2.0 Alternatives Including the Proposed Action

IN THIS CHAPTER

Chapter 2 describes and compares the alternative ways the available land at former Homestead AFB could be redeveloped. This chapter has the following sections:

Section 2.1
- Describes the current use of retained and transferred property.
- Describes how alternatives were identified for the available property.
- Describes ongoing growth and development in the area surrounding the former base.

Section 2.2 describes the Proposed Action, to transfer the disposal property to the Miami-Dade County Aviation Department for a commercial airport.

Section 2.3 describes a Commercial Spaceport alternative suggested by Vision Council, Florida Spaceport Authority, Enterprise Florida, and potential spaceport users.

Section 2.4 describes a Mixed Use alternative that includes no civil aviation. The Air Force would keep the runway and operate it for military and government use. This alternative considers different ways the rest of the land might be used, including developing incrementally in response to market demands, or as laid out in plans by Collier Resources Company and/or the Hoover Environmental Group.

Section 2.5 describes the No Action alternative. Existing military and government operations would continue, but the rest of the property would remain in caretaker status.

Section 2.6 describes independent land use concepts for use of portions of the available property. Some of these concepts could be included in the Proposed Action or other alternatives.

Section 2.7 briefly reviews alternatives considered but not analyzed in detail.

Section 2.8 describes other potential projects and developments in the region that were considered in the analysis of cumulative impacts.

Section 2.9 summarizes and compares the environmental impacts of the Proposed Action and other alternatives.

Section 2.10 summarizes the cumulative environmental impacts of the Proposed Action and alternatives in combination with other projects and developments in the region.

Section 2.11 summarizes potential mitigation measures that could reduce the environmental impacts of the Proposed Action and alternatives.

Section 2.12 discusses the preferred alternative.

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

This chapter describes the alternatives considered for analysis in this SEIS, including the Proposed Action, other reasonable reuse alternatives carried forward for detailed study, and the No Action alternative. It briefly describes alternatives eliminated from detailed study. This chapter also presents the environmental impacts of the alternatives in comparative form, focusing on the principal environmental issues identified through scoping, and discusses potential mitigation measures that could be considered to reduce adverse impacts.

The Draft SEIS contained three main reuse alternatives: the Proposed Action (commercial airport), Commercial Spaceport alternative, and Mixed Use alternative. Under the Mixed Use alternative, three scenarios were examined: Market-Driven development, a proposal submitted by Collier Resources Company, and a plan developed by the Hoover Environmental Group. In the Final SEIS, the Mixed Use alternative has been expanded to add a new joint proposal submitted by Collier and Hoover during the public review of the Draft SEIS, referred to as the Collier-Hoover proposal.

Each alternative is described and analyzed as it could develop over the first five years, the ensuing ten years, out to its full potential. Information about development and operations are presented for three milestone years: 2000, 2005, and 2015. These years were selected to keep the structure and planning periods similar to the 1994 Final EIS. Information is also presented for "full buildout" of each alternative, providing for complete development of the property if this is not expected to be achieved by 2015. No specific year for full buildout is identified because it is uncertain when full buildout could be achieved, and it would likely vary among the alternatives.

The information provided for each alternative described in detail includes on-site land use and development, aircraft operations, employment and population (on-site residents), vehicle traffic and utilities demand, and reuse-related secondary development estimated for each of the three milestone years and for full buildout. To place this information in context, the background information in Section 2.1 describes, first, the ongoing and projected activities of portions of former Homestead AFB that were retained by the Air Force or already transferred or proposed for transfer to another user, and, second, the projected growth and development that could occur in the region surrounding former Homestead AFB. This information is also estimated for 2000, 2005, and 2015 and provides a baseline for assessing the impacts of the Proposed Action and alternatives. Future regional growth and development are not provided for full buildout, because it is not known when that would be likely to occur, and because population and other forecasts are generally not available for more than about 20 years into the future.

The summary and comparison of the environmental impacts of the alternatives, provided in Section 2.9, pulls from the detailed analysis in Chapter 4 of the SEIS. It includes a review of selected topics identified by agencies and public and private entities as being of high interest and concern. Those topics include (1) economic revitalization of south Florida, (2) preservation of the national parks in the area, (3) aircraft noise effects on the community, (4) issues related to agriculture, (5) the potential for establishing a buffer between the former base and Biscayne National Park, (6) safety issues, and (7) possible future expansion of a commercial airport at former Homestead AFB.

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2.1 CONTEXT FOR DEVELOPMENT OF REUSE ALTERNATIVES

As discussed in Chapter 1, this SEIS addresses the proposed disposal of approximately 1,632 acres of land formerly part of Homestead AFB. Homestead AFB was realigned in 1994, and some of the land was converted to other uses. Those uses, including Air Force Reserve Command and Florida Air National Guard operations, are ongoing and expected to continue indefinitely. They remain common to all alternatives analyzed in the SEIS. The alternatives presented in this chapter differ with respect to the remaining surplus property.

Because the reuse of the disposal property would be implemented by the entities that ultimately receive the property, rather than the Air Force, the alternatives considered in the SEIS reflect a range of reasonably foreseeable outcomes of the property disposal decision to be made by the Air Force. The alternatives were developed in consideration of the characteristics of the available surplus property, specific plans and proposals received by the Air Force, and the redevelopment potential of the land, based on population forecasts, market studies, anticipated market trends, and the land's relative attractiveness for development. Projections about future growth under these alternatives are believed to be plausible and achievable, but they are only projections, not statements of fact.

Pursuant to the Air Force Record of Decision in 1994, 867.7 acres of former Homestead AFB property were retained for use by AFRC and FANG units, and 382.6 acres were transferred or otherwise conveyed to other federal and local entities for public benefit uses. An additional 29.8 acres is also expected to be retained by the Air Force as a safety area for the FANG, increasing the total retained area to approximately 897.5 acres. In addition, approximately 26 acres are proposed for transfer to the School Board of Miami-Dade County, Florida (formerly Dade County Public Schools), increasing the total potential transfers to approximately 408.6 acres. If these parcels are not retained or transferred as expected, up to 56 acres could be added to the surplus land available for disposal. This small potential increase in acreage would be inconsequential to the analysis in the SEIS. Ongoing activities on the retained and conveyed areas influence the range of uses that could occur on the remaining surplus land.

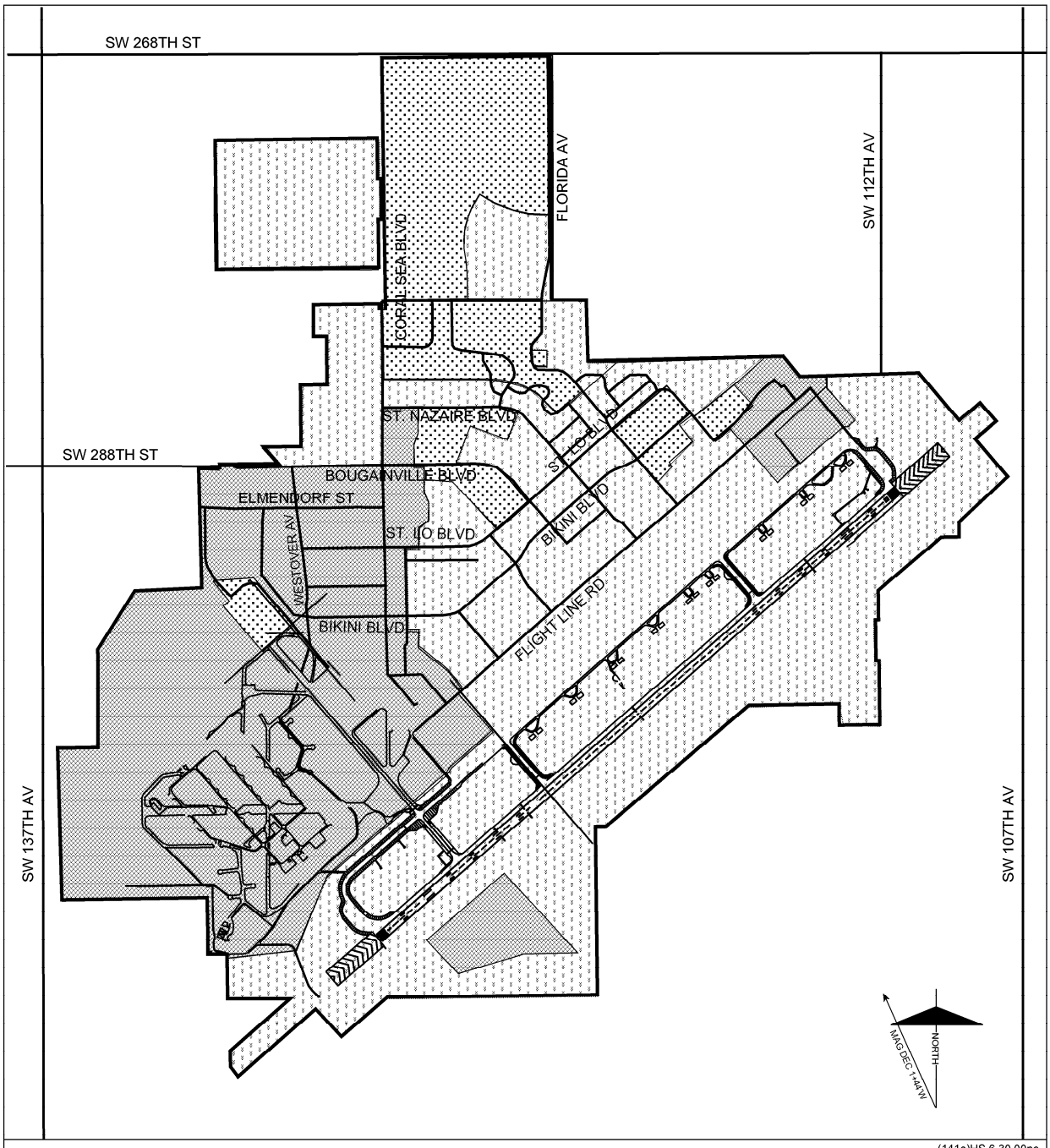
The reuse of the retained property and completed or proposed conveyances are described in Section 2.1.1. Section 2.1.2 describes the process used to identify reasonable alternatives for the remaining surplus property, and Section 2.1.3 addresses ongoing population growth in the surrounding areas that can be expected to occur with or without reuse of the disposal property at former Homestead AFB.

2.1.1 Existing Status and Use of Former Homestead AFB Property

Figure 2.1-1 shows the retained areas, completed and proposed conveyances, and areas that remain surplus and available for disposal. **Table 2.1-1** summarizes the property disposition (retained, conveyed, surplus) of land on former Homestead AFB. Of the 2,937.9 acres comprising the former base property, 1,306.1 acres are expected to be retained or conveyed subsequent to the 1994 ROD.

2.1.1.1 Land Use and Development

Figure 2.1-2 illustrates the general land use of existing reuse areas, and **Table 2.1-2** summarizes acreage by land use. The land identified for military use includes approximately 30 acres of undetermined disposition currently expected to be retained. The 26 acres proposed to be transferred to the School Board of Miami-Dade County is shown as institutional use. The figure also shows four areas on the former base where use, construction, or building occupancy are restricted due to safety considerations. These safety zones are generally associated with facilities where munitions are assembled, stored, or



LEGEND

- Former Homestead AFB Boundary
- Surplus
- Retained
- Conveyed (completed and proposed)

(141e)HS 6.30.00nc

0.25 0 0.25 0.5

Scale In Miles

Derived from: AFBCA 1996

Figure 2.1-1
Property Status of Former Homestead AFB

Table 2.1-1. Summary of Property Status of Former Homestead AFB

Land Status	Acres[1]	Percent
Existing Reuse		
Retained by Air Force[2]	897.5	30
Conveyed[3]	408.6	14
Subtotal	***1,306.1***	***44***
Surplus Property	1,631.8	56
Total	**2,937.9**	**100**

Source: **AFBCA 1996**.
Notes: [1] Rounded to nearest tenth acre.
[2] Includes 29.8 acres expected to be retained.
[3] Includes proposed transfer of 26 acres to School Board of Miami-Dade County.

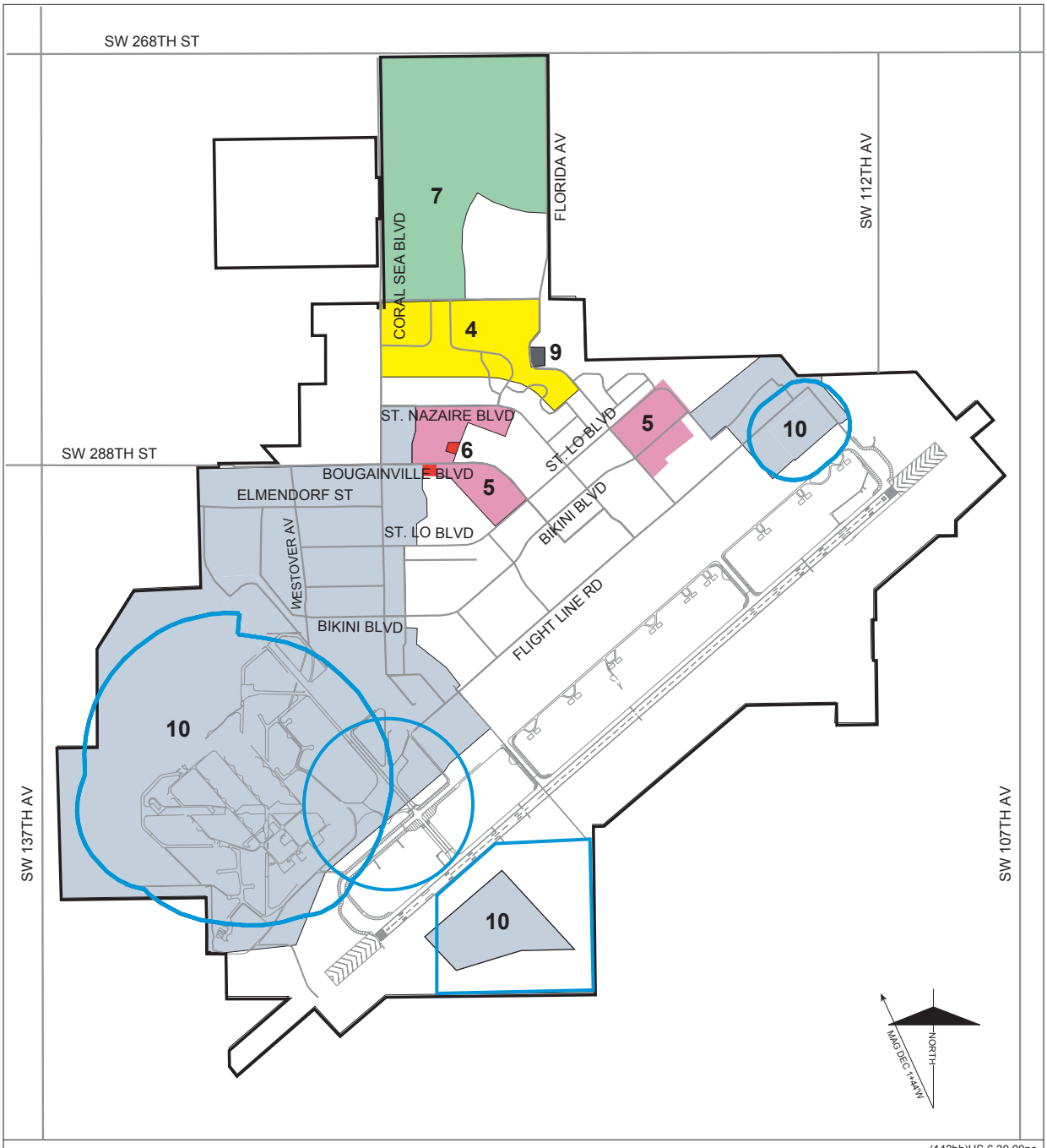
mounted on aircraft. They may also define areas where occupational safety standards apply, such as around the engine run-up facilities on the south side of the airfield, where hearing protection is required for personnel during engine run-ups.

Table 2.1-2. Acres of Existing Land Use on Former Homestead AFB

Land Use[1]	Acres[2]	Percent
Military/Government	940[3]	72
Commercial	2	<1
Institutional	67[4]	5
Residential	84	6
Recreation	213	16
Utilities	1	<1
Total	**1,306**	**100**

Source: Derived from **AFBCA 1996**.
Notes: [1] Excluding the disposal property.
[2] Rounded to nearest acre; sum not equal to total due to rounding.
[3] Includes approximately 30 acres expected to be retained.
[4] Includes 26 acres proposed for transfer to the School Board of Miami-Dade County.

Table 2.1-3 summarizes additional development that is, for purposes of the analysis, assumed to occur on this property between now and 2015 and at full buildout. Most of the facility construction on the retained land occurred following Hurricane Andrew. About 1 mile of stormwater trenches have also been constructed. The assumed new construction is primarily associated with a regional park in the north part of the former base. The full buildout includes potential expansions of the property conveyed to the bank and initially conveyed to the credit union and subsequently sold to the Job Corps. The estimates for these properties are based on typical lot coverage allowed under Miami-Dade County's zoning code for commercial land use. A total of 77 acres of ground disturbance is estimated for ongoing and projected construction in the retained and conveyed areas by full buildout. This assumes that additional development not currently planned could occur on some of the land over the long term.



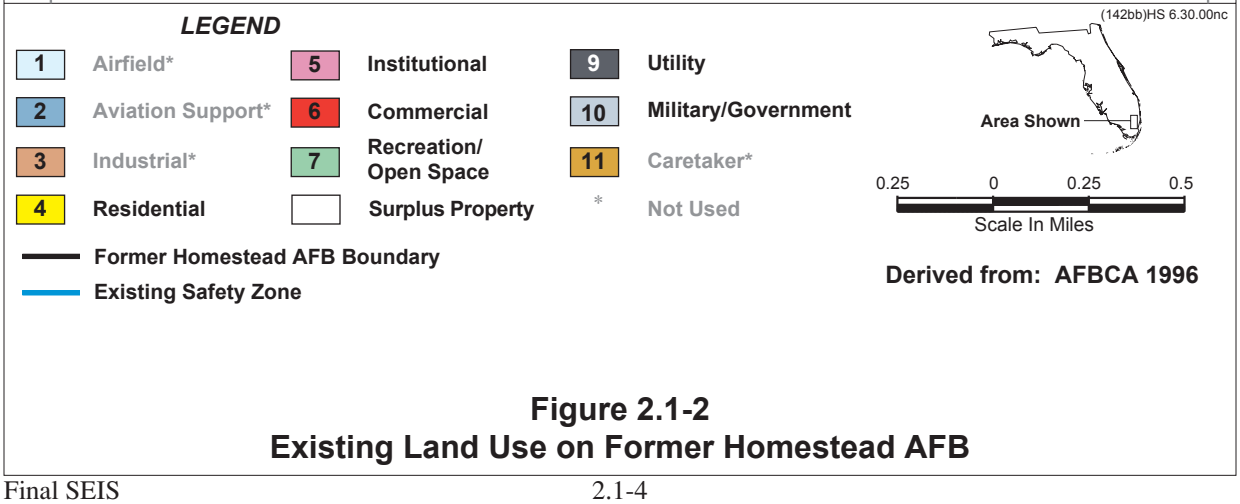


Figure 2.1-2
Existing Land Use on Former Homestead AFB

Table 2.1-3. Assumed Facility Development on Retained and Conveyed Property

	1998–2015	Full Buildout[2]
Facility Demolition (000 SF)	19	NA[3]
Facility Retention (000 SF)	1,456	1,456
Facility Renovation (000 SF)	0	0
New Construction (000 SF) [1]	479	497
New Paving (acres)	26	27
Ground Disturbance (acres)	74	77
Impervious Surface (%)	24	25

Source: SAIC.
Notes: [1] Includes new facilities constructed for Job Corps and Homeless Center between 1998 and 2000.
[2] Reflects total potential development.
[3] Not able to estimate.
NA not available
SF square feet

Currently, an estimated 778 acres of the entire former base land area (2,938 acres) is covered by impervious surface (excluding wet areas). This represents a sitewide average impermeable coverage of about 26 percent. Compared to this, an estimated 309 acres (24 percent) of the 1,306 acres of retained and conveyed land is impermeable. The larger sitewide average is attributable to the runway, taxiways, and aircraft apron on the surplus property. Upon completion of the regional park and possible buildout of other facilities, impermeable surface is assumed to increase to 25 percent of the 1,306 acres of retained and conveyed property.

The following paragraphs summarize specific land uses in the retained and conveyed (completed and proposed) areas.

Military/Government

Approximately 790 acres of the retained land is located in a cantonment on the southwest portion of the former base. The cantonment has about 800,900 square feet of facilities for the 482nd Fighter Wing (482 FW) at Homestead ARS. AFRC also retained a non-contiguous 45 acre parcel on the south side of the runway where Hush Houses are located. The 482 FW has 18 assigned F-16C aircraft stationed at Homestead ARS. The Wing's primary mission is to maintain readiness for combat support of air operations.

Facilities within the cantonment include aviation support facilities (hangars and maintenance workshops), munitions and fuel storage facilities, administrative facilities, visitors quarters, and commercial and community facilities (including dining, recreational facilities, and a clinic). Most of these facilities are new, and with the exception of possible construction of a fire training area in the future, no new construction is anticipated in the military areas.

At the northeast end of the runway, Detachment 1 of the 125 FW (FANG) occupies about 47,700 square feet of facilities on 20 acres. FANG maintains four F-15 aircraft at Homestead ARS. Two aircraft are armed at all times and parked on the alert pad off the north end of the runway. Because these aircraft are armed, use of the land within a defined explosive safety area is restricted. Some of this area is outside the

current FANG property and affects approximately 30 acres of adjacent property, expected to be retained by the Air Force.

Together, the 482 FW and 125 FW at Homestead ARS have approximately 42 full-time active duty employees and 1,133 part-time reservists and guardsmen, all living off site (**HARB 1998**). In addition, there are approximately 688 civilian employees, mostly full-time, working in the cantonment from Monday through Friday (excluding Base Exchange and commercial bank employees). Because of both weekday and weekend training by reservists and guardsmen, there is a moderate level of activity in the cantonment on a continual daytime basis.

Adjacent to the FANG is a 10 acre area with two buildings (comprising 59,000 square feet) that was transferred to the 50th Air Support Group (50 ASG) of the Florida Army National Guard (FLARNG) (**Blowers and Baumann 1998**). The FLARNG has approximately 14 full-time military employees and 132 authorized part-time guardsmen (**Stout 1998**). Each guardsman trains one weekend a month. The primary mission of the 50 ASG is to provide command and control of subordinate units and provide logistical support for any military activity within an assigned combat area. Weekend training involves practice in use of equipment for logistical support and weapons firing.

Thirty-two acres contained within the main cantonment were transferred to the Department of the Treasury for U.S. Customs, Drug Enforcement Administration (DEA). U.S. Customs performs a drug interdiction mission along the south and southeastern border of the United States. A secondary mission supports law enforcement agencies in narcotics-related investigations. U.S. Customs has two new facilities comprising 80,000 square feet, located along an apron with direct access to the runway, and 12 aircraft stationed at the airfield (10 fixed-wing and 2 helicopters). Currently, 65 U.S. Customs personnel (both government and contractor) are at Homestead ARS, and U.S. Customs plans to increase employment to 75 or 80 employees in the future (**Manhold 1998**).

The Base Exchange was retained for the Army Air Force Exchange Service (AAFES). This 93,000 square foot facility is a supermarket/store (similar to a small Wal-Mart) for military employees, dependents, and retirees. It occupies 12.5 acres and employs about 96 persons (**HARB 1998**). Currently, it serves about 1,050 customers daily. No expansions are anticipated (**Henson 1998**). Most of the customers are military retirees residing in the surrounding area.

Commercial

A 1.3 acre parcel was conveyed to the First National Bank of Homestead. It is expected to continue to operate as a branch bank from its 4,000 square foot facility. Currently, it serves between 50 and 100 customers daily. Past levels of service were much higher when the base was fully operational, and future service levels are expected to be related to future reuse of the disposal property (**Wilman 1998**). Full buildout of this parcel could result in 13,000 square feet of commercial facility, supporting about 30 jobs.

A 1 acre parcel with a 2,500 square foot branch facility was conveyed to the Pan American Credit Union. This branch has not been operating due to customer decline, and it was recently sold to the Job Corps Center. For purposes of analysis, it has been assumed that the parcel could be developed in the long term, and full buildout could support a 10,000 square foot facility and about 20 jobs.

Institutional

A 40.5 acre parcel was transferred to the U.S. Department of Labor (DOL) for a Job Corps training program for youth. The program will offer classes and training in job skills. About 320,000 square feet of

facilities are planned, including reuse of 275,000 square feet of renovated facilities. An existing dining facility will also be reused. One new security facility and associated parking area are planned (**Brown 1998**). Construction will be completed by 2000. When the program is fully implemented, the center could accommodate up to 496 students, most of whom will reside temporarily on site. Instruction will be provided during the day to both resident and day students. Although the exact number is not yet known, DOL estimates there could be 165 employees at the facility, based on standard planning criteria (**Medina 1998**). This number has been assumed for analysis.

Twenty-six acres are proposed for transfer to the School Board of Miami-Dade County (sponsored by the U.S. Department of Education) for an aviation education program for teaching a range of technical skills in aviation maintenance and avionics. The site includes about 67,000 square feet of existing facilities that are expected to be reused. Building 779 (a three-bay hangar) would be renovated for use as teaching shops. About 31,000 square feet could be used for a variety of administrative or storage functions in the future. It is expected that the program will ultimately have approximately 150 secondary and post-secondary students a day (**Halasz 1998a**).

Residential

Eighty-four acres have been transferred to the U.S. Department of Health and Human Services on behalf of the Dade County Homeless Trust. A Homeless Assistance Center was constructed in 1998 and a Meta Therapy Center is under construction in the north-central portion of the former base where housing and the base hospital were previously located. Construction of an 80,000 square foot facility with individual and family units to house up to 300 persons has been completed. In addition, about 55,000 square feet will be constructed for the Meta Therapy Center, providing 50 family units and 100 beds for an additional 300 persons. It is estimated that up to 600 residents and 110 full-time staff members (for both facilities) will be located on this site by 2000.

Recreation

Approximately 213 acres were transferred to Miami-Dade County Parks and Recreation Department for a regional park. The transfer was sponsored by the National Park Service. The parcel is located at the north end of the former base in an area previously used for base housing and a portion of the golf course. The park will provide a full range of outdoor recreational facilities and is expected to attract about 750,000 visitors annually (**Asher 1998**).

Development of the park will occur in phases as funds are available. For this analysis, development is assumed to occur over a 10 year period. The first phase consists of site preparation and primarily involves removal of old pavement and roadways, clearing and grading about one-third of the site, and general landscaping. This phase has been funded and should be completed by 2000. The second phase will include construction of playgrounds, picnic facilities, and ball fields. During the third phase, lighted facilities (including tennis, racquet/hardball, volleyball, and basketball courts and football/soccer and baseball fields) will be constructed. A stadium with a 2,400 person capacity and support facilities are also planned (**Asher 1998**).

Utilities

The electrical system for the former base was sold to Florida Power and Light Company (FPL). The sale included a 1 acre parcel with the electrical substation equipment (previously owned by FPL) and the electrical distribution lines throughout the former base property.

Stormwater drains are being constructed in connection with new construction in the cantonment, Homeless Trust, and Job Corps areas. The system is comprised of about a mile of 3 foot wide trenches that are 15 feet deep.

2.1.1.2 Airfield Operations

The airfield of former Homestead AFB is part of the property identified as surplus and available for disposal, although it is currently used by the AFRC, FANG, and U.S. Customs Service. The airfield facilities include the northeast/southwest-oriented Runway 5-23, which is 11,200 feet long and 300 feet in paved width. A parallel taxiway runs the length of the runway on the north side. Adjacent to the taxiway is a wide apron area (about 1,000 feet wide by 8,700 feet long). The FANG is sited at the north end of this taxiway. A perpendicular taxiway at the south end of the airfield, Taxiway B, connects a parking ramp within the main cantonment, used by the 482 FW and U.S. Customs Service, to the parallel taxiway. The runway, taxiways, and aprons were originally designed to serve B-52 bombers and have the structural capacity to handle all military and civilian aircraft. The airfield paving sustained minor damage from Hurricane Andrew and remains in good condition (**PBS&J 1994**). A new control tower has been built along the flightline (outside the main cantonment). It is currently operated by AFRC.

Estimated current government aircraft operations at Homestead ARS are presented in **Table 2.1-4** and consist of a total of almost 20,000 annual aircraft operations. In 1997, the aviation activity at the facility was by military and government aircraft operations. Based on current Air Force plans and on best estimates, the level of operations by those users is expected to remain largely unchanged through the analysis period. The majority of these (66 percent) are conducted by F-16 and F-15 jet aircraft based at Homestead ARS. The U.S. Customs Service conducts about 3,600 operations annually with a mix of helicopters (H60), turboprop (PA31, C206), and general aviation jet-type aircraft (C550). Nearly all military and government flight operations occur during daytime hours (between 7:00 a.m. and 10:00 p.m.) and consist of landings, takeoffs, and “closed pattern” (or “touch-and-go”) operations. Closed pattern operations are performed as part of military training and include “rectangular” patterns at altitudes of 1,000 and 2,000 feet and overhead patterns at 1,500 feet. At 1,000 feet, the patterns are visual operations, while at 2,000 feet they are radar controlled. Overhead patterns at 1,500 feet are conducted by military fighter aircraft during initial approach to the airfield. A closed pattern is counted as two flight operations: approach (arrival) and takeoff (departure), even though the aircraft flies over the runway without touching down.

An average of about 28 engine runups per day are also performed on military aircraft. Usually, about 30 percent of them are performed within a sound-proofed Hush House. Runups are performed for various durations and at various power settings averaging about 2.5 hours per day. No runups are performed between 10:00 p.m. and 7:00 a.m.

Primary flight tracks are defined for arrival, departure, and closed pattern operations in an east (Runway 5) and west (Runway 23) direction. Currently, aircraft operate in east flow approximately 90 percent of the time; west flow operations are conducted the remaining 10 percent. Flight tracks are illustrated in **Figures 2.1-3** (departures), **2.1-4** (arrivals), and **2.1-5** (closed patterns). Northbound departures on Runway 5 turn south, then west and north, to climb above Miami International Airport (MIA) traffic arriving from the west. Some departures on a northeast heading are conducted by U.S. Customs aircraft, which maintain a low altitude of 2,000 feet along the coastline. The distribution of aircraft operations by flight track is presented in **Table 2.1-5**.

Table 2.1-4. Estimated Current and Projected Military and Government Aircraft Operations at Homestead ARS

User	Type of Aircraft	Current	Forecast			
			2000	2005	2015	Full Buildout
AFRC	F-16	12,000	12,000	12,000	12,000	12,000
FANG	F-15	1,100	1,100	1,100	1,100	1,100
Transient Military	C-141 (changing to C-17 by 2015)	104	104	104	104	104
Transient Military	C-5	20	20	20	20	20
Transient Military	P-3	1,500	1,500	1,500	1,500	1,500
Transient Military	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 Operations		**19,824**	**19,824**	**19,824**	**19,824**	**19,824**

Source: **Landrum & Brown 1999a**.

2.1.1.3 Employment and Population

Employment and on-site population associated with retained and conveyed property are shown in **Table 2.1-6**. The SEIS assumes direct employment of about 990 full-time equivalent jobs on retained areas, including military and civilian jobs with AFRC, FANG, and the Base Exchange, based on information available at the time of the analysis. This included 42 full-time military and 784 full-time civilian employees. It also included 1,133 part-time reservists who perform training one weekend each month and for two weeks during the year. The time they spend working at Homestead ARS is equivalent to about 163 full-time jobs. As of fiscal year 2000, assigned personnel at Homestead ARS included 1,041 part-time reservists (150 full-time equivalents) and 572 full-time military and civilians. The change in employment does not discernibly change the SEIS analysis and would not affect the reuse of the disposal property.

Direct employment on conveyed land is assumed to increase from about 100 jobs currently up to about 480 jobs at full buildout and includes jobs with the FLARNG, U.S. Customs, the School Board of Miami-Dade County, DOL, Homeless Trust, regional park, bank, and former credit union property. The increase in employment on conveyed land over the planning period reflects expected increases in staffing at the Homeless Trust and Job Corps programs and expansion of the regional park. It also reflects a potential increase in employment at the bank and with future development of the former credit union properties. Future development on conveyed land will support a small number of construction jobs. This number varies depending on the timing of development, mostly associated with the regional park, Jobs Corps, and Homeless Trust facilities. As a result, total jobs associated with the retained and conveyed property are expected to vary from 1,400 to 1,500 jobs during the analysis period.

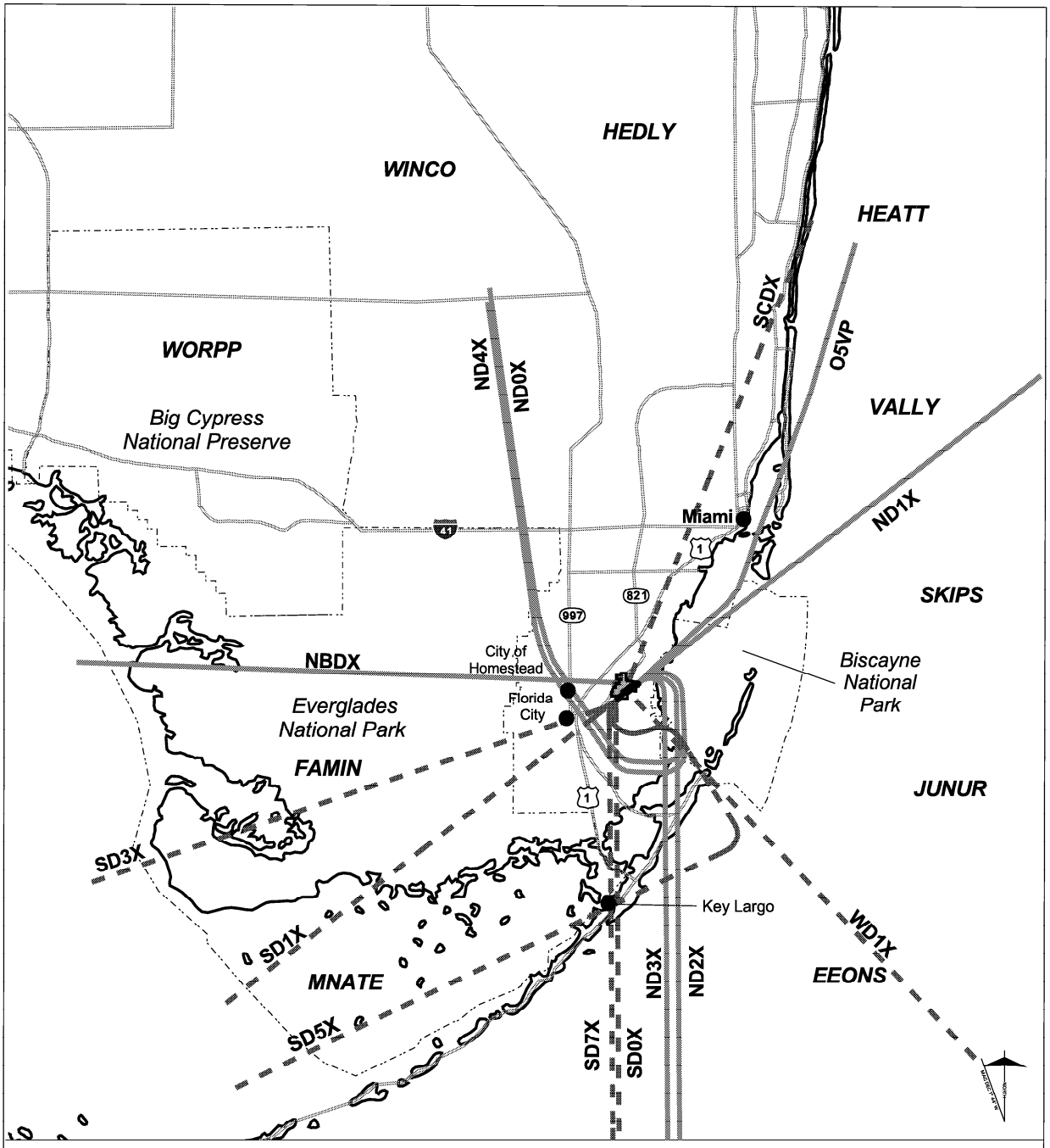


Figure 2.1-3
Current Departure Flight Tracks
at Homestead ARS

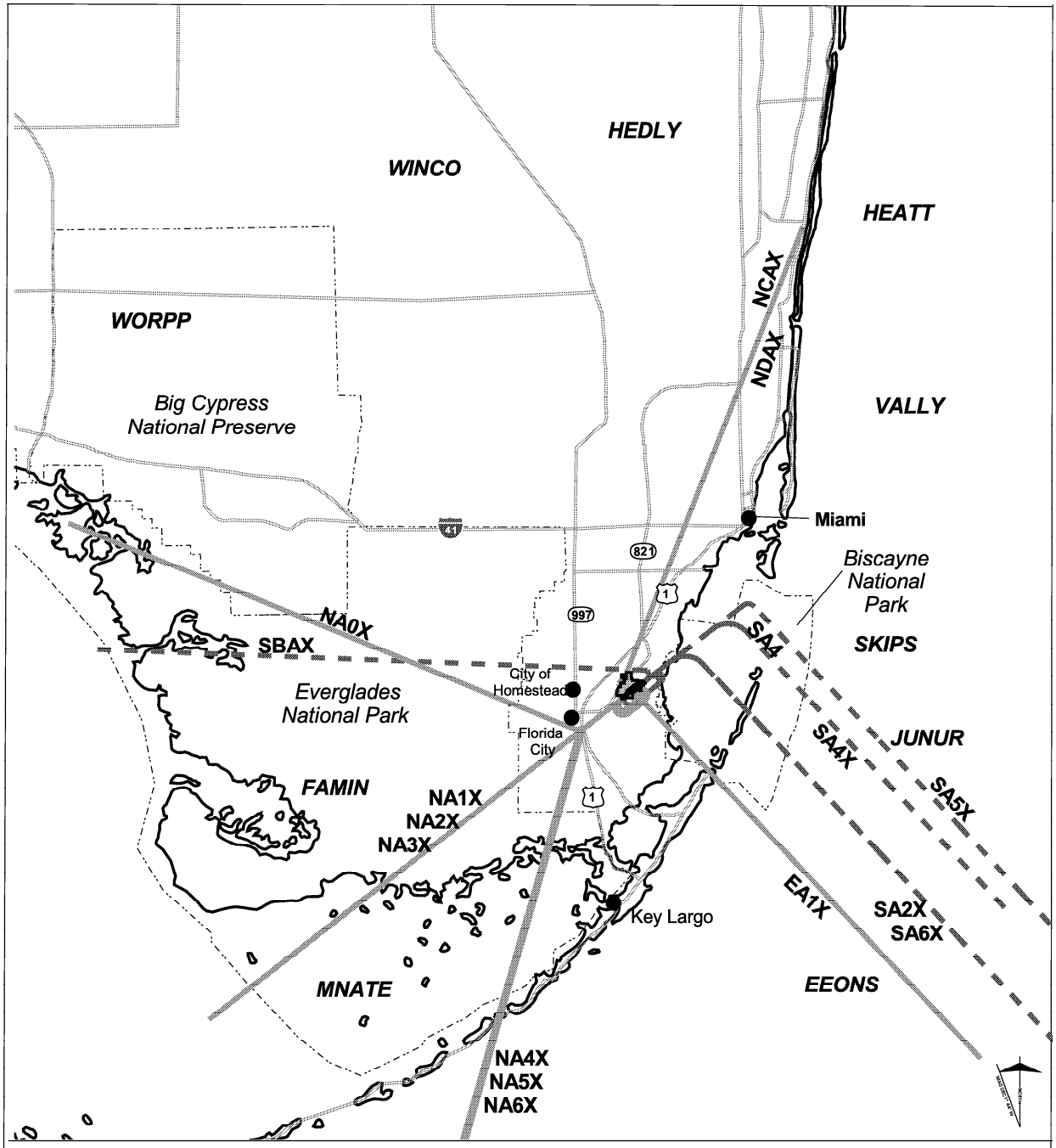


Figure 2.1-4
Current Arrival Flight Tracks
at Homestead ARS

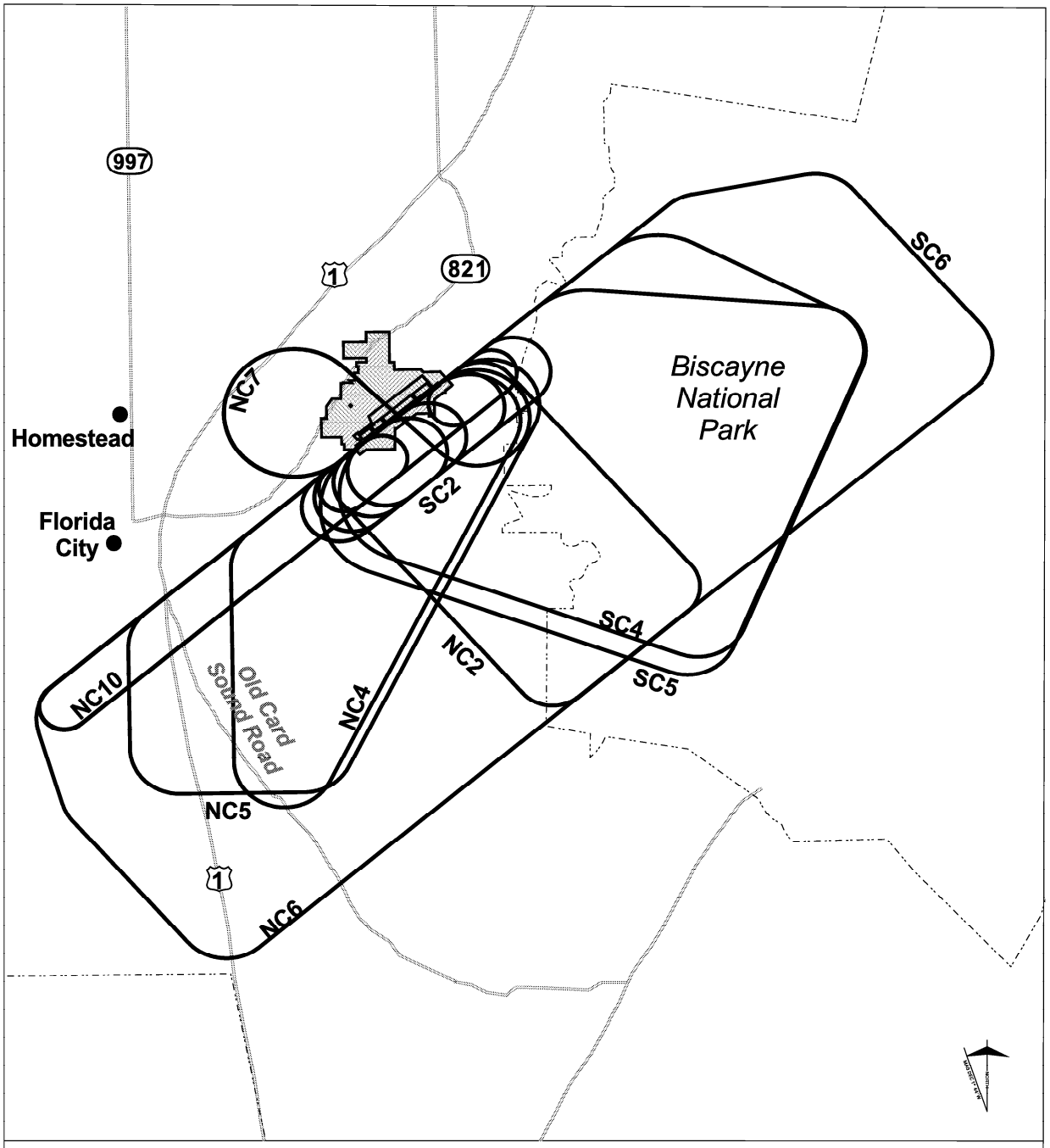


Figure 2.1-5
Current Closed Patterns
at Homestead ARS

Table 2.1-5. Estimated Distribution of Current Aircraft Operations by Flight Track

Aircraft	Current Operations[1]	Percent of Operations by Flight Track[2]															
Arrivals		**NA0**	**NA1**	**NA2**	**NA3**	**NA4**	**NA5**	**NCA**	**SA2**	**SA4**	**SA5**	**SA6**	**SBA**	**EA1**			**Total**
F-15	500			16.4	73.9				8.1			1.6					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		90.0								10.0						100.0
C-5	10		90.0								10.0						100.0
P-3	500		90.0								10.0						100.0
H65	500												100.0				100.0
PA31	200		90.0								10.0						100.0
C206	200		90.0								10.0						100.0
H60	200							2.5						97.5			100.0
C550	200		90.0								10.0						100.0
Departures		**ND0**	**ND1**	**ND2**	**ND3**	**ND4**	**NBD**	**SD0**	**SD1**	**SD4**	**SD5**	**SD6**	**SD7**	**SD8**	**SCD**	**WD1**	**Total**
F-15	500	70.2		10.0				4.4		6.6	8.9						100.0
F-16	3,600	33.6	0.6	3.8	1.7	50.4			0.1		3.9	5.6	0.2	0.3			100.0
C-141	52				90.0								10.0				100.0
C-5	10				90.0								10.0				100.0
P-3	500				90.0								10.0				100.0
H65	500														100.0		100.0
PA31	200		90.0						10.0								100.0
C206	200				90.0								10.0				100.0
H60	200						2.5									97.5	100.0
C550	200		9.4		80.6				1.0				9.0				100.0
Closed Patterns		**NC2**	**NC4**	**NC5**	**NC6**	**NC7**	**NC10**	**SC2**	**SC4**	**SC5**	**SC6**						**Total**
F-15	100	73.4						26.6									100.0
F-16	4,800	46.1	7.8	7.2	15.0	15.4	0.1	5.0	0.9	0.8	1.7						100.0
P-3	500	45.0			45.0			5.0			5.0						100.0
H65	500				90.0						10.0						100.0
PA31	500	90.0						10.0									100.0
C206	500	90.0						10.0									100.0
H60	500				90.0						10.0						100.0
C550	500	90.0						10.0									100.0

Source: **Landrum & Brown 1999b**.

Notes: [1] Current operations are estimated based on annual activity by military and U.S. Customs Service.

[2] Flight tracks are identified in Figures 2.1-3, 2.1-4, and 2.1-5.

Table 2.1-6. On-Site Employment and Population—Existing Reuse Property

	Current	2000	2005	2015	Full Buildout
Employment					
On-site jobs (retained land)[1]	990	990	990	990	990
On-site jobs (conveyed land)[2]	100	390	410	450	480
On-site construction jobs	NA	110	10	40	NA[3]
Total On-Site Employment	**1,090**	**1,490**	**1,410**	**1,480**	**1,470**[4]
On-Site Population	160[5]	1,210	1,210	1,210	1,210

Source: **HARB 1998**.
Notes: Estimates rounded to the nearest ten.
[1] Includes 1,133 part-time Air Force reservists calculated as 163 full-time equivalent jobs, based on number of annual training days per reservist.
[2] Includes 132 part-time FLARNG guardsmen calculated as 19 full-time equivalent jobs.
[3] Construction workers not estimated for full buildout because the time frame is not known.
[4] Total without construction workers.
[5] Continuous average occupancy of visitors' quarters.
NA not available

Total residential population on the retained and conveyed land is also shown in Table 2.1-6. This residential population is primarily associated with the Job Corps, Homeless Trust, and Meta Therapy Centers. Residents of the Homeless Trust Center and Job Corps could comprise a continual population of about 1,050 temporary residents. It is assumed that full occupancy could be achieved by 2000. In addition, the Visiting Officers' Quarters (VOQ)/Visiting Airmen's Quarters (VAQ) in the cantonment have a combined capacity of 197 temporary residents. Occupancy varies from about 60 to 100 percent. An average of 160 temporary residents is assumed for analysis. On the first weekend of each month, when unit training is conducted, there are about 375 reservists at Homestead ARS, of which 197 are accommodated in VOQs and VAQs and about 80 are lodged in commercial lodging in the City of Homestead.

Other visitors to these areas will include customers at the commercial facilities and users of the regional park. Customers of the bank are assumed to work at Homestead ARS or live in the vicinity. However, the regional park is expected to attract visitors from a wider area. The park is being designed to serve about 750,000 annual users.

2.1.1.4 Traffic and Utilities Use

Table 2.1-7 summarizes current and projected vehicle trips associated with land uses on the retained and conveyed areas. The daily vehicular traffic reflects trips by personnel arriving and leaving the cantonment and conveyed areas. In addition, it includes trips by residents at the Homeless Trust and Job Corps Centers. As facilities are developed at the regional park, there will be additional traffic associated with park users. Traffic loads are expected to be greatest during times employees arrive to work in the morning and leave in the evening. There is also traffic on weekends associated with reservist training. Typically, an average of 375 reservists and guardsmen travel to and from the former base on unit training weekends. When the 2,400 person stadium and other sports facilities are developed at the park, there will be sporadic peak traffic loads for athletic events.

Table 2.1-7. Estimated Vehicle Trips—Retained and Conveyed Property

	Average daily vehicle trips				
	Current	**2000**	**2005**	**2015**	**Full Buildout**
On-Site Employees	3,878	4,872	5,256	5,451	6,617
On-Site Population	78	422	422	422	422
Regional Park Visitors	0	68	274	1,644	2,055
Total Daily Trips	**3,956**	**5,362**	**5,952**	**7,517**	**9,094**
Peak Hour Trips	***567***	***773***	***871***	***1,124***	***1,559***

Source: Derived from employment and population projected in Table 2.1-6 using Trip Generation, 6th Edition.

Current and projected utilities use for retained and conveyed areas is provided in **Table 2.1-8**. Demand was calculated based on standard consumption rates. The projected increases in utility use over the period of analysis will be associated primarily with an initial increase in residents at the Job Corps and Homeless Trust Centers and a gradual increase in use of the regional park. The additional increases for full buildout reflect potential expansion of the bank and the former credit union property.

Table 2.1-8. Estimated Utilities Use on Retained and Conveyed Property

	Current	**2000**	**2005**	**2015**	**Full Buildout**
Water (mgd)[1]	0.09	0.29	0.29	0.30	0.30
Wastewater (mgd)[1]	0.07	0.23	0.23	0.24	0.24
Solid Waste (tons/day)[2]	1.5	4.6	4.6	4.9	5.0
Electricity (MWh/day)	50	56	56	67	67

Source: SAIC; **Baichoo 1998**.
Notes: [1] Does not include consumption attributable to deteriorated distribution or collection lines.
[2] Includes recyclable wastes.
mgd million gallons per day
MWh megawatt hours

Water use and wastewater generation at the former base has historically been high due to leaky distribution lines. Metered water use has averaged about 0.8 million gallons per day (mgd), and wastewater delivered from the base to the South District Wastewater Treatment Plant has been as high as 2.0 mgd. Recent repairs and replacements of distribution lines have been completed in the cantonment and conveyed parcels, and unused portions of the system have been plugged. It is expected that water use and wastewater generation at the retained and conveyed properties will decline considerably. These declines are reflected in Table 2.1-8. The projections are based on standard consumption rates for the types of activities on these areas. The projected increase in solid waste generation reflects new residential use at the Homeless Trust and Job Corps Centers.

2.1.1.5 Military Canal

Stormwater runoff at former Homestead AFB drains into a network of on-site canals, is collected by a Boundary Canal system, and discharges into Military Canal, which carries the water to Biscayne Bay. The system and its components are described in detail in Section 3.10. The sediments of Military Canal have been the subject of study of contamination due to past activities at Homestead AFB. The Air Force is conducting a Feasibility Study on the appropriate method to use to remediate Military Canal

sediments. Based on the outcome of this study and review by regulators and the public, a remediation method will be selected and implemented. Remediation activities could start as early as fiscal year 2001.

2.1.2 Process for Defining Alternatives

The purpose of the SEIS is to assist Air Force decisions regarding disposal of approximately 1,632 acres of surplus land at former Homestead AFB and FAA decisions concerning the suitability of the former base for a commercial airport, unconditional approval of a one-runway Airport Layout Plan, possible funding of airport development, and other actions and approvals related to the safe and efficient operation of a commercial airport. As required by NEPA and its implementing regulations, the SEIS examines reasonable alternatives for the reuse of the disposal property, to help the Air Force and FAA understand potential outcomes associated with disposal options for the property. These alternatives encompass a range of uses and intensities of future development on the disposal property, within the scope of previous decisions. The analysis of a range of alternatives can also provide information to assist in identifying any appropriate mitigation measures.

The 1,632 acres that are the focus of this analysis do not include about 30 acres that may be retained by the Air Force or transferred to the FLARNG, nor does it include 26 acres proposed to be transferred to the School Board of Miami-Dade County. It is possible these dispositions will not take place and one or both of those parcels could be available for disposal. It is not anticipated that adding any portion of the 56 acres in question will appreciably affect the analysis or alter the conclusions of this SEIS.

Since completion of the Final EIS for the Disposal and Reuse of Homestead AFB in 1994, several events have occurred that influence possible development of the property available for disposal. Subsequent to signing the ROD on the 1994 EIS, the Air Force conveyed almost 383 acres of the former base property to public and private entities for reuse. The uses and activities on this land will continue under any alternative considered for the remaining surplus property, including the Proposed Action. Because AFRC, FANG, and U.S. Customs will conduct aircraft operations for the foreseeable future, any reuse alternative will also involve continued use of the airfield for aviation.

2.1.2.1 Definition of the Local Redevelopment Authority's Proposed Action

In accordance with DOD policy, the Proposed Action for purposes of analysis in the SEIS is the reuse plan submitted to the Air Force by the Local Redevelopment Authority, Miami-Dade County. The county submitted a plan to develop a commercial airport at former Homestead AFB. This plan, adopted into the Miami-Dade County Comprehensive Development Master Plan (CDMP), forms the foundation for the Proposed Action in the SEIS.

In June 1996, Miami-Dade County entered into a lease agreement with Homestead Air Base Development, Inc. (HABDI) to develop and operate an airport at former Homestead AFB. The HABDI development plan incorporated elements of existing Miami-Dade County plans and studies, including the county's Airport Master Plan. It also schematically defined commercial and industrial development for revenue-producing property at the future airport.

Miami-Dade County applied for a Surface Water Management Permit from South Florida Water Management District for the first phase of proposed new construction of a regional airport at former Homestead AFB. The county also applied for approval of that initial development under Chapter 288 of the Florida Statutes. This process resulted in adoption of an amendment to the county's CDMP. The amendment identifies land use designations for the former base property and proposed levels of development. The Proposed Action for the SEIS incorporates, but is not limited to, these elements.

Because of delays in implementing the county's plans and changes in regional and local circumstances, the projections of development and airport operations under the Proposed Action have been adjusted to reflect a nominal five-year delay in implementing airport development. The delay in facility construction and startup indicate that levels of operation originally expected to be obtained by 2000 are more likely to be achieved by 2005. However, it is possible that the levels of operation forecast for 2015 in the 1994 master plan could be achieved by 2015, although they would represent an optimistic projection. General aviation operations were reduced by half from the county's forecasts to reflect changes in the number of general aviation aircraft based in Miami-Dade County as a whole and in the Homestead area in particular. Appendix A provides a detailed discussion of the assumptions and analysis behind the adjustments in forecasts of potential civil aircraft operations for the Proposed Action.

Widely used and standard planning factors, such as floor area ratios and utilities consumption rates, have been used to estimate details about construction, employment, and other aspects of the Proposed Action for the purpose of analyzing environmental impacts. In most cases, actual planning for the Proposed Action has not progressed far enough to provide these details, and planning estimates had to be generated for the SEIS.

2.1.2.2 Identification of Alternatives

Several factors were considered in identifying possible alternatives to the Proposed Action for analysis in the SEIS, including review of existing plans and studies, expressions of interest, economic demand, land use compatibility, and the ability of an alternative to be implemented. The following paragraphs describe how these factors were used in defining the alternatives.

Review of Existing Plans and Studies. Existing plans and studies addressing reuse of former Homestead AFB include the 1994 Airport Master Plan, the 1993 Homestead Air Force Base Re-Use and Economic Redevelopment Plan, the 1994 Homestead Air Force Base Reuse and Economic Development Implementation Plan, and the 1993 Homestead Air Force Base Feasibility Study, Phase I: Assessment of Potential Civilian Aviation Uses. These plans and studies identified several possible uses for the property and provided a basis for assigning land use for airport, commercial, and industrial development.

Expressions of Interest. Several sources were used to identify ideas for reuse of the surplus property, including ongoing planning efforts by local redevelopment entities (such as Vision Council, Team South Dade, and the Mayor's Economic Summit for Redevelopment of South Dade County), inputs received during public scoping for the SEIS, and subsequent proposals received by the Air Force.

Economic Demand. A market study was conducted by Science Applications International Corporation (SAIC) to evaluate the economic demand for private-sector residential, commercial, and industrial development in south Miami-Dade County, based on current and projected market conditions. This study provided a basis for estimating the potential for development and reuse of surplus property at former Homestead AFB in the event that the land is not transferred to Miami-Dade County for use as a commercial airport. The study considered the potential of latent local demands to generate reuse, as well as the effect of economic incentives on stimulating redevelopment.

Land Use Compatibility Considerations. Reasonable uses of the property were identified in the context of existing uses at the former base. Specifically, under all alternatives the airfield will continue to be used for military and government aircraft operations. Other activities on retained and previously conveyed property will also continue. These include educational, residential, commercial, military mission support, and administrative activities. Considerations of compatibility with existing activities resulted in the

elimination of some potential reuse options, such as residential development adjacent to the airfield, or uses that interfered with military and government operations.

Ability to be Implemented. Reasonable alternatives carried forward for detailed analysis need to relate to a disposal decision that can be made by the Air Force. Although specific property recipients were not always identified, consideration was given to the viability of implementing potential alternatives within the constraints of applicable property disposal laws.

Another consideration in developing alternatives for detailed analysis was the need to provide for the disposition and reuse of the entire surplus property. Each alternative comprises a complete reuse plan. Potential uses for individual parcels or portions of the surplus property were considered as possible components of the overall reuse alternatives and included as independent land use concepts.

The alternatives evaluation process resulted in the identification of two alternatives for detailed analysis, in addition to the Proposed Action and the No Action alternatives. One alternative was defined around a concept for developing a Commercial Spaceport at former Homestead AFB. Another alternative, the Mixed Use alternative, focuses on non-aviation reuses. Under that alternative, the Air Force would retain the airfield (915 acres) for continued military and government use, but there would be no civil airport. Reuse of the other 717 acres was defined from four sources: (1) the market study performed in connection with the SEIS, (2) a proposal received by the Air Force from Collier Resources Company, (3) a proposal received by the Air Force from the Hoover Environmental Group, and (4) a joint proposal submitted by Collier Resources Company and the Hoover Environmental Group subsequent to publication of the Draft SEIS. The county has not ever proposed a plan for this alternative, but disposal to the county in anticipation of the kinds of redevelopment analyzed in the Mixed Use alternative is also possible.

The No Action alternative assumes that no development would occur on the disposal property. It provides a comparative baseline for each of the action alternatives.

2.1.2.3 Quantification of Alternatives

Each of the comprehensive alternatives outlined above has been further described in terms of the amount of new construction and demolition, ground disturbance, impervious surface coverage, aircraft operations, on-site employment and population, vehicular traffic, utilities use, and amount of potential related off-site (secondary) development. These details were estimated by integrating geographic information (designated land use acreage, existing site coverage), projected disposition of existing facilities (reuse, renovation, or demolition), and planning metrics (e.g., floor area ratios, absorption rates, employees per square foot, utility consumption per employee or resident). Sources for the planning metrics have been extracted from existing plans, zoning criteria, previous base closure EISs, planning guidelines, case studies, redevelopment plans, and comparable existing development. It is recognized that the alternatives may not evolve precisely as envisioned in this SEIS, but these definitions provide a reasonable basis for analysis and comparison of potential environmental effects.

Reuse-related secondary development was estimated for two types of development: (1) off-site development directly related to the functions proposed at the former base property (e.g., off-site parking associated with the proposed commercial airport) and (2) residential, commercial, and industrial development to support in-migrating population attracted to the area because of reuse activities at former Homestead AFB. The amount of land needed to support secondary development was estimated using the average number of housing units per acre (for residential) and the average number of employees per acre (for commercial and industrial) in Miami-Dade County (**Usherson 1999**).

2.1.3 Baseline Growth and Development in the Region Surrounding Former Homestead AFB

Just as land use on the retained and conveyed property has been projected from 2000 to 2015, the area surrounding former Homestead AFB in southern Miami-Dade County can be expected to grow and develop over that time, independent of the disposition of the disposal property. In order to predict the level of potential growth and development that could occur over the time frame of analysis, various forecasts of population growth were examined.

Several organizations have generated population forecasts for Miami-Dade County, including the Department of Commerce's Bureau of Economic Analysis (BEA), the State of Florida, the University of Florida Bureau of Economic and Business Research (BEBR), and the Miami-Dade County Planning Department. BEBR develops high, medium, and low forecasts. Most of these organizations have forecasts through 2020. As **Figure 2.1-6** shows, there is close agreement among the BEA, state, and BEBR medium-growth forecasts. The Miami-Dade County forecasts, similar to the BEBR high-growth forecasts, anticipate rapid growth in population, partly attributable to increased immigration into the region, particularly from South and Central America. The BEBR low-growth forecasts project a decrease in population.

Given the consistency among the BEA, state, and BEBR medium-growth forecasts, they were selected as the most realistic basis for projecting baseline conditions for comparison to the Proposed Action and other reuse alternatives. Two adjustments were made to the forecasts. First, because the forecasts were only available for certain years (2000, in some cases 2005, and 2020), estimates had to be generated for the intervening analysis years (2005 and/or 2015). This was done through a straight-line interpolation. Second, BEA, state, and BEBR data are not available at the subcounty level. Only the Miami-Dade County forecasts addressed subcounty areas.

Miami-Dade County has proposed an amendment to its CDMP that revises the countywide population forecasts published in 1994 and adopted in 1996. The county's Department of Planning and Zoning estimates that the population has shown less growth in the past few years than anticipated. The county's new forecasts are more in line with those of the BEA, state, and BEBR medium-growth forecasts. The county has not generated subcounty projections reflecting these revised forecasts.

As Figure 2.1-6 shows, the county's high-growth population forecast for 2005 was very close to the interpolated BEA, state, and BEBR medium-growth forecasts for 2015. Therefore, the county forecasts for subcounty areas in 2005 were used as the basis for estimating more moderate growth projections for 2015. These are shown in **Table 2.1-9** for Miami-Dade County and the area of the county south of Eureka Drive, where former Homestead AFB is located and most of the effects of activities at the former base are concentrated.

Table 2.1-9. Recent and Projected Baseline Population for Miami-Dade County (Moderate Growth)

Population	1995	2000[1]	2005[1]	2015
Miami-Dade County	2,056,789	2,175,243	2,293,697	2,530,604
South County	163,235	182,324	201,414	239,592

Source: Derived from **Miami-Dade County 1998f**.
Note: [1] Interpolated data.

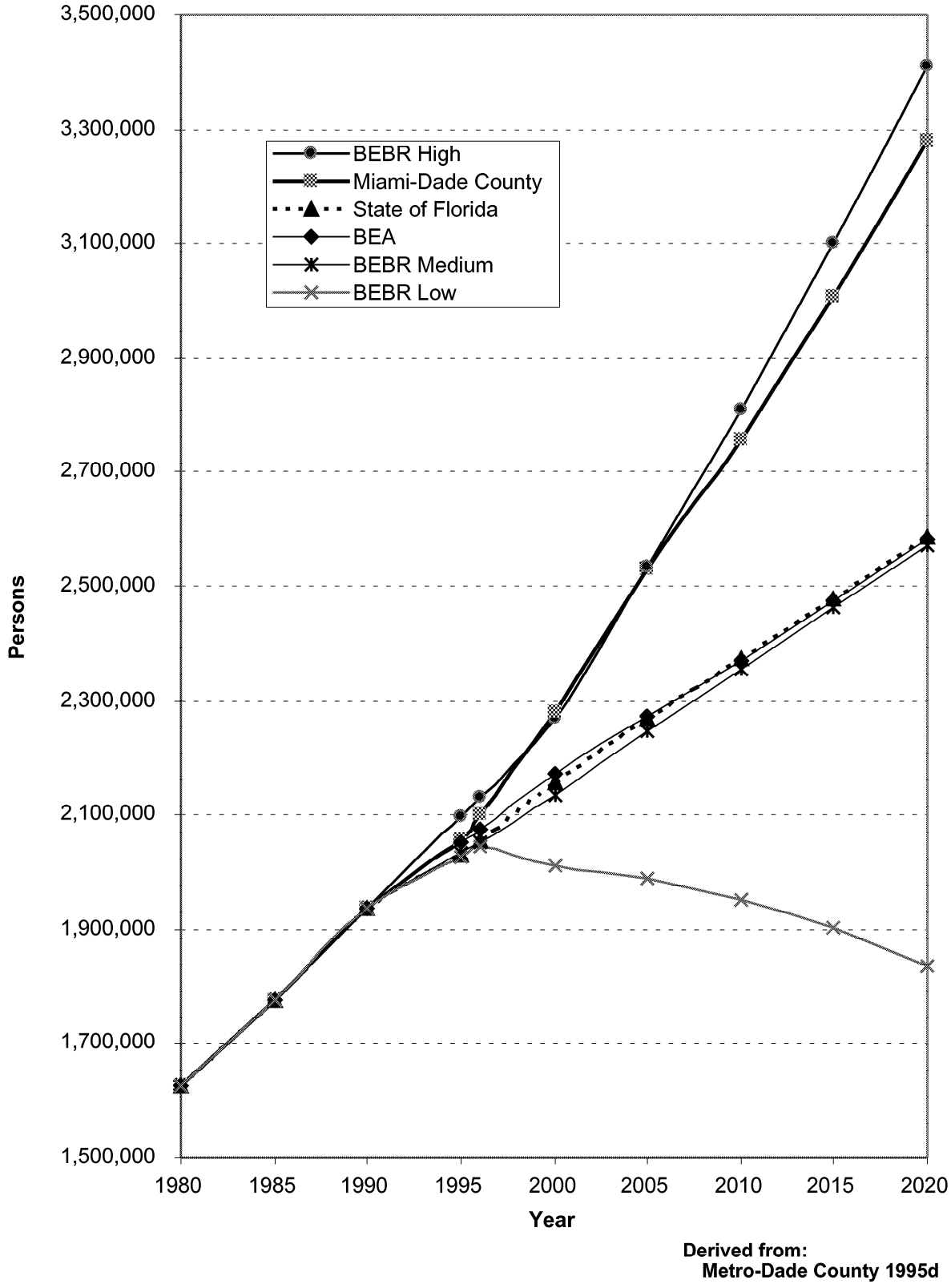


Figure 2.1-6
Population Forecasts for Miami-Dade County

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The population growth can be expected to result in development of additional residential, commercial, and industrial land uses and conversion of vacant (undeveloped) and, potentially, agricultural lands to more intensive use. The amount of development that might be expected between now and 2015 has been estimated by applying typical acreage ratios for housing and employment to the projected baseline population growth. **Table 2.1-10** shows the estimated changes in land use in the portion of Miami-Dade County south of Eureka Drive. The table shows that, as projected development increases, the amount of residential, commercial, and industrial land use is also projected to increase, and there is expected to be a corresponding decrease in the vacant land available for development (i.e., not otherwise protected) and in agricultural land. Vacant land that is protected (e.g., wetlands) is not projected to be affected because of the prohibitions against development on those lands.

Table 2.1-10. Projected Baseline Changes in Land Use in South Miami-Dade County

Land Use Category		1995–2000[1] (acres)	2001–2005[1] (acres)	2006–2015 (acres)	Total Change
Residential (High Density)		234	234	468	936
Residential (Medium Density)		1,649	1,649	3,298	6,596
Commercial		188	188	376	752
Industrial		48	47	95	190
Vacant (Unprotected)[2]		–1,114	–1,115	–2,229	–4,458
Agriculture[2]		–1,004	–1,004	–2,009	–4,017

Source: SAIC, based on Miami-Dade County Transportation Analysis Zone data.
Notes: [1] Interpolated data.
[2] Negative numbers indicate a decrease in the land use category.

The changes shown in Table 2.1-10 were calculated based on data by Transportation Analysis Zone (TAZ) developed by the Miami-Dade County Planning Department, applying forecasts for 2005 to 2020 and interpolating the intervening years. There are 146 TAZs in the county south of Eureka Drive. Future residential development was estimated by taking the ratio of residential development to population in 1994 and multiplying by the projected population increases. The distribution between high-density and medium-density housing was based on existing 1994 ratios within each TAZ. Commercial development was estimated at 10 percent and industrial development at 2.5 percent of residential, which were the existing ratios in the county in 1994. The estimated increases in development were then subtracted from existing unprotected vacant land and agricultural land. Within each TAZ, if there was vacant unprotected land available, it was assumed to be developed first. If there was not sufficient vacant unprotected land available in the TAZ, it was assumed that agricultural land would be converted. If there was neither sufficient vacant nor agricultural land in the TAZ, the residential density was increased for that TAZ.

Miami-Dade County has established an Urban Development Boundary (UDB) within which most development is confined. Development outside this boundary is highly restricted, and supporting infrastructure is very limited. Section 3.6 discusses the UDB in detail. It is anticipated that most of the land use changes reflected in Table 2.1-10 would occur within the UDB. However, it is likely that some development will occur outside the UDB.

It is important to recognize that these growth and development estimates are for baseline growth over the next 15 years and do not include any projected reuse of the disposal property at former Homestead AFB. They only include continued operations at Homestead ARS and on the surplus property that has already been conveyed.

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2.2 PROPOSED ACTION (COMMERCIAL AIRPORT)

The Proposed Action is to transfer the total remaining surplus land (the disposal property) at former Homestead AFB, approximately 1,632 acres including the airfield, to Miami-Dade County Aviation Department (MDCAD) for development of a commercial airport, designated Homestead Regional Airport (HST). The Air Force proposes to transfer the property by means of a public benefit conveyance, though other methods of conveyance could be used. In general, the Proposed Action is expected to be developed and operated as outlined in the *Final Homestead Air Force Base Feasibility Study Airport Master Plan* (1994), with adjustments described in the Airport Planning Technical Report in Appendix A, as well as 1998 amendments to the Miami-Dade County CDMP. The following description of the Proposed Action also incorporates conceptual elements of the HABDI development proposal that are consistent with the CDMP, as amended. These sources provided the framework for the type and intensity of activities that could occur on the disposal property.

The CDMP amendments used as one of the sources for defining the Proposed Action were based on approval given in April 1998 by the Florida Administration Commission (composed of the Governor and Cabinet) of Miami-Dade County's proposed "Phase 1" (initial) development of HST. This approval was given pursuant to the county's application under Chapter 288 of the Florida Statutes, a process specifically developed to facilitate reuse of defense installations closed under the Base Closure and Realignment Act. The Administration Commission's approval was subsequently reversed and remanded by the Third District Court, and resolution is awaiting the completion of this SEIS. For analysis purposes, the county's plan, as initially approved by the commission and reflected in recent CDMP amendments, is considered a reasonable representation of the county's intentions and the best available description of the proposed airport development.

Under the Proposed Action, HST is assumed to be developed over time to function primarily for scheduled air passenger services, with some air cargo and general aviation operations. HST would serve a foreseeable need for additional commercial service airport capacity in Miami-Dade County, as described in Appendix A. A small percentage of operations are projected for unscheduled passenger charters and aircraft maintenance. The airport would be dual-use with continued military and government air operations.

In addition to the runways, almost half the disposal property is expected to be used for aviation support and aviation-related uses. Development would likely include a new passenger terminal and support facilities (such as rental car lots), air cargo and aircraft maintenance hangars, general aviation facilities, and expansion of aprons and taxilanes. Based on the CDMP and HABDI plans, the other half of the property is assumed to be developed as mixed industrial (e.g., fabrication and assembly, warehousing) and commercial uses (e.g., retail, offices, hotel), or left as open space.

Miami-Dade County has identified a number of measures to address potential adverse impacts from airport development. These include developing and implementing a Surface Water Management Master Plan, a Wildlife/Habitat Management and Mitigation Plan, and a Noise Management and Mitigation Plan. The county has also committed to several strategies and initiatives outlined in CDMP amendments. These mitigation measures, assumed to be incorporated in the Proposed Action, are described in Section 2.2.6.

2.2.1 Land Use and Development

This section describes and estimates land use and development associated with the Proposed Action on former Homestead AFB property, based on the documents described above and on various planning

factors. **Figure 2.2-1** illustrates overall land uses for the disposal property, and **Table 2.2-1** summarizes the estimated acreage for each land use. Over half of the 1,632 acre disposal property is comprised of the airfield (approximately 915 acres). The remaining land area (approximately 717 acres) is expected to be used about equally for aviation support and for other revenue-producing non-aviation development (including commercial and industrial uses). A small area (28 acres) would remain as open space with possible public recreational use. It is probable that the county would acquire additional land for navigation equipment (about 12 acres), and the runway protection zones (about 54 acres) at some point in the future (shown in Figure 2.2-1).

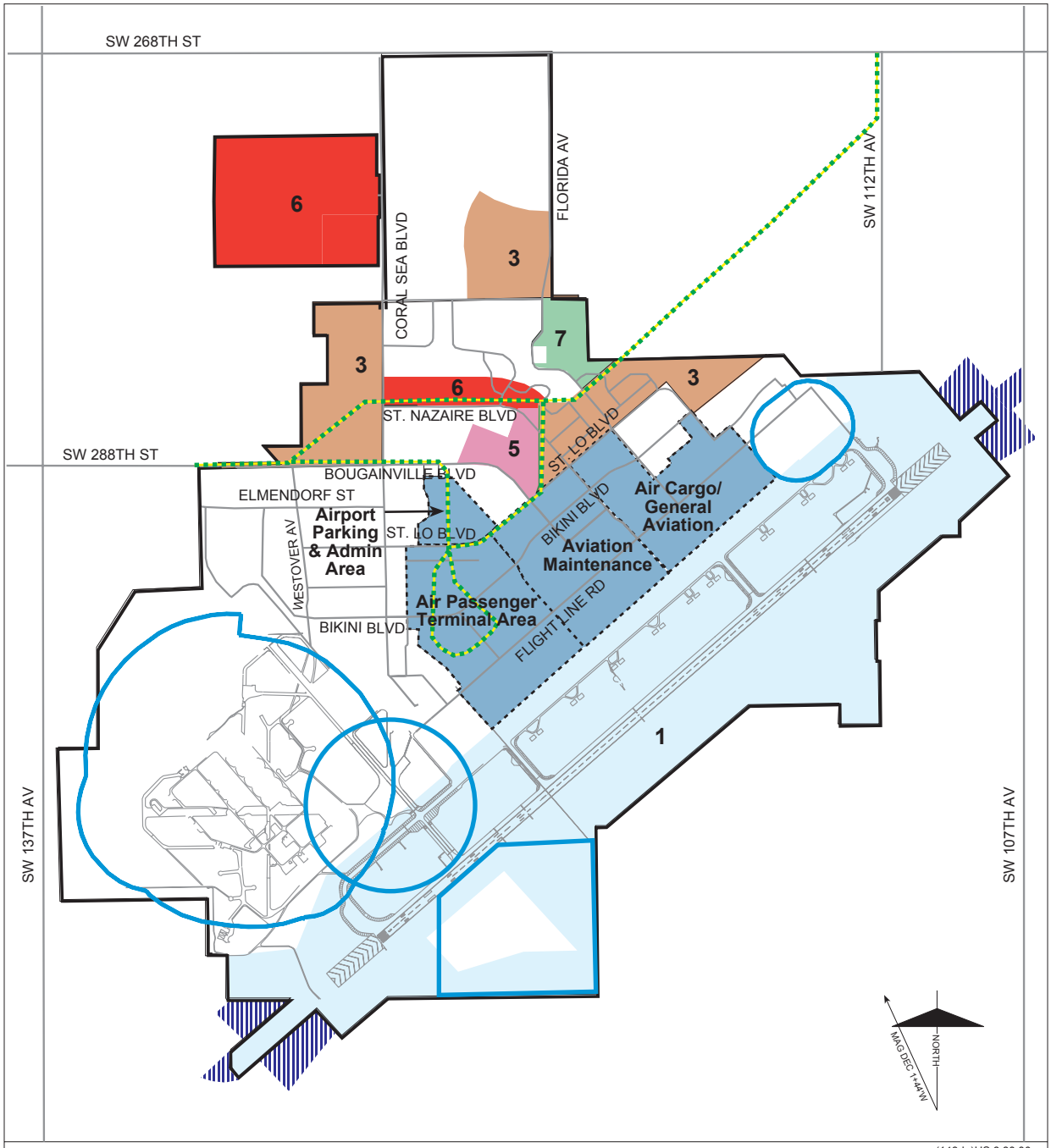
The county has proposed to develop the property in phases. **Table 2.2-2** estimates the amount of facility construction completed (cumulatively) at the end of each analyses phase and at full buildout. The first phase, between 2000 and 2005, is assumed to include construction of aviation facilities specified in the current CDMP amendments. A small amount of start-up development in commercial and industrial areas is assumed in the first phase. In general, the estimated development beyond the first phase reflects a five-year delay from that projected in the Airport Master Plan of 1994 and the HABDI proposal.

Table 2.2-2 shows that a total of about 4.8 million square feet of new facilities are assumed to be constructed on the disposal property by 2015. By full buildout, there could be up to 6.4 million square feet of facilities and 12.9 million square feet of new paved area. The estimates for full buildout represent maximum facility development based on planned or standard local floor area ratios for the designated land use. About 449,000 square feet of facility could be reused or renovated (mostly for aircraft maintenance use), and about 312,000 square feet could be demolished between 2000 and 2015. Projected demolition is significantly less than that identified in the 1994 Disposal and Reuse Final EIS because much of it (about 2.9 million square feet) has already occurred.

Estimated ground disturbance is shown in **Table 2.2-3**, including disturbance from demolition and site preparation for new facilities, roadways, parking areas, and apron areas. About 566 acres are assumed to be disturbed on the disposal property by 2015, increasing to about 710 acres by full buildout. Most areas north of the runway and aprons, excluding some pine rockland areas, would probably be disturbed by 2015.

Table 2.2-4 summarizes the area of impervious surface estimated for the disposal property resulting from the proposed development. The impervious surface on the disposal property is estimated to increase from about 469 acres (29 percent) currently to 724 acres (44 percent) by 2015. Overall, the former base property could increase from about 26 percent to about 38 percent impervious surface.

In addition to the facilities, infrastructure improvements would be constructed. Several roadways are expected to be widened to provide access through the airport and within different functional areas. Main roads through the disposal property would probably generally follow existing alignments, but many may be widened. Initially, it is expected that about half a mile of small roadways would be widened to provide better traffic flow and to comply with building codes. St. Nazaire Boulevard is assumed to be developed as a 75 foot wide roadway from SW 288th Street east and north through the airport. The final alignment has not been designed, but it may require use of some previously transferred property for the expanded right-of-way. As traffic increases during the analysis period, additional signals and signage would be added to improve circulation. Other projects are identified in the *Near-Term Roadway Improvements, Homestead-Dade County Regional Airport, 1996* (**PBS&J 1996b**).



LEGEND

1	Airfield	5	Institutional	9	Utility*
2	Aviation Support	6	Commercial	10	Military/Government*
3	Industrial	7	Recreation/ Open Space	11	Caretaker*
4	Residential*		Retained & Conveyed Areas	*	Not Used

Former Homestead AFB Boundary
Existing Safety Zones
Additional Land to be Acquired
New Roadway
Subareas

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Area Shown

0.25 0 0.25 0.5
Scale In Miles

Derived from: AFBCA 1996, PBS&J 1994, Stierheim 1998, PBS&J 1996a

Figure 2.2-1
Land Use–Proposed Action (Commercial Airport)

Table 2.2-1. Estimated Acres by Land Use—Proposed Action

Land Use	Acres[1]	Percent
Airfield	915	56
Aviation Support	327	20
Industrial	187	12
Commercial	152	9
Institutional	24	1
Open Space	28	2
Total Disposal Property	**1,632**	**100**
Retained and Conveyed Property[2]	1,306	
Total	**2,938**	

Source: Derived from **Miami-Dade County 1998e**.
Notes: [1] All acreages are approximate and rounded to the nearest acre.
[2] Includes approximately 30 acres expected to be retained and 26 acres proposed to be transferred to the School Board of Miami-Dade County.

Table 2.2-2. Estimated Facility Construction and Reuse by Land Use—Proposed Action

Land Use Category	Facility Retention[1,2] (000 SF)	Facility Demolition[3] (000 SF)	New Pavement[4] (000 SF)	Cumulative New Facility Construction (000 SF)			
				2000	2005	2015	Full Buildout
Airfield	3	0	500[5]	0	0	0	0
Aviation Support	417	159	4,901	0	342	1,417	2,381
Industrial	8	9	3,467	0	213	1,766	2,228
Commercial	0	42	3,566	0	145	1,615	1,615
Institutional	21	102	417	0	0	0	146
Open Space	0	0	0	0	0	0	0
Total Disposal Property	**449**	**312**	**12,851**	**0**	**700**	**4,799**	**6,370**
Retained and Conveyed Property	1,456	19	1,155	155[6]	174	479	497
Total	**1,905**	**331**	**14,006**	**155**	**874**	**5,277**	**6,867**

Source: SAIC; **NPS 1996b**, **HABDI 1994**, **PBS&J 1997b**.
Notes: [1] Includes facilities to be renovated.
[2] Does not include miscellaneous utility structures throughout the former base totaling about 13,270 square feet.
[3] Does not include demolition of paved areas nor removal of about 40,000 square feet of temporary structures on the aircraft ramp areas.
[4] New pavement primarily for parking and internal circulation at full buildout.
[5] For new fuel storage tanks, engine run-up facilities, holding pad, and taxilanes.
[6] Includes 135,000 square feet for new Homeless and Meta Therapy Centers and 20,000 square feet for Job Corps security facility (estimated).
SF square feet

Table 2.2-3. Estimated Acres Disturbed—Proposed Action

Land Use	Cumulative Acres			
	2000	2005	2015	Full Buildout
Airfield	0	0	14	14
Aviation Support	0	112	221	298
Industrial	0	19	160	202
Commercial	0	13	171	171
Institutional	0	0	0	25
Open Space	0	0	0	0
Total Disposal Property[1]	**0**	**144**[2]	**566**	**710**
Retained and Conveyed Property	33[3]	40	74	77
Total	**33**	**184**	**640**	**787**

Source: SAIC.
Notes: [1] Includes disturbance from demolition of facilities, removal of pavement, and site preparation for new facilities and pavement.
[2] Does not include 0.3 acres disturbed for new storm drains.
[3] Disturbance associated with construction for Job Corps and Homeless Trust Centers and new facilities in regional park.

Table 2.2-4. Estimated Impervious Surface—Proposed Action

Land Use	Cumulative Acres				
	Existing	2000	2005	2015	Full Buildout
Airfield	204	204	204	216	216
Aviation Support	202	202	227	263	298
Industrial	34	34	44	114	134
Commercial	19	19	27	121	121
Institutional	8	8	8	8	14
Open Space	2	2	2	2	2
Total Disposal Property	**469**	**469**	**512**	**724**	**785**
Percent Coverage Disposal Property	**29%**	**29%**	**30%**	**44%**	**48%**
Retained and Conveyed Property[1]	309	290	296	323[2]	324
Total[3]	**778**	**761**	**810**	**1,049**	**1,111**
Total Percent Coverage	**26%**	**26%**	**27%**	**36%**	**38%**

Source: SAIC.
Notes: [1] Declines reflect clearing of land for new regional park and minor construction for Homeless Trust and Job Corps facilities.
[2] Does not include 2 acres for widening of loop roadway.
[3] Includes pavement and building footprints.

A system of stormwater drains would be constructed, consistent with the county's Surface Water Management Master Plan and Environmental Resources Permit (ERP) application to South Florida Water Management District (SFWMD). The plan includes almost 2 miles of French drains in the disposal area to support the first phase of development. The trenches would be about 3 feet wide and 15 feet deep.

Discussions are ongoing between the county and the Air Force on how to implement some components of the system as currently designed. If revisions are needed, it is expected that the system would still perform to the same standards. Existing water supply and wastewater lines are expected to be replaced as the land is redeveloped. The new lines would be tied into local utility systems.

The following sections describe proposed activities and development associated with each land use category.

2.2.1.1 Airfield

The airfield land use category (915 acres) comprises about 56 percent of the disposal property, including the runway, which is 11,200 feet long and 300 feet wide. The airfield would support military, other government, and civilian aviation operations. New navigational equipment would need to be installed to upgrade and improve runway capabilities for commercial operations. Specifically, Runway 5 would be upgraded to Category II/III with precision approach lighting, and a standard instrument landing system (ILS) or global positioning system (GPS) would be installed on Runway 23. The new approach and runway lighting is assumed to be similar to current systems, except that the configuration of approach lighting for Runway 23 may extend between 500 and 1,000 feet beyond the airport boundary to the northeast. Runway and approach lights include constant and sequenced flashing lights and have a range of intensity settings, allowing adjustments depending on weather and visibility. Runway lighting is oriented downward to illuminate the runway rather than upward, which could cause a blinding glare for pilots. Between 2005 and 2015, a new parallel taxiway (about 4,500 feet long and 100 feet wide) may be constructed between Taxiways C and D. Taxiways linking the runway to the parallel taxiway may be improved through widening and addition of a new high-speed exit. See Appendix A for more detailed facility descriptions.

2.2.1.2 Aviation Support

Aviation support development was estimated based on the ALP, the CDMP amendments, and the HABDI plan. Approximately 327 acres, or about 20 percent of the total disposal property, is expected to be used for aviation support. The aviation support areas are located in the central portion of the base just north of the parallel taxiway and are expected to include a terminal complex for air passenger service, an aircraft maintenance area, a cargo/general aviation area, aircraft ramp areas, vehicle parking, rental car lots, and supporting administrative areas for MDCAD. This area is locally referred to as the "Beachfront." Altogether, by full buildout, it is assumed that about 417,000 square feet of facilities in the aviation areas could be reused or renovated, about 159,000 square feet would be demolished, and about 2.4 million square feet of new facilities would be constructed.

Initial construction of aviation facilities is assumed to occur within the first two years after property transfer. It is assumed about 530,000 square feet of facilities, including 180,000 square feet of redeveloped or renovated facilities, could be developed for aviation maintenance use. The terminal complex area on the western end of the aviation support area is assumed to comprise about 120 acres and include new air passenger terminal facilities; interim-use cargo facilities; parking areas for rental cars, passengers, and employees; and truck loading areas. The existing air traffic control tower would be used. Consistent with the county's ERP application to SFWMD for phase one development at Homestead Regional Airport (**PBS&J 1997b**), it is assumed that about 20 acres of apron pavement would be removed and about 39 acres of new apron paving would be constructed, for a net increase of about 19 acres of pavement.

Based on an analysis performed in connection with this SEIS (see Appendix A), it is assumed that the airport could enplane about 160,000 passengers annually by 2005, 1.3 million by 2015, and up to 3.9 million with maximum operations on the existing runway. Some of these passengers would be connecting to other flights and not travel locally outside the airport. The number of annual enplaned origin and destination passengers who arrive and depart from the airport is assumed to be 148,515 by 2005 and 1,072,940 by 2015. Terminal facilities would be expanded as passenger levels increased. A total of 1,200,000 square feet of terminal facility is ultimately planned for this area. A loop road is expected to be constructed to serve the terminal area.

Parking and car rental lots on the north side of the terminal are assumed to expand incrementally as passenger levels increase. At some point, perhaps by about 2010 to 2012, it is expected that no space would remain in the aviation support areas to meet estimated parking demands. At that time, commercial parking lots could be developed on other portions of the disposal property, multiple-story parking structures could be built, or parking lots could be located off the property in the local area.

The aircraft maintenance area in the central portion of the aviation support area is assumed to occupy about 90 acres. Development plans include the use of about 380,000 square feet of existing buildings and construction of 420,000 square feet of new buildings. The existing buildings include warehouses, a water tower, a metal fabrication/overhaul shop, an engine overhaul shop, and a modification facility that could be used for commercial aircraft repairs. New facilities could include a commercial aircraft strip/paint facility, a large aircraft hangar, and an addition to an existing hangar for use as an aircraft modification facility (**HABDI 1994**). The new construction would probably occur after 2005. The types of aircraft maintenance services that might locate at HST include aircraft corrosion control and painting; airframe component repairs and inspections; non-destructive testing; avionics and instrumentation repairs and retrofits; and specialized services for electronic systems, landing gear, and hydraulic systems.

The cargo and general aviation area on the eastern end of the aviation support area is assumed to occupy about 100 acres. About 613,000 square feet of new facilities are estimated. No reuse of existing facilities is planned. New facilities could include cargo buildings, hangars, small airplane “T” hangars, a Fixed Base Operator (FBO) terminal, and storage areas. About 125,800 square feet of cargo space and 121,600 square feet of hangar and FBO terminal space are assumed to be constructed during the first two years of site development. The remaining new construction is assumed to occur incrementally over the subsequent 10 years.

An area of about 20 acres between St. Lo and Bougainville Boulevards could be used for administrative offices for the airport operators and MDCAD. It is assumed that one of the existing dormitories would be renovated for this purpose. Other structures would be demolished, opening up space for additional airport parking lots between 2005 and 2015.

Both aviation gasoline and jet fuel for civilian use would be used at the former base. The county’s plan indicates that existing fuel storage areas at Homestead ARS would be expanded and used, and trucks would transport the fuel from the storage area to the ramp. In the long term, hydrant fueling facilities could be constructed on the ramp. However, arrangements to use government fuel storage facilities have not been made, and alternative storage areas, new fuel tanks, or a hydrant system may be required.

The number of employees that might be supported by aviation-related activities in the Beachfront area could reach about 4,000 in 2015 and 8,000 at maximum operation of the one-runway airport.

2.2.1.3 Industrial

The industrial area is assumed to include about 187 acres, or about 12 percent of the total disposal property. The land could be developed for a mixture of light industrial (such as warehousing), medium industrial (fabrication and processing and repair workshops), and intermingled offices. There are very few facilities to reuse in the industrial areas. Table 2.2-2 indicates that a total of about 1.8 million square feet of facilities could be developed by 2015. This is consistent with the 1998 CDMP amendment for HST. Full buildout using floor area ratios from the CDMP could result in a total of 2.2 million square feet of industrial facilities. This would absorb the land left unassigned in the CDMP amendment.

The land immediately north of the aviation support area and immediately west of the Job Corps and Homeless Centers could be developed for functions that support aviation activities but do not require access to the runway. Typical facilities could include warehouses where cargo is staged, packaged, and distributed, or specialized aircraft maintenance workshops. New construction would be expected to respond to demands from cargo and maintenance operations, as well as other industrial uses. The industrial areas would have immediate access to the primary roadway linking the airport to the regional road network and, as such, would be well located for express and package drop-off stations.

An area of about 50 acres surrounded by the new regional park could be used for office-industrial park development. This location would be suitable for subcomponent workshops, electronics or medical laboratories, or research facilities. An 11 acre site in this location is assumed to be developed as a 200 room corporate hotel between 2005 and 2015. The hotel is estimated to be about 100,000 square feet.

Overall, proposed industrial development might support about 2,000 jobs by 2015 and 2,600 jobs ultimately.

2.2.1.4 Commercial

About 152 acres (9 percent) of the disposal property is assumed to be developed for commercial use, including office parks (estimated at 110 acres) and retail businesses (estimated at 40 acres). Retail and business areas would be expected to locate along the access roadways, including a new east/west artery through the airport and Coral Sea Boulevard from SW 268th Street. The roadway development would reduce the developable portion of the retail area to about 30 acres. Construction is assumed to begin by 2005 in response to demands from increased passenger throughput and on-site population. New facilities are estimated to total about 162,000 square feet. The development could include convenience services (such as automatic teller machines, small markets, gas stations, salons, and food services). These uses tend to generate a moderate number of jobs and relatively high customer activity.

Office park development is identified for the northwest portion of the disposal property (consistent with the CDMP amendment). Development could begin late in the first phase, and the area would likely be built out by 2015. A total of about 1.4 to 1.5 million square feet of office space would be consistent with the CDMP amendment. No existing facilities would be reused. Typical businesses may include professional offices, “back office” space for large companies, a conference center, telemarketing businesses, television/film studios, and computer software companies. Some of these uses were identified in previous studies and plans, during scoping, and by ongoing economic development efforts. Section 2.6 provides more information on several commercial concepts that would be suitable on the property.

It is expected that most of the customer base for retail services would be drawn from on-site businesses, airport passengers, and visitors. A small portion of office space may be used by the airport operators (such as airline companies), but most of the development would probably be independent of airport

demands. At full buildout (and assuming full occupancy), about 6,500 jobs could be generated by commercial activities.

2.2.1.5 Institutional

An area of about 24 acres between the Homeless Trust and Job Corps Centers and the planned new access loop into the airport terminal is projected for institutional uses. No specific tenant for this land has been identified, but it could be used for educational purposes, local government offices, storage, or parking. Based on similar site conditions as the Job Corps area, there may be about 150,000 square feet of new facilities in this area by full buildout.

2.2.1.6 Open Space

Mystic Lake occupies about 28 acres in the northeastern corner of the former base. The levees of the lake are planned to be increased in height as part of the stormwater management system in order to increase the lake's stormwater holding capacity. Improvements in this area may incorporate new pathways and picnic facilities that could be used for recreation.

2.2.2 Airport Operations

Under the Proposed Action, HST would be operated under the direction of the MDCAD, with the federal government units as tenant users. The civil airport authority would operate under the municipal authority of Miami-Dade County. Military use of the airfield would be arranged through a formal Airfield Joint Use Agreement between the Air Force and MDCAD. The agreement would address military and government use of the airport and areas of cooperation between the county and the Air Force.

A number of aviation forecasts for HST were evaluated to estimate potential aircraft operations for analysis in this SEIS (see Appendix A). The forecasts used for the SEIS analysis have been revised from the 1994 Airport Master Plan to reflect a delay in airport development, so that levels originally estimated for the year 2000 would be achieved in 2005. General aviation forecasts were also reduced from the county's original projections. Further explanation of forecast changes and analyses is provided in Appendix A. The estimated flight operations are shown in **Table 2.2-5**.

By 2000, after the projected transfer of the facility, the forecast civil activity at HST is estimated to include nearly 41,000 operations by general aviation aircraft, mostly single- or twin-engine propeller planes. 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. Airport activity is estimated to total 60,658 annual aircraft operations in 2000, including civil general aviation, military, and U.S. Customs aircraft.

By 2005, the forecast annual 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 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 include about two-thirds turboprop and one-third jet aircraft and total 1,560. Cargo flights might be expected to serve both domestic and international markets. Airport activity is estimated to total 74,697 annual aircraft operations by 2005.

Table 2.2-5. Estimated Aircraft Operations for the Proposed Action

Category of Operation[1]	Type of Aircraft[2]	Current	Forecast			
			2000	2005	2015	Maximum Use[3]
Commercial Passenger–Long-Term Market Driven						
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
Commercial Passenger–Niche Market Service						
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			3,040	4,860	17,500
Subtotal Commercial Passenger		***0***	***0***	***7,610***	***51,220***	***126,243***
General Aviation						
Single Engine	C150, C172	0	26,304	27,993	33,821	29,000
Multi Engine	PA31	0	10,430	12,100	16,260	21,000
Jet	Lear, Citation	0	2,090	2,550	3,610	3,610
Helicopter		0	2,010	2,490	3,080	3,161
Subtotal General Aviation		***0***	***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
Subtotal Aircraft Maintenance		***0***	***0***	***570***	***1,470***	***1,470***

Category of Operation[1]	Type of Aircraft[2]	Current	Forecast			
			2000	2005	2015	Maximum Use[3]
Cargo						
Miscellaneous Air Cargo						
Turboprop	Cessna, Caravan, King Air	0	0	1,040	0	0
Narrowbody Jet	B-727, MD-80	0	0	520	2,600	7,966
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
Subtotal 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 by 2015)	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
Subtotal Military/ Government		***19,824***	***19,824***	***19,824***	***19,824***	***19,824***
Total Operations		**19,824**	**60,658**	**74,697**	**150,735**	**231,274**

Source: **Landrum & Brown 1999a**.
Notes: [1] A single aircraft landing and then taking off is counted as two operations.
[2] Representative aircraft are provided by category. Actual fleet will depend on carriers that operate at HST.
[3] Reflects maximum capacity use of the single runway at HST.

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/government activity at moderate levels, the passenger and cargo operations are estimated to become a dominant portion of the activity. 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 commercial passenger service user groups are forecast to have 20,300 jet and 30,920 turboprop annual operations by 2015. Of these 51,220 operations, more than 80 percent 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 by 2015. Overall, the forecast estimates for 2015 reflect a high rate of aviation growth at HST that exceeds the national planning norms, particularly for new civilian airports, and may not materialize on this fast a schedule.

The estimates in Table 2.2-5 reflect replacement of civilian aircraft types that do not meet FAA Stage 3 noise standards, required to be in place by 2000. FAA Stage 3 noise standards apply only to civilian aircraft that weigh more than 75,000 pounds. These standards do not apply to military aircraft. For all years, between 90 and 95 percent of civilian operations are anticipated to occur between 7:00 a.m. and 10:00 p.m.

At some point beyond 2015, the airport may reach its single-runway capacity of more than 230,000 operations. The final column of Table 2.2-5 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/government groups are assumed to maintain their 2015 levels, while passenger and miscellaneous cargo activity are assumed to grow to the capacity level of the one-runway airport. Airport activity is estimated to total 231,274 operations for the forecast maximum use of the one runway. The forecast for maximum use is farther in the future than the forecast for 2015 and is therefore less predictable than the estimates for earlier years. HST, at maximum capacity of a single runway, would still be far below the activity level of a major airport such as Miami International. The effect of constructing a second runway to increase the airport's capacity, shown for future planning purposes on Miami-Dade County's ALP, is addressed in Section 2.2.7.

Airspace routes and flight paths for commercial operations at HST were developed in consultation with the FAA's Miami Terminal Radar Approach Control (TRACON) staff according to existing FAA air traffic control procedures and in consideration of:

- Existing airspace routings for other airports in the Miami airspace (including Miami International and Fort Lauderdale airports);
- Performance characteristics of potential and future commercial aircraft, which will differ significantly from the high performance military jets currently operating at the base; and
- Potential conflicts between aircraft from HST and nearby airports, considering the increase in volume of air traffic.

Appendix A provides more detailed discussion of the development of these flight paths.

Figures 2.2-2 and 2.2-3 show the proposed departure and arrival flight paths, respectively, for civil operations at HST. These routes differ from routes previously presented in the 1994 HST Airport Master Plan and the 1994 Final EIS for Disposal and Reuse of Homestead AFB. The routes have been modified to avoid potential conflicts with MIA. Because of local wind conditions, it is expected that civil aircraft would operate in east flow over 90 percent of the time, similar to current military and government operations.

The routes depicted in Figures 2.2-2 and 2.2-3 are generalized paths ("backbones") for aircraft operations in and out of the Miami air traffic control area through established navigation points. The points, known as outer fixes, used for arriving aircraft include FAMIN, WORPP, HEATT, and JUNUR. Departing aircraft use WINCO, HEDLY, VALLY, SKIPS, EEONS, and MNATE. **Table 2.2-6** summarizes the predicted average daily number of civil jet and propeller aircraft operations on different arrival and departure flight tracks related to the outer fixes. The locations of the different flight tracks for east and west flow arrivals and departures are graphically depicted in Appendix E, Exhibits II-5 through II-8. Flight tracks ending in the letter "J" are jet aircraft flight tracks. Propeller aircraft flight tracks end in the letter "P." More detailed tables showing individual aircraft types by flight track are in Appendix E, Tables II-7 through II-16. The actual heading used for any given flight to get to those points would be

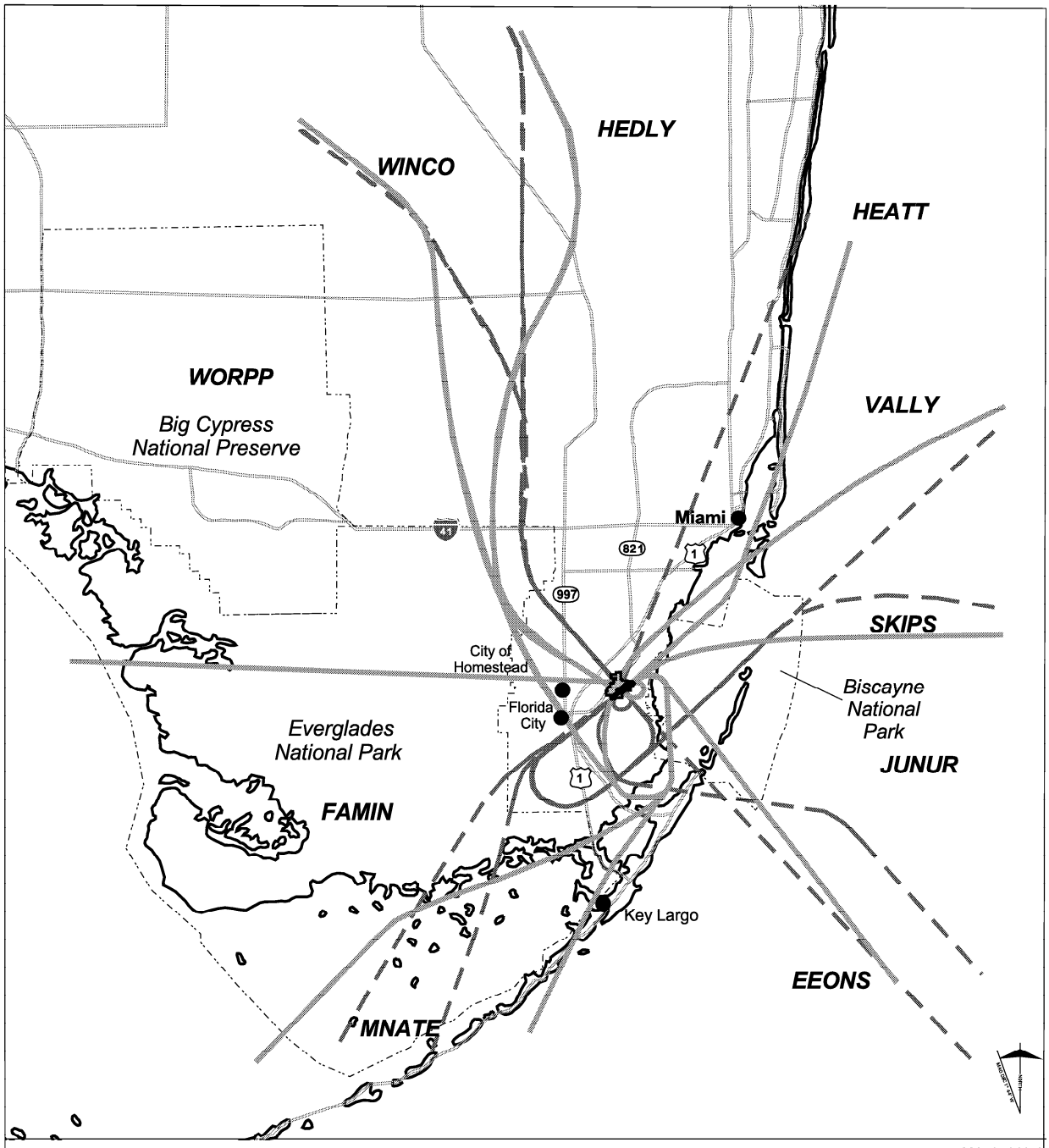


Figure 2.2-2
Proposed Departure Flight Paths
at Homestead Regional Airport
Under the Proposed Action

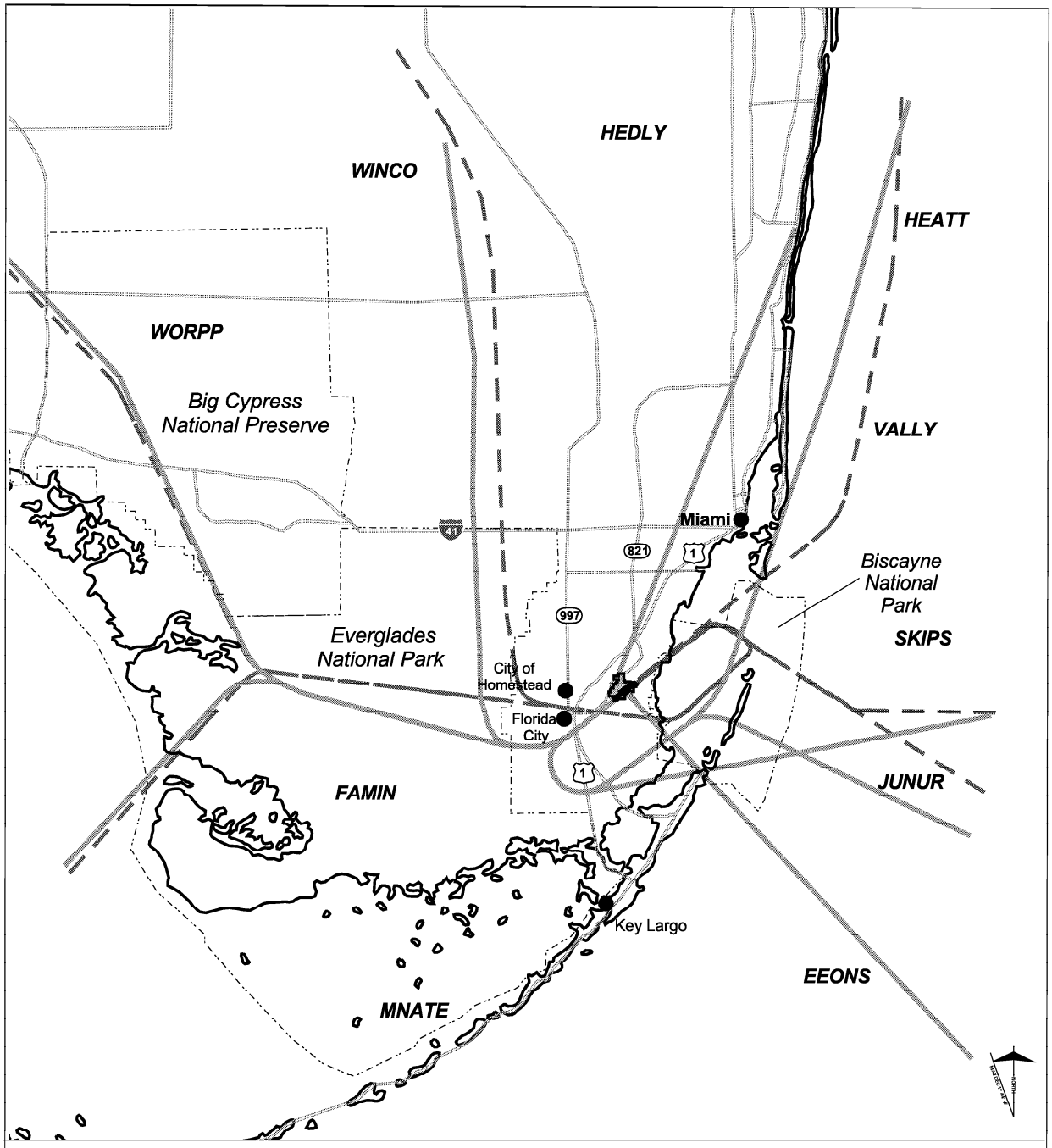


Figure 2.2-3
Proposed Arrival Flight Paths
at Homestead Regional Airport
Under the Proposed Action

Table 2.2-6. Civilian Operations by Flight Track—Average Daily Itinerant Traffic by Year

Fix	Typical Tracks East/West	Aircraft Category	Average Daily Operations							
			2000		2005		2015		Maximum Use	
			East Flow	West Flow	East Flow	West Flow	East Flow	West Flow	East Flow	West Flow
Departures										
WINCO	05WJ/23WJ	Jets	0	0	2	0	10	1	31	2
	05WP/23WP	Props	9	1	10	1	14	1	22	2
		Total	9	1	12	1	25	2	53	4
HEDLY	05HJ/23HJ	Jets	0	0	2	0	10	1	29	2
	05HP/23HP	Props	8	1	10	1	14	2	22	2
		Total	9	1	12	1	24	2	51	4
VALLY	05VJ/23VJ	Jets	0	0	2	0	8	0	23	1
	05VP/23VP	Props	7	0	10	0	11	0	11	0
		Total	7	0	12	0	19	0	35	1
SKIPS	05SJ/23SJ	Jets	0	0	0	0	12	1	32	2
	05SP/23SP	Props	1	0	4	0	17	1	18	1
		Total	1	0	4	0	30	2	51	3
EEONS	05EJ/23EJ	Jets	0	0	0	0	6	0	16	1
	05EP/23EP	Props	1	0	2	0	9	1	9	1
		Total	1	0	2	0	15	1	26	2
MNATE	05MJ/23MJ	Jets	0	0	0	0	11	1	29	2
	05MP/23MP	Props	1	0	4	0	16	1	18	1
		Total	2	0	4	0	27	2	47	3
Arrivals										
WORPP	05PJ/23PJ	Jets	0	0	2	0	11	1	34	3
	05PP/23PP	Props	10	1	12	1	16	1	25	2
		Total	10	1	14	1	27	2	59	5
HEATT	05TJ/23TJ	Jets	0	0	3	0	15	2	46	4
	05TP/23TP	Props	13	1	16	1	22	2	35	3
		Total	14	1	19	2	37	3	81	7
JUNUR	05JJ/23JJ	Jets	0	0	1	0	19	2	49	4
	05JP/23JP	Props	1	0	6	0	25	2	27	2
		Total	2	0	6	1	44	4	76	7
FAMIN	05FJ/23FJ	Jets	0	0	0	0	11	1	29	2
	05FP/23FP	Props	1	0	4	0	16	1	17	1
		Total	2	0	4	0	27	2	47	4

Source: **Landrum & Brown 1999a**.
Notes: Numbers displayed may not total due to rounding.
Table does not include military/government operations or general aviation closed pattern (touch-and-go) operations.

provided to pilots by air traffic controllers at the actual time. Additional information on flight tracks is provided in Appendix B, which illustrates the dispersion of tracks around the backbone paths for each fix. The flight paths for military and government operations are depicted on Figures 2.1-3, 2.1-4, and 2.1-5.

Aircraft altitudes would vary along the flight paths as aircraft ascended and descended. Figures 1-9 and 1-10 in Appendix A provide an indication of altitudes at various locations along the flight paths.

Military operations would continue to include closed patterns around the airfield, but as commercial activity increases, use of closed patterns during peak periods may be adjusted. General aviation operations that are not leaving the local area may also use current closed pattern flight tracks. This is typical when learner pilots are practicing takeoffs and landings.

2.2.3 Employment and Population

Table 2.2-7 presents estimates of on-site employment for the Proposed Action. These estimates were generated by applying standard multipliers for the projected land uses and construction activity. Direct on-site employment associated with redevelopment of the disposal property would include airport employees (e.g., air traffic control, fire and rescue, airline personnel, airport maintenance); jobs with airport-related activities (e.g., concessionaires, cargo operators, car rental services); and jobs generated by other commercial, industrial, and institutional uses on the disposal property. Total direct employment on the disposal property is estimated to increase by about 13,200 jobs (including construction workers) above current levels by 2015. Operating at full capacity, the airport property could support about 17,500 jobs. Jobs directly associated with airport functions are expected to comprise about 30 to 40 percent of on-site employment in 2015 and increase to about 45 to 50 percent at maximum operating levels. The average annual earnings per employee is estimated to be about $29,000, including both aviation-related and other on-site commercial and industrial activities.

It is assumed the new hotel on the disposal property would house a temporary population of about 200 to 300 persons on a continuous basis. This would increase estimated on-site population from about 160 in 1998 to about 1,410 residents in 2015. Residential use of the Homeless Trust and Job Corps facilities is assumed to begin shortly after the facilities are available in 2000 and to remain at projected occupancy levels from 2005 on.

2.2.4 Traffic and Utilities Use

Traffic would be generated by employees, passengers, visitors, customers, and on-site residents. **Table 2.2-8** summarizes the estimated average daily on-site vehicle trips for the Proposed Action. Total average daily trips are estimated to increase from about 4,000 currently to about 52,000 in 2015. These estimates were generated using standard multipliers for employees, residents, and visitors contained in the *Trip Generation, 6th Edition* (**Institute of Transportation Engineers 1991**). In the first phase of the Proposed Action, ingress and egress to HST would continue to be predominantly along SW 288th Street. As commercial and industrial activity developed after the year 2005, the original north gate entry on Coral Sea Boulevard might be reopened (**PBS&J 1996b**). After development of St. Nazaire as the primary arterial through the airport, the airport would be accessible from both SW 288th Street and SW 112th Avenue. This is projected to occur in the second phase of development (see Section 2.2.5). It is assumed about 25 percent of traffic would use the SW 112th Avenue access once it is available.

Table 2.2-7. Estimated On-Site Employment and Population—Proposed Action

Employment	Current	2000	2005	2015	Full Buildout
Disposal Property					
On-Site Reuse Jobs	0	0	2,070	12,777	17,459
On-Site Construction Jobs	0	0	141	410	NA[1]
Total On-Site Reuse Employment	***0***	***0***	***2,211***	***13,187***	***17,459***
Retained and Conveyed Property[2]	1,090	1,490	1,410	1,480	1,470
Total On-Site Employment	**1,090**	**1,490**	**3,621**	**14,667**	**18,929[3]**
Population	**Current**	**2000**	**2005**	**2015**	**Full Buildout**
On-Site Reuse Population (Transient)[4]	0	0	0	200	300
Retained and Conveyed Property	160	1,210	1,210	1,210	1,210
Total On-Site Population	**160**	**1,210**	**1,210**	**1,410**	**1,510**

Source: SAIC.
Notes: [1] Construction jobs for full buildout not estimated due to uncertainty of time frame.
[2] Includes 105 construction jobs annually by 2000, 5 by 2005, and 42 by 2015.
[3] Excludes reuse construction jobs.
[4] Hotel occupants.
NA not available

Table 2.2-8. Estimated Vehicle Trips—Proposed Action

	Current	2000	2005	2015	Full Buildout
Proposed Action					
Average Daily On-Site Trips	0	50	6,502	44,601	67,007
Peak Hour Trips	0	*UNK*	*706*	*4,979*	*7,687*
Retained and Conveyed Property					
Average Daily On-Site Trips	3,956	5,362	5,952	7,517	9,094
Peak Hour Trips	*567*	*773*	*871*	*1,124*	*1,559*
Total Average Daily On-Site Trips	**3,956**	**5,412**	**12,454**	**52,118**	**76,101**
Total Peak Hour Trips	***567***	***773[1]***	***1,577***	***6,103***	***9,246***

Source: SAIC.
Note: [1] Does not include Proposed Action peak hour trips, which could not be estimated.
UNK Unknown

Table 2.2-9 summarizes estimated on-site utilities use for the Proposed Action. The most substantial projected increase would be in generation of solid waste, increasing from less than 2 tons per day currently to an estimated 44 tons per day by 2015 and 66 tons per day at full buildout. This is primarily due to the volume of solid waste assumed to be generated by airport and commercial activities. Electricity demands, based on the estimated square footage of facilities, are assumed to increase by 229 megawatt hours (MWh) per day over current consumption by 2015, and more than 300 MWh per day at full buildout. Water use for the entire former base is assumed to increase to about 1 million gallons per day (mgd) by 2015. It is assumed that the developer would upgrade or replace existing water and wastewater lines between 2000 and 2005.

Table 2.2-9. Estimated On-Site Utilities Use—Proposed Action

	Current	2000	2005	2015	Full Buildout
Reuse of Disposal Property					
Water (mgd)	0	0	0.11	0.73	1.02
Wastewater (mgd)	0	0	0.09	0.58	0.82
Solid Waste (tons/day)	0	0	7.4	39.4	60.6
Electricity (MWh/day)	0	0	37	212	286
Retained and Conveyed Property[1]					
Water (mgd)	0.09	0.29	0.29	0.30	0.30
Wastewater (mgd)	0.07	0.23	0.23	0.24	0.24
Solid Waste (tons/day)	1.5	4.6	4.6	4.9	5.0
Electricity (MWh/day)	50	56	56	67	67
Combined Use					
Water (mgd)	0.09	0.29	0.40	1.03	1.32
Wastewater (mgd)	0.07	0.23	0.32	0.82	1.05
Solid Waste (tons/day)	1.5	4.6	12.0	44.2	65.6
Electricity (MWh/day)	50	56	93	279	353

Source: SAIC.
Note: [1] Reflects increased use of Homeless Trust and Job Corps Centers, park visitors, and potential buildout of bank and former credit union property.
mgd million gallons per day
MWh megawatt hours

2.2.5 Secondary Development

The development of a successful commercial airport at HST could generate additional airport-related facilities and adjunct commercial or industrial business beyond the airport property. Many of these uses would locate on the airport property itself if land is available and affordable. These uses may be defined by airport facility needs or revenue-producing goals. The type of "spill over" activities that could locate off site include budget car rental services, hotels, restaurants and fast food establishments, gas stations, avionics and aircraft component workshops, offices, and warehouses supporting cargo operations or businesses that do not require access to the runway.

In quantifying site development at the airport under the Proposed Action, it has been assumed that airport and aviation-related facilities would be located on site, so long as there is room to accommodate them. However, some businesses may choose to locate outside the airport if they do not require direct access to the airfield and if costs are lower. Therefore, while the location of specific facilities on or off the site may differ from the estimates made here, the amount of development, which is demand driven, is assumed to be close to what has been estimated for this analysis.

For analysis, the following airport-related development has been assumed to occur outside the airport property. These estimates are based on standard multipliers for airport-related parking, a brief survey of hotel rooms in the vicinity of similar size airports, and other common planning factors.

Space for terminal parking (for employees and passengers) could become constrained after about 2011–2012, and an additional 8,000 vehicle parking spaces (estimated 75 acres) could be needed to meet

demands of maximum use of the single-runway airport. This increased demand could be accommodated by construction of multi-level parking structures, use of undeveloped industrial land at the airport, or parking areas or rental car lots outside the airport. Areas along the access roads to the west of the airport or adjacent to the north side of the FANG area (identified for possible expansion in the Airport Master Plan) would be the most likely locations for this off-site development.

Other commercial businesses (fast food eateries, gas stations, restaurants, hotels) could develop along the main access roadways (such as SW 288th Street, SW 112th Avenue) and at the Turnpike interchanges servicing the airport. It is not known what the overall demand for these services would be. The development would be similar to other general business and commercial areas, with relatively high-intensity use. New hotels similar to the one planned for HST could occupy 10 to 15 acre sites and support small restaurants. It is estimated that about 700 additional hotel rooms may be needed by 2015. This could absorb about 40 acres of land. By full buildout of HST, up to 150 acres in the Homestead area might be developed for transient lodging for passengers, providing about 2,600 rooms.

Proposed amendments to the Miami-Dade County CDMP indicate that SW 288th Street (Biscayne Boulevard) and SW 112th Avenue could be widened to six lanes to improve access to HST (**PBS&J 1996b**) (see Figure 2.2-1). The Turnpike interchange at SW 112th Avenue could be extended into HST to link up with SW 288th Street.

The secondary development would generate new jobs in the region. In addition, spending by the employees who took the on-site and secondary jobs, as well as procurements by the airport, would stimulate additional "indirect" jobs in many commercial and industrial sectors. **Table 2.2-10** shows the number of on-site direct and off-site secondary/indirect jobs estimated to be generated by the Proposed Action (a total of 27,546 jobs by 2015). It also shows that the majority of these jobs (23,191 jobs by 2015) are expected to be in south Miami-Dade County. Most new secondary jobs would likely be in commercial services serving the growing community and in niche services that support transient airport-related travelers in the area. Some additional industrial jobs would also be likely to emerge as economic activity increases, particularly with easy access to air transportation. It is assumed that all these jobs are additional to current or future jobs projected for Miami-Dade County and south Miami-Dade County under the projected baseline.

There are a number of potential sources of workers who could fill the jobs created (directly and indirectly) by the Proposed Action. They include:

- Persons newly entering the workforce (especially in later years);
- Unemployed persons residing in south Miami-Dade County;
- Employed persons residing in south Miami-Dade County, working in north Miami-Dade County, and currently commuting who would change their place of work;
- Workers in-migrating to Miami-Dade County to fill specialized jobs or hoping to find employment at the site who are assumed to take up residence in the southern part of the county; and
- Employed and unemployed persons currently residing in north Miami-Dade County who would relocate their place of residence to south Miami-Dade County.

Some jobs may be filled by Monroe County residents, some of whom might commute from Key Largo. However, due to the small size of that county's population, this is not expected to be a major source of workers for HST. The Proposed Action is not anticipated to generate population in-migration into Monroe County.

Table 2.2-10. Estimated Employment, Population, and Land Use Generated by the Proposed Action

	2000	2005	2015	Full Buildout
Miami-Dade County				
Proposed Action Employment				
On Site[1]	0	2,211	13,187	17,459
Off Site	0	2,316	14,359	20,995
Total Countywide Reuse-Related Employment	***0***	***4,527***	***27,546***	***38,454***
Jobs Filled by In-Migrants	0	226	1,377	1,923
In-Migrating Population[2]	0	518	3,156	4,407
South Miami-Dade County				
Proposed Action Employment				
On Site[1]	0	2,211	13,187	17,459
Off Site	0	1,426	10,004	15,257
Total South County Reuse-Related Employment	***0***	***3,637***	***23,191***	***32,716***
Jobs Filled by In-Migrants and Relocating Workers[3]	0	226	4,624	6,524
In-Migrating and Relocating Population[2]	0	518	10,597	14,951
Reuse-Related Off-Site Land Use[4]				
Residential (acres)[5]	0	33	640	906
Commercial/Industrial (acres)[6]	0	183	1,333	1,956
Total Land Use (acres)	***0***	***216***	***1,973***	***2,862***

Source: SAIC.

Notes:
1 Includes on-site construction jobs, except for full buildout.
2 Population associated with in-migrating and/or relocating workers.
3 Relocating workers are persons who would relocate to south Miami-Dade County from another location in the county as a result of job opportunities provided by the Proposed Action.
4 Reuse-related land requirements assumed to be in south Miami-Dade County.
5 Residential development for in-migrating and relocating families.
6 Includes land for airport-related commercial development (parking lots, hotels) and other additional reuse-related indirect employment in the area.

Table 2.2-10 shows that if the airport develops, an estimated 1,377 workers may in-migrate to Miami-Dade County as a result of the new job opportunities created by 2015. Based on labor availability and unemployment rates, an estimated 4,624 workers are projected to move into the south Miami-Dade County area. These include both in-migrants and workers who might relocate from the north part of the county to the south part as result of the job opportunities provided by HST. Those in-migrating workers and their families would result in an estimated countywide population increase of 3,156 persons by 2015. The population increase in south Miami-Dade County associated with in-migrating and relocating workers is estimated to be 10,597 by 2015. Approximately 3,854 additional dwelling units could be needed in south Miami-Dade County by 2015 to house this new population.

Reuse-related employment and new housing demands would be expected to increase development of residential, commercial, and industrial land in south Miami-Dade County, in addition to the land needed for airport-related secondary development. Table 2.2-10 summarizes the amount of residential and commercial/industrial land estimated to be needed for reuse-related off-site development in south Miami-Dade County. This estimate assumes that there would be an average of six housing units per acre and an

average of about eight employees per acre, based on current commercial/industrial employment densities in the area. By 2015, almost 2,000 acres could be required for off-site development. The airport-related development would likely be located along the primary access routes into the airport or near turnpike interchanges. Other commercial, industrial, and residential development could occur on any suitable land in the south Miami-Dade area.

Vehicular trips associated with secondary development close to the airport (such as hotels and rental car lots) are included in the estimated trips for passengers arriving and departing from the airport (see Table 2.2-8). Other new businesses may attract some customers from the local area, but although these trips may result in some redistribution of traffic, they are not expected to appreciably increase local traffic.

Concerns have been expressed that, in addition to the on-site and airport-related off-site development described above, a commercial airport on former Homestead AFB property could act as a "growth engine," attracting additional development beyond that associated with the airport itself. Businesses have been known to locate near airports for a variety of economic or operational reasons, even if they do not serve airport-driven functions.

Available information about development around airports indicates a large range of possible outcomes, from little or no development up to intensive growth. Appendix C summarizes the results of a survey of literature about development at and near other airports. Some businesses have been attracted to the general vicinity of airports because of the superior accessibility they offer. This could result in a net increase in the total regional employment, or it could simply redistribute employment within the region without increasing the total number of jobs (i.e., businesses that would have located in the region anyway elect to be close to the airport). The main incentive for locating around a new or fledgling airport is lower land prices. However, as the airport grows, the frequency of flight service can create a more intensive demand for additional or denser development (**ULI 1993**).

Estimating the amount of this kind of additional development and the associated number of jobs that could be stimulated by HST is extremely difficult. Although easy access to a major airport is an important factor in business location decisions, there are a number of other factors that are also important, such as a favorable tax climate, government incentives, and the quality of the surface transportation network surrounding the airport. For the purposes of analysis in this SEIS, no additional employment has been assumed beyond that reflected in Table 2.2-10. Whether development occurs in an area is dependent on demand. In the absence of a demand, non-airport-related induced development at Homestead would probably be limited. At present, there does not appear to be a large demand for extensive development around a regional airport at Homestead, and it is not considered likely to occur. Therefore, a moderate level of growth and commensurate levels of secondary development have been assumed for the analysis.

Should there be a higher level of demand for industrial and commercial development in the region than reflected in the moderate-growth forecasts, more of the development could locate in the vicinity of HST. In this circumstance, it is not anticipated that HST would be responsible for generating the increased demand, but it might become a factor in where within the region development occurred. This is the kind of situation that might lead to the level of growth reflected in the high-growth population forecasts (see Section 2.1.3) and considered in the cumulative impact analysis (see Section 2.8). Without a higher than anticipated level of demand to stimulate this growth, however, it is not expected that HST itself would generate appreciable additional development.

2.2.6 Mitigation Measures Assumed in the Proposed Action

Miami-Dade County has proposed several measures to be implemented in concert with development of a commercial airport at former Homestead AFB to reduce adverse effects from the Proposed Action. Some of these mitigations were required by order of the Governor and Cabinet, sitting as the Administration Commission, on the Homestead Air Force Base Reuse Plan put forward under the Chapter 288 process (**Florida Administration Commission 1998**). Others have been developed independently based on previous consultations with federal and state agencies, including the National Park Service and South Florida Water Management District. These mitigation measures were documented in the 1998 amendments to the CDMP.

The Administration Commission required preparation of three plans: a Surface Water Management Master Plan, a Wildlife/Habitat Management and Mitigation Plan, and a Noise Management and Mitigation Plan. The Surface Water Management Master Plan, originally completed in April 1998 and supplemented in October 1998, has been submitted to SFWMD for review and concurrence. SFWMD and county regulatory criteria are the basis for this plan. The Wildlife/Habitat Management and Mitigation Plan has also been prepared. The components of those plans are briefly summarized in the following paragraphs. The Noise Management and Mitigation Plan is expected to be completed after this SEIS. That plan will be prepared by the Miami-Dade County Aviation Department in consultation with the Department of Planning, Development, and Regulation; Miami-Dade County's Department of Environmental Resources Management (DERM); FAA; the Air Force; and National Park Service. The Administration Commission's Final Order (**Florida Administration Commission 1998**) provided for review of the wildlife and noise plans by the Florida Department of Community Affairs.

The Third District Court reversed and remanded the Administration Commission's Final Order, finding the county premature in adopting the base reuse plan and mitigation plans ahead of completion of the SEIS. Even though these mitigations are subject to change (because neither the Chapter 288 process nor the SFWMD process is complete), it is considered unlikely that any future changes would reduce the extent of the mitigations that have already been required by state officials and agreed to by Miami-Dade County. Therefore, the plans developed by the county have been incorporated in the analysis of the Proposed Action.

Surface Water Management Master Plan

In January 1997, Miami-Dade County applied to SFWMD for a permit to construct and operate a surface water management system to serve HST. The application was intended to address short-term construction in the "Beachfront" area required to support the civilian airport for the first 5 to 7 years. Subsequently, the county and SFWMD negotiated a Memorandum of Understanding obligating the county to several actions. One of these included preparation of a Storm Water Management Master Plan by April 1998. As agreed, the county prepared and submitted the HST Surface Water Management Master Plan (**PBS&J 1998a**). Review of this master plan precipitated evaluation of alternative scenarios that were documented in supplemental material (**PBS&J 1998c**) submitted in October 1998.

The purpose of the Surface Water Management Master Plan is to improve the detention/retention of surface water on HST. This is to be accomplished by connecting Mystic Lake and Phantom Lake to the Boundary Canal system and by adding three weirs to the system to retain up to 5 feet-National Geodetic Vertical Datum (NGVD) of water within the new combined system. In addition, levees would be built around the two lakes to increase their holding capacity. Almost 2 miles of French drains would be added to the mile of French drains that have already been built (or are under construction) in the cantonment, the Homeless Trust Center, and the Job Corps area. The predicted effect of these surface water

management improvements is a 23 percent reduction in the peak flow that would occur during a 25 year, 72 hour storm event. The analysis in the SEIS assumes the operational settings recommended under Scenario 2 in the October 1998 Supplement to the plan.

The current plan no longer includes deep-well injection of excess stormwater as proposed in the county's outstanding permit application to SFWMD for surface water management on the disposal property. Under the revised plan, excess stormwater would be discharged through Military Canal.

Wildlife/Habitat Management and Mitigation Plan

The county's Wildlife/Habitat Management and Mitigation Plan was developed to protect rare plants and wetlands on former Homestead AFB property. In general, the plan recommends the preservation of all jurisdictional wetlands, although management practices for those wetlands that could result in increased bird-aircraft strike hazard are subject to further study. These wetlands are between the runway and taxiway and between the runway and the southeast boundary of the former base.

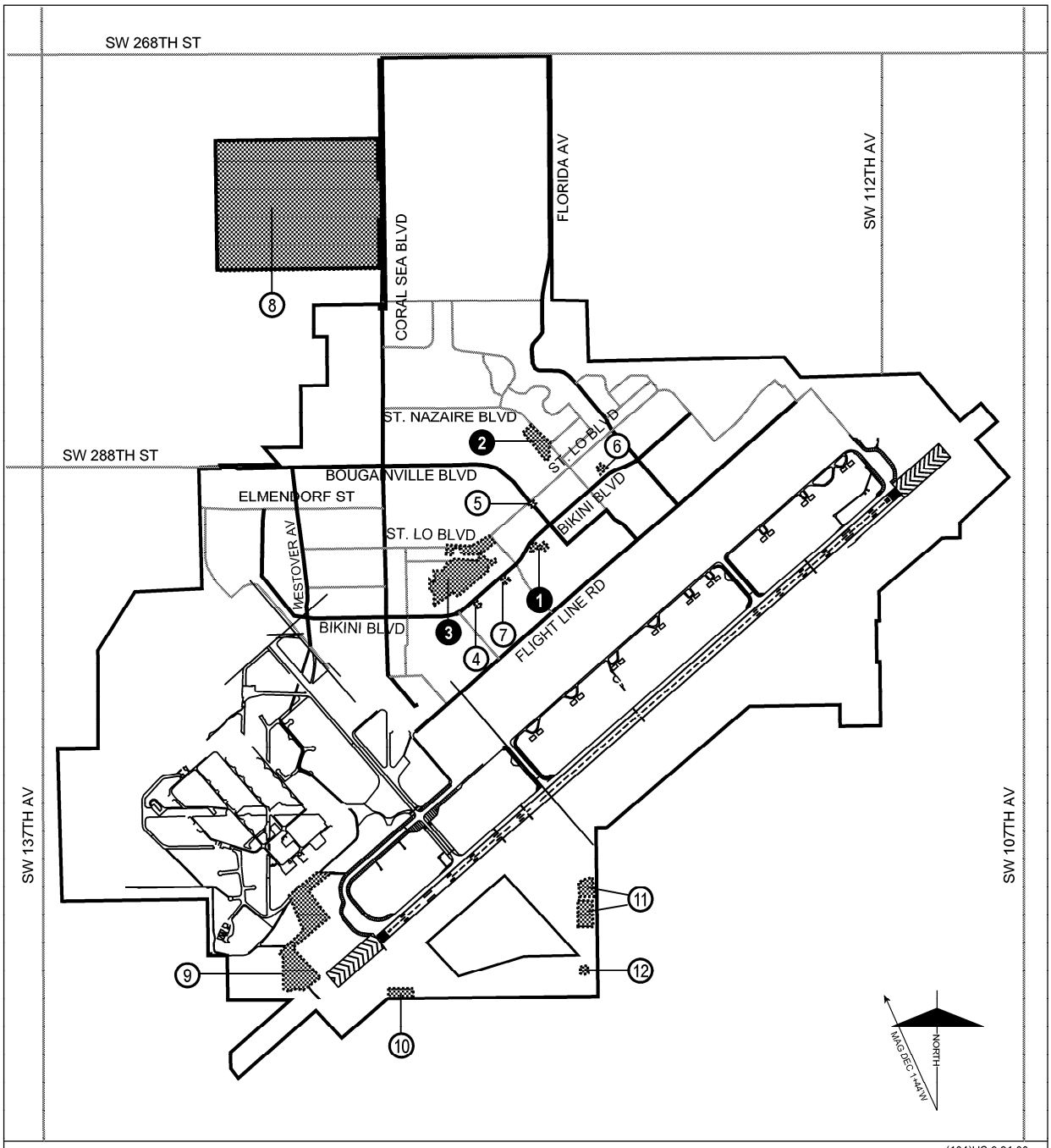
Twelve sites on the disposal property were identified to contain federal and/or stated listed plant species (see **Figure 2.2-4**). Sites 1 through 4 were recommended for preservation in the Wildlife/Habitat Management and Mitigation Plan. Sites 5 through 8 were not recommended for preservation, and Sites 9 and 10 are still under study. The areas not recommended for preservation were considered either too small or already extensively degraded by previous construction and the invasion of exotic species. Sites 11 and 12 had already been included in the Miami-Dade County Future Land Use Plan as Environmental Protection Areas.

The protections recommended in the Wildlife/Habitat Management and Mitigation Plan include:

- Conservation easements for sites recommended for protection;
- Establishment of a barrier around the sites to eliminate or greatly reduce the invasion of non-native turf grasses;
- Fences around the sites to prevent or discourage human activity;
- Signs to identify the purpose and content of the sites; and
- Appropriate management techniques to foster long-term suitability of the sites for extant species, including removing exotic plants, using controlled burns in the spring to eliminate fire-intolerant species (the native species are adapted to fire), and planting or seeding slash pine to provide an appropriate overstory to protect the rare native plants.

In addition, consideration will be given to using selected plants at the remnant pine rocklands for reintroduction or to enhance the density of plants on other sites identified for protection. It is recognized that relocation of most pine rockland rare plants is difficult.

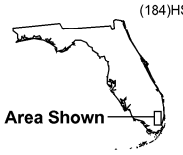
The plan also discusses lands outside the former base that would be appropriate as conservation areas, although specific recommendations for those areas were not formalized. In general, the plan recommends that the canals and wetlands between the former base and Biscayne Bay be considered for protection and, where habitat degradation has occurred, that actions be taken to improve this habitat. Developed and vacant lands to the north, west, and southwest of the former base were not recommended for protection.



LEGEND

- Former Homestead AFB Boundary
- Sites Containing Sensitive Plants
- (#) Site Number
- Sites with Small's milkpea
- (#) Site Number

(184)HS 9.21.00nc



0 0.25 0.5

Scale In Miles

Derived from: PBS&J 1998b

Figure 2.2-4
Sensitive Habitat Areas on Former Homestead AFB

CDMP Amendments

The CDMP amendments approved by the Miami-Dade County Board of Commissioners on July 14, 1998 (**Stierheim 1998**) specified a number of commitments to mitigate potential impacts of the development of former Homestead AFB. These include commitments to:

- Prepare and implement the plans required by the Administration Commission.
- Implement a program to acquire land or development rights in wetland, glade, and agricultural areas east and southeast of the former base, and possibly industrial areas east and southeast of the former base.[1] No details were provided on the size or precise location of such an area. The buffer concept is described in more detail in Section 2.9.2.
- Landbank sites around county airports to provide expansion capability and buffering to ensure availability when needed, as well as provide for compatible uses surrounding airports.
- Participate in the South Florida Ecosystem Restoration Working Group and take steps necessary to maximize federal cleanup of the base and Military Canal prior to property conveyance.
- Eliminate or significantly reduce reliance on Military Canal discharges into Biscayne Bay as the principal means of providing flood protection for the former base, and ensure that stormwater discharges resulting from future development of the base meet the non-degradation standards required by the bay's Outstanding Florida Water status.
- Participate with SFWMD and the South Florida Regional Planning Council in preparing and implementing an area-wide land use and water management plan for the south Miami-Dade County watershed.
- Monitor the need for a second runway at HST and, if it is necessary, initiate all required impact assessment analyses and procedures, including a federal EIS, CDMP amendment, and Development of Regional Impact (DRI), prior to development of a second runway.
- Establish a Biscayne National Park Area Planning Oversight Committee[2] to ensure county decisions related to the airport are consistent with and effectively implement the policies set forth in the CDMP amendment.
- Not use the development of the base as a rationale for extending the Urban Development Boundary, except for aviation infrastructure such as navigational and visual aids, and ensure that any expansion is consistent with agreed requirements of the Areawide Land Use and Water Management Plan.
- Avoid incompatible land uses around the base.
- Ensure that additional development at the former base is approved by the Florida Department of Community Affairs under Chapter 163, Part 2, Florida Statutes, relating to comprehensive plan amendments, and under the DRI review process in Chapter 380, Florida Statutes, if statutory thresholds are triggered.

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[1] The concept of a buffer area to limit development east of the airport has been endorsed by Miami-Dade County, the State of Florida, and the South Florida Ecosystem Restoration Task Force and Working Group.

[2] The committee shall consist of representatives of the National Audubon Society, Tropical Audubon Society, Sierra Club, Biscayne National Park, Everglades National Park, the City of Homestead, the City of Florida City, a Miami-Dade agricultural organization, a tourism organization, the south Miami-Dade business community, the county's airport developer, the Military Base Host unit, South Florida Regional Planning Council, SFWMD, and a south Miami-Dade civic association.

No specific impact reductions were assumed in the SEIS to reflect these commitments, except as they have been incorporated in the Stormwater Management Plan or Wildlife/Habitat Management and Mitigation Plan for the site.

During the public hearings for the Draft SEIS, Mayor Penelas of Miami-Dade County indicated that the county would seriously consider returning 39 square miles of land in Big Cypress National Preserve to the federal government if a commercial airport is developed at former Homestead AFB. That land is currently the site of Dade Collier Airport.

2.2.7 Possible Future Airport Expansion

The Master Plan and ALP for HST developed by Miami-Dade County include an ultimate second runway. FAA guidance encourages airports to develop plans for the 20 year time frame. ALPs typically include long-range expansion projects to discourage development of land that may ultimately be needed for the airport or incompatible land use near the airport. There are currently no plans to implement this expansion, and during public hearings on the Draft SEIS, Mayor Penelas stated that Miami-Dade County is committed to the redevelopment of former Homestead AFB as a single runway facility.

There is insufficient land at former Homestead AFB to accommodate a second runway, so this potential expansion, if it were to occur, would require acquisition of additional property. Although the ALP has been conditionally approved by FAA, its implementation will be dependent on sufficient demand to support expansion, because the cost of construction and land acquisition is high. Additional federal and state environmental impact analysis and public input would be required before FAA would unconditionally approve the ALP to permit the airport boundary to be expanded and a second runway to be constructed.

If a commercial service airport at Homestead successfully captured niche markets and achieved forecast levels of operations, at some point the one-runway airport could reach its operating capacity. The operating capacity of the single runway at HST is approximately 231,000 annual aircraft operations. If and when growth approaches that level, Miami-Dade County could propose to build a second runway to better accommodate the traffic demand and to more efficiently handle operations. The ALP 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.

Given the capacity of the existing single runway at Homestead ARS, 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 percent capacity, the time frame of second runway initial operation could be around 2038. Assuming the addition of a second runway, the time frame in which a two-runway system at HST 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 time frame 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 40 years in the future (2038) to almost 60 years in the future (2057). Considering the changes in aviation that have occurred during the last 60 years puts the uncertainty of the degree of change that may occur in the technologically active future years into perspective. The future development of aviation is expected to see as many radical changes as the last 60 years, making any detailed quantification of air operations or development highly speculative and unreliable.

Figure 2.2-5 provides one possible layout for a second runway that was identified as the preferred option in the 1994 Airport Master Plan for HST. Approximately 1,060 acres would need to be acquired for such an expansion (for runways, taxiways, and protection zones), resulting in a total airport area of about 2,690 acres. Most of the acquired land (about 860 acres) would be on the south/southeast side of the existing airfield. About 200 acres would be located on the northeast and north end of the existing property. About 500 acres of the newly acquired land would be within the "object free area" of the new runway and taxiways. Another 500 acres would be available for new aviation support facilities (including terminals, cargo facilities, and maintenance hangars) and new roads.

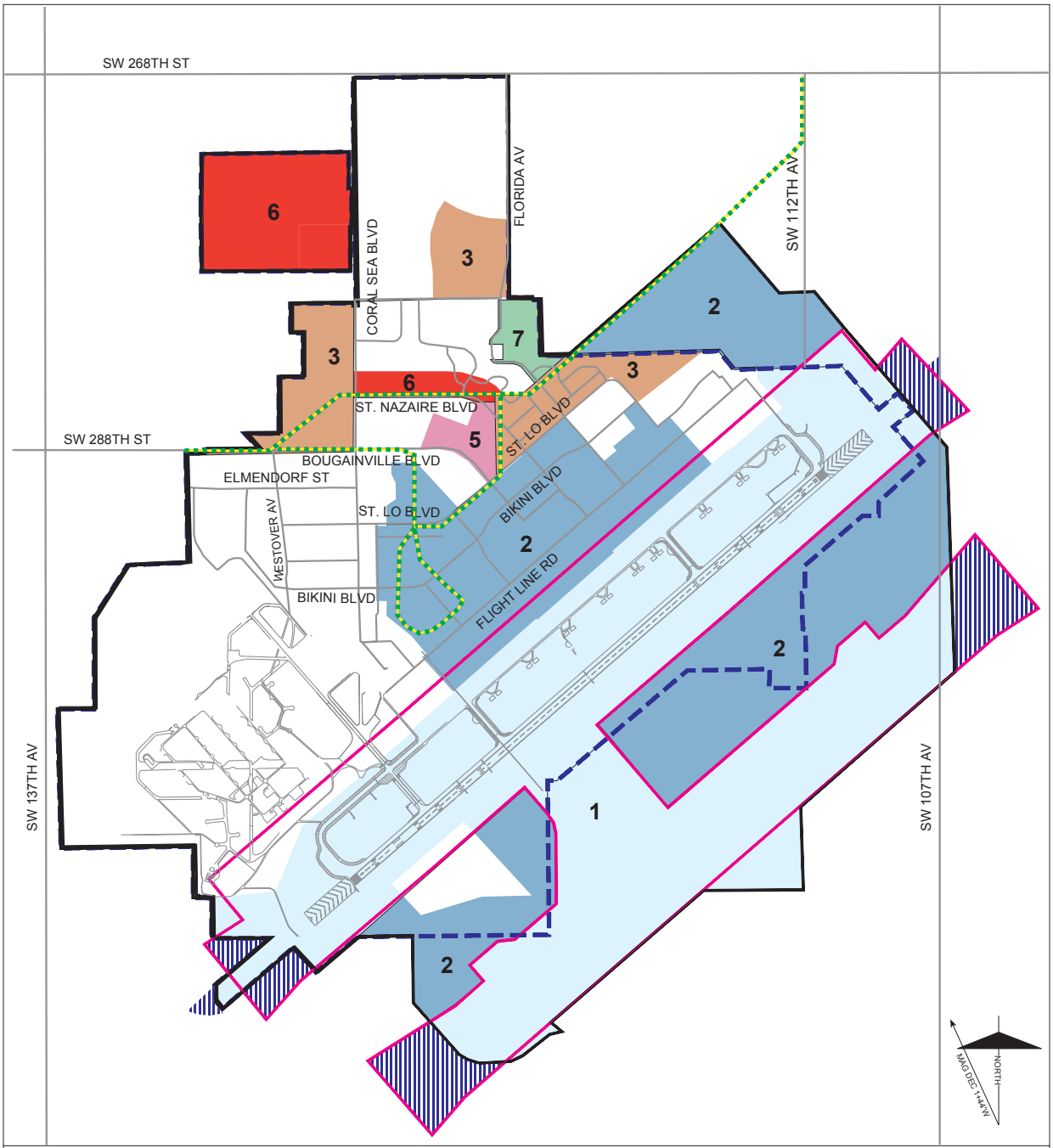
The potential number of aircraft operations, passengers, and facility/land requirements for maximum operations at a two-runway airport are summarized in **Table 2.2-11**. It is extremely unlikely that maximum operations for a two-runway system would occur before 2050. The estimated facilities and employment presented in Table 2.2-11 are based on current planning factors. Because airport design and functions could change substantially over the next 30 to 50 years, it is not known if current factors would apply, but the estimates provide a context for possible development and consideration of potential impacts.

The ALP indicates that the "midfield" area (between the runways) would be developed with a new terminal area, and land on the north side of the airfield (next to the existing FANG area) would have new cargo and maintenance hangars linked to the runway by a new taxilane. It is not known whether previously constructed facilities would continue to be used (and only additional requirements would be built), or if the facilities would be converted for other aviation use. For example, the terminal facilities built for the single-runway airport could continue to be used, or they could be converted into cargo hangars or demolished to provide space for new parking structures. A new control tower would be needed in the midfield area to provide adequate line-of-sight for operations on both runways. The ALP indicates that portions of Mowry, Boundary, and Military Canals would need to be relocated where they intercept the new development. Many existing service roads would also need to be realigned, and a new internal network of roads would need to be constructed.

Figure 2.2-5 provides a concept of general land uses at an expanded airport. It is possible that about 450 acres in the midfield area would eventually be fully developed with terminal, aviation support facilities, and other commercial or industrial development. About 285 acres could be in the expansion area and 165 acres in the existing airfield area outside the object free area. About 145 acres on the northeast side of the existing runway could be developed with cargo hangars. Approximately 800 acres might be disturbed for new development on the expanded airport. The land for the expansion is currently undeveloped and therefore generally pervious. After development, about 40 percent of it could be covered and become impervious. New development in the midfield area could also increase the overall impervious area on the disposal property.

A two-runway airport could have a capacity of about 370,000 annual aircraft operations. It is speculative with respect to the aircraft operations that would actually be distributed on the two runways. Many aircraft currently operating will no longer be flying in 40 years, but replacements or new prototypes have not yet been identified.

When operating at full capacity, a two-runway airport may enplane 8 to 10 million passengers annually. Using equivalent ratios of area per employee for various airport functions and projected facility requirements, the expanded airport might support about 8,000 additional employees. Changes in airport design and functions, however, could radically alter employment levels in the future.



LEGEND

1	Airfield	5	Institutional	9	Utility*
2	Aviation Support	6	Commercial	10	Military/Government*
3	Industrial	7	Recreation/ Open Space	11	Caretaker*
4	Residential*		Retained & Conveyed Areas	*	Not Used

Expanded Airport Boundary
Former Homestead AFB Boundary
Runway Protection Zone
Additional Land to be Acquired
New Roadway

(147Bb)HS 6.30.00nc

Area Shown

0.25 0 0.25 0.5
Scale In Miles

Derived from: AFBCA 1996, PBS&J 1996a

Figure 2.2-5
Land Use–Possible Expanded Airport

Table 2.2-11. Potential Development and Operations at an Expanded Airport

	Maximum One-Runway Airport	Maximum Two-Runway Airport[1]	Increase
Airport Land Area	1,632 acres	2,690 acres	1,060 acres
Annual Aircraft Operations	231,000	370,000	139,000
Annual Enplaned Passengers	3.9 million	8–10 million	4–6 million
Airport Facilities:			
Runways	Single 11,200 foot runway	Second parallel 9,000 foot runway, separated by 3,500 feet	New runway
Air Traffic Control Tower	Existing control tower	New midfield tower	New tower
Passenger Terminal	1,200,000 SF	2,900,000 SF	1,700,000 SF
Cargo/Maintenance	150 acres	180 acres	30 acres
Airport Access	Direct access by 4–6 lane highway	Alternative direct access by 6 lane highway	New access highway to midfield terminal area
Airport/Aviation Employment	8,100	16,400	8,300
Employee Parking	50 acres	135 acres	85 acres
Passenger/Taxi/Limo/Bus Parking	65 acres	130–165 acres	65–100 acres
Rental Car Parking	16 acres	30–50 acres	14–34 acres
Ground Disturbance	700 acres	1,500 acres	800 acres
Impervious Surface	1,110 acres	1,650 acres	540 acres

Source: SAIC; **PBS&J 1996a**, **PBS&J 1994**.
Note: [1] Unlikely to occur before 2050.
SF square feet

Additional vehicular traffic would result from increased passenger levels and employment. Using current planning factors, there could be approximately 105,000 daily vehicular trips to and from the expanded airport when operating at full capacity.

Expanding the airport could also generate additional secondary off-site development in the vicinity of HST. Based on requirements in Table 2.2-11, the expanded site should be able to accommodate projected new airport and aviation facilities, parking, and roadway development. However, little land would remain for other commercial uses supporting increased passenger levels. Also, the ALP does not indicate any additional revenue-producing uses in the expanded area. New hotels, restaurants, and other commercial businesses supporting additional airport passengers and employees would need to locate outside the airport. If projected passenger enplanements of 10 million were achieved, there could be as much as 300 acres of additional land developed in the vicinity of the airport for lodging. Additional commercial development for restaurants and other services would also result.

Both FAA and the National Aeronautics and Space Administration (NASA) have undertaken a program to identify further aircraft noise reduction technologies which are anticipated to be implemented in the early 2000s. Research programs are also ongoing to reduce future aircraft engine exhaust emissions. Because of many anticipated changes in technology, current information cannot be used to accurately describe airport and aircraft operations in 30 years or beyond in a quantifiable way. The information presented here may provide a general understanding of the possibilities, but any detailed analysis would have to be conducted at a future date based upon a specific proposal and known parameters.

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2.3 COMMERCIAL SPACEPORT ALTERNATIVE

During scoping for this SEIS, the Air Force received two proposals from prospective commercial space launch vehicle operators to use former Homestead AFB as a location for launching missions. The concept of establishing a spaceport at the former base also received support from Spaceport Florida Authority, Enterprise Florida, a working group of Team South Dade, and Vision Council, a local redevelopment agency. This alternative reflects those proposals in a plan to develop a Commercial Spaceport on the surplus property for Reusable Launch Vehicles (RLVs). The new launch vehicles described in these proposals are currently under development and are being designed to take off and land horizontally like airplanes. It is anticipated that these vehicles will be able to use conventional runways. However, it should be noted that the concept of a launch complex dedicated to reusable vehicles is new and there are no existing launch sites for horizontally launched reusable vehicles. The analysis in this SEIS is based on the most recent information, assumptions, and estimates.

The Homestead area holds some attraction for commercial space companies because of operational advantages of this location over other airfields in the continental United States. Specifically, Homestead's location relative to the equator provides advantages for launching space vehicles. The increased velocity produced by the earth's rotation can be used to assist propulsion of vehicles orbiting the earth. Also, proximity to the equator limits the distance that vehicles must traverse through the atmosphere to place satellites in low earth orbits (LEOs) and geosynchronous transfer orbits (GTOs) over the equator. These factors make it more efficient to launch from Homestead than from other locations.

Space vehicle developers are designing systems that would minimize operational costs, using concepts of reusability, reliability, and conventionality. The new horizontally launched vehicles are being designed to function more like aircraft and to use conventional runways. This could reduce operating costs when compared to specialized launch facilities and expand options for selecting staging locations. The systems could be readily serviced and maintained for sequential operations, like commercial airplanes. While these are the operational goals of developers, it is uncertain whether the new systems will be able to meet FAA's requisite safety standards for operating at conventional airports.

Although no specific recipient has been identified to whom the disposal property at former Homestead AFB would be conveyed to implement this alternative, it would likely be a public entity or authority.

FAA's Licensing Process

In accordance with the Commercial Space Launch Act (CSLA) and Commercial Space Transportation Licensing Regulations, any company wishing to operate a launch site or launch a vehicle from the United States or a U.S. company launching from a foreign territory must apply for a license. There are two distinct actions involved in the licensing process: (1) an environmental review, as required under the National Environmental Policy Act, and (2) the licensing and safety evaluation. The following is a basic outline of the flow of the process an applicant follows when applying for a launch site operator or launch specific license.

Currently, FAA issues two general types of launch licenses. A launch specific license authorizes a licensee to conduct one or more launches, having the same launch parameters, of one type of launch vehicle from one launch site. The license identifies, by name or mission, each launch authorized under the license. A licensee's authorization to launch terminates upon completion of all launches authorized by the license or the expiration date stated in the license, whichever occurs first. A launch operator license authorizes a licensee to conduct launches from one launch site, within a range of launch parameters, of launch vehicles from the same family of vehicles transporting specified classes of payloads. A launch operator license remains in effect for five years from the date of issuance.

There are several key components to the launch licensing process:

- Pre-application consultation
- Application evaluation, comprised of:
  - — Policy review and approval
  - — Safety review and approval
  - — Payload review and determination
  - — Financial responsibility determination
  - — Environmental review
- Compliance monitoring

Pre-application consultation is accomplished prior to the formal submittal of a license application. The policy review, safety review, payload review, financial responsibility determination, and environmental review are part of the launch license application evaluation. These activities do not have to be completed in any particular order and may occur simultaneously. Compliance monitoring is performed after the license has been issued.

An applicant may submit data related to the policy review, safety review, and payload review together as a single package or separately. An applicant may also request a maximum probability of loss determination separately to determine its financial responsibility requirements early in its launch program. Environmental information is required for evaluation if the proposed activity is not adequately addressed in existing environmental documentation. The following is a brief description of each component of the launch licensing process.

Pre-Application Consultation. An applicant must consult with the FAA before submitting an application. Pre-application consultation consists of meetings, communications, or draft application submittals that a potential applicant may undertake with the FAA prior to submitting a formal application. Pre-application consultation allows a prospective applicant to familiarize the FAA with its proposal and the FAA to familiarize the prospective applicant with the licensing process. It also provides a potential applicant with an opportunity to identify any unique aspects of its proposal and develop a schedule for submitting an application.

Policy Review and Approval. The FAA reviews a license application to determine whether it presents any issues affecting U.S. national security or foreign policy interests, or international obligations of the United States. A major element of the policy review is the interagency review of the launch proposal. An interagency review allows government agencies to examine the proposed mission from their unique perspectives. The FAA consults with the Department of Defense, the Department of State, and other federal agencies, such as the National Aeronautics and Space Administration, that are authorized to address national security, foreign policy, or international obligation issues.

Safety Review and Approval. The purpose of the safety review is to determine whether an applicant can safely conduct the launch of the proposed launch vehicle(s) and payload. Because the licensee is responsible for public safety, it is important that the applicant demonstrate an understanding of the hazards involved and discusses how the operations will be performed safely. There are a number of technical analyses, some quantitative and some qualitative, that the applicant may perform in order to demonstrate that its commercial launch operations will not pose an unacceptable threat to the public. The quantitative analyses tend to focus on the reliability and functions of critical safety systems, and the hazards associated with the hardware, and the risk those hazards pose to public property and individuals

near the launch site and along the flight path, to satellites and other on-orbit spacecraft. The qualitative analyses focus on the organizational attributes of the applicant such as launch safety policies and procedures, communications, qualifications of key individuals, and critical internal and external interfaces.

For applicants proposing to launch from a federal launch range who have contracted with the federal launch range for the provision of safety-related launch services and property, the FAA issues a safety approval if the applicant satisfies the requirements of the regulations and if those launch services and the proposed use of launch property are within the federal launch range's experience. FAA's Launch Site Safety Assessments document general information and range capabilities of a federal launch range and provide a safety assessment of the federal launch range to support FAA's licensing determination.

Payload Review and Determination. The FAA reviews a payload proposed for launch to determine whether a license applicant or payload owner or operator has obtained all required licenses, authorization, and permits, unless the payload is exempt from review. The FAA does not review payloads that are subject to regulation by the Federal Communications Commission, the Department of Commerce, National Oceanic and Atmospheric Administration, or owned or operated by the U.S. government.

If not otherwise exempt, the FAA reviews a payload proposed for launch to determine whether its launch would jeopardize public health and safety, safety of property, U.S. national security or foreign policy interests, or international obligations of the United States. The FAA may review and issue findings regarding a proposed class of payload (e.g., communications, remote sensing, or navigation). However, each payload is subject to compliance monitoring by the FAA before launch.

Financial Responsibility Determination. Section 70112 of CSLA requires that all commercial licensees demonstrate financial responsibility to compensate for the maximum probable loss from claims by a third party for death, bodily injury, or property damage or loss resulting from an activity carried out under the license; and the U.S. government against a person for damage or loss to government property resulting from an activity carried out under the license. Section 70112 also requires that the Department of Transportation set the amounts of financial responsibility required of the licensee. The licensee can then elect to meet this requirement by proving it has financial reserves equal to or exceeding the amount specified, placing the required amount in escrow, or purchasing liability insurance equal to the amount specified. The most common and preferred method is purchase of liability insurance.

The maximum probable loss determination is based on an analysis and assessment of the maximum monetary losses likely to be incurred by government and third-party personnel and property in the event of a mishap. It is calculated by assessing the dollar value of government and third-party properties at risk by launch accidents likely to occur as the result of the conduct of launch activities.

Environmental Review. The environmental evaluation ensures that proposed launch activities pose no unacceptable threat to the natural environment. FAA is required to consider the environmental effects of commercial space launches authorized under a license because the issuance of a license is considered to be a major federal action under NEPA. An applicant must provide information sufficient to enable FAA to comply with the requirements of NEPA, Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA, and FAA Order 1050.1D.

Compliance Monitoring. The purpose of compliance monitoring is to ensure that a licensee complies and continues to comply with the CSLA, the regulations, and the terms and conditions set forth in its license. A launch licensee shall allow access by, and cooperate with, federal officers or employees or other individuals authorized by the FAA to observe any activities of the licensee, or of the licensee's contractors or subcontractors, associated with the conduct of a licensed launch.

The Commercial Space Act of 1998 amended the CSLA of 1984 to include licensing authority for reentry vehicles and reentry operations. As a result of this amendment, FAA is authorized to regulate three new types of launch activities: (1) reentry, (2) RLV, and (3) landing site operations. Reentry activities include the purposeful return of a reentry vehicle and its payload, if any, from earth orbit or from outer space to earth. Reentry operations involve launch vehicles going from earth to outer space and returning to earth substantially intact. RLVs are meant to be launched and recovered more than once and usually contain vehicle stages that may be recovered by a launch operator for future use in the operation of a substantially similar vehicle. Landing site operator activities involve the use of a site to support the reentry of a reentry vehicle for which the requisite safety footprint of the vehicle upon reentry is wholly contained within the site. The same categories described above also apply to the licensing process for RLVs, reentry sites, and reentry site operations.

The concept of commercial launch complexes is in the early stages of definition. Both vehicle concepts described in this document for former Homestead AFB are still in the development stages and would likely not be ready for commercial operation until the 2005–2006 time frame. The implementation of this concept is dependent on financial, environmental, regulatory, and operational feasibility requirements that are under development. Applicable approvals and licenses would have to be obtained from FAA by future site operators and proposed launch programs. The CSLA mandates that an application for a license be processed within 180 days of submission of a complete application. At this time, no application has been submitted to FAA for either a launch complex or space launch operations at former Homestead AFB. Additional environmental documentation for launch-specific environmental issues would likely be needed before space launch operations could begin at Homestead. For the purposes of this analysis, it is assumed that applicable licensing requirements would be met before this alternative could be implemented.

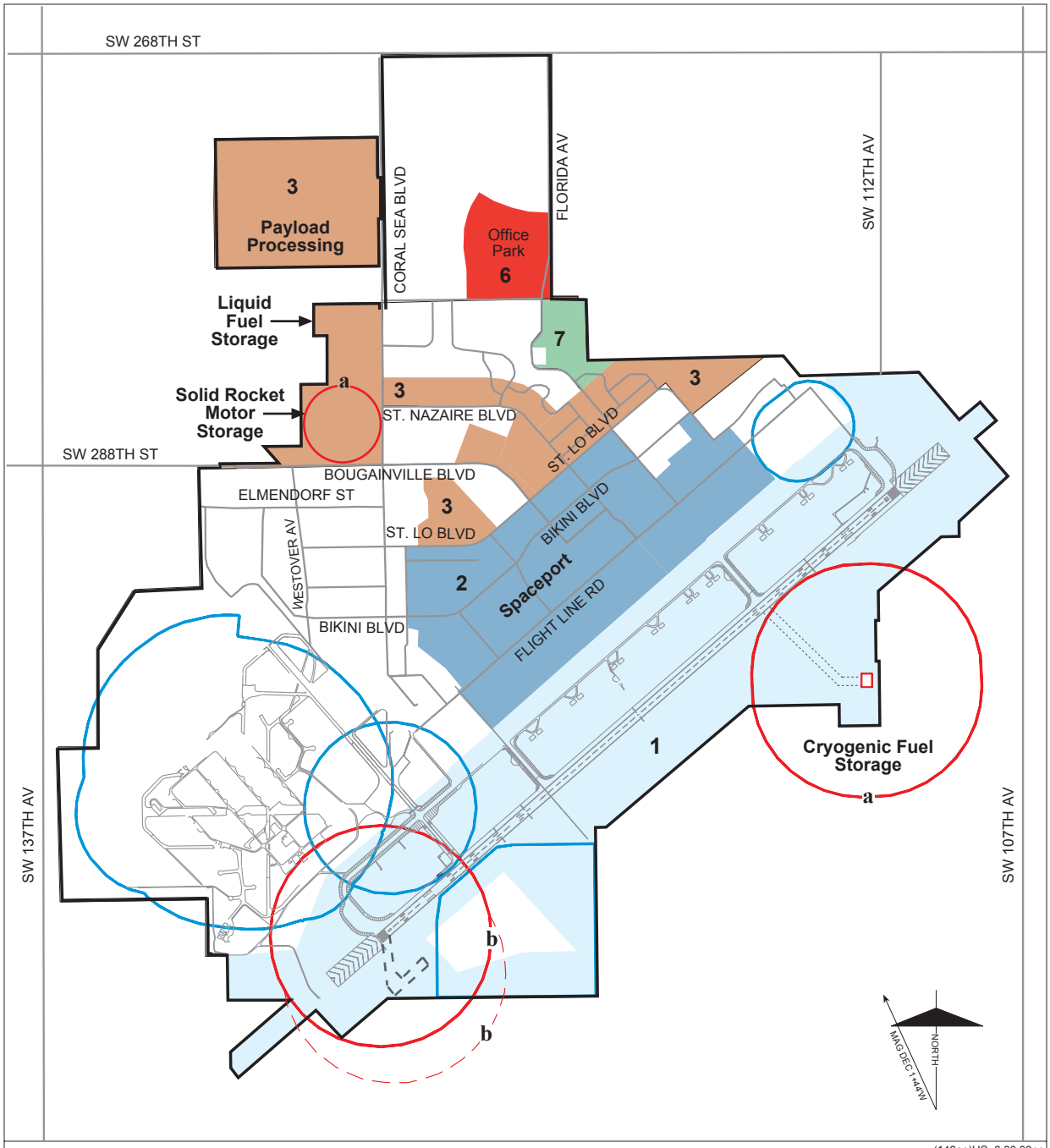
A launch complex at former Homestead AFB could be used by one operator or multiple operators, depending on each prospective operator's facility requirements and compatibility with existing military and other government activities and the other conveyed property. The description of the Commercial Spaceport alternative in the following sections is based on information furnished by potential operators and represents the best available information on how this alternative might be implemented.

2.3.1 Land Use and Development

Figure 2.3-1 illustrates and **Table 2.3-1** lists the land uses on the disposal property assumed for this alternative. The aviation support activities are assumed to be designed to meet commercial space operations requirements. Suitable industrial land would likely be developed for aviation-related technical service industries and warehouses. Commercial use would likely focus on limited office park development characterized by high numbers of employees per square foot but relatively few visitors. Some consumer-focused businesses might serve on-site employees and residents of the Homeless Trust Center and Job Corps facilities.

Estimates of facility development are provided by land use in **Table 2.3-2**. Most of the spaceport construction is assumed to occur before about 2007. Industrial areas would likely be constructed at the same rate, while other non-industrial and commercial development is assumed to occur gradually over the period of analysis. For purposes of this analysis it is assumed that the commercial and mixed industrial areas would be developed at a rate of about 5 percent per year.

The estimates of new construction assume reuse and renovation of some existing facilities, as shown in Table 2.3-2. Initially, about 460,000 square feet of existing facilities are assumed to be renovated and reused as part of this alternative. Approximately 746,000 square feet of new facilities are assumed to be constructed by 2005 and an additional 1.5 million square feet to be constructed between 2005 and 2015. Demolition in aviation areas is assumed to occur primarily during initial construction. In commercial and industrial areas, demolition is assumed to occur primarily after 2005.



LEGEND

1	Airfield	5	Institutional*	9	Utility*
2	Aviation Support	6	Commercial	10	Military/Government*
3	Industrial	7	Recreation/ Open Space	11	Caretaker*
4	Residential*		Retained & Conveyed Areas	*	Not Used

Former Homestead AFB Boundary
Existing Safety Zone
Spaceport Safety Zone
(based on DoD specifications and assumed locations)
a fuel storage area
b pre-takeoff final check

New Taxilane
Possible Holding Pad and High Speed Taxilane
Associated Safety Zone

(146ee)HS 6.30.00nc

0.25 0 0.25 0.5
Scale In Miles

Derived from: AFBCA 1996, DOD 1997, Gunn 1998, Homestead ARS 1998

Figure 2.3-1
Land Use–Commercial Spaceport Alternative

Table 2.3-1. Estimated Acres by Land Use—Commercial Spaceport Alternative

Land Use	Acres[1]	Percent
Airfield	915	56
Aviation Support	306	19
Industrial	335	20
Commercial	48	3
Open Space	28	2
Total Disposal Property	**1,632**	**100**
Retained and Conveyed Property[2]	1,306	
Total	**2,938**	

Source: SAIC.
Notes: [1] Rounded to the nearest acre.
[2] Includes approximately 30 acres expected to be retained and 26 acres proposed to be transferred to the School Board of Miami-Dade County.

Table 2.3-2. Estimated Facility Construction and Reuse by Land Use—Commercial Spaceport Alternative

Land Use Category	Facility Retention[1,2] (000 SF)	Facility Demolition[3] (000 SF)	New Pavement[4] (000 SF)	Cumulative New Facility Construction (000 SF)			
				2000	2005	2015	Full Buildout
Airfield	3	0	286[5]	0	NA	NA	NA
Aviation Support	401	64	1,523	0	85	354	622
Industrial	56	234	3,147	0	493	1,359	1,773
Commercial	0	<1	1,045	0	168	505	673
Open Space	0	<0	0	0	0	0	0
Total Disposal Property	**460**	**298**	**6,001**	**0**	**746**	**2,218**	**3,068**
Retained and Conveyed Property	1,456	19	1,155	155[6]	174	479	497
Total	**1,916**	**317**	**7,156**	**155**	**920**	**2,697**	**3,565**

Source: SAIC.
Notes: [1] Includes facilities to be renovated.
[2] Does not include miscellaneous utility structures throughout the former base totaling about 13,270 SF.
[3] Does not include demolition of paved areas.
[4] New pavement primarily for parking and internal circulation at full buildout.
[5] For new fuel storage tanks, engine run-up facilities, holding pad, and taxilanes.
[6] Includes 135,000 square feet for new Homeless Trust and Meta Therapy Centers and 20,000 square feet for Job Corps security building (estimated).
NA not available
SF square feet

Tables 2.3-3 and 2.3-4 estimate ground disturbance and impervious surface, respectively, resulting from the site development described above. By 2015, an estimated 289 acres on the disposal property could be disturbed for development, increasing to a total of 370 acres at full buildout. This assumes that existing aprons would be adequate to provide aircraft parking and access to facilities, and no apron expansions would be required. Some local and on-site roadways may need to be widened to meet code standards and provide improved access for truck traffic. These requirements would depend on the extent of on-site

fabrication and assemblage of space vehicles and are not currently known. It is assumed that stormwater drainage improvements similar to those in the Proposed Action would be required. For analysis purposes, these are assumed to include construction of 2 miles of French drains.

Table 2.3-3. Estimated Acres Disturbed—Commercial Spaceport Alternative

Land Use	Cumulative Acres			
	2000	2005	2015	Full Buildout
Airfield	0	8	8	8
Aviation Support	0	40	67	94
Industrial	0	76	169	208
Commercial	0	15	45	60
Open Space	0	0	0	0
Total Disposal Property[1]	**0**	**139**[2]	**289**	**370**
Retained and Conveyed Property	33[3]	40	74	77
Total	**33**	**179**[2]	**363**	**447**

Source: SAIC.
Notes: [1] Includes disturbance from demolition of facilities, removal of pavement, and site preparation for new facilities and pavement.
[2] Does not include 0.3 acres disturbed for new storm drains.
[3] Disturbance associated with construction of Job Corps and Homeless Trust Centers and new facilities in regional park.

Impervious surface is assumed to increase from about 29 percent on the disposal property currently to about 34 percent coverage by 2015 and 36 percent at full buildout. These estimates include all pavements and facility footprints. The increases would primarily be associated with new construction and paving in industrial and commercial areas. Impervious surface averaged over the entire former base property is estimated to increase from about 26 percent currently to 31 percent at full buildout.

The following sections describe development and activities assumed for each land use.

2.3.1.1 Airfield

This alternative is assumed not to require any major alterations to the existing runway. Launch vehicle operations may require additional navigational aids. A taxilane and ramp area is assumed to be constructed from the runway to the fuel storage area. It is anticipated that horizontally launched vehicles would use the runway or existing taxiway to taxi to the southwest end of the runway for takeoff. Alternatively, a new taxilane could be constructed along the southern boundary of the former base, terminating in a holding pad with a high-speed taxilane at the end of the runway. This is illustrated schematically on Figure 2.3-1 but has not been included in the calculations in Tables 2.3-2, 2.3-3, or 2.3-4.

A new cryogenic fuel storage area would be needed for storage of liquid hydrogen and liquid oxygen. The most likely location would be the south side of the airfield. An area of about 0.5 acres is assumed to be needed for this facility. The location shown on Figure 2.3-1 would provide the greatest separation from other airport facilities and the runway. Siting a new fuel storage facility in this location would likely require acquisition of restrictive easements from adjacent property owners for safety purposes and possible relocation of Boundary Canal in the vicinity of the reservoir.

Table 2.3-4. Estimated Impervious Surface—Commercial Spaceport Alternative

Land Use	Cumulative Acres				
	Existing	2000	2005	2015	Full Buildout
Airfield	204	204	211[1]	211[1]	211[1]
Aviation Support	193	193	199	208	218
Industrial	60	60	68	101	120
Commercial	10	10	18	33	40
Open Space	2	2	2	2	2
Total Disposal Property[2]	**469**	**469**	**498**	**555**	**591**
Percent Coverage Disposal Property	**29%**	**29%**	**30%**	**34%**	**36%**
Retained and Conveyed Property	309	290[3]	296	323	324
Total	**778**	**759**	**794**	**878**	**915**
Total Percent Coverage	**26%**	**26%**	**27%**	**30%**	**31%**

Source: SAIC.
Notes: [1] Does not include acreage for possible new parallel taxiway, final check pad, or aerospace vehicle run-up facilities.
[2] Includes pavement and building footprints.
[3] Decline reflects clearing of land for new regional park and minor construction for Homeless Trust and Job Corps facilities.

The fuel storage area requirements would be specific to the type of launch vehicle that would operate from the site. One proposal would use a ramjet engine powered by liquid hydrogen, liquid oxygen, and liquid air. Nominal fuel storage for such a system could include:

- Storage of between 500,000 and 1,000,000 pounds of liquid hydrogen in a 72 foot diameter, above-ground, spherical tank. This tank would require about a 150 foot by 150 foot area, allowing for space to maneuver between and around the tank.
- Storage of 500,000 to 1,000,000 pounds of liquid oxygen in two above-ground 12 foot by 70 foot tanks. An area 40 feet by 100 feet would allow space to maneuver between and around the tanks.
- Storage of between 200,000 and 400,000 pounds of liquid air. An area the same size as the liquid oxygen area (about 4,000 square feet) could be occupied by liquid air storage. The liquid air tank would be located above ground as well.
- Liquid nitrogen and helium gas would most likely be trucked in for each launch; therefore, no area has been included for this type of storage.
- It is assumed the liquid hydrogen, oxygen, and air would also be transported by truck, and the tanks would be refilled from one to three times each month.

Based on these assumptions, a total area of about 30,000 square feet would be needed for storage of cryogenic fuel. Other systems could use other types of fuel that would have different storage requirements.

Long-term plans for the spaceport could include making liquid hydrogen on site. This assumes adequate electricity and natural gas could be supplied to the site and that FAA would determine it was safe to locate in proximity to the airfield.

An unmounted engine run-up area would be needed and probably require a Hush House similar in design to (but smaller than) those used for F-16 engine run-ups. A Hush House of this type would allow engine tests at night and in inclement weather. A 75 foot by 75 foot (approximately 5,000 square feet) Hush House is included in this alternative on the south side of the airfield. The engine run-up facility is projected to be used about one to four times per month.

A mounted engine run-up area would also be needed to perform vehicle engine tests. This run-up area would need to be designed to withstand the size and weight of a large aerospace vehicle. It is possible that this area could be located adjacent to the existing military run-up area. It might be used once every couple of months.

Easements may be required from adjacent property owners to accommodate safety areas for use of the run-up facilities, depending on where they were located, the noise levels during run-ups, and the quantities of fuel being used. Shielding with blast pads could reduce or eliminate the need for easements.

For safety purposes, it is possible that a new parallel taxiway on the south side of the runway would provide flexibility for current users and spaceport functions. This is not currently proposed or included in the site development calculations (of area disturbed or impervious surface). The feasibility of the option and both physical and environmental consequences would need to be evaluated before a decision could be made to construct a new parallel taxiway.

2.3.1.2 Aviation Support

Under this alternative, the aviation support area would be developed as a spaceport enclave, as shown on Figure 2.3-1. Several factors would influence the extent of facility development required for a spaceport. These include the number of commercial space operators; the volume of the market being served; the size, type, and number of systems being operated and maintained; and arrangements for shared-use of specialized facilities. For the purpose of analysis, assumptions have been made about physical development, based on information provided by potential operators.

The following is a generalized list of facilities estimated to be required by one operator:

Mission Management Center	8,400 SF
Payload Processing Facility	73,600 SF
Integration/Maintenance Facility	194,000 SF
Fabrication and Subcomponent Assembly	150,000 SF
Warehouse (general storage)	80,000 SF
Administrative Areas	54,000 SF
Total	**560,000 SF**

Of these requirements, about 486,400 square feet are assumed to be located in the aviation support area. A separate payload processing facility could be located in the industrial area and could be shared by multiple operators at the spaceport. About 401,000 square feet of existing facilities along the flightline could be used (most needing renovation), and 85,000 square feet of new construction is projected by 2005. For example, Building No. 741, the largest hangar on the flightline, might be expanded to provide space for horizontal integration of a satellite to a launch vehicle. It is assumed that construction and engineering techniques (e.g., blast shields) would be used to reduce the size of the safety area, allowing more efficient use of the flightline. An estimated 16,000 square feet of older or unsuitable facilities would likely be demolished.

The projected Mission Management Center could include launch control and possibly a telemetry area, auto landing, avionics lab, and office space. If an existing building large enough to house all those activities is not available, it might be feasible to split them up and use several smaller buildings. If all these activities were collocated, it would require about an 8,450 square foot building. Both GPS and satellite communications would be used to track the launch vehicles. Mission control may also be linked to other government ranges in order to track special missions.

The Integration/Maintenance Facility is assumed to include an upper stage preparation and payload integration room, an upper stage and satellite installation room, and a launch vehicle maintenance and preparation room. A storage warehouse and smaller facilities for fabrication and sub-component assembly could also be located in the aviation area. An estimated 417,600 square feet would be required to accommodate these functional areas.

Expansion of the spaceport to accommodate other operators would require additional facilities. A second operator would likely have similar requirements, although some specialized facilities (such as flight control center, payload processing, and fuel storage) could probably be shared or would require only minimal expansion. It has been assumed that about 269,000 square feet of additional facilities might be constructed in the aviation area for an additional tenant, including a separate Integration/Maintenance Facility and some fabrication functions. Additional workshop storage and administrative space could be developed in the industrial area behind the flightline between about 2005 and 2007. A similar expansion could subsequently occur for full buildout. If this is not the case, or if a second operator had different facility requirements, then these estimates could change.

2.3.1.3 Industrial

The land identified for industrial use (about 335 acres) is assumed to be developed primarily for aviation-related uses that do not need access to the runway. A Payload Processing Facility could be located on the parcel west of the new regional park. This area is much larger than required for an estimated 73,600 square foot complex of facilities, but it would allow for future expansion, containment of safety areas, and siting of a small microwave antennae area (this could be located on any suitable industrial land in the disposal area). The facility could provide payload processing services to a variety of tenants or users of the spaceport.

To the south of this area, approximately 75 acres (in a former military housing area) could be used for storage of solid propellants used in some payloads. These fuels are classified as type 1.1 or 1.3 explosives and would be stored in concrete bunkers. A safety setback area around this fuel storage area is assumed to be about 600 feet (**Gunn 1998**). Liquid propellant storage would likely also be needed. The fuel requirements could vary depending on the type of launch vehicles deployed at the spaceport. For example, one proposed vehicle would require kerosene (refined jet fuel). A 50,000 gallon tank would provide sufficient capacity for several missions. Other types of vehicles could use propellants, such as nitrogen tetroxide (a hypergolic oxidizer), hydrazine, and rocket fuel (Rocket Propellant 1, "RP-1"). These propellants could also be stored in above-ground tanks on the site. It is assumed all solid and liquid fuels would be transported to the spaceport by truck.

The areas adjacent to the aviation support area could be available for a variety of industrial uses. Related space technology businesses could be attracted by the proximity to the spaceport. This land could be developed for workshops for avionics equipment and subcomponent repairs, fabrication, research, and developed communication systems. Although many of these businesses could locate outside the disposal property, for the purpose of this analysis, it is assumed that suitable on-site industrial land would be developed first. Commercial aviation maintenance services and fabrication shops could start up at the initiation of on-site construction. It is expected that over the long term, as high-tech industries became

established on the disposal property, similar types of developers would be attracted to the site. Other industrial uses that could be accommodated include communications enterprises and industrial material plants, as described in Section 2.6 Independent Land Use Concepts.

A commercial spaceport at Homestead could attract synergistic research and development industries to the site. For example, an environmental institute named GemStone has been established to provide a framework for the development of collaborative enterprises between universities, industry, and government. With the center of activities in south Miami-Dade County, GemStone is focused on science and technology with a particular emphasis on satellite and remote sensing systems (**GemStone 2000**). GemStone activities are anticipated to be distributed over multiple locations. Some activities could be located at former Homestead AFB.

Overall, only a small amount of existing facilities in industrial areas would be expected to be used (about 56,000 square feet). Older facilities would likely be demolished to clear areas for the new facilities. About 493,000 square feet of new facilities could be constructed by 2005, almost 1.4 million square feet by 2015, and over 1.8 million square feet by full buildout.

2.3.1.4 Commercial

The remainder of the disposal property (almost 50 acres) would be available for commercial uses. It is expected that the majority of development on this land would be office-type, with a small amount of retail/services. Without passenger demands, on-site demand for commercial services would be less than under the Proposed Action. A modest rate of development of 12 acres every 5 years has been assumed, with full buildout occurring soon after 2015. Office park development would benefit from a regional park setting in the north part of the disposal property. Retail businesses would likely locate along the primary access roads and near the Homeless Trust and Job Corp Centers. Table 2.3-2 summarizes the facility development assumed for commercial use, resulting in about 168,000 square feet of new construction by 2005 and just over 500,000 square feet by 2015.

2.3.1.5 Open Space

It is assumed the former Mystic Lake park area (about 28 acres) would serve as a stormwater holding area for the site. Levees would be built to increase its holding capacity, as under the Proposed Action.

2.3.1.6 Other Uses

Section 2.6 discusses several uses for the disposal property that were identified during the scoping process. It indicates which of these would likely be viable within the overall land use framework of a Commercial Spaceport. Many of the specific industrial or commercial uses could occur under this alternative. A commercial spaceport might be combined with other mixed uses, such as those proposed by Collier Resources Company.

2.3.2 Commercial Spaceport Operations

Estimated launch vehicle operations are presented in **Table 2.3-5**. Military and government operations, also shown in Table 2.3-5, would comprise the largest component of the aviation activity under this alternative. These estimates assume there would be approximately one space launch mission per week by one operator, increasing up to as many as three missions per week by one or more operators by 2015. Based on current commercial space market projections, this represents an optimistic capture of the commercial space launch market at this location and may overestimate launch activity. During each space mission, one vehicle would take off, and two to three component stages would return to the airfield.

Table 2.3-5. Estimated Aircraft Operations for Commercial Spaceport Alternative

Category of Operation	Type of Aircraft	Current	Forecast			
			2000	2005	2015	Full Buildout
Space Launch						
Commercial Space Vehicle[1]	ASC, RSC, ROC	0	0	160	320	320
Commercial Space Vehicle[1]	B-747, Astroliner	0	0	0	160	160
Subtotal Space Launch		***0***	***0***	***160***	***480***[2]	***480***[2]
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 by 2015)	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
Subtotal Military/Government		***19,824***	***19,824***	***19,824***	***19,824***	***19,824***
Total Operations		**19,824**	**19,824**	**19,984**	**20,304**	**20,304**

Source: SAIC; **Landrum & Brown 1999a**.
Notes: [1] Space vehicle takeoff counted as one operation, but each stage landing is counted as a separate operation.
[2] Assumes about two to three launches per week by one or two operators.

It is assumed that safety procedures would be developed and implemented for the spaceport that would ensure joint use of the airfield by other users. Also, because the commercial spaceport concept is new and only in the very early phases of planning, flight paths and airspace corridors have not been developed for spaceport operations at former Homestead AFB. The spaceport licensee applicant would be responsible for choosing corridors that satisfy FAA safety standards. Criteria were recently adopted in new regulations (14 CFR Part 400, Chapter III) setting standards for vehicle reliability and fatal accident potential based on the system and population density of underlying areas. For purposes of this analysis, two possible corridors extending straight out from the airfield to the northeast and southwest have been assumed for departing and returning space vehicles. The following sections summarize the concept of operations for a Commercial Spaceport alternative and estimated levels of operations.

2.3.2.1 Spaceport Operations

RLV technology is still being developed. For purposes of analysis, it is assumed that permitting, licensing reviews, and approvals could be completed and operations initiated by 2005.

Two commercial space enterprises, Space Access LLC and Kelly Space and Technology, Inc., have expressed interest in operating from former Homestead AFB. Both companies are still developing their launch vehicles, operational procedures and will need to go through a licensing process with the FAA. This process requires a thorough safety review as well as an environmental determination based on vehicle and site-specific data that will need to be developed in addition to the baseline data provided in

this SEIS. Over the course of the licensing process, more detailed definition of the proposed operations would be produced. This section summarizes programmatic information about the concept of operations for a spaceport considering the two proposals.

Space Vehicle Characteristics

Space Access LLC is developing an unmanned launch vehicle designed to transport satellites into orbit. The launch vehicle would include two or three reusable stages to deliver payloads into either LEO or GTO, respectively. A hypersonic Aerospacecraft (ASC) would serve as the first stage. The second stage, a reusable spacecraft (RSC) would carry the payload for LEO missions. For GTO missions, a third stage, a reusable orbital transfer craft (ROC), would place the payload into orbit. Each stage would return to the staging location and would be reused after being serviced and refueled. All three stages would use liquid hydrogen, liquid air, and/or liquid oxygen as propellants.

The ASC is assumed to resemble the Concorde airplane and be comparable to the Boeing 747 in weight. It would take off and land horizontally on the existing runway. The ASC would primarily use liquid hydrogen and liquid air to fuel "air-breathing" ramjet engines.

The Eclipse Astroliner tow-launch system being developed by Kelly Space and Technology, Inc., would use a Boeing 747 (fueled with conventional jet fuel) to tow the first stage, a winged and partially powered Astroliner launch vehicle, from a conventional runway to a launch location at an altitude of about 20,000 feet. At that point, the Astroliner's air-breathing rocket engines (fueled by liquid oxygen and refined jet fuel) would be ignited and the tow released. The Astroliner would climb to a pre-determined altitude where a second space vehicle, powered by solid rocket motors, would be ignited. This vehicle would place the payload into orbit. Both the tow vehicle and the Astroliner would use a powered return to the staging location.

Launch Activities

It is assumed the launch vehicles would generally be maintained, repaired, and integrated at the spaceport. The vehicles could also be assembled in facilities on site. Vehicle parts and components would probably be manufactured at different locations and brought in by air or ground transportation. Potential operators have proposed that the commercial spaceport on former Homestead AFB be used as the test site as much as possible; however, if necessary, testing could be conducted at other locations in the United States (primarily government test ranges).

In general, pre-launch activities would be expected to include assembling (processing) the payload for flight and "mating" it to the upper stage(s). The payloads would be fueled during this process, resulting in safety stand-off requirements. The payloads are assumed to use traditional propellants, but other fuels may be used in some cases. Following this assembly, the payload and upper stage(s) would be mounted onto the launch vehicle. These activities would require a controlled clean room facility. Finally, the entire assembly would be fueled, then towed to the end of the runway and launched.

Launch schedules should be known from 45 days to 6 or 8 months in advance. Once exact orbital conditions are known, favorable "launch windows" can be identified. There is some flexibility in selecting the best launch window since the launch vehicles can alter their flight paths to a certain extent. This would also allow them to perform under a range of weather conditions. The schedule for some missions would be extremely time sensitive (timed to the second) in order to place payloads in the desired orbit. Most launches would occur during the daytime or early evening; however, some launch windows are inflexible and may occasionally require night takeoffs.

Once fueled, it is assumed that part of the airfield would be off limits to other users as the vehicle taxied to its launch location. The fueled vehicle would taxi on the runway to the southwest threshold, where final checks would be performed prior to takeoff.

The launch vehicles would likely take off to the northeast and climb rapidly over water. On a small percentage of missions, they might turn slightly to the east after takeoff for some equatorial orbits. In most cases, the vehicle is assumed to achieve supersonic speed at an altitude of approximately 18,000 feet above sea level and a distance of at least 18 to 20 miles from the runway (preliminary estimates). Some missions may require acceleration to supersonic speed at lower altitude in order to gain the precise orbital orientation for launching the second stage.

The Space Access ASC is projected to climb to a predetermined altitude (about 300,000 feet above sea level) where it would release the RSC. In some cases, a third stage ROC would be used to place the payload into orbit. After each vehicle released its load, it would return to the airfield. The vehicles would be unpowered during their final approach and land in a manner similar to a glider. The ASC has some flexibility to return under power. Reentries would likely be from the northeast. Alternate approaches from the southwest may be possible. The ASC is projected to return about 1 hour after takeoff, and the RSC and ROC about 7 and 9 hours after takeoff, respectively. The landing of each vehicle would be precisely timed and predetermined and could require exclusive access to the runway for between 5 minutes and half an hour. The distance of the vehicles from the runway and their altitude when decelerating through the sound barrier has not been determined and will be analyzed in the licensing review process by FAA.

In the Kelly Space and Technology system, both the Boeing 747 and the Astroliner would be manned. Takeoff would be similar to other commercial aircraft, insofar as the Boeing 747 operates with conventional jet fuel and power settings. This aircraft would be towing the Astroliner, a vehicle as large as a Boeing 747, operating under partial power. Both vehicles would be powered on return and able to land like other aircraft, using regular flight tracks and fitting into flight sequences for landing. The tow vehicle is projected to land about 2 hours after takeoff, and the Astroliner to return about 30 minutes later.

The new RLV systems are being designed for minimal turnaround time (about four days) between missions, but actual launch frequency would depend on payload customer demand. Table 2.3-5 reflects about one launch per week by 2005, potentially increasing to about three launches per week by 2015. This would appear to be optimistic, based on current commercial launch market projections.

2.3.2.2 Military/Government Operations

Military and government use of the airfield is expected to remain stable at about 19,824 operations annually through the year 2015 (see Table 2.3-5). F-16 aircraft would account for the majority of military operations. Schedules for training might be able to be adjusted around known launch dates and times. However, FANG and U.S. Customs Service both perform missions that need to be able to depart on demand. Therefore, access to the runway is paramount and may conflict with launch vehicle requirements. Procedures would need to be developed to enable these aircraft missions to coexist with launch vehicle operations. The feasibility of establishing launch operations at the airfield would depend on finding operable solutions for military and government users. Military and government aircraft would continue to use their current flight tracks as described in Section 2.1.1.2.

2.3.3 Employment and Population

Table 2.3-6 summarizes estimated employment and on-site population associated with this alternative. About 6,600 new jobs could be generated at full buildout of the disposal property, focused on the spaceport and associated high-tech industry and commercial development. About 890 jobs could be

generated directly by spaceport functions by 2005, increasing to about 1,380 jobs soon after. At full operations, there may be up to 1,800 spaceport jobs, comprised of a mixture of technical, administrative, and industrial sectors. Industrial jobs (expected to be mostly in high-tech industries) could grow from 520 in 2005 to about 1,570 in 2015, and 2,100 at full buildout. These would be expected to be predominantly jobs for highly skilled technicians and engineering professionals. Commercial job opportunities could grow from about 680 in 2005 to about 2,040 by 2015 and 2,700 jobs at full buildout if office park and retail development were fully occupied.

Table 2.3-6. Estimated On-Site Employment and Population—Commercial Spaceport Alternative

Employment	Current	2000	2005	2015	Full Buildout
Disposal Property					
On-Site Reuse Jobs	0	0	2,094	4,984	6,600
On-Site Construction Jobs	0	0	167	144	NA[1]
Total On-Site Reuse Employment	***0***	***0***	***2,261***	***5,128***	***6,600***
Retained and Conveyed Property[2]	1,090	1,490	1,410	1,480	1,470
Total On-Site Employment	**1,090**	**1,490**	**3,671**	**6,608**	**8,070[3]**
Population	**Existing**	**2000**	**2005**	**2015**	**Full Buildout**
On-Site Reuse Population	0	0	0	0	0
Retained and Conveyed Property	160	1,210	1,210	1,210	1,210
Total On-Site Population	**160**	**1,210**	**1,210**	**1,210**	**1,210**

Source: SAIC.
Notes: [1] Construction jobs for full buildout not estimated due to uncertainty of time frame.
[2] Includes 105 construction jobs annually by 2000, 5 by 2005, and 42 by 2015.
[3] Excludes reuse construction jobs.
NA not available

There would be no residential use of disposal property under this alternative. On-site population on retained and conveyed areas would remain as projected.

2.3.4 Traffic and Utilities Use

Table 2.3-7 estimates total daily vehicle trips to and from former Homestead AFB under this alternative. About 7,100 additional trips are estimated to be generated by the year 2005, 16,970 by 2015, and 22,480 by full buildout. These estimates assume that most of the retail customers would be on-site residents or employees. Over-sized vehicles may be used occasionally to transport large components or satellite payloads to the spaceport. Large tanker trucks would be expected to deliver fuel periodically.

Table 2.3-7. Estimated Vehicle Trips—Commercial Spaceport Alternative

	Current	2000	2005	2015	Full Buildout
Commercial Spaceport					
Average Daily On-Site Trips	0	0	7,103	16,973	22,480
Peak Hour Trips	*0*	*0*	*757*	*1,991*	*2,501*
Retained and Conveyed Property					
Average Daily On-Site Trips	3,956	5,362	5,952	7,517	9,094
Peak Hour Trips	*567*	*773*	*871*	*1,124*	*1,559*
Total Average Daily On-Site Trips	**3,956**	**5,362**	**13,055**	**24,490**	**31,574**
Total Peak Hour Trips	***567***	***773***	***1,628***	***3,115***	***4,060***

Source: SAIC.

Table 2.3-8 summarizes estimated utilities use for the Commercial Spaceport alternative. Electricity demands are estimated to increase by 128 MWh/day, and solid waste by over 17 tons per day over current consumption on the former base by 2015, based primarily on the increase in occupied facilities. Water consumption and wastewater generation are estimated to increase by about 0.2–0.3 mgd over current levels by 2015, due to increased employment and activity at the spaceport.

Table 2.3-8. Estimated On-Site Utilities Use—Commercial Spaceport Alternative

	Current	2000	2005	2015	Full Buildout
Reuse of Disposal Property					
Water (mgd)	0	0	0.12	0.28	0.38
Wastewater (mgd)	0	0	0.10	0.22	0.30
Solid Waste (tons/day)	0	0	7.5	17.3	23.1
Electricity (MWh/day)	0	<1	57	128	171
Retained and Conveyed Property[1]					
Water (mgd)	0.09	0.29	0.29	0.30	0.30
Wastewater (mgd)	0.07	0.23	0.23	0.24	0.24
Solid Waste (tons/day)	1.5	4.6	4.6	4.9	5.0
Electricity (MWh/day)	50	56	56	67	67
Combined Use					
Water (mgd)	0.09	0.29	0.41	0.58	0.68
Wastewater (mgd)	0.07	0.23	0.33	0.46	0.54
Solid Waste (tons/day)	1.5	4.6	12.2	22.2	28.1
Electricity (MWh/day)	50	56	113	195	238

Source: SAIC.
Notes: [1] Reflects increased use of Homeless Trust and Job Corps Centers, park visitors, and potential buildout of the bank and former credit union property.
Not all numbers sum due to rounding.
mgd million gallons per day
MWh megawatt hours

2.3.5 Secondary Development

Commercial Spaceport activities could be expected to generate additional demand for supporting industries and commerce. It is anticipated that the land required for businesses and operations directly supporting these functions would easily be accommodated on the disposal property. However, it is possible that some businesses may locate elsewhere for a variety of reasons. In that case, development on the disposal property could be less than described in this alternative, while there could be increased development elsewhere in the surrounding area. No net increase in off-site secondary development has been included in the analysis of this alternative.

However, spending associated with an estimated 5,128 jobs on the disposal property in 2015 and procurements for the on-site development could stimulate an estimated 4,937 additional, indirect jobs off site. **Table 2.3-9** shows that about 3,344 of these jobs are assumed to be in south Miami-Dade County. All the jobs are assumed to be additional to jobs estimated for south Miami-Dade County under the projected baseline.

Table 2.3-9. Estimated Employment, Population, and Land Use Generated by a Commercial Spaceport Alternative

	2000	2005	2015	Full Buildout
Miami-Dade County				
Commercial Spaceport Alternative Employment				
On Site[1]	0	2,261	5,128	6,600
Off Site	0	2,144	4,937	6,417
Total Countywide Reuse-Related Employment	***0***	***4,405***	***10,065***	***13,017***
Jobs Filled by In-Migrants	0	220	503	651
In-Migrating Population[2]	0	504	1,153	1,492
South Miami-Dade County				
Commercial Spaceport Alternative Employment				
On Site	0	2,261	5,128	6,600
Off Site	0	1,271	3,344	4,339
Total South County Reuse-Related Employment	***0***	***3,532***	***8,472***	***10,939***
Jobs Filled by In-Migrants[3]	0	220	503	651
In-Migrating Population[2]	0	504	1,153	1,492
Reuse-Related Off-Site Land Use[4]				
Residential (acres)[5]	0	32	70	90
Commercial/Industrial (acres)[6]	0	163	429	556
Total Land Use (acres)	***0***	***195***	***499***	***646***

Source: SAIC.
Notes: [1] Includes on-site construction jobs, except for full buildout.
[2] Population associated with in-migrating workers.
[3] No net change in population assumed from relocation of workers within the county.
[4] Reuse-related land requirement assumed to be in south Miami-Dade County.
[5] Residential development for in-migrating families.
[6] For reuse-related indirect employment.

As described in the Proposed Action, there are a number of potential sources of new jobs created by redevelopment. Based on labor availability, unemployment levels, and other factors, it is estimated that about 503 workers could in-migrate to Miami-Dade County by 2015 as a result of job opportunities at the Commercial Spaceport. With those in-migrating workers and the available labor supply, it is expected that all the reuse-related jobs in south Miami-Dade County could be filled. Therefore, no relocating workers are assumed for this alternative. An estimated population increase of 1,153 by 2015 would be associated with the in-migrating workers. About 420 additional housing units are estimated to be needed in south Miami-Dade County by 2015 for these workers and their families. The off-site employment and new housing demands could absorb an additional 70 acres for residential use (for in-migrating workers) and 429 acres for commercial and industrial use by 2015. This development could occur on any suitable land in the south Miami-Dade County area.

2.3.6 Combined Commercial Spaceport/Airport

The concept of a Commercial Spaceport for reusable launch vehicles is an emerging idea, and as of the publication of this document, there are no existing commercial launch facilities for horizontally launched reusable launch vehicles, although other project developers are in various stages of the process of obtaining necessary approvals, permits, and licenses. Also, there are no commercial airports that support launch vehicle activities, so there are no historic data on the feasibility of this alternative. However, some commercial space launch operators are interested in pursuing this concept. Therefore, this SEIS examines the possibility of a combined Commercial Spaceport/Airport in the event that it is determined to be feasible and viable in the future. Because of the uncertainties associated with the feasibility of a combined facility, this option was not analyzed at the same level of detail as the other reuse alternatives.

It appears that there would be substantial limitations on commercial aviation operations at a spaceport. For example, scheduled passenger services require relatively unrestricted runway and airspace access and could be disrupted by launch vehicle operations. For this analysis, it has been assumed that airport users that are generally tolerant of delays or could work around launch schedules might locate at the airport. A mixture of aircraft maintenance, air cargo, unscheduled passenger services, and general aviation has been incorporated into this concept.

Estimated land use for this option is shown in **Figure 2.3-2**. It shows a slight expansion of the aviation areas (to 327 acres) to include both spaceport facilities (including payload processing) and commercial aviation facilities. Because of the hazards posed by fuels in the payloads during final processing and integration with launch vehicles, blast shields would need to be used to minimize safety areas around these facilities to allow for more efficient use of the flightline. It is assumed that each launch vehicle operator would develop independent facilities but would share fuel storage facilities. Fuel storage facilities could be developed in the same locations as described in Sections 2.3.1.1 and 2.3.1.3.

Overall development under this option would be expected to be more intensive than for a dedicated spaceport. Flightline areas could accommodate about 960,000 square feet of facilities for space operations, 800,000 square feet for aircraft maintenance, and about 92,000 square feet for cargo hangars and passenger terminal space. The total amount of development for this option is expected to be less than the amount of development projected for the Proposed Action. Similarly, parking requirements for this option would likely be greater than without commercial aviation but less than projected for the Proposed Action.

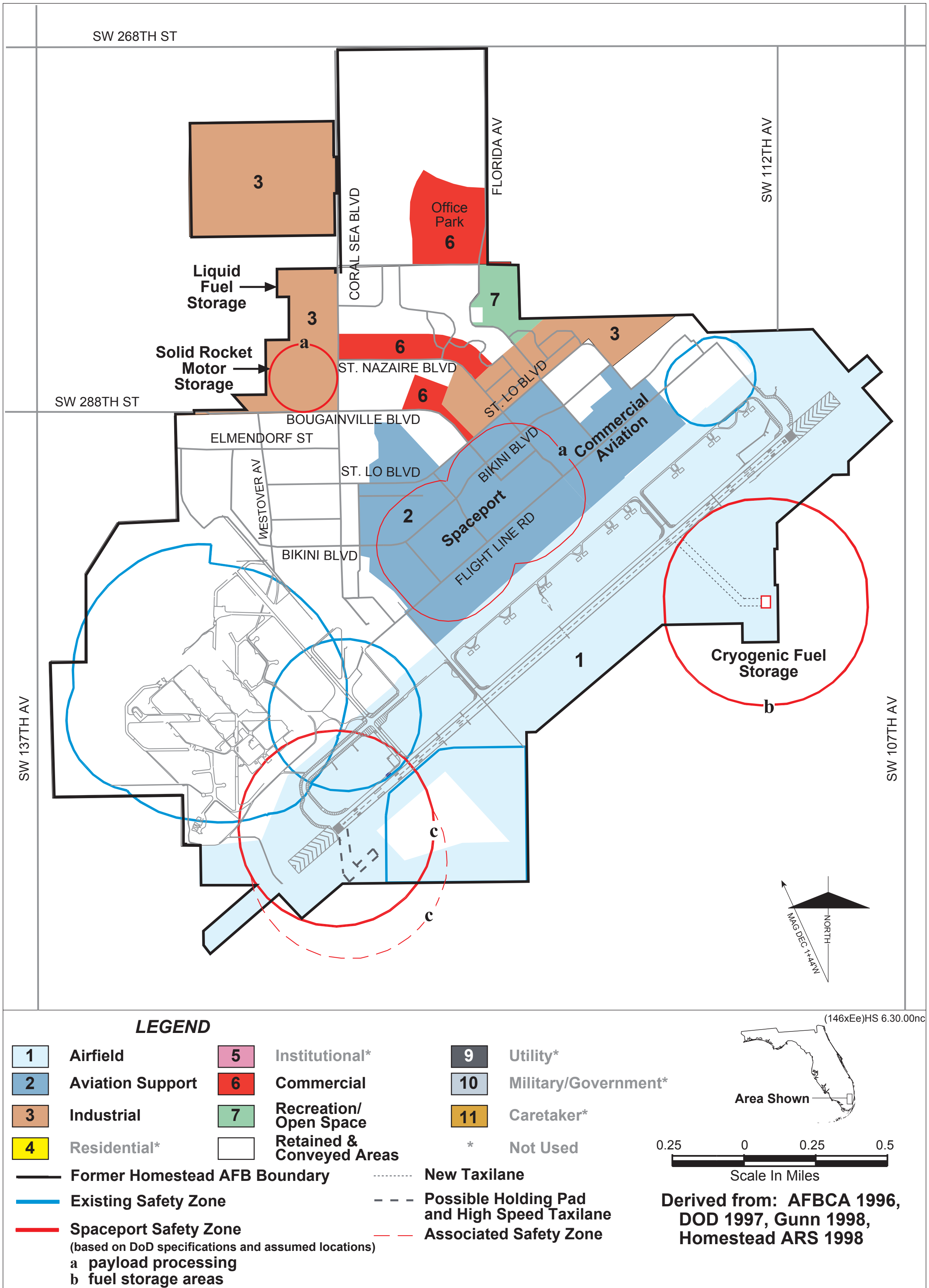


Figure 2.3-2
Land Use–Combined Commercial Spaceport/Airport

The expanded aviation area (north of St. Lo Boulevard) could accommodate employee or passenger parking, allowing space for new commercial aviation facilities along the flightline. Aircraft maintenance facilities might be interspersed along the flightline, but other commercial aviation uses would probably locate at the north end of the spaceport area, outside the safety areas. By 2005, charter passenger services could require a small start-up passenger facility (estimated at about 22,000 square feet) that could expand to about 70,000 square feet by 2015. Miscellaneous cargo operations are estimated to use about 13,400 square feet of hangar and staging space by 2005, increasing to 22,300 square feet in 2015.

About 260 acres could be developed for industrial use. Of this, 75 acres are assumed to be used for spaceport fuel storage as described in Section 2.3.1.3. In the remaining 185 acres, a mix of specialty workshops supporting space programs, general warehousing, and non-aviation industrial uses could develop. About 100 acres are allocated to commercial use. This could be developed as an office/research park and some retail services responding to on-site demands (e.g., Homeless Trust and Job Corps residents), as well as serve airline passengers. Other industrial and commercial uses identified in Section 2.6 could locate on industrial and commercial land, providing tenants and revenue base for the site. About 2.7 million square feet of industrial and commercial facilities could be developed by 2015 and 3.5 million by full buildout. A buildout rate of 10 acres per year for commercial and industrial land (20 acres combined) has been assumed and would result in all of the commercial property being developed by about 2010 and the industrial land being 80 percent developed by 2015.

There would be additional ground disturbance (about 182 acres by 2015) resulting from combined Commercial Spaceport/Airport development, since the expanded aviation area and industrial areas would be developed more intensively. It is assumed that existing pavement would be cleared for redevelopment and new parking areas would be constructed. The overall impervious surface area would also be greater. For this option, spaceport operations are assumed to be the same as described in Section 2.3.2. In addition, operations for a mixture of aviation maintenance, air cargo, niche market unscheduled passenger service, and general aviation could occur. Estimated levels of operations for a possible mixture of commercial aviation are provided in **Table 2.3-10**. By 2015, there are assumed to be 26,230 commercial operations, in addition to Commercial Spaceport operations. About 160,000 passengers could be enplaned by 2005. Passenger levels could increase to about 255,590 by 2015. Because there probably would be no scheduled passenger service, cargo operators that use space on scheduled passenger aircraft or delay-sensitive cargo operators (such as express services) would not be expected to locate at the airport. Nominal levels of general aviation operations are included because they are expected to be generally compatible with spaceport operations. However, other small airports in the area are expected to be more attractive to general aviation operations than a specialty spaceport facility. The levels projected for aircraft maintenance operations assume that about 400 commercial aircraft could be serviced annually by 2015, with two check flights for each aircraft that flies in to the airfield. Flight tracks for commercial, military, and government users are assumed to be the same as described and illustrated in Sections 2.1.1.2 and 2.2.2.

Employment levels at a combined Commercial Spaceport/Airport would be relatively high, reflecting mostly high ratios of employees per square foot of building area associated with passenger services, increased commercial development, and additional jobs in the aircraft maintenance sector, as compared to a spaceport only development. An estimated 5,400 on-site jobs might be achieved by 2005, increasing to 10,900 by 2015 and 11,750 at full build out. Of this, about 30 percent are assumed to be in aviation sectors and the remainder in general industrial and commercial sectors.

Water, wastewater, and solid waste levels are estimated to be about 30 to 50 percent higher than at a spaceport only alternative. Electricity use is estimated to be about 20 to 25 percent higher.

Table 2.3-10. Estimated Aircraft Operations for Combined Commercial Spaceport/Airport

Category of Operation[1]	Type of Aircraft[2]	Current	Forecast			
			2000	2005	2015	Full Buildout
Commercial Passenger—Niche Market						
International Turboprop	Dash-8, ATR-42, SWM, SF3	0	0	4,570	7,300	7,300
Domestic Narrowbody Jet	B-737/500/300/900, A320, MD-80			3,040	4,860	4,860
Subtotal Commercial Passenger		***0***	***0***	***7,610***	***12,160***	***12,160***
General Aviation						
Single Engine	C-150, C-172	0	6,203	6,203	6,203	6,203
Multi Engine	PA31	0	2,681	2,681	2,681	2,681
Jet	Lear, Citation	0	564	564	564	564
Helicopter		0	552	552	552	552
Subtotal General Aviation		***0***	***10,000***	***10,000***	***10,000***	***10,000***
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
Subtotal Aircraft Maintenance		***0***	***0***	***570***	***1,470***	***1,470***
Space Launch						
Commercial Space Vehicles	ASC, RSC, ROC	0	0	160	320	320
Commercial Space Vehicles	B-737, Astroliner	0	0	0	160	160
Subtotal Space Launch		***0***	***0***	***160***	***480***[3]	***480***[3]
Air Cargo						
Turboprop	Cessna, Caravan, King Air	0	0	1,040	0	0
Narrowbody Jet	B-727, MD-80	0	0	520	2,600	2,600
Subtotal Air Cargo		***0***	***0***	***1,560***	***2,600***	***2,600***
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 by 2015)	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
Subtotal Military/Government		***19,824***	***19,824***	***19,824***	***19,824***	***19,824***
Total Operations		**19,824**	**29,824**	**39,724**	**46,534**	**46,534**

Source: **Landrum & Brown 1999a**; SAIC.

Notes: [1] A single aircraft landing and then taking off is counted as two operations. Spacecraft takeoff counted as one operation, but each stage land is counted as a separate operation.

[2] Representative aircraft are provided by category. Actual fleet will depend on carriers that operate at the site.

[3] Assumes about two to three launches per week by one or two operators.

Off-site airport-related secondary development is estimated to be low, due to the amount of commercial and industrial land that would be available on the disposal property. The level of services for this market would be lower than under the Proposed Action. By 2015, there might be adequate demand to support a small motel (100 to 150 rooms). This could be located on about 5 acres of commercial land on the airport. Alternatively, this demand could result in slightly higher occupancy levels in existing hotels and motels in the area. The site would not be expected to provide a magnet for non-aviation related development or growth in the area.

Off-site employment, population in-migration, and land use to support indirect employment and in-migration could be more than double those estimated for the Commercial Spaceport only (**Table 2.3-11**) but less than for the Proposed Action. Initially, off-site impacts of a combined Commercial Spaceport/Airport might be higher due to a faster projected rate of development, but the development would likely peak earlier too.

Table 2.3-11. Estimated Employment, Population, and Land Use Generated by a Combined Commercial Spaceport/Airport

	2000	2005	2015	Full Buildout
Miami-Dade County				
Combined Commercial Spaceport/Airport Employment				
On Site[1]	0	5,414	10,914	11,746
Off Site	0	5,584	11,268	11,998
Total Countywide Reuse-Related Employment	***0***	***10,998***	***22,182***	***23,744***
Jobs Filled by In-Migrants	0	550	1,109	1,187
In-Migrating Population[2]	0	1,260	2,541	2,720
South Miami-Dade County				
Combined Commercial Spaceport/Airport Employment				
On Site	0	5,414	10,914	11,746
Off Site	0	3,286	7,608	8,124
Total South County Reuse-Related Employment	***0***	***8,700***	***18,522***	***19,870***
Jobs Filled by In-Migrants3	0	550	1,109	1,187
In-Migrating Population[2]	0	1,260	2,541	2,720
Reuse-Related Off-Site Land Use[4]				
Residential (acres)[5]	0	80	153	164
Commercial/Industrial (acres)[6]	0	421	975	1,042
Total Land Use (acres)	***0***	***501***	***1,128***	***1,206***

Source: SAIC.

Notes:
1 Includes on-site construction jobs, except for full buildout.
2 Population associated with in-migrating workers.
3 No net change in population assumed from relocation of workers within the county.
4 Reuse-related land requirement assumed to be in south Miami-Dade County.
5 Residential development for in-migrating families.
6 For reuse-related indirect employment.

2.3.7 Mitigation Measures Assumed in the Commercial Spaceport Alternative

It is assumed that the stormwater management system for the Commercial Spaceport alternative would have to be at least as effective as that for the Proposed Action. It is therefore assumed that a surface water management plan similar to the Proposed Action would be required by state and local agencies. Other mitigation measures assumed to be incorporated in this alternative are related to expected safety requirements.

Safety areas are applied to provide protection for people and property through appropriate restrictions on use in the immediate surrounding area. The standards in DOD 6055.9-STD, DOD Ammunition and Explosives Safety Standards, were applied in the absence of any other applicable rules or standards. A special working group of the DOD Explosive Safety Board is evaluating (with the purpose to define) appropriate safety distances and handling procedures for liquid propellants. The following summarizes the safety area requirements that may apply to the Commercial Spaceport:

- Satellites fully loaded with hypergolic or other fuels would require a clear area of about 1,250 feet (radius).
- Fully fueled launch vehicles would need about 1,200 feet separation from other aircraft (parked on the apron) and 1,800 feet separation from inhabited buildings. No safety restrictions have been identified for fueled vehicles when moving.
- The fuel storage area for liquid hydrogen and liquid oxygen would need to be separated from parked aircraft by 1,250 feet and from inhabited structures by 1,800 feet.
- Additional Runway Protection Zone and Object Free Area may be imposed by FAA.
- An evacuation area may be activated during launches. A 20 degree cone-shaped area extending from the end of the runway has been assumed. It is assumed that the evacuation area would extend between the runway and the Biscayne Bay shoreline to the northeast. It is not known how far the evacuation area would extend to the southwest if this departure track is used.

The following assumptions have been made about how these safety areas would be applied at former Homestead AFB:

- The safety area required around integration facilities (see Figure 2.3-1) could be reduced through special construction in order to avoid conflicts with existing activities on former base property and use of other facilities along the flightline.
- When launch assemblages are moved out of the integration facility onto the ramp, a 1,250 foot safety area would be in effect and constrain parking and movement of other aircraft along the flightline.
- When the fueled launch vehicle(s) enters the runway's Object Free Area, access to the runway would be restricted for other aircraft.
- Easements would be required from adjacent property owners where safety areas extended beyond the boundary of the site.

Safety areas required around the integration facility and fuel storage area would be continually in effect. Safety areas that would only apply when launch vehicles were moving around the airfield are listed below, along with any restrictions, and the estimated length of time of the restriction.

- There would be a 1,250 foot (radius) safety area around the fully integrated launch vehicle as it was being towed from the integration facility to the fuel storage area. The runway would be restricted for about 5 to 10 minutes on launch day.
- An 1,800 foot separation would be required between the fully fueled launch assemblage and inhabited structures while taxiing on the runway to the takeoff position and while performing final checks before takeoff. This could require from 15 minutes to 2 hours on launch days.
- The runway would be closed for 5 minutes to half an hour at predetermined times on landing days when the space vehicles returned to the airfield (for a total of about 15 minutes up to one hour per mission).

The potential impact of runway closures on national security (particularly the military alert mission and other government users at former Homestead AFB) would be fully evaluated in the policy review of the site operation application.

2.4 MIXED USE ALTERNATIVE

The Mixed Use alternative reflects the type of reuse that might be expected on surplus property at former Homestead AFB if it were not converted to civilian aviation use. In that event, the Air Force would retain the 915 acres comprising the airfield and control tower for continued military and other government use. This would leave approximately 717 acres of surplus land available for disposal and reuse. As part of this SEIS, a market study was conducted to identify the non-aviation development potential of this property. In addition, during preparation of the Draft SEIS, two comprehensive non-aviation-related proposals for redevelopment of the disposal property were submitted to the Air Force for consideration, one by Collier Resources Company and the other by the Hoover Environmental Group. In March 2000, these two entities submitted a joint plan for consideration in the Final SEIS. This plan is referred to as the "Collier-Hoover proposal." While the Collier-Hoover proposal is intended by its proponents to replace the separate Collier and Hoover plans analyzed in the Draft SEIS, the information on those original plans has been retained in the Final SEIS for comparison and to provide a wide range of potential reuses for analysis.

A summary of the findings of the market study is presented in Appendix D. The study estimated demand for private-sector residential, commercial, and industrial uses, based on current and projected market conditions. The approach used to quantify demand considered the following factors:

- Existing land use and development patterns in south Miami-Dade County;
- Future demand for land, based on a range of population and employment forecasts;
- The suitability of the disposal property for specific types of development, considering its location and adjacent uses, including continued use of the airfield for military and other government operations;
- The availability of other vacant, developable land in the vicinity to meet local demands; and
- Effects of local planning and economic incentives on marketing of industrial property.

The market analysis examined two levels of potential growth, a moderate level based on federal and state population forecasts for Miami-Dade County, and a high level population forecast by the Miami-Dade County Planning Department (see Section 2.1.3 for a discussion of population forecasts). It also examined latent demand for residential, commercial, and industrial land in the vicinity of former Homestead AFB and estimated absorption of the surplus property under two scenarios: (1) assuming the land would be sold at fair market value (and compete with all other available properties in the area), and (2) assuming a portion of the land would be conveyed at a discount to a public entity, which would be able to offer incentives to stimulate industrial development on the site. For the purposes of analysis in the SEIS, it is assumed that the moderate growth population forecasts are more likely, but that there is a good probability that incentives would be provided to increase industrial development above a relatively low latent demand.

Under this alternative, the surplus land could be disposed of in large parcels to a single public or private entity for economic development, or incrementally in smaller parcels as latent market demands, economic opportunities, or future community needs emerged. Some of the independent land use concepts described in Section 2.6 might be candidates for uses under this alternative.

The plan originally submitted by Collier Resources Company is an example of a single owner acquiring the total disposal property. Collier proposed to exchange oil and gas rights of equal value in Big Cypress National Preserve for surplus property (excluding the airfield and control tower) at former

Homestead AFB. The original Collier proposal emphasized commercial development, recreation, and some light industry. It was focused on a golf-oriented vacation complex, with a luxury recreational vehicle (RV) park, three hotels, and other attractions that would cater to a full range of family or executive traveler interests (featuring amenities for executive and tourist lodging and recreation). These included a water park, movie theatre, retail areas, and possibly an aquarium. The proposal represented a comprehensive development of the property, with landscaping, road and bike/pedestrian networks, infrastructure, and buildings to achieve a marketable image and quality.

The plan originally developed by Hoover Environmental Group was also a mixed-use development, titled the WetLand Project, that included commercial, industrial/research, and residential uses. This proposal was planned as a demonstration of sustainable development and would feature a world-class aquarium celebrating local marine, estuarine, and wetland ecologies.

The joint Collier-Hoover proposal is a mixed commercial development aimed at tourist and vacation markets in south Florida. The development combines recreational and educational attractions. The concept features a golf resort (with two golf courses), three hotels, a luxury recreational vehicle (RV) park, a world-class aquarium, a festival marketplace, a movie theater, retail and restaurant areas, and office and research parks. Constructed landscapes would showcase marine, estuarine, and wetland ecologies of south Florida. Visitors would learn about sustainable development and principles of conservation and recycling. The project would provide an extensive bike/pedestrian network as well as conventional vehicular access. It would use alternative wastewater treatment and energy generation technologies.

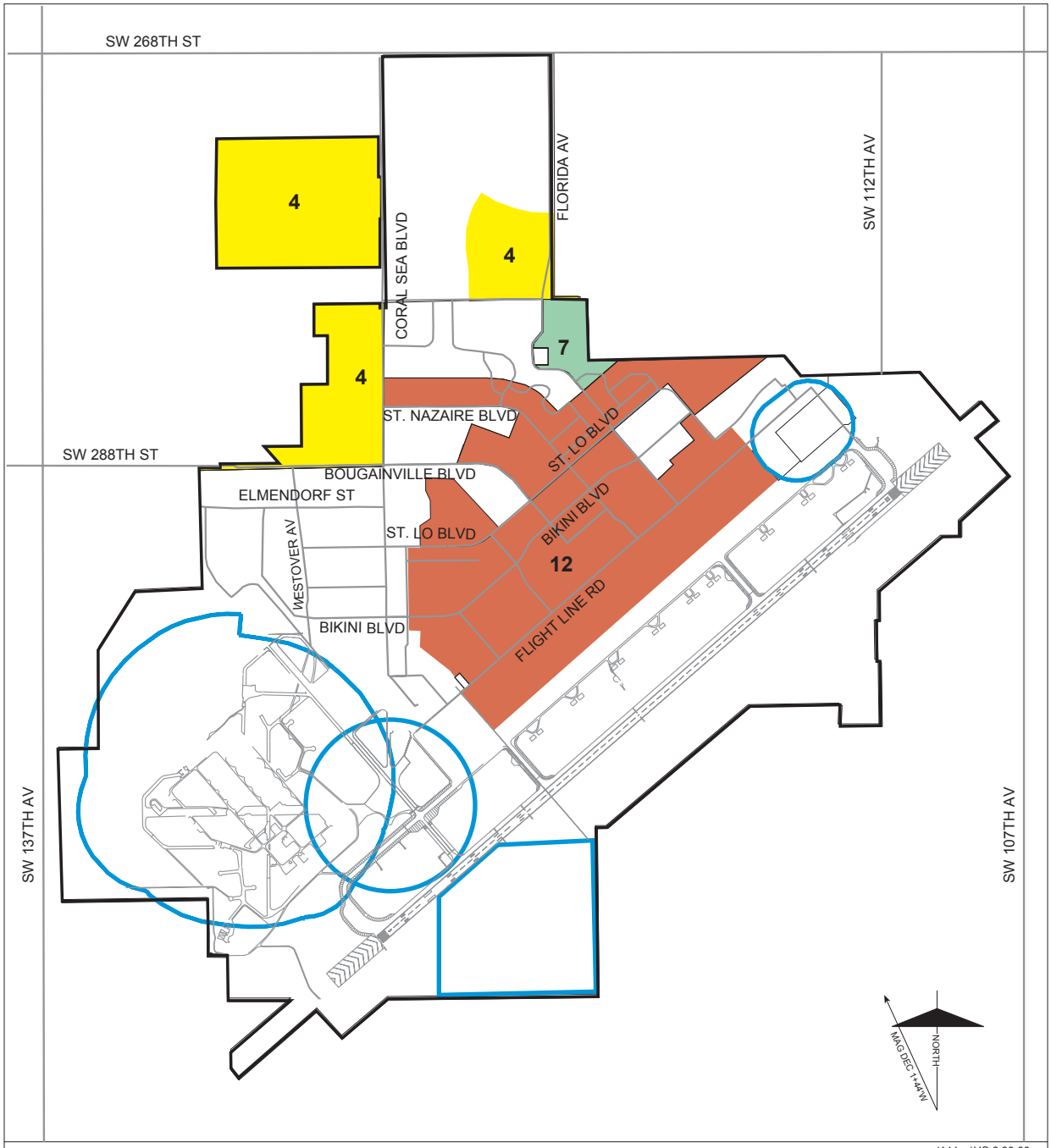
Like the original Collier proposal, the Collier-Hoover proposal involves an exchange of oil and gas rights in Big Cypress National Preserve for the surplus property at former Homestead AFB. The site plan includes approximately 75 acres that have been transferred to Miami-Dade County for a regional park. Collier assumes this would be an exchange with the county. If an exchange cannot be made, the Collier-Hoover proposal would need to be modified.

Four scenarios for Mixed Use are examined in the SEIS: (1) a Market-Driven scenario based on the market study, (2) the Collier-Hoover proposal, (3) the original Collier proposal, and (4) the original Hoover plan. This section describes a range of land uses, development intensities (demolition, new construction, ground disturbance, and impervious surface), timings, direct and secondary employment effects, population effects, daily traffic, and utility use based on these four potential scenarios.

Miami-Dade County did not express interest in the Mixed Use alternative during scoping and the public comment period, and therefore there was no specific county plan that could be analyzed for this alternative. Nevertheless, disposal to the county under this alternative would be possible. In that circumstance, the kinds of reuse development available to the county would be included within the range of reuses analyzed for the four scenarios described below.

2.4.1 Land Use and Development

Land use plans reflecting the Market-Driven development potential, the Collier-Hoover joint proposal, the original Collier Resources proposal, and the original Hoover plan are presented in **Figures 2.4-1**, **2.4-2**, **2.4-3**, and **2.4-4**, respectively. **Table 2.4-1** summarizes the estimated acreage for each land use category, and **Table 2.4-2** provides an estimate of the timing of development for each plan. The following sections summarize land use and development for each of the plans. **Table 2.4-3** estimates facility development by land use for the four scenarios. **Tables 2.4-4** and **2.4-5** indicate the estimated area disturbed and resulting extent of impervious surface.



LEGEND

1	Airfield*	5	Institutional*	9	Utility*
2	Aviation Support*	6	Commercial	10	Military/Government*
3	Industrial	7	Recreation/ Open Space	11	Caretaker*
4	Residential		Retained & Conveyed Areas	12	Commercial/ Industrial

Former Homestead AFB Boundary

Existing Safety Zone

* Not Used

(144cc)HS 6.30.00nc

Area Shown

0.25 0 0.25 0.5

Scale In Miles

Derived from: AFBCA 1996, Homestead ARS 1998

Figure 2.4-1
Land Use–Market-Driven Development

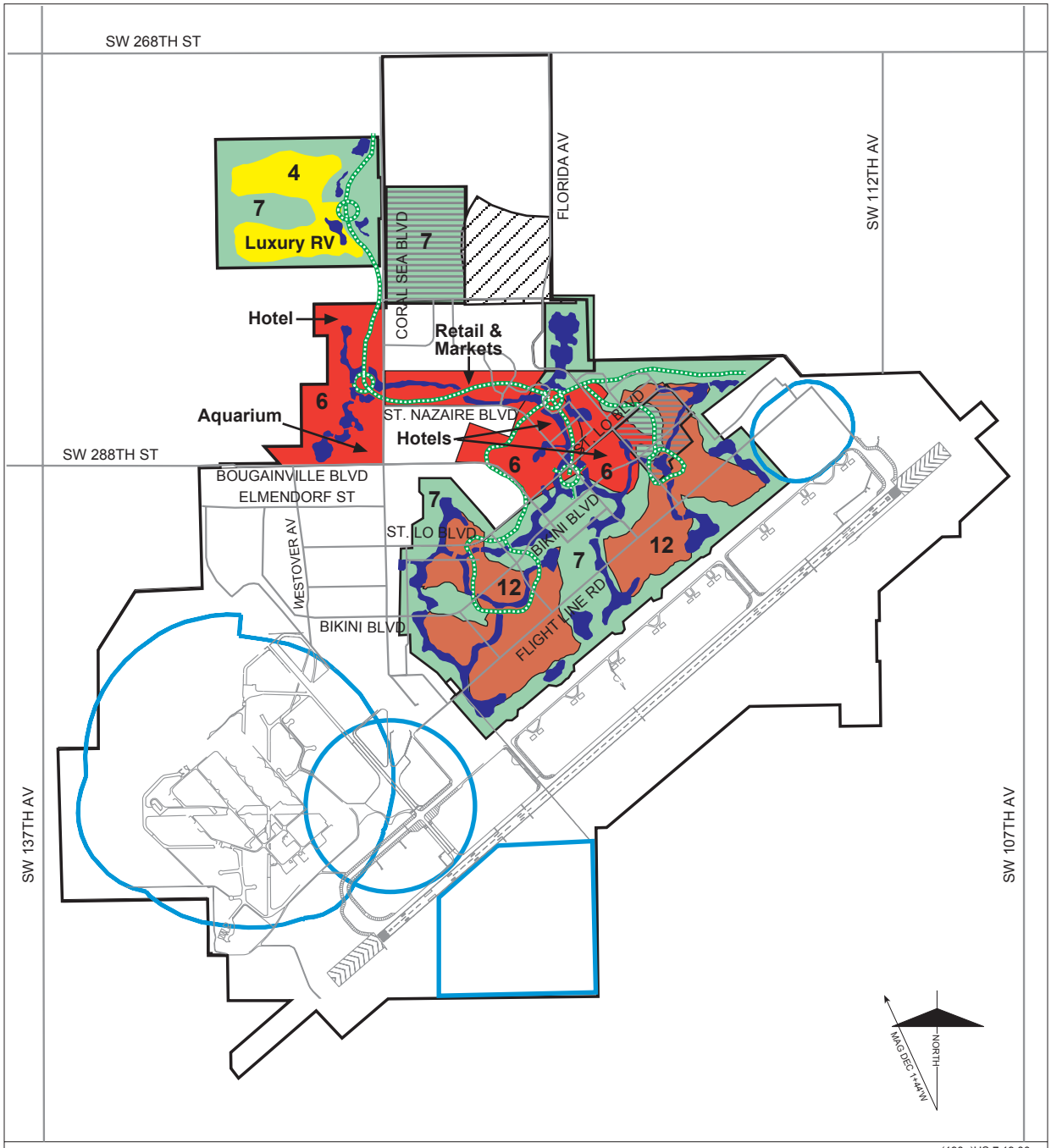
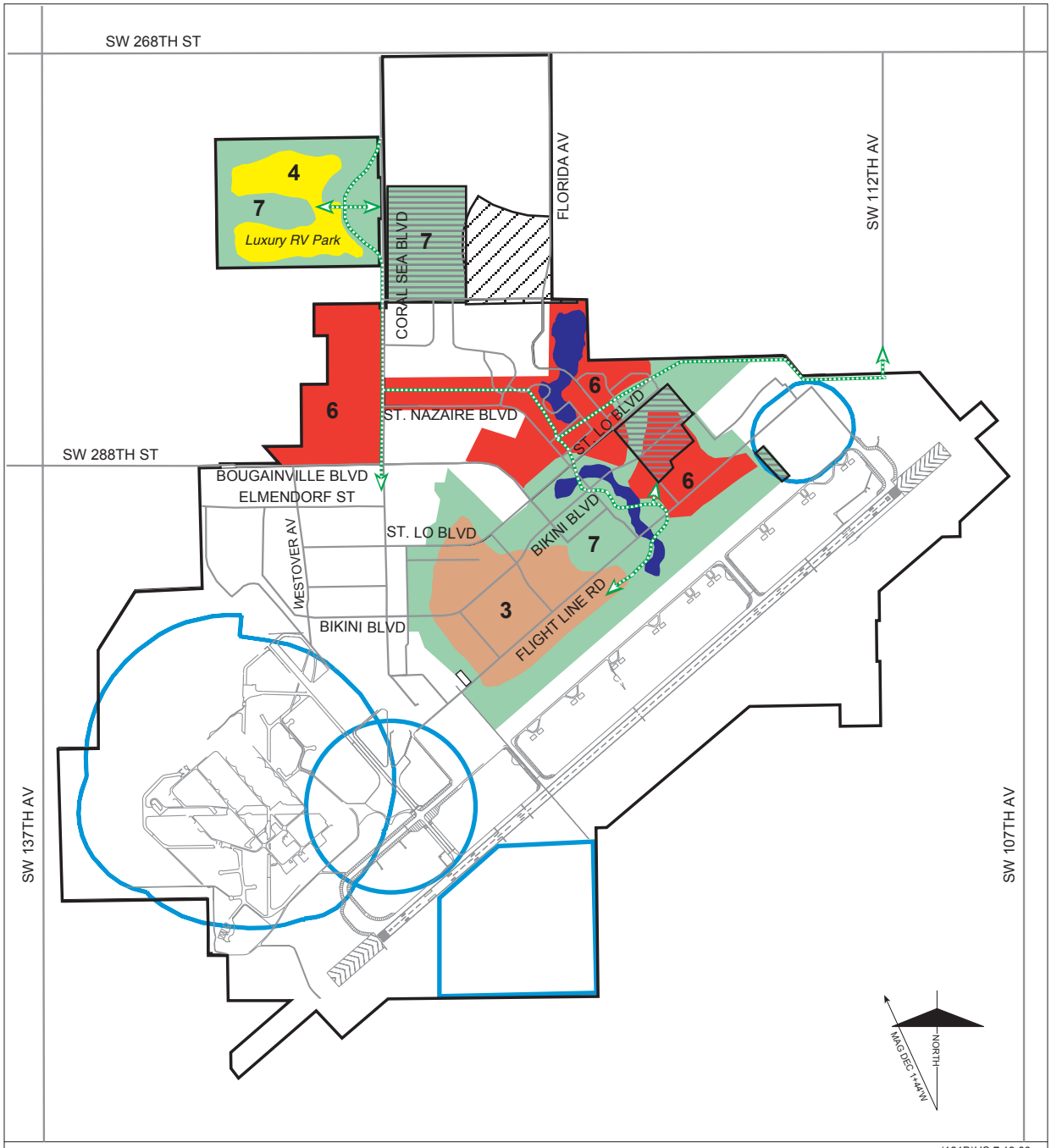


Figure 2.4-2
Land Use–Joint Collier-Hoover Proposal



LEGEND

1	Airfield*	5	Institutional*	9	Utility*
2	Aviation Support*	6	Commercial	10	Military/Government*
3	Industrial	7	Recreation/ Open Space	11	Caretaker*
4	Residential		Retained & Conveyed Areas	*	Not Used

- Former Homestead AFB Boundary
- Existing Safety Zone
- Surplus property not included in proposal
- Property previously conveyed or proposed for conveyance to other entities
- Waterway
- Proposed Spine Road

(181B)HS 7.19.00nc

0.25 0 0.25 0.5
Scale In Miles

Derived from: AFBCA 1996, Collier Resources Company 1999, Homestead ARS 1998

Figure 2.4-3
Land Use–Original Collier Resources Company Proposal

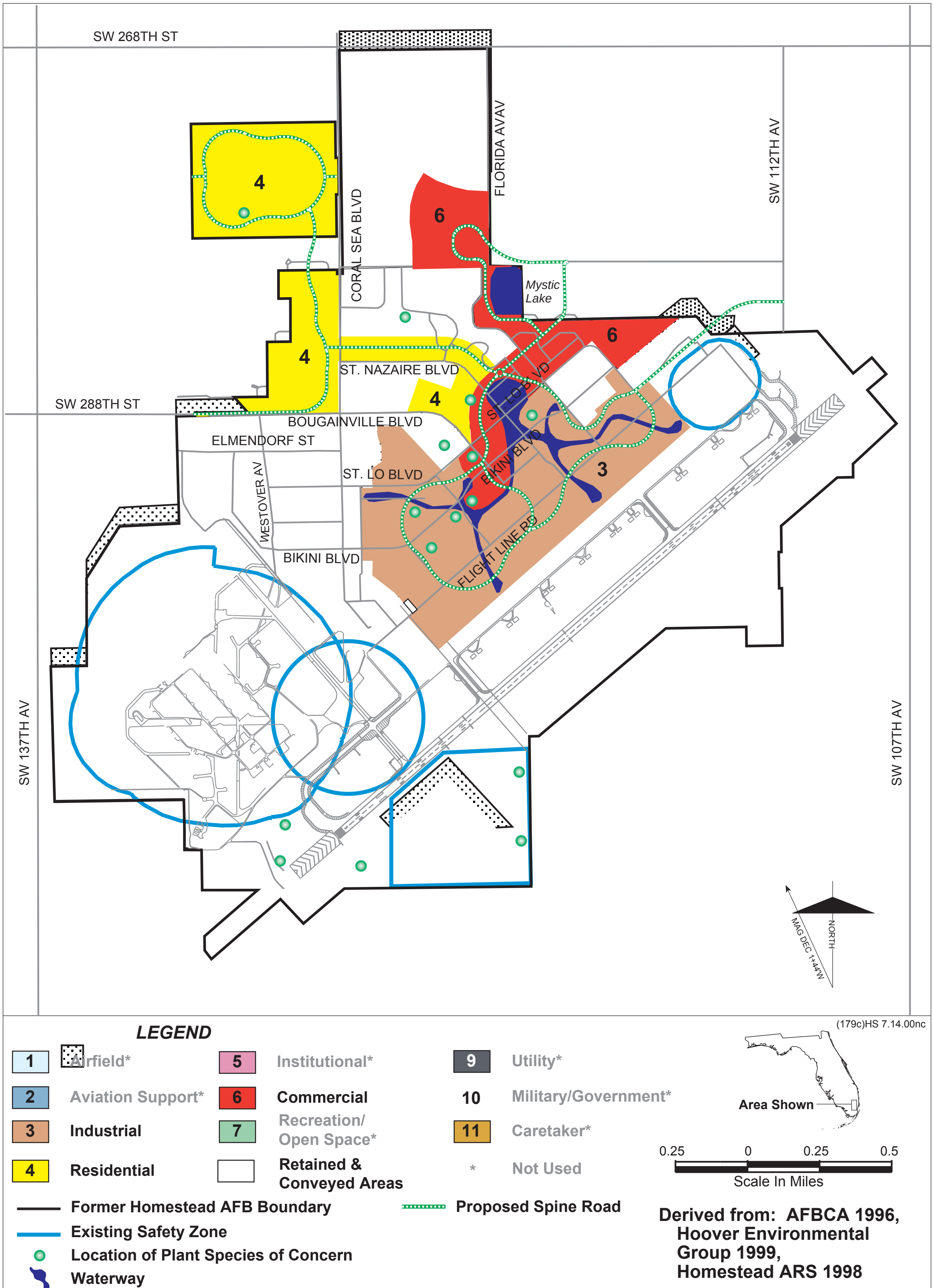


Figure 2.4-4
Land Use–Original Hoover Environmental Group Plan

Table 2.4-1. Estimated Acres by Land Use—Mixed Use Alternative

Land Use	Acres[1]	Percent
Market-Driven Development		
Commercial/Industrial	450	63
Residential—Medium density	208	29
Residential—High density	31	4
Open Space (Mystic Lake)	28	4
Subtotal	***717***	***100***
Joint Collier-Hoover Proposal		
Commercial/Industrial[2]	142	20
Commercial[3]	158	22
Residential[4]	324	45
Recreational (Commercial)	59	8
Transportation (Right-of-Way)	25	3
Open Space[5]	9	1
Subtotal	***717***	***100***
Original Collier Proposal		
Industrial	111	15
Commercial	186	26
Residential[4]	45	6
Recreational (Commercial)	338	47
Transportation (Right-of-Way)	28	4
Open Space[5]	9	1
Subtotal	***717***	***100***
Original Hoover Plan		
Industrial	264	37
Commercial	174	24
Residential—Medium density	203	28
Residential—High density	31	4
Environmental Protection	17	2
Open Space (Mystic Lake)	28	4
Subtotal	***717***	***100***
Retained and Conveyed Property[6,7]	2,221	
Total	**2,938**	

Source: SAIC, **Collier Resources Company 1999**, **Hoover Environmental Group 1999, CRC/HEG 2000**.

Notes:
[1] Rounded to the nearest acre.
[2] Research and development/office park.
[3] Includes 8 acres of commercial retail in the R&D/office park area.
[4] Luxury RV park.
[5] Dispersed throughout the site; not locatable on Figure 2.4-2 or 2.4-3.
[6] Includes 915 acres comprising the airfield and air traffic control tower.
[7] Includes approximately 30 acres expected to be retained and 26 acres proposed to be transferred to the School Board of Miami-Dade County.

Table 2.4-2. Estimated Rate of Development of the Disposal Property

Land Use Category	Suitable (acres)[1]	2000 (acres)	2005 (acres)	2015 (acres)	Full Buildout (acres)[1]
Market-Driven Development					
Commercial/Industrial[2]	450	0	62	165	450
Residential—Medium Density	208	0	20	65	208
Residential—High Density	31	0	3	10	31
Open Space (Mystic Lake)	28	28	28	28	28
Total	**717**	**28**	**113**	**268**	**717**
Joint Collier-Hoover Proposal					
Commercial/Industrial	142	0	20	64	142
Commercial	158	0	88	137	158
Residential	59	0	17	38	59
Recreational	324	0	132	324	324
Transportation	26	0	26	26	26
Open Space	9	9	9	9	9
Total	**717**	**9**	**292**	**598**	**717**
Original Collier Proposal					
Industrial	111	0	20	53	111
Commercial	186	0	102	152	186
Recreational	338	0	338	338	338
Residential (RV Park)	45	0	13	41	45
Transportation	28	0	28	28	28
Open Space	9	9	9	9	9
Total	**717**	**9**	**510**	**621**	**717**
Original Hoover Plan					
Industrial	265	0	68	155	264
Commercial	175	0	57	125	174
Residential—Medium Density	203	0	75	203	203
Residential—High Density	31	0	10	31	31
Open Space (Mystic Lake)	28	28	28	28	28
Environmental Protection Land	17	17	17	17	17
Total	**717**	**45**	**255**	**559**	**717**

Source: SAIC, **Collier Resources Company 1999**, **Hoover Environmental Group 1999, CRC/HEG 2000**.
Note: [1] 450 acres suitable for either industrial or commercial uses. At full buildout, it is assumed that about 258 acres would be in commercial use and 192 acres in industrial use.

Table 2.4-3. Estimated Facility Construction and Reuse by Land Use—Mixed Use Alternative

Land Use Plan	Facility Retention[1,2] (000 SF)	Facility Demolition[3] (000 SF)	New Pavement[4] (000 SF)	Cumulative New Facility Construction (000 SF)			
				2000	2005	2015	Full Buildout
Market-Driven Development	465	281	7,699	0	941	2,655	7,626
Joint Collier-Hoover Proposal	0[5]	746[6]	10,606[7]	0	866	1,792	2,964
Original Collier Proposal	0	746	10,012	0	1,040	1,836	2,840
Original Hoover Plan	0	746	8,813[7]	0	1,768	4,656	6,156
Total Disposal Property	**0–465**	**281–746**	**7,699–10,012**	**0**	**866–1,768**	**1,792–4,656**	**2,840–7,626**
Retained and Conveyed Property	1,469[8]	19	1,155[9]	155[10]	174	479	497
Total	**1,469–1,934**	**300–765**	**8,854–11,167**	**155**	**1,040–1,942**	**2,271–5,135**	**3,337–8,123**

Source: SAIC.
Notes: [1] Includes facilities to be renovated.
[2] Does not include miscellaneous utility structures throughout the former base totaling about 13,270 square feet.
[3] Does not include demolition of paved areas.
[4] New pavement primarily for parking and internal circulation.
[5] Not yet determined if Building 741 (119,240 SF) would be reused. Assumed not reused.
[6] Includes Building 741.
[7] Permeable materials would be used in some areas. The degree of permeability is not defined.
[8] Includes facilities in airfield and the air traffic control tower.
[9] New pavement primarily for regional park and potential future buildout of bank and former credit union property.
[10] Includes 135,000 square feet for new Homeless Trust and Meta Therapy Centers and 20,000 square feet for Job Corps security building (estimated).
SF square feet

Table 2.4-4. Estimated Acres Disturbed—Mixed Use Alternative

Scenario	Cumulative Acres[1]			
	2000	2005	2015	Full Buildout
Market-Driven Development	0	80	223	633
Joint Collier-Hoover Proposal	0	702	1,115	1,215
Original Collier Proposal	0	897	976	1,062
Original Hoover Plan	0	507	986	1,176
Total Disposal Property	**0**	**80–897**	**223–1,115**	**633–1,215**
Retained and Conveyed Property	33[2]	40	74	77
Total	**33**	**120–937**	**297–1,189**	**710–1,292**

Source: SAIC.
Notes: [1] Includes disturbance from demolition of facilities, removal of pavement, and site preparation for new facilities, pavement, recreation, landscaped areas, and lakes.
[2] Disturbance associated with construction of Job Corps and Homeless Trust Centers and new facilities in regional park.

Table 2.4-5. Estimated Impervious Surface—Mixed Use Alternative

Scenario	Cumulative Acres				
	Current	2000	2005	2015	Full Buildout
Market-Driven Development[1,2]	469	469	492	536	661
Joint Collier-Hoover Proposal[1,3]	469	469	313	406	481
Original Collier Proposal[1,2]	469	469	339	409	469
Original Hoover Plan[1,2,4]	469	469	330	452	516
Total Disposal Property[2]	**469**	**469**	**313–492**	**406–536**	**469–661**
Percent Coverage Disposal Property	**29%**	**29%**	**19–30%**	**25–33%**	**29–41%**
Retained and Conveyed Property	309	290[5]	296	323	324
Total[1,2]	**778**	**760**	**609–788**	**729–859**	**793–985**
Total Percent Coverage	**26%**	**26%**	**21–27%**	**25–29%**	**27–34%**

Source: SAIC.
Notes: [1] Includes pavement and building footprints. Does not include water bodies or wetlands.
[2] Includes 204 acres for the airfield that would be retained by the Air Force under this alternative.
[3] Includes 2.4 acres in 2005, 5.3 acres in 2015, and 9.1 acres at full buildout of parking areas that would be surfaced with materials that are partially pervious.
[4] Includes 102 acres in 2005, 185 acres in 2015, and 228 acres at full buildout of roadways and parking areas that would be surfaced with materials that are partially pervious.
[5] Decline reflects clearing of land for new regional park and minor new construction for Job Corps and Homeless Trust facilities.

2.4.1.1 Market-Driven Development

The market study indicated a strong anticipated future demand for residential development, a moderate demand for commercial uses, and a relatively modest demand for industrial properties. The Market-Driven scenario reflects a mix of those uses, based on their relative strength of demand and the suitability of the available disposal property for each type of use. Projected land uses for this option were also based on considerations of accessibility, site and parcel configuration, and existing surrounding land uses. An area of about 239 acres was considered suitable for residential development. This land is farthest from the runway, easily accessible, and close to existing community and residential areas. It is composed of three parcels of land that could be developed as discrete subdivisions. The area around Mystic Lake (about 28 acres) is assumed to remain open space. The remaining 450 acres of the surplus property could be developed for either industrial or commercial use.

The market study was used to estimate the ultimate mix and the rate of absorption for each land use category. In the study, it was assumed that suitable residential and commercial land on the disposal property would be absorbed at the same rate as other suitable vacant land in the surrounding area and in proportion to the amount of suitable land that the site would add to the available supply of vacant land in the area.

Projections for residential and commercial absorption for this alternative were based on moderate growth rates for south Miami-Dade County. An analysis of recent development in the local area showed that industrial land has been absorbed at a higher rate than originally projected, primarily as a result of local financial incentives that have been offered to attract developers. Therefore, industrial development was calculated assuming the same kind of incentives could stimulate industrial demand for the disposal property. Table 2.4-2 summarizes the estimated rate of development of the disposal property for each scenario analyzed in this alternative.

Based on the moderate growth forecasts under the Market-Driven scenario, only about a third of the site would be developed within the first 15 years. The remainder would probably not be fully developed until well after 2015. However, if the population were to grow at the higher rate projected by Miami-Dade County, and incentives were provided for industrial development, the residential land could be fully developed as early as 2014, and the remaining property would be expected to develop at about twice the estimated rate. At the other end of the spectrum, if population were to grow at the more moderate rate and no incentives were provided, the site might not be fully developed until well past the middle of the next century.

The estimated site development for the Market-Driven scenario was based on typical floor area ratios and impervious coverage for each land use category. It is possible that many facilities would be renovated and reused and existing aprons would remain in place and become parking areas for industrial or commercial uses. It is assumed that most other paving (about 85 to 90 percent) would be removed over time to facilitate new development. This combination of development could ultimately result in almost 8 million square feet of new facility construction and about 8 million square feet of new paved area (for roads and parking throughout the site), with about 630 acres disturbed by demolition and new construction. Ultimately, about 65 percent of the surplus property (excluding the airfield area) could become impervious, compared to 37 percent currently. The impervious surface area of the former base property as a whole could increase by 7 percent over current conditions.

It is assumed that the developers of the site would provide new utility services, including new water and wastewater distribution lines linked directly to local service providers. Linkages to old systems would all be closed. Access to the site is assumed to be from SW 288th Street and SW 268th Street.

Specific stormwater improvements are not included as part of the Market-Driven development. Property developers would be required to meet standards that are in effect at the time of development. If larger parcels were developed (over 100 acres in size), then stormwater performance standards similar to the Proposed Action would be required by the South Florida Water Management District and Miami-Dade County Department of Environmental Protection. However, no requirements have been assumed for analysis of this scenario in the SEIS.

The description of development estimated for each type of land use under the Market-Driven scenario follows.

Industrial. This scenario assumes that industrial development would be stimulated by providing financial advantages to developers that are not available for most other property in the area. This could be discounted land costs, tax incentives, or a special status such as a Free Trade Zone. Industrial property is assumed to be developed at a rate of 4.4 acres per year, compared to a rate of 1 acre per year for the surrounding area projected by the Miami-Dade County Planning Department. At the higher rate, about 250,000 square feet could be developed by 2005, almost 700,000 square feet by 2015, and up to 1.9 million square feet at full buildout.

Industries that might locate on the property could be similar to those in the Park of Commerce in the City of Homestead. They could include “clean” industries such as warehousing, communication systems, and fabrication and assembly. Other industries that might be attracted to the area include high-tech or bio-medical research and development, light manufacturing and processing, and auto service and repair shops. Development parcels could vary in size from a few acres to most of the available land. In general, industrial activities generate about 600 to 700 square feet of facility per employee.

In the near term, some facilities (such as hangars along the flightline) could provide low-cost reuse opportunities for warehousing or manufacturing. Aging facilities would generally be expected to be replaced in the long term. About 200,000 square feet are identified for reuse and about 61,000 square feet for demolition, mostly located in areas close to the airfield. The airfield control tower (Building 708) would be retained by the Air Force.

Commercial. Based on the market study, commercial property is assumed to be developed at a rate of about 6 acres per year. Commercial development could include a variety of uses. Neighborhood retail services (such as convenience markets, small restaurants, laundromats, hair salons, and fitness centers) would likely locate along roadways and in the vicinity of the Job Corps and Homeless Trust Centers. Wholesale and warehousing enterprises might locate closer to the airfield (between St. Lo and Bikini Boulevards) and could initially use the existing large buildings in the area. Alternatively, this area could be developed as a small shopping mall. The parcel surrounded by the regional park would be suitable for a planned office park development. About 1.2 million square feet of new commercial facilities are estimated by 2015, increasing up to 3.4 million square feet at full buildout.

Residential. About 240 acres of suitable land could be developed for residential use, achieving about 2.4 million square feet of housing. About 31 acres are assumed to be developed for high-density housing (16 units per acre) and the remainder for medium density (4 units per acre). This would result in about 490 high-density units and between 840 medium-density units by full buildout. This mixture reflects the same proportion of medium- and high-density housing projected by Miami-Dade County for the area. It is assumed that there would be a mixture of one to three story units. Residential areas are assumed to locate farthest from the airfield and near the existing residential area on the former base (Homeless Trust Center). About 410 units could be developed by 2015 and about 890 more beyond that time.

Other. An area of about 28 acres around Mystic Lake would not be suitable for development. It would likely continue to be used for on-site water retention and possibly a landscape or recreation feature in a commercial development.

Section 2.6 describes several uses for the disposal property that were identified during the scoping process. That section indicates which of these would be viable within the overall land use framework and airport functions under this alternative.

2.4.1.2 Joint Collier-Hoover Proposal

The joint Collier-Hoover proposal, shown in Figure 2.4-2, is a mixed-use plan with commercial, recreational, business, research, and entertainment uses on the site. The development concept would combine education and recreation to attract a wide range of tourists and vacationers. Almost half the site would be used for commercial recreation featuring two golf courses. The golf courses would weave among other commercial and industrial areas on the site. Commercial development would feature a world-class aquarium, three hotels, retail/dining, and a water park. The site is planned to be used to demonstrate sustainable and environmentally compatible development, highlighting the marine, estuarine, and wetland ecologies of the region. Lakes and wetlands would cover over 90 acres, providing natural habitat, landscaping, and challenges for the golf courses.

About 40 percent of the site is planned to be developed within the first five years. Plans call for the major visitor attractions to be in place by 2015. Beyond that time, the buildout of remaining research and office areas (about 50 percent) would be completed. About 870,000 square feet of facilities are estimated to be constructed by 2005, 1.8 million by 2015, and almost 3 million by full buildout. Full buildout of the site is projected for about 2020. Most structures would be between two and three stories in height. All

existing infrastructure and buildings (with the possible exception of Building 741) are planned to be demolished and a new road system constructed prior to 2005. The roads would be augmented with a pedestrian and bike path network. The plans indicate that development of the property would tend to occur from north to south over time. Due to the timing and extent of demolition and extensive contouring of the landscape required for the proposed features, the projected acreage disturbed is higher than for the other alternatives. This includes disturbance for demolition and site preparation for landscaping, new construction, and pavements.

Overall impervious coverage at full buildout would be about 39 percent on the disposal property (about 280 of the 717 acres). The remaining land would include 300 acres of golf course to be developed by 2015, and 90.3 acres of lakes and wetlands (both existing and constructed) by full buildout. These areas would weave in and around all the commercial and industrial lands.

Stormwater would be collected and detained in the system of meandering waterways, comprised of existing and newly constructed lakes, wetlands, and shallow marsh. About two thirds of the waterways would be lake and one third would be wetland/marsh. These are proposed to be designed to contain a total of about 720 acre-feet of stormwater. It is proposed that some lakes would be about 12 feet in depth. The proposal included plans for vegetative enhancements using submerged aquatic vegetation to decrease nutrient loads, and detention ponds would also reduce suspended solids and nutrients. Stormwater would be pretreated using 0.5 inch of dry detention. Best management practices, such as screw gates, bleeddown devices, turbidity screens, and baffles in discharge structures, are proposed to restrict discharge of poor quality surface water.

The developer would provide new utility infrastructure and ensure that old lines were closed off or removed. Potable water would be supplied by public purveyor. Wastewater would be treated on site using Living Machines, a biological wastewater treatment that uses engineered ecologies to purify sewage and industrial wastewater (**CRC/HEG 2000**). Irrigation water for the golf course and landscaping could be supplied from on-site stormwater detention lakes and canals and from on-site treated wastewater. It is estimated the treated wastewater could supply about 40 percent of the irrigation demand. The site would also be connected to the public wastewater system for back up.

As Figure 2.4-2 shows, this proposal includes areas of the former base that have already been transferred to Miami-Dade County or are proposed to be transferred to the School Board of Miami-Dade County. The plan anticipates that these areas, comprising a total of about 75 acres, would be exchanged for equivalent acreage on or off the site. If this exchange is not feasible, the plan would have to be modified. Assuming the overall land use and proposed development remained the same, this modification is not expected to affect the environmental impacts of this alternative.

A spine road network using a total of 25 acres is proposed for access throughout the site. Small shuttle vehicles are proposed for circulation within the development.

A description of the proposed development by land use follows.

Commercial/Industrial. A mixture of office space and light industrial enterprises is planned for 142 acres in the southern part of the disposal property. The development is proposed to have a campus-like setting with large landscaped areas and relatively low structural density. A total of about 1.8 million square feet of space is planned by full buildout, with almost half constructed by 2015. Targeted industries include professional offices, medical offices and clinics, biomedical research and development (R&D), visitor services, and film and entertainment industry.

Commercial. About 150 acres in the center of the site are proposed to be developed with visitor and tourist attractions and amenities. By full buildout, approximately 1 million square feet of commercial structures are proposed. A 200,000 square foot aquarium with living and non-living exhibits, interactive programs, and research facilities would be constructed by 2005, along with a hotel aimed at executives and short-stay business travelers (440 rooms), and extended weekly stay "villas" with 180 rooms. A third hotel aimed at vacationers and golfers (with 400 rooms) would be built early in the second phase (after 2005). The hotels would include swimming pools, dining areas, tennis courts, a chip and putt facility, and shops. A festival marketplace (290,000 square feet), with retail stores and restaurants, and a movie theater (40,000 square feet) are planned to complement the core attractions and to cater to visitors and tourists. About 100,000 square feet are planned by 2005, 150,000 additional square feet by 2015, and the remainder by full buildout. An additional 8 acres (with 100,000 square feet) of retail and service commercial business are also planned to be interspersed among the office and R&D development.

Residential. Almost 60 acres in the northwest portion of the disposal property are identified for a luxury RV park. The park is proposed to have about 100 concrete pads (each 20 feet by 60 feet) by 2005, 650 pads by 2015, and 1,250 pads by full buildout, with supporting amenities such as an activity center, shower and laundry facilities, utility hookups, potable water, sanitary sewage dumping stations, and second vehicle parking. Golf course areas would surround the RV park. The RV park would be aimed at attracting a transient retired or semi-retired population and estimated to have an average daily population of about 1,560 persons when completed.

Recreation. About 324 acres are proposed to be developed for commercial recreation. A 112 acre executive golf course with a small clubhouse is planned to be developed in the north part of the site by 2005. Between 2005 and 2015, a 192 acre championship course is planned for the southern part of the site. This golf course would also feature a driving range and a clubhouse with a pro shop, tennis courts, and a restaurant. Lakes and wetlands would be interwoven throughout the greens to add interest and challenge for the golfers. A landscaped water park featuring a lake (former Mystic Lake) and walking trails is planned for about 19 acres.

Transportation. The spine road system is estimated to use about 26 acres. About half the land is projected to be paved and half landscaped.

Open Space. It is estimated that about 9 acres of open space, distributed around the disposal property, would not be developed.

2.4.1.3 Original Collier Resources Company Proposal

The land use plan contained in the original Collier proposal is shown on Figure 2.4-3. Table 2.4-1 shows that almost half the 717 acre disposal area is projected to be used for commercial recreation. An executive and a championship golf course would be woven among other commercial areas and around an industrial enclave. The recreational/resort concept is expected to attract vacationers, tourists, seasonal retiree residents, and local residents. Table 2.4-2 shows that much of the site (about 70 percent) is projected to be developed early. Nearly all the recreational areas and attractions (including golf facilities, water park, and theatre) could be completed by 2005. About half the industrial and between 50 and 75 percent of office and retail commercial development could occur by 2015. The luxury RV park is projected to be 90 percent built out by 2015. Full buildout of all areas is projected by 2020. It is assumed there would be a variety of one- to four-story buildings.

This scenario assumes all existing facilities would be demolished, as well as virtually all paving (about 247 acres, including about 120 acres of apron). Demolition is projected to occur in the first few years after conveyance. New construction is assumed to occur fairly constantly for the first 15 years (with an initial surge). Site work for the two new golf courses and other commercial features is also assumed to occur in the first few years, with office commercial and industrial buildout tending to occur later.

Like the joint Collier-Hoover proposal, the timing and extent of demolition would contribute to a relatively high amount of ground disturbance over the development period, with most (about 900 acres) occurring prior to 2005. About 200 acres more would be disturbed by full buildout. It is assumed that most of the new roadways would be constructed in the initial phase of construction. Because of the low imperviousness of the proposed golf courses, overall impervious coverage on the disposal property is estimated at about 29 percent.

It is assumed the developer would provide new utility infrastructure and ensure that old lines were closed off or removed. In addition to standard telecommunications linkages, a fiber optics system is included in the plan. It is expected that comprehensive site development for the original Collier proposal would need to meet the same minimum standards for stormwater retention and discharges that would apply to the Proposed Action. The system would not need to be as extensive because of the lower amount of impervious surface.

As Figure 2.4-3 shows, the original Collier proposal included areas of the former base that have already been transferred to Miami-Dade County or are proposed to be transferred to the School Board of Miami-Dade County. Collier proposed to exchange these areas, comprising an estimated total of about 75 acres, for equivalent acreage on or off the site.

A description of development by land use follows.

Industrial. About 110 acres are planned for office/industrial uses such as light industrial, community/semi-regional services, corporate offices, and other business/offices. Development is projected to occur incrementally along the "Beachfront" area (near the flightline), and a flexible land use/zoning category is planned to allow for changing market conditions. About 250,000 square feet are planned for initial construction, with 1.3 million square feet at full buildout.

Commercial. Commercial areas would be generally located in the center of the project development. About 190 acres are projected to be developed with up to about 1.5 million square feet of commercial space. A mixture of neighborhood commercial, retail, and office development is planned. A new water park (incorporating Mystic Lake), theatre, three hotels (with a combined capacity of 1,020 rooms), and retail are planned during the first five years to complement the golf-resort theme of this development. Office park development is projected to mostly occur after 2005.

Recreation. This scenario includes development of two golf courses on 338 acres. An executive and a championship course would extend throughout the site, providing both recreational opportunities and a landscaped background for hotel guests and RV park residents. There would be clubhouse facilities, a driving range, tennis courts, and pro shops. These facilities are all projected to be developed by 2005.

Residential. About 45 acres were identified to be developed for a 1,000 space luxury RV park. Each space would have a 1,200 square foot concrete pad, utility and communications hookups, and second car parking. There would also be sewage/sanitary dumping stations, barbecue pits, potable water sources, central laundry facilities, and a central activity center with recreation and laundry facilities. The RV park

would be located in the northwest area of the site and be surrounded by the golf course. About 275 spaces are projected to be completed by 2005, 900 by 2015, and 1,000 by full buildout.

Other. The original Collier proposal identified about 28 acres as exclusive use for a spine roadway network. In other alternatives, land for roadways has been accounted for within each land use area. About 9 acres of open space and buffers would be interspersed around the property.

2.4.1.4 Original Hoover Environmental Group Plan

The original Hoover plan was a conceptual plan and no developer or proponent had been identified to implement this idea. Therefore, the following description contains preliminary estimates of how this plan might be implemented. The organization of land uses in that plan is shown in Figure 2.4-4. The land uses are generally similar to those shown in the Market-Driven development. Residential development was projected to occur on land farthest from the runway, while areas closest to the airfield would be used for industry. Commercial areas were planned to be located between the residential and industrial areas. The residential and commercial land was projected to be developed more rapidly than under the Market-Driven scenario (see Table 2.4-2). All of the residential land, nearly 60 percent of the industrial land, and about two-thirds of the commercial land was projected to be absorbed by 2015. The timing of full buildout was not projected.

This scenario provides for a mixture of land uses over most of the site. Most buildings are assumed to be one to four stories, but the hotel might be five stories high. Throughout the site, areas that were not developed (with buildings, roads, or outdoor features) would be used as part of a sitewide constructed wetland, covering about half the area, that would function as a wastewater purification system and stormwater retention system incorporated into the overall aesthetics of the site.

It is assumed all existing facilities and paving would be removed. To the extent feasible, recycling of most of the materials (rather than landfilling) is proposed. Plans for demolition are phased, with about 65 to 75 percent occurring by 2005 and the remainder by 2015.

It is estimated that ground disturbance in the first five years would affect about 500 acres for demolition and new construction, with almost 1,000 acres disturbed by 2015 and 1,200 acres disturbed by full buildout. Use of partially permeable materials is proposed for roads and parking areas, but the degree of permeability is not known. It is estimated that impervious coverage at full buildout could range from 18 to 32 percent.

The original Hoover plan emphasizes recycling of construction materials (from demolition) and solid wastes. On-site wastewater treatment was proposed to be accomplished using a system that assists with biodegradation of wastes in specially designed pools. Any on-site treatment system would need to obtain applicable state and local permits. Generation of solar power for on-site needs was also proposed, using a solar (photovoltaic) system.

The scenario includes a few new off-site roadway segments (totaling about 1 mile) to connect between on-site residential areas on the northwest side and existing roadways (including SW 112th Avenue) on the northeast side of the disposal property. Use of an existing road through government land (used by the FANG or FLARNG) for access to commercial and industrial areas is also indicated in the original Hoover plan.

It is assumed that this scenario would need to meet the same minimum standards for stormwater retention and discharge that would apply to the Proposed Action. The systems would not need to be as extensive because of the lower amount of impervious surface proposed. Based on preliminary estimates, about 350 to 370 acres of the site would be constructed wetland.

Additional information on development by land use follows.

Industrial. The industrial niche planned for the site could support research in agricultural, local ecology, and sustainable development. Much of the proposed 265 acre industrial area in the "Beachfront" area would be used as part of the constructed wetland system. The intensity of industrial development would be relatively low, with about 650,000 square feet planned by 2015 and up to 1.1 million square feet by full buildout. Industrial land might also be used for parking supporting commercial areas.

Commercial. A total of 2.1 million square feet of commercial development is projected to occur on about 175 acres in the central part of the site. A 150,000 to 200,000 square foot world-class aquarium is proposed to be the anchor for the commercial development. It would be in a central location on the site. A 450 to 600 room hotel (about 300,000 square feet), festival market place, restaurants, and other retail and office commercial space (about 1 million square feet at full buildout) are planned on about 175 acres. The original Hoover plan estimated that the aquarium and IMAX theatre could attract about 2 million visitors each year.

Residential. The plan includes about 230 acres of residential use, with about 2.2 million square feet of housing. About 31 acres were identified for about 490 units of high-density housing (16 units per acre) and the remainder for about 810 units of medium-density housing (4 units per acre). Residential areas were generally planned for areas farthest from the airfield and near the existing residential areas. About 462 housing units were identified to be constructed by 2005 and an additional 840 units by 2015.

Other. An area of about 28 acres around Mystic Lake would not be suitable for development. It is assumed to continue to be used for on-site water retention and possibly a landscape or recreation feature. The original Hoover plan also proposed to preserve about 17 acres of pine rockland habitat dispersed throughout the surplus property.

2.4.2 Airfield Operations

Under any of the scenarios analyzed in this alternative, the airfield would continue to be used for military and government operations. There would be no commercial airport development. Future aircraft operations would be the same as described in Section 2.1.1.2.

2.4.3 Employment and Population

Table 2.4-6 provides the estimated on-site employment for the four Mixed Use scenarios analyzed. The Collier-Hoover proposal projects somewhat higher job growth for the next 15 years than the Market-Driven development, with an estimated 5,500 direct jobs by 2015, compared to 4,600 jobs. The Market-Driven development could achieve higher job intensity at full buildout, but possibly not until the middle of the 21st century. These estimates are based partially on employment levels for similar facilities (such as aquariums and commercial golf courses) and partially on standard square footage per employee, standard floor area ratios, and projected buildout of commercial and industrial facilities.

Table 2.4-6. Estimated On-Site Employment and Population—Mixed Use Alternative

Employment	Current	2000	2005	2015	Full Buildout
Market-Driven Development					
On-Site Reuse Jobs	0	0	1,657	4,411	12,052
On-Site Construction Jobs	0	0	214	196	NA[1]
Total On-Site Reuse Employment	0	0	1,871	4,607	12,052
Joint Collier-Hoover Proposal					
On-Site Reuse Jobs	0	0	2,234	5,381	10,069
On-Site Construction Jobs	0	0	329	105	NA[1]
Total On-Site Reuse Employment	0	0	2,563	5,486	10,069
Original Collier Proposal					
On-Site Reuse Jobs	0	0	1,912	4,005	6,810
On-Site Construction Jobs	0	0	199	72	NA[1]
Total On-Site Reuse Employment	0	0	2,111	4,077	6,810
Original Hoover Plan					
On-Site Reuse Jobs	0	0	2,550	6,510	10,910
On-Site Construction Jobs	0	0	497	309	NA[1]
Total On-Site Reuse Employment	0	0	3,047	6,819	10,910
Retained and Conveyed Property[2]	1,090	1,490	1,410	1,480	1,470[1]
Total On-Site Employment	**1,090**	**1,490**	**3,281–4,457**	**5,557–8,299**	**8,280–13,522**
Population	**Current**	**2000**	**2005**	**2015**	**Full Buildout**
Market-Driven Development	0	0	340	1,080	3,440
Joint Collier-Hoover Proposal[3]	0	0	1,220	2,610	3,050
Original Collier Proposal[3]	0	0	2,140	2,930	3,050
Original Hoover Plan[4]	0	0	1,200	4,440	4,440
Retained and Conveyed Property	160	1,210	1,210	1,210	1,210
Total On-Site Population	**160**	**1,210**	**1,550–3,350**	**2,290–5,650**	**4,260–5,650**

Source: SAIC.
Notes: [1] Construction jobs for full buildout not estimated due to uncertainty of time frame.
[2] Includes 105 construction jobs annually by 2000, 5 by 2005, and 42 by 2015.
[3] Includes 1,800 hotel guests per night (average) and 1,250 average daily RV park residents at full buildout.
[4] In addition to residential population, includes 1,060 hotel guests per night (average) from 2005 onwards.

Achievement of these projected job levels includes a high level of uncertainty since market conditions could delay development or affect occupancy rates. Between about 65 and 86 percent of the jobs are estimated to be in commercial sectors. Industrial jobs are estimated to represent about 20 percent for Market-Driven development and 33 percent for the Collier-Hoover proposal. The Collier-Hoover proposal envisions that these would be research/education-oriented technical and professional jobs rather than manufacturing or warehouse jobs. By 2005, employment on the former base property could double or triple over current levels, if projections are achieved. The average earnings per employee is assumed to range from about $26,500 to $27,500 per year.

The Market-Driven development includes medium- and high-density residential development with a projected on-site population of 1,080 by 2015 and 3,440 by full buildout. The Collier-Hoover proposal includes an average daily transient population of 3,050 at full buildout (1,250 RV park residents and 1,800 hotel guests), although seasonal fluctuations would be expected. The Collier-Hoover proposal does not include a permanent residential population. Table 2.4-6 shows that, combined, the estimated typical daily on-site population could range from about 2,290 to 3,820 for the Market-Driven and Collier-Hoover scenarios in 2015, including 1,210 residents on retained and previously conveyed property. The range of employment levels for this alternative has not changed with the inclusion of the joint Collier-Hoover proposal.

2.4.4 Traffic and Utilities Use

Table 2.4-7 indicates the estimated number of daily vehicle trips for the Mixed Use alternative. Total daily vehicular trips to and from the former base could increase from current levels of about 3,956 to between about 26,339 and 47,123 in 2015 and between about 62,034 and 66,644 at full buildout for the Market-Driven or Collier-Hoover scenarios. By 2015, the Collier-Hoover proposal would have higher trips due to visitation projected for the aquarium. By full buildout, the estimated number of trips is similar for the two scenarios due to the increase in residences projected for the Market-Driven development. The full range of traffic levels remains the same as prior to the submission of the joint Collier-Hoover proposal. Truck traffic associated with industrial and commercial uses would account for a small portion of daily trips.

Table 2.4-7. Estimated Vehicle Trips—Mixed Use Alternative

	Current	2000	2005	2015	Full Buildout
Market-Driven Development					
Average Daily On-Site Trips	0	0	6,251	18,822	52,940
Peak Hour Trips	*0*	*0*	*719*	*2,143*	*6,011*
Joint Collier-Hoover Proposal					
Average Daily On-Site Trips	0	0	21,557	39,606	57,550
Peak Hour Trips	*0*	*0*	1,511	3,407	5,578
Original Collier Proposal					
Average Daily On-Site Trips	0	0	17,580	31,637	37,402
Peak Hour Trips	*0*	*0*	*503*	*963*	*1,235*
Original Hoover Plan					
Average Daily On-Site Trips	0	0	28,789	48,931	66,748
Peak Hour Trips	*0*	*0*	*2,179*	*4,384*	*6,427*
Retained and Conveyed Property					
Average Daily On-Site Trips	3,956	5,362	5,952	7,517	9,094
Peak Hour Trips	*567*	*773*	*871*	*1,124*	*1,559*
Total Average Daily On-Site Trips[1]	**3,956**	**5,362**	**12,203–34,741**	**26,339–56,448**	**46,496–75,842**
Total Peak Hour Trips[1]	***567***	***773***	***1,374–3,050***	***2,087–5,508***	***2,794–7.986***

Source: SAIC.
Notes: [1] Includes trips for activities on retained and previously conveyed areas.

Under the Market-Driven development, the primary access route into the commercial and industrial areas is assumed to be SW 288th Street (Biscayne Boulevard). SW 268th Street could provide access to new residential areas and the regional park. Some internal roadways could be widened and intersections improved to allow for adequate flow of traffic. It is assumed that about 8 to 10 percent of the gross land area would be used for the on-site roadway network.

The Collier-Hoover proposal includes construction of an internal spine road network, using about 26 acres as right-of-way. Access onto the site would be from SW 268th Street on the north side of the site. Other smaller roadways would be built within commercial and industrial parcels. The Collier-Hoover plan proposes to use electric-powered vehicles to shuttle people between activities and parking areas both on and off the site.

Table 2.4-8 summarizes the estimated utilities demands generated by reuse of the disposal property and total demands at the former base. Utility use was estimated using standard rates for different land uses, based on square footage, employment, or per capita consumption. Estimated water use for the Collier-Hoover proposal was provided by the proponent. Energy requirements were calculated using building square footage.

Water use is projected to increase by a minimum of about 0.4 mgd by 2015 from new commercial/industrial activities and on-site residential use. Under the Collier-Hoover proposal, water use is projected to increase to about 2 mgd because of the golf course irrigation demands. Some of this would be supplied by on-site treated wastewater and from stormwater detention, reducing the overall water demand. At full buildout, estimated demands for potable water and wastewater generation are highest for Market-Driven development due to the permanent residential population.

The Collier-Hoover plan proposes to use an on-site system to treat wastewater for irrigation. If successful, slightly more than half a million gallons of sewage may be treated per day, supplying about two fifths of the irrigation needs for the proposed golf courses and landscaping. The site would also be connected to the public wastewater treatment system as a backup. The reclaimed water used to irrigate the golf courses and landscaped areas would be expected to infiltrate to groundwater.

Estimated solid waste generation for the Collier-Hoover proposal is lower than either the original Collier proposal or the original Hoover plan because the joint proposal no longer includes residential development. At full buildout, the residential populations included in the Market-Driven development would continue to generate the most solid waste. Proposed recycling included in the Collier-Hoover proposal would reduce the amount of solid waste sent to local landfills.

Electricity demands are estimated as a function of floor area and, as such, the Market-Driven development could generate the highest demands for electricity in the long term. Proposed energy-saving design and potential on-site photovoltaic power generation could lessen the energy requirements for the Collier-Hoover proposal. It is assumed this system would be tied into the commercial distribution lines, but it is not known if it would generate more or less than the on-site demands.

It is estimated that the Collier-Hoover proposal would have the highest water demand, but this would be offset by proposed use of recycled water for irrigation. For all other utility categories, the Market-Driven development would be expected to generate higher demands.

Table 2.4-8. Estimated On-Site Utilities Use—Mixed Use Alternative

	Current	2000	2005	2015	Full Buildout
Reuse of Disposal Property					
Water (mgd)					
Market-Driven Development	0	0	0.15	0.44	1.29
Joint Collier-Hoover Proposal[1,2]	0	0	0.90	1.82	2.11
Original Collier Proposal[2]	0	0	1.73	1.95	2.17
Original Hoover Plan[1]	0	0	0.41	1.09	1.45
Wastewater (mgd)					
Market-Driven Development	0	0	0.12	0.35	1.03
Joint Collier-Hoover Proposal	0	0	0.20	0.38	0.54
Original Collier Proposal[2]	0	0	0.31	0.49	0.66
Original Hoover Plan[1]	0	0	0.33	0.88	1.16
Solid Waste (tons/day)					
Market-Driven Development	0	0	5.4	14.9	42.1
Joint Collier-Hoover Proposal	0	0	7.3	15.4	25.4
Original Collier Proposal	0	0	10.1	19.8	28.9
Original Hoover Plan	0	0	13.5	34.5	48.9
Electricity (MWh/day)					
Market-Driven Development	0	0	35	98	279
Joint Collier-Hoover Proposal	0	0	32	75	123
Original Collier Proposal	0	0	42	82	119
Original Hoover Plan	0	0	61	161	213
Retained and Conveyed Property[1]					
Water (mgd)[3]	0.09	0.29	0.29	0.30	0.30
Wastewater (mgd)[3]	0.07	0.23	0.23	0.24	0.24
Solid Waste (tons/day)[3]	1.5	4.6	4.6	4.9	5.0
Electricity (MWh/day)[3]	50	56	56	67	67
Combined Use					
Water (mgd)	0.09	0.29	0.44–2.02	0.74–2.25	1.59–2.47
Wastewater (mgd)	0.07	0.23	0.35–0.56	0.59–1.12	0.78–1.40
Solid Waste (tons/day)	1.5	4.6	10.0–18.1	19.8–39.4	30.4–53.9
Electricity (MWh/day)	50	56	88–117	142–228	186–346

Source: SAIC.

Notes: [1] Recycled wastewater would be used for some portion of projected water demands, particularly for non-potable uses such as irrigation. On-site wastewater treatment could reduce the use of public wastewater treatment services.

[2] Includes 1.49 gallons per day for the Collier-Hoover proposal and 1.35 for the original Collier scenario (at full buildout) for irrigating golf courses and open space that would not contribute to wastewater generation.

[3] Reflects increased use for Homeless Trust and Job Corps Centers, park visitors, and potential buildout of bank and former credit union property.

mgd million gallons per day

MWh megawatt hours

2.4.5 Secondary Development

Under the Market-Driven development, the disposal and reuse of property at former Homestead AFB is not expected to generate any specific secondary development. If financial incentives were offered for industrial land on the disposal property, it could be in direct competition with comparable industrial land in the Park of Commerce. The extent to which the two areas could attract different markets would influence the rate of future development in the area.

Reuse would be generated by existing latent demand and attracted development, but it would not be expected to induce additional growth in the area. It is possible that commercial and industrial enterprises on the site could capture new markets and infuse the local economy with additional jobs generated by spending and procurements. In that case, development of off-site land in the south Miami-Dade County area could increase.

Table 2.4-9 shows estimated reuse-related employment, population in-migration, and off-site land use for Market-Driven development. This scenario is assumed to generate a modest number of indirect jobs (4,680 jobs by 2015). The majority of these jobs (3,647 jobs by 2015) would be expected to be in south Miami-Dade County. All the jobs are assumed to be additional to the projected baseline. This is estimated to result in potential in-migration of about 464 workers, which could increase the population in south Miami-Dade County by 1,063. The indirect employment and new housing demands are estimated to result in development of an additional 64 acres for residential use and 468 acres for commercial and industrial use by 2015.

The Collier-Hoover proposal has identified the possible need for 32 to 55 acres of parking off site for visitors to the aquarium. No other off-site development has been identified by this proposal. Some secondary development could be expected in connection with employment and population in-migration generated by the plan.

Table 2.4-10 shows estimated reuse-related employment, population in-migration, and off-site land use for the Collier-Hoover proposal. This plan would have higher secondary effects over the next 15 years than Market-Driven development. The specific nature of the development, targeting tourists and vacationers, can be expected to stimulate more indirect opportunities in south Miami-Dade County than in the county as a whole. For example, there could be almost 14,000 total jobs generated by the Collier-Hoover proposal compared to about 8,000 by 2015 for Market-Driven development. This is estimated to result in almost 1,420 in-migrants and development of about 90 acres of residential and 1,060 acres of commercial or industrial land in south Miami-Dade County. At full buildout, the two scenarios are similar in the estimated secondary growth and development. The total estimated amount of development includes up to 55 acres for off-site parking for the Collier-Hoover proposal.

Table 2.4-11 presents the range of reuse-related employment, population in-migration, and off-site land use estimated for the original Collier and Hoover scenarios. A comparison of Tables 2.4-10 and 2.4-11 shows that the joint Collier-Hoover proposal falls within the ranges estimated for the original Collier and Hoover scenarios, when off-site parking is included.

Table 2.4-9. Estimated Employment, Population, and Land Use Generated by Market-Driven Development

	2000	2005	2015	Full Buildout
Miami-Dade County				
Market-Driven Development Employment				
On-Site[1]	0	1,871	4,607	12,052
Off-Site	0	1,855	4,680	12,425
Total Countywide Reuse-Related Employment	***0***	***3,726***	***9,287***	***24,477***
Jobs Filled by In-Migrants	0	186	464	1,224
In-Migrating Population[2]	0	426	1,063	2,805
South Miami-Dade County				
Market-Driven Development Employment				
On-Site[1]	0	1,871	4,607	12,052
Off-Site	0	1,449	3,647	9,669
Total South County Reuse-Related Employment	***0***	***3,320***	***8,254***	***21,721***
Jobs Filled by In-Migrants[3]	0	186	464	1,224
In-Migrating Population[2]	0	426	1,063	2,805
Reuse-Related Off-Site Land Use[4]				
Residential (acres)[5]	0	27	64	169
Commercial/Industrial (acres)[6]	0	186	468	1,240
Total Land Use (acres)	***0***	***213***	***532***	***1,409***

Source: SAIC.
Notes:
[1] Includes on-site construction jobs, except for full buildout.
[2] Population associated with in-migrating workers.
[3] No net change in population assumed from relocation of workers within the county.
[4] Reuse-related land requirement assumed to be in south Miami-Dade County.
[5] Residential development for in-migrating families.
[6] For reuse-related indirect employment.

2.4.6 Mitigation Measures Assumed in the Mixed Use Alternative

No mitigation measures have been assumed for the Market-Driven development. Developers are assumed to have to comply with applicable county, state, and federal standards, codes, and regulations.

The proponents of the Collier-Hoover proposal have identified a number of actions they would undertake to reduce the impacts of development. These include:

- Use of architectural design, siting, and vegetation to minimize energy use.
- On-site generation of electricity using a photovoltaic system.
- Preservation of natural and native habitat and species, including management of remaining stands of pine rocklands.
- Removal of non-native species, including Australian pine and Brazilian pepper.
- Education of workers and visitors about ecological relationships to promote “environment friendly” behavior.

Table 2.4-10. Estimated Employment, Population, and Land Use Generated by the Collier-Hoover Proposal

	2000	2005	2015	Full Buildout
Miami-Dade County				
Collier-Hoover Proposal Employment				
On-Site[1]	0	2,563	5,486	10,069
Off-Site	0	3,737[7]	6,871[7]	11,683[7]
Total Countywide Reuse-Related Employment	***0***	***6,300***	***12,357***	***21,752***
Jobs Filled by In-Migrants	0	315	617	1,087
In-Migrating Population[2]	0	719	1,414	2,491
South Miami-Dade County				
Collier-Hoover Proposal Employment				
On-Site[1]	0	2,563	5,486	10,069
Off-Site	0	5,850	8,278	12,014
Total South County Reuse-Related Employment	***0***	***8,413***	***13,764***	***22,083***
Jobs Filled by In-Migrants[3]	0	315	619	1,089
In-Migrating Population[2]	0	719	1,418	2,496
Reuse-Related Off-Site Land Use[4]				
Residential (acres)[5]	0	45	86	151
Commercial/Industrial (acres)[6]	0	805[8]	1,116[8]	1,595[8]
Total Land Use (acres)	***0***	***850***[8]	***1,202***[8]	***1,746***[8]

Source: SAIC.

Notes:
1 Includes on-site construction jobs, except for full buildout.
2 Population associated with in-migrating workers.
3 No net change in population assumed from relocation of workers within the county.
4 Reuse related land requirement assumed to be in south Miami-Dade County.
5 Residential development for in-migrating families.
6 For reuse-related indirect employment.
7 Net increase in employment includes relocation of some jobs from the northern part of the county to the south county.
8 Includes estimated 55 acres for off-site parking.

- Minimizing human access to sensitive areas.
- Use of landscape sculpting and vegetation to blunt the impact of storms and hurricanes.
- Use of plantings, slopes, and physical structures to minimize the extent of open grassy and water areas that may attract flocking birds and pose a hazard to military and government aircraft. Includes a program to monitor the effectiveness of these techniques, reevaluate, and implement appropriate control actions in the future.
- Use of partially permeable "turf block" in low use parking areas.
- Minimizing the use of public utilities through on-site sewage treatment and reuse of treated water for irrigation, energy conservation, and on-site energy generation.
- Irrigation of golf courses and landscapes using stormwater runoff from roofs and pavements (treated in surface flow constructed wetlands) and treated sewage that is stored in the water features of the golf courses.

Table 2.4-11. Estimated Employment, Population, and Land Use Generated by the Original Collier and Hoover Scenarios

	2000	2005	2015	Full Buildout
Miami-Dade County				
Employment				
On-Site[1]	0	2,111–3,047	4,077–6,819	6,810–10,910
Off-Site	0	1,905–3,976[7]	4,845–7,860[7]	7,138–11,982[7]
Total Countywide Reuse-Related Employment	***0***	***4,016–7,023***	***8,922–14,679***	***13,948–22,892***
Jobs Filled by In-Migrants	0	201–351	446–734	697–1,145
In-Migrating Population[2]	0	461–805	1,023–1,682	1,597–2,624
South Miami-Dade County				
Employment				
On-Site[1]	0	2,111–3,047	4,077–6,819	6,810–10,910
Off-Site	0	1,487–5,992	3,771–9,024	5,540–12,181
Total South County Reuse-Related Employment	***0***	***3,498–9,039***	***7,848–15,843***	***12,350–23,091***
Jobs Filled by In-Migrants[3]	0	201–351	446–734	697–1,145
In-Migrating Population[2]	0	461–805	1,023–1,682	1,597–2,624
Reuse-Related Off-Site Land Use[4]				
Residential (acres)[5]	0	29–51	62–102	97–159
Commercial/Industrial (acres)[6]	0	191–823[8]	483–1,212[8]	710–1,617[8]
Total Land Use (acres)	***0***	***220–874***[8]	***545–1,314***[8]	***807–1,776***[8]

Source: SAIC.

Notes:
1 Includes on-site construction jobs, except for full buildout.
2 Population associated with in-migrating workers.
3 No net change in population assumed from relocation of workers within the county.
4 Reuse related land requirement assumed to be in south Miami-Dade County.
5 Residential development for in-migrating families.
6 For reuse-related indirect employment.
7 Net increase in employment includes relocation of some jobs from the northern part of the county to the south county under the original Hoover plan.
8 Includes up to 55 acres for off-site parking under the original Hoover plan.

- Sloping the sides of lakes and wetlands no steeper than 4:1 to a depth of 2 feet below control elevation.
- Planting submerged aquatic vegetation in stormwater detention ponds to decrease nutrient loads.
- Using slow release fertilizers for all turf and greens, minimizing the use of insecticide and herbicides, and using breakdown components.

2.4.7 Exchange Properties

Collier Resources Company proposes to exchange subsurface oil and gas properties owned by the Collier family in Big Cypress National Preserve for the disposal property at former Homestead AFB. Other properties may also be offered or sought in exchange. Some commentors on the Draft SEIS suggested other properties should be acquired in exchange, including parcels of environmentally sensitive lands in southwest Florida. To date, only the mineral rights in Big Cypress National Preserve have been identified. There is currently no proposal to change the existing use of these properties, which are undeveloped. Therefore, the proposed exchange itself is not anticipated to have any adverse environmental consequences. It could reduce or otherwise affect potential future development of the exchange property by existing owners.

2.5 NO ACTION ALTERNATIVE

The No Action alternative is discussed in this SEIS for the purposes of comparison to the Proposed Action and other reuse alternatives. The Base Closure and Realignment Act and federal property laws require federal agencies to dispose of property that is surplus to government needs. However, for purposes of analysis in the SEIS, this alternative presumes the Air Force would retain ownership of all remaining property (1,632 acres) at former Homestead AFB. The airfield would continue to be used for military and other government operations, but except for the air traffic control tower, the remaining property (717 acres) would not be reused by the Air Force or other entities.

Under the No Action alternative, the Air Force would continue to operate the airfield. Existing facilities on the remaining surplus property would be emptied and any remaining utility supplies would be disconnected. The surplus land would be fenced and minimal caretaker functions, such as periodic inspections for dumping or vandalism, may be performed. There would be no further demolition in the caretaker areas unless required for environmental, health, or safety reasons. However, cleanup of previously contaminated sites would continue as planned.

2.5.1 Land Use and Development

Figure 2.5-1 depicts land use for the No Action alternative, and **Table 2.5-1** summarizes the acreage in each land use. The airfield and air traffic control tower would be added to the retained property. The remaining 717 acres of surplus property would be maintained in caretaker status.

Table 2.5-1. Acres by Land Use—No Action Alternative

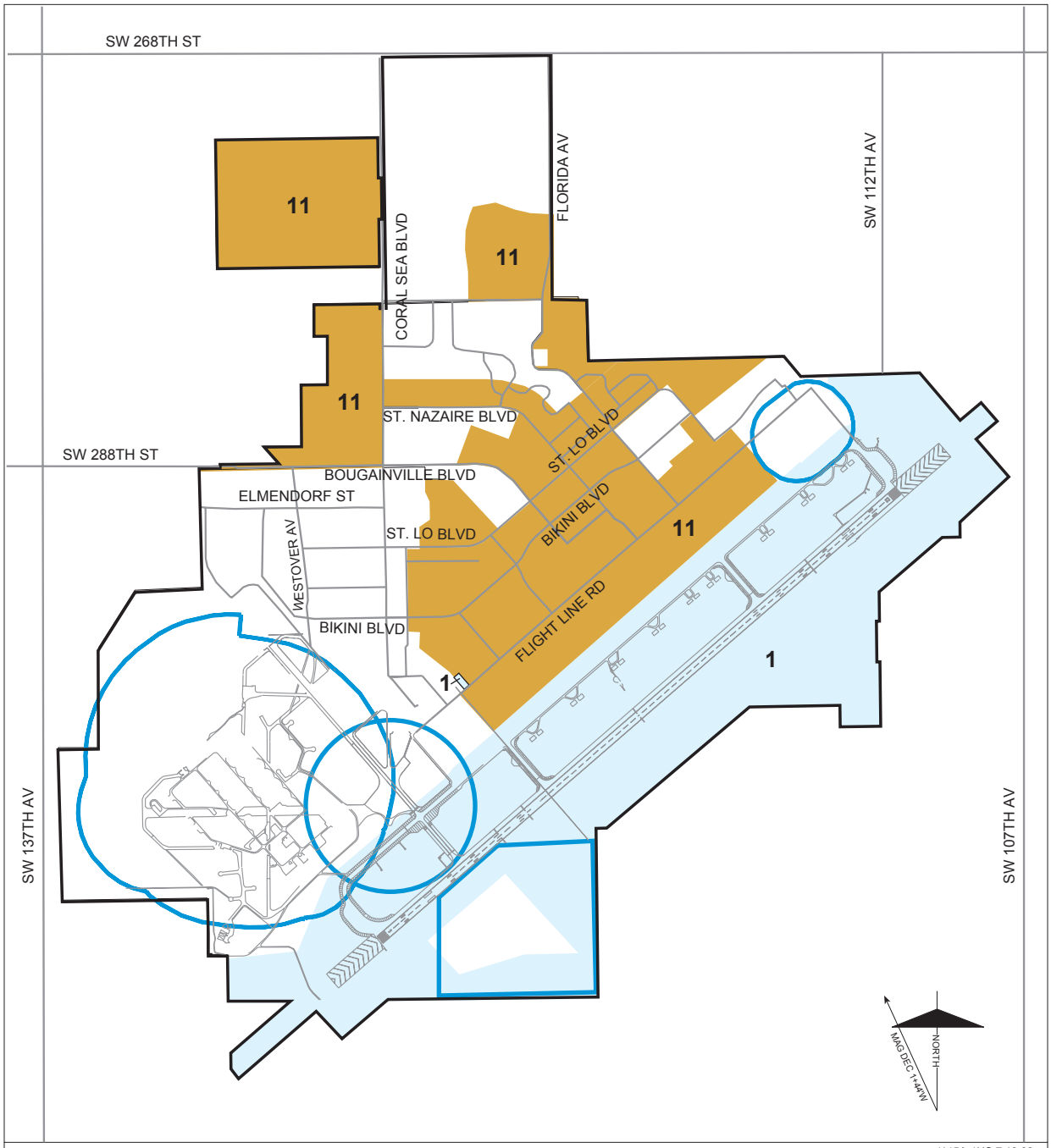
Land Use	Acres	Percent
Retained and Conveyed Property[1]	1,306	44
Airfield[2]	915	31
Caretaker[3]	717	25
Total	**2,938**	**100**

Source: Derived from **AFBCA 1996**.
Notes: [1] Includes approximately 30 acres that could be retained or conveyed and 26 acres proposed to be transferred to the School Board of Miami-Dade County.
[2] Would no longer be surplus due to requirements of AFRC, FANG, and U.S. Customs Service. Includes air traffic control tower.
[3] Would be retained by the Air Force but not used.

Facility development for the existing reuse property is summarized in Table 2.1-3 and described in Section 2.1.1.1. No additional construction or demolition is projected for the airfield or surplus property.

2.5.2 Airfield Operations

Use of the airfield and aircraft operations would be the same as described in Section 2.1.1.2. Aircraft operations are summarized in Table 2.1-4, and flight tracks are illustrated in Figures 2.1-3, 2.1-4, and 2.1-5. The airfield would be used only by military and other government users. There would be no civil aviation operations at former Homestead AFB under this alternative.



LEGEND

1	Airfield	5	Institutional*	9	Utility*
2	Aviation Support*	6	Commercial*	10	Military/Government*
3	Industrial*	7	Recreation/ Open Space*	11	Caretaker
4	Residential*		Retained & Conveyed Areas	*	Not Used

Former Homestead AFB Boundary

Existing Safety Zone

(145Aa)HS 7.19.00nc

0.25 0 0.25 0.5

Scale In Miles

Derived from: AFBCA 1996, Homestead ARS 1998

Figure 2.5-1
Land Use–No Action Alternative

2.5.3 Employment and Population

Employment under the No Action alternative would remain as shown in Table 2.1-6.

2.5.4 Traffic and Utilities Use

Traffic would be the same as described in Section 2.1.1.4. Utility use would be the same as shown in Table 2.1-8.

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2.6 INDEPENDENT LAND USE CONCEPTS

A number of reuse suggestions were submitted through the scoping process and as part of local planning initiatives. Most were not firm proposals and did not identify a sponsor or implementing strategy. However, many were ideas that would be feasible at former Homestead AFB and could be considered as part of the future development of former base property. Most of these independent concepts would only involve a portion of the disposal property, but some could be implemented as part of or in concert with one or more of the comprehensive reuse alternatives described in Sections 2.2 through 2.4. Some of the inputs received by the Air Force provided details about the amount of land or construction that would be involved; others were simply conceptual ideas. This section describes these independent concepts in terms of land use and site development; extent, intensity, and timing of activity; and compatibility with the comprehensive reuse alternatives considered in this SEIS. **Table 2.6-1** summarizes the potential compatibility of the independent concepts in the framework of each of those reuse alternatives. The following paragraphs provide brief summaries of each concept.

Table 2.6-1. Summary of Compatibility of Independent Land Use Concepts With the Proposed Action and Other Reuse Alternatives

Land Use Concept	Proposed Action	Commercial Spaceport Alternative	Mixed Use Alternative
Agriculture	Possible	Possible	Yes
Aircraft Maintenance Facility	Yes	Yes	No
"Back Office" Operations	Yes	Yes	Yes
Cemetery	Possible	Possible	Yes
Corrections Complex	Possible	Possible	Yes
Education Complex	Yes	Yes	Yes
Film/Television Production Studio	Yes	Yes	Yes
Research Facilities	Yes	Yes	Yes
Small Package and Mail Distribution Center	Yes	Possible	No
Structural Insulated Panels Manufacturing	Yes	Yes	Yes
Theme Park	Possible	Possible	Yes
World Teleconference Center	Yes	Yes	Yes
Golf-Oriented Resort	Possible	Possible	Yes
Aquarium/Ecotourism Park	Possible	Possible	Yes

Possible Uses could be incompatible but could be made compatible through visual or noise separation.
Yes Uses are generally compatible.
No Uses are not compatible and cannot be made compatible through separation.

Agriculture. The use of the former base as a plant nursery was suggested. Agricultural activities on the former base would be compatible with surrounding land use and would help to preserve the agricultural resources in southern Miami-Dade County. The area that could be occupied by agricultural activities includes the majority of the surplus land, excluding the airfield. The northwest area of the base, however, would be the most logical location for agricultural use because of its separation from more developed parts of the base.

Aircraft Maintenance Facility. This concept was among the uses proposed by a working group of Team South Dade tasked with identifying reuse alternatives for former Homestead AFB. This industry could include service repair and overhaul of aircraft components and systems. Services might include repair and installation of instruments and equipment, aircraft painting and refinishing, repairs of aircraft structural and interior components, service and repair of electronic and hydraulic systems, and testing and monitoring of systems and airframe integrity. This use could require facilities ranging from 20,000 to 300,000 square feet (or more), and some services may require flightline locations with ramp areas for parking aircraft. The industry supports a range of skilled technical and administrative jobs. This concept has been incorporated in the Proposed Action and the Combined Commercial Spaceport/Airport option.

"Back Office" Operations. Back office operations are characteristically business support providers who perform labor-intensive functions for other companies, such as data entry and answering service calls for large corporations (e.g., insurance or credit companies, catalog or retail ordering, airline reservations service). These industries are generally information-intensive and heavy users of telecommunications and data processing technology. Their activities generate high-occupancy office space and require state-of-the-art (or, at a minimum, reliable) telecommunication infrastructure. Fiber-optic lines and microwave stations may require new infrastructure to capture this market. This type of operation would be compatible with any of the three reuse alternatives described in this chapter.

Cemetery. Part of the former base could be used as a federal, local, or private cemetery. A cemetery would result in relatively low employment and low visitation compared to most other potential uses. The most logical placement of a cemetery would be the northwest area of the former base.

Corrections Complex. A corrections complex can conceptually encompass a wide range of correctional facilities, ranging from low- to high-security prisons, to parole officer office space. A prison facility would involve high-density development and could create some conflicts with adjacent uses, but a complex of office space for parole officers would be similar to a low-occupancy office building with relatively few visitors.

Education Complex. Different types of educational complexes have been suggested, ranging from high schools to aviation training schools, to colleges or universities. Suggestions for secondary schools would require relatively small land areas, while aviation training or tertiary education facilities might occupy larger portions of the former base. With the exception of aviation training, in which additional flight operations could be generated, schools would generally be similar to low-density office buildings but with high visitation. Such types of buildings are incorporated into all the reuse alternatives. Locations farther from the airfield (and associated aircraft noise) on the north and northwest sides of the disposal property would be most suitable for an education complex.

Film/Television Production Studio. One suggested reuse involved development of a large-scale Latin-American film/television production studio. A studio would be similar to many commercial uses in the amount of employment and vehicular activity to and from the site. It would include offices and a variety of staging and recording areas. The area required could vary from a few acres to a couple hundred acres and could generate a few thousand jobs for a large operation. This industry currently employs about 22,000 in the Miami area (**Sorenson 1998**). Because of continued use of the airfield, locations farther removed from the airfield would be more suitable for controlling indoor sound levels.

Research Facilities. A variety of types of research facilities were suggested by several individuals, with specific mention of biomedical, environmental, or electronics research activities. Most of these activities would be characterized as moderate-density development with low visitation. Depending on the type of research being carried out, some specialized waste management facilities might be required. For

example, biomedical research would require some method for disposing of pathogenic wastes (possibly on-site incineration). Electronics research might require disposal of hazardous wastes, probably by contract to an off-site hazardous waste landfill. While the areal extent of these facilities could range from a few acres to the entire disposal property, it is assumed that land within the areas designated for industrial or commercial use could be available for research activities under any of the reuse alternatives.

Small Package and Mail Distribution Center. Portions of the disposal property could be developed for small package and express mail services serving Central and South American markets by carriers such as DHL, Federal Express, Emory Worldwide Airlines, and Airborne Express. The dedicated fleets of these companies would not be dependent on commercial passenger services for transporting cargo. The amount of facilities needed for these operators would vary depending on the volume of service, but for a single operator might include a distribution center (about 100,000 square feet), warehousing (about 40,000 square feet), and offices (about 3,000 square feet), with both truck loading access and flightline access to some facilities. Land requirements could vary from about 8 to 40 acres, and employment would range from 70 to several hundred personnel (**Sorenson 1998**). Typically, these services operate at night, with night takeoff and landings of aircraft and early morning and evening truck traffic. Trends in the industry indicate a move toward more round-the-clock activities to meet customer needs.

Structural Insulated Panels Manufacturing. A proposal for fabrication of structural insulated panels was provided during scoping as a possible use of the disposal property. This industry involves gluing foam panels between interior and exterior sheathing boards to form an insulated building material. A typical facility for this industrial process would be about 25,000 to 35,000 square feet. It would be long and narrow, allowing a linear sequence of activities. Raw materials would be delivered by truck, and most materials could be stored outside, requiring some cover for moisture protection. Deliveries and distribution of finished products would generate a small amount of truck traffic (about one trip per day). Some plants also do custom cutting of panels prior to shipping. Employment for a typical factory could range from about 6 to 20 persons (depending on the amount of customizing provided). An additional 30 jobs for administration and sales would also be typical. Some existing large facilities close to the flightline (south of St. Lo Boulevard) would offer suitable sites for this industry.

Theme Park. Several people suggested that the former base be developed as a theme park, a botanic garden, an agricultural park, a water park, or similar use. A theme park could occupy a small portion of the former base or take up the majority of the disposal property. Theme parks could vary from primarily open, unbuilt areas to highly developed facilities. Traffic could vary extensively, depending on the type of park—a high-density theme park might draw several hundred to several thousand vehicles per day in season, while a botanic garden might draw tens of vehicles per day. Depending on the type of park, a variety of locations on the disposal property could be appropriate.

World Teleconference Center. The World Teleconference Center concept would be a large communications-based complex with a variety of video and audio teleconference rooms and large offices manned by telephone-based sales or service personnel. The center could be housed in a single large building or a few small buildings. It is generally classified as a commercial enterprise, but would have a high number of employees per square foot of floor space and relatively few visitors compared to other commercial space. It generally would have the characteristics of high-occupancy office space. Development of a teleconference center might require additional telephone and other communications infrastructure. Such a center would be compatible with any of the reuse alternatives.

Golf-Oriented Resort. A proposal submitted by Collier Resources Company would develop surplus property at former Homestead AFB as a mixed industrial/commercial/recreational complex. The proposal is for the entire disposal property (excluding the airfield) and, as such, constitutes a comprehensive reuse

plan, which has been included in the Mixed Use alternative. However, portions of the plan, such as the golf courses and associated hotels and RV park, could be implemented on portions of the property and possibly combined with one of the other reuse plans or independent land use concepts. More detailed information on the Collier proposal is presented in Section 2.4.

Aquarium/Ecotourism Park. A plan was submitted by the Hoover Environmental Group to develop the disposal property (excluding the airfield) as a mixed-use development centered around a world class aquarium and ecological park. The proposal as a whole includes commercial, industrial/research, and residential uses and is included in the Mixed Use alternative as a comprehensive reuse plan. It is possible that components of the plan, such as the aquarium, IMAX theater, and/or other ecotourism attractions, could be developed on portions of the disposal property. More detailed information on the Hoover proposal is presented in Section 2.4.

2.7 ALTERNATIVES ELIMINATED FROM DETAILED ANALYSIS

The Proposed Action and alternatives presented in Sections 2.2 through 2.5, along with the independent land use concepts described in Section 2.6, encompass a wide variety of reuse options for the surplus property at former Homestead AFB. These options include various commercial airport functions, heavy aviation industrial, light industrial warehousing, commercial office and retail, residential, and open space. Alternative uses that were considered and eliminated from further analysis are described below.

Close Homestead ARS and Cease All Aviation Operations. During scoping, some commentors requested that the SEIS analyze the impacts that might occur if no commercial airport were developed at former Homestead AFB, and the Air Force decided to close the airfield entirely and relocate current military and government users to other locations. This request is not an alternative that meets the underlying Air Force need, which is to dispose of surplus federal property. Further, AFRC and FANG have no plans to alter their current missions or assignments to Homestead ARS. Therefore, this alternative was not considered further. If government plans were to change in the future, additional environmental impact analysis would be performed.

Spaceport with Scheduled Commercial Airport. Consideration was given to combining the Proposed Action and the Commercial Spaceport alternative in an alternative that would support both spaceport and scheduled passenger service at former Homestead AFB. It was determined that the available land and capability of the disposal property would be insufficient to support both activities. Space for development along the flightline is limited and could not accommodate required facilities for both purposes in the long term. Also, as the demand and volume of air passenger service increased, the potential delays and interruptions associated with space launch operations would discourage airlines from locating at the airport. For these reasons, this alternative was not carried over for detailed analysis. A less intensive combined Commercial Spaceport/Airport option, without scheduled passenger service, is considered under the Commercial Spaceport alternative.

Wildlife Sanctuary. One suggestion would involve converting the former base to a wildlife sanctuary. This was eliminated from further consideration because it was considered unlikely that the land, which was previously developed and contains extensive amounts of construction fill, would be suitable as a wildlife sanctuary. In addition, it could attract birds to the immediate vicinity of the runway, exacerbating concerns about bird-aircraft strike hazards. Therefore, this was not considered a reasonable alternative for analysis.

Hospital. One scoping comment suggested that the plans for the former base include a hospital, specifically a veterans' hospital. Neither a private hospital nor a veterans' hospital was considered to be a viable alternative because of existing excess capacity at private hospitals in the area and excess capacity at veterans' hospitals nationwide. A clinic could be possible.

New Military Mission. A number of commentors suggested that the Air Force return to the former base (specifically, that the functions of Patrick AFB be moved to Homestead), the Southern Command be relocated to Homestead from Miami, or the Coast Guard facility at Opa-Locka be moved to Homestead. This request, however, is not an alternative that meets the underlying Air Force need, which is to dispose of surplus federal property. Further, although future expansion of military use is possible, no expansions have been planned.

General Aviation Airport. It has been suggested that former Homestead AFB could be established as a general aviation airport for small jets and propeller aircraft. An evaluation of regional general aviation requirements showed recent declines and slow growth in demand for general aviation services, and there are already a number of alternate airports in the region to adequately meet these needs (see Appendix A).

General aviation has been included as part of the Proposed Action, but is not considered a viable alternative by itself.

Federal Park. A few comments on the Draft SEIS suggested that former Homestead AFB be turned into a federal park like the Presidio in San Francisco or to tie together Biscayne and Everglades National Parks. The National Park Service, the agency responsible for managing federal parks, has not expressed interest in transfer of the disposal property for the purpose of establishing such a park. NPS did obtain 213 acres at the former base on behalf of Miami-Dade County Parks and Recreation Department for a regional park.

Rainforest. One comment received during the public review of the Draft SEIS suggested the former base be converted into an ecological theme park involving a rainforest. One of the options considered under the Mixed Use alternative includes elements of an ecological theme park, but focused on the environment that is indigenous to south Florida. Establishing a rain forest at former Homestead AFB would require different soils, climatic, and other conditions than exist at that location.

Build Commercial Airport at Another Location. Some commentors have suggested that the SEIS evaluate locations other than Homestead for a commercial airport as an alternative to the Proposed Action. This was eliminated from detailed analysis in the SEIS for several reasons. The decision before the federal government is the disposal and reuse of portions of former Homestead Air Force Base. An alternative location for an airport does not address the need to decide how to dispose of Homestead property. Additionally, the Air Force, as current owner of former Homestead AFB and lead agency on the disposal decision and the SEIS, has no authority to consider and make federal decisions concerning other potential locations for a commercial airport.

The FAA does have authority to make federal decisions to support commercial airport location and development. However, the FAA cannot itself locate and develop a new commercial airport and cannot act in the absence of an application from a current or prospective airport proprietor. Neither Miami-Dade County nor any other prospective airport proprietor has submitted such an application. There is no proposed action that is ripe for federal consideration or decision.

Finally, there is a question of whether there is a feasible and prudent alternative location for commercial airport development in the region. Miami-Dade County has tried periodically and unsuccessfully since the late 1960s to site and develop a new commercial airport to supplement Miami International Airport. In the late 1960s, Miami-Dade County purchased 39 square miles in south-central Florida and constructed a training airport called the Dade Collier Training and Transition Airport, which was ultimately proposed to be developed as a full commercial service airport. Because of concerns of potential harm to Everglades National Park, commercial airport development at this location was prevented by the Everglades Jetport Pact of 1970 signed by federal, state, and county government. A key component of the Jetport Pact was to find another location in south Florida for a commercial airport. Thirty-six candidate airport sites were evaluated. A federal EIS was approved for the preferred site, identified as Site 14, in 1981. Although Site 14 was regarded as among the most environmentally acceptable sites at the time and the EIS was jointly approved by the FAA and the Department of the Interior, the State of Florida ultimately rejected the development of a commercial airport in a Water Conservation Area. There are currently no known feasible and prudent sites for a new airport. Undeveloped land locations are limited and are further restricted by Everglades National Park, Big Cypress National Preserve, water conservation areas, environmentally protected lands (wetlands, biologically sensitive lands, and other lands with valuable environmental characteristics), and endangered species habitat.

With respect to attaining more commercial service capability at existing airports, MIA is the only commercial service airport in Miami-Dade County. Even with the current addition of a fourth runway,

MIA is projected by Miami-Dade County's forecast to fall short of the capacity for commercial service demand by 2010. FAA's most recent forecast is in general agreement, with MIA's capacity projected to be exceeded by 2009–2010. None of the other airports in Miami-Dade County are commercial service airports. None of them have the sizeable runway dimensions that former Homestead AFB has. All existing airports are affected to varying degrees by environmental factors that pose problems for expansion. Opa-Locka Airport is viewed as the only existing general aviation airport that is viable for commercial service. Miami-Dade County is pursuing opportunities for limited commercial service at Opa-Locka, which if realized would provide some capacity gain in the near term but would not, by itself, satisfy the overall long-term need for full-service commercial airport capacity in Miami-Dade County.

The Draft SEIS identified several constraints affecting Opa-Locka Airport's expansion capability. Opa-Locka's longest runway is 8,002 feet, and nonstop long-haul service would require a longer runway than may be feasible to develop at Opa-Locka. Opa-Locka also has close-in surrounding residential and business development adjacent to it and environmental concerns. More recent studies performed by Miami-Dade County as part of the ongoing aviation system plan update and airport master planning for Opa-Locka are reviewing potential ways to achieve some expansion of Opa-Locka for commercial service. The county's planning efforts recognize complicated airspace interactions among MIA, FLL, and Opa-Locka, and indicate that 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 concluded its planning, and the FAA has not yet restudied the airspace. In any case, pursuit of limited commercial expansion at Opa-Locka does not negate the need for a commercial service facility at Homestead. Reasonable and balanced plans to add airport capacity in Miami-Dade County at both Homestead and Opa-Locka are complementary efforts, rather than competing efforts, 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.

Appendix A provides a discussion of regional airport needs and constraints, taking into consideration the Draft 1996 Aviation System Plan Technical Report available during the preparation of the SEIS. The appendix discusses the role envisioned for the various airports within Miami-Dade County. Miami-Dade County is currently updating its aviation system plan. It is anticipated that this update will reflect aviation planning information and airport roles that are consistent with this SEIS. An addendum has been added to Appendix A to provide additional FAA analysis of aviation growth and airport capacity and of the potential role of former Homestead AFB as a civil airport.

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2.8 OTHER FUTURE PROPOSALS, INITIATIVES, AND DEVELOPMENTS IN THE REGION

The Proposed Action and alternatives for reuse of former Homestead AFB, in combination with other projects and activities planned for the south Florida region, may have the potential to contribute to or alter cumulative environmental impacts. This section describes the other activities in the region included in the cumulative impact analysis. They include accelerated population growth in south Florida, South Florida Ecosystem Restoration Projects, a proposed stormwater treatment and distribution area east of the former base, and widening of U.S. Highway 1 south of Florida City. None of these projects is part of the Proposed Action or other alternatives for reuse of former Homestead AFB. They are independent projects that could occur in the same region and during the same time frame as redevelopment of the former base.

There are likely to be numerous smaller projects and activities over the period of analysis that could also contribute to cumulative environmental impacts in the region. These are assumed to be subsumed within the overall growth projected for the years 2000, 2005, and 2015.

The results of the cumulative environmental effects analysis are presented in Chapter 4 and summarized in Section 2.10.

2.8.1 Accelerated Population Growth in South Florida

Section 2.1.3 describes the population growth projected to occur in Miami-Dade County between 1995 and 2015. The baseline for purposes of analyzing the environmental effects of reuse of former Homestead AFB is based on this projected population and assumes a moderate rate of growth similar to that forecast for the county by the Bureau of Economic Analysis and other agencies. The Miami-Dade County Planning Department has forecast a more aggressive rate of growth over the next 20 years, although it is in the process of revising its forecasts. It is possible that growth will occur as predicted in the high-growth forecasts. Therefore, the cumulative impact analysis in this SEIS evaluates the potential environmental effects of the Proposed Action and reuse alternatives in combination with this accelerated growth.

Table 2.8-1 summarizes the high-growth population forecasts and projected employment and housing unit demands for 2000, 2005, and 2015, for the county as a whole and for the south Miami-Dade subarea (defined as the area south of Eureka Drive). Under high growth, countywide population is projected to increase to over 2.5 million persons by 2005 and 3 million persons by 2015 (interpolated from 2020 forecasts). For comparison, BEA and the state have projected a countywide population of less than 2.3 million in 2005 and 2.5 million in 2015 (interpolated from 2020 forecasts). The high-growth forecasts for the southern portion of the county (south of Eureka Drive) show an increase in population from about 163,000 in 1995 to about 201,000 in 2000, 240,000 in 2005, and 407,000 in 2015 (interpolated). Comparable federal and state forecasts would place the population at an estimated 182,000 in 2000, 201,000 in 2005, and 240,000 in 2015 (see Table 2.1-9).

If the high-growth forecasts are accurate, the projected growth could result in a substantial change in the distribution and intensity of land use in the region by 2015. The extent of the change was estimated using county Transportation Analysis Zone data that contain spatially distributed information on population, land use, and employment for 1995 and projected population and employment for 2005 and 2020. Using the distribution patterns from the county's data, projected changes in land use were calculated for the high-growth forecasts.

Table 2.8-1. High-Growth Employment, Population, and Housing Forecasts for Miami-Dade County and the South County Area

	1995	2000	2005	2015[1]
Miami-Dade County				
Population	2,056,789	2,293,697	2,530,604	3,030,495
Employment	1,125,612	1,203,745	1,281,878	1,403,563
Housing Units	812,767	896,470	980,172	1,145,515
South Miami-Dade County				
Population	163,235	201,414	239,592	407,017
Employment	41,683	55,074	68,464	81,076
Housing Units	56,700	70,892	85,083	140,567

Source: Derived from **Metro-Dade County 1994a**, **Miami-Dade County 1998f**.
Note: [1] Interpolated from forecasts for 2020.

Table 2.8-2 summarizes acreage expected to be in generalized land use categories under high-growth conditions in south Miami-Dade County (south of Eureka Drive). The table shows the estimated changes in acres in each land use category in the south county area for 2000, 2005, and 2015. As development increases, the proportion of residential, commercial, and industrial land use would be expected to grow, with a corresponding decline in unprotected vacant and agricultural land. It is assumed that vacant land which is protected (such as Environmentally Endangered Lands) would not be developed, and only unprotected land would be used for development. Between 1995 and 2015, about 19,000 additional acres of land could be developed for residential, commercial, and industrial uses under the high-growth projections.

Table 2.8-2. Estimated Land Use Changes in South Miami-Dade County Based on Miami-Dade County High-Growth Forecasts

Land Use Category	1995–2000[1] (acres)	2001–2005 (acres)	2006–2015[1] (acres)	Total (acres)
Residential (High Density)	468	468	1,180	2,116
Residential (Medium Density)	3,298	3,298	8,137	14,733
Commercial	377	376	936	1,689
Industrial	95	95	235	425
Vacant (Unprotected)[2,3]	–2,229	–2,229	–3,729	–8,187
Agriculture[3]	–2,008	–2,009	–6,759	–10,776

Source: SAIC; **Miami-Dade County 1998f**.
Notes: [1] Estimates are interpolated.
[2] Vacant land not protected from development by land use restrictions.
[3] Negative numbers indicate a decrease in the land use category.

2.8.2 South Florida Ecosystem Restoration Projects

2.8.2.1 South Florida Ecosystem Restoration Task Force

In 1993, the South Florida Ecosystem Restoration Task Force was established through interagency agreement among six federal departments involved in restoration and protection of the south Florida

ecosystem. In 1996, the Task Force was expanded to include Florida-based federal, state, and tribal representatives and various advisory boards and other technical working groups involved in the project. It subsequently was authorized by statute (Public Law 104-303, Section 528(f), Water Resources Development Act of 1996) and membership was expanded to include seven federal members, two tribal representatives, and five representatives of the State of Florida[1]. The State of Florida has also established the Governor's Commission for a Sustainable South Florida to address restoration issues and initiatives. The overall project is aimed at making the south Florida ecosystem more sustainable in the future. Goals include restoring the natural hydrology of south Florida, enhancing and restoring native habitat and species, and improving quality of life (**South Florida Ecosystem Restoration Task Force 1998b**).

The project consists of over 200 actions, programs, and initiatives addressing environmental restoration, growth management, agriculture, and urban revitalization. In order to provide direction and oversight for this massive initiative, the Working Group has been developing an Integrated Plan that will document a common vision for restoration efforts, facilitate collaboration and coordinated progress in fulfilling the vision, and provide mechanisms for tracking progress. The plan will be a focal point for continuous reevaluation of goals and objectives, linking resources, disseminating information, and coordinating actions to achieve the vision (**South Florida Ecosystem Restoration Task Force 1998a**).

The plan addresses all the lands within the SFWMD and contiguous nearshore coastal waters (including Biscayne Bay and portions of Florida Bay). It is grounded in five guiding principles: (1) an ecosystem approach that integrates ecological, economic, and social factors; (2) shared vision through collaboration; (3) reliance on sound science; (4) use of adaptive management; and (5) public involvement (**South Florida Ecosystem Restoration Task Force 1998a**).

The Integrated Plan will support an approach that addresses a total system comprised of natural and human-built ecosystems. However, this will be accomplished by evaluating projects and policies for smaller local areas and learning from successful initiatives. The process for developing the plan has included the following five phases:

1. Affirmation and refinement of the broad vision and objectives of the Working Group and Governor's Commission.
2. Identification of successful current and recent local projects to create a portfolio of ideas and contacts that can be shared regionally.
3. Development of new strategies to achieve the vision and objectives.
4. Designing a new system for sharing ideas and resources and monitoring success.
5. Documenting the process and results and distributing the Integrated Plan.

The Task Force has issued an Integrated Financial Plan (**South Florida Ecosystem Restoration Task Force n.d.**) that lists all the programs, studies, and initiatives presently identified. It provides a brief description and identifies the lead organization for each project, financial requirements, and

[1] Members include seven federal members each represented by one designee at the level of assistant secretary or equivalent including the Secretary of the Interior (as Chairperson), the Secretary of Commerce, the Secretary of the Army, the Attorney General, the Administrator of the Environmental Protection Agency, the Secretary of Agriculture, and the Secretary of Transportation; one member appointed by the Secretary of the Interior from the Seminole Tribe of Florida and one from the Miccosukee Tribe of Indians of Florida; and two representatives of the State of Florida, one representative of the SFWMD, and two representatives of local government in the State of Florida appointed by the Secretary of the Interior based on the recommendations of the Governor.

appropriations to date. Several have been identified as critical projects and have been ranked by their priority. Projects on the list that are geographically coincident with the region of influence being considered in the SEIS (excluding those addressed as part of the Restudy in Section 2.8.2.2) are briefly described below. Some of these projects may include several initiatives discussed in the Integrated Financial Plan. The Governor's Commission has identified the following five projects relevant to the Homestead area as on the "critical project funding" list.

Melaleuca Eradication Project and Other Exotic Plants. The Melaleuca project is focused on research of biological control agents to control several invasive exotic plants throughout south Florida. Other components of this effort include actual removal of a variety of invasive species, including melaleuca Australian pine, Brazilian pepper, latherleaf, torpedograss, and old world climbing fern.

Florida Keys Carrying Capacity Study. This study will develop information to support decisions about future development approvals and investment in infrastructure, based on potential impact to the ecology and natural systems in the Florida Keys and Florida Bay.

South Miami-Dade Agriculture and Rural Land Use and Water Management Plan. The Miami-Dade County CDMP amendments for the reuse of former Homestead AFB include provisions for collaboratively preparing an areawide land use and water management plan for the south Miami-Dade County watershed.

South Miami-Dade/C-111 Basin Hydrological/Water Quality, Sustainable Agricultural Program. This is primarily a research program to improve and enhance agriculture as a valuable and durable agent in the ecosystem restoration.

L-31E Flowway Redistribution Project. This project consists of constructing a freshwater distribution system along the L-31E levee west of Biscayne National Park to convey water from two canals into wetlands between the levee and the shoreline. This project is described in more detail in the following section.

2.8.2.2 Central and Southern Florida Project Comprehensive Review Study

The Jacksonville District and South Atlantic Division of the U.S. Army Corps of Engineers, in partnership with South Florida Water Management District, is reevaluating and redesigning the complex system of canals and flow control structures that currently control water distribution south of Lake Okeechobee. The Restudy is focused on two major goals: (1) enhancing ecologic values and (2) enhancing economic values and social well being. Under the first goal, there are three objectives:

- Increase the total spatial extent of natural areas;
- Improve habitat and functional quality; and
- Improve native plant and animal species abundance and diversity.

The second goal encompasses four objectives:

- Increase availability of fresh water for agricultural, municipal, and industrial use;
- Reduce agricultural and urban flood damage;
- Provide recreational and navigational opportunities; and
- Protect cultural and archeological resources and values.

A Final Integrated Feasibility Report and Programmatic Environmental Impact Statement (**USACE 1999**) was published in April 1999, and forwarded to Congress in July 1999. It outlined the major features of a range of proposed projects in south Florida. Identified activities in the area of former Homestead AFB are generally included under the Biscayne Bay Coastal Wetlands feature. This feature, covering approximately 13,600 acres from the Deering Estate at C-100C to the Florida Power and Light Company's Turkey Point Nuclear Power Plant, is generally aligned with canal L-31E. The purpose of the feature is to rehydrate wetlands and reduce point source discharges to Biscayne Bay. The proposed project would replace lost overland flow and partially compensate for the reduction in groundwater seepage by redistributing available surface water from regional canals. The redistribution of freshwater flow, across a broad front, would restore or enhance freshwater wetlands, tidal wetlands, and nearshore bay habitat. This project would create conditions that would assist the reestablishment of oysters and other components of the oyster reef community in Biscayne Bay.

There are several components of this feature that involve redesigning and restructuring the canals in southeastern Florida. The most directly applicable of the proposed activities around former Homestead AFB is the L-31E Flowway Redistribution project, but parts of the systemwide Melaleuca Eradication Project and Other Exotic Plants component are also relevant.

The L-31E Flowway project, shown schematically in **Figure 2.8-1**, would reestablish conditions for living oyster bars along the shoreline of the bay and hydrologically isolate the Miami-Dade County landfill. A flow redistribution system would be created west of L-31E, and wetlands would be restored between L-31E and the western boundary of the redistribution system. A swale with a western levee would be built along the boundary in the vicinity of the former base. The wetland area west of L-31E would be used for short-term ponding of water to help drive freshwater flow to the nearshore bay. Depending on water quality, flows may need to be routed through a stormwater treatment area. The concept involves installation of culverts and risers under L-31E, construction of a spreader swale east of L-31E, and backfilling Military Canal between L-31E and Biscayne Bay. The current design concept involves construction of a stormwater treatment area between C-102 and C-103 (Princeton Canal to Mowry Canal) and a new canal west of L-31E[2].

Figure 2.8-1 indicates that there would be discharges from the existing South District wastewater treatment plant into C-102 and L-31E (to C-100). This would depend on future upgrades that could allow wastewater that is currently being deep-injected into groundwater to be further treated and discharged into the canals. It is not clear who would undertake this project or when, and no additional description is provided in the Restudy. It was initially on the Restudy Critical Projects list but was recently removed and will be implemented as an Other Project Element.

2.8.2.3 Recent Legislative Actions

A bill was signed in May 2000 by the Governor of Florida committing the State of Florida to spend $2 billion to restore the Everglades. In September, the U.S. Senate approved the Comprehensive Everglades Restoration Plan under the Water Resources Development Act of 2000 (Senate Bill 2796). The House of Representatives approved a comparable plan in October. Differences in the two bills were worked out in conference and, as of this writing, the legislation has been forwarded to the White House for signature.

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[2] These projects could be located in a buffer area between former Homestead AFB and Biscayne National Park, if one were established. Consideration of a buffer is mentioned in Section 2.2.6 and discussed in more detail in Section 2.9.

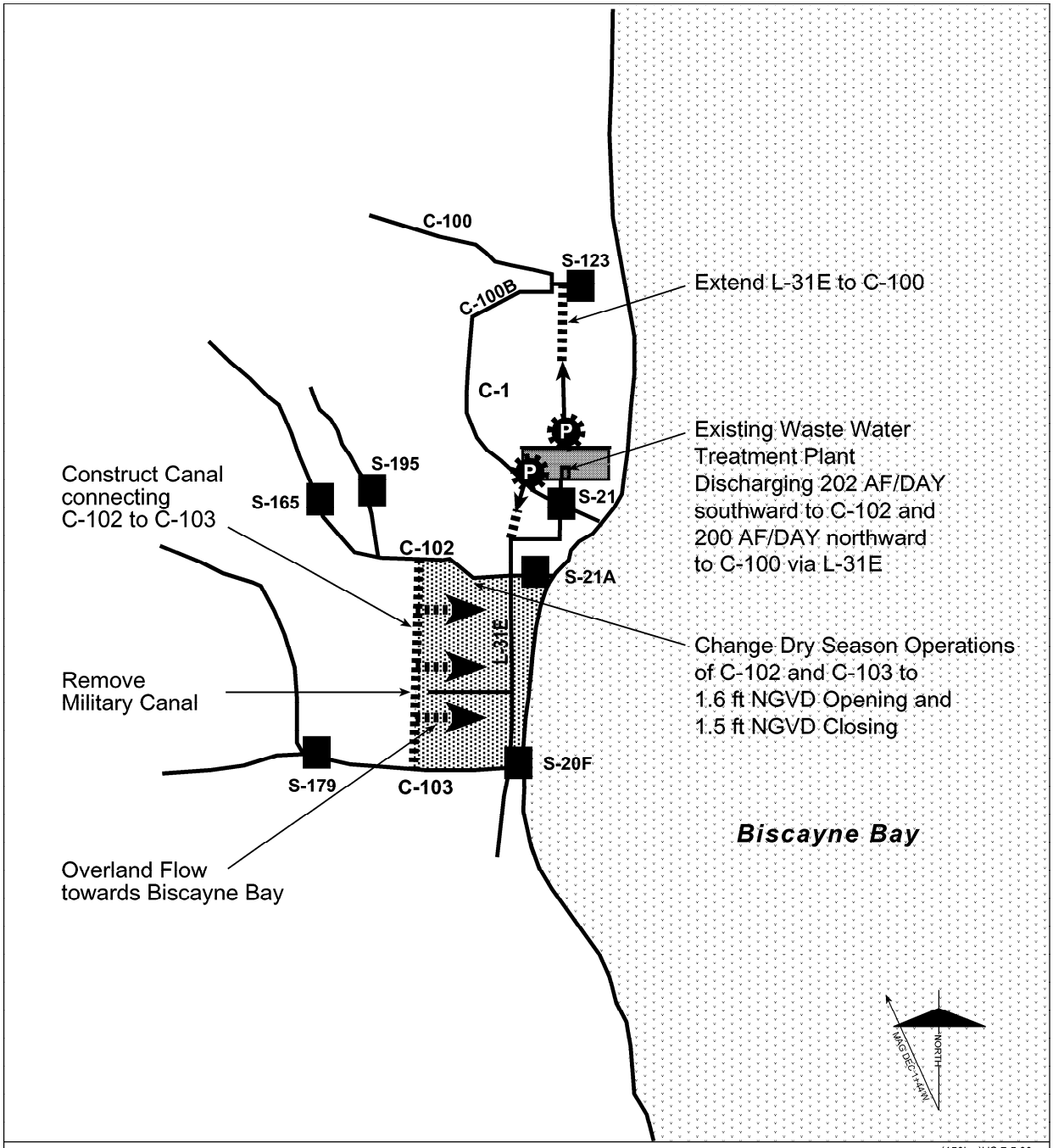


Figure 2.8-1
Alternative D13R South Biscayne Bay and Coastal Wetlands Enhancement Component

The Everglades restoration is estimated to cost nearly $8 billion over 36 years, to be divided among about 70 projects involving land acquisition, levee building, and redirecting Lake Okeechobee water away from the Atlantic and back through the wetlands. The legislation includes measures for 50-50 cost share between the State of Florida and the federal government.

Though not amending the existing process, Section 602 of Senate Bill S2796 expressed the sense of the Senate that development at former Homestead AFB could potentially degrade the nearby national parks and other federal resources, and that the redevelopment of the base should be consistent with Everglades restoration goals and provide desirable numbers of jobs and economic redevelopment for the community. The section charged federal agencies to carefully weigh all available information and encouraged the Air Force to proceed as quickly as practicable to issue the Final SEIS and a Record of Decision. The section indicated that, following property conveyance, the Secretary of the Army should cooperate with the property recipients so that the planned reuse is implemented in a manner consistent with the goals of the Everglades restoration plan.

2.8.3 Miami-Dade County Stormwater Treatment and Distribution Area

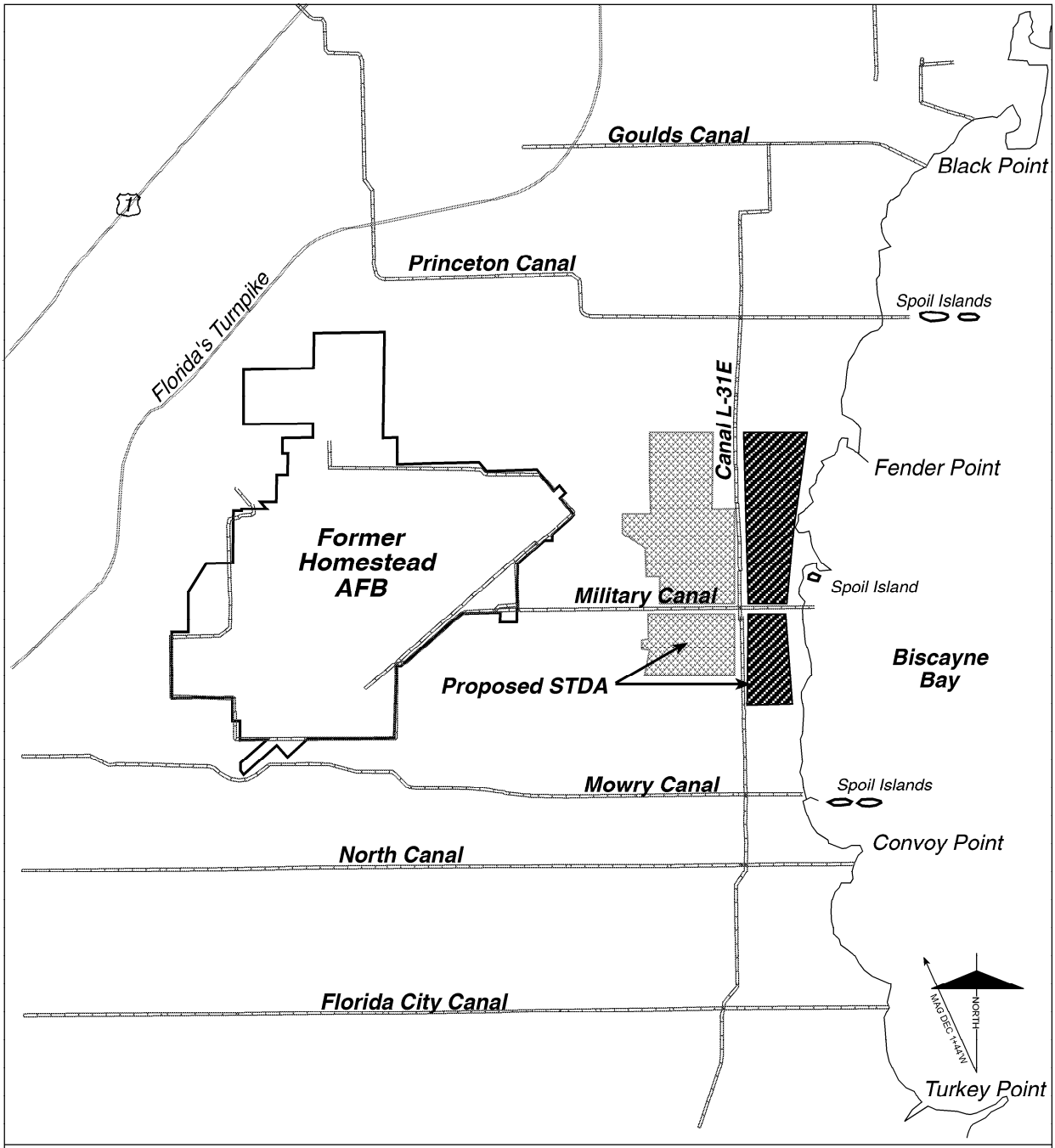
Miami-Dade County has had plans since the late 1980s to construct a Stormwater Treatment and Distribution Area (STDA) between Princeton and Mowry Canals east of former Homestead AFB (shown in **Figure 2.8-2**). The STDA would receive stormwater flows from Military Canal. The county's objective in developing the STDA is to improve water quality of discharges into the bay over levels achievable with the existing canal system.

The proposed approach to the STDA, which was adopted from a system used in the Everglades to remove phosphorous, is unproven, and the county intends to conduct a pilot program to test its effectiveness in treating the discharge from local canals. Depending on the findings, the STDA could ultimately become part of the system for treating runoff from the environs of former Homestead AFB. It may also be tied into ecosystem restoration projects emerging from the Restudy described above.

2.8.4 Widening of U.S. Highway 1

This project, in planning for several years, would involve widening U.S. Highway 1 from Florida City to Key Largo. Currently, this stretch of U.S. Highway 1 is a two-lane highway, with interspersed sections that are three lanes. Under this project, the highway would be widened to four lanes for the entire distance, increasing its capacity, with the goal of decreasing the time required to evacuate the Florida Keys in case of emergency. The likelihood and timing of implementation will be determined, in part, by environmental concerns, particularly wetland issues.

Construction plans for the project are complete, but some environmental studies are pending. Hurricane evacuation studies, required by the governor, were scheduled to be completed in October 2000. The decision on whether to proceed with construction will be based on the results of the hurricane evacuation study (**Ciscar 2000**).



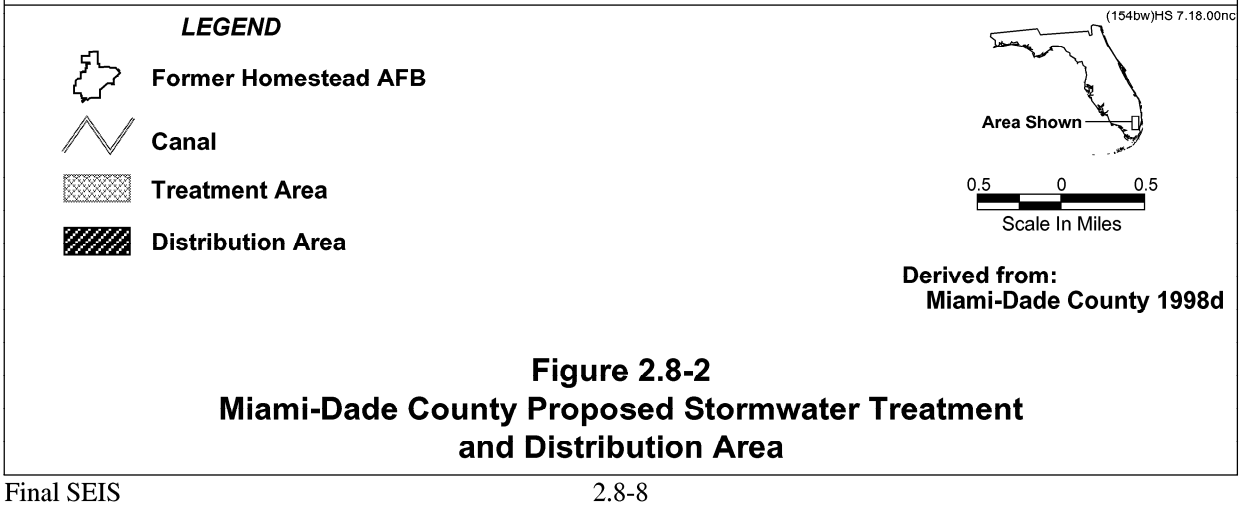


Figure 2.8-2
Miami-Dade County Proposed Stormwater Treatment and Distribution Area

2.9 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

This section summarizes the findings of the SEIS on the potential environmental consequences of the Proposed Action and alternatives. The section begins with a summary and comparison of the major elements of each alternative, including construction activities, estimated employment, and transportation and utility use. This is followed by a discussion of the environmental impacts of the alternatives in seven topical areas that were highlighted as important issues during public scoping for the SEIS. These topics include (1) economic revitalization of south Florida, (2) protection of nearby national parks, (3) community noise, (4) agriculture, (5) buffer lands, (6) safety, and (7) possible airport expansion. Finally, environmental impacts of the alternatives across the environmental resources analyzed in the SEIS are compared in table form.

2.9.1 Summary and Comparison of Alternatives

This section summarizes, in comparative form, reuse-related characteristics associated with the Proposed Action and the other reuse alternatives. **Table 2.9-1** provides a summary of factors that were used to analyze environmental impacts from development and reuse of the disposal property at former Homestead AFB. The No Action alternative is not included on the table because it assumes no development of the disposal property.

The information in Table 2.9-1 does not include changes expected to occur on the retained and conveyed property. Those changes are common to all alternatives and part of the future baseline. In addition to information about on-site activities, the table provides estimates of reuse-related off-site employment, population increases, and development in south Miami-Dade County, where the majority of effects from reuse of the disposal property are expected to be concentrated.

Plans for the Proposed Action and alternatives are not fully formulated, and best estimates have been generated for analysis purposes. These alternatives encompass a range of land uses and levels of development for the disposal property. The alternatives may not develop exactly as described in this SEIS. The projections far into the future, especially for full buildout, are likely to evolve and may differ somewhat from the predictions in this document.

For example, construction projections for the Proposed Action were based on plans prepared by Miami-Dade County. Those plans provide substantial detail on the first phase of development, up to about 2005. Development after the first phase is less well defined, but it is based on plans prepared by Miami-Dade County and by prospective developers. Even aspects of the first phase development are subject to a number of reviews and approvals that might require adjustments in the plans. The Florida Administration Commission approval through the Chapter 288 (Florida Statutes) process has been remanded and will need to be reaccomplished. The county's Surface Water Management Master Plan for the site will require a permit from South Florida Water Management District, and its terms may change in the process. That plan still has to be coordinated with and agreed to by Homestead ARS. However, it is reasonable to assume that any stormwater plan that is permitted will be required to perform at least as well as the county's plan.

The number and type of aircraft operations, as well as flight tracks identified for the Proposed Action, represent best estimates of how a commercial airport at former Homestead AFB would operate and grow. These estimates were based on forecasts developed by Miami-Dade County Aviation Department and others, and flight tracks were identified in consultation with FAA air traffic managers. It is not certain

Table 2.9-1. Summary of Estimated Reuse-Related Influencing Factors (Part 1 of 2)

Factor	Proposed Action (increase over projected baseline)				Commercial Spaceport Alternative (increase over projected baseline)				Mixed Use Alternative–Market-Driven (increase over projected baseline)			
	2000	2005	2015	Full Buildout	2000	2005	2015	Full Buildout	2000	2005	2015	Full Buildout
Reuse of Existing Facilities (000 square feet)	0	449	449	449	0	460	460	460	0	79	182	465
Demolition (000 square feet)	0	38	207	312	0	123	240	298	0	39	104	281
New Construction (000 square feet)	0	700	4,799	6,370	0	746	2,218	3,068	0	941	2,655	7,626
Ground Disturbance (acres)[1]	0	144	566	710	0	139	289	370	0	80	223	633
Impervious Surface (percent coverage)[2]	29	30	44	48	29	30	34	36	29	30	33	41
Aircraft Operations	60,658	74,697	150,735	231,274	19,824	19,984	20,304	20,304	19,824	19,824	19,824	19,824
On-Site Employment[3]	0	2,211	13,187	17,459	0	2,261	5,128	6,600	0	1,871	4,607	12,052
On-Site Population	0	0	200	300	0	0	0	0	0	340	1,080	3,440
Site-Related Daily Vehicle Trips	50	6,502	44,601	67,007	0	7,103	16,973	22,480	0	6,251	18,822	52,940
Site-Related Peak Hour Vehicle Trips	0	706	4,979	7,687	0	757	1,991	2,501	0	719	2,143	6,011
On-Site Water Demand (mgd)	0.00	0.11	0.73	1.02	0.00	0.12	0.28	0.38	0.00	0.15	0.44	1.29
On-Site Wastewater Generation (mgd)	0.00	0.09	0.58	0.82	0.00	0.10	0.22	0.30	0.00	0.12	0.35	1.03
On-Site Solid Waste Generation (tons/day)	0.0	7.4	39.4	60.6	0.0	7.5	17.3	23.1	0.0	5.4	14.9	42.1
On-Site Electricity Demand (MWh/day)	0	37	212	286	0	57	128	171	0	35	98	279
Total Off-Site Employment	0	2,316	14,359	20,995	0	2,144	4,937	6,417	0	1,855	4,680	12,425
South County Off-Site Employment[4]	0	1,426	10,004	15,257	0	1,271	3,344	4,339	0	1,449	3,647	9,669

Factor	Proposed Action (increase over projected baseline)				Commercial Spaceport Alternative (increase over projected baseline)				Mixed Use Alternative–Market-Driven (increase over projected baseline)			
	2000	2005	2015	Full Buildout	2000	2005	2015	Full Buildout	2000	2005	2015	Full Buildout
Population In-Migration to Miami-Dade County	0	518	3,156	4,407	0	504	1,153	1,492	0	426	1,063	2,805
Population In-Migration and Relocation to South County	0	518	10,597	14,951	0	504	1,153	1,492	0	426	1,063	2,805
Off-Site Development (acres)[5]	0	216	1,973	2,862	0	195	499	646	0	213	532	1,409

Notes:
[1] Includes disturbance from removal of old pavement and new pavement construction.
[2] Impervious coverage is based on 1,632 acres gross land area (including the airfield) for all alternatives.
[3] Includes operations and construction jobs (except for full buildout).
[4] Employment in south Miami-Dade County, south of Eureka Drive.
[5] Land to support off-site employment and housing for increased population. Assumed to be in south Miami-Dade County.

mgd million gallons per day
MWh megawatt hours

Table 2.9-1. Summary of Estimated Reuse-Related Influencing Factors (Part 2 of 2)

Factor	Mixed Use Alternative–Collier-Hoover Proposal (increase over projected baseline)				Mixed Use Alternative–Original Collier Plan (increase over projected baseline)				Mixed Use Alternative–Original Hoover Plan (increase over projected baseline)			
	2000	2005	2015	Full Buildout	2000	2005	2015	Full Buildout	2000	2005	2015	Full Buildout
Reuse of Existing Facilities (000 square feet)	0[6]	0[6]	0[6]	0[6]	0	0	0	0	0	0	0	0
Demolition (000 square feet)	70	746	746	746	0	746	746	746	0	563	746	746
New Construction (000 square feet)	0	866	1,792	2,964	0	1,040	1,836	2,840	0	1,768	4,656	6,156
Ground Disturbance (acres)[1]	0	702	1,115	1,215	0	897	976	1,062	0	507	986	1,176
Impervious Surface (percent coverage)[2]	29	19	25	29	29	21	25	29	29	20	28	32
Aircraft Operations	19,824	19,824	19,824	19,824	19,824	19,824	19,824	19,824	19,824	19,824	19,824	19,824
On-Site Employment[3]	0	2,560	5,490	10,070	0	2,111	4,077	6,810	0	3,047	6,819	10,910
On-Site Population	0	1,220	2,610	3,050	0	2,140	2,930	3,050	0	1,200	4,440	4,440
Site-Related Daily Vehicle Trips	0	21,557	39,606	57,550	0	17,580	31,637	37,402	0	28,789	48,931	66,748
Site-Related Peak Hour Vehicle Trips	0	1,511	3,407	5,578	0	503	963	1,235	0	2,179	4,384	6,427
On-Site Water Demand (mgd)	0.00	0.90	1.82	2.11	0.00	1.73	1.95	2.17	0.00	0.41	1.09	1.45
On-Site Wastewater Generation (mgd)	0.00	0.20	0.38	0.54	0.00	0.31	0.49	0.66	0.00	0.33	0.88	1.16
On-Site Solid Waste Generation (tons/day)	0.0	7.3	15.4	25.4	0.0	10.1	19.8	28.9	0.0	13.5	34.5	48.9
On-Site Electricity Demand (MWh/day)	0	32	75	123	0	42	82	119	0	61	161	213
Total Off-Site Employment	0	3,737	6,871	11,683	0	1,905	4,845	7,138	0	3,976	7,860	11,982
South County Off-Site Employment[4]	0	5,850	8,278	12,014	0	1,487	3,771	5,540	0	5,992	9,024	12,181

Factor	Mixed Use Alternative–Collier-Hoover Proposal (increase over projected baseline)				Mixed Use Alternative–Original Collier Plan (increase over projected baseline)				Mixed Use Alternative–Original Hoover Plan (increase over projected baseline)			
	2000	2005	2015	Full Buildout	2000	2005	2015	Full Buildout	2000	2005	2015	Full Buildout
Population In-Migration to Miami-Dade County	0	719	1,414	2,491	0	461	1,023	1,597	0	805	1,682	2,624
Population In-Migration and Relocation to South County	0	719	1,418	2,496	0	461	1,023	1,597	0	805	1,682	2,624
Off-Site Development (acres)[5]	0	850	1,202	1,746	0	220	545	807	0	874	1,314	1,776

Notes:
[1] Includes disturbance from removal of old pavement and new pavement construction.
[2] Impervious coverage is based on 1,632 acres gross land area (including the airfield) for all alternatives.
[3] Includes operations and construction jobs (except for full buildout).
[4] Employment in south Miami-Dade County, south of Eureka Drive.
[5] Land to support off-site employment and housing for increased population. Assumed to be in south Miami-Dade County.
[6] May reuse Building 741, about 120,000 square feet.

mgd million gallons per day
MWh megawatt hours

that HST would grow at the rapid pace forecast, or that the type of aircraft operating from the airport would be exactly as analyzed, but the sources of the assumptions used in the SEIS represent the best information available and are consistent with other airport operations in the area.

The Commercial Spaceport alternative contains a number of estimates and assumptions as well. Although proposals and expressions of interest were received by the Air Force to use the former base for a spaceport, spacecraft that launch and recover horizontally are only now under development. Therefore, their operational and performance parameters can only be estimated. The estimates used for the SEIS analysis were based on information supplied by companies who are developing horizontal launch vehicles and represent the best information available. The number of spacecraft operations that might occur is dependent on market demands that could change. In addition, the licensing process and the full range of safety and other requirements for commercial spacecraft are still being formulated by FAA. The SEIS summarizes the current status of the licensing rule making process.

The Mixed Use alternative examined a range of possible non-aviation developments at the former base. There are a number of ways this alternative might be implemented. The property could be acquired and developed by a single owner, such as is proposed by Collier Resources Company, or it could be acquired and developed incrementally, as reflected in the Market-Driven development. Predicting how the property might be used is more difficult with multiple potential owners, and any program that is dependent on market demands is subject to uncertainties in how those demands will change in the future. The Collier-Hoover proposal and the original Collier proposal are dependent on the ability to exchange mineral rights in Big Cypress National Preserve for property at former Homestead AFB, and it is not certain whether such an exchange can occur.

There are also inherent uncertainties in the characterization of the existing environment and the analysis of environmental impacts. The effects of the Proposed Action and alternatives are added to and presented in the context of population growth and development in south Florida. Population forecasts are prepared by federal, state, and county-level agencies. The various forecasts prepared for Miami-Dade County differ widely in their expectation of growth in south Florida over the next 20 years. Federal and state forecasts envision a moderate rate of growth, while the Miami-Dade County Planning Department has forecast a high rate of growth. The county is considering an amendment to the Comprehensive Development Master Plan to reduce their forecasts. The SEIS considers this range of forecasts in both the analysis of the reuse alternatives and in the cumulative analysis of reuse in combination with other growth and development in the region.

Information on Biscayne Bay and specifically on the relationship between water quality conditions and biological processes is also limited. The analysis performed for this SEIS relied on the best available information, but certain assumptions had to be made about the behavior of physical conditions and biological organisms. Water quality in Biscayne Bay is affected by numerous sources of pollutants. The impact of individual activities and pollutants are not well understood. The analysis in this document considers a number of potential sources of pollutants from the Proposed Action and alternatives, such as deposition of atmospheric nitrogen compounds and polycyclic aromatic hydrocarbons emitted from aircraft engines, but the behavior of those emissions can only be generally assessed. As another example, the potential for changes in transport of pollutants through groundwater is not fully understood, and possible impacts cannot be precisely determined. The SEIS acknowledges reasonable possibilities and includes general observations to the extent available data allow.

A large number of studies have been conducted on the effect of noise on wildlife, but few studies have involved the same species that are in the south Florida region of influence for Homestead. The analysis of impacts is based on available studies and relies on reasonable comparisons of similar species, general

findings drawn from studies, and empirical observations of the activity and behavior of some species in the vicinity of military and government aircraft operations at Homestead ARS.

Environmental impact statements are predictive in nature and typically contain numerous assumptions and analytic estimates of future conditions that are not precisely known. They depend on the current state of knowledge and science, which are continuously evolving. Uncertainty is a normal feature of EISs. In addition, there are often legitimate differences of opinion about the meaning of scientific studies and the interpretation of data. The analyses in this SEIS has considered and incorporated differing data sources, analytical results, and opinions to provide as comprehensive a presentation as practicable of how reuse of former Homestead AFB could affect and change the environment surrounding it.

2.9.2 Summary of Environmental Consequences for Selected Topics

This section summarizes environmental consequences identified for the Proposed Action and alternatives on selected topics that received high interest during scoping. A number of these topics cut across multiple environmental resources.

2.9.2.1 Economic Revitalization of South Florida

Following Hurricane Andrew and the realignment of Homestead AFB, the public leadership and business community of south Miami-Dade County initiated plans for recovering from the deleterious effects that the hurricane and base downsizing had on the local economy. The Mayor of Miami-Dade County established an Economic Summit to address South Miami-Dade Revitalization. The county held a workshop that identified three priorities for ensuring the south county's economic future: developing Homestead AFB, sustaining agriculture, and expanding tourism.

Overall, redevelopment of former Homestead AFB is expected to have a beneficial impact on the local south Miami-Dade County economy. The approximately 27,546 on-site and off-site jobs estimated to be generated by 2015 under the Proposed Action would contribute about 2 percent to countywide employment. In the area south of Eureka Drive, the employment estimated for the Proposed Action would more than double the amount of job growth expected to occur without reuse of the former base. At full buildout, the Proposed Action could generate 38,454 jobs. An equivalent increase in earnings could also result from the Proposed Action. Reuse-related earnings are estimated to be about $799 million by 2015, which could be about a third of earnings in south Miami-Dade County. This could increase to over $1 billion by full buildout.

Employment generated by the Commercial Spaceport alternative, although less than the Proposed Action, is also projected to be substantial. An estimated 10,065 additional jobs in Miami-Dade County by 2015 would represent about 1 percent of countywide employment, but in the south county, there could be a 32 percent increase over projected baseline job growth. By full buildout, reuse-related employment is estimated to increase to 13,017 jobs. Earnings are estimated at about $295 million in 2015, increasing to about $381 million at full buildout. A spaceport could provide relatively high-paying skilled and technical jobs and attract other high-tech industries. The novelty of a spaceport could also attract tourism.

The economic effect of the Mixed Use alternative would depend on the method of implementation. Market-Driven development would be expected to have the least short-term effect on the local economy (other than the No Action alternative), especially if most of the reuse of former base property depended on latent demands in the area. The availability of former base property might affect the location of industrial and commercial development within the region, but it would be unlikely to stimulate increased development. If incentives were used to attract development, there could be a potential for reuse to

contribute 9,287 jobs to job growth and about $263 million in earnings by 2015. By full buildout, this could increase to 24,477 jobs and $695 million in earnings, but this might not occur until the middle of the next century.

The joint proposal submitted by Collier Resources Company and the Hoover Environmental Group, as well as the original proposals submitted by these proponents, emphasize tourism and vacationing and could complement other attractions in the area and augment tourism and service industries. These plans project more rapid development initially than assumed for the Market-Driven development. By 2015, the Collier-Hoover proposal is estimated to generate 12,357 jobs and $358 million in earnings. This could increase to 21,752 jobs and $631 million in earnings by full buildout. This is more than projected for the original Collier proposal (13,948 jobs and $405 million at full buildout) and slightly less than projected for the original Hoover plan (22,892 jobs and $665 million by full buildout). Any of the plans analyzed under the Mixed Use alternative could have substantial beneficial effects on the local economy. The original Collier proposal's contribution is estimated to be similar to the Commercial Spaceport alternative, while that of the Collier-Hoover proposal and original Hoover plan, if they achieved the levels of visitation envisioned, could be higher.

The reuse alternatives differ in their anticipated impacts on population growth in the region. Because of the size of the labor pool in the region, any of the alternatives would likely have only a moderate effect on population growth at the county level. Reuse-related employment could have the potential to affect the distribution of population growth within the county. If Miami-Dade County grows at the moderate rate forecast by the Bureau of Economic Analysis and the State of Florida, population south of Eureka Drive could increase from about 163,235 residents in 1995 to about 239,592 in 2015. Although the available labor force in the county as a whole would be sufficient to meet the employment demands of the Proposed Action and alternatives, the number of workers in the south county, where most reuse jobs could be located, would not be enough to fill all the jobs that could be generated by the Proposed Action. Therefore, some relocation of workers and their families from the north part of the county to the south county could be expected if the Proposed Action were implemented. This is not necessarily the case for the Commercial Spaceport and Mixed Use alternatives. Under any alternative, a small number of people from outside the region would likely be attracted to the area by the job opportunities.

By providing more jobs in south Miami-Dade County, the Proposed Action and alternatives could improve the balance between the number of jobs and the number of residents in the south county. Currently, there are an estimated 0.8 jobs per housing unit in the south county, well below the countywide average of 1.4 jobs per housing unit. The Proposed Action could increase the number of jobs per housing unit in the south county to about 1.0 by 2015, and the other reuse alternatives somewhat less. This could result in increased household income and spending. It would also add to the local tax base and generate increased capital for maintaining and improving community infrastructure. The increase in local population would place more demands on public services, but the impact on public services is not expected to be as great as the benefits.

2.9.2.2 Protection of the Nearby National Parks

Two national parks are located near former Homestead AFB. Biscayne National Park is about 2 miles and Everglades National Park about 10 miles from the former base. Both parks are affected by the activities and developments that have occurred in south Florida over the years. Most notably, the Central and South Florida Project dramatically altered the south Florida environment by channelizing and controlling flood water and stormwater runoff. This decreased the amount of surface and groundwater inputs into the parks. The South Florida Ecosystem Restoration Program is aimed at reversing some of the past effects on the ecosystems of the parks, and the Everglades in particular.

Under the National Park Service Organic Act, "the fundamental purpose" of Biscayne and Everglades National Parks, as of other units of the National Park System, "is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide the enjoyment of the same in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations." NPS interprets the resources that it is mandated to preserve unimpaired to include, among others, natural soundscapes, air quality, water quality, and wildlife.

The values and resources of Biscayne and Everglades NPs are influenced by a wide range of environmental factors, including air quality, water quality, habitat alteration, and intrusions on the solitude and natural quiet. These factors are interrelated components of the environments within each park. The following sections summarize how the Proposed Action and alternatives may change these factors, how those changes may interact to affect the environment of the parks, and how the effects relate to the National Park Service's policies, goals, and management activities at the two national parks.

Biscayne National Park

Biscayne NP has four main types of environments that form the planning units used by NPS to manage the park: the mainland area, the bay, the barrier islands (keys), and the coral reefs. Each has a unique combination of attributes, habitats, wildlife, and recreation opportunities. Specific management actions are employed to preserve the unique resources of each environment, as well as those of the park as a whole. The Superintendent of Biscayne NP has identified water pollution, reduced surface and groundwater inflow, loss of undeveloped buffer land, and noise as the most serious potential impacts from outside the park.

In addition, there were other issues identified during scoping concerning potential impacts on Biscayne NP. Pressures from urban development, and in particular from secondary development related to reuse of former Homestead AFB, were a source of potential concern. Air emissions from vehicles and aircraft also were identified as potential sources of impact. Questions were raised about the possible effects of redevelopment on flora and fauna in Biscayne NP.

To address these concerns, the discussion that follows summarizes potential impacts related to population growth, air quality, water quality, noise, and biological resources. Issues related to the loss of undeveloped buffer land adjacent to Biscayne NP and possible establishment of a protected area between the former base and the park are addressed separately in sections 2.9.2.4, Agriculture, and 2.9.2.5, Buffer Lands.

Population Growth. South Florida has experienced significant population growth in the last several decades and is expected to continue to grow in the future. To date, most of the growth has been concentrated in northern Miami-Dade County, around the City of Miami. Future population forecasts project more growth and development in southern Miami-Dade County, near Homestead and closer to Biscayne National Park. This growth is projected to occur with or without reuse of the disposal property at former Homestead AFB.

The level of growth and its resulting impacts depend on how rapidly the population of south Miami-Dade County increases. Federal and state agencies that forecast population growth have projected a relatively moderate rate of growth over the next 20 years. The county itself, however, has forecast a much higher growth. If the county's forecasts are realized, the population of Miami-Dade County south of Eureka Drive could more than double by 2015.

This level of growth, whether at a moderate or a high rate, will generate significant development pressures on the south county. It is estimated that, by 2015, a moderate growth rate could result in development of approximately 8,500 additional acres of land in the south county that is currently vacant or in agricultural use. Secondary development associated with the Proposed Action and alternatives could add another 2,000 acres of development by that time. With a high level of growth, the baseline amount of development could be as high as 20,000 acres or more. This represents about 20 percent of all the undeveloped land in south Miami-Dade County that is not currently protected from development. Depending on whether the moderate or high-growth forecasts are realized, the Proposed Action could increase the rate of development in the south county by 10 to 20 percent.

The potential impacts of this growth and development on Biscayne NP would depend in part on the land use controls imposed by Miami-Dade County. The county currently limits most development to an area defined by an Urban Development Boundary. The county has also identified an Urban Expansion Area for future development outside the UDB. The current UDB ends at former Homestead AFB. The area between the former base and Biscayne NP is currently outside the UDB. Concerns have been expressed that development pressures will encourage the county to relax the current limitations on development outside the UBD, and it will encroach more and more on Biscayne NP.

Much of the area between the former base and the park is presently protected from encroachment through other programs, such as the county's Environmental Endangered Lands program. However, there are some private lands and agricultural areas that could be developed. It cannot be guaranteed that, under current conditions, development will not expand into this area and come closer to the fragile and sensitive ecological areas that line the western shoreline of Biscayne NP.

Air Quality. Aircraft air pollutant emissions can potentially affect air quality, and they include chemicals that can settle to the surface and potentially affect water quality (addressed below). The main air quality issue in Miami-Dade County is ozone. The county has exceeded the National Ambient Air Quality Standard for ozone in the past and, although it is in attainment of the standard now, it is classified as a "maintenance" area and has to carefully monitor air pollutant emissions that may affect its status. Ozone is formed in the atmosphere from nitrogen oxides and volatile organic compounds, both of which are emitted by aircraft, as well as by automobiles and other combustion engines.

Nitrogen oxides are of greater concern in Miami-Dade County than volatile organic compounds because a smaller increase would be needed to exceed the National Ambient Air Quality Standard for ozone. Therefore, the analysis for the SEIS focused primarily on emissions of nitrogen oxides from the Proposed Action and alternatives.

The Proposed Action is estimated to contribute about 0.5 percent of the county's emissions of nitrogen oxides in 2015. The Commercial Spaceport alternative's contribution is estimated at less than 0.1 percent (0.2 for a combined Commercial Spaceport/Airport), and the Mixed Use alternative also at less than 0.1 percent. These levels would not jeopardize Miami-Dade County's ability to meet the National Ambient Air Quality Standards for ozone or appreciably change the air quality of Biscayne NP. None of the alternatives are expected to generate other air pollutants in quantities sufficient to affect the county's ability to remain in attainment of the National Ambient Air Quality Standards or appreciably affect Biscayne NP air quality.

Water Quality. Biscayne NP is about 95 percent water. Water quality in Biscayne Bay is of prime importance to preserving the park's resources. Biscayne Bay has been designated as an Outstanding Florida Water. The bay supports the diverse and important resources that make Biscayne NP unique and

are the focus of the National Park Service's management activities there. Maintaining water quality in Biscayne Bay is important to preserving sensitive wildlife habitat and other resources of the park.

The concerns related to effects on water quality in Biscayne Bay from the Proposed Action and alternatives include changes in stormwater runoff, changes in groundwater flows, and emissions of air pollutants from aircraft and other sources.

Development on former Homestead AFB would increase the amount of impervious surface on the site, resulting in more stormwater runoff. This runoff would enter the network of on-site canals leading to Boundary Canal and, ultimately, Military Canal. As a result of the increase in impervious surface, total stormwater runoff from the site is estimated to increase by 43 percent under the Proposed Action, 30 percent under the Commercial Spaceport alternative, and 15 percent under the Mixed Use (Market-Driven) alternative. The amount of this runoff that would be discharged to Biscayne Bay would vary, depending on how stormwater is managed on the former base.

The Proposed Action includes a Surface Water Management Master Plan for managing on-site stormwater. The plan is required to comply with permit provisions pending before the South Florida Water Management District. It includes a network of French drains and other features designed to retain as much of the stormwater as possible on the airport property. This would reduce fresh-water discharges from Military Canal into Biscayne Bay. It is estimated that the county's plan could reduce discharges from the former base into the bay by about 28 percent by 2015, despite an estimated 43 percent increase in runoff.

It is assumed that the Commercial Spaceport alternative would be required to have a similar plan. The Mixed Use alternative might or might not face a similar requirement. If the property were acquired and developed in small parcels (less than 100 acres), as envisioned with Market-Driven development, a comprehensive stormwater management plan may not be developed, although some level of stormwater management may be required. Without a comprehensive stormwater management system that retained stormwater on site, the amount of water discharged into Biscayne Bay from Military Canal could increase by an estimated 15 percent by 2015. If the property were acquired by a single developer, such as Collier Resources Company, a system similar to the Proposed Action's would be required. The Collier-Hoover proposal, like the original Hoover plan, incorporates a system that would retain the bulk of stormwater on site.

Retaining stormwater on the site would reduce the amount of chemicals (including nitrogen) discharged to Biscayne Bay. It would also increase the amount of water that entered the bay through groundwater because more of the stormwater would sink into the ground. However, understanding the total effect of reuse of Homestead AFB on water discharges to Biscayne Bay requires considering the net impact of both on-site development and secondary off-site development stimulated by the Proposed Action and alternatives. While plans to retain most of the stormwater from on-site development would reduce surface water discharges and increase groundwater discharges, secondary development could have the opposite effect.

The secondary development would not necessarily include the level of stormwater management and control as is proposed for the site itself. Most of the secondary development is anticipated to be concentrated in areas close to the site, and the runoff from these areas would flow into Princeton and Mowry Canals. Therefore, the reductions in surface water discharges to Biscayne Bay achieved by the proposed Surface Water Management Master Plan (and similar ones implemented with other reuse alternatives) would be offset by increases in discharges from Princeton and Mowry Canals. Under the Proposed Action the net effect is estimated to be a 2.0 percent increase in the combined surface water

discharges from Princeton, Mowry, and Military Canals over projected baseline levels in 2015. The net effect of the Commercial Spaceport alternative would be a 0.1 percent increase in combined surface water discharges. The Mixed Use alternative could result in a net increase of 0.9 percent (Market-Driven) to 1.1 percent (Collier-Hoover) in the combined surface water discharges of the three canals, compared to the projected baseline in 2015.

The increases in surface water discharges would be the result of an increase in impervious surface due to development. Without more use of stormwater retention systems, there would be a concomitant decrease in groundwater recharge and groundwater discharges to Biscayne Bay. Considering both surface and groundwater discharges together, all the reuse alternatives would be expected to result in an overall net increase in surface water flowing into Biscayne Bay (i.e., the increase in surface water flows is greater than the decrease in groundwater flows). The net increase is estimated to be highest for the Proposed Action and lowest for the Commercial Spaceport alternative.

Under the Proposed Action, the changes by 2015 are estimated to be equivalent to about 0.6 percent of combined projected baseline surface water discharges from Military, Mowry, and Princeton Canals. For the Commercial Spaceport alternative, the estimate is an increase of less than 0.1 percent, for the Market-Driven scenario of the Mixed Use alternative the estimate is a 0.3 percent increase, and for the Collier-Hoover proposal it is 0.5 percent. It is assumed that Military, Mowry, and Princeton Canals comprise about 60 percent of total surface water inputs to southern Biscayne Bay. If total inputs are considered, the percentages of increase are about 40 percent lower than listed above. In addition, these estimates do not take into consideration existing groundwater inputs to Biscayne Bay, the magnitude of which is not known but expected to be substantial.

Nitrogen compounds enter Biscayne Bay through stormwater, groundwater, and atmospheric deposition. Stormwater discharges are the largest source, and are anticipated to increase with the net increase in surface water inputs from the Proposed Action and other reuse alternatives. Nitrogen loads in groundwater are expected to decline with the net decrease in groundwater inputs under the Proposed Action and Market-Driven scenario, but increase under the Commercial Spaceport alternative and, possibly, the Collier-Hoover scenario. Airborne nitrogen oxides are emitted by aircraft and other air emissions sources and deposited on the surface. Atmospheric nitrogen deposition in Biscayne Bay from aircraft and vehicle traffic associated with the Proposed Action is estimated to increase by about 30,000 pounds per year by 2015, assuming no reduction in future nitrogen oxide emission rates from aircraft.

Considering the total increase in nitrogen inputs through surface water and airborne sources, and the decrease through groundwater, the Proposed Action is estimated to result in a net increase of about 67,000 pounds per year in nitrogen inputs to Biscayne Bay by 2015. This is equivalent to about 3.6 percent of projected baseline nitrogen inputs through surface water discharges from Military, Mowry, and Princeton Canals alone.

Atmospheric nitrogen deposition under the Commercial Spaceport alternative is estimated to be about 10 percent of the Proposed Action. This deposition, estimated at about 4,057 pounds per year in 2015, would represent about 0.2 percent of the combined input from Mowry, Princeton, and Military Canals into Biscayne Bay. This could increase to 0.4 percent with a combined Commercial Spaceport/Airport. The net increase in nitrogen inputs from all sources is estimated to be about 24,000 pounds per year over the projected baseline by 2015. This would be about 1.3 percent of the combined projected baseline inputs of the three canals.

The Mixed Use alternative is estimated to generate a net increase in nitrogen inputs of between 16,735 (Market-Driven) and 32,518 (Collier-Hoover) pounds per year in 2015 (0.9 to 1.7 percent of the

combined projected baseline input from the three canals). However, in the case of the Collier-Hoover scenario, this is probably an overestimate, as some nitrogen would likely be taken up by plants on site.

Atmospheric nitrogen concentrations would decrease with distance from the airfield, so higher levels of deposition would occur in nearshore areas than out by the keys. The nearshore levels are estimated to be about four times the average for the bay. For example, if the average annual deposition would be an estimated 0.33 pounds per acre for the Proposed Action (29,768 pounds divided by 90,000 acres), the nearshore rate would be closer to 1.43 pounds per acre per year.

Aircraft (and other combustion engines that use petroleum products) also emit polycyclic aromatic hydrocarbons. These are very small particles and, as a result, settle to the surface very slowly. Emitted from aircraft thousands of feet above Biscayne Bay, they would be dispersed widely by wind before settling to the surface. Most would not be expected to reach the bay. Compounds from ground vehicles and aircraft on the ground at the airport could settle to the ground more readily and be transported into the canal system through stormwater runoff. There they would be likely to attach to sediments and be retained in the canals rather than be discharged into Biscayne Bay. It is not anticipated that the increases in these emissions from the Proposed Action and alternatives would be a major factor affecting water quality in Biscayne Bay.

Noise. Of particular interest to NPS in considering the development of a commercial airport at former Homestead AFB is preservation of the park's natural soundscape, which could be affected by aircraft noise. Biscayne NP has initiated a public planning process to develop a Soundscape Management Plan. The plan will evaluate and identify ways to mitigate intruding noise sources and consider alternatives for restoring the soundscape in areas with excessive noise intrusion.

The noise effects that might be expected from reuse of Homestead have been analyzed using five metrics that focus on different aspects of noise. Two metrics, Sound Exposure Level (SEL) and Maximum Sound Level (LAmax), measure the sound level of individual aircraft flights and are essentially used to identify the loudest aircraft. Two metrics, Day-Night Average Sound Level (DNL) and Peak Hour Equivalent Sound Level (Leq(h)), evaluate cumulative amounts of noise in a typical day. Cumulative sound levels reflect total acoustic energy based on the number of noise events, their magnitude of sound, and their duration. The fifth metric, Time Above (TAamb), is a time-based metric that calculates the length of time in an average day that aircraft could be heard above the traditional ambient sound level (i.e., all sounds other than aircraft).

Three of these five metrics were primarily used to evaluate noise in the national parks and refuges. LAmax was selected as the single-event metric to assess the loudest aircraft noise that park visitors might hear. Leq(h) was selected as the cumulative metric to assess the total amount of aircraft noise that visitors might hear, based on aircraft operations for the busiest hour. TAamb was selected to assess the amount of time that aircraft noise would be above all other sounds in the national parks.

Biscayne NP is currently overflown by military and other government aircraft using Homestead ARS and by civil aircraft using other airports, primarily Miami International Airport. These aircraft overflights will continue, regardless of how former Homestead AFB may be reused for other aviation or nonaviation purposes. The Homestead airfield is projected to remain active in the future as a military/government airfield much as it is today.

Military aircraft such as the F-16 and F-15 are the loudest aircraft heard in Biscayne NP. The maximum sound levels produced by military aircraft are between 65 and 85 decibels for most of Biscayne NP, although levels as high as the low 90s to the low 100s occur along the western shoreline of the park

nearest the runway. The cumulative amount of noise Biscayne NP currently experiences from Homestead and other airports ranges from Leq(h) of 50–60 decibels along the western side of the park nearest the runway, to 40–50 decibels in a large north-central area of the park, to 35 decibels and lower in roughly the southeastern third of the park. The future retirement from the civil fleet of some of the noisiest large aircraft is expected to reduce the cumulative noise effect of Miami International on the north-central area of Biscayne NP by 2015.

Aircraft operations from Homestead ARS and other airports produce noise that exceeds traditional ambient sound levels in Biscayne NP. The traditional ambient sound level includes all natural sounds (wind, waves, wildlife) and all human sounds (voices, boats, equipment), except for aircraft. At Biscayne NP, traditional ambient levels (all sounds except aircraft) were measured in the 45–56 decibel range.

Most of the eastern half of Biscayne NP currently receives a daily average of 1 to 10 minutes of aircraft noise above the traditional ambient, while most of the western half receives between 10 and 30 minutes above the traditional ambient. Along the western border of the park, there are a few areas that receive between 30 minutes and 1 hour. These are not consecutive minutes, but time accumulated from aircraft operations throughout an average day. The future retirement from the civil fleet of some of the noisiest large aircraft using Miami International is also expected to reduce the amount of time that aircraft noise would be above the traditional ambient in Biscayne NP by 2015.

If a commercial airport is established at Homestead, Biscayne NP would experience essentially no change in the loudest aircraft noise heard (LAmax). This is because military aircraft that will continue to operate at Homestead in the future generate the highest maximum sound levels, ranging from 5 to more than 20 decibels louder than civil aircraft. At maximum capacity use of the runway (well beyond the year 2015), a commercial airport might increase LAmax between 3 and 5 decibels in two areas of water in Biscayne NP east of the barrier islands, comprising about 5 percent of the park.

Leq(h) would increase in Biscayne NP along with forecast increases in commercial aircraft operations. However, even at maximum use of the runway at Homestead, the increase in Leq(h) above the traditional ambient sound level due to the addition of commercial aircraft to the military/government aircraft would be less than 3 decibels. In most areas of the park, cumulative noise levels resulting from commercial airport operation would be below the level of other measured nonaircraft sounds. At maximum use of the runway, Leq(h) could range from the 30s in the eastern portion of the park, to the 40s in the central region, to the mid-50s at the western shoreline nearer to the runway. In one area nearest the runway, Leq(h) may slightly exceed 60 decibels at maximum use.

The greatest difference in noise in Biscayne NP due to a commercial airport would be increases in the length of time that aircraft noise would be above the traditional ambient sound levels, since there would be many more civil aircraft operations than military ones. In 2005, the average daily TAamb is calculated to increase by less than 1 minute in roughly the eastern half of the park, and 1–10 minutes in the western half of the park. Two western shoreline areas would receive higher increases of 10–30 minutes. The TAamb would increase more in 2015 and again at maximum use. For maximum use, the central and eastern areas of Biscayne NP could experience daily increases amounting to less than 10 minutes, while areas along the western shoreline could receive increases of 10–30 minutes. Two areas close to the runway could receive increases of 1–2 hours.

If the former base were reused as a commercial spaceport, instead of a conventional airport, the space launch vehicle is anticipated to be louder than the military aircraft. When a space launch would occur (estimated to be, at most, once a week by 2005 and three times a week by 2015), it would be the loudest

aircraft and would increase LAmax in the northernmost portion of Biscayne NP. LAmax increases for 2015/full buildout are calculated at 5–10 decibels, except for two areas along the northern boundary of the park, where the estimated increase would be 12 and 17 decibels.

A commercial spaceport should be about the same as a conventional airport in overall effects on Leq(h) in most of Biscayne NP. The notable difference is that, by 2015 with a commercial spaceport, several areas along the northwest and northern edge of the park are estimated to receive Leq(h) increases between 5 and 10 decibels above the traditional ambient level, with one area receiving 15 decibels above the traditional ambient level.

The Commercial Spaceport alternative presents a very different assessment of the time that aircraft noise could be expected to be above all other nonaircraft sounds in Biscayne NP. Although a commercial space launch vehicle would be quite noisy, it would operate on an infrequent schedule (estimated at three times a week at most by 2015). This would result in an increase in TAamb level of less than 3 minutes, averaged on a daily basis.

The result of either a commercial airport or a commercial spaceport at Homestead is that Biscayne NP would experience more noise. This could disturb and annoy some visitors and would make it more difficult for the park to accomplish its goals of improving and preserving a more natural soundscape. The Mixed Use alternative, which would not include civil aviation use, would not increase aircraft noise, but would result in the same noise effects on Biscayne NP as the No Action alternative; that is, continuing military and other government aircraft operations together with aircraft overflights from other airports.

The FAA has examined alternative noise abatement flight tracks for a commercial service airport at HST that could reduce noise over the national parks. Alternative flight tracks cannot eliminate aircraft overflights of Biscayne NP because of the park's location relative to the airport and because of airspace interactions with Miami International Airport. Alternative flight tracks could reduce TAamb up to about 10 minutes in western and southern areas of Biscayne NP, which would receive the most noise. The tradeoff would be that the relocated flight tracks would increase TAamb by a similar amount in the northeast portion of the park.

Advances in technology offer anticipated prospects for future noise reduction. Additional reductions in the noise made by large civil aircraft are expected to be in place years before HST would reach maximum use. Quieter aircraft of the future would reduce forecast noise effects in Biscayne NP beyond what can currently be quantified. Aircraft operational techniques and air traffic procedures that depend on advanced technology offer future noise abatement applications. Periodic reviews, at reasonably spaced intervals, of the noise effects of commercial airport operation, considering actual noise at the time and available gains in technology, could be established to minimize noise to the extent possible for Biscayne NP in the future.

There are currently too many operational unknowns about the Commercial Spaceport alternative to be able to develop noise mitigation options. If this alternative were to be selected, specific mitigation measures would be developed as part of the analysis required for FAA licensing.

Biological Resources. Aspects of the Proposed Action and alternatives analyzed for potential effects on biota in Biscayne NP include changes in water discharged into Biscayne Bay, changes in water quality, and noise exposures. As noted above, surface water discharge from Military Canal to Biscayne Bay is expected to decrease, and would be accompanied by increases in groundwater flows. This would be offset by expected increases in surface water discharges and decreased groundwater flows due to secondary development. The net effect for the Proposed Action would be an increase in surface water

discharges of about 2.0 percent and a decrease in groundwater discharges of about 1.4 percent of the projected baseline discharges from Military, Mowry, and Princeton Canals in 2015. The effects of the other alternatives would be smaller.

This amount of change would not, by itself, be expected to result in appreciable changes in the biota of Biscayne Bay. However, baseline population growth and development over the 15-year period between 2000 and 2015, independent of the reuse of former Homestead AFB, are anticipated to increase surface water discharges by about 8 percent and decrease groundwater discharges by about 6 percent compared to surface water flows from the three canals in 1995. Therefore, the Proposed Action in combination with projected baseline growth could increase surface water discharges from the three canals by a total of about 10 percent above 1995 discharges. Wetlands behind the mangrove swamp bordering the western shore of the bay are not expected to be appreciably changed by the change in water regime.

The increase in nutrient and pollutant inputs is estimated to range from 1.2 to 2.5 percent over projected baseline levels under the Proposed Action (and less for the other alternatives). Some of the nutrients, especially un-ionized ammonia, would increase under the Commercial Spaceport alternative and, possibly, the Collier-Hoover proposal.

The net effect of the changes in nutrient and chemical inputs would probably include continued nutrient enrichment of nearshore seagrasses that fosters epiphytic growth of algae, reducing the vitality and growth potential of the seagrasses. Sediment toxicity near the mouths of the three canals would probably remain about the same. Therefore, ongoing impacts on biota in these areas would likely continue but not be discernably changed.

As discussed above, noise from aircraft is not expected to get louder, but it is expected to be more frequent, particularly along the western shoreline of Biscayne Bay, which lies underneath many of the proposed flight tracks. Manatees and bottlenose dolphins in the bay and at the mouths of canals, wading birds along the mangrove swamp and on nearby keys, and crocodiles along the western shoreline would all be exposed to high noise levels from overflying aircraft. Current maximum noise levels in this area range from 92 to just over 108 decibels. Commercial aircraft, which would fly over this area most frequently, would be about 15 decibels quieter than military aircraft.

Manatees and bottlenose dolphins are expected to be little affected by these noise levels because they apparently habituate to noise. There is limited information to predict noise impacts on crocodiles, but it is expected that they would not be affected sufficiently to stop the expansion of their range northward from Turkey Point. Wading birds may flush or be startled during feeding, loafing, or roosting, but it is not anticipated that nesting birds would be sufficiently affected to abandon their nests. Some species of wading birds appear to habituate to high noise levels, while others may choose to relocate to quieter areas with suitable habitat.

Any reuse of former Homestead AFB property would have some effect on Biscayne NP resources, which have already suffered degradation from other sources. NPS is concerned that the cumulative effect would be to make it more difficult to prevent those resources from becoming further degraded. The analysis has attempted to identify opportunities to reduce impacts.

Everglades National Park

Everglades NP is the largest remaining subtropical wilderness in the continental United States. The park was established in 1947 to preserve the habitat and environment of the “river of grass.” The park also contains fresh and saltwater areas, open prairies, tropical hardwood forests, offshore coral reefs, sloughs

and swamps, lakes and ponds, and mangrove forests. For management purposes, the park is divided into general outdoor recreation areas, natural environment areas, outstanding natural areas, and primitive areas. Management objectives for Everglades NP include restoring and protecting the park in ways that allow natural processes, functions, cycles, and biota to be reestablished and maintained in perpetuity, thus providing park visitors a variety of opportunities to experience the park's unique subtropical values.

Everglades NP is farther from former Homestead AFB than Biscayne NP is and therefore potentially affected by somewhat different aspects of the reuse alternatives. The park is a Class I Prevention of Significant Deterioration area under the Clean Air Act. As such, both physical and visual degradation of air quality is a particular concern at the park. On the other hand, it is not tied into the canal system that drains former Homestead AFB and is too far to be affected by stormwater runoff from the former base.

Aircraft noise is an issue at Everglades NP, as it is at Biscayne NP, although its greater distance from the Homestead airfield means that, in general, aircraft would be at higher altitudes, and noise levels would be consequently lower. The park contains a number of sensitive species, most notably the endangered Cape Sable seaside sparrow, which exists solely in the grassy prairie along the eastern and western flanks of Shark River slough in Everglades NP. Visual impacts could also come from increased numbers of overflying aircraft, both during the day and at night. One of resources most prized at Everglades NP are the night skies. Aircraft identification lights would be an intrusion into the darkness. The aircraft would be at relatively high altitudes over most of the Everglades.

The following paragraphs provide more detailed discussion of impacts on air quality, noise, and biological resources in Everglades NP.

Air Quality. The Clean Air Act charges federal land managers of Class I areas, which in the case of Everglades NP is the National Park Service, with an affirmative responsibility to protect the air quality related values of these areas from adverse air pollution impacts. These values, as identified by NPS, include visibility, flora, fauna, cultural and historical resources, odor, soil, water, and virtually all resources that are dependent upon and affected by air quality. The principal concerns listed by NPS for Everglades NP were visibility and impacts on sensitive plant species. The primary air pollutant of concern is ozone.

Air pollutant emissions that are precursors to ozone are nitrogen oxides and volatile organic compounds. Between the two, nitrogen oxides are of greater concern, both because existing emissions in the region are higher and because the increase in emissions attributable to the Proposed Action and alternatives would be larger than for volatile organic compounds. Therefore, the analysis concentrated on nitrogen oxide emissions as the limiting factor. It is estimated that the Proposed Action at full buildout would add less than 1 percent to the ambient concentration of nitrogen dioxide at the eastern edge of Everglades NP, where emissions from aircraft would be most concentrated. This is not expected to exceed National Ambient Air Quality Standards or to measurably affect visibility in the park. Emissions in other areas of the park would be even lower. The other alternatives would generate lower emissions than the Proposed Action.

Increases in atmospheric nitrogen deposition from the Proposed Action were estimated for the eastern edge of Everglades NP. Annual atmospheric nitrogen deposition was estimated to increase by 0.06 pounds per acre in 2005 and 0.37 pounds per acre in 2015. Annual atmospheric nitrogen deposition rates in 2015 under the Commercial Spaceport alternative are estimated to be approximately 0.06 pounds per acre, or about 1 percent higher than the 1994–1998 rates. A combined Commercial Spaceport/Airport could increase that rate by an estimated 0.16 pounds per acre per year in 2015, or about 2.5 percent

higher than the 1994–1998 rates. With the Mixed Use alternative, atmospheric nitrogen deposition is estimated to increase by 0.07 pounds per acre per year in 2015.

Noise. Everglades NP is currently overflown by military and other government aircraft using Homestead ARS and by civil aircraft using other airports, including Miami International, Fort Lauderdale-Hollywood International, Kendall-Tamiami, and Homestead General. The loudest single event levels of aircraft noise occur under the straight-in approach to the Homestead ARS runway, along a north-south Visual Flight Rule corridor on the eastern edge of the park, and under an approach corridor that extends from the west across the north-central part of the park and that serves aircraft using Miami International, Fort Lauderdale, and Tamiami as well as Homestead ARS. The maximum sound levels (LAmax) from aircraft are as high as 75–85 decibels in the areas of loudest single event noise to below 45 decibels in western and southern areas of Everglades NP.

Average daily cumulative sound levels (in Leq(h)) from aircraft operations are less than 30 decibels in most of Everglades NP. This means that cumulative aircraft noise is generally below traditional ambient sound levels (all sounds except aircraft) in the park. Measured traditional ambient sound levels range from 31 decibels at Eastern Sparrow, a remote location, to 54 decibels at Anhinga Trail, a visitor site. The decibel average for traditional ambient sound levels measured in Everglades NP is the low 40s.

On the eastern edge of the park from its northern boundary down to the approach to Homestead ARS, Leq(h) ranges from 30 decibels up to 50 decibels closer to the park's eastern edge. The highest Leq(h) of 55 decibels occurs in one area at the eastern boundary of the park closest to Homestead ARS and Homestead General Airport. In general, the eastern edge of Everglades NP is affected more by general aviation aircraft using Homestead General and Tamiami airports, and by commercial aircraft using Miami International, than by Homestead ARS.

Most of Everglades NP currently receives less than 1 minute of average daily aircraft noise above traditional ambient sound levels. However, there are longer durations of TAamb in the eastern portion of the park. Under the straight-in approach to Homestead ARS, TAamb is generally 10–30 minutes at areas in the park closest to the runway, and 1–10 minutes farther out under the approach corridor. Longer durations of TAamb, ranging from 10 minutes to over 2 hours, occur north of Homestead ARS along the VFR corridor and under the approach and departure paths of Miami International and Tamiami airports. The areas receiving more than 2 hours of TAamb are in the northeastern corner of the park, which is affected the most by Miami International Airport.

Noise levels under the Proposed Action would be lower in Everglades NP than in Biscayne NP because of greater distances from Homestead and higher aircraft altitudes. However, there would be noise increases in Everglades NP with a commercial airport. Unlike Biscayne NP, commercial aircraft would produce some of the loudest maximum sound levels over parts of Everglades NP at farther distances from HST, where civil flight corridors would diverge from military corridors. LAmax increases generally ranging from 5 to over 10 decibels are projected to occur along the western approach corridor in the north-central part of the park, and under approach and departure routes in the southeastern part. The highest LAmax in areas not dominated by military aircraft was calculated to be 62 decibels. Close to HST, where LAmax levels are higher, military aircraft would continue to be the loudest aircraft.

At maximum use, the Proposed Action could increase the amount of cumulative aircraft noise, as measured in Leq(h), between 5 and 10 decibels at the eastern edge of the park closest to the approach to the runway and in an area under the Visual Flight Rule corridor. Increases of less than 5 decibels in Leq(h) are projected along the approach corridor from the west, in a broader area under the Visual Flight Rule corridor, and under approach and departure routes south of HST in the southeastern park area. At

maximum use of the existing runway, Leq(h) would still remain below traditional ambient levels in most of the park.

The amount of time that aircraft noise would be above other nonaircraft sounds in Everglades NP would increase as projected civil aircraft operations increased. In 2000 and 2005, TAamb would generally range from a daily average increase of 1–10 minutes along the western approach corridor to 10–60 minutes in the eastern area of the park. By 2015 and maximum use, the growth of commercial operations at HST would increase the daily average TAamb in these areas. Increases would range from 1 to 30 minutes along the western approach corridor, and from 10 minutes to over 2 hours in the eastern area. An increase of over 2 hours is projected for the area closest to the approach to the HST runway. Other areas of Everglades NP would experience no increases or increases of less than 1 minute a day.

Noise abatement flight track alternatives could reduce TAamb in portions of Everglades NP that would receive the most increases under the Proposed Action (i.e., the eastern area of the park and the north-central area under the approach corridor from the west). Decreases in TAamb could amount to 1–10 minutes per average day in some areas, 10–30 minutes in some areas, and over 30 minutes in other areas. The amount of decrease, and the extent to which decreases in some areas would involve increases in other areas, would depend on the flight track selected.

In general, technological advances in aircraft noise reduction, aircraft operational parameters, and air traffic procedures are expected to result in future noise reductions of commercial aircraft operations that should be in place before HST would reach maximum use. Future noise reductions would also benefit Everglades NP.

Based on available information, a Commercial Spaceport alternative is expected have almost no noise effect on Everglades NP because its noise is expected to be primarily east and northeast of Homestead, in the direction of space launches. No increases in the LAmax or Leq(h) are projected for Everglades NP if the former base is reused as a commercial spaceport, even at 2015/full buildout. TAamb for this alternative at 2015/full buildout is estimated to increase less than 3 minutes daily on average in some areas in the eastern portion of the park.

The Mixed Use alternative would not increase aircraft noise but would result in the same noise effects on Everglades NP as the No Action alternative; that is, continuation of military and other government aircraft operations at Homestead, together with overflights from other airports.

Biological Resources. Biota at Everglades NP could be sensitive to both increases in air pollutant emissions and noise. With the small percentage increase in ambient air pollutant concentrations predicted for the eastern boundary of the park, ozone-sensitive species are not likely to be discernably affected. Directly west of the former base, maximum noise levels are currently 85 decibels or less. This would not change with the Proposed Action, but the frequency of noise events would increase. The amount of time that this area could be exposed to aircraft noise above traditional ambient sound levels could increase by more than 2 hours in some places. This might cause some noise-sensitive wading birds to relocate their feeding or loafing grounds, but breeding and roosting habitat would not generally be affected. The highest noise level from civil aircraft in areas where noise from military aircraft is not currently dominant would be 62 decibels.

There are three Cape Sable seaside sparrow populations in Everglades NP. The closest is about 12 miles west of the former base. Under the Proposed Action, LAmax is projected to increase in some portion of all three populations. The largest increase (21.5 decibels) would be over a portion of the westernmost population, where LAmax could increase from 37 to 58.5 decibels. The highest LAmax at that population

is projected to be 77 decibels, which would not be a change from current levels. The highest LAmax over the Ingraham Population would be 66 decibels, again, not changing from current levels. This population would experience the least change due to the Proposed Action. At the eastern population, the one closest to Homestead, where LAmax is projected to increase, the increase averages less than 5 decibels and raises the LAmax to a maximum of 77 decibels. There are areas of this population with higher LAmax currently, but they are not projected to change. Increases in TAamb in the eastern population are projected to range from 4 minutes to over 3 hours per day on average at maximum use of the one runway. There is a potential for aircraft overflights under the Proposed Action to have a slight, temporary masking effect on the Cape Sable seaside sparrow and occasionally to disrupt breeding bird surveys at certain times in certain locations, for example where LAmax would be above 60 decibels and TAamb would increase to 2 hours or more. Intermittent disruptions could also occur from continuing military aircraft operations under any alternative. Space launch operations are not expected to have any additional effect on these populations.

2.9.2.3 Community Noise

Airport operations produce noise, and individuals living near an airport may notice changes in their noise environment. Noise effects from aircraft operations are assessed using a variety of metrics. The metric used by the Air Force and FAA to characterize noise levels around airports and assess their impacts on surrounding people and land uses is the Day-Night Average Sound Level, designated as DNL. This metric is measured in decibels and represents the logarithmic average of all measured noise events during a 24 hour period. DNL takes into account the sound levels of all individual events, the number of times those events occur, and whether they occur during the day or at night. To account for the greater annoyance caused by noise intrusion at night, DNL incorporates a penalty for noise events between 10:00 p.m. and 7:00 a. m.

DNL levels are typically depicted as contours around the airport runway. In accordance with Federal Aviation Regulations, DNL contours of 60, 65, 70, and 75 decibels were developed and analyzed for compatibility with land uses surrounding the Homestead airfield. FAA has adopted land use compatibility guidelines for civil airports based on studies showing a relationship between DNL and the percent of people highly annoyed. Those guidelines indicate that all community land uses are generally considered compatible with DNL levels below 65 decibels. The most noise-sensitive land uses are residences, which are generally considered incompatible with noise levels above DNL of 65 decibels unless the residences have received adequate sound insulation to reduce interior noise levels.

About 6,458 acres around Homestead ARS are within the DNL 60 decibel contour as a result of current military and government aircraft operations. If a commercial airport were developed at Homestead, about 262 additional acres could be within the 60 decibel contour by 2005. By 2015, 1,344 additional acres could be within the contour, which would be about 20 percent more than with only military and government operations. At maximum use of the one runway, almost 1,600 additional acres could be exposed to DNL levels above 60 decibels. An estimated 439 existing housing units and 2,446 existing residents in the South Dade Center Housing Area could be within the 60 decibel contour at maximum use of the Proposed Action. Currently, 297 housing units with about 1,804 residents are within the 60 decibel contour. If development near the airport was not controlled to preclude additional residential building, it is also possible that more residents could be living within the DNL 60 decibel noise contour in the future.

Within the DNL 65 decibel contour, an estimated 68 dwelling units with 513 residents are projected to experience increases of 1.5 decibels or more in DNL by 2015. This could increase to 219 units with about 967 residents at maximum use of the runway. Within the DNL 60–65 decibel contour, an estimated

43 dwelling units with 127 residents could experience increases of 3 decibels or more in DNL by 2015, increasing to 74 units with 219 residents at maximum use.

The same type of grid analysis that was used for the national parks and refuges has also been applied to the community in the vicinity of Homestead to describe noise effects using other noise metrics, although DNL remains the best metric for assessing community noise. A number of representative community locations were examined using noise modeling to assess the extent of change in aircraft noise levels under the Proposed Action.

At maximum use, the cumulative amount of noise (in DNL) could increase to 42 decibels at the Homestead Campus of Miami-Dade Community College, compared to the existing DNL of 39 decibels. City Hall in Florida City is estimated to increase from 35 to 39 decibels. Homestead High School could increased from an existing DNL of 43 decibels to 48 decibels at maximum use. The Keys Gate community could increase from 43 to 51 decibels. A portion of the South Dade Center housing area, acknowledged in the analysis to be incompatible with significant aircraft noise exposure levels, could increase from DNL of 69 to 71 decibels. The Homeless Trust Center on former Homestead AFB is estimated to go from an existing level of 54 decibels to 56 decibels. Residents in the Naranja area north of the former base may receive an increase from 45 to 48 decibels. DNL in Redland, based on a sample point at the Redland Fruit and Spice Park, is estimated to increase from 37 to 40 decibels. Key Largo could increase from 23 to 31 decibels, Ocean Reef from 35 to 39 decibels, and Angler's Club from 35 to 40 decibels.

At most of the representative community points, aircraft noise at maximum one-runway use would still be below ambient noise levels in those locations. None of the representative locations, except South Dade Center, would receive cumulative amounts of aircraft noise high enough to be classified as moderate or significant under federal land use guidelines.

At the representative community points analyzed, the maximum noise level (i.e., the loudest aircraft heard) would be from military aircraft, except in the Naranja area, which would experience a barely perceptible increase of 3 decibels in maximum noise levels due to civil aircraft operations. With the exception of South Dade Center, none of the points analyzed would receive an increase in time that aircraft noise levels were above 65 decibels (the level at which some speech interference might be experienced) of more than 3 minutes a day on average. Most locations would have no increase in time above 65 decibels.

Although some space vehicles could be louder than conventional aircraft, the number of space vehicle operations is expected to be low. By 2015, there could be at most three space vehicle missions a week at Homestead. Specific flight tracks have not been developed for the Commercial Spaceport alternative. Based on available information, it is assumed that most of the noise increases from spaceport operations would be concentrated northeast of the airfield. The area within the DNL contour of 60 decibels and above is estimated to increase by about 435 acres by 2005 and 960 acres by 2015 if this alternative is implemented. This would encompass 315 existing housing units and affect an estimated 1,883 residents, about 960 more than with just military and government aircraft operations. New residential development in the area between now and 2015 could increase the number of people within the DNL 60 decibel noise contour, if land use controls are not adopted to prevent encroachment. The noise contours are not expected to change between 2015 and full buildout. The areas within the DNL 60 decibel contour projected to receive increases of 1.5 decibels or more, as well as the areas within the 60–65 decibel contour projected to receive increases of 3 decibels or more, are generally undeveloped, and no existing residents are expected to experience these increases in noise levels.

The Commercial Spaceport alternative would not increase the existing DNL levels at all at most of the representative community points analyzed. In 2015 and full buildout, the Homestead Campus of Miami-Dade County Community College and the South Dade Center housing area could experience an increase of 1 decibel in DNL. DNL at the Homeless Trust Center and in Naranja could increase 2 decibels. The space vehicles are expected to be the loudest aircraft heard in those areas. The loudest single event aircraft noise at the other locations would continue to be from military aircraft operations. South Dade Center is estimated to receive 4 minutes average daily increase in time above 65 decibels in 2015/full buildout; the Homeless Trust Center and Naranja area, 1 minute average daily increase; and the other representative locations analyzed would experience no increase in time above 65 decibels.

The Mixed Use alternative would not add civil aviation operations. Aircraft noise levels from military and government operations at Homestead ARS are expected to be similar to current conditions.

2.9.2.4 Agriculture

Agriculture has been identified as one of the priority components of the economy and lifestyle of south Miami-Dade County. In 1995, countywide earnings from agriculture were estimated at about $195 million. Most of the county's agriculture is concentrated in the southern portion of the county.

In the vicinity of former Homestead AFB, agriculture is the dominant land use. In 1994, about 78 percent of the land in Miami-Dade County south of Eureka Drive was in agriculture. About 84 percent of this agricultural land was outside the Urban Development Boundary. Agricultural land is mostly located between urbanized areas within the UDB and Everglades National Park and, to a lesser extent, Biscayne National Park.

As urbanization has increased, some people have placed more value on the quality of agricultural land. To some, this land symbolizes a rural lifestyle. This rural character has also been cited as important for promoting ecotourism in the area.

Even with a moderate rate of growth, projected population increases can be expected to affect agricultural lands between now and 2015 independent of the reuse of former Homestead AFB. Baseline population growth over the next 15 years could result in development of another 8,500 acres for residential, commercial, and industrial uses in the south county. Although there is sufficient vacant land in the area to accommodate that development, it is likely that some of the development will occur on agricultural land. Given the county's current policy, land within the UDB is more likely to be developed than areas outside the UDB. There is agricultural land inside the UDB, but much of it has been fragmented into small holdings with marginal economic viability.

Reuse of former Homestead AFB property is not expected to directly affect agriculture, but secondary development and population growth associated with the reuse alternatives could have an indirect effect. Off-site development related to the Proposed Action could use about 2,000 additional acres of land in the local area by 2015, increasing to nearly 2,900 acres at full buildout. This additional demand could not be met by vacant land within the UDB alone. It could be met by a combination of vacant land inside and outside the UDB, or by a combination of vacant and agricultural land inside the UDB. It is reasonable to assume that at least a portion of this development would be on land currently used for agriculture, and some of that land could be outside the UDB. For example, the Miami-Dade County Comprehensive Development Master Plan allows for low-density residential development outside the UDB. The extent to which agricultural land is developed before available vacant land depends in part on the degree to which development is restricted to the area within the UDB.

Secondary development related to the Commercial Spaceport alternative would be much less than the Proposed Action. An estimated 500 acres could be used for off-site development by 2015 and 650 acres by full buildout. This would likely have a minor impact on agricultural land. A combined Commercial Spaceport/Airport could generate off-site land use of about 1,100 acres by 2015 and about 1,200 acres at full buildout. In either case, there is sufficient vacant land in the UDB to accommodate the need, although it would be reasonable to expect that some agricultural land could be used. Under the Mixed Use Alternative, off-site secondary development could range from nothing to an amount similar to the Commercial Spaceport alternative, or as much as about 1,800 acres by full buildout. This could affect agricultural land, but not to the extent likely under the Proposed Action.

Concerns have been expressed that a commercial airport at former Homestead AFB could introduce agricultural pests like Medfly and citrus canker to south Miami-Dade County. Medfly has been eradicated from the county, but citrus canker continues to be a potential threat. The quarantine area for citrus canker now extends to the southern boundary of Miami-Dade County. Bringing commercial aircraft traffic to Homestead could make it more difficult to eliminate this pest.

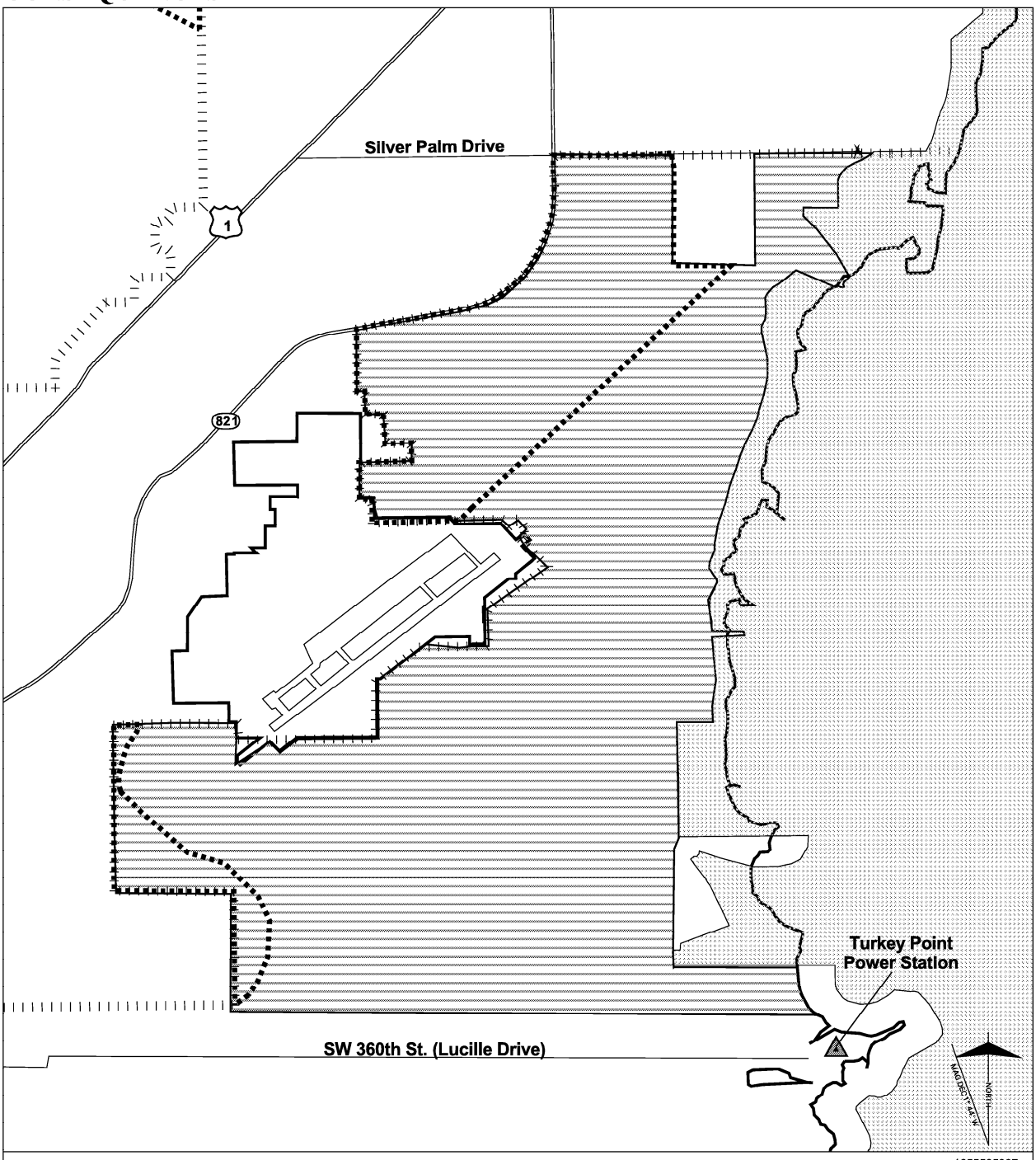
2.9.2.5 Buffer Lands

Several agencies and organizations have recommended that a protected area be created between former Homestead AFB and Biscayne National Park to buffer Biscayne Bay from potential impacts of a commercial airport. The South Florida Ecosystem Restoration Working Group's Issue Advisory Team and Drafting Subcommittee reports, the Florida Department of Community Affairs' report to the Administration Commission, the Administration Commission's final Order on Chapter 288 amendments, and the Miami-Dade County Comprehensive Development Master Plan amendments all include proposals for a buffer area. In addition, the county's Wildlife/Habitat Management and Mitigation Plan for HST (June 1998) describes "Preservation Considerations for Areas Outside of the Former Base." According to the plan, the areas east and southeast of the former base are most significant for habitat protection and should be considered for preservation and management.

None of those proposals have included any details on the configuration or use of the buffer area. In September 1997, the National Park Service prepared the *Homestead-Biscayne Buffer Area Report*. This report identified the need for a buffer between urban areas and protected natural areas. The report concluded that "such a buffer is essential to protect the nationally and regionally significant resources and values of Biscayne National Park." (**NPS 1997**)

The NPS report analyzed the impacts of establishing a 15,000 acre land buffer between the park and the urban areas of southeast Miami-Dade County where existing agriculture and open space would be maintained. The areas would be located northeast, east, and south of former Homestead AFB, extending from Silver Palm Drive on the north to SW 360th Street in the south (**Figure 2.9-1**). The western boundary of the buffer would be defined by the existing Urban Development Boundary, which defines the extent of the land currently zoned for development. Low-density residential development (one dwelling per 5 acres) is permitted on agricultural land outside the UDB. The 15,000 acres analyzed by NPS includes agricultural (6,400 acres), open lands (4,000 acres), and environmentally sensitive lands already designated for protection (4,000 acres).

NPS does not propose to establish or manage the buffer, and the NPS report did not define a mechanism for implementing the buffer. The report did find that the buffer area would serve several purposes in protecting and restoring conditions in Biscayne NP. The key benefits of a buffer emphasized in the NPS report include:



LEGEND

- Former Homestead AFB
- Analyzed Buffer Area
- Biscayne National Park
- Urban Development Boundary
- Urban Expansion Area
- Street
- U.S. Highway
- State Highway

0.5 0 0.5 1

Scale in Miles

Derived from: NPS 1997

Figure 2.9-1
Buffer Area Analyzed by
the National Park Service

Park Resources. NPS has concluded that water discharges from canals along the eastern shoreline and changes in surface water hydrology have degraded water quality in Biscayne Bay and can affect marine communities and wildlife. NPS is also concerned that scenic beauty, solitude, and quiet expected by visitors in a national park can be affected by changes in noise and pollution, developed landscape, and night lighting from urban areas. A buffer area could provide open space for managing surface water and restoring natural flow of water into the bay. It could also provide separation from urban buildup.

Farmland. Estimates of land needed for population growth in south Miami-Dade County imply continued absorption of vacant undeveloped and agricultural land. The report concludes that use of buffer lands for agriculture would be compatible with preserving park resources and would preserve the rural character of the area by limiting conversion of agricultural land.

Tourism. Tourism is a key component of the south Miami-Dade County economy. The report points out that preserving the qualities that the area promotes is essential to the continuation of tourism. As such, the buffer is expected to provide beneficial conditions for resources that are important for sustaining ecotourism.

Public Health and Safety. Much of the land analyzed for the buffer area is susceptible to hurricane winds and storm surge flooding. It is also in the center of an Emergency Planning Zone for potential accidents at Turkey Point Nuclear Power Plant. Therefore, the area is subject to potential risks and possible evacuation requirements. The buffer analyzed by NPS would reduce those risks by limiting population density in the area.

Wetlands. Wetlands along the shoreline are a major part of the natural ecosystem of south Florida. Construction in wetlands is subject to strict regulatory control and permitting. Preserving a contiguous wetland area in the southern tip of Florida is a goal of the South Florida Ecosystem Restoration Program and is intended to enhance natural conditions in several protected areas in Biscayne NP, Everglades NP, and throughout the Florida Keys. The buffer analyzed by NPS would be consistent with this goal.

There is currently very little development east and south of former Homestead AFB, in the area analyzed by NPS as a potential buffer. An area north of the former base and east of the existing Urban Development Boundary has been identified for urban expansion in the Miami-Dade County Comprehensive Development Master Plan. The area immediately to the southeast of the former base has tentatively been identified by the county for future expansion of the commercial airport.

Urban encroachment has been identified by Biscayne National Park as one of the principal threats to the preservation of the park. Although much of the area between the former base and the park has already been designated for protection, the area also contains a lot of agricultural land that may be vulnerable to development. The source of the development pressures is rapid growth and development in south Florida. Miami-Dade County has forecast a population increase of almost 250 percent in the southern portion of the county between 1995 and 2015. Although federal and state population forecasts are more moderate, it seems clear that the population density of the Homestead area is destined to increase dramatically, whether or not the former base is redeveloped. The establishment of a commercial airport at Homestead, as proposed by the county, could add to the projected population increases in south Miami-Dade County by an estimated 4 percent by 2015.

Miami-Dade County has estimated that the area analyzed by NPS contains about 4,900 acres that have been recently used for agriculture (**Miami-Dade County 2000c**). The county's initial estimate for acquiring these lands is about $85 million. The cost of acquiring the development rights has been estimated at about $70 million. The county has indicated a preference for focusing on existing acquisition

priorities (e.g., Environmentally Endangered Lands program) and implementing interim protective measures pending completion of the South Miami-Dade Watershed Planning Project and the county's Agricultural Study before establishing a buffer acquisition program. The additional interim protection initiatives suggested by the county include:

- Increasing the requirement for amending the Urban Development Boundary from two thirds to three fourths of the full membership of the Board of County Commissioners.
- Imposing the same requirement to approve any zoning for any use other than agriculture or residences on minimum 5 acre lots outside the Urban Development Boundary.
- Executing a memorandum of understanding between the county and assigned federal agencies providing those agencies an agreed upon role in the formulation or review of the Watershed Plan and/or agreement not to extend the Urban Development Boundary until the Watershed Plan has been adopted.

The consolidation and solidification of a commitment to protect Biscayne National Park from encroachment by establishing a buffer could affect environmental and socioeconomic conditions in various ways. The beneficial effects could include helping preserve agriculture and habitat for birds and other wildlife and preventing noise-sensitive development within airport noise contours, in addition to contributing to protection of Biscayne NP. Eventually, limiting the expansion of development would likely force densities within urbanized areas to increase. Future increases in property tax revenues could be curtailed by limitations on development of private lands within the buffer. If these lands were acquired in fee to form the buffer, property tax revenues would be eliminated. If development rights were acquired or transferred, property taxes would not be eliminated, but they could be limited to current levels. Depending on the scope and nature of a buffer, it could also complicate or prohibit construction of a second runway at HST.

A buffer west of Biscayne NP could be helpful in promoting the projects and initiatives of ecosystem restoration in south Florida. Projects like the proposed L-31E Flowway Redistribution would be located in that area. Miami-Dade County's proposed stormwater treatment and distribution area would also be within the buffer, on land already owned by the county. The Biscayne Bay Coastal Wetlands feature identified in the Restudy (see Section 2.8.2.2) would also be largely located in this area.

2.9.2.6 Safety

The principal safety issues identified during scoping were related to the potential for aircraft accidents and the resulting consequences. Specifically, risks associated with a potential aircraft accident at the Turkey Point Nuclear Power Plant were of particular concern.

Accident rates of commercial aircraft are very low. FAA statistical data for the last five years identified 24 major and serious accidents with over 68 million flight hours. This translates into an accident about every 2–3 million flying hours. Based on the number of commercial aviation operations projected at HST in 2015 under the Proposed Action, an accident involving commercial aircraft could statistically be expected to occur once every 462 years with current accident rates. These estimates cannot actually predict when or where a mishap will occur. Aviation accident rates have historically declined with technological advances and enhanced safety measures. Therefore, accident rates are expected to be lower by 2015 and at maximum use of the runway.

The accident rate is higher for general aviation. Based on FAA data for the last five years, a fatal accident occurred about once every 61,000 flying hours. Using the estimated number of general aviation

operations projected for the Proposed Action in 2015, a fatal accident would be statistically predicted once every 13 years.

There are no data available for commercial space vehicles, but FAA safety analysis criteria require operators to demonstrate that the risk of casualty will be within acceptable levels in order to be licensed. At a combined Commercial Spaceport/Airport, the addition of some commercial aircraft operations could result in a statistical risk of an accident involving a commercial aircraft once every 2,112 years and involving general aviation aircraft once every 74 years. The Mixed Use alternative would not involve civil aviation at former Homestead AFB.

One factor that can increase the risk of aircraft accidents is the presence of large numbers of birds in the vicinity of an airport. The habitat around former Homestead AFB attracts a wide variety of birds. Techniques for dispersing birds, such as making loud, startling sounds, are used regularly at Homestead ARS. Vegetation control on the base is also used to reduce bird attraction.

Bird-aircraft strikes involving F-16 aircraft at Homestead ARS currently occur about once every 3,300 operations. There are no comparable statistics for civil aircraft. If the current bird-aircraft strike rate for F-16s were applied to the forecast civil aircraft operations at HST, an estimated 45 bird-aircraft strikes could occur annually by 2015, increasing to 69 at maximum use of the one runway. A serious aircraft accident is estimated to result from about 0.06 percent of bird strikes. These are only rough estimates, as there are numerous factors, such as aircraft size and speed, that could affect the actual number of bird-aircraft strikes. FAA has issued an advisory circular to assist airport operators in managing bird attractants on and near airports.

If an aircraft accident were to occur, the resulting environmental impacts would depend on the size of the aircraft, where the accident occurred, and the extent of the damage. Plants or animals in the immediate vicinity of the aircraft's impact would probably be killed. Off shore, fuels, oils, and hydraulic fluids would float and would be expected to disperse relatively rapidly. Lighter fuels would evaporate. Some heavier oils might sink. Most damage to marine organisms would occur along shorelines and intertidal areas, because the great majority of petroleum products would float. Coral reefs that are below the surface would generally not be expected to be affected, unless they were directly impacted by the aircraft. Physical damage to reefs could take as long as decades to recolonize. Other areas would be expected to recolonize more rapidly. Cleanup activities could cause additional damage if, for example, propellers of boats trying to get to the crash site damaged seagrass.

On shore, the most environmental damage would occur if an aircraft crashed in a wetland area. Fuels and oils would evaporate more slowly than off shore because they would not be dispersed as widely. Aquatic organisms could be smothered. Some fuel and oil could permeate into the soils and reduce the opportunity for vegetation to recolonize. In upland areas, spilled fuels and oils would not spread as far and damage would be more contained. Soils and vegetation in the impacted area would be damaged, but clean up and restoration would be easier and more rapid than in wetland or marine environments. Cleanup operations would themselves create some impacts from vehicles and soil removal.

Florida Power and Light Company operates two reactor units at Turkey Point, approximately 5 miles from former Homestead AFB. The Nuclear Regulatory Commission licenses the plant. Part of the licensing process is a requirement for a safety risk analysis in accordance with federal regulations. The Code of Federal Regulations, Title 10, Part 100.10, requires that the risk of an accident resulting in significant radiological consequences be less than one in 10 million. Florida Power and Light Company conducted a risk analysis based on the number of aircraft operations previously estimated for HST and recently updated the analysis based on aircraft operations and flight paths identified for the Proposed

Action. The analysis concluded that the probability of an aircraft accident preventing safe shutdown of Units 3 and 4 or resulting in radiological consequences in excess of dosages specified in the regulations would be approximately 3.63 to 4.43 × 10^{-7} per year. This was based on conservatively high estimates of accident risks and is within regulatory limits. The analysis was reviewed and approved by the Nuclear Regulatory Commission.

2.9.2.7 Possible Airport Expansion

This SEIS will not be used for a decision concerning possible future expansion of HST beyond the boundaries of former Homestead AFB. However, it does recognize such a possibility. If a commercial service airport at Homestead successfully captured niche markets and achieved forecast levels of operations, at some point the airport could reach its operating capacity. The operating capacity of the single runway at Homestead is estimated to be approximately 231,000 annual aircraft operations.

If and when growth approached that level, Miami-Dade County could propose to build a second runway to better accommodate the traffic demand and to more efficiently handle operations. In fact, the Airport Layout Plan developed by the 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. If an expansion were to occur, the ALP indicates that about 1,060 additional acres would need to be acquired.

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 percent capacity, a second runway could begin operations around 2038. A two-runway system at Homestead might reach full capacity around 2057 or later. At capacity, an expanded airport could support up to 370,000 aircraft operations and serve an estimated 8 to 10 million passengers.

The ability to analyze environmental impacts so far into the future beyond a reasonably foreseeable time frame 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 30 to 60 years in the future. Considering the pace of changes in aviation that have occurred in the last 30 to 60 years, it is easy to understand that assumptions based on current conditions could rapidly become outdated in this high technology industry.

A second runway cannot be accommodated within the boundaries of the disposal property at the former base and its implementation is uncertain. Because a second runway is speculative at this time, it is outside the scope and decisions of this SEIS. The federal decisions that will be made pursuant to this SEIS only involve the existing surplus property. Any expansion of the property boundaries in the future would require further FAA approval and additional NEPA analysis and public input. Nevertheless, public and agency interest has been expressed in the impacts of constructing a second runway. Therefore, some consideration was given to the types of impacts that might be expected if a second runway were constructed at HST. The following paragraphs provide some notional ideas of what those impacts might be.

The increased economic activity (employment, passengers) associated with an expanded airport could double airport-related earnings in south Miami-Dade County over levels projected for 2015 under the Proposed Action. The number of in-migrating and relocating persons coming into the south county area

could increase by an estimated 23,000. This could, in turn, double the estimated increase in traffic on local roads and also about double the projected increase in utilities demand.

Changes in air traffic routes in the region could be required to accommodate the increased aircraft operations, although anticipated technological advances may dramatically change air traffic procedures from those in place today. General aviation operations would not be expected to increase at a two-runway airport because of the volume of commercial aviation; general aviation pilots would be likely to chose less active airports to operate from. Technological changes and improved safety measures have historically enabled improvements to be made in aircraft safety, and accident rates have correspondingly been lowered. Today's statistical aircraft accident rate should not be presumed to remain the same for the future.

Initially, the number of aircraft operations using the two runways would be the same as forecast for maximum use of one runway. Noise contours may change somewhat to reflect the redistribution of operations. If the airport continued to grow and arrivals and departures are assumed to be distributed relatively evenly on the two runways, the noise contours could be expected to widen by approximately 3,500 feet. Beyond the immediate airport surroundings, increases in the number of aircraft operations and potential modifications to flight tracks may increase the time aircraft noise would be above traditional ambient sound levels in some areas over the national parks. Noise levels have been declining, and new noise standards are being defined. Future aircraft are expected to be significantly quieter than current aircraft. Anticipated reductions in aircraft source noise can be expected to offset noise increases, but it is not known by how much.

Air pollutant emissions could also increase. However, newer aircraft engines are expected to have lower emissions, which would offset some of the effects of the increase in numbers of aircraft operations. It cannot be predicted precisely when or if a second runway will be constructed at HST, or how quickly the number of operations would increase, so quantitative calculations of air pollutant emissions could not be performed.

Similarly, the increase in stormwater runoff could not be precisely calculated, but based on the likely land coverage at the airport itself, on-site runoff from the airport might be expected to increase by almost 60 percent. The existing Boundary Canal system around former Homestead AFB would need to be altered, and portions of Military and Mowry Canals would need to be relocated to accommodate a second runway.

The area south of and parallel to the existing runway, where a second runway would likely be constructed, contains wetlands and habitat for the federally listed threatened eastern indigo snake and the state listed threatened rim rock crowned snake. Existing wetlands and other aquatic habitat, such as drainage ditches, and about 14 acres of remnant pine rocklands could be eliminated during the construction of a second runway. With the loss of wetland habitat, wading birds, including the endangered wood stork, would have to relocate their foraging activities. Although there have been no recent sightings, the endangered Florida panther has been sighted in the past in the area of the possible airport expansion.

Before HST could be expanded and a second runway constructed, a detailed environmental impact analysis would have to be prepared examining these and other potential impacts in greater detail.

2.9.3 Summary of Environmental Consequences By Resource

Table 2.9-2 summarizes the environmental and socioeconomic changes of each of the alternatives analyzed in detail in the SEIS. These findings are summarized by the resource topics presented in Chapters 3 and in 4. The table focuses on changes in south Miami-Dade County and the area around former Homestead AFB where the majority of effects from the Proposed Action and other reuse alternatives are anticipated to occur. The first column of the table presents the projected baseline, which reflects conditions that would be expected to prevail in the future without reuse of the disposal property at the former base. The projected baseline is the same as the No Action alternative.

The columns following the projected baseline/No Action alternative present the changes estimated under each reuse alternative. In most cases, data are presented for 2015, with some data presented for 2005. In general, information on full buildout is not presented in this table because of the uncertainty of the timeframe when full buildout could be achieved, as well as the variability in that time frame among the alternatives. In addition, projected baseline information is not available for full buildout. For these reasons, data on full buildout is not always suitable for direct comparison among the reuse alternatives and between those alternatives and the projected baseline/No Action alternative. An exception has been made in the Noise section of the table. There, information on maximum use of the runway at former Homestead AFB is presented in discussing the noise effects on the national parks and refuges in the region.

The summary in Table 2.9-2 provides only a cursory overview of the impact analysis conducted for the SEIS. The potential impacts from reuse of the disposal property at former Homestead AFB involve a large number of complex factors that cannot be thoroughly described in a summary table. For a more complete discussion of impacts, refer to the resource sections in Chapter 4.

Table 2.9-2. Summary of Environmental Consequences by Reuse Alternative

Projected Baseline/ No Action Alternative	Proposed Action	Commercial Spaceport Alternative	Mixed Use Alternative
Socioeconomics			
Projected baseline employment in south Miami-Dade County of 48,378 in 2000, 55,074 in 2005, and 68,464 in 2015. Earnings in south county projected to be $1.4 billion in 2000, $1.6 billion in 2005, and $2 billion in 2015.	Employment in south county estimated to increase by 3,637 jobs in 2005 and 23,191 jobs in 2015. Earnings estimated to increase $105 million in 2005 and $673 million in 2015. Increase in employment and earnings in south county of about 7% over baseline by 2005 and 34% by 2015.	Employment in south county estimated to increase by about 3,532 jobs in 2005 and 8,472 jobs in 2015. Earnings estimated to increase $103 million in 2005 and $248 million in 2015. Increase in employment and earnings in south county of about 7% over baseline by 2005 and 13% by 2015. Combined spaceport/airport could increase employment and earnings by 32% in 2015.	Employment in south Miami-Dade County estimated to increase by between 3,320 and 9,039 jobs in 2005, and between 7,848 and 15,843 jobs in 2015. Earnings estimated to increase between $94 and $243 million in 2005; $228–459 million in 2015. Increase in employment and earnings in south county of about 6–11% over baseline by 2005 and 11–23% by 2015.
Projected baseline population in south Miami-Dade County of 182,324 in 2000, 201,414 in 2005, and 239,592 in 2015.	Reuse-related in-migration and relocation into south county estimated at about 518 by 2005 and 10,597 by 2015. Represents about 0.3% increase over baseline population growth in 2005 and 4% in 2015.	Reuse-related in-migration into south county estimated at about 504 by 2005 and 1,153 by 2015. Represents about 0.2% increase over baseline population growth in 2005 and 0.5% in 2015. Population increase with combined spaceport/airport could be 1% over baseline growth in 2015.	Reuse-related in-migration into south county estimated at about 426–805 by 2005 and 1,023–1,682 by 2015. Represents about 0.2% increase over baseline population growth in 2005 and up to 1% in 2015.
Baseline number of housing units in south Miami-Dade County projected at 63,796 units in 2000, 70,892 units in 2005, and 85,083 units in 2015.	Estimated need for about 188 additional housing units in south county by 2005 and 3,854 by 2015.	Estimated need for about 183 additional housing units in south county by 2005 and 419 by 2015. Increase of 923 units by 2015 with combined spaceport/airport.	Estimated need for about 155–293 additional housing units in south county by 2005 and 372–612 by 2015.
	Minor increases in public service demands associated with population increase. Offsetting increase in tax base and public revenues available for operations and government services.	Minor increases in public service demands associated with population increase. Offsetting increase in tax base and public revenues available for operations and government services.	Minor increases in public service demands associated with population increase. Offsetting increase in tax base and public revenues available for operations and government services.

Projected Baseline/ No Action Alternative	Proposed Action	Commercial Spaceport Alternative	Mixed Use Alternative
Transportation			
Total average daily trips from former Homestead AFB of 5,362 in 2000, 5,952 in 2005, and 7,517 in 2015. Maximum service capacity projected to be exceeded along segments of U.S. Highway 1.	Daily vehicle trips from former base estimated to increase by about 6,502 by 2005 and 44,601 over projected baseline by 2015. Traffic volumes on segments of SW 127th Avenue, SW 288th Street, and Krome Avenue would be at unacceptable level of service by 2015. Further aggravate exceeded service capacity along segments of U.S. Highway 1 projected in baseline.	Daily vehicle trips estimated to increase by about 7,103 by 2005 and 16,973 over projected baseline by 2015. Impacts on roadways similar to Proposed Action, except on SW 127th Avenue. Impacts of combined Commercial Spaceport/ Airport about the same as Proposed Action.	Daily vehicle trips estimated to increase by about 6,251–28,789 by 2005 and 18,822–48,931 over projected baseline by 2015. Impacts on roadways similar to either Commercial Spaceport alternative or Proposed Action, depending on intensity of development.
Emergency evacuation time estimated at 8 hours for hurricane and 4.2 hours for accident at Turkey Point Nuclear Power Plant in 2015.	Hurricane evacuation time estimated to increase by about 20 minutes. Evacuation time for accident at Turkey Point estimated to increase by about 12 minutes.	No increase in emergency evacuation time.	No increase in hurricane evacuation time. Small potential increase (6 minutes) in evacuation time for Turkey Point emergency.
Utilities			
Projected baseline water consumption in south Miami-Dade County of 208.5 in 2000, increasing to 279.3 million gallons per day by 2015. Will exceed capacity of three water treatment plants by between 11% and 41%, even with planned expansions.	Increase of 10.2 million gallons per day (4%) water consumption in south county by 2015. Further aggravate projected capacity problems at three water treatment plants if additional improvements are not implemented.	Increase of 1.3 million gallons per day (1%) in water consumption in south county by 2015. Increase of 2.9 million gallons per day (1%) with combined spaceport/airport. Further aggravate projected capacity problems at three water treatment plants if additional improvements are not implemented.	Increase of 1.4–3.0 million gallons per day (up to 1%) in water consumption in south county by 2015. Further aggravate projected capacity problems at three water treatment plants if additional improvements are not implemented.

Projected Baseline/ No Action Alternative	Proposed Action	Commercial Spaceport Alternative	Mixed Use Alternative
Projected baseline wastewater generation of 87.8 in 2000, increasing to 116.9 million gallons per day by 2015.	Increase of 4.7 million gallons per day (4%) in wastewater generation in south county by 2015. Within capacities of planned expansions except at one plant, where capacity would be exceeded by about 2%. Interconnected service able to divert excess to plants with available capacity.	Increase of 0.6 million gallons per day (less than 1%) in wastewater generation in south county by 2015. Increase of 1.4 million gallons per day (1%) with combined spaceport/airport. Within capacities of planned plant expansions.	Increase of 1.0–1.6 million gallons per day (up to 1%) in wastewater generation in south county by 2015. Within capacities of planned expansions except at one plant, where capacity would be exceeded slightly. Interconnected service able to divert excess to plants with available capacity.
Projected baseline solid waste generation of 782 tons per day in 2000, increasing to 1,088 tons per day by 2015.	Increase of 76 tons per day (7%) in solid waste generation in south county by 2015. Within capacity of disposal facilities.	Increase of 21 tons per day (2%) in solid waste generation in south county by 2015. Increase of about 37 tons per day (3%) for combined spaceport/airport. Within capacity of disposal facilities.	Increase of 19–41 tons per day (2–4%) in solid waste generation in south county by 2015. Within capacity of disposal facilities.
Projected baseline electricity demand of 28,869 megawatt hours per day in 2000, increasing to 38,010 megawatt hours per day by 2015. Projected baseline gas demand of 110,553 therms per day in 2000, increasing to 145,278 therms per day in 2015. No gas service at former base.	Increase of 1,529 megawatt hours per day (4%) in electricity consumption and 5,039 therms/day (1%) in natural gas consumption in south county by 2015. No gas service at former base property. Within capacities of utilities services.	Increase of 270 megawatt hours per day (less than 1%) in electricity and 543 therms/day (less than 1%) natural gas consumption in south county by 2015. Increase of 503 megawatt hours (1%) and 1,202 therms/day (less than 1%) for combined spaceport/airport. No gas service at former base property. Within capacities of utilities services.	Increase of 244–427 megawatt hours per day (up to 1%) in electricity and 505–1,020 therms/day in natural gas consumption in south county by 2015. No gas service at former base property. Within capacities of utilities services.
Airspace and Safety			
Military and government aircraft operations continue to use existing flight tracks.	New flight tracks established for civil aircraft operations. No major changes in airspace classification anticipated. New flight tracks and increased air traffic require management by air traffic control.	New flight track needed for space vehicles. May require special advisories to pilots. Could interfere with routine airspace use during launching and recovery of space vehicles.	No change in airspace or safety from projected baseline.

Projected Baseline/ No Action Alternative	Proposed Action	Commercial Spaceport Alternative	Mixed Use Alternative
Class A mishap involving F-16 aircraft statistically estimated every 23 years.	Serious accident involving commercial aircraft statistically estimated every 462 years by 2015. Fatal accident involving general aviation aircraft statistically estimated every 13 years by 2015. No change in risk of mishap with military aircraft.	Safety hazards and risks from space vehicle operations not yet known. Permitting and licensing of spaceport and space vehicle operations predicated on safety analysis and review, demonstrating level of risk meets FAA standards. At combined spaceport/airport, serious accident involving commercial aircraft statistically estimated every 2,112 years by 2015. Fatal accident involving general aviation aircraft statistically estimated every 74 years by 2015. No change in risk of mishap with military aircraft.	
Bird-aircraft strikes involving F-16 estimated 6 times per year. Serious accident statistically estimated to occur on 0.06 percent of bird strikes.	Estimated 45 bird-aircraft strikes per year by 2015, based on current F-16 rates. Serious accident statistically estimated to occur on 0.06 percent of bird strikes. Florida Power & Light Company and Nuclear Regulatory Commission estimated risk of aircraft accident preventing safe shutdown of Units 3 and 4 at Turkey Point Nuclear Power Plant or resulting in radiological consequences above regulatory limits to be 3.63 to 4.43 $\times 10^{-7}$.	Estimated 14 bird-aircraft strikes per year by 2015, based on current F-16 rates. Serious accident statistically estimated to occur on 0.06 percent of bird strikes. Insufficient data to estimate risks at Turkey Point Nuclear Power Plant.	

Projected Baseline/ No Action Alternative	Proposed Action	Commercial Spaceport Alternative	Mixed Use Alternative
Noise			
Estimated 6,458 acres exposed to Day-Night Average Sound Levels of 60 decibels and above. 60 decibel contour encompasses 297 dwelling units with estimated 1,804 residents.	Increase of about 262 acres exposed to Day-Night Average Sound Levels of 60 decibels and above by 2005, 1,344 acres by 2015, and 1,568 acres by maximum use. 60 decibel contour would encompass 33 additional dwelling units with about 184 residents by 2005, 96 additional units and 433 residents by 2015, and 143 additional units and 645 residents at maximum use of runway.	Increase of about 435 acres exposed to Day-Night Average Sound Levels of 60 decibels and above by 2005 and 947 acres by 2015. 60 decibel contour would encompass 11 additional dwelling units with about 40 residents by 2005; 18 additional units and 79 residents by 2015. No change between 2015 and full buildout.	No change from projected baseline.
	Estimated 68 existing dwelling units (513 residents) within 65 decibel contour would receive increase in Day-Night Average Sound Level of 1.5 decibels or more by 2015; 219 existing units (967 residents) at maximum use. Estimated 43 existing units (127 residents) within 60–65 decibel contour would receive increase in Day-Night Average Sound Level of 3 decibels or more by 2015; 74 existing units (219 residents) at maximum use.	No dwelling units or residents within 65 decibel contour would receive 1.5 decibel or more increase in Day-Night Average Sound Level. No dwelling units or residents within 60–65 decibel contour would receive 3 decibel or more increase in Day-Night Average Sound Level.	
Maximum sound levels over national parks and refuges range from less than 45 decibels to over 100 decibels.	Little or no change in maximum noise levels in Biscayne NP and Crocodile Lake NWR. Increases from 5 to over 10 decibels in Everglades NP and Big Cypress National Preserve where civil and military flight corridors diverge. Loudest civil aircraft is 62 decibels in Everglades NP in areas not dominated by military aircraft.	No change in maximum noise levels in Everglades NP, Crocodile Lake NWR, and Big Cypress National Preserve. Increases of 5–10 decibels in northern Biscayne NP, and 12–16 decibels in two areas on northern boundary of Biscayne NP.	

Projected Baseline/ No Action Alternative	Proposed Action	Commercial Spaceport Alternative	Mixed Use Alternative
Peak hour equivalent sound levels over national parks and refuge range from less than the traditional ambient sound level (all sounds except aircraft) to over 60 decibels.	Peak hour equivalent sound levels at maximum use increase less than 5 decibels in national parks and refuge, except in area of Everglades NP nearest to runway and under flight corridor in eastern part of park.	Peak hour equivalent sound levels at maximum use increase 5–10 decibels in a few areas and 15 decibels in one area on north and northwest boundary of Biscayne NP under space vehicle flight path. No increases in other parks or Crocodile Lake NWR.	
Amount of time that aircraft noise is more than the traditional ambient sound level in national parks and refuge ranges from less than 1 minute to more than 2 hours per day on average, depending on location.	Increase in average daily time aircraft noise above traditional ambient levels (all sounds except aircraft) at maximum use less than 1 minute in northeast Biscayne NP, south Everglades NP, and northwest Everglades NP. Increase of 1–10 minutes in central Biscayne NP, north-central and southeastern Everglades NP, and southern Crocodile Lake NWR. Increase of 10–30 minutes in western Biscayne NP, north-central and some eastern areas of Everglades NP, and central and southwestern Crocodile Lake NWR. Increase of 30–60 minutes in some eastern areas of Everglades NP and northern Crocodile Lake NWR. Increases of 1–2 hours in two areas on western edges of Biscayne NP and Crocodile Lake NWR and two areas in eastern Everglades NP. Increases of over 2 hours in eastern edge of Everglades NP nearest to the runway.	Increases in average daily time above traditional ambient levels in 2015/full buildout could be less than 3 minutes in Biscayne NP, east Everglades NP, and Crocodile Lake NWR with infrequent launch schedule.	

Projected Baseline/ No Action Alternative	Proposed Action	Commercial Spaceport Alternative	Mixed Use Alternative
Land Use and Aesthetics			
Disposal property in caretaker status.	Potential for incompatibilities between existing residential and reuse-related industrial development on and adjacent to the former base.	Potential for land use incompatibilities similar to Proposed Action.	Potential for incompatibilities between residential and industrial development less than other reuse alternatives.
	Airport-related traffic and noise and secondary development could affect nearby residential communities.	Less off-site impacts on adjacent areas than Proposed Action and less secondary development projected.	Impacts on adjacent land uses dependent on type, rate, and intensity of development. High visitor use associated with Collier-Hoover plan could create traffic and circulation problems in vicinity of former base.
Continuation of existing aircraft noise from military and government aircraft operations in Biscayne and Everglades NPs and state lands.	Increased aircraft noise could annoy some visitors in national and state parks and lands. Additional noise could make it more difficult for National Park Service to accomplish objectives to improve and preserve natural soundscape in Biscayne and Everglades NPs.	Most noise increases confined to areas northeast of runway, affecting northern edge of Biscayne NP; little noise effect on Everglades NP or state lands. Noise associated with a combined airport/spaceport similar to Proposed Action in 2005.	Aircraft noise in national parks and state lands same as projected baseline.
Development associated with projected baseline population growth could result in conversion of about 4,000 acres of agricultural land to development by 2015.	Reuse-related off-site development could result in additional reduction of about 800 acres of agricultural land by 2015.	Reuse-related off-site development could result in additional reduction of about 200 acres of agricultural land by 2015 (450 acres with combined spaceport/airport).	Reuse-related off-site development could result in additional reduction of about 200–500 acres of agricultural land by 2015.
Overflying military and government aircraft from Homestead ARS and civil aircraft from other airports in region visible in national parks. Aircraft identification lights may intrude on night skies in national parks.	Overflying aircraft visible more often from national parks. Increased potential for aircraft identification lights to intrude on night skies.	Overflying aircraft from combined spaceport/airport visible from national parks. Potential for aircraft lights to intrude on night skies slightly higher than projected baseline; less than Proposed Action.	Visibility of overflying aircraft in national parks same as projected baseline.

Projected Baseline/ No Action Alternative	Proposed Action	Commercial Spaceport Alternative	Mixed Use Alternative
Hazardous Materials, Hazardous Waste, and Petroleum Products			
Main hazardous materials stored and used on site include petroleum products, paints, thinners, cleansers.	Estimated eightfold increase in hazardous materials stored and used on site by 2015, including petroleum products, paints, thinners, cleansers.	Additional hazardous materials potentially stored and used on site, including liquid oxygen, liquid hydrogen, hypergolic fuels, and solid rocket fuels, as well as petroleum products, paints, thinners, cleansers. Increase of about fourfold with combined spaceport/airport.	Less use of petroleum products and chemicals than Proposed Action or Commercial Spaceport alternative. Possibly more use of fertilizers and pesticides for on-site landscaping. Collier-Hoover plan includes limited use of non-persistent pesticides.
Air Reserve Station generates about 184 tons per year of hazardous waste.	Increase of about 1,435 tons per year of hazardous waste generated on site by 2015.	Increase of about 438 tons per year of hazardous waste generated on site by 2015.	Increase of about 49 tons per year of hazardous waste generated on site by 2015.
Estimated 912 off-site industrial facilities in south county by 2015. Off-site small quantity generators in south Miami-Dade County generate about 7,667 tons per year of hazardous waste.	Estimated 40 additional off-site industrial facilities in south county by 2015. Off-site small quantity generators in south county would generate 339 additional tons per year of hazardous waste.	Estimated 4–10 additional off-site industrial facilities in south county by 2015. Off-site small quantity generators in south county would generate 37–81 additional tons per year of hazardous waste.	Estimated 3–6 additional off-site industrial facilities in south county by 2015. Off-site small quantity generators in south county would generate 33–54 additional tons per year of hazardous waste.
Cleanup of Installation Restoration Program sites at former Homestead AFB will continue.	Continuing cleanup of Installation Restoration Program sites at former Homestead AFB not expected to affect reuse.	Continuing cleanup of Installation Restoration Program sites at former Homestead AFB not expected to affect reuse.	Continuing cleanup of Installation Restoration Program sites at former Homestead AFB could delay reuse and/or require changes to the Collier-Hoover plan.
Air Quality			
Miami-Dade County in attainment of all National Ambient Air Quality Standards; designated maintenance area for ozone.	Increase in air pollutant emissions not expected to exceed National Ambient Air Quality Standards.	Increase in air pollutant emissions not expected to exceed National Ambient Air Quality Standards.	Increase in air pollutant emissions not expected to exceed National Ambient Air Quality Standards.

Projected Baseline/ No Action Alternative	Proposed Action	Commercial Spaceport Alternative	Mixed Use Alternative
Nitrogen oxides of primary concern due to potential for ozone formation.	Increase in nitrogen oxides of about 45 tons/year in 2005 and 392 tons/year by 2015. In 2015, this would be less than 1% of countywide emissions.	Increase in nitrogen oxides of about 19 tons/year in 2005 and 59 tons/year by 2015. In 2015, this would be much less than 1% of countywide emissions. Increase in nitrogen oxides with combined spaceport/airport about 62 tons/year in 2005 and 144 tons per year in 2015.	Increase in nitrogen oxides of about 17 tons/year in 2005 and 41 tons/year by 2015. In 2015, this would be much less than 1% of countywide emissions.
Annual atmospheric nitrogen deposition in 1994–1998 estimated at 7.08 kilograms/hectare in Everglades NP and assumed to be about the same in Biscayne NP.	Annual atmospheric nitrogen deposition could increase by 0.43 kilograms/hectare in Everglades NP and 1.61 kilograms/hectare in Biscayne NP by 2015.	Annual atmospheric nitrogen deposition could increase by 0.07 kilograms/hectare in Everglades NP and 0.22 kilograms/hectare in Biscayne NP by 2015. Combined spaceport/ airport could increase annual atmospheric nitrogen deposition by 0.18 kilograms/hectare in Everglades NP and 0.63 kilograms/hectare in Biscayne NP by 2015.	Annual atmospheric nitrogen deposition could increase by 0.08 in Everglades NP and 0.20 in Biscayne NP by 2015.
Polycyclic aromatic hydrocarbons emitted from aircraft and ground vehicles; amount not known.	Increase in emissions of polycyclic aromatic hydrocarbons; amount not known but assumed to be proportional to increase in nitrogen oxide emissions (less than 1%).	Increase in emissions of polycyclic aromatic hydrocarbons; amount not known but assumed to be proportional to increase in nitrogen oxide emissions (less than 1%).	Increase in emissions of polycyclic aromatic hydrocarbons; amount not known but assumed to be proportional to increase in nitrogen oxide emissions (much less than 1%).
Earth Resources			
Development associated with projected baseline population increase could result in loss of hydric soils and reduction of 4,000 acres of unique farmland by 2015.	Reuse-related off-site development could result in loss of small additional amount of hydric soils and reduction of 800 additional acres of unique farmland in south county by 2015.	Reuse-related off-site development could result in loss of small additional amount of hydric soils and reduction of 200 additional acres of unique farmland in south county by 2015. Combined spaceport/airport could result in reduction of 450 additional acres of unique farmland by 2015.	Reuse-related off-site development could result in loss of small additional amount of hydric soils and reduction of 200–500 additional acres of unique farmland in south county by 2015.

Projected Baseline/ No Action Alternative	Proposed Action	Commercial Spaceport Alternative	Mixed Use Alternative
Water Resources			
Stormwater runoff from former base estimated at 4,591 acre-feet/year. Discharges from Military Canal into Biscayne Bay estimated at 5,133 acre-feet/year.	Stormwater runoff from former base estimated to increase to 5,188 acre-feet/year (13% over baseline) by 2005 and 6,565 acre-feet/year (43% over baseline) by 2015. Surface Water Management Master Plan prepared for airport anticipated to retain most runoff on site. Discharges from Military Canal into Biscayne Bay estimated to decrease 31% by 2005 and 28% by 2015.	Stormwater runoff from former base estimated to increase to 4,912 acre-feet/year (7% over baseline) by 2005 and 5,968 acre-feet/year (30% over baseline) by 2015. Stormwater management system anticipated to retain most runoff on site. Discharges from Military Canal into Biscayne Bay estimated to decrease 31% by 2005 and 29% by 2015.	Stormwater runoff from former base estimated to increase to 5,004 acre-feet/year (9% over baseline) by 2005 and 5,280 acre-feet/year (15% over baseline) by 2015 with Market-Driven development. Market-Driven development may not include stormwater management system. Discharges from Military Canal into Biscayne Bay could increase 4% by 2005 and 9% by 2015. Collier-Hoover proposal likely to result in decreases similar to Proposed Action or greater.
Combined stormwater discharges from Princeton, Mowry, and Military Canals estimated at 245,945 acre-feet/year in 2005, increasing to 255,338 acre-feet/year by 2015 with projected baseline population growth.	Reuse-related off-site development could result in net increase in discharges from Princeton, Mowry, and Military Canals into Biscayne Bay of 2.0% above projected baseline by 2015.	Reuse-related off-site development could result in net decrease in discharges from Princeton, Mowry, and Military Canals into Biscayne Bay of less than 0.1% by 2015. Net increase in discharges with combined spaceport/ airport of 0.1% above projected baseline by 2015.	Reuse-related off-site development could result in net increase in discharges from Princeton, Mowry, and Military Canals into Biscayne Bay of 0.9% by 2015 with Market-Driven development (assuming no on-site stormwater management plan). Collier-Hoover proposal estimated at 1% above projected baseline.
Existing ammonia in groundwater in vicinity of former base being slowly transported to Biscayne Bay by groundwater.	Net groundwater flows estimated to decrease by 3,664 acre-feet/year by 2015. Net nitrogen (ammonia) loads estimated to decrease by 9,792 pounds/year.	Net groundwater flows estimated to decrease by 336 acre-feet/year by 2015. Nitrogen (ammonia) loads estimated to increase by 8,834 pounds/year.	Net groundwater flows estimated to decrease between 1,707 acre-feet/year (Market-Driven) and 1,627 acre-feet/year (Collier-Hoover) by 2015. Nitrogen (ammonia) loads estimated to decrease by 9,548 pounds/year with Market-Driven development and possibly increase by 1,870 pounds/year with Collier-Hoover proposal.

Projected Baseline/ No Action Alternative	Proposed Action	Commercial Spaceport Alternative	Mixed Use Alternative
Any spills of fuels or chemicals at Homestead ARS generally contained in Boundary Canal system.	Any spills of fuels or chemicals on the site generally contained in Boundary Canal system.	Any spills of fuels or chemicals on the site generally contained in Boundary Canal system.	Any spills of fuels or chemicals from continued military and government operations generally contained in Boundary Canal system.
Average annual atmospheric nitrogen deposition into Biscayne Bay in 1994–1998 assumed to be about 6 pounds per acre.	Reuse-related annual atmospheric nitrogen deposition in nearshore Biscayne NP estimated to increase 1.43 pounds per acre by 2015.	Reuse-related annual atmospheric nitrogen deposition in nearshore Biscayne NP estimated to increase 0.19 pound per acre by 2015.	Reuse-related annual atmospheric nitrogen deposition in nearshore Biscayne Bay estimated to increase 0.18 pound per acre by 2015.
Current deposition of polycyclic aromatic hydrocarbons in Biscayne Bay; amount not known.	Increased deposition of polycyclic aromatic hydrocarbons in Biscayne Bay; amount not known.	Increased deposition of polycyclic aromatic hydrocarbons in Biscayne Bay; amount not known, estimated at about 85% less than Proposed Action.	Increased deposition of polycyclic aromatic hydrocarbons in Biscayne Bay; amount not known, estimated at about 84% less than Proposed Action..
Biological Resources			
Stormwater discharges to Biscayne Bay currently contributing to higher salinity and chemical and nutrient inputs. Fuels and oils released in event of aircraft accident and subsequent cleanup activities could damage biota on water surface and along shoreline.	Identifiable effects on estuarine and marine communities unlikely. Fuels and oils released in event of aircraft accident and subsequent cleanup activities could damage biota on water surface and along shoreline.	Potential impacts on estuarine and marine communities similar to but less than Proposed Action. Less statistical risk of aircraft accident. Fuels from spacecraft accident likely to burn.	Potential impacts on estuarine and marine communities similar to but less than Proposed Action. Potential effects from aircraft accident same as projected baseline.
Many wetlands between former base and Biscayne Bay are protected, but unprotected wetlands may be affected by development associated with projected baseline population growth. Fuels and oils spilled in event of aircraft accident and subsequent cleanup could cause substantial, localized damage.	Development effects on wetlands anticipated to be minor due to protection under federal and state regulations. Fuels and oils spilled in event of aircraft accident and subsequent cleanup could cause substantial, localized damage.	Development effects on wetlands anticipated to be minor due to regulatory protection. Fuels spilled in event of spacecraft accident likely to burn.	Wetlands unlikely to be affected and could increase under Collier-Hoover plan. Potential effects from aircraft accident same as projected baseline.

SUMMARY OF CONSEQUENCES

Projected Baseline/ No Action Alternative	Proposed Action	Commercial Spaceport Alternative	Mixed Use Alternative
Potential loss of remnant pine rocklands on disposal property through invasion of exotic plant species, if not protected.	Probable loss of small area of remnant pine rocklands on airport, with potential for losses off site through secondary development. Some areas on airport identified for preservation in airport Wildlife/Habitat Management and Mitigation Plan.	Possible loss of larger area of remnant pine rocklands on disposal property than Proposed Action if not preserved as part of development.	Possible loss of remnant pine rocklands on disposal property. Identified for preservation in Collier-Hoover plan.
Wading birds forage in shallow wetlands on disposal property.	Small reduction in wading bird habitat on site.	Small reduction in wading bird habitat similar to Proposed Action.	Small reduction in wading bird habitat less than Proposed Action and Commercial Spaceport alternative. Increase in habitat under Collier-Hoover plan.
Military aircraft operations currently generating highest maximum noise levels in Biscayne NP, especially along western shoreline of Biscayne Bay.	Civil aircraft noise about 15 decibels quieter than military aircraft but up to eight times more frequent along western shoreline of Biscayne Bay. Some species of wading birds may habituate to noise levels, while others may choose to relocate to quieter areas with suitable habitat. Increase in aircraft noise exposure could disturb wildlife, but based on available information, is not anticipated to affect the abundance or general distribution of sensitive wildlife populations or the viability of their habitat.	Increase in loudness of noise from spacecraft in limited area northeast of former base. Increase in frequency of aircraft noise events much less than Proposed Action.	Wildlife exposure to aircraft noise same as projected baseline.

Projected Baseline/ No Action Alternative	Proposed Action	Commercial Spaceport Alternative	Mixed Use Alternative
Cultural Resources			
No known significant cultural resources on former Homestead AFB. Development associated with projected baseline population growth has potential to affect cultural resources. Existing aircraft overflights of cultural resources and potential historic landscape in Biscayne NP.	On-site development not expected to affect significant cultural resources. No foreseeable adverse effect from secondary development on cultural resources. Increase in aircraft overflights of cultural resources and potential historic landscape in Biscayne NP.	On-site development not expected to affect significant cultural resources. No foreseeable adverse effect from secondary development on cultural resources. Small increase in overflights of cultural resources and potential historic landscape in Biscayne NP.	On-site development not expected to affect significant cultural resources. No foreseeable adverse effect from secondary development on cultural resources. Continued aircraft overflights of cultural resources and potential historic landscape in Biscayne NP by military and government operations.
Minority and Low-Income Populations			
Over 200 farmworker housing units exposed to Day-Night Average Sound Levels of 60 decibels or higher.	Additional farmworker housing units exposed to Day-Night Average Sound Levels of 60 decibels or higher by 2015.	No additional farmworker housing units exposed to Day-Night Average Sound Levels of 60 decibels or higher.	No change from baseline.
DOT Act Section 4(f) Lands			
Section 4 (f) not applicable.	No direct or constructive use of public parks, recreation areas, wildlife/ waterfowl refuges, or historic properties.	No direct use of public parks, recreation areas, wildlife/waterfowl refuges, or historic properties. Too many uncertainties for constructive use determination.	Section 4 (f) not applicable to this alternative.

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2.10 SUMMARY OF CUMULATIVE IMPACTS

Over the last several decades, population growth and development and major reconstruction of the natural drainage system in central and south Florida have altered the landscape and natural habitat from its original condition. It is expected that population growth will continue and result in continued conversion of open land into a built environment. The goals and initiatives of the South Florida Ecosystem Restoration program and U.S. Army Corps of Engineers' Restudy are designed to restore the natural ecology of the region and facilitate methods that could offset the adverse impacts of expanding human development.

The cumulative impact assessment in the SEIS considers the contribution of reuse of former Homestead AFB to a future defined by both accelerated growth and implementation of these restorative programs (described in Section 2.8). It also addresses three specific projects: the proposed L-31E Flowway Redistribution Project (a Restudy initiative), a stormwater treatment and distribution area proposed by Miami-Dade County, and proposed widening of U.S. Highway 1 between Key Largo and the City of Homestead. The possible future expansion of a commercial airport at Homestead is not included in the cumulative impact analysis. Potential effects of airport expansion are addressed in Section 2.9.7. The following sections summarize the cumulative impacts identified in the resource analyses in Chapter 4.

2.10.1 Cumulative Effects of Accelerated Growth in South Florida

Population growth translates into land development and increased human activity that can affect environmental and socioeconomic conditions. These changes can cause crosscutting effects on several resources.

Miami-Dade County's high-growth forecasts project that population in the southern portion of the county[1] could increase by almost 250 percent, to over 400,000 residents, by 2015. Over the same time frame, the number of jobs is forecast to almost double (from about 40,000 in 1995 to about 80,000 in 2015). In the county as a whole, both population and employment are estimated to increase by almost 25 percent. This difference in forecast population growth and employment in the south county may indicate a trend for south Miami-Dade County to become more of a bedroom community for the central and north county employment centers.

Under the Proposed Action, the reuse of former Homestead AFB and associated secondary development could contribute over 27,000 jobs to south Miami-Dade County by 2015. It is likely that some of these jobs are accounted for in the 40,000 new jobs projected for the area between 1995 and 2015 in the county high-growth forecasts. However, if all reuse-related jobs were additional, they would represent a 57 percent increase over projected job growth. The added potential for jobs would provide local employment opportunities and offset commuting trends implied in the county high-growth forecasts. The reuse-related jobs would be mostly in the south part of the county and could provide employment alternatives to south county residents who would otherwise be commuting to jobs in the north county. Increased employment would also stimulate similar increases in earnings (and spending) in the local economy.

[1] The geographic area used for south Miami-Dade County in the SEIS is defined by contiguous Transportation Analysis Zones south of Eureka Drive.

The additional, reuse-related employment would be expected to have a relatively small effect on population levels if the high-growth forecasts were achieved. Because current and projected jobs per household for south Miami-Dade County are low compared to the county as whole, it is expected that additional jobs at the former base and in the local Homestead area would draw from the local labor pool. Consequently, the ratio of jobs per household in the south county could increase to levels more typical of the county as whole. As such, reuse-related population in-migration, given a high growth situation, is estimated to increase the south county population by only about 3,000 residents. This represents about 1 percent of projected population growth in the south county between 1995 and 2015.

Higher population growth in the south county would result in higher demands for public services and increased traffic. The capacity of some water and wastewater treatment facilities servicing areas south of Eureka Drive could be exceeded before 2015. High growth could accelerate the need for improvements to these utilities by as much as 10 years compared to a moderate growth rate. The contribution of reuse-related activity to the overall growth pressures would be less than 2 percent. Similarly, planning and budgeting for anticipated deficiencies in regional and local transportation systems (based on high-growth population estimates) would be only slightly affected by an estimated 1 percent overall increase in traffic generated by reuse of the former base. The associated increase in air pollutant emissions from this increase in traffic volume would not be expected to affect the county's ability to meet its emission budgets. However, if commuter patterns were to alter due to local job opportunities, there may be a slight beneficial effect on air quality.

Population growth would also result in more rapid land development. In 1994, about 36,000 acres of the land in south Miami-Dade County was developed. About 95,000 acres of the land area was categorized as vacant (with no protective restrictions) or agricultural. Of this land, about 19,000 acres were within the Urban Development Boundary. It is estimated that the high-growth population forecasts could increase development between 1995 and 2015 by about 19,000 acres, resulting in about 42 percent of the developable land in the south county being developed by 2015, compared to about 27 percent in 1995. If development were to be limited to areas within the UDB, undeveloped land (including land currently in agricultural production) would be depleted by about 2014. It is likely that at least some of the development would occur outside the UDB.

By 2015, off-site development related to reuse of the disposal property at former Homestead AFB is estimated to range from a high of about 2,000 acres under the Proposed Action to a low of about 500 acres under some options of the Mixed Use alternative. This could increase development an additional 3–10 percent above the high-growth forecasts by 2015. Development related to reuse of the former base could accelerate the conversion of vacant and agricultural land to urban uses by about 1 to 2 years.

The cumulative effect of high population growth could result in a conversion of as much as 18 percent of the agricultural land in south Miami-Dade County, reducing its dominance of the south county landscape. Reuse of former Homestead AFB is estimated to contribute about 7 percent to that change. The proposed L-31E Flowway Redistribution Project and county's STDA would further reduce the amount of agricultural land by converting it to wetlands. At the same time, residential land use can be expected to grow from about 8 percent to about 17 percent of the land in the south county.

This increased population density could lead to encroachment in areas immediately surrounding the Homestead airfield by incompatible land uses, if adequate controls are not implemented to limit the type of development in areas exposed to high noise levels. It could also place pressures on local infrastructure, including roads used to evacuate south Florida and the Florida Keys in the event of an emergency. Traffic on U.S. Highway 1, for example, is expected to exceed capacity between SW 112th Avenue and SW 308th Street by 2015. However, the Miami-Dade County Metropolitan Planning Organization is basing roadway

improvement plans on the county's high-growth forecasts so that the regional transportation network is able to accommodate the accelerated growth. The Proposed Action's contribution to these increased population pressures is relatively modest, estimated at about 1 percent.

The level of development predicted for high growth presents a risk of loss of some wetlands and threatened and endangered species habitat in the area. Larger wetlands are protected and less vulnerable to impacts than smaller, unregulated wetlands, some of which would likely be lost. The contribution from reuse of former Homestead AFB would be about 3–10 percent, assuming it is proportional to the percent of cumulative development attributable to the Proposed Action and alternatives. Potential loss of wetlands from proposed widening of U.S. Highway 1, a project included in the Miami-Dade County Long-Range Transportation Plan, has already been mitigated and therefore should cause no cumulative reduction in wetlands. Similarly, it is assumed that state and local regulations would require no net loss in wetlands for any other major development in the future.

2.10.2 Cumulative Effects of South Florida Ecosystem Restoration Projects

A number of wide-ranging restoration projects, many now only conceptually defined, are aimed at restoring, as much as possible, the ecological systems in south Florida. While the majority of these projects would be focused on the Everglades, some components address water inputs to Biscayne Bay and the removal of exotic vegetation that has invaded disturbed land over the last few decades. Depending on the extent to which these projects are implemented, they could have substantial impacts on the environment of specific areas of southern Miami-Dade County, including the area between former Homestead AFB and Biscayne Bay.

Projects such as the L-31E Flowway Redistribution Project would not only affect the amount of water reaching Biscayne Bay, but would improve the quality of the water reaching the bay through stormwater treatment areas, sheet flow, and increased groundwater inputs. If the Flowway Distribution Project is implemented, Military Canal will no longer discharge into Biscayne Bay. The project would reduce the pulsed input of water to the bay, encouraging the development of more estuarine-like conditions. Specific projects that would help eradicate exotic species in the vicinity of former Homestead AFB have not yet been formulated. There are no activities associated with reuse of the former base expected to interfere with these projects.

Implementation of the flowway project and other ecosystem restoration initiatives, if they were to occur, would be expected to improve or maintain water and habitat quality. The development pressures that can be expected if the Miami-Dade County high-growth forecasts are realized would, however, offset and reduce some of the benefits of the ecosystem restoration projects, by increasing the amount of impervious surface and increasing stormwater runoff volumes and contaminants. Increased water demand and wastewater generated by this higher population would also have a countervailing effect.

Plans for reuse of former Homestead AFB can be expected to have both supporting and countervailing effects on the goals of ecosystem restoration initiatives. Supporting elements that would have a positive effect include:

- Reduction in surface water discharges to Biscayne Bay from Military Canal under all alternatives except the Market-Driven Mixed Use alternative.
- Preservation of all pine rockland areas containing the federally listed Small's milkpea on the former base.
- Removal of exotic plant species and caiman from the former base under the Collier-Hoover proposal. This could also be a mitigation measure under the other alternatives.

Reuse elements that would have a negative effect include:

- Increase in nitrogen inputs into Biscayne Bay under all reuse alternatives, with the highest increase under the Proposed Action.
- Increased surface water, nutrient, and toxic chemical discharge from areas surrounding the former base due to reuse-related secondary development. This would occur under all alternatives but would be highest with the Proposed Action.
- Net decrease in groundwater flows to Biscayne Bay under all reuse alternatives; decreases the most with the Proposed Action.
- Net increase in ammonia inputs to Biscayne Bay through groundwater under Commercial Spaceport alternative and, possibly, Collier-Hoover scenario.
- Wildlife exposure to increased numbers of aircraft noise events and longer noise exposures above traditional ambient levels under the Proposed Action and the Commercial Spaceport alternative, possibly leading to wildlife avoiding some areas in the immediate vicinity of the base.
- Increased development pressure and potential loss of native habitat on lands surrounding the former base, including agricultural lands.
- Small increase in the potential for spilled hazardous materials and waste to enter Biscayne Bay during flooding (e.g., from hurricane) if the Proposed Action or Commercial Spaceport alternative is implemented.
- Small increase in the risk of catastrophic aircraft accidents destroying wildlife and habitat under the Proposed Action and Commercial Spaceport alternatives.

Many of these countervailing effects (except aircraft noise and increased risks of aircraft accidents and on-site spills of hazardous materials and waste) would be the result of off-site secondary development. Unrelated baseline growth and development in south Florida would have similar effects. All impacts from secondary development could potentially be avoided or reduced through more restrictive land use regulations (zoning) and stormwater management controls on development. The analysis of the Proposed Action's contribution to growth-related impacts, as well as of the other reuse alternatives, indicates that the redevelopment and reuse of former Homestead AFB would be consistent with the goals of the Everglades restoration plan and would not prevent the projects from achieving overall restoration goals, although they could marginally contribute to reductions in the projects' effectiveness.

2.10.3 Cumulative Effects of Miami-Dade County Stormwater Treatment and Distribution Area

The county's proposed STDA would have a highly beneficial effect on stormwater discharges to Biscayne Bay by evening out surface water flows, removing pollutants, and increasing groundwater inputs. Reuse of former Homestead AFB is not anticipated to adversely affect this project, and the implementation of a stormwater management plan for the former base would reduce the quantity of pollutants discharged to Military Canal and ultimately into the STDA. Remediation of Military Canal, as is planned by the Air Force, would also decrease potential contaminants going into the STDA.

2.10.4 Cumulative Effects of Widening of U.S. Highway 1

U.S. Highway 1 is proposed to be widened between Florida City and Key Largo, principally to increase the highway's capacity for emergency evacuation in the event of a hurricane. Most of the land adjacent to this stretch of highway is protected from development, so the potential for the project to stimulate strip development is limited. It is possible, however, that the improved access could contribute to further development of the Keys. Secondary development in connection with reuse of former Homestead AFB could contribute marginally to this growth, but it is anticipated to be concentrated closer to the Homestead area rather than south of Florida City.

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2.11 SUMMARY OF MITIGATION MEASURES NOT ALREADY INCLUDED IN THE PROPOSED ACTION

The analysis of the Proposed Action and alternatives assumed that certain mitigation measures would be accomplished as part of the action (see Sections 2.2.6, 2.3.7, and 2.4.6). This section describes and evaluates potential mitigation measures that could be implemented to further reduce environmental impacts from the Proposed Action or alternatives for reuse of the disposal property at former Homestead AFB. Some mitigation measures were previously proposed by committees of the South Florida Ecosystem Restoration Working Group. Other potential mitigation measures have been identified in the course of preparing this SEIS.

2.11.1 Previously Identified Mitigation Measures

In July 1997, Ron Smola, Chairperson of the South Florida Ecosystem Restoration Working Group, forwarded recommendations to the Department of the Interior concerning the transfer of former Homestead AFB (**Smola 1997**). These recommendations were drafted by two committees of the Working Group: the Homestead Air Force Base Issue Team and the Homestead Air Force Base Drafting Subcommittee. DOI forwarded these recommendations to the Air Force.

The Issue Team Report presented recommendations in six main categories: protection buffer, water resources, noise, air quality, wildlife and habitat, and south Florida ecosystem restoration. The recommendations included conditions to be placed on property transfer and actions that would be taken by federal, state, and local agencies. Most of the recommendations involved conducting studies and developing plans. The recommended actions in each of the six categories are summarized below.

Biscayne National Park Protection Buffer. The Issue Team recommended that Miami-Dade County, supported by federal, state, and regional governments, acquire interest in lands, through fee simple title, development rights, easements, or other means, to create a protection buffer for Biscayne National Park. The recommended buffer would include at least 75 percent of existing agricultural land between the Urban Development Boundary and Biscayne Bay. Miami-Dade County has committed to the concept of a buffer, but not defined any details for it. The National Park Service has analyzed one potential configuration of a buffer. The potential for a buffer is discussed in Section 2.9.2.5.

Water Resources. Recommendations for eliminating adverse impacts on water included developing and implementing a remediation plan for Military Canal, developing and implementing a Base Stormwater Master Plan, developing and implementing Outstanding Florida Water non-degradation standards and interim Pollution Load Reduction Goals to be used in stormwater management for the former base, developing and implementing an Integrated Land Use and Water Management Watershed Plan for Miami-Dade County, expediting the design and implementation of the L-31E Flowway Redistribution Project, requiring Miami-Dade County to apply for an Environmental Resources Permit or its equivalent, developing a groundwater monitoring system, and identifying and mitigating impacts on water supply.

Many of these recommendations have been incorporated in the Proposed Action by Miami-Dade County. The county has developed a Surface Water Management Master Plan and applied for an Environmental Resources Permit from South Florida Water Management District. The county has agreed to developing a Land Use and Watershed Management Plan.

The L-31E Flowway Redistribution Project has been identified as a critical project by the State of Florida. Implementing that project would substantially improve surface water flows into Biscayne Bay and eliminate any potential discharges of stormwater runoff from former Homestead AFB into the bay.

Noise. Recommendations for minimizing noise impacts included developing site-specific protocols, conducting a study, and developing and implementing a noise management plan. These recommendations included placing a limit on commercial aviation until a plan is agreed upon and implemented. Such a limitation was included in the Administration Commission's approval of Miami-Dade County's proposed Phase 1 development of HST.

A number of noise abatement flight path alternatives have been evaluated in the SEIS to reduce aircraft noise in certain sensitive areas of the national parks. These and other potential mitigation measures are discussed in Section 2.11.2. Noise impacts and potential mitigation measures are addressed in more detail in the Noise analysis (Section 4.5) of the SEIS.

Air Quality. The Issue Team recommended a study on the impacts of aircraft emissions on the national parks and preparation and implementation of an Air Quality Plan, subject to approval by the Department of the Interior. The plan would address impacts from aircraft emissions and increased traffic created by proposed roadway improvements, as well as from secondary development. Aircraft and ground vehicle emissions and conformity with the Clean Air Act are addressed in the Air Quality analysis (Section 4.8) of the SEIS.

Wildlife and Habitat. The Issue Team recommended preparing and implementing wildlife and habitat management protection and mitigation plans for all state and federal listed wildlife resources impacted by activities on former Homestead AFB. The recommendation specified that any nesting least terns be protected and potential nesting habitat on the property be enhanced. It also specified preservation of pine rockland habitat and restoration of pine rockland remnants, as well as removal of invasive exotic vegetation. A Wildlife/Habitat Mitigation and Management Plan has been developed for the Proposed Action. It includes protection of some remnant pine rocklands on the former base and management of exotic vegetation (see Section 4.11).

South Florida Ecosystem Restoration. The recommendations in this category focused on placing conditions on the planning process and on construction and operations to ensure consistency with ecosystem restoration goals and ongoing studies and management plans. Some specific recommendations included concentrating development within the UDB, using principles of "sustainable building" to conserve water and energy, controlling hazardous waste generators, using native landscaping and xeriscaping, and maximizing recycling. The Proposed Action is not expected to interfere with south Florida ecosystem restoration efforts. Some potential mitigation measures, such as reducing discharges from Military Canal, or even blocking off the canal's mouth at Biscayne Bay (and providing alternative treatment of stormwater from the former base), could support restoration initiatives.

The Drafting Subcommittee reviewed the Issue Team report and refined the recommendations concerning remediation of Military Canal, establishment of a buffer, and limiting development and aircraft operations until a noise management plan and air quality plan have been agreed upon and implemented.

2.11.2 Additional Potential Mitigation Measures

This section describes other mitigation measures identified in the course of preparing the SEIS. These include (1) restructuring some of the departure and arrival flight paths to and from HST to reduce or eliminate aircraft noise in certain areas, and (2) other potential mitigation measures identified to reduce specific resource impacts.

2.11.2.1 Noise Abatement Flight Paths

The proposed flight paths for civilian aircraft operations included in the Proposed Action (see Section 2.2.2) were developed in consultation with FAA Air Traffic Control officials and represent their estimation of the most efficient, safe utilization of the regional airspace. During federal discussions on possible ways to mitigate noise from aircraft flying over the national parks on these flight tracks, NPS requested that FAA examine the possibility of eliminating all flights over the national parks and refuges. If complete avoidance would not be possible, NPS requested that FAA identify flight tracks that would spend the shortest possible time and generate the least amount of noise over the parks and refuges.

It was determined that there is no way that flights over national parks and refuges could be entirely eliminated. Biscayne and Everglades NPs and Crocodile Lake National Wildlife Refuge (NWR) are relatively close to Homestead, and flexibility within the airspace of south Florida is restricted by other air traffic in the area. The airspace in south Florida is a complex, three-dimensional network of crossing approach and departure traffic. Multiple tracks are interwoven in a complex system in which a change to one part results in ramifications to other parts of the airspace as far away as the Gulf of Mexico and as far north as Orlando and Jacksonville. Even existing military aircraft at Homestead ARS and traffic from other airports currently fly over the national parks and the refuge. The ability to introduce new flights tracks to serve commercial traffic at HST is restricted by procedures already in place.

Although complete avoidance of the national parks and refuge was not deemed possible, several potential modifications to the Proposed Action flight corridors were considered. Three noise abatement flight path alternatives were developed for examination in this SEIS, to assess their potential for reducing impacts from the Proposed Action on noise-sensitive areas in Biscayne NP, Everglades NP, Crocodile Lake NWR, and Big Cypress National Preserve. They are shown in **Figures 2.11-1**, **2.11-2**, and **2.11-3**. As the figures show, each alternative includes a relocation of some of the flight corridors, either away from the national properties or to different areas over those properties.

The noise abatement flight path alternatives result in very little change to noise levels in areas close to the runway. Day-Night Average Sound Level contours of 60 decibels and above are almost identical. The effects of the modifications are more discernible farther out. The following subsections summarize the effects of each alternative relative to the base case analyzed for the Proposed Action. Maps showing the reductions and increases in noise levels are provided in Section 4.5.

Noise Abatement Flight Path Alternative 1. This alternative would not affect overall Peak Hour Equivalent Sound Levels, but it would involve some decreases and corresponding increases in single-event maximum sound levels in central and southwestern portions of Everglades NP. The differences are greater in the amount of time aircraft noise would exceed the traditional ambient sound levels in the national properties. At maximum use of the single runway at HST, reductions of up to 10 minutes per day, on average, could be expected in the western and southern portions of Biscayne NP. Reductions of up to 10 minutes per day could also occur in north-central and southeastern areas of Everglades NP, with further reductions of up to 30 minutes per day in some portions of these areas. Reductions of up to a half hour, exceeding a half hour in some areas, might be realized along the eastern edge of Everglades NP, north of the extended runway centerline at HST. Corresponding increases in time of noise exposure would result over Crocodile Lake NWR (mostly under 10 minutes per average day but 10 to 30 minutes in some areas), northeast portion of Biscayne NP (less than 10 minutes), and the area under the straight-in approach corridor in Everglades NP (amounting to over 30 minutes per average day in places), as well as portions of central and southeastern Everglades NP (less than 10 minutes).

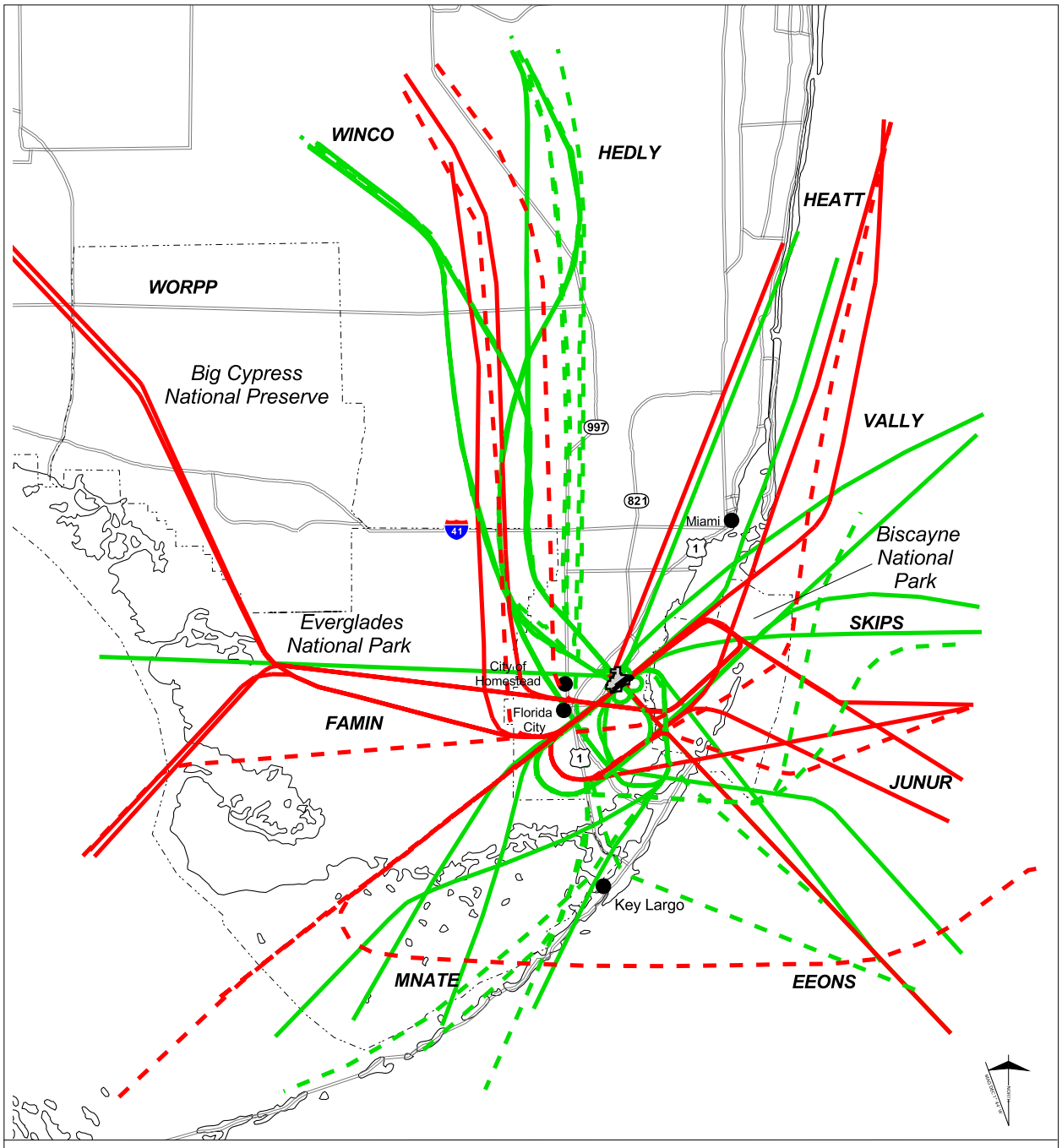
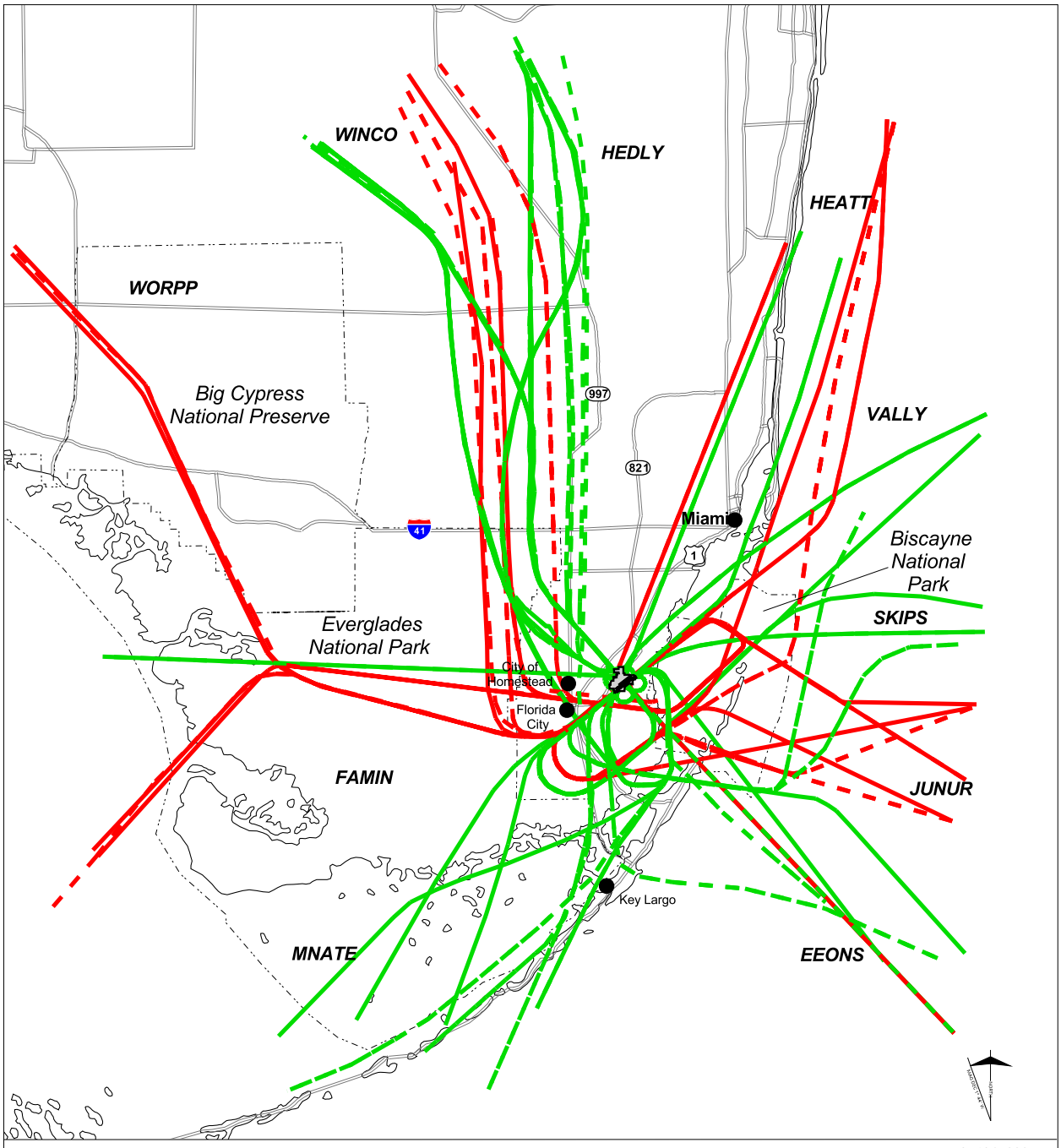


Figure 2.11-1
Noise Abatement Flight Path
Alternative No. 1



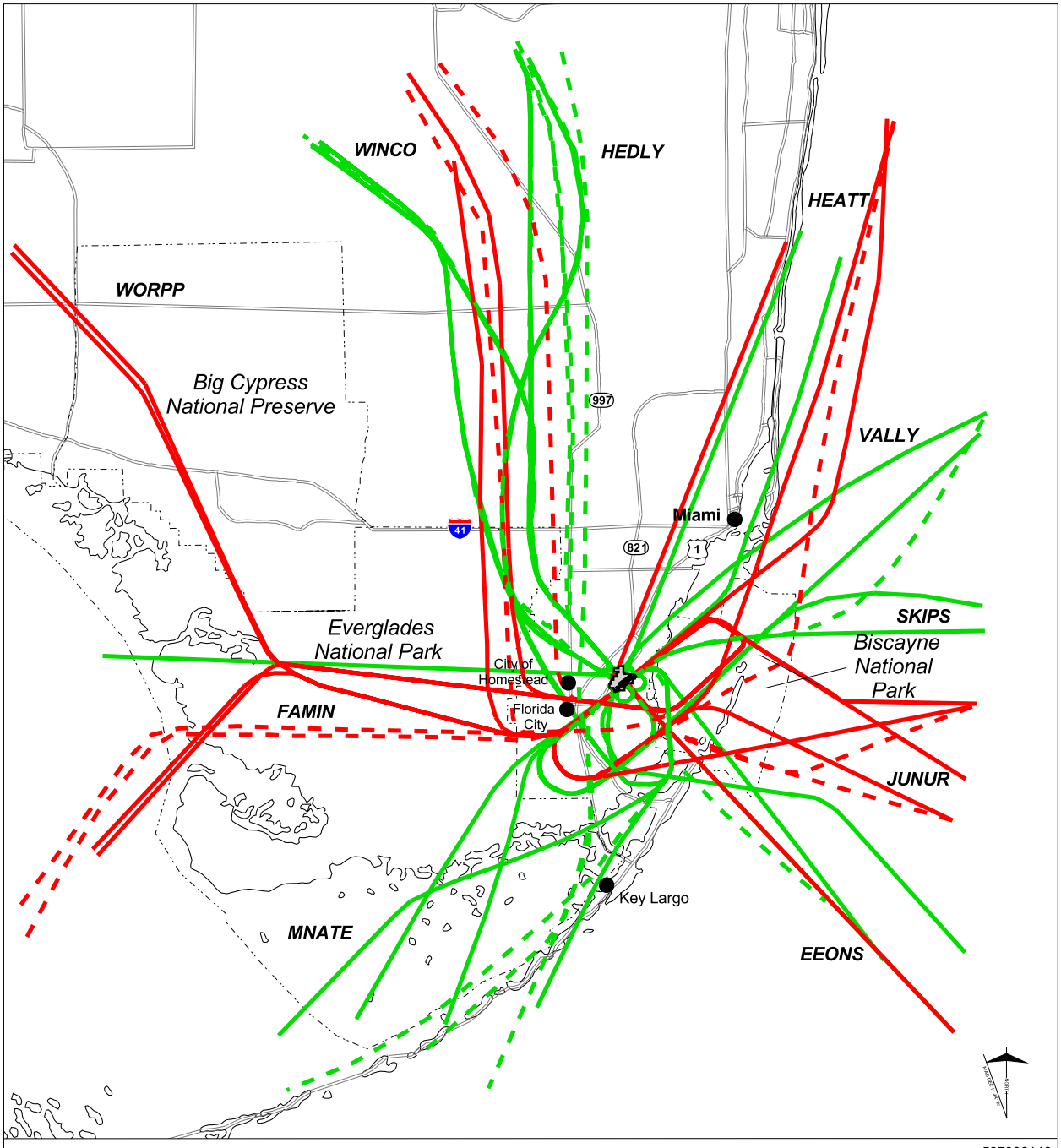
LEGEND

- Proposed Action Arrival Flight Path
- Proposed Action Departure Flight Path
- Noise Abatement Arrival Flight Path
- Noise Abatement Departure Flight Path
- *EEONS* Navigational Fix
- Former Homestead Air Force Base
- National Park or Preserve Boundary
- City
- Highway
- Interstate Highway
- U.S. Highway
- State Highway

10 0 10
Scale in Miles

Derived from: Landrum & Brown 1999c, Landrum & Brown 1998

Figure 2.11-2
Noise Abatement Flight Path
Alternative No. 2



LEGEND

- Proposed Action Arrival Flight Path
- Proposed Action Departure Flight Path
- Noise Abatement Arrival Flight Path
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- *EEONS* Navigational Fix
- Former Homestead Air Force Base
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- City
- Highway
- Interstate Highway
- U.S. Highway
- State Highway

10 0 10
Scale in Miles

Derived from: Landrum & Brown 1999c, Landrum & Brown 1998

Figure 2.11-3
Noise Abatement Flight Path
Alternative No. 3

Noise Abatement Flight Path Alternative 2. As with the first noise abatement alternative, this alternative would not affect overall Peak Hour Equivalent Sound Level. Unlike the first alternative, this alternative would reduce the maximum sound level through 2015 in a very few areas of Everglades NP and Biscayne NP without noticeably increasing it in other areas. Examination of changes in the amount of time above traditional ambient sound levels indicated that the east half of Everglades NP would experience a general reduction in time of exposure, as would the western portion of Biscayne NP. A large part of the eastern half of Everglades NP could receive a decrease of up to 10 minutes as a daily average, while the northeastern portion of the park could receive a larger decrease of up to 30 minutes a day. The northeastern third of Biscayne NP, a southeastern area of Everglades NP, and scattered areas within Everglades NP would experience increases of less than 10 minutes per day, on average. Crocodile Lake NWR would experience increases of less than 10 minutes per average day in its central area, increases of 10 to 30 minutes north and south, and increases greater than 30 minutes in a few northerly areas.

Noise Abatement Flight Path Alternative 3. One of the flight track relocations included in this noise abatement alternative would have the effect of decreasing the maximum sound level in areas at the west-central edge of Everglades NP, with corresponding increases in LAmax along an east-west band through the central area of the park. Peak Hour Equivalent Sound Levels would not be affected. Exposure time above traditional ambient levels would be reduced in northeast Everglades NP, southwest of the airport over Florida Bay, the western edge of Everglades NP, the southern half of Biscayne NP, and the northern portion of Crocodile Lake NWR. Except for the northeastern Everglades NP area and one area near the western edge of Biscayne NP, where decreases could be up to 30 minutes a day (and over 30 minutes in a portion of east Everglades NP), the decreases would generally be less than 10 minutes per day. Corresponding increases would be experienced in the northern half of Biscayne NP, the southern half of Crocodile Lake NWR, and the center and southeastern portions of Everglades NP. All would be less than 10 minutes a day, except the middle of Everglades NP, where increases of up to 30 minutes a day could be experienced at maximum use of the single runway.

2.11.2.2 Other Potential Mitigation Measures

The analysis of environmental consequences identified a number of mitigation measures that could reduce or eliminate potential adverse impacts. The measures with the most potential for reducing environmental impacts are summarized below by resource. It is assumed that redevelopment and reuse of the disposal property would employ best management practices in compliance with existing and future laws and regulations. These are not included as mitigations.

Socioeconomics. Miami-Dade County or the site developer for the selected alternative could establish training programs to enable the local workforce to qualify for reuse-related jobs.

Transportation. Traffic generated by the Proposed Action and alternatives could further degrade level of service on several segments of U.S. Highway 1, Krome Avenue, 127th Avenue, 268th Street, and/or 288th Street. Adding lanes along these segments would increase capacity and maintain acceptable level of service on these roadways. This mitigation could be implemented by Miami-Dade County and may be funded with Federal Highway Administration and/or state funds. At the time that development and associated traffic reached substantial levels (close to 2015), consideration could be given to providing more mass transit support to the site. This would be appropriate under the Proposed Action or Collier-Hoover proposal.

Utilities. The Alexander Orr, City of Homestead, and Florida City water treatment plants are expected to experience capacity problems with or without the reuse of former Homestead AFB, as a result of overall population growth in the region. Reuse of the former base would further aggravate these problems to a

small degree. Improvements are already planned at these plants. With the additional demand generated by the Proposed Action, as well as the other reuse alternatives, the expansion plans should be reviewed and revised if necessary to ensure they include an adequate margin of extra capacity.

Airspace and Safety. Certain land uses in the vicinity of the Homestead airfield have the potential to increase the risk of bird-aircraft strikes. Activities that attract large congregations of birds, such as landfills and wetlands, could be of concern under the Proposed Action and Commercial Spaceport alternative. Coordination between airport operators, local developers, and natural resource management agencies could be focused to reducing the risk. The most effective method for reducing bird-aircraft strike risks is through land use practices on or close to the airport (such as those in FAA Advisory Circular 150/5200-33), to avoid attracting and sustaining populations of birds that pose hazards for aviation. For areas that may already pose a risk, the airport operator would need to develop a bird-airstrike hazard mitigation plan that might include measures to control vegetation and to discourage birds, particularly wading birds, from congregating near the airfield. Plans to increase wetlands in the vicinity of the former base, including the county's proposed stormwater treatment and distribution area east of the former base, would need to be reviewed by the airport operator to assess their potential to increase bird-aircraft strike risks. If the Collier-Hoover proposal (one potential approach to the Mixed Use alternative) were to be implemented, the proposed on-site network of wetlands would need to be evaluated for its potential to increase bird-aircraft strike risks for continuing military and government aircraft operations. Measures such as vegetation control to discourage congregation of birds near the airfield might need to be incorporated in the development.

Noise. In addition to the noise abatement flight path alternatives described in Section 2.11.2.1, other potential measures for reducing the effects of aircraft noise could be considered. Potential mitigation may involve acquisition of residential property and relocation of residents in areas of significant noise exposure; alternatively, structural sound attenuation could be employed. Miami-Dade County could adopt land use controls to prevent new residential development in areas that would be exposed to DNL 65 decibels or higher. This mitigation would be appropriate under any alternative, including the Mixed Use and No Action alternatives, to prevent development that would be incompatible with continued military and government aircraft operations at Homestead. If a buffer is established, portions of the buffer could prevent noise-sensitive development within airport noise contours.

Thrust management during aircraft departures and approaches is used at some airports to reduce noise. A typical close-in noise abatement departure profile can benefit areas 3 to 5 miles from a runway, while a typical distant noise abatement departure profile can benefit areas 5 to 9 miles away. Noise abatement departure profiles are related to specific aircraft, as operated by specific air carriers, and cannot be quantified with more clarity at this time. There are also techniques for reducing noise on approach (e.g., reducing level segments in the approach profile, maintaining higher altitudes). These would require more system-wide review of airspace interactions in south Florida. Advanced navigational procedures using new technology, such as global positioning, flight management systems, and area navigation systems, are expected to provide future opportunities for avoiding or minimizing noise over sensitive areas. Noise benefits would be expected at greater distances from the airport than the immediate adjacent community and would be more likely to accrue to the national parks and refuge.

A restriction on the number of air carrier operations has been suggested for noise mitigation. The federal government is not authorized by law to impose such a restriction. An airport proprietor such as Miami-Dade County may adopt reasonable, nondiscriminatory restrictions on aircraft operations that do not impose a burden on interstate commerce. The Airport Noise and Capacity Act of 1990 requires a demanding benefit/cost analysis and conformance with strict criteria before a restriction may be adopted by an airport proprietor. An airport proprietor operating on a military airfield under a joint management agreement would be subject to the same standards as a condition of receiving an FAA grant.

While not within the range of mitigation reviewed in the SEIS, reductions in the source noise of commercial aircraft are expected to be in place years before a commercial airport at Homestead would reach maximum use. Quieter aircraft of the future would have beneficial noise reduction effects on the community and the national parks and refuge.

Miami-Dade County, in consultation with FAA, NPS, and other appropriate parties, could periodically review the noise impact of a commercial airport at Homestead in order to develop, maintain, and implement a program to minimize noise for the community and the national parks and refuge. Periodic reviews at reasonably spaced intervals could evaluate the growth in aircraft operations and noise, advances in aircraft noise reduction, new technologies in aircraft operation and air traffic procedures, and changes in community land uses and in national park plans and operations that are relevant to noise. Such reviews can also help determine whether airport noise restrictions are needed to abate noise.

Land Use and Aesthetics. If the Proposed Action or Commercial Spaceport alternative were implemented, areas near the airfield and under the immediate approach and departure paths into and out of the airfield would be exposed to high noise levels. Land use controls could be adopted in the Miami-Dade County Comprehensive Development Master Plan to prevent incompatible land uses, such as residences, from being developed in those areas in the future. A land buffer between the site and Biscayne NP would be one method for preventing incompatible development east of the site. The county could consider the location of residential uses in planning transportation routes to commercial and industrial areas, and noise attenuation measures such as greenbelt buffers and noise barriers could be implemented if warranted. Similarly, landscaping and buffering could be used in the Mixed Use alternative to reduce impacts from visitor traffic and noise in proximity to the Homeless Trust Center.

A buffer between the former base and Biscayne NP could help contribute to preservation of agriculture in areas within the buffer. Implementation mechanisms that have been mentioned include direct purchase of land, purchase of development rights, and transfer of development rights. Other incentives and supports to local farmers could be used to help ensure the continued viability of agriculture in the region and inhibit conversion of agricultural land to development.

Use of noise abatement flight path alternatives could reduce the number of aircraft operations over sensitive visual resources in the national parks. Miami-Dade County could consider the effects of increased on-site lighting, especially from vehicle parking areas, in the airport design to reduce visibility from Biscayne NP.

Hazardous Materials and Waste. Phased development plans coordinated between the Air Force and the recipients of the disposal property are suggested to enable construction to begin in areas with no outstanding cleanup requirements. It is assumed that a single site owner operator, such as Miami-Dade County or a Commercial Spaceport operator, would develop appropriate hazardous materials and waste management plans and spill control and countermeasures plans. If the property were to be disposed of incrementally to multiple owners, as is considered under the Market-Driven approach to the Mixed Use alternative, those owners could establish a coordinated planning body for managing hazardous materials and waste and increasing the effectiveness of compliance, spill response, and waste minimization. A coordinated approach could also reduce the costs associated with compliance for the individual property owners.

Earth Resources. Invasion of exotic plant species on disturbed areas could be minimized by replanting areas that are disturbed during construction of facilities. This mitigation could apply to any of the alternatives and would be implemented by the developer(s). An agricultural land protection program in Miami-Dade County could reduce the permanent conversion of unique farmlands to non-agricultural uses due to reuse-related secondary development, as well as ongoing growth and development in the south county.

Air Quality. A substantial portion of the increased air pollutant emissions from the Proposed Action and alternatives is estimated to come from increased traffic. The Metropolitan Planning Organization for Miami-Dade County could develop a transportation plan in connection with Homestead redevelopment that would examine transit alternatives, including light rail connections to Miami, to reduce vehicle air pollutant emissions. Airport-related emissions could be reduced by encouraging use of larger aircraft and using electric-powered ground equipment. Terminal development could provide central power and air conditioning to reduce the need for auxiliary power units. Air quality monitoring could also be implemented.

Water Resources. The stormwater management system assumed in the Proposed Action would help reduce stormwater runoff flows from Military Canal into Biscayne Bay. This would, in turn, reduce the risk of contaminants being carried into the bay through surface water. Further reductions in potential contamination could be achieved by building a stormwater treatment and distribution area to receive the runoff from the site. If such a system were designed to distribute the treated water overland to Biscayne Bay, the quality of surface water inputs into the bay could be substantially improved, and Military Canal could be blocked off to eliminate any discharges from the canal into the bay. If the canal is not blocked off, capping or cleaning up the contaminated sediments in the canal, as is being evaluated in the ongoing Feasibility Study, would reduce the possibility that contaminants could be transported to Biscayne Bay. A land buffer between the former base and Biscayne NP could help with the management of surface water inputs into Biscayne Bay and limit development that could result in increased runoff discharging into the bay. If the Mixed Use alternative is selected, the Air Force and the recipient of the disposal property could develop a joint site-wide master stormwater management plan. A comprehensive water quality monitoring program could be implemented under any alternative.

Biological Resources. The Proposed Action includes a Wildlife/Habitat Mitigation and Management Plan that would protect the most important remnant pine rocklands on former Homestead AFB. Measures to protect the pine rocklands that are not included in the plan could be implemented but would be expected to have marginal additional benefit. The Collier-Hoover proposal includes a statement of intent to protect the pine rocklands but no specific plan. As requested by U.S. Fish and Wildlife Service, deed covenants will be used to ensure protection of the pine rocklands with Small's milkpea under any reuse alternative. Surveys for the threatened eastern indigo snake are suggested prior to construction on the disposal property. If any are found, appropriate mitigation would need to be developed in consultation with U.S. Fish and Wildlife Service and the Florida Game and Fresh Water Fish Commission. A land buffer between the former base and Biscayne NP would help protect sensitive wildlife along the mangrove fringes from encroachment by development.

Effects on Minority and Low-Income Populations. An area of farmworker housing is located southwest of the Homestead ARS airfield. Implementation of the Proposed Action would increase that area's exposure to aircraft noise. A number of mitigation measures are available to reduce the effects of increased noise levels. Noise measurements could be taken to assess the sound attenuating capabilities of the housing structures, and additional structural attenuation might be provided to reduce indoor noise levels. Alternatively, residents could be relocated to a more compatible area. If residents are not relocated initially, periodic noise evaluation could be performed by the airport operator to monitor noise increases as commercial aircraft operations increased, in order to determine whether further mitigation would be warranted. Federal Aviation Regulation Part 150 provides procedures for assessing impacts from aviation noise and implementing appropriate mitigation measures. If the Commercial Spaceport or Mixed Use alternative is implemented, Miami-Dade County, the City of Homestead, or the reuse developer could voluntarily relocate this housing area to mitigate exposure to high aircraft noise levels from ongoing military and government operations at Homestead ARS.

2.12 IDENTIFICATION OF THE PREFERRED ALTERNATIVES

Council on Environmental Quality regulations (Section 1502.14) require federal agencies to identify their preferred alternative in the final environmental impact statement. The preferred alternative is to be identified by the lead agency; in this case, there are two lead agencies, the Air Force and FAA. The identification of a preferred alternative is a required disclosure of the lead agencies' present preferences, but the agencies have not made any final decisions, and all alternatives will be considered.

The SEIS has examined four alternatives: the Proposed Action, the Commercial Spaceport, Mixed Use, and No Action. Of those, the Commercial Spaceport would require lengthy additional planning and analysis, and the No Action alternative is not consistent with the basic goal of economic redevelopment. By contrast, the Proposed Action and the Mixed Use alternative, especially in the form of the Collier-Hoover proposal, are backed by proponents capable of implementing them in the near term, and both could bring substantial economic redevelopment to the local area. The Air Force does not consider the potential environmental impacts of either of those alternatives to be disqualifying. Therefore, the Air Force prefers the Proposed Action and Mixed Use alternatives and believes that it could implement either one, or parts of one, consistent with its stated goals.

The Air Force also has a preference for disposing of the surplus property to Miami-Dade County. Base closure policies of the Congress and of DOD normally favor disposal to the Local Redevelopment Authority. Either of the two preferred alternatives could be implemented in whole or in part by disposal to the LRA.

The FAA has a stronger preference for the commercial airport proposal because it would provide needed additional airport capacity for south Florida. The FAA believes that the commercial airport proposal can include appropriate environmental mitigation for the surrounding community, Biscayne Bay, and the national parks.

The cooperating agencies have identified the alternative they consider to be preferred and most in keeping with their missions and responsibilities. The Department of the Interior (the agency of which the National Park Service and U.S. Fish and Wildlife Service are a part) has identified the Collier-Hoover proposal as its preferred alternative. USEPA identified the Mixed Use alternative as its preferred alternative.

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