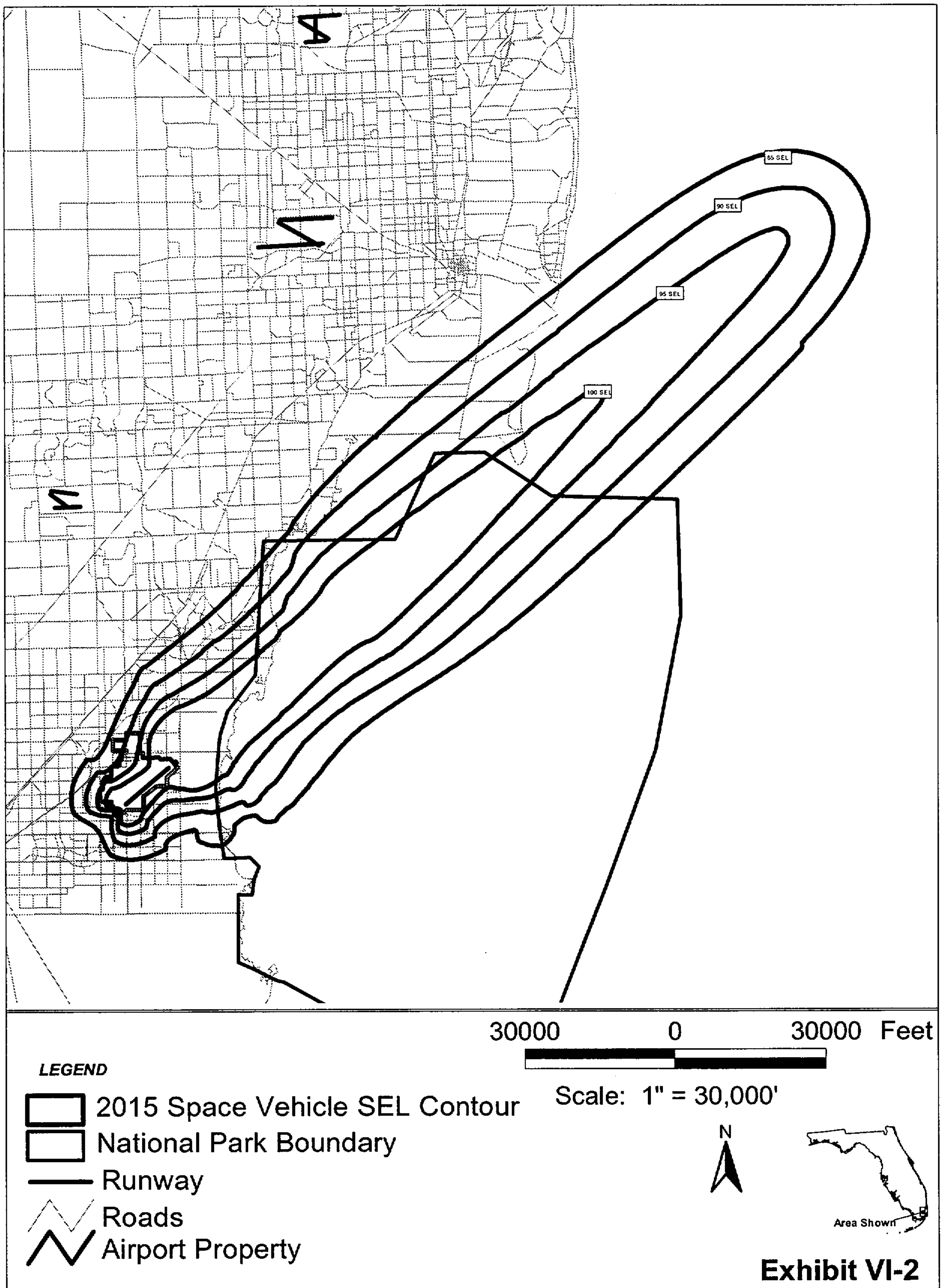


Exhibit VI-2

SEL Pattern - 2015 Space Vehicle - Supersonic Vehicle (Concorde)

VI.C. Spaceport Noise Exposure (DNL) Contours

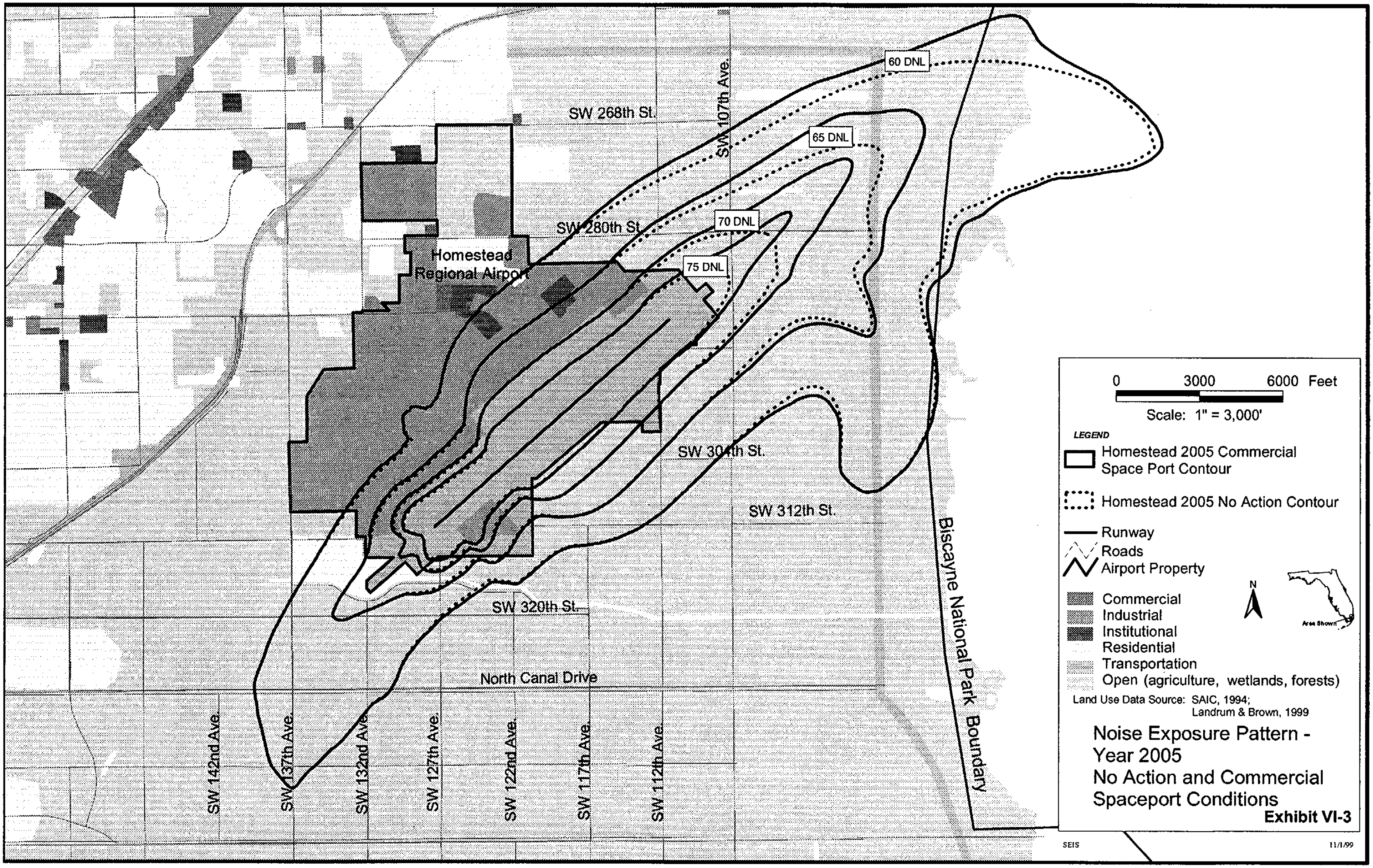
Noise exposure contours using the DNL metric were computed for the commercial spaceport operation, assuming the continued presence of military and government activity now in place at Homestead as well as the space launch activity presented in the previous section. Activity and noise levels from other regional airports are included, as they were in the Proposed Action noise analysis. Amounts of change in noise effects between the No Action conditions and the Commercial Spaceport conditions would be entirely attributable to the Commercial Spaceport alternative. Noise contours were prepared for two activity levels of potential space launch operations indicated in Table VI-1 (2005 and 2015/full buildout).

In 2005 (the first year assessed), only the ASC/RSC/ROC option would be in place, and then only at half its anticipated level at full buildout. **Exhibit VI-3** displays the expected DNL contours of 60 dBA or more resulting from this initial level of commercial spaceport activity, compared to the No Action conditions of the same year (2005). As can be seen, the contours are virtually identical along and to either side of the runway. However, to the northeast of the airport, the commercial spaceport contours are larger than the No Action contours, exhibiting increases of several decibels in some locations. The 75 DNL contour of the commercial spaceport alternative extends beyond the 70 DNL No Action contour, and the 70 DNL contour for the commercial spaceport extends nearly to the 65 DNL of the No Action condition. The 65 DNL for the commercial spaceport is larger than the No Action contour, but remains west of the shoreline. In contrast, the 60 DNL contour extends across the shoreline and into Biscayne National Park.

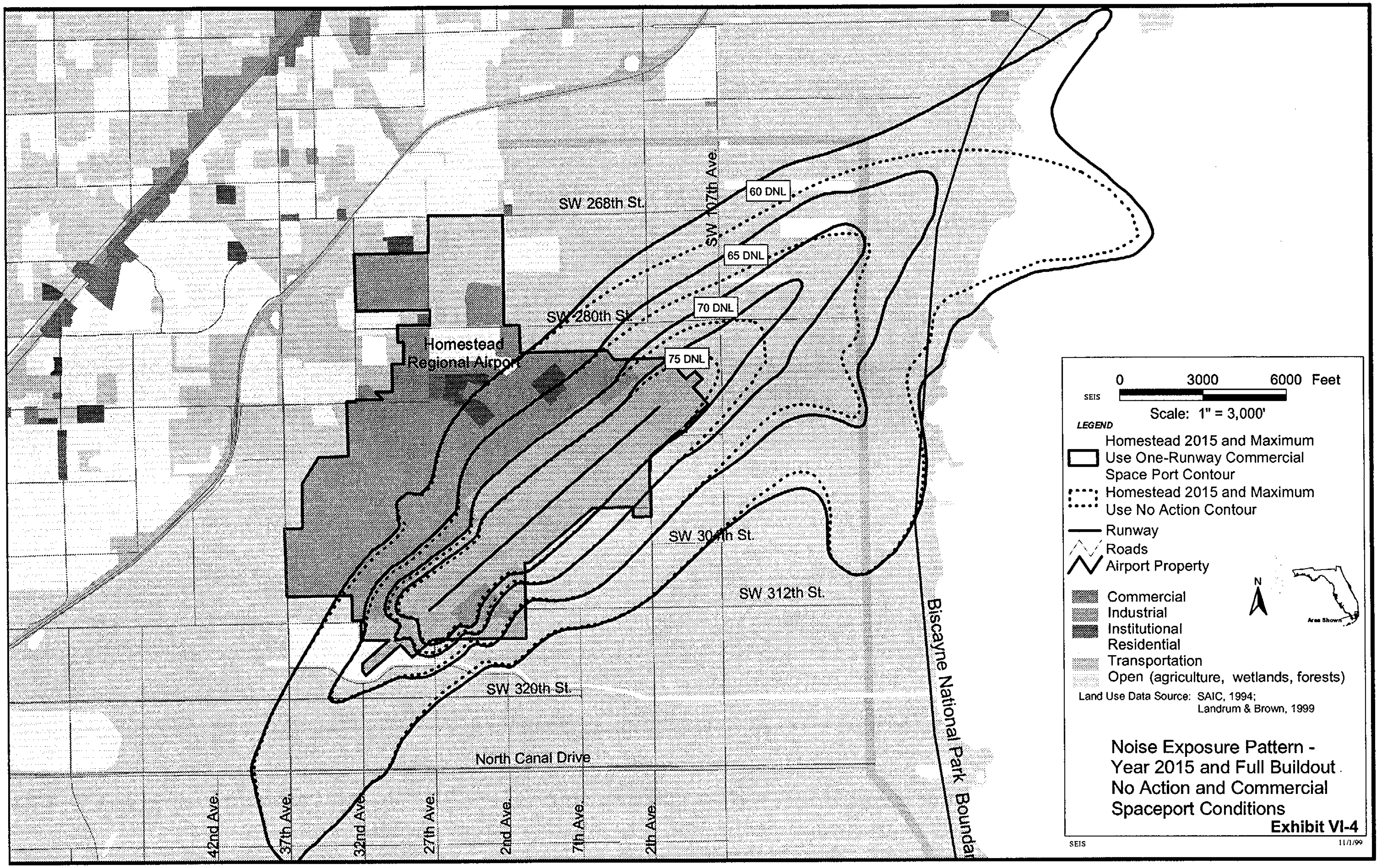
By 2015, the spaceport would be expected to reach its full forecast activity level. **Exhibit VI-4** presents the noise contours for 2015 and Maximum One Runway Use (full buildout) conditions. The contours for the two years are identical because there is no difference between the commercial spaceport operating assumptions for these conditions. Once the spaceport would reach full utilization, the 75 DNL contour would be expected to extend well beyond the No Action 70 DNL contour. The commercial spaceport 70 DNL contour would extend to the 65 DNL of the No Action condition. The 65 DNL of the commercial spaceport would extend beyond that of the No Action condition, but would not reach the shoreline. The 60 DNL contours of both the No Action and the Commercial Spaceport noise patterns would extend into Biscayne National Park.

The increases in DNL noise levels in the airport vicinity for the commercial spaceport alternative would exceed those of the Proposed Action as well as the No Action conditions presented in Chapter III, particularly to the northeast of the airport. **Exhibits VI-5 and VI-6** indicate the areas that would receive an increase above the No Action conditions of 1.5 DNL or more within the 65 DNL and higher contours, and areas that would receive an increase of 3 DNL or more between 60 and 65 DNL. Exhibit VI-5 shows, for 2005, a large area of 1.5 DNL increase within the 65 DNL contour northeast of the airport. This area is the result of infrequent high noise levels during the initial stages of takeoff and final stages of approach. A small area having an increase of 3 DNL within the 60-65 DNL range is also present farther to the northeast, partly within Biscayne National Park. In both cases, the areas outside the park are over lands that are largely undeveloped currently, but could develop in future years if growth is not controlled.

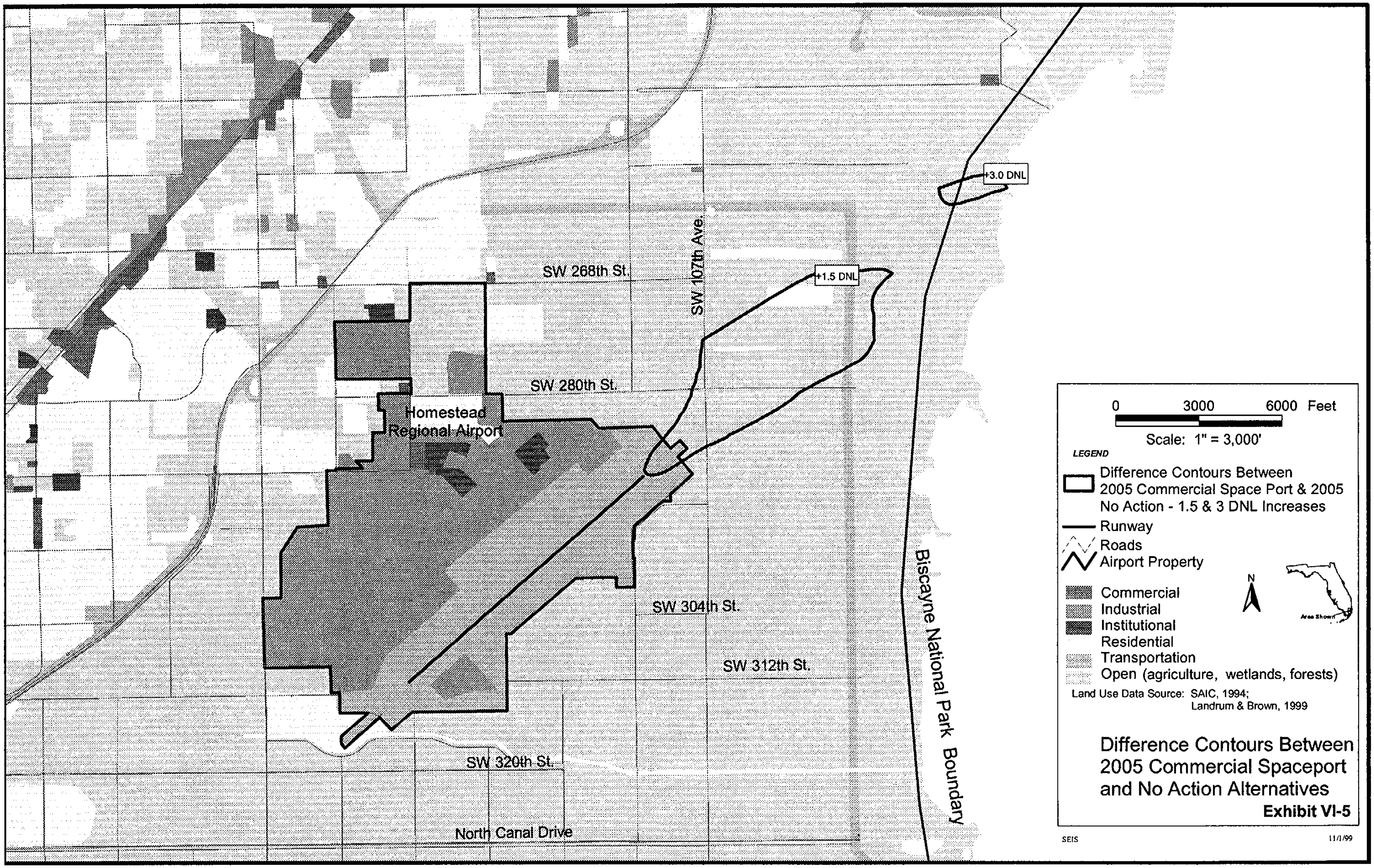
Exhibit VI-6 indicates areas expected to be exposed to DNL increases of 1.5 and 3, respectively, in 2015 and full buildout conditions. The area expected to experience an increase of 1.5 DNL within the 65 DNL and higher would be larger than in 2005, reflecting the contour growth displayed between Exhibits VI-3 and VI-4. An area primarily within the airport boundary would also experience an increase of 1.5 decibels of DNL under the full buildout condition. A small area of vacant off-airport land immediately south of the west end of the runway lies within this 1.5 DNL area of increase. To the northeast of the airport, two areas between 60 and 65 DNL would experience increases of 3 DNL or more under full buildout conditions. The areas outside the park are largely undeveloped currently, but uncontrolled



60 DNL
65 DNL
70 DNL
75 DNL
SW 268th St.
SW 280th St.
SW 107th Ave.
Homestead Regional Airport
SW 304th St.
SW 312th St.
SW 320th St.
North Canal Drive
Biscayne National Park Boundary
SW 142nd Ave.
SW 137th Ave.
SW 132nd Ave.
SW 127th Ave.
SW 122nd Ave.
SW 117th Ave.
SW 112th Ave.
0 3000 6000 Feet
Scale: 1" = 3,000'
LEGEND
Homestead 2005 Commercial Space Port Contour
Homestead 2005 No Action Contour
Runway
Roads
Airport Property
Commercial
Industrial
Institutional
Residential
Transportation
Open (agriculture, wetlands, forests)
N
Land Use Data Source: SAIC, 1994; Landrum & Brown, 1999
Noise Exposure Pattern - Year 2005
No Action and Commercial Spaceport Conditions
Exhibit VI-3
SEIS
11/1/99

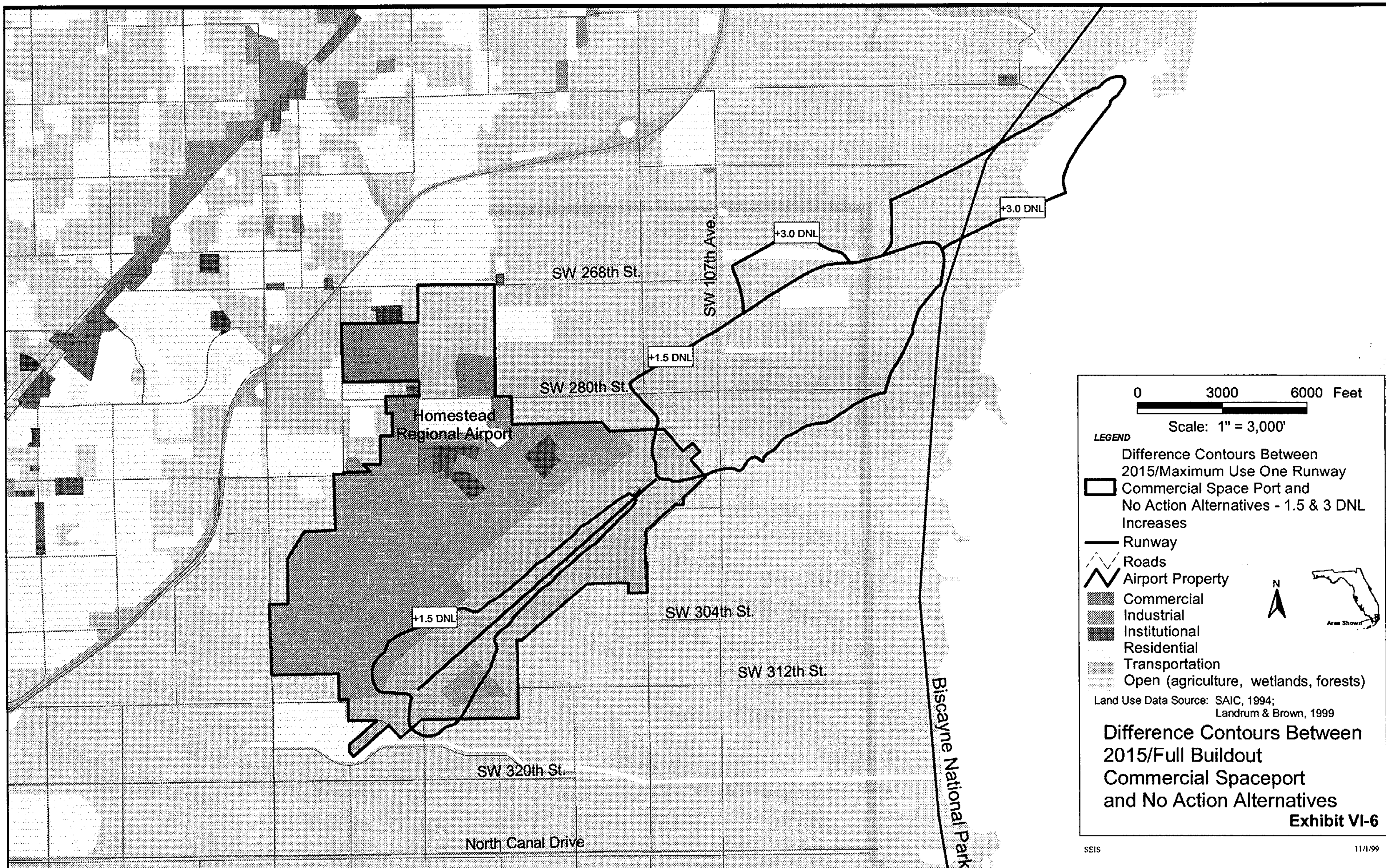


SW 268th St.
SW 107th Ave.
60 DNL
65 DNL
70 DNL
75 DNL
SW 280th St.
Homestead Regional Airport
SW 304th St.
SW 312th St.
SW 320th St.
North Canal Drive
42nd Ave.
37th Ave.
32nd Ave.
27th Ave.
2nd Ave.
7th Ave.
2th Ave.
Biscayne National Park Boundar
0 3000 6000 Feet
SEIS
Scale: 1" = 3,000'
LEGEND
Homestead 2015 and Maximum Use One-Runway Commercial Space Port Contour
Homestead 2015 and Maximum Use No Action Contour
Runway
Roads
Airport Property
Commercial
Industrial
Institutional
Residential
Transportation
Open (agriculture, wetlands, forests)
N
Area Shown
Land Use Data Source: SAIC, 1994; Landrum & Brown, 1999
Noise Exposure Pattern - Year 2015 and Full Buildout No Action and Commercial Spaceport Conditions
Exhibit VI-4
SEIS
11/1/99



Difference Contours Between 2005 Commercial Spaceport and No Action Alternatives

Exhibit VI-5



Difference Contours Between 2015/Full Buildout Commercial Spaceport and No Action Alternatives

Exhibit VI-6

SEIS

11/1/99

growth in the area could introduce residences and population. One area of 3 dB increase within the 60-65 DNL contours, i.e., a noticeable increase in moderate noise exposure, would be expected to reach into the northwest portion of Biscayne National Park near Black Point and would be larger than the area within the park exposed to a 3dB increase in 2005.

Table VI-2 provides data on the amount of area and the number of persons and dwellings that are projected to be within the 60 DNL and higher noise contours for the commercial spaceport alternative in successive years evaluated. Noise sensitive residential land uses are considered noncompatible with noise exposure levels of 65 DNL or more in FAA guidelines on land use compatibility, unless structures are sound insulated. The table verifies that uncontrolled growth in the airport environs could result in the introduction of many additional noncompatible land uses within these noise contours in future years. The lines labeled "current impacts" indicate the number of persons and dwellings now located in the airport environs that would fall within the contours for each space access scenario. The lines labeled "introduced impacts" indicate the number of persons or dwellings that would be introduced into the noise contour area if growth is allowed to occur as indicated by the Dade County plans for the residential development of the area.

Table VI-3 indicates the amount of area, the population, and the number of dwelling units that would receive increases of 1.5 and 3 DNL, respectively, in the years evaluated.

The columns headed "1997" in Table VI-3 indicate the population and dwellings currently located in the areas expected to be exposed to the identified increases of noise with the commercial spaceport alternative. The differences in the numbers under the columns headed "Forecast" are the result of the potential growth risk for the area if noncompatible growth is not controlled.

Table VI-3
Acreage, Population, and Dwelling Units
With 1.5 and 3 DNL Increases for Commercial Spaceport Alternative
Homestead Regional Airport SEIS

Year and Area	Area (acres)	Population		Dwelling Units	
		1997	Forecast	1997	Forecast
2005					
Increase of 1.5 DNL	627	29	56	13	23
Increase of 3.0 DNL	38	2	4	1	2
2015					
Increase of 1.5 DNL	1,517	49	170	21	64
Increase of 3.0 DNL	544	27	94	12	36
Full Buildout					
Increase of 1.5 DNL	1,517	49	3,605	21	1,110
Increase of 3.0 DNL	544	27	1,952	12	598

Source: Landrum & Brown, 1999.

VI.D Spaceport Grid Point Analysis

A grid point assessment, using the same approach as described in detail in Chapter IV for the Proposed Action, was conducted to evaluate the noise effects of the commercial spaceport alternative on the four national properties. Maps of the differences between the noise levels and exposure times between the commercial spaceport alternative and the No Action conditions were prepared for LAmax, Leq(h) and

Table VI-2
Projected Area, Population and Dwelling Unit Impacts of the Commercial Spaceport Alternative
Homestead Regional Airport SEIS

	60-65 DNL			65-70 DNL			70-75 DNL			75 DNL or More			60 DNL or More		
Year and Condition	Area	Pop.	D.U.s	Area	Pop.	D.U.s	Area	Pop.	D.U.s	Area	Pop.	D.U.s	Area	Pop.	D.U.s
2005															
No Action	3,712	1,259	249	1,434	682	105	602	0	0	710	0	0	6,458	1,941	354
Proposed Action	3,827	1,291	254	1,530	696	111	730	16	7	806	0	0	6,893	2,003	372
Project Change	115	32	5	96	14	6	128	16	7	96	0	0	435	62	18
Current Impacts	--	1,172	205	--	663	99	--	9	4	--	0	0	--	1844	308
Introduced Impacts	--	119	49	--	33	12	--	7	3	--	0	0	--	159	64
2015															
No Action	3,706	1,384	296	1,427	717	117	602	0	0	710	0	0	6,445	2,101	413
Proposed Action	4,103	1,463	312	1,600	761	133	812	50	19	890	7	3	7,405	2,281	467
Project Change	397	79	16	173	44	16	210	50	19	180	7	3	960	180	54
Current Impacts	--	1,201	212	--	664	100	--	16	2	--	2	1	--	1883	315
Introduced Impacts	--	262	100	--	97	33	--	34	17	--	5	2	--	398	152
Full Buildout															
No Action	3,706	11,365	3,751	1,427	2,783	727	602	18	6	710	0	0	6,445	14,169	4,485
Proposed Action	4,103	11,884	3,906	1,600	3,806	1,052	812	1,068	328	890	159	49	7,405	16,917	5,335
Project Change	397	519	155	173	1,023	325	210	1,050	322	180	159	49	960	2,748	850
Current Impacts	--	1,201	212	--	664	100	--	16	2	--	2	1	--	1883	315
Introduced Impacts	--	10,683	3,694	--	3,142	952	--	1,052	326	--	157	48	--	15,034	5,020

Source: Landrum & Brown, 1999.

TA(amb) metrics. The effects of the commercial spaceport alternative on each grid point located in each national property were computed. Detailed grid point data was also developed for each of the twelve specific locations selected and reported in Chapter IV. The resulting information is presented in this section.

VI.D.1. Single Event Noise Changes With the Commercial Spaceport

Exhibits VI-7, and VI-8 present the grid maps showing the maximum single-event aircraft noise increases, using the LAmax noise metric, of the commercial spaceport alternative compared to No Action conditions. **Table VI-4** presents the tabular LAmax data. The only national property that would experience increases in LAmax levels as a result of the commercial spaceport operations is Biscayne National Park. The northwest portion of Biscayne NP would experience LAmax increases of more than 3 to more than 10 decibels as shown on the grid maps and more specifically tabulated in Table VI-4. The number of grid locations with an LAmax increase of more than 5 decibels nearly doubles between 2005 and 2015 as space launch activity is forecast to increase. In 2015/full buildout conditions, the additional points are influenced by a reduction in the No Action level rather than an increase in the alternative level. The area of Commercial Spaceport overflight is impacted principally by aircraft using MIA under the No Action scenario. In years after 2005, the retrofitted Stage 3 aircraft expected to remain in the mix for 2005 are expected to be retired. Consequently, the reduction of the No Action level under an unchanged alternative noise level by the ASC will result in an increase in differences. The loudness of the individual event does not, however reflect the changes to overall noise levels in the environs.

Table VI-5 provides information for peak SEL values that occur at least once daily for individual aircraft/flight track combinations. The SEL values that would be associated with spaceport activity do not appear on the table because that activity will occur less than daily. In contrast, the LAmax levels presented in Table VI-4 are not limited to the daily occurrence criteria the INM applies to the SEL and represent the expected maximum noise level at each location, regardless of event frequency.

VI.D.2. Cumulative Noise Exposure Changes With the Commercial Spaceport

Changes in the Peak Hour Leq metric (Leq(h)) attributable to the implementation of the commercial spaceport alternative are presented graphically in **Exhibits VI-9, and VI-10**. A limited number of grid cells indicate an intensification of the peak hour Leq noise level northeast of the airport in the northwest portion of Biscayne NP during each future year assessed. The Leq(h) is predicted to increase by five to ten or more dB in two grid cells in 2005, and to increase by the same magnitude of amounts at more locations in 2015 and full buildout, with one grid cell in north Biscayne NP receiving 15 or more dB increases in the later years. Because Leq(h) is a function of the average daily traffic level, the data indicated in these exhibits and in **Table VI-6** may overpredict the peak hour noise level for this alternative, particularly if other aircraft operations have to be discontinued during launch and recovery periods. This data is then, considered to be a worst case estimate of the effect on Leq(h) of the commercial spaceport alternative.

Data associated with the DNL levels for the commercial spaceport alternative are presented in **Table VI-7** and compared to the No Action DNL noise levels for each grid point in the national properties. DNL data has not been mapped. It would show a pattern similar to Leq(h) mapping.

VI.D.3. TA(amb) Changes With the Commercial Spaceport

Increases in the amount of time locations in the national properties would be exposed to noise above the traditional ambient levels are presented in **Exhibits VI-11 and VI-12**. The underlying data is presented in tabular form in **Table VI-8**. To the northeast of Homestead in Biscayne NP, the pattern is essentially

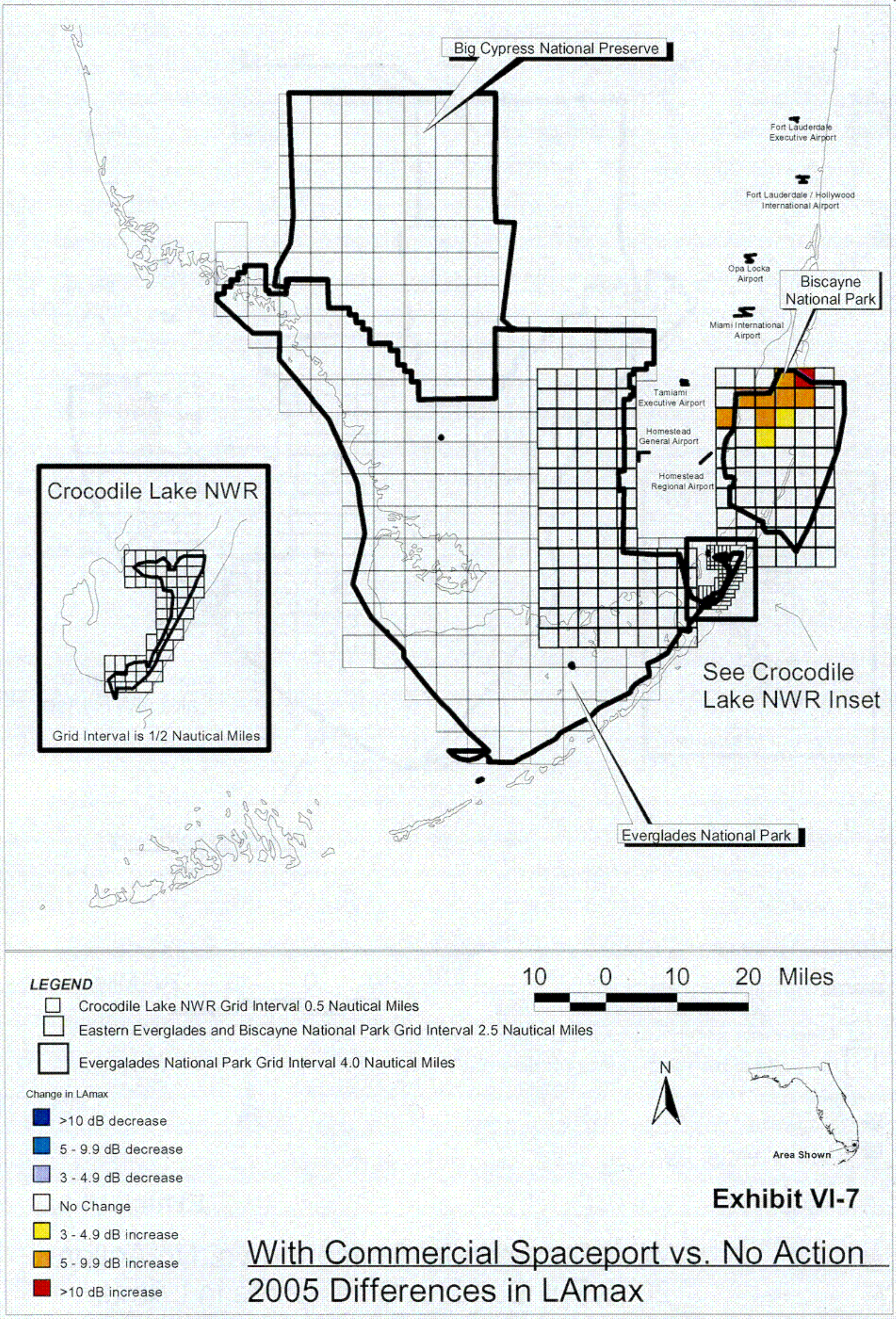


Exhibit VI-7

With Commercial Spaceport vs. No Action
2005 Differences in LAmax

C-22

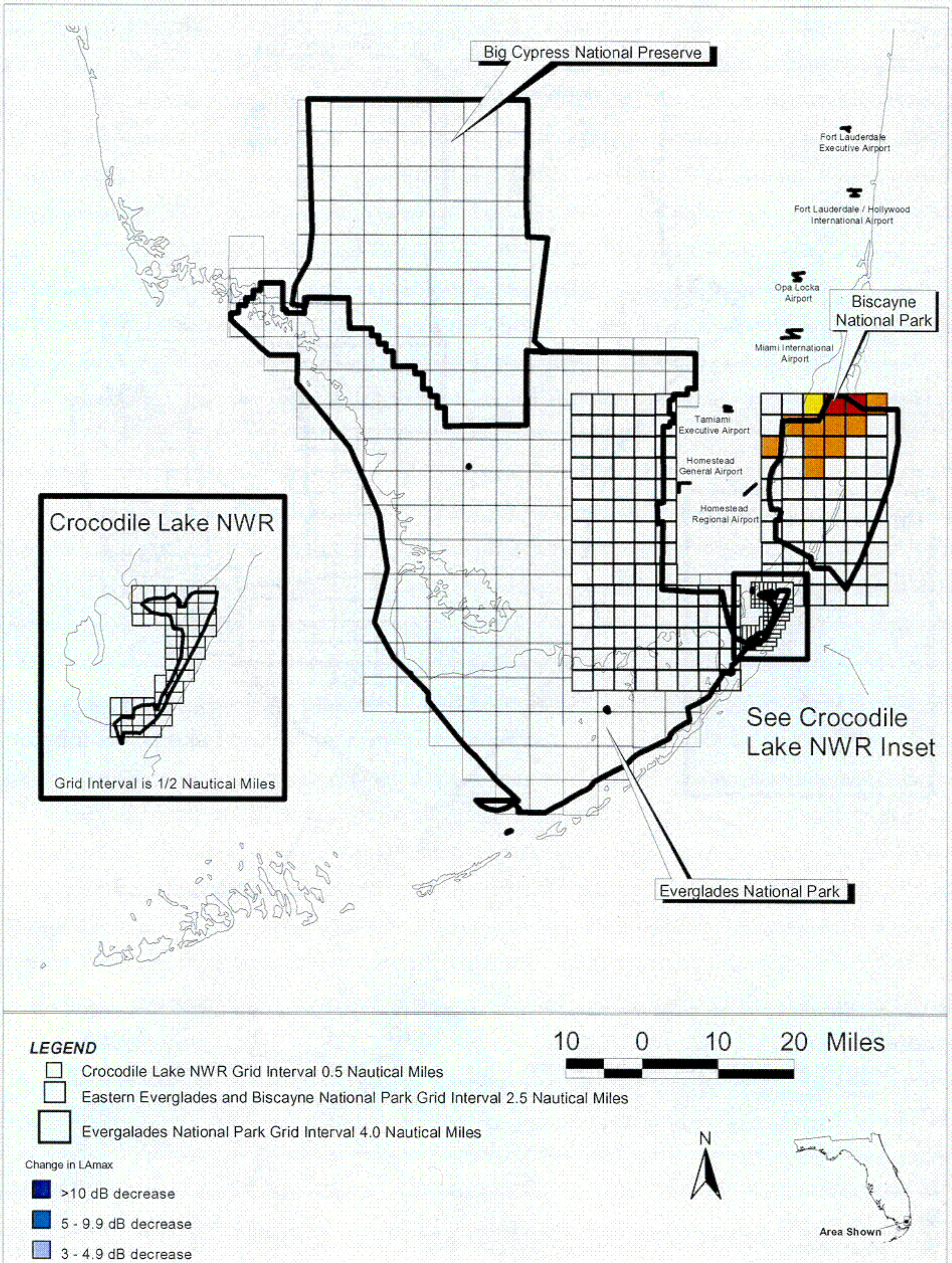


Exhibit VI-8

With Commercial Spaceport vs. No Action
2015/Full Buildout Differences in LAmax

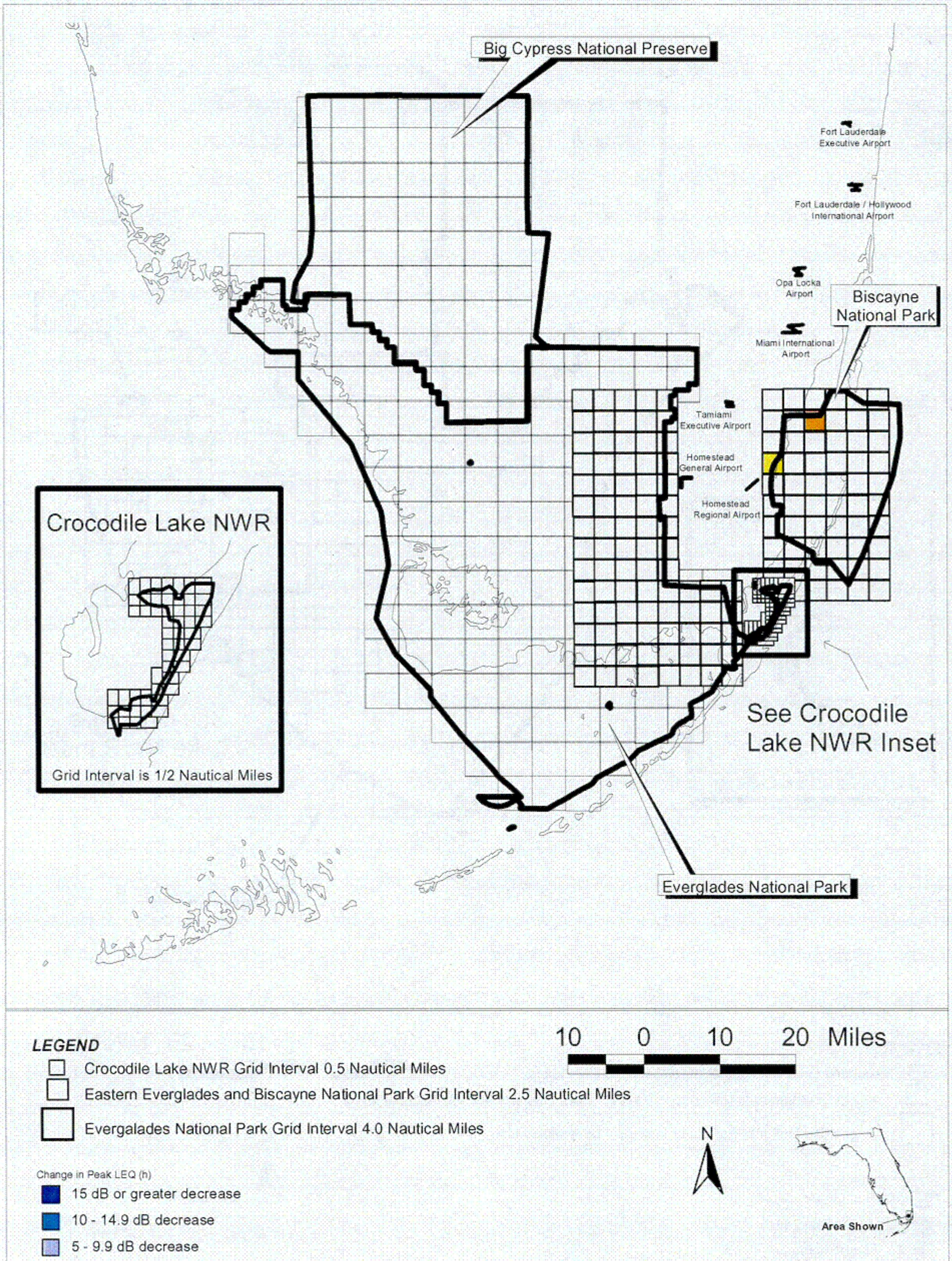


Exhibit VI-9

With Commercial Spaceport vs. No Action
2005 Differences in Peak LEQ (h)

C-24

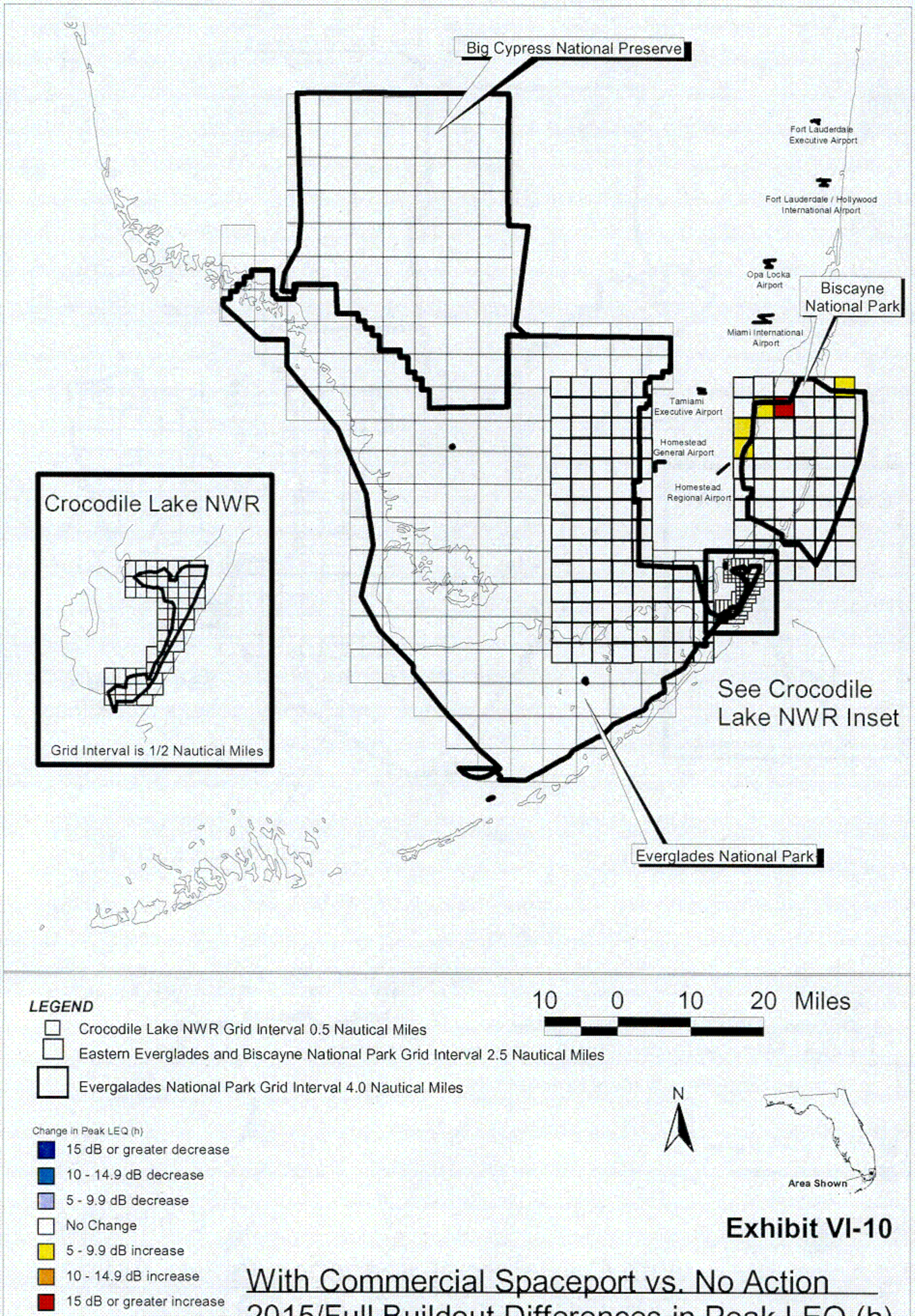
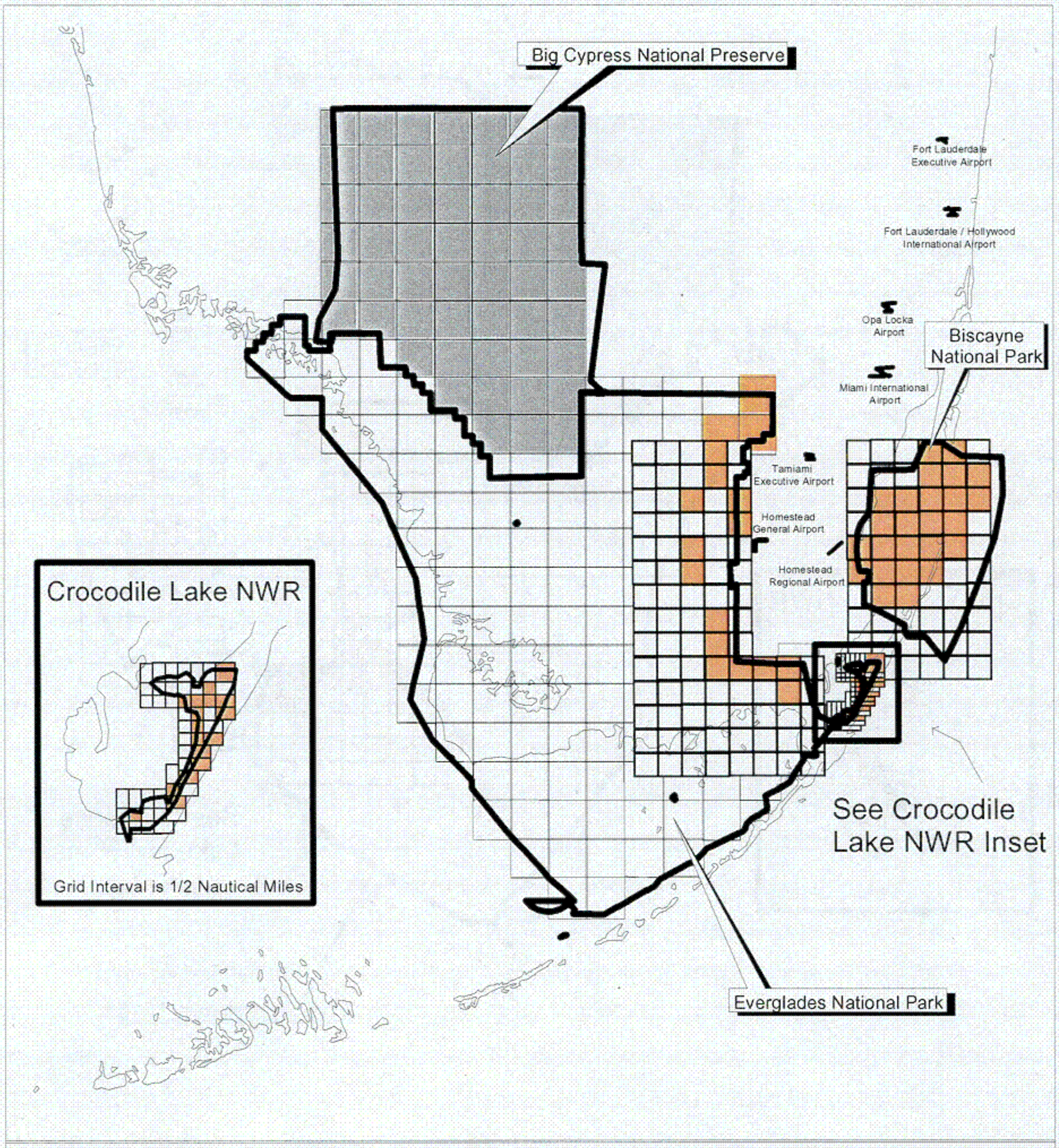


Exhibit VI-10

With Commercial Spaceport vs. No Action
2015/Full Buildout Differences in Peak LEQ (h)



LEGEND

- Crocodile Lake NWR Grid Interval 0.5 Nautical Miles
- Eastern Everglades and Biscayne National Park Grid Interval 2.5 Nautical Miles
- Evergalades National Park Grid Interval 4.0 Nautical Miles

10 0 10 20 Miles

N

Change in $TA_{(amb)}$ Level*

- > 10 minutes less
- 3.0 - 9.9 minutes less
- 0.1 - 2.9 minutes less
- No Change
- 0.1 - 2.9 minutes more
- 3.0 - 9.9 minutes more
- > 10 minutes more
- No Data

Exhibit VI-11

With Commercial Spacport vs. No Action

2005 Differences in $TA_{(amb)}$*

* Traditional Ambient (Excluding Aircraft Noise) is used to define ambient levels.

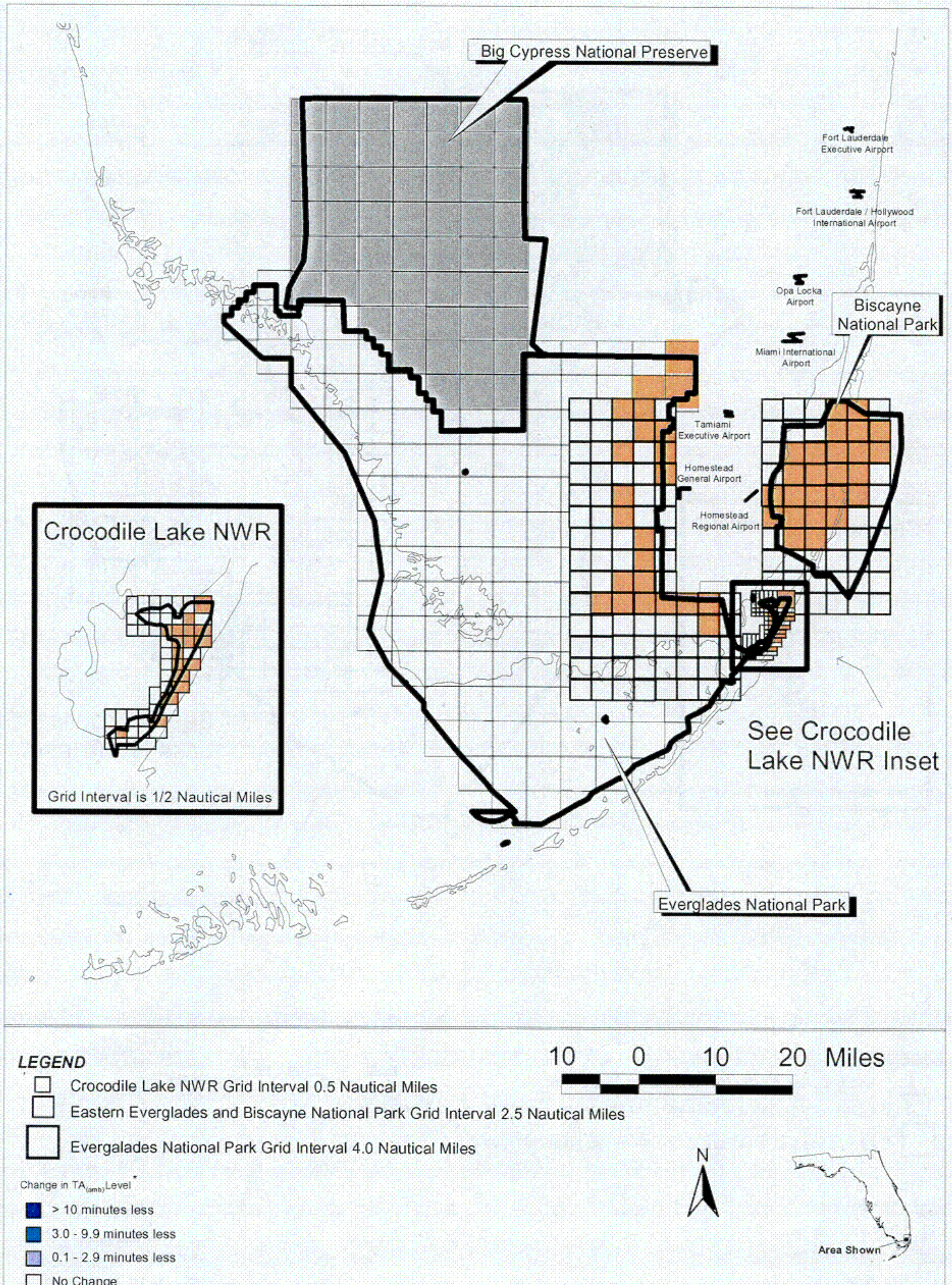


Exhibit VI-12

With Commercial Spaceport vs. No Action
2015/Full Buildout Differences in TA (amb)*

* Traditional Ambient (Excluding Aircraft Noise) is used to define ambient levels.

the same for all three time periods, with a relatively broad area in Biscayne NP receiving small amounts of increases of less than 3 minutes on a daily average. Locations in Crocodile Lakes NWR would also receive small increases in time exposure; these would be less than experienced in Biscayne NP. The pattern also reflects expected increases in exposure times across the eastern portion of Everglades NP. Three grid cells on the eastern edge of Everglades NP southwest of the extended runway centerline of Homestead would receive an additional daily exposure of less than three minutes of noise above the traditional ambient level in the later years. The introduction of the Astroliner system after 2005 would result in powered approaches made from the southwest and consequently, an increase in the time that area would be exposed to noise above traditional ambient levels.

VI.D.4 Special Assessments of No Action and Commercial Spaceport Alternatives in National Properties

Site specific noise data was computed for each of the twelve locations evaluated in Chapter IV. Detailed information was gathered for all twelve sites for the commercial spaceport alternative, but only at Sites MI and ML did the noise data calculated for the special assessments have more than a 0.1 decibel effect on the total noise energy at the site. Also, only at these two sites was an aircraft in the commercial spaceport fleet included among the five primary aircraft contributors to the noise environment at the site. The two sites at which the alternative would have an effect are discussed below.

VI.D.4.a Site MI - Elliot Key

Table VI-9 presents the detailed noise level data for the Elliot Key site. A comparison of No Action conditions with the commercial spaceport alternative for the year 2015 and at full buildout indicates that the ASC (Concorde) would become one of the principal five aircraft contributors to the noise environment. Even so, the ASC would have less effect on the site than the B-747-400s in international service from Miami International Airport and the military F-15 forecast to remain in operation at Homestead. While the ASC would become one of the primary aircraft contributors to the noise energy level at the site, it would be located more than twice as far from the site as any of the other principal aircraft contributors (at nearly ten miles). Even at that distance, the SEL for a single ASC takeoff is forecast to be ten decibels louder than the other most influential aircraft at the location.

VI.D.4.b Site ML - Soldier Key

The detailed noise and operating data associated with the commercial spaceport alternative is compared to the No Action data at Soldier Key in **Table VI-10**. This location is, under No Action conditions, affected principally by aircraft using Miami International. The introduction of the ASC in 2005 would immediately change the primary aircraft contributor to the noise levels at the location, and would by itself, increase the annual total Leq at the site by almost a decibel. By 2015, the full utilization of the spaceport would result in the ASC raising the average noise level by more than two decibels by its presence, even though its number of average day operations would be quite low (less than one). The SEL for the aircraft is projected to be more than 86 decibels, several decibels higher than the next loudest of the five principal aircraft at the site. In fact after 2015, the ASC is ten decibels louder than the next loudest of the five aircraft. The ASC would also be about twice as far from the site as the other four aircraft. At this location, the ASC would produce substantively higher noise levels than would be present in the No Action conditions.

VI.D.5. Assessment of No Action and Commercial Spaceport Alternatives at Community Location Points

The effects of the Spaceport Alternative, relative to the No Action Alternative, are provided in **Table VI-11** for noise-sensitive location indicated in Exhibit IV-6C. The addition of commercial spaceport activity

Table VI-9
Detailed Grid Point Assessment - Commercial Spaceport Alternative
Homestead Regional Airport
Point: MI - Elliot Key

Traditional Ambient Noise Level = 48.6 dB

Aircraft	Type of Operation	Airport	Runway	Track	Slant Range	Altitude	Daily LEQ and SEL for One Operation
2005 No Action							Leq = 30.3
74720B	D	MIA	9L	9LJM	10605	10580	75.9
F15A	A	HST	23	SA2X	3214	2475	83.8
74720B	D	MIA	12	12JM	13952	9713	72.0
74720B	D	MIA	9L	9LJM	22279	9666	66.3
F16PW0	A	HST	23	SA2X	4716	4243	72.5
2005 Commercial Spaceport Alternative							Leq = 30.3
74720B	D	MIA	9L	9LJM	10605	10580	75.9
F15A	A	HST	23	SA2X	3214	2475	83.8
74720B	D	MIA	12	12JM	13952	9713	72.0
74720B	D	MIA	9L	9LJM	22279	9666	66.3
F16PW0	A	HST	23	SA2X	4716	4243	72.5
2015 No Action							Leq = 30.3
747400	D	MIA	9L	9LJM	11614	11578	73.1
747400	D	MIA	12	12JM	14579	10581	70.6
747400	D	MIA	9L	9LJM	22672	10528	66.6
F15A	A	HST	23	SA2X	3214	2475	83.8
F16PW0	A	HST	23	SA2X	4716	4243	72.5
2015/Full Buildout Commercial Spaceport Alternative							Leq = 30.3
747400	D	MIA	9L	9LJM	11614	11578	73.1
747400	D	MIA	12	12JM	14579	10581	70.6
747400	D	MIA	9L	9LJM	22672	10528	66.6
F15A	A	HST	23	SA2X	3214	2475	83.8
CONCRD	D	HST	05	SPCD	49953	2613	70.7

Table VI-10
Detailed Grid Point Assessment - Commercial Spaceport Alternative
Homestead Regional Airport
Point: ML - Solidier Key

Traditional Ambient Noise Level = 56.2 dB

Aircraft	Type of Operation	Airport	Runway	Track	Slant Range	Altitude	Daily LEQ and SEL for One Operation
2005 No Action							Leq = 37.1
74720B	D	MIA	12	12JM	7483	6252	79.7
74720B	D	MIA	9L	9LJM	10836	6411	75.2
727EM2	D	MIA	12	12JM	9064	8075	77.1
74720B	D	MIA	9L	9LJM	10414	6883	76.0
74720B	D	MIA	12	12JM	10937	5581	74.7
2005 Commercial Spaceport Alternative							Leq = 37.9
CONCRD	D	HST	05	SPCD	20423	6002	86.3
74720B	D	MIA	12	12JM	7483	6252	79.7
74720B	D	MIA	9L	9LJM	10836	6411	75.2
727EM2	D	MIA	12	12JM	9064	8075	77.1
74720B	D	MIA	9L	9LJM	10414	6883	76.0
2015 No Action							Leq = 34.7
747400	D	MIA	12	12JM	7844	6672	76.8
747400	D	MIA	9L	9LJM	11107	6851	73.2
747400	D	MIA	9L	9LJM	10756	7382	73.8
747400	D	MIA	12	12JM	11115	5917	72.6
767JT9	D	MIA	12	12JM	12928	12663	68.7
2015/Full Buildout Commercial Spaceport Alternative							Leq = 37.1
CONCRD	D	HST	05	SPCD	20423	6002	86.3
747400	D	MIA	12	12JM	7844	6672	76.8
747400	D	MIA	9L	9LJM	11107	6851	73.2
747400	D	MIA	9L	9LJM	10756	7382	73.8
747400	D	MIA	12	12JM	11115	5917	72.6

Table VI-11
Homestead Regional Airport SEIS - Grid Point Assessment
Community Grid Points and Noise Data
DNL, LAmax and Time Above Threshold Levels for No Action and Commercial Spaceport Cases
(DNL and LAmax in decibels, Time Above in minutes)

Community Site	Site Name	Proximate Grid Point	2005 No Action	2005 Proposed Spaceport	2005 Project Change	2015 No Action	2015 Proposed Spaceport	2015 Project Change	Maximum One-Runway Use No Action	Maximum One-Runway Use Proposed Spaceport	Maximum One-Runway Use Project Change
DNL											
BBP	Bill Baggs Cape Florida State Park	D131	45	47	2	42	48	6	42	48	6
ORX	Ocean Reef	D90,C1213	35	35	0	35	35	0	35	35	0
ACX	Angler's Club	D90,C1214	35	35	0	35	35	0	35	35	0
RFP	Redland Fruit and Spice Park	B125	38	38	0	37	37	0	37	37	0
HCC	Homestead Community College	F58,F75	39	40	1	39	40	1	39	40	1
KGX	Keys Gate	F71	43	43	0	43	43	0	43	43	0
FCH	Florida City City Hall	F38	39	39	0	39	39	0	39	39	0
CKL	City of Key Largo	B115,B134	22	22	0	23	23	0	23	23	0
NHA	Nursing Home	NHA	44	44	0	44	44	0	44	44	0
MH1	South Dade Center	F177,F178	70	71	1	70	71	1	70	71	1
NJA	Naranja Housing Area	F217	45	46	1	45	47	2	45	47	2
HTA	Homeless Trust Housing	F215	54	55	1	54	56	2	54	56	2
HSH	Homestead High School	F90	43	43	0	43	43	0	43	43	0
JPP	John Pennekamp Coral Reef State Park	D100	37	37	0	37	37	0	37	37	0
FK1	Fl. Keys National Marine Sanct. 1	A233	3	4	1	8	8	0	8	8	0
FK2	Fl. Keys National Marine Sanct. 2	D135	22	22	0	25	25	0	25	25	0
LAmax											
BBP	Bill Baggs Cape Florida State Park	D131	73	86	13	70	86	16	70	86	16
ORX	Ocean Reef	D90,C1213	77	77	0	77	77	0	77	77	0
ACX	Angler's Club	D90,C1214	77	77	0	77	77	0	77	77	0
RFP	Redland Fruit and Spice Park	B125	74	74	0	74	74	0	74	74	0
HCC	Homestead Community College	F58,F75	71	71	0	71	71	0	71	71	0
KGX	Keys Gate	F71	97	97	0	97	97	0	97	97	0
FCH	Florida City City Hall	F38	72	72	0	72	72	0	72	72	0
CKL	City of Key Largo	B115,B134	69	69	0	69	69	0	69	69	0
NHA	Nursing Home	NHA	83	83	0	83	83	0	83	83	0
MH1	South Dade Center	F177,F178	107	107	0	107	107	0	107	107	0
NJA	Naranja Housing Area	F217	78	82	4	78	82	4	78	82	4
HTA	Homeless Trust Housing	F215	83	89	6	83	89	6	83	89	6
HSH	Homestead High School	F90	80	80	0	80	80	0	80	80	0
JPP	John Pennekamp Coral Reef State Park	D100	79	79	0	79	79	0	79	79	0
FK1	Fl. Keys National Marine Sanct. 1	A233	30	30	0	30	30	0	30	30	0
FK2	Fl. Keys National Marine Sanct. 2	D135	72	72	0	72	72	0	72	72	0
Minutes Above											
BBP	55 Bill Baggs Cape Florida State Park	D131	13	14	1	7	8	1	7	8	1
ORX	65 Ocean Reef	D90,C1213	<1	<1	0	<1	<1	0	<1	<1	0
ACX	65 Angler's Club	D90,C1214	<1	<1	0	<1	<1	0	<1	<1	0
RFP	65 Redland Fruit and Spice Park	B125	<1	<1	0	<1	<1	0	<1	<1	0
HCC	65 Homestead Community College	F58,F75	1	1	0	1	1	0	1	1	0
KGX	65 Keys Gate	F71	2	2	0	2	2	0	2	2	0
FCH	65 Florida City City Hall	F38	1	1	0	1	1	0	1	1	0
CKL	65 City of Key Largo	B115,B134	0	0	0	0	0	0	0	0	0
NHA	65 Nursing Home	F107	2	2	0	2	2	0	2	2	0
MH1	65 South Dade Center	F177,F178	86	88	2	86	90	4	86	90	4
NJA	65 Naranja Housing Area	F217	5	5	0	5	6	1	5	6	1
HTA	65 Homeless Trust Housing	F215	16	16	0	16	17	1	16	17	1
HSH	65 Homestead High School	F90	2	2	0	2	2	0	2	2	0
JPP	50 John Pennekamp Coral Reef State Park	D100									
FK1	46 Fl. Keys National Marine Sanct. 1	A233	Time Above may be estimated from adjacent site data.								
FK2	52 Fl. Keys National Marine Sanct. 2	D135									

to the No Action condition would result in incremental noise changes in areas in close proximity to the runway and under the flight path northeast of the airport. The data indicate that three housing areas (Sites MH1, NJA and HTA), Homestead Community College (Site HCC) and Bill Baggs Cape Florida State Park (Site BBP) will experience increases in DNL with a spaceport in place. Bill Baggs Park is projected to experience an increase of six DNL with full spaceport development, while the other four sites will experience increases of 1 or 2 decibels. Only at the migrant housing area (MH1) will the levels exceed the thresholds of significance or compatibility purposes.

Three locations are projected to experience louder LAmax levels with the spaceport in place than under No Action conditions. These are Bill Baggs Park, as well as the Naranja and Homeless Trust housing areas. Time Above 65 decibels (55 in Bill Baggs Park) is expected to be little changed from No Action conditions. Only at the migrant housing site (MH1) is the time above the ambient level expected to increase by more than one minute per day, and there by only four minutes under the full buildout of the spaceport.

VI.D.5. Assessment of No Action and Commercial Spaceport Alternatives at Community and Other Park Location Points

The effects of the Spaceport Alternative, relative to the No Action condition, are provided in **Table VI-11** for community and park locations indicated in Exhibit IV-6C. Among the locations evaluated, the commercial spaceport would generally not affect the noise levels for cumulative, single-event, or time above metrics at sites located south, southeast and west of the airport. No change from No Action conditions would be expected at Ocean Reef, Angler's Club, Redland Fruit and Spice Park, Keys Gate, City Hall at Florida City, City of Key Largo, Nursing Home, Homestead High School, John Pennekamp Coral Reef State Park, or Florida Keys National Marine Sanctuary.

At Homestead Community College, the DNL is projected to increase by 1 dB (from 39 to 40 decibels) as a result of the commercial spaceport. This DNL increase would not be noticeable. LAmax and Time Above 65 decibel levels at the site would be unchanged from No Action conditions.

At South Dade Center (Site MH1), the DNL is projected to increase by 1 decibel over No Action conditions (from DNL 70 to 71 dB) as an additional 2 to 4 minutes per day are calculated to be added to the time of exposure above 65 decibels. This DNL increase is not considered to be a significant increase under FAA environmental guidelines. The LAmax level at the site is projected to remain unchanged.

At the two housing areas immediately north of the airfield (Naranja and Homeless Trust), the DNL is projected to increase by 1 decibel in 2005 and by 2 decibels in full buildout of the spaceport -- from 45 to 46 and 47, and from 54 to 55 and 56 decibels, respectively. These levels of DNL increases are considered small. At each site, the Time Above 65 is projected to increase by one minute over No Action levels with the full buildout of the commercial spaceport. The LAmax would increase from 78 to 82 decibels at the Naranja site and from 83 to 89 decibels at the Homeless Trust Housing site.

At community locations closest to Homestead, particularly the South Dade Center, the Naranja housing area, and the Homeless Trust Housing, the unusual nature of the operation of the commercial space launch vehicle and its noise characteristics may cause it to be noticed more than conventional aircraft, even though overall noise distinctions between the No Action condition and Commercial Spaceport alternative are relatively small.

Bill Baggs Park (Site BBP), located under the departure path for all commercial spaceport launches, would experience the most noticeable changes in noise exposure from the spaceport. The LAmax level at the site would increase from 73 to 86 decibels in the early years of the operation, and from 70 to 86 decibels at full buildout (the No Action level is estimated to decrease in the future because louder aircraft included in the No Action condition are forecast to be phased out of service at Miami International Airport). The spaceport activity would also contribute to an increase of the site's DNL from 45 to 47 decibels (a change of 2 decibels) in the short term and from 42 to 48 decibels (an increase of 6 decibels) at full buildout. These amounts of DNL increase are not considered sizeable at the levels at which they occur. The total time of exposure above the traditional ambient level of 55 decibels at the site is expected to increase by one minute for the average day for each year analyzed for the commercial spaceport.

Chapter VII
Qualitative Assessment of Noise Exposure Characteristics for Operations from a Two-Runway Airport Configuration

If a commercial service airport at Homestead successfully captures niche markets and achieves forecast levels of operations, at some point the airport could reach its operating capacity. The operating capacity of the single runway at Homestead approximates 238,000 annual aircraft operations. If and when growth approaches that level, a proposal by Dade County to build a second runway to better accommodate the traffic demand and to more efficiently handle operations would be anticipated. In fact, the Airport Layout Plan for Homestead developed by Dade County includes, for future facility planning purposes, a second runway, 9,000 feet long and located parallel to and 3,500 feet southeast of the present runway. The FAA requested the SEIS consultant to do an independent review of the potential second runway planning outlook and timeframe. Specific information relating to the potential usage and configuration of a second runway is provided in the Technical Report on Airport Planning Data.

A new Federal EIS would be required before any second runway could be approved or constructed, in addition to any State of Florida requirements. Given the capacity of the existing single runway at Homestead, there is no foreseeable need for a second runway for capacity reasons until well beyond 2015. If the construction of such a runway were approved and operations began near the time the existing runway is forecast to reach 100% capacity, the timeframe of second runway initial operation would be around the year 2038. Assuming the addition of a second runway, the timeframe in which a two-runway system at Homestead might reach capacity is estimated to be 2057 or later.

The ability to analyze a runway so far into the future beyond a reasonably foreseeable timeframe is highly speculative, particularly in an area of high technology like the aviation industry. Aircraft types, and the technological advancements that are certain to occur in the operation and control of aircraft, are not currently defined for conditions that may be some forty years in the future (year 2038) to almost 60 years in the future (year 2057). If one considers changes in aviation that have occurred during the last sixty years, the uncertainty of the degree of change that may occur in the technologically active future years is put into perspective.

- 1939 - 1st test flight of jet aircraft in Germany
- 1949 – Post-war growth of scheduled service using large propeller aircraft
- 1959 - 1st round the world jet passenger service by Pan Am Boeing 707
- 1969 - 1st flight of the 747 and Concorde; Apollo 11 lands on the moon
- 1979 - Airlines are deregulated; Space Shuttle in development; formal noise abatement planning begins
- 1989 - The phase-out of Stage 1 jets weighing more than 75,000 pounds is complete and the phase out of Stage 2 aircraft begins.
- 1999 - The phase-out of Stage 2 jets weighing more than 75,000 pounds scheduled for completion, leaving an all Stage 3 fleet of large jet aircraft

The future development of aviation is expected to see as many radical changes as the last sixty years, making any detailed quantitative noise analysis highly speculative and unreliable. Detailed noise modeling cannot achieve the reasonable level of accuracy that can be projected for the next ten to fifteen years. This section of the technical memorandum attempts to provide a qualitative review of the possible noise implications of the addition of a second parallel runway.

I.A. Airport Facility Assumptions

A potential second parallel runway is assumed to be as indicated on Dade County's Airport Layout Plan (ALP). Its location would be 3,500 feet southeast and directly parallel to the present runway, constructed at a length of 9,000 feet and width of 200 feet. Its position is not staggered from the existing runway. Figure 2.2-4 of Section 2.0 "Alternatives Including the Proposed Actions" (October 30, 1998) provides the ALP for the facility showing the parallel runway.

I.B. Fleet Assumptions

Because the date of the potential construction of a parallel runway is forecast to be more than 30 years into the future, any projected mix of specific aircraft types is a matter of conjecture. Aircraft in commercial service usually have an estimated useful life of 25 to 30 years. Although a few aircraft may survive beyond that life, any aircraft now in service would not normally be expected to be in operation more than 30 years into the future. Therefore, only those aircraft types that are presently in production, or in development, are expected to still be in operation in that timeframe.

Technological advances are anticipated to substantially reduce the amount of source noise produced by commercial aircraft in the future. The FAA and the National Aeronautical and Space Administration (NASA) began co-sponsorship of a research program in the early 1990's to develop technologies for substantial aircraft source noise reduction beyond Stage 3. The research included new engine technology with sound absorbent construction, the development of noise-cancellation technology (anti-noise), and aerodynamic structure and design to reduce airframe noise. Based on the progress in this program, the FAA plans to amend aircraft noise standards and regulations in the first decade of the 2000's.

It is also not reasonably foreseeable to project the type or extent of change in military mission and aircraft operational characteristics in far future years.

The potential for future change in the type and design of aircraft is broad ranging. Nevertheless, certain assumptions as to the character and associated noise levels of the future operating fleet have been made in this technical memorandum to allow the evaluation of an "order of magnitude" approximation of the potential noise impacts of adding a second parallel runway at Homestead. The same aircraft fleet used to assess a potential maximum one-runway operational condition (i.e., the "quietest" representatives of the Stage 3 fleet), coupled with assumptions of runway use discussed in the following paragraphs, provides a broad indication of how a second runway may affect the noise environment in the vicinity of the airport.

I.C. Runway Operational Assumptions

The noise pattern in the immediate airport vicinity resulting from the presence of a second parallel runway would vary based on the utilization of that runway.

I.C.1. Predicted Usage Immediately After Construction

If and when a proposed second runway is first constructed, it would probably be used principally to reduce congestion on the existing runway. Airports are usually operated so that aircraft departures occur on the inboard runway(s) closest to the terminal and aircraft arrivals occur on the outboard runway(s). With the terminal complex north of the existing runway at Homestead, this operational scheme would be expected, applying today's general operating mode. Military aircraft conducting overhead approaches and general aviation touch-and-go training would be more likely to be conducted on the new parallel runway, because the patterns associated with these activities would be south of the airport to avoid aircraft using the existing runway. Approach paths for itinerant operations on a new runway would likely extend straight in to the threshold from positions at least three miles from touchdown.

I.C.2. Alternative More Mature Usage of Two Parallel Runways

If the airport and its level of operations continues to grow and if a new terminal area is developed between the runways (as shown for future planning purposes on the ALP), it is likely that the operational use pattern of the airport would shift. Airports with mid-field terminal complexes between runways typically operate with mixed operations on both runways. This means that both arrivals and departures by passenger aircraft would likely occur on each runway, with the runway selected being related to the side of the terminal on which the user has its gates. Activity by general aviation, maintenance, military and cargo operators (except local military and general aviation operations) would likely remain focused on use of the existing runway since those ground-related facilities would be developed on the north side of the runway pair. One may logically assume that if half of the passenger aircraft operators use gates on the south side of the mid-field terminal, they would by consequence use the south (new) runway. All other aircraft operators could be expected to use the existing runway for itinerant operations, but all local operations (touch-and-go training and overhead approaches) would probably be conducted on the south (new) runway to avoid conflicts with operations on the north runway.

Flight paths for approaches to the new runway would likely remain along the runway centerline for itinerant traffic, but a divergent departure course occasionally would be required when simultaneous takeoffs were conducted from both runways. It is likely that the divergent departure course would be along a heading or electronic course 15 degrees to the south of the extended centerline of the new runway. This divergence meets current FAA standards for traffic separation. It is required only when departures are made at the same time from both runways. At all other times, an initial straight-out departure course could be maintained until intercepting enroute turns to fixes. Once the initial departure course is established, it is anticipated that the traffic departing from both runways would blend into the departure stream leading to the enroute fixes established for the airport.

I.C.3. Maximum Usage of Two Parallel Runways

If and when a two-runway airport would reach its operating capacity of about 370,000 annual aircraft operations (possibly around the year 2057), it is likely that both runways would continue to be used by both landings and takeoffs by passenger aircraft. However, the usage of the runways would likely be flexible, with peak period arrivals using both runways while departures would use only one runway, and peak period departures using both runways while arrivals use only one runway. Cross-field taxiways would be required to facilitate movement to and from the runway ends. It is likely that the divergent departure courses from the new runway frequently would be used for most departures from that runway during peak departure periods.

It is likely that training activity by military operators would remain on the south (new) parallel runway. Training activity by general aviation operators would be likely to move to other airports, owing to the high level of itinerant traffic that would be expected to be present. As is projected for the one-runway airport condition, it is likely that as the capacity of a two-runway system would be approached, the mix of aircraft operations would shift to a greater extent from small general aviation and commuter aircraft to commercial jet activity. Maintenance, jet general aviation, and cargo operations would likely remain on the north runway unless the airport were expanded to accommodate additional landside development in those activities.

I.D. Airspace Assumptions

As difficult as it is to predict aircraft noise characteristics and airport operations far into the future, it is even more difficult to predict future air traffic control parameters that would enable reasonable assumptions to be made about the location of aircraft along flight paths in far future years. Technology is truly advancing at a rapid pace in this arena. In 1996, the FAA began to develop a National Airspace System modernization plan to define what the aviation system of the future would look like. The primary navigation system coming on line in the 21st century will be a Global Navigation Satellite System to replace the current ground-based navigation system. This system will be implemented in phases. It will provide a quality of aircraft positioning information never before available to the aviation community and will permit greater precision in directing aircraft operations than currently is available. With greater precision comes the ability to decrease separations of aircraft from each other and still assure safety of operations.

Technological advances create the need to redesign the airspace to meet evolving needs. A concept called "free flight" has been established as the key direction for evolution of the National Airspace System. Free flight is designed ultimately to permit aircraft operators to select their own routes as alternatives to published IFR routes. Advanced automation tools, in conjunction with satellite-based navigation, will permit pilots to fly the most direct routes between takeoff and landing instead of having to fly routes structured around ground-based navigation systems. These future changes in airspace configuration, architecture, and structure will have effects on the air traffic control system, the user community, and the environment. The future system of free flight, although now conceptual in nature, portends substantial changes to the current system. The uncertainties inherent in new technologies make quantitative predictions far into the future unreliable.

I.E. Future Noise Patterns for A Two-Runway Airport

Given the speculative nature of the fleet mix, airport geometry and operations, and future airspace parameters, the noise effects associated with the potential future development of a second parallel runway at Homestead can only be qualitatively estimated in general terms.

In the early years of a second runway, the primary assumptions are that the aircraft fleet mix and total numbers of aircraft would be about the same as for the maximum one-runway condition, and the existing runway would be predominantly used for aircraft departures (primarily in an east flow) while the second southerly runway would be predominantly used for aircraft arrivals (also primarily in an east flow).

The noise exposure (DNL) contours as shown in Chapter III, Exhibit III-6, for the Proposed Action/No Action in a maximum one-runway condition are a good reference point. Since departures toward the northeast would be expected to remain predominantly on the existing runway, the noise contours northeast of the airport that are governed by aircraft departures would be about the same as with the Proposed Action one-runway configuration for that timeframe, as shown in Exhibit III-6. Southwest of the airport, with few arrivals expected on the existing runway, the contours would more closely resemble the No Action Conditions in Exhibit III-6 on the southwest end of the existing runway. Long, thin arrival spikes in the noise contours associated with placing all final approaches on the second runway would be expected to extend to the southwest from that runway. The width of the noise contours near the airport would be slightly wider with a second runway than is presented by the one-runway Proposed Action condition.

If the airport continues to grow, if departures and arrivals are assumed to be distributed relatively evenly on two runways, and if a mid-field terminal is developed, the noise contours could be expected to widen along their full length by approximately 3,500 feet (i.e., the separation distance between the runways) along the southeastern edge of the airport parallel to the new runway. The length of the contours to the northeast may increase beyond the maximum use one-runway Proposed Action contours, owing to a higher service level. (The degree to which aircraft source noise is reduced as time extends farther into the future would be a governing factor relative to potential contour extension.) Under the approaches to both runways, parallel spikes of arrival noise would be present to the southwest of the airport. Each arrival spike would be expected to be shorter, but broader than the single arrival spike off the southwest end of the second runway in earlier years because of the more equal distribution of arrival traffic on both runways.

The maximum operation of a two-runway system at its capacity could produce noise contours that would roughly duplicate over two runways the single set of concentric contours shown in Exhibit III-6 for the Proposed Action. (Although, since the level of operations for a two-runway configuration at its capacity is less than double the maximum use one runway operational level, simply duplicating a one-runway noise contour pattern is an overestimation for two runways.) A higher proportion of commercial passenger and cargo aircraft, and a lower number of smaller general aviation aircraft, in the mix would serve to increase contour size and extend it outward northeast and southwest of the airport off the ends of both runways. However, reductions in aircraft source noise in the far future years would counterbalance increased numbers of aircraft by an unknown amount.

Beyond the immediate airport environs and over the national properties, few changes would be anticipated in the early years of a second runway. Since the runways are parallel and only 3,500 feet apart, the direction and general location of aircraft departures and arrivals would be the same as with one runway. Aircraft departures would essentially be expected to remain on the existing runway using the same flight tracks. Aircraft arrival noise would shift only very slightly to the southeast near the airport upon final approach. When not in arrival and departure modes close to the airport, aircraft would fly the defined corridors leading to the established enroute fixes. The grid point analysis performed for the Proposed Action maximum one-runway condition is also the best available prediction of noise effects over the national properties for the early years of a second runway. Total numbers of aircraft operations on flight tracks and types of aircraft would be expected to be approximately the same.

As aircraft activity would grow on a two-runway system at Homestead, the assumption is that there would be increased numbers of aircraft over the national properties. Modifications to airspace in the area would be anticipated to handle additional traffic (not only for Homestead, but more importantly for Miami International and other airports), as well as to incorporate technological advances. Aircraft departure noise would assume a somewhat different pattern over Biscayne NP with departures more balanced on two runways and a divergent departure from the southerly runway at times of simultaneous departures. Increases in numbers of aircraft arrivals would be assumed for the eastern portion of Everglades NP that lies directly southwest of the centerlines of the runways. Any noise increases, either in Time Above Ambient or Peak Hour Leq, would be assumed to be related to increased numbers of aircraft operations and/or modifications to flight tracks, rather than louder aircraft. Anticipated reductions in aircraft source noise are assumed to negate any potential increases in LAmax or SEL and to reduce potential increases in Time Above Ambient and Peak Hour Leq—by how much is not currently known.

Unknown is the extent to which dramatic changes in airspace management and use, enabled by new technology, coupled with anticipated reductions in aircraft source noise will render these predicted noise effects over the national properties totally obsolete, as we surpass reasonable ten to twenty year forecast periods.

Chapter VIII
Pre-Realignment Conditions

Prior to its closure, Homestead Air Force Base was the home of a much greater number of military aircraft operations than use the Air Reserve Station under existing conditions. This chapter draws upon the information included in the 1988 AICUZ study's NOISEMAP input files to provide a historical frame of reference for conditions of past years.

In 1988, the United States Air Force prepared an Air Installation Compatible Use Zone assessment of noise conditions surrounding Homestead Air Force Base. The noise contours prepared for that evaluation were developed using the NOISEMAP computer model, based on 1987 operational information. The NOISEMAP model is comparable to the INM in that it uses definitions of aircraft type, numbers of operations during day and night periods, flight locations and performance characteristics to create contours of equal noise exposure. The 1988 noise exposure condition accounted for approximately 222 arrivals and departures and 153 closed-pattern operations daily, compared to existing levels of slightly more than 54 operations per day. At that time, the mix of aircraft was much more complex than at present, and the types of missions flown were more numerous. The flight tracks used by those operations are presented in the *Technical Report on Airport Planning Data*, prepared as a part of the SEIS supplemental material.

The conditions modeled in the 1988 AICUZ study were converted directly from the NOISEMAP input files used by the Air Force to a form acceptable for computation by the INM. While the INM includes all of the military aircraft used in the NOISEMAP model, it does not internally provide for the wide variety of operating modes flown by the military in its mission -- operations that include low and overhead approaches, simulated flame out descents, rapid vertical departures and multiple circling activity. Each of these operation types was extracted from NOISEMAP input files and coded to provide user-based definitions of activity. The numbers of operations assigned to each flight track defined by the NOISEMAP input files were assigned to the INM files. To maintain flight track accountability between the two models, track dispersion was not used for the INM computations of the 1988 data.

One important difference between the NOISEMAP and INM contour process is that the operations information modeled in NOISEMAP assumes a day of active operation and is not distributed across the full 365 days of the year, as is modeled with the INM. For example, numerous military aircraft in the 1987 mix of activity for Homestead Air Force Base were presumed to operate only 250-260 days per year, thus resulting in higher average day activity levels than data assessed over the full 365 day year. Because of this computational difference, the INM contours based on NOISEMAP input files may be as much as 1.5 decibels larger than those which would result from direct computation by NOISEMAP. In contrast, the inclusion of algorithms to account for the difference between noise attenuation over hard and soft surfaces is present in this version of the INM and not in NOISEMAP. The inclusion of hard surfaces (water) causes an increase in noise levels of approximately one to two decibels over that which would be expected over a homogeneous soft (grass) surface, as computed by NOISEMAP. Therefore, the overstatement of the INM by average day operations is balanced in part by the understatement of NOISEMAP for hard surfaces.

VIII.A. Noise Exposure (DNL) Contours - Pre-Realignment

The results developed from NOISEMAP in 1988 included approximately 57.8 square miles within the 65 DNL noise contour. In order to provide a degree of comparability between the 1988 data and the noise levels now present at the facility, as well as those expected to exist if the airport is developed as proposed, the NOISEMAP input data was translated into a form readable by the INM. The resulting contours are presented in **Exhibit VIII-1**. The area within the 65 DNL contour for pre-realignment conditions, as computed by the INM using the modifications for this evaluation previously discussed, is 69.6 square miles. The difference between the NOISEMAP- and INM-computed areas is a function of both the different assumptions as to what represents an average day of operation and the enhancements to the INM that provide for consideration of the character of the surface over which aircraft fly. The main body of the INM contour and the NOISEMAP contour correlate to an acceptable degree. The difference between the two conditions is principally in the inclusion of long spikes in the 65 DNL contour along the closed overhead patterns south of the airport. These are present in the INM-computed contour and absent in the NOISEMAP-computed contour for the same data because the two models consider the thrust levels (and consequent noise levels produced) along departure and approach segments differently. The INM uses a gradual change of thrust along a segment, while the NOISEMAP considers thrust to change at the end points of segments. In either case, the differences occur principally over uninhabited areas. **Table VIII-1** provides the acreage and estimated housing and population counts within the noise contours as computed by the INM. The population and housing data is based on current housing distributions that differ significantly from the distributions in the area prior to the wide-spread destruction of many residential areas by Hurricane Andrew in 1992.

Table VIII-1
Area of Noise Exposure in Acres, With Current Population and Housing
Pre-Realignment Conditions

Noise Level	Acreage	Population	Dwellings
60-65 DNL	104,928	5,787	1,729
65-70 DNL	23,955	3,720	1,058
70-75 DNL	10,886	2,605	496
75+ DNL	9,696	1,725	323
Total Above 60	149,466	13,837	3,606

Source: Landrum & Brown, 1999.

Noise exposure data for Homestead's pre-realignment condition are not used in this report to define noise impacts associated with the present proposal to redevelop Homestead as a civil airport. The information may assist some SEIS reviewers who are unfamiliar with aircraft noise analyses to understand existing and anticipated future levels of noise within a context of historical noise that has been experienced by them.

VIII.B. Grid Analysis of Aircraft Noise - Pre-Realignment

The amount of noise present at Homestead Air Force Base prior to its closure after Hurricane Andrew exceeded current noise levels. The pre-realignment noise levels for each grid point location are provided in **Table VIII-2**. The presence of large numbers of operations by loud military jet fighter and transport aircraft prior to realignment caused average noise levels for cumulative metrics to be several decibels greater than are currently experienced. The change in the numbers and types of aircraft using the facility after Hurricane Andrew resulted in a reduction in both cumulative and single event noise levels.

It should be noted that Table VIIII-2 does not present a precise comparison of aircraft noise for pre-realignment and existing conditions. The pre-realignment noise metrics do not include aircraft noise from other airports in the area that overfly the national properties; the existing condition noise metrics include aircraft noise from Miami International, Fort Lauderdale-Hollywood International, Kendall-Tamiami, and Homestead General Aviation Airports. Furthermore, where ambient noise levels are applied to grid cells

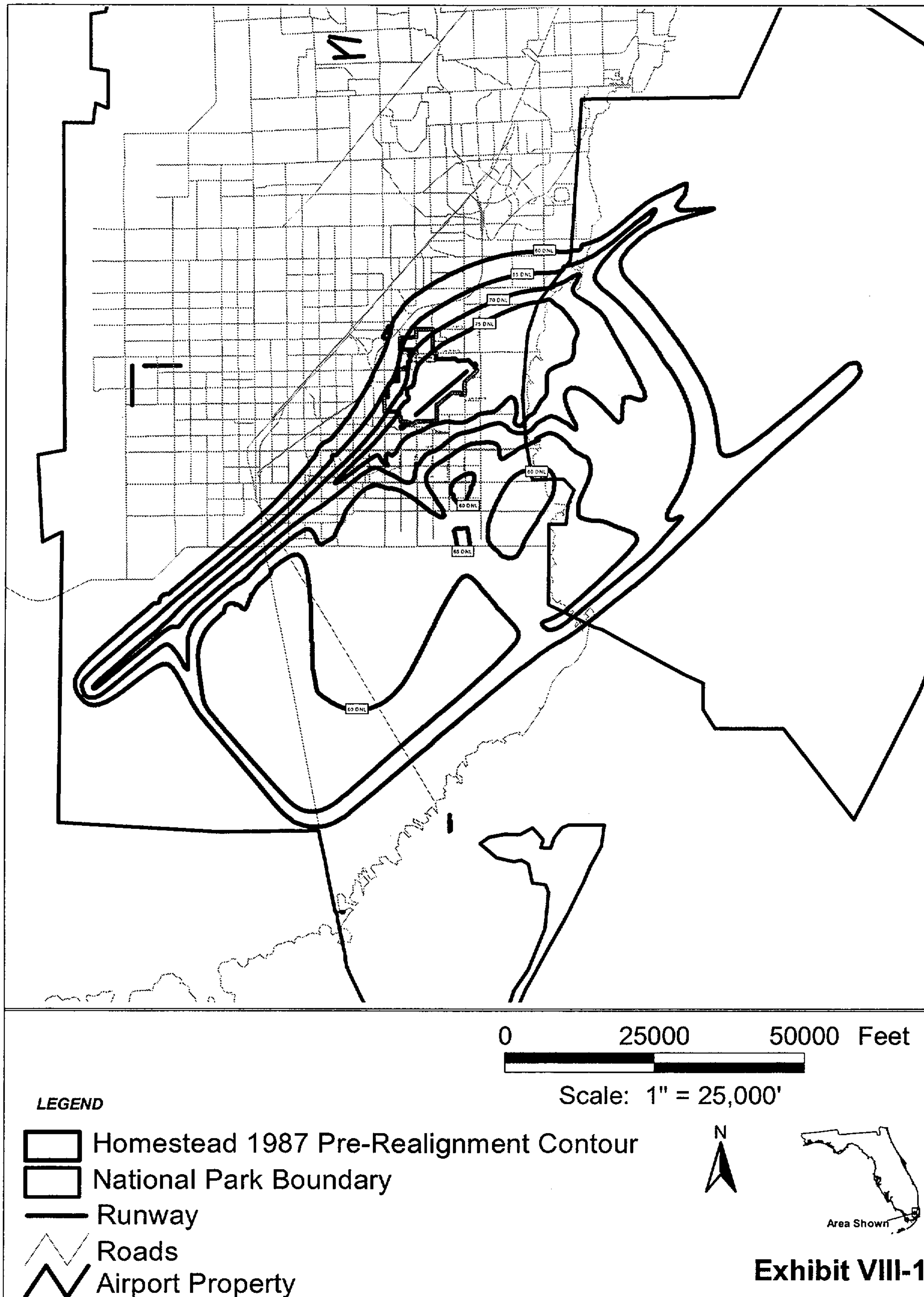


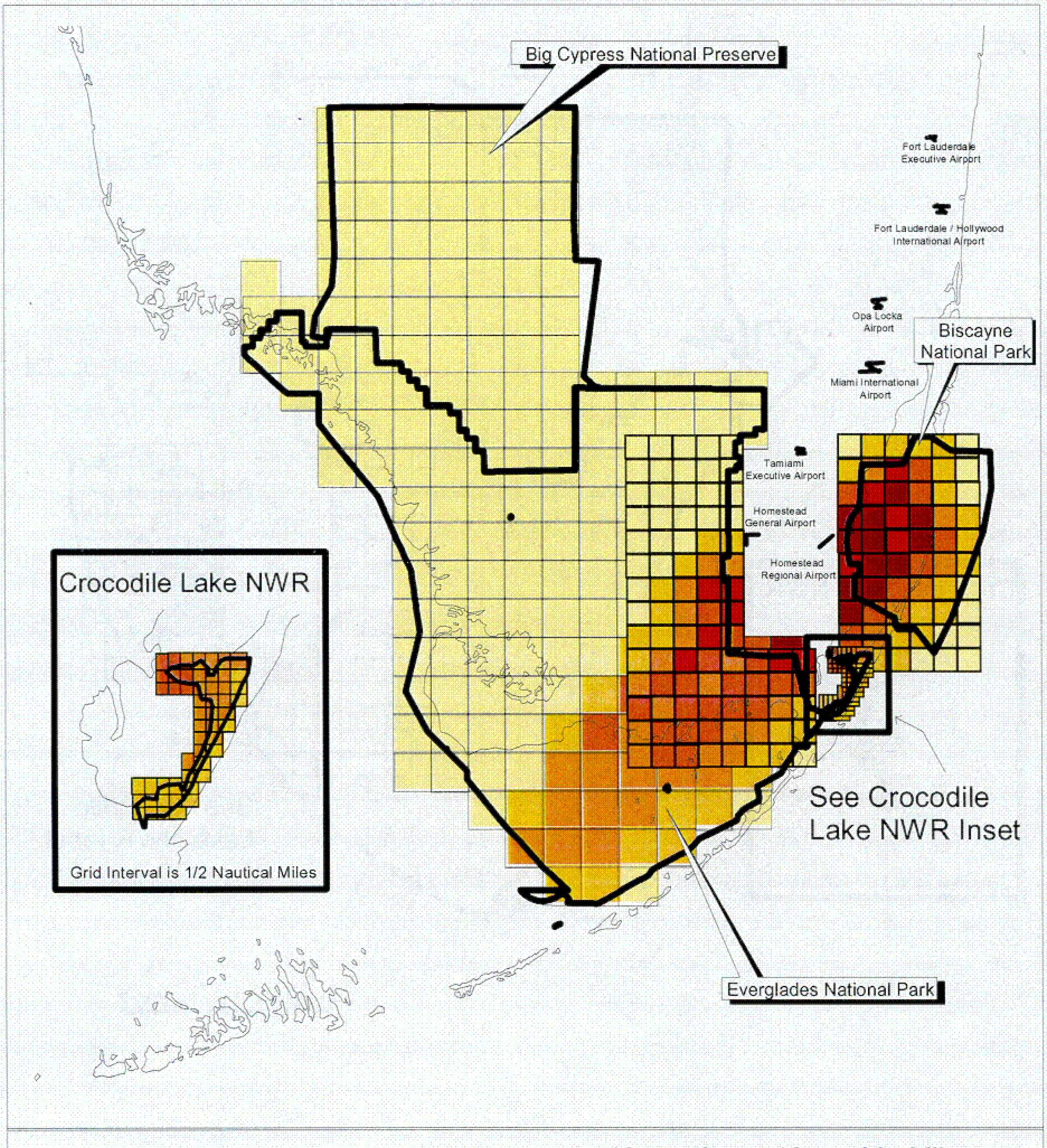
Exhibit VIII-1

Homestead 1987 Pre-Realignment Noise Contour and location points as thresholds of evaluation, the ambient levels are representative of 1998 levels rather than what may have been the condition in 1987.

Exhibit VIII-2 presents the LAmax noise grid pattern associated with the operation of Homestead Air Force Base in 1987. The highest single event noise levels were logically located under the departure and approach routes aligned with the runway, and east and south of the runway. Records indicate that little or no traffic from Homestead flew over large areas northwest of the airport. This absence of traffic is reflected by the computed LAmax levels below 45 dBA in the west and north parts of Everglades NP and all of Big Cypress. In contrast, the southeast portion of Everglades NP, Biscayne NP, and Crocodile Lakes properties are all calculated to have been exposed to peak noise levels above 65 dBA, with levels at individual sites ranging as high as 106 dBA. Sites in Biscayne Bay that are nearest the airport were exposed to the highest levels as aircraft climbed out during easterly takeoffs.

Exhibit VIII-3 displays the hourly average noise level (Peak Hour Leq(h)) for the peak hour of operation at Homestead AFB prior to realignment. The grid pattern reflects the noise levels associated with the operations at Homestead during a busy hour of operations. The pattern displayed by the map indicates that the highest peak hour Leq noise levels were present northeast of the airport under the departure paths. Because most pattern and overhead operations occurred to the south of the airport, the highest noise levels were biased in that direction, with most of the west half of Biscayne NP calculated to have been covered by Peak Leq(h) greater than 55 decibels and virtually all of the park above 45 decibels of Peak Leq(h). To the southwest of the airport, the noise levels over the eastern Everglades NP would have been typically less than the levels found in Biscayne NP, although a few locations along the extended centerline or under the overhead approach pattern are calculated to have exceeded 45 decibels of Leq(h). The remainder of the areas in the national properties appear to have been subject to Leq(h) noise of increasingly lower levels as distance between the flight routes near the airport and the locations increased -- a common characteristic of areas exposed to sideline noise events.

Exhibit VIII-4 indicates the amount of time, during the average annual day, that the area was exposed to noise above the current traditional ambient level from aircraft using only Homestead Air Force Base prior to its realignment. In this specific case, the noise levels and exposure patterns related to aircraft using other airports is not included. Historical data was not available in proper form to include noise levels for the 1987 time frame from the other airports. Ambient mapping data was not available for Big Cypress National Preserve because of the small number of measurements there, or in areas adjacent to but not within the other national properties. The area of exposure to noise levels above the traditional ambient level was concentrated in the eastern and southeastern portions of Everglades NP, in Biscayne NP, and Crocodile Lakes NWR. Again, the areas that experienced the greatest number of minutes above the traditional ambient level were located along the principal routes of departure traffic. Areas that primarily experienced arrival traffic were exposed to fewer minutes above the traditional ambient levels. Several sites along the western edge of Biscayne NP experienced aircraft noise above current traditional ambient levels totaling more than six hours per day.



LEGEND

- Crocodile Lake NWR Grid Interval 0.5 Nautical Miles
- Eastern Everglades and Biscayne National Park Grid Interval 2.5 Nautical Miles
- Evergalades National Park Grid Interval 4.0 Nautical Miles

LAmax Level

- <45 dB
- 45.1 - 55 dB
- 55.1 - 65 dB
- 65.1 - 75 dB
- 75.1 - 85 dB
- >85 dB

10 0 10 20 Miles

N

Area Shown

Exhibit VIII-2

1987 Pre-Realignment LAmax

L-28

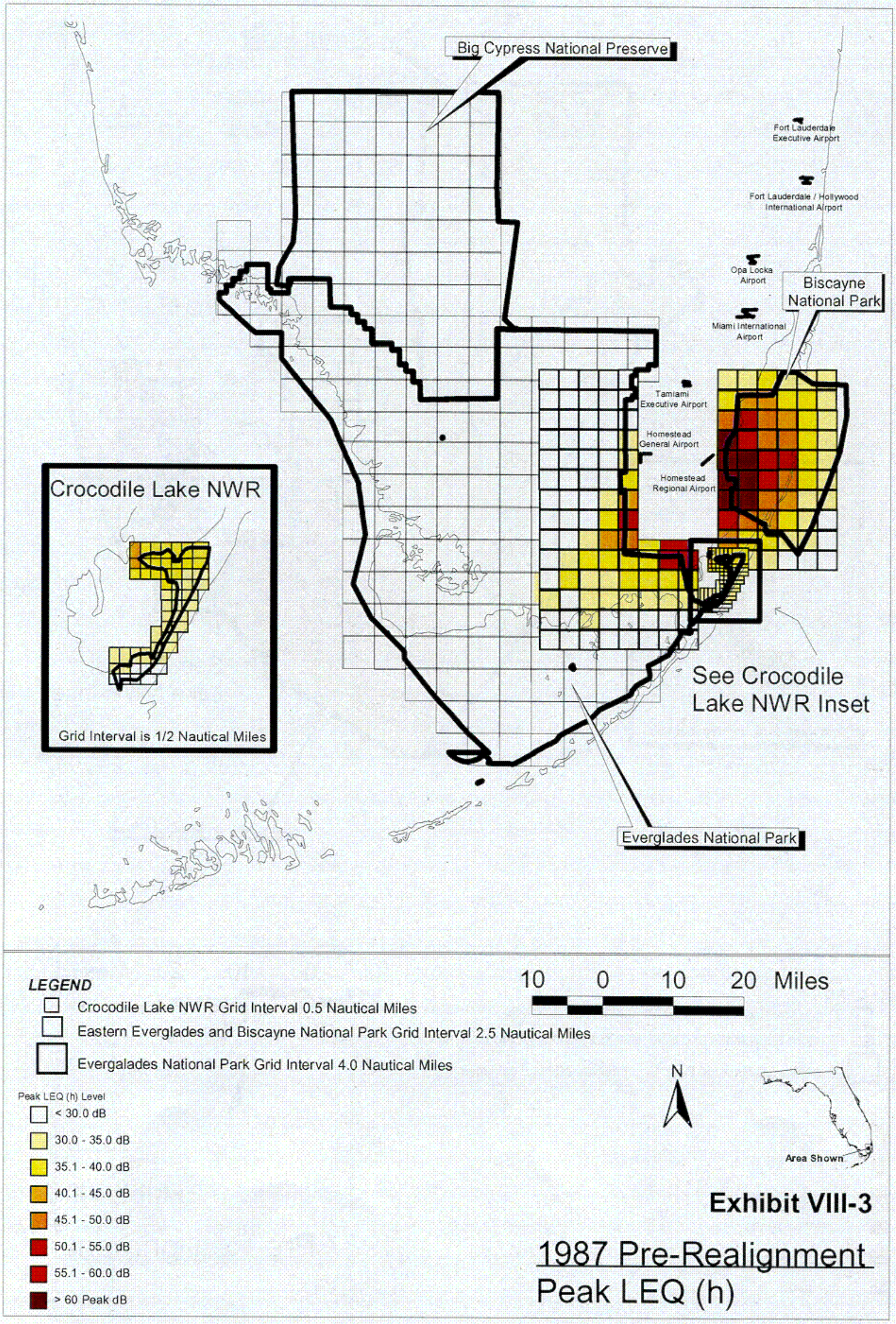


Exhibit VIII-3

1987 Pre-Realignment
Peak LEQ (h)

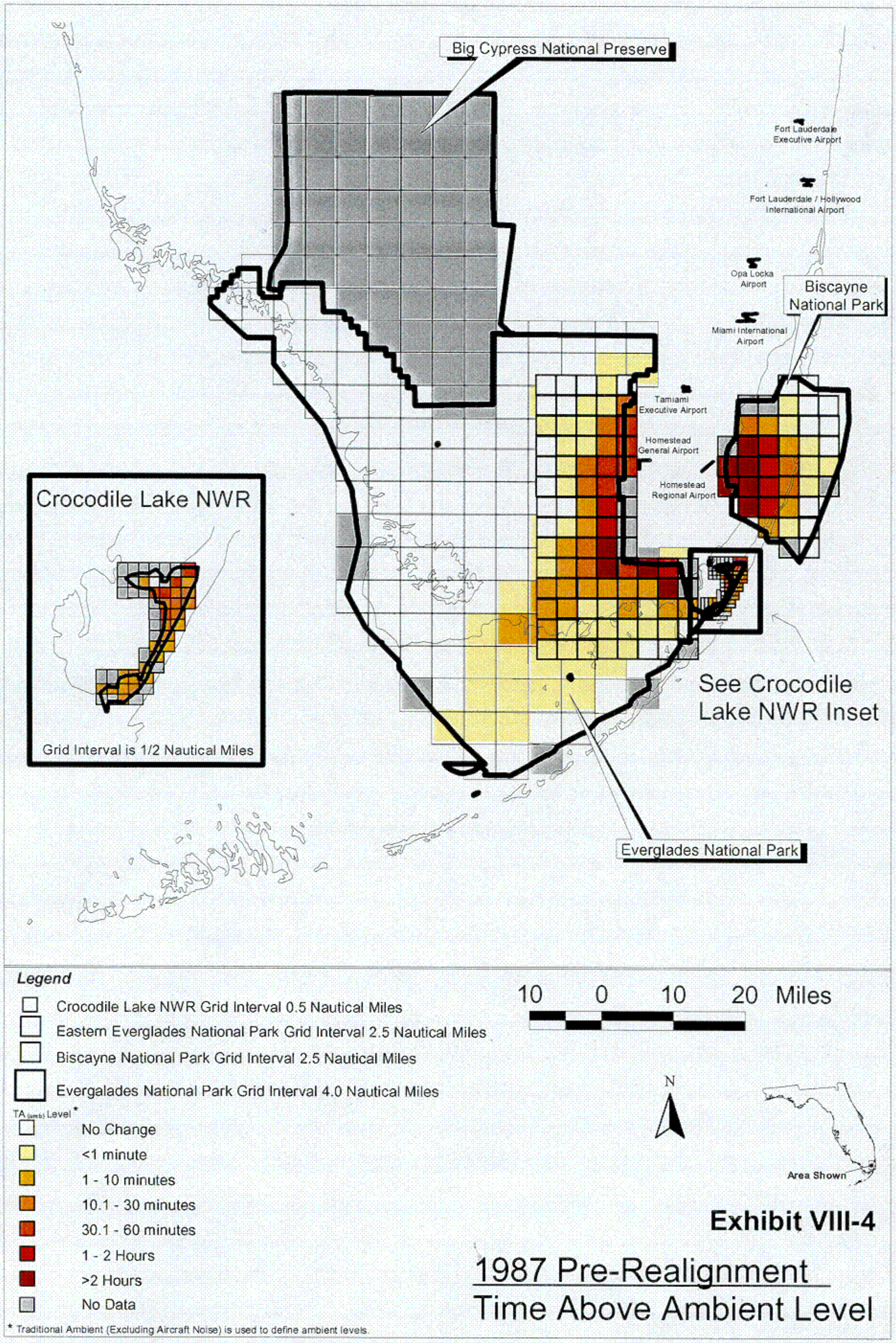


Exhibit VIII-4

1987 Pre-Realignment
Time Above Ambient Level

C-30

ADDENDUM TO APPENDIX E

This Addendum contains noise grid point analyses for Key Largo Hammocks State Botanical Site and South Florida Water Management District lands in the vicinity of Homestead (Southern Glades Wildlife and Environmental Area, Model Lands Basin, and Frog Pond).

Key Largo Hammocks State Botanical Site

The Key Largo Hammocks State Botanical Site is located adjacent to the northeast corner of Crocodile Lake NWR, in the center of grid location D89 of the Biscayne National Park grid array. The average traditional ambient noise level is 41 decibels. The maximum aircraft noise level would remain at 72.6 decibels throughout the planning period, owing to the continuation of Homestead's use by military fighter jet aircraft. Cumulative noise levels from aircraft operations are projected to increase in the future with the Proposed Action—in 2015, from 34.3 to 38.6 Leq(h); and at maximum use, from 34.3 to 37.8 Leq(h). The maximum use increase is slightly less than the increase in 2015 because of the removal of the MD-80 aircraft from the civil fleet. In both future time frames, cumulative aircraft noise levels would remain below the average traditional ambient noise level.

Time Above Ambient information is not available for grid D89. The closest grid to Key Largo Hammocks State Botanical Site for which TAamb is available is grid C1214 in Crocodile Lake NWR. In grid C1214, TAamb would increase from 13.1 minutes per average day without the Proposed Action to 49.7 minutes in 2015 and 71.2 minutes at maximum use of the single runway airport. TAamb increases would be expected to be less in grid D89 at the Botanical Site than in grid C1214 because both LAmax and Leq(h) levels are lower in grid D89 than in grid C1214.

Difference from No Action	LAmax (dB)	Peak Leq(h) (dB)	Time Above (minutes)
D89 - Increase in 2015	Constant at 72.6	34.3 to 38.6	Not available
D89 - Increase at Maximum Use	Constant at 72.6	34.3 to 37.8	Not available
C1214 - Increase in 2015	Constant at 73.3	36.7 to 42.3	13.1 to 49.7
C1214 - Increase at Maximum Use	Constant at 73.3	36.7 to 41.4	13.1 to 71.2

Noise Grid Analysis for South Florida Water Management District Lands—Southern Glades, Model Lands, and Frog Pond

For noise grid point analysis purposes, a grid has been superimposed over a map of the South Florida Water Management District (SFWMD) lands nearest to Homestead (**Figure A**). LAmax, Peak Hour Leq, and DNL noise level information are provided in **Tables A, B, and C** for 1997 and for the projected baseline/No Action and Proposed Action conditions in 2015 and at maximum use.

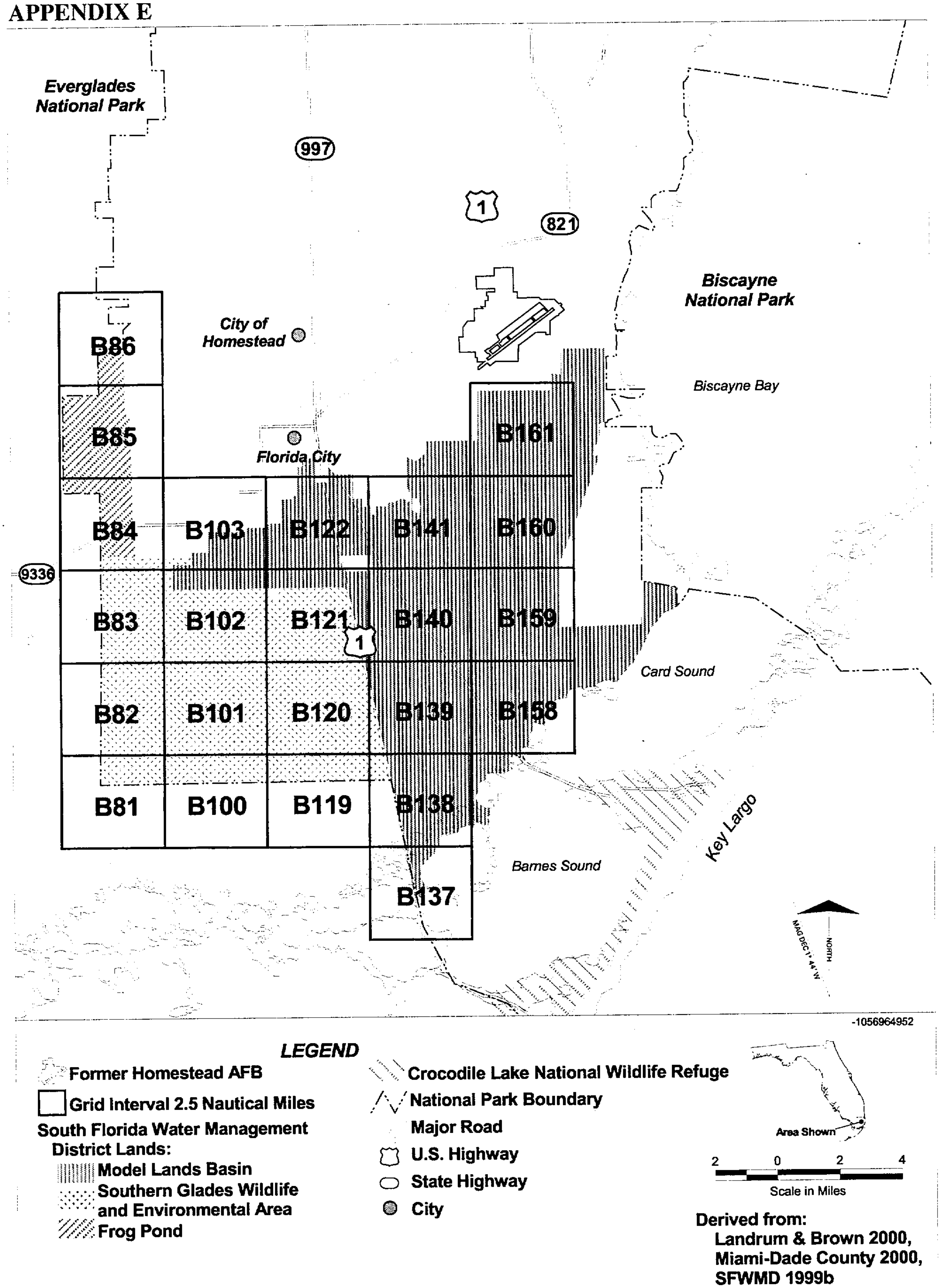


Figure A
SFWMD Lands Grid Index

Table A. South Florida Water Management District Grid LAmax Comparison

Grid No.	Area*	Ambient Noise Level (dB)	1997 (dB)	2015 (dB)			Maximum Use (dB)		
				No Action	Proposed Action	Difference	No Action	Proposed Action	Difference
B81	G	31.0	64.9	64.9	64.9	0.0	64.9	64.9	0.0
B82	G	31.0	80.9	80.9	80.9	0.0	80.9	80.9	0.0
B83	G	31.0	82.6	82.6	82.6	0.0	82.6	82.6	0.0
B100	G	31.0	60.5	60.5	62.6	2.1	60.5	60.5	0.0
B101	G	NA	69.7	69.7	69.7	0.0	69.7	69.7	0.0
B102	G	NA	86.9	86.9	86.9	0.0	86.9	86.9	0.0
B119	G	45.0	74.2	74.2	74.2	0.0	74.2	74.2	0.0
B120	G	NA	68.4	68.4	68.4	0.0	68.4	68.4	0.0
B121	G	NA	68.9	68.9	68.9	0.0	68.9	68.9	0.0
B84	F	31.0	72.1	72.1	72.1	0.0	72.1	72.1	0.0
B85	F	31.0	72.7	72.7	72.7	0.0	72.7	72.7	0.0
B86	F	40.0	81.7	81.7	81.7	0.0	81.7	81.7	0.0
B103	M	NA	85.3	85.3	85.3	0.0	85.3	85.3	0.0
B122	M	NA	95.4	95.4	95.4	0.0	95.4	95.4	0.0
B137	M	47.0	74.2	74.2	74.2	0.0	74.2	74.2	0.0
B138	M	40.0	77.4	77.4	77.4	0.0	77.4	77.4	0.0
B139	M	NA	83.1	83.1	83.1	0.0	83.1	83.1	0.0
B140	M	NA	84.4	84.4	84.4	0.0	84.4	84.4	0.0
B141	M	NA	88.2	88.2	88.2	0.0	88.2	88.2	0.0
B158	M	NA	77.7	77.7	77.7	0.0	77.7	77.7	0.0
B159	M	NA	80.6	80.6	80.6	0.0	80.6	80.6	0.0
B160	M	NA	90.2	90.2	90.2	0.0	90.2	90.2	0.0
B161	M	NA	90.3	90.3	90.3	0.0	90.3	90.3	0.0

Note: Differences in noise where ambient noise measurements are available consider the ambient level as a threshold for reporting. This measured threshold applies to grids B81–86, B100, B119, B137, and B138.

* G = Grid in Southern Glades
F = Grid in Frog Pond
M = Grid in Model Lands

The tables identify the grids that are primarily associated with various SFWMD lands in sequential order—Southern Glades (G), Frog Pond (F), and Model Lands (M). Grids are spaced at 2.5 mile intervals. Since the grids are square and property boundaries are irregular, there is not an exact match between grid spacings and property boundaries. Coverage of lands by the grids is almost complete; some edges of the Model Lands Basin overlap the area of the Grid B coverage.

Table B. South Florida Water Management District Grid Peak Hour Leq Comparison

Grid No.	Area*	Ambient Noise Level (dB)	1997 (dB)	2015 (dB)			Maximum Use (dB)		
				No Action	Proposed Action	Difference	No Action	Proposed Action	Difference
B81	G	31.0	31.3	31.6	34.6	3.0	31.4	34.4	3.0
B82	G	31.0	39.8	39.8	41.0	1.2	39.8	40.9	1.1
B83	G	31.0	41.3	41.2	43.3	2.0	41.2	44.0	2.8
B100	G	31.0	31.6	31.6	36.6	5.0	31.6	36.0	4.4
B101	G	NA	34.5	34.6	43.5	7.9	34.6	43.2	7.6
B102	G	NA	42.9	42.9	49.3	6.4	42.9	49.8	6.9
B119	G	45.0	36.3	36.3	43.1	0.0	36.3	40.4	0.0
B120	G	NA	33.3	33.2	42.8	9.7	33.2	44.2	11.0
B121	G	NA	37.8	37.7	42.2	4.5	37.7	42.2	4.5
B84	F	31.0	39.0	39.3	42.3	2.9	39.3	43.6	4.3
B85	F	31.0	45.8	46.3	46.7	0.4	46.6	47.0	0.4
B86	F	40.0	54.5	55.3	55.5	0.2	55.7	56.0	0.3
B103	M	NA	39.0	38.7	45.2	6.5	38.7	46.7	8.0
B122	M	NA	47.6	47.5	52.0	4.5	47.5	53.6	6.1
B137	M	47.0	29.1	29.1	36.7	0.0	29.1	36.3	0.0
B138	M	40.0	33.8	33.8	40.2	0.2	33.8	38.9	0.0
B139	M	NA	39.8	39.7	45.6	5.9	39.7	46.2	6.5
B140	M	NA	46.2	46.2	47.5	1.3	46.2	47.3	1.1
B141	M	NA	52.4	52.4	52.7	0.3	52.4	52.7	0.3
B158	M	NA	42.8	42.8	46.9	4.1	42.8	45.8	3.0
B159	M	NA	50.4	50.4	51.1	0.7	50.4	51.3	0.9
B160	M	NA	57.8	57.8	57.9	0.1	57.8	57.9	0.1
B161	M	NA	49.7	49.6	50.4	1.0	49.6	50.7	1.1

Note: Differences in noise where ambient noise measurements are available consider the ambient level as a threshold for reporting. This measured threshold applies to grids B81–86, B100, B119, B137, and B138.

* G = Grid in Southern Glades
F = Grid in Frog Pond
M = Grid in Model Lands

Traditional ambient noise levels are available for grids that abut Everglades National Park and Biscayne National Park and for special noise assessment locations where ambient measurements were done. The tables use all available traditional ambient data. Generally, along the western edge of the Southern Glades and Frog Pond, traditional ambient levels are around 31 decibels, increasing to 40 decibels in the northern Frog Pond grid, B86. Grids located closer to U.S. Highway 1 within the Southern Glades and Model Lands Basin have higher traditional ambient levels of 40, 45, and 47 decibels. Grids along the Biscayne National Park edge of the Model Lands Basin (where the Model Lands edges extend somewhat east of Grid B) also have higher traditional ambient levels. The average traditional ambient level is 45 decibels east of grid B158; 49 decibels, east of grid B159; and 56 decibels, east of grid B161.

Table C. South Florida Water Management District Grid DNL Comparison

Grid No.	Area*	Ambient Noise Level (dB)	1997 (dB)	2015 (dB)			Maximum Use (dB)		
				No Action	Proposed Action	Difference	No Action	Proposed Action	Difference
B81	G	31.0	26.7	26.8	31.3	0.3	26.8	31.0	0.0
B82	G	31.0	35.1	35.1	37.1	2.0	35.1	37.0	1.9
B83	G	31.0	36.6	36.6	39.6	3.0	36.6	40.5	3.9
B100	G	31.0	27.1	27.1	33.7	2.7	27.1	33.1	2.1
B101	G	NA	31.1	31.0	40.8	9.7	31.0	40.7	9.7
B102	G	NA	38.3	38.3	46.5	8.3	38.3	47.2	9.0
B119	G	45.0	31.7	31.7	40.1	0.0	31.7	37.4	0.0
B120	G	NA	29.0	28.8	40.3	11.5	28.8	41.9	13.1
B121	G	NA	33.6	33.4	39.4	6.0	33.4	39.4	6.0
B84	F	31.0	33.8	33.8	38.6	4.8	33.8	40.3	6.5
B85	F	31.0	39.5	39.9	40.8	0.9	40.1	41.2	1.1
B86	F	40.0	47.7	48.5	49.0	0.5	48.8	49.4	0.6
B103	M	NA	35.1	34.4	42.6	8.2	34.4	44.4	10.0
B122	M	NA	43.0	42.9	49.0	6.1	42.9	51.0	8.1
B137	M	47.0	24.7	24.8	34.2	0.0	24.8	33.7	0.0
B138	M	40.0	29.4	29.3	37.5	0.0	29.3	36.0	0.0
B139	M	NA	35.3	35.2	42.9	7.7	35.2	43.7	8.5
B140	M	NA	41.6	41.5	43.6	2.1	41.5	43.4	1.9
B141	M	NA	47.9	47.8	48.3	0.5	47.8	48.3	0.5
B158	M	NA	38.2	38.2	43.8	5.7	38.2	42.6	4.5
B159	M	NA	45.8	45.8	46.9	1.1	45.8	47.3	1.5
B160	M	NA	53.2	53.2	53.3	0.1	53.2	53.3	0.1
B161	M	NA	45.2	45.0	46.6	1.6	45.0	46.8	1.8

Note: Differences in noise where ambient noise measurements are available consider the ambient level as a threshold for reporting. This measured threshold applies to grids B81–86, B100, B119, B137, and B138.

* G = Grid in Southern Glades
F = Grid in Frog Pond
M = Grid in Model Lands

Table A presents the maximum noise level (LAmax) to which each grid would be exposed for baseline and future conditions. In all but one case, the maximum noise level now present from military fighter aircraft would remain the maximum level in the future. Only within one grid, B100 in the Southern Glades, is the maximum level predicted to increase in 2015 because of the MD-80 civil aircraft. When MD-80 aircraft are removed from the civil fleet by the time of maximum use of the runway, the maximum noise level would again be by military aircraft. Maximum noise levels would range from 60.5 decibels in Southern Glades grid B100 about 14 miles southwest of the airport to 95.4 decibels in Model Lands grid B122 located under the approach to the runway approximately 5 miles southwest of the airport.

Table B provides the Peak Hour Leq level to which each grid would be exposed for baseline and future conditions. In areas where traditional ambient noise levels are available, the ambient level sets a threshold for computation of the Leq(h) increases associated with the Proposed Action. In grids where no ambient measurements were done—which comprise the largest number of these grids—the difference between the No Action and Proposed Action condition is simply the absolute calculated difference.

Peak Hour Leq increases of less than 5 decibels are *de minimis* and considered to constitute no change in cumulative aircraft noise. In 2015, Leq increases of 5 to 9.7 decibels are projected in grids B100, B101, B102, and B120 in the Southern Glades, and increases of 5.9 and 6.5 decibels are projected in grids B139 and B103 in the Model Lands Basin. At maximum use, Leq increases of 6.9 to 11 decibels are projected in grids B101, B102, and B120 in the Southern Glades, and increases of 6.1 to 8.0 decibels are projected in grids B103, B122, and B139 in the Model Lands Basin. Aircraft noise Leq(h) increases would probably be less in comparison to a traditional ambient threshold if more traditional ambient measurements were available for the Southern Glades and Model Lands grids. This assumption is based on looking at the traditional ambient measurements that are available in these areas as distance from Everglades National Park increases and more human-made noises from other sound sources contribute to higher traditional ambient levels.

In the Southern Glades at maximum use of a commercial airport, Peak Hour Leq values from aircraft noise are projected to range from 34.4 decibels in the area farthest from Homestead to 49.8 decibels closest to the extended runway centerline. By comparison, No Action aircraft noise Leq(h) values for the maximum use timeframe would be between 31.4 and 42.9 decibels. In the Model Lands Basin, commercial airport maximum use Peak Hour Leq values are projected to range from 36.3 decibels farthest from Homestead to 57.9 decibels closer to the runway. The No Action comparison range of Leq(h) from aircraft noise would be between 29.1 and 57.8 decibels in the Model Lands Basin. These Leq(h) values are only reporting aircraft noise. In the two Model Lands grids with the lowest aircraft Leq(h) values (grids B137 and B138), the average traditional ambient is higher than cumulative aircraft noise levels under either No Action or Proposed Action conditions. In the Frog Pond, Leq(h) values are projected to range from 43.6 to 56.0 decibels with the Proposed Action at maximum use, compared to a range of 39.3 to 55.7 decibels under future No Action conditions.

With the exception of grid B122 in the Model Lands Basin, areas with the highest absolute Leq values (i.e., above 50 decibels) are projected to have the smallest increases in Leq with the Proposed Action because the No Action Leq values are similar (e.g., at maximum use—Frog Pond B86: No Action = 55.7 vs. Proposed Action = 56.0; Model Lands B141: No Action = 52.4 vs. Proposed Action = 52.7; Model Lands B159: No Action = 50.4 vs. Proposed Action = 51.3; Model Lands B160: No Action = 57.8 vs. Proposed Action = 57.9; Model Lands B161: No Action = 49.6 vs. Proposed Action = 50.7).

Table C provides DNL values for each grid. Although DNL and peak hour Leq numbers are somewhat different because of the difference in calculating the two metrics, both are cumulative noise metrics and present similar patterns of aircraft noise effects. The DNL values are somewhat lower than the Leq(h) values because the Leq(h) calculates values based on the peak (i.e., busiest) hour of the day. At maximum use with the Proposed Action, the DNL in the Southern Glades is projected to range from 31.0 to 47.2 decibels. In the Model Lands Basin, the maximum use Proposed Action DNL range would be from 33.7 to 53.3 decibels. The DNL in the Frog Pond would range from 40.3 to 49.4 decibels at maximum use of the Proposed Action.

F Soil Map Unit Descriptions