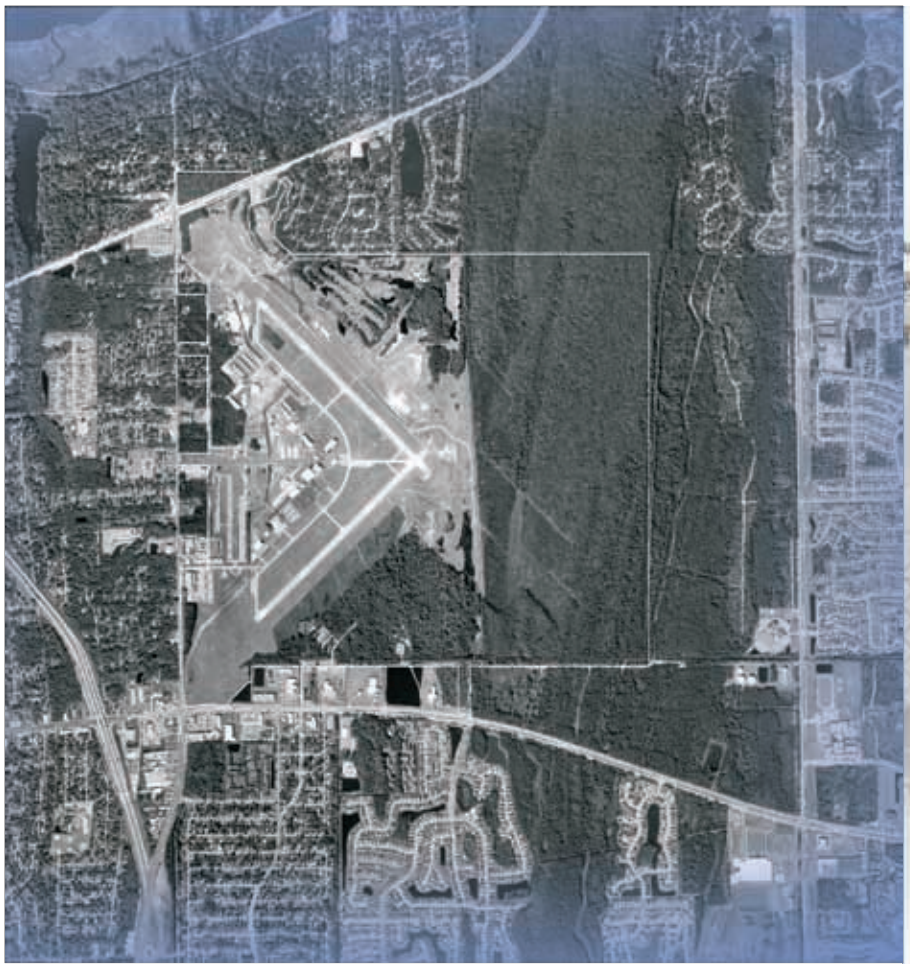
CRAIG AIRPORT
FAR PART 150 NOISE AND LAND USE COMPATIBILITY STUDY

Noise Exposure Maps and Noise Compatibility Plan

Prepared for:
Jacksonville Airport Authority

December 2006



JACKSONVILLE AIRPORT AUTHORITY

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INTRODUCTION

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INTRODUCTION

The purpose of the Craig Municipal Airport (CRG) Federal Aviation Regulation (FAR) Part 150 Study is to evaluate the Airport's existing noise conditions, determine if current voluntary operational procedures are achieving their desired effect, and identify other opportunities to reduce aircraft-related noise impacts on the communities surrounding the Airport. The Study provides the opportunity for the Jacksonville Airport Authority (JAA), the aviation industry, affected political jurisdictions and Airport neighbors to work together in the evaluation of potential noise reduction and land use control measures.

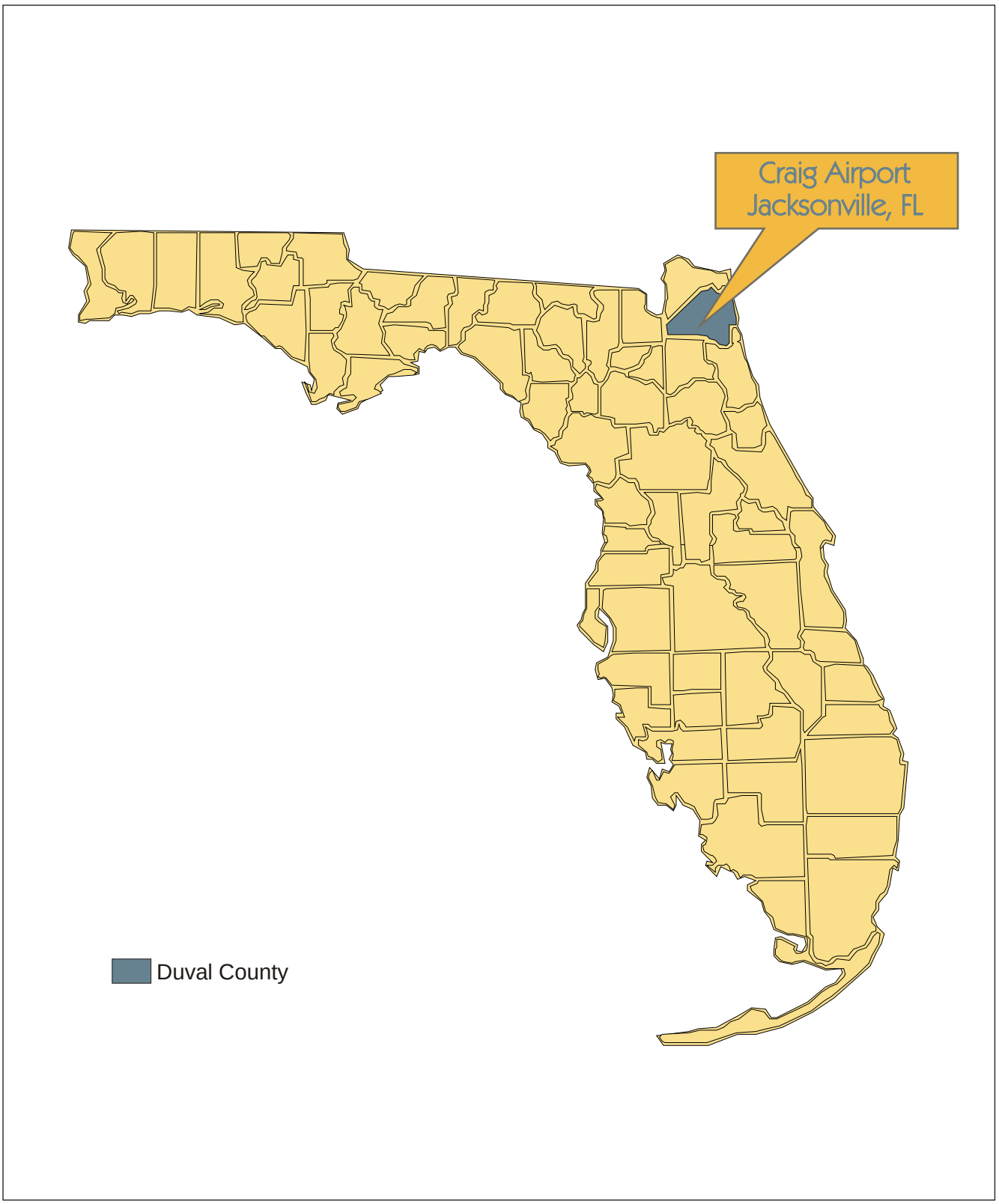
A. AIRPORT LOCATION

As shown in **Exhibit 1-1** Craig Municipal Airport (CRG) is located in Duval County, Florida and is within the corporate limits of the City of Jacksonville. The airport is approximately nine miles east of the downtown central business district, in the area known as Arlington. The airport resides on approximately 1,432 acres that is owned by the Jacksonville Airport Authority (JAA). The Airport is bordered by five main arterial roadways; to the south is Atlantic Boulevard; to the east is Kernan Road; to the west St. Johns Bluff Road; and to the north is Monument Road and portions of McCormick Road. As shown in **Exhibit 1-2** the airport property is adjacent to residential, commercial/institutional, and conservation type land uses.

B. AIRPORT ROLE

CRG is a designated Reliever Airport for Jacksonville International Airport (JAX), as defined in the FAA's National Plan of Integrated Airports Systems. The role of a reliever is to provide a close alternative airport for certain types of air traffic thus relieving congestion at the larger commercial service airport. CRG is located approximately 14 miles southeast of JAX, drawing General Aviation air traffic away from JAX, thereby reducing delays and congestion for scheduled airlines serving passengers at the International Airport. CRG is home to more than 300 based aircraft which include single and twin engine propeller aircraft, turboprop and turbojet aircraft and helicopters. The Airport also has facilities to accommodate the mooring of blimps.

In addition to serving as a reliever airport to JAX, Craig provides economic stimulus to the local economy. An economic study completed in 1999 indicated that Craig Airport contributes $40 million annually to the region's economy. **Exhibit 1-3** (Base Map) illustrates the extent of existing development within the vicinity of the Airport.



SOURCE: ESA Airports

Craig FAR Part 150 Study. 203086

Exhibit 1-1

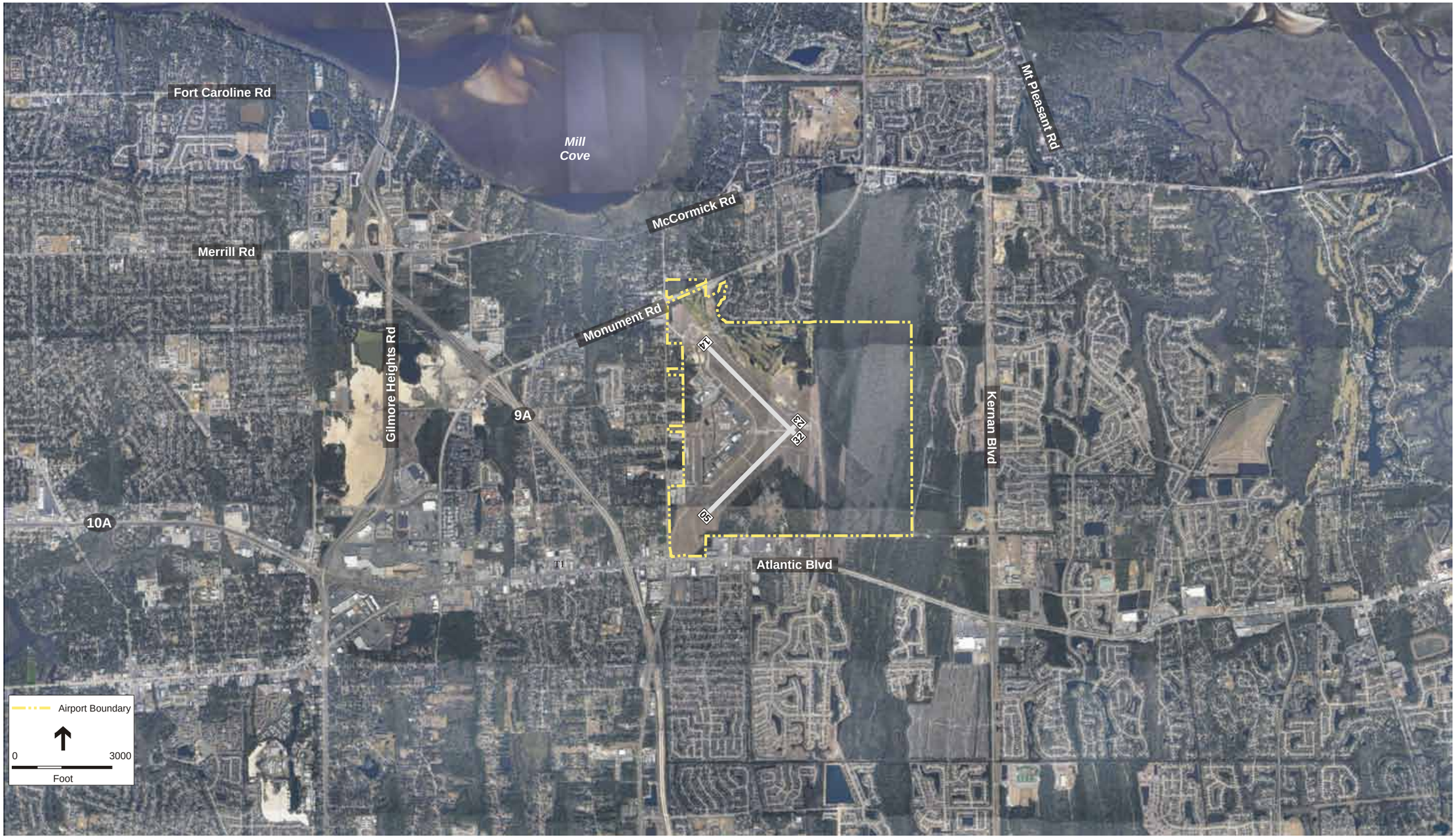
Location Map

SOURCE: ESA Airports

Craig FAR Part 150 Study . 203086

Exhibit 1-2

Airport Vicinity



AERIAL SOURCE: City of Jacksonville, 2004

Exhibit 1-3

Aerial Base Map

C. HISTORY OF THE AIRPORT

Craig Airport's origin dates back more than 60 years to its initial development by the US military during World War II. The airport is one of six Jacksonville airports developed by the US military for training activities during this period and one of the two airports given to the City of Jacksonville for general aviation use following the war under the Federal Surplus Properties Act of 1946. The other airport is Herlong Airport. On the day the City took over the operation of the Airport, it was officially named Craig Field after Jacksonville's first hero of World War II, Navy Commander James Edwin Craig. Commander Craig was killed during the attack on Pearl Harbor. Craig Airport has the distinction as the site of the first performance of the Navy Flight Demonstration team, months later to be officially named the Blue Angels.

Craig Airport remained under city operation until 1968 whereupon it was turned over to the Jacksonville Port Authority (JAXPORT) for operation along with Herlong and the nearly completed Jacksonville International Airport. Craig remained under JAXPORT operation until the establishment of the Jacksonville Airport Authority (JAA) in 2001. At this time the management and operation of all three airports along with Cecil Field was taken over by the JAA.

D. PREVIOUS STUDIES

The following studies were obtained from the JAA or other agencies during the data collection phase of this project. These documents were reviewed for valuable historic data and significant insight into the process of long-range planning at the Airport and the areas within the study area that may be influenced by aircraft activity and it associated noise levels.

- Master Plan Update, Prosser & Hallock, Inc., TriState Planning & Engineering, P.C. October, 2001.
- Noise Mitigation Program and Noise Contour Analysis, TSI/ESA Airports, March 2000.
- Zoning Maps (City of Jacksonville)
- Comprehensive Plans (City of Jacksonville)

E. NEED FOR THE PREPARATION OF A FAR PART 150 STUDY

A noise mitigation program and noise contour analysis study was developed in the year 2000 that recommended and implemented a number of mitigation measures to help reduce the noise impacts around CRG. However, there has never been a formal FAA FAR Part 150 study conducted at CRG Airport. With the new mitigation measures in place, the JAA wanted to proceed with a formal FAR Part 150 study to not only review the effectiveness of these mitigation efforts but also review and assess recent changes at the Airport (such as the relocation of National Guard Apache helicopters from CRG to Cecil Field).

F. FAR PART 150 PLANNING PROCESS

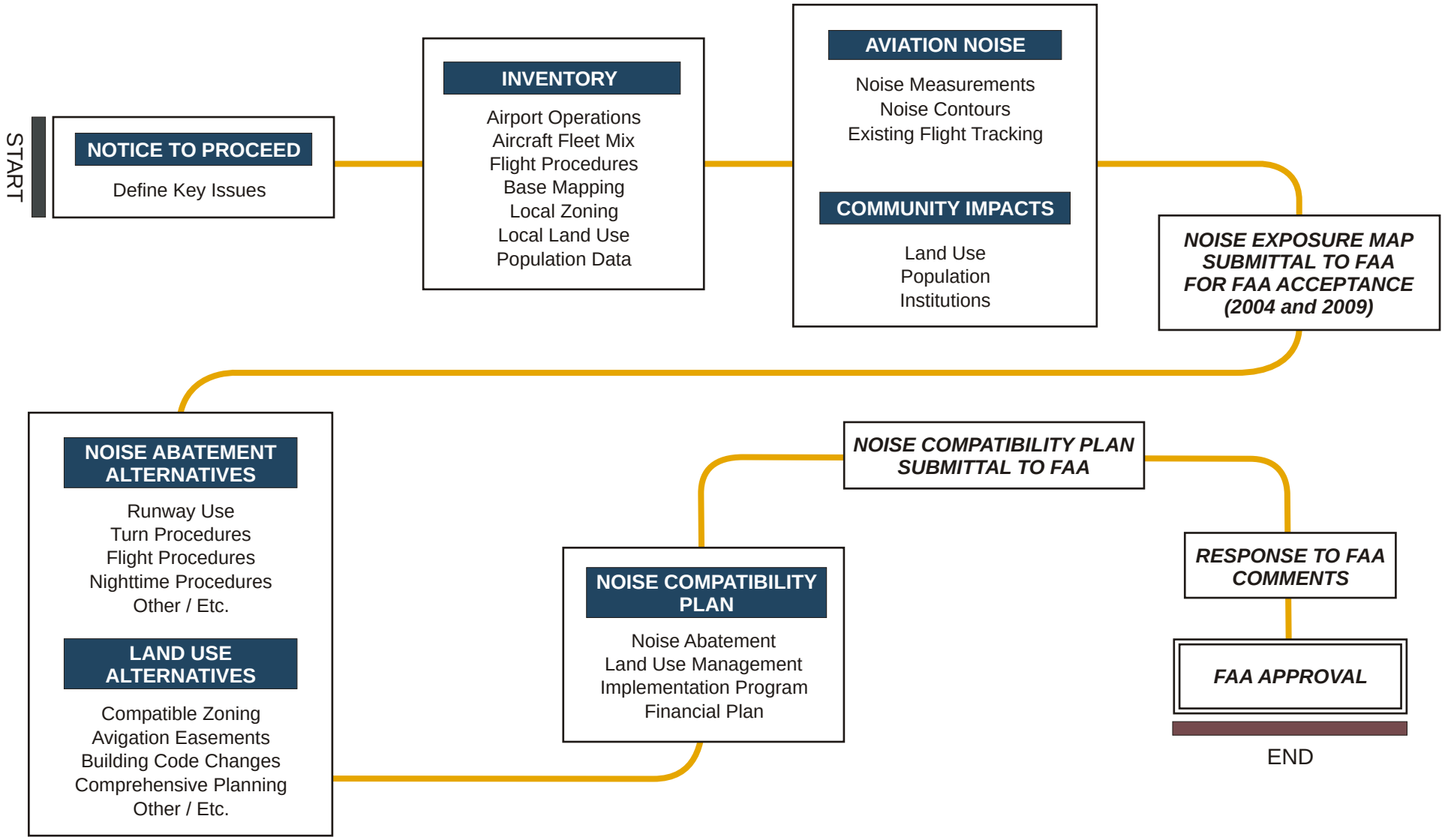
The preparation of a FAR Part 150 Study requires compilation of accurate information regarding the airport and a series of steps which will serve as the foundation for the Noise Exposure Maps and the eventual development of the Noise Compatibility Program. **Exhibit 1-4** provides an outline of this process. First, an airport's existing facilities and operational activity is inventoried. This involves data collection efforts concerning the number of aircraft operating at the airport on an annual basis, the time of day in which the aircraft operate (day/night) and the types of aircraft. Existing aircraft operational procedures are also inventoried (i.e., runway use, departure and arrival corridors). After collecting this data, a noise prediction computer model (required for use by the FAA) is used to produce noise contours (areas of equal noise exposure) for the existing condition. For the CRG Study, the year 2004 represents the baseline year for existing conditions.

A forecast of aircraft operations for a period five years from the existing baseline year is used to produce noise contours for the projected five year noise exposure condition. The current and future five year noise contours are collectively known as an airport's Noise Exposure Maps (NEM). The NEM's serve as a basis for analyzing and comparing alternative operational and land use noise mitigation measures and for determining the extent of off-Airport compatibility. Existing/future land use and zoning plan data are also collected for the political jurisdictions directly affected by aircraft noise. The NEM's are then overlaid on the land use mapping to identify noise sensitive sites and land uses that are incompatible with aircraft noise. Following the completion of the NEMs, measures to improve noise compatibility around the Airport are evaluated including possible changes in the aircraft operational procedures and possible changes to the affected jurisdiction's future land use and zoning requirements.

A Noise Compatibility Plan (NCP) is then prepared that documents the noise mitigation alternatives considered and presents recommended changes. The combined NEM/NCP report is the FAR Part 150 study and once finalized it is submitted to the FAA for approval.

Throughout this process, the study is coordinated with representatives of the affected political jurisdictions and aviation interests. Coordination also occurs with the public through public meetings, workshops or hearings. These public forums present any findings and the status of the study and are scheduled and advertised by the JAA.

The FAR Part 150 Study Update for CRG was developed in two Phases. Volume 1 of this report presents documentation for the first phase: the identification of current operational activities at CRG, development of both the current and future NEM's and the existing/future land use plans for the political jurisdictions in the vicinity of the Airport. It should be noted that the five year NEM presented in Phase I assumes that existing operational procedures remain the same in the future as they occur today. Volume 2 represents the second phase of the Study (the NCP) and addresses the consideration of changes in the operational procedures at CRG, other mitigation actions that may be desired, and land use regulations to enhance noise / land use compatibility.



SOURCE: ESA Airports

Craig FAR Part 150 Study . 203086

Exhibit 1-4

Study Process

CHAPTER 2

CURRENT NOISE ABATEMENT/LAND USE MANAGAMENT PROGRAM

CHAPTER 2

CURRENT NOISE ABATEMENT / LAND USE MANAGEMENT PROGRAM

Noise abatement procedures that are currently in use at CRG were developed during the preparation of the 2000 Noise Mitigation Program and Noise Contour Analysis study and the 2001 Master Plan Update study. The implementation of the current noise abatement procedures has been the responsibility of the Airport Authority, the FAA and aircraft operators. Current measures include:

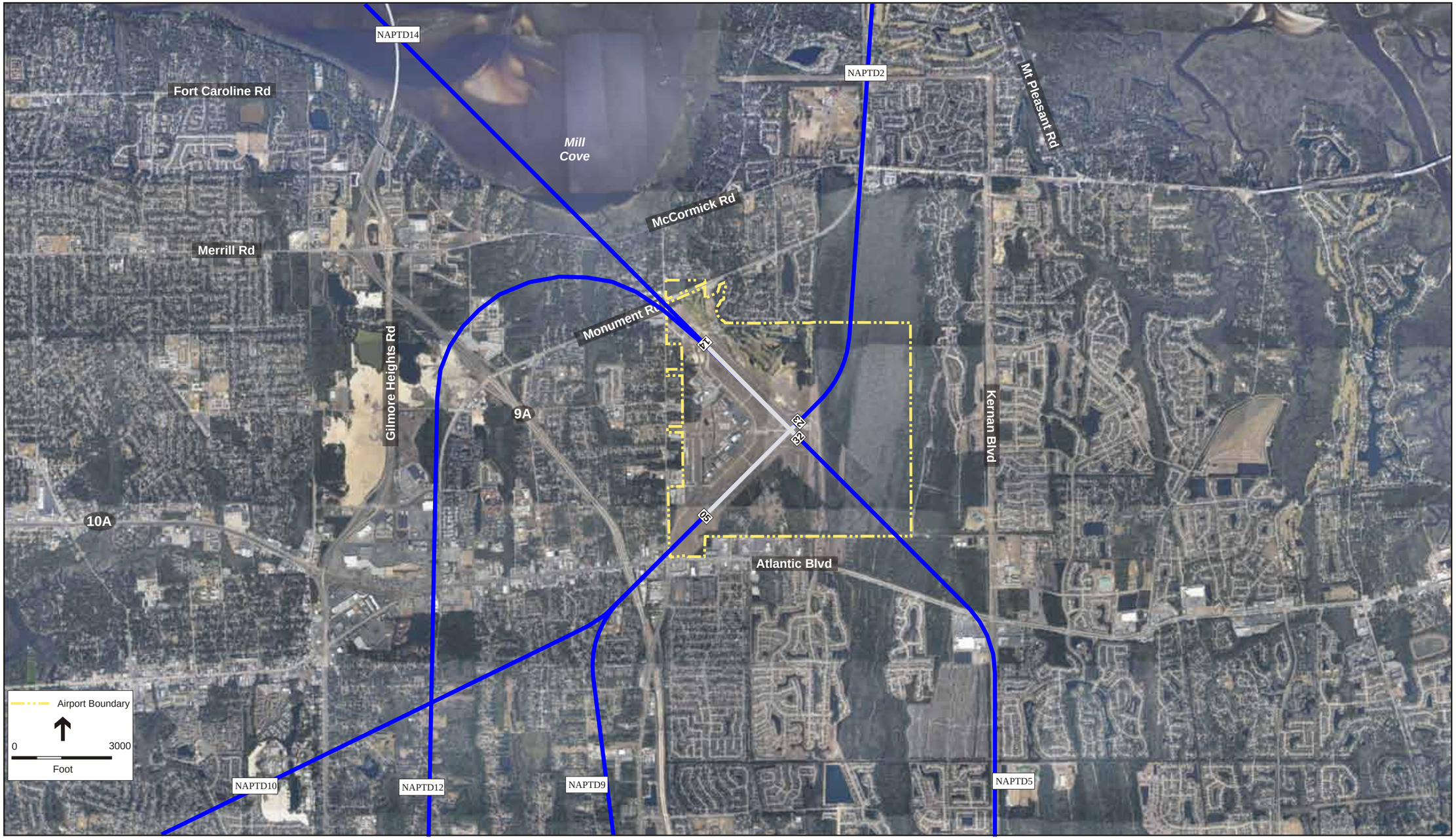
- Operational Procedures
  - Aircraft Departure Procedures
  - Aircraft Arrival Procedures
  - Aircraft Touch and Go Procedures
  - Shorten Runway 5-23 Training Pattern
  - Helicopter Arrival and Departure Corridors
  - Minimize Turbojet Instrument Approach Practice
  - Control Ground Maintenance Engine Run-ups
  - Staff Position as an Airport Noise Specialist
  - Educate Operators on Procedures
  - Encourage Use of NBAA Noise Abatement Procedures
  - Preferential Runway Use Program
- Land Use Mitigation

A. OPERATIONAL PROCEDURES

Noise abatement operational procedures are aircraft operational procedures that change how an aircraft operates while in the air or on the ground in efforts to reduce potential noise to noise sensitive uses. This section highlights the various procedures identified in the 2000 study and indicates the status of each. The "tracks" shown in Exhibits 2-1 through 2-4 indicate flight tracks that were recommended for modification following the 2000 study.

Aircraft Departure Procedures

Exhibit 2-1 shows VFR Noise Abatement Procedure Departure Tracks D2, D5, D9, D10, D12, and D14 which take advantage of areas with higher background noise levels, open space, or less densely populated areas. The D2 track is centered on Monument Road northward. Aircraft on the track would be climbing as they depart over primarily commercial/industrial land use rather than over the residential area. Track D5 is centered on Kernan Road south. Aircraft departing on D5 maintain runway heading and execute a right turn in the vicinity of the Atlantic



AERIAL SOURCE: City of Jacksonville, 2004

SOURCE: ESA Airports

Craig FAR Part 150 Study . **203086**

Exhibit 2-1

VFR Noise Abatement Departure Flight Corridors

Boulevard/Kernan Road intersection. This places aircraft to the west of Kensington. Track D9 has aircraft turning as soon as practicable and heading to St. Johns Bluff Road. Track D10 places aircraft over less densely populated portions of Arlington. Departing aircraft on Track D12 climb out over some residential areas but would turn to the south along Monument Road to avoid some residential area overflights. Track D14 has aircraft climbing out over water. Due to the turn requirements of some of these tracks and the speed at which they fly, jet aircraft and certain high performance turboprops may be limited in their ability to follow certain tracks and would likely be restricted to a more straight out departure path.

It should be noted that these recommended departure flight tracks place the aircraft over certain roadways. These tracks however should be considered as centerlines of a flight corridors and some spread to either side of these roadways would occur.

Status: The recommended departure flight tracks have been published and provided to pilots in an informational handout entitled "Craig Airport is a noise sensitive airport!" A graphic depicting each track is provided along with specific operating instructions for each track (see Appendix A). The flight tracks are assigned a name (i.e. "Runway 32 – Dames Point Departure") to help clarify which track was being referenced. The location of nearby residential areas are also identified. Notice of the procedures is published in the Airport Facilities Directory. Meetings with the flight training companies at the airport indicated that each is aware of the modified flight tracks and they use them to the extent that wind and weather permit.

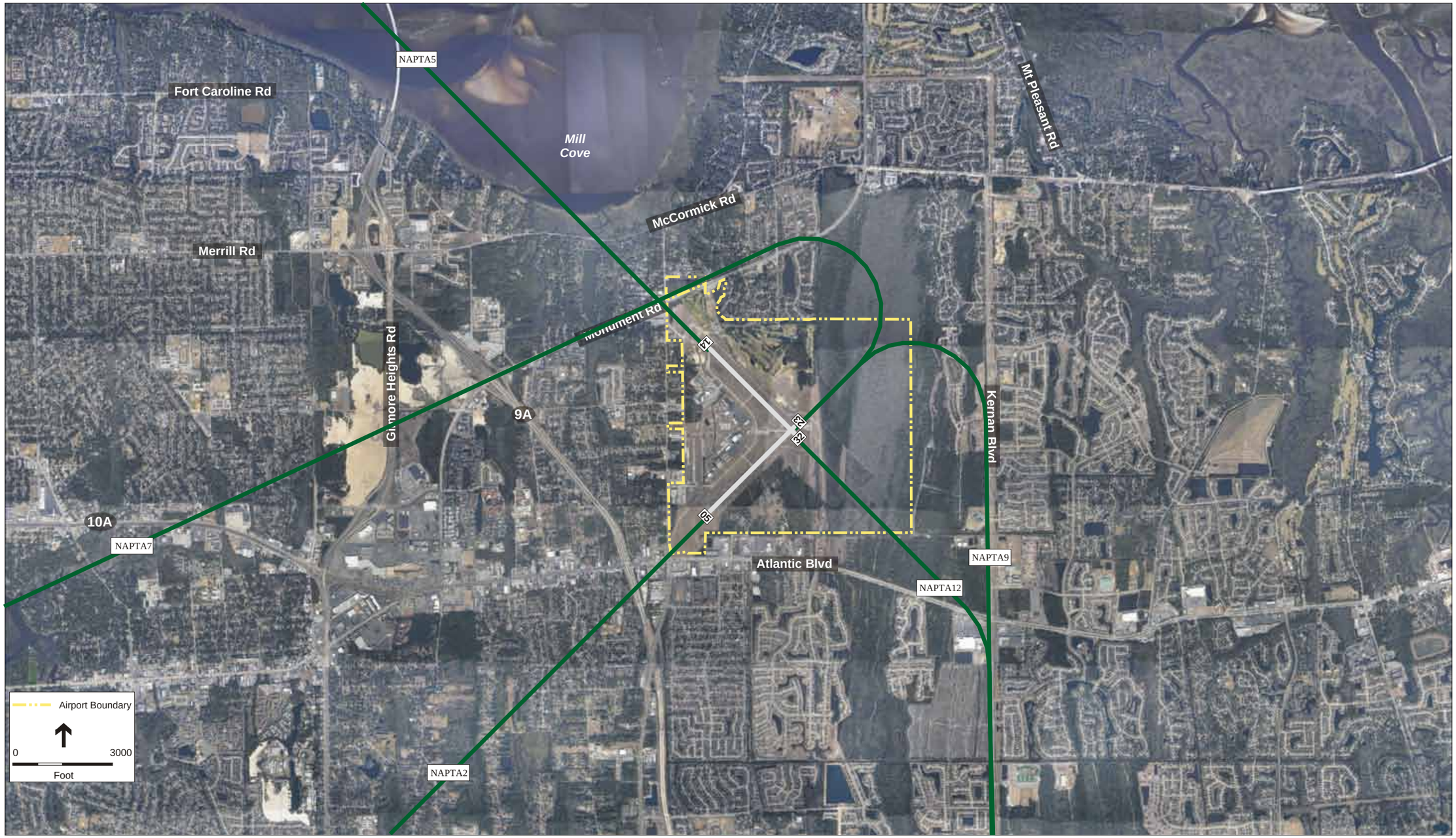
Aircraft Arrival Procedures

VFR aircraft tracks A2, A5, A7, A9, and A12 (**Exhibit 2-2**) were modified to take advantage of less noise sensitive areas. Tracks A5 and A2 are straight in approaches to each respective runway end. Aircraft on these approaches remain over water or less densely populated areas of Arlington prior to touchdown. Track A7 arrivals approach the Airport along Monument Road and complete the lowest altitude portion of their approach over open space/conservation land. Tracks A9 and A12 follow Kernan Road northward until it is necessary to turn for final approach. As indicated for departures, these tracks should be considered as centerlines of flight corridors. Again, because of the speed and turn requirements for jet aircraft, some of these aircraft may have limited ability to follow these tracks and may be restricted to a more straight in arrival path.

Status: Same as for aircraft departure procedures.

Aircraft Touch and Go Procedures

Touch and go tracks T1, T4, T5 and T7 (**Exhibit 2-3**) represent the preferred touch and go tracks at the airport and support nearly 95 percent of the training activity. It should be noted that when a number of aircraft are in the training pattern at the same time, the flight tracks extend further from the airport. Establishment of a touch and go track south of Runway 5-23 would be



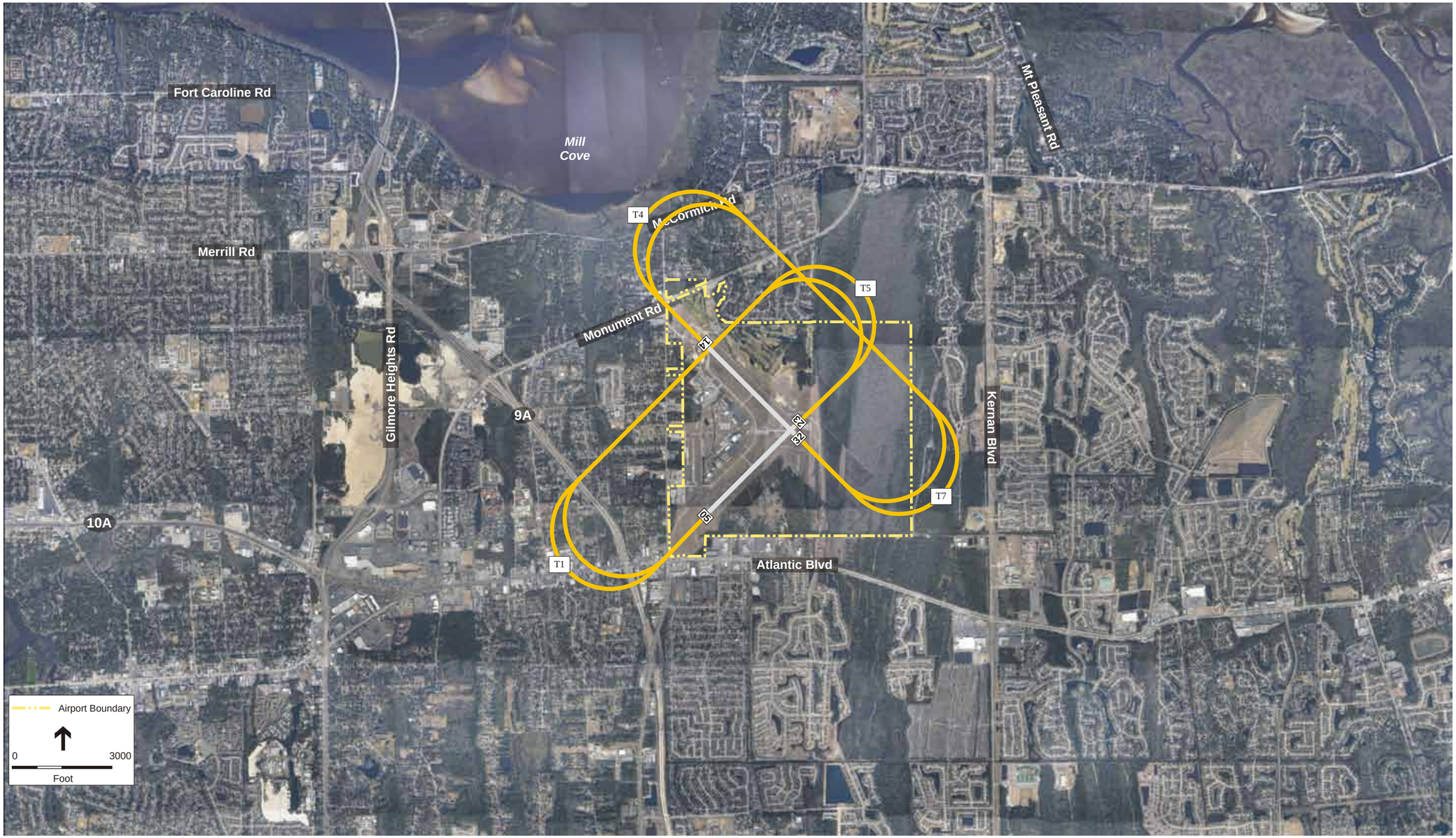
AERIAL SOURCE: City of Jacksonville, 2004

SOURCE: ESA Airports

Craig FAR Part 150 Study . 203086

Exhibit 2-2

Centerline of VFR Noise Abatement Arrival Flight Corridors



AERIAL SOURCE: City of Jacksonville, 2004

SOURCE: ESA Airports

Craig FAR Part 150 Study . 203086

Exhibit 2-3

Centerline of VFR Noise Abatement Training Touch and Go Corridors

desirable because it remains largely over airport property. However, it was not recommended due to conflicts with the ILS approach for Runway 32.

Status: Tracks T1, T4, T5 and T7 are currently in operation.

Shorten Runway 5-23 Training Pattern to the Southwest

Aircraft conducting touch and go operations on Runway 5-23 initiate turns on departure and to final approach approximately above the intersection of Atlantic Boulevard and St. Johns Bluff Road which extend the turn over residential areas to the south. ATCT has indicated that they could not require an aircraft to turn at any particular point in the touch and go pattern only that they must not initiate a departing turn prior to the runway end. While ATCT can not require an aircraft to turn at a given point, for safety reasons, they can advise an aircraft to turn as soon as practicable. Turns to final approach and upon departure from runway 5-23 would be a voluntary action and should be promoted as part of the signage and promotion materials for any noise abatement program at Craig.

Status: This remains a voluntary action and is somewhat dependent on airport congestion.

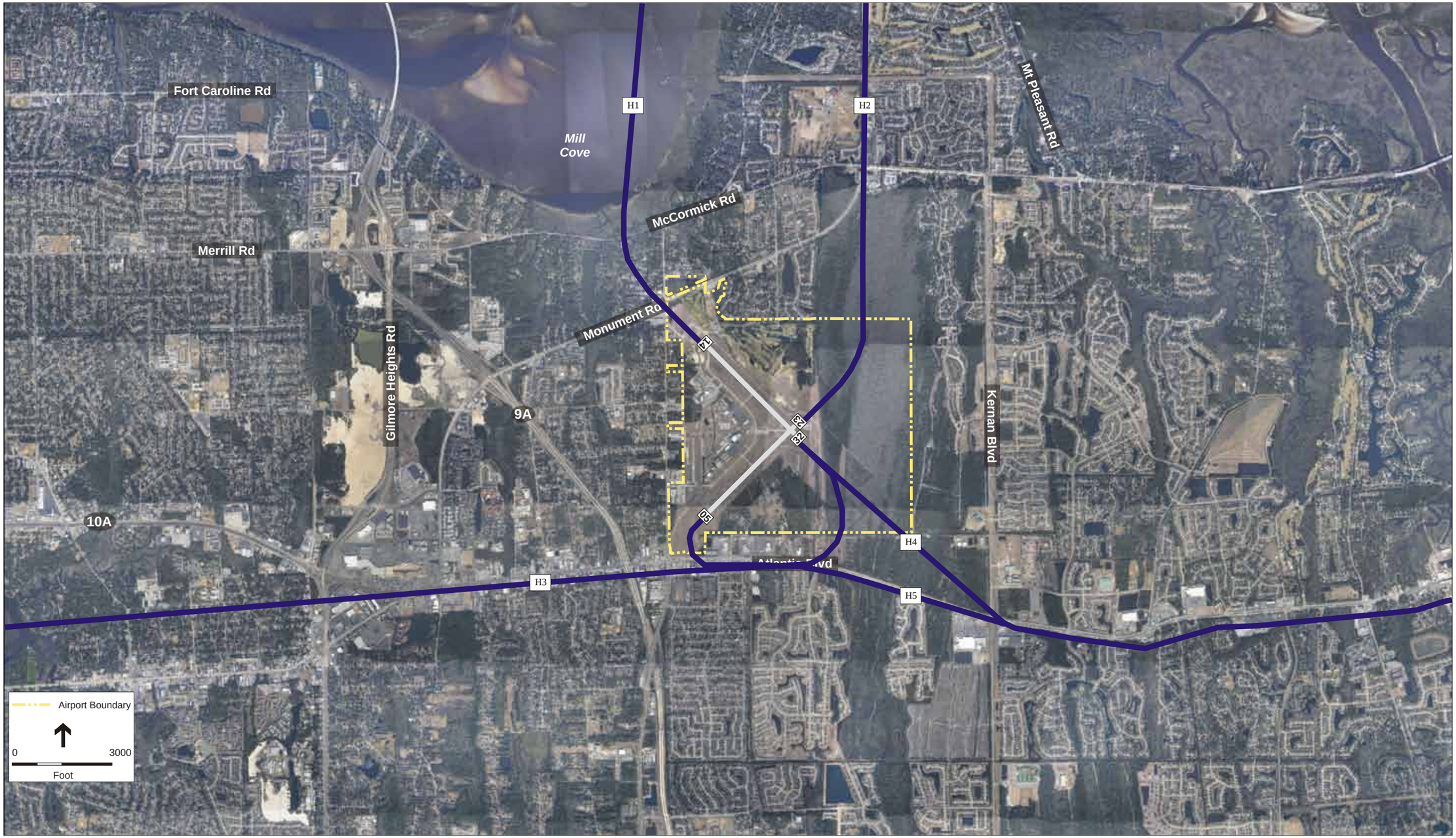
Helicopter Arrival and Departure Corridors

Noise complaints over the years have involved the operation of Navy aircraft, particularly Navy helicopters. In an effort to resolve noise complaints regarding Navy Helicopter operations, JAA and NS Mayport have an agreement to require Navy Helicopters to remain at 1,000 feet of altitude and execute a curved approach into the Airport. The curved approach to the touchdown point keeps the helicopter close to or within Airport property. Arriving helicopters maintain a minimum of 1,000 feet of altitude until required for final approach. The agreement was implemented in the Spring of 1999 and has reduced the number of noise complaints in the area of CRG. With the relocation of this activity to Cecil Field, military helicopter noise has become less of an issue.

Helicopter operations other than the Navy's are sometimes a noise concern. Established helicopter arrival and departure corridors assist in removing unexpected noise from helicopters arriving and departing CRG. Exceptions to these corridors include mosquito control conducting spraying operations and the Duval County Sheriff's Department conducting emergency activities. The centerline of helicopter corridors for noise abatement purposes are outlined in **Exhibit 2-4**.

Helicopter arrivals to Runway 23 are directed to fly south along Monument Road and then over planned open space to the runway (Route H2). Arrivals to Runway 14 fly over Mill Cove then to touchdown on the runway (Route H1).

Arrivals to Runway 5 approach along Atlantic Boulevard to touchdown on the runway (Route H5). Helicopters arriving to Runway 32 use two of the Atlantic Boulevard approaches (Route



AERIAL SOURCE: City of Jacksonville, 2004

SOURCE: ESA Airports

Craig FAR Part 150 Study . 203086

Exhibit 2-4

Centerline of Helicopter Noise Abatement Flight Corridors

H3 and H4) which direct them over major road corridors and/or open space. Departing Helicopters would follow the same flight paths out of the Airport area.

Helicopter hovering operations are identified as "not recommended" at CRG. Extended hovering operations increase noise levels at the facility. When hovering operations are conducted, they are directed near the intersection of Runways 23 and 32 (a central point on the airfield).

Status: A Jeppesen flight chart insert entitled "VFR Helicopter Noise Abatement Procedures" was published and distributed that provides helicopter pilots with a graphic and written guidance detailing specific operational instructions by runway end (see Appendix A). It also identifies the location of residential areas. An additional graphic and written guidance defines hover areas (near the intersection of Runway 23 and Runway 32) and provides guidance on helicopter flight patterns. Notice of the procedures is published in the Airport Facilities Directory. While there is an awareness of these procedures, it has been noted that more than half of the helicopter activity associated with the airport is related to the Duval County Sheriff's Department which typically flies the most direct path to the incident scene.

Minimization of Turbojet Instrument Approach Practice

The ILS approach to Runway 32 at CRG is essential to the safety and utility of the Airport. Occasionally, jet aircraft make practice instrument approaches to the runway but ATCT estimated this type of operation comprises less than 1% of the operations at the Airport.

Turbojet aircraft conducting practice approaches under instrument conditions should be limited to one practice approach at CRG. Subsequent practice approaches should be conducted at other facilities.

It was recommended that all practice ILS activity be conducted at Cecil Field rather than at CRG. This shift is recommended because Cecil Field is sited in a more rural area than CRG and is surrounded by more compatible land uses than those surrounding CRG.

Status: Some activity uses Cecil Field for this type of operation due to the limited runway length available for touch and go operations at CRG. Additionally, airport congestion makes it desirable for aircraft to use Cecil Field for this type of operation. However, while the airport can encourage aircraft to utilize other airports for this purpose it cannot restrict aircraft from conducting these approaches at CRG.

Control of Ground Maintenance Engine Run-ups

Maintenance activities at CRG are conducted on all types of aircraft. Starting-up and prolonged running of aircraft engines, both reciprocating and jet, is a requirement of certain maintenance processes. Currently, run-ups are conducted on the taxiway at the intersection of runways 32 and 23. This places run-ups at a point that is farthest from the nearest population points.

Maintenance run-ups also occur at parking aprons near maintenance facilities. While rare in occurrence, the positioning of the maintenance facilities is far enough away from population points as to not have a significant impact off Airport.

CRG and ATCT have a mid-field run-up procedure and a procedure whereby nighttime run-ups would be allowed only under emergency conditions. Nighttime maintenance run-ups of aircraft engines are allowed with prior approval of the airport manager. Emergency/Public Safety run-up situations (i.e. Sheriff's Department emergency maintenance) would be allowed.

Status: Although a guideline recommending this operation was not published in any documentation, the taxiway area adjacent runways 32 and 23 appears to be commonly used. In fact, every observed instance of engine run-up took place at this location.

Staff Position as an Airport Noise Specialist

In order to implement a number of the noise abatement procedures detailed in this study, CRG has identified a specific point of contact for citizens concerned with airport noise. This position typically entails supervising the noise program and responding to citizens as part of the job duties.

Status: This point of contact has been identified as the Airport Compliance Specialist. There is currently one full time and one part time person filling this position. The printed noise abatement handouts do list a contact person for questions but will need to be updated to reflect the airport's current personnel.

Educate Operators on Procedures

During ATCT operation, aircraft can be instructed to follow the established procedures. When the ATCT is closed, aircraft operators should be knowledgeable on the noise mitigation procedures in order to follow the procedures without ATCT instruction. The JAA has established informational handouts for fixed wing and helicopter operators advising them of the recommended noise abatement procedures. It has also contacted tenants and users directly to ensure that operators (that appear to be unaware of the procedures) understand the importance of the recommendations and implications to the local communities.

Status: Numerous signs have been posted throughout the airport property identifying CRG as a noise sensitive airport. Additionally, notice of the procedures has been published in the Airport Facilities Directory. Finally, the airport manager periodically meets with airport operators to educate them on operational and noise problems.

Encourage Use of NBAA Noise Abatement Procedures

Some aircraft manufacturers have developed specific noise abatement arrival and departure information for particular aircraft: others have not. The NBAA (National Business Aviation Association) has established noise abatement procedures that can be followed by most business turbojet operators. The procedure steps call for power reductions and altitude adjustments during arrival and departure operations.

Manufacturer established noise abatement procedures are practiced by some turbojet operators at CRG. However, it was recommended that JAA adopt the use of the NBAA procedures for aircraft absent of noise abatement procedures. Compliance with the NBAA procedures should be based upon safety, aircraft operating characteristics, Federal Aviation Regulations, and aircraft operating limitations. Aircraft operators should be given latitude to determine thrust requirements and reductions during flight within the parameters of the abatement procedures.

Status: In the pilot informational handout entitled "Craig Airport is a noise sensitive airport!", it is recommended that pilots remain "clean, stable" and use "low power, low drag" to achieve a quieter approach. It further recommends that on final approach, the aircraft "Stay at or above the PAPI" (an approach guidance navigational aid). The handout also identifies a general noise abatement procedure for departures which is defined as "use minimum power necessary and achieve maximum altitude possible under the circumstances". These procedures generally reflect the recommendations outlined by the NBAA.

Preferential Runway Use

While not specifically referenced in the previous report, CRG has a published preferential runway use program. It is noted in the Airport Facilities Directory that, weather permitting, Runway 5 is the preferred runway for approach and Runway 32 is the preferred runway for departures.

B. LAND USE MANAGEMENT

The City of Jacksonville currently has an airport zoning ordinance in place that restricts land use surrounding each of the seven airports that fall within the city's boundary based on noise conditions. However, this zoning currently provides very limited land use compatibility protection. The existing zoning allows conditional approval within the 75 DNL contour for single family residential if a noise level reduction (LNR) of 35 decibels is provided. No schools are allowed within the 75 DNL contour. Within the 65 to 75 DNL contour, single family residential can be conditionally approved if a 25 decibel LNR is provided. Schools can be conditionally approved if they provide a 30 LNR. There are no noise controls beyond the 65 DNL contour. Recognizing the accelerating encroachment of development around a number of the airports, the City of Jacksonville is currently reviewing and updating the airport zoning ordinance to enhance the land use protection provided for noise sensitive uses. While finalization of this ordinance is pending, it currently appears that no residential will be allowed within the 70 DNL contour and only conditional approvals based on soundproofing LNR will be provided within the 65-70 and 60-65 contours. Schools would be restricted from the 65 and higher contours completely and only conditionally approved within the 60-65 DNL contours. In consideration of this, all noise maps included in this report reflect the 60 and higher DNL contours. The pending ordinance will also be addressed further in the NCP.

CHAPTER 3

AIRPORT FACILITIES AND LOCAL AIRSPACE

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AIRPORT FACILITIES AND LOCAL AIRSPACE

The 2001 Craig Airport Master Plan Update includes a comprehensive survey of airport facilities which are summarized in this report. The facilities outlined in the following section include runways, taxiways, general aviation support, other aviation related facilities and ancillary facilities that have some influence on activity at the airport. **Exhibit 3-1** presents the locations of these airport facilities.

A. AIRPORT FACILITIES

Runways

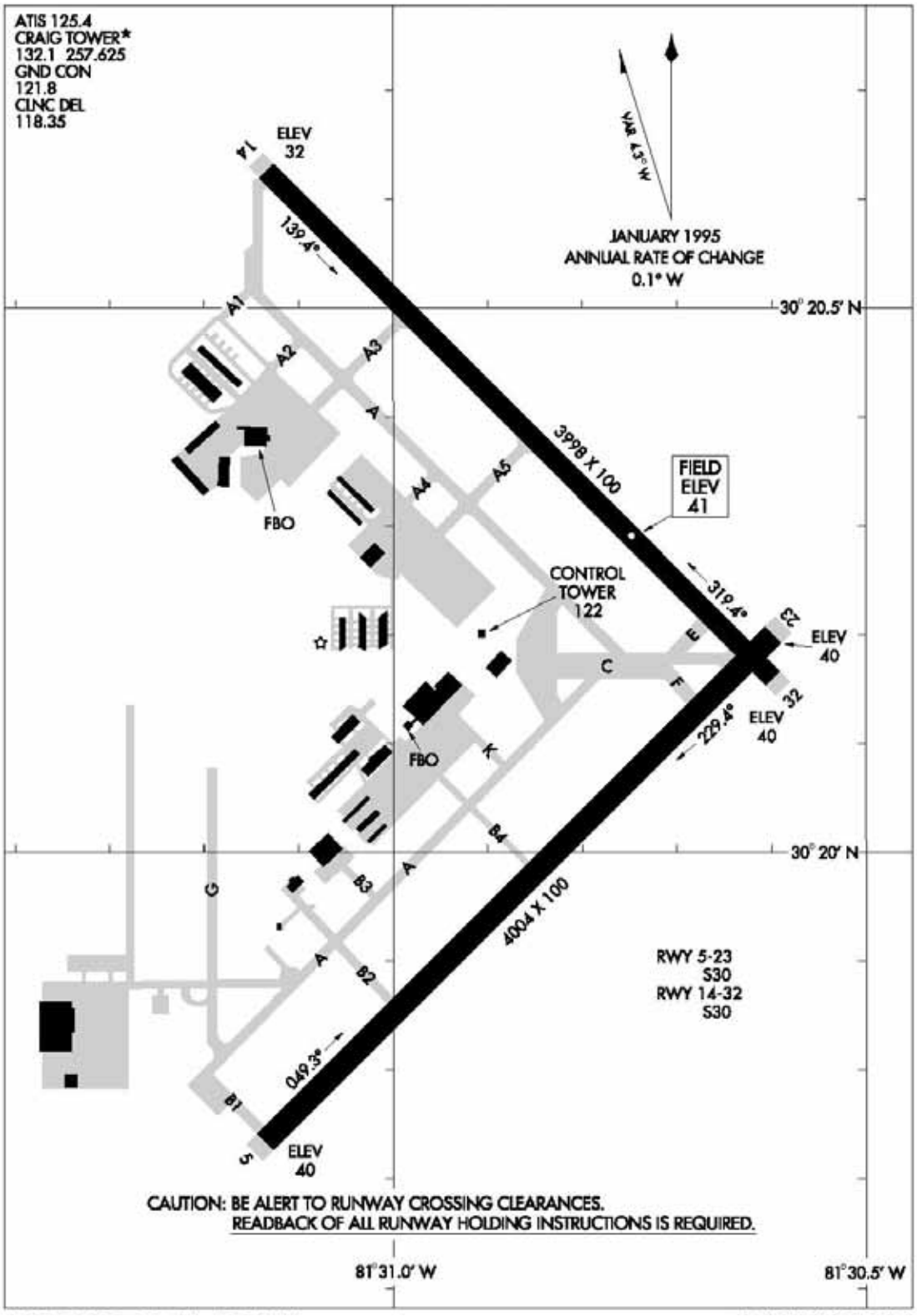
Craig Airport has two active runways, identified as Runway 14-32 and Runway 5-23. As depicted in **Exhibit 3-1**, the runways are oriented in a ">" configuration intersecting one another at the 23 and 32 runway ends. Runway 14-32 is 3,998 feet long by 100 feet wide and serves traffic departing to and arriving from the northwest and southeast. Runway 14 and Runway 32 have designated stopways approximately 75 feet beyond the runway ends. Runway 32 currently provides the only precision approach to the airport through use of an Instrument Landing System (ILS). Runway 14 offers a non-precision approach through the use of the Very High Omni-directional Range (VOR) and the Global Positioning System (GPS). Runway 5-23 is 4,004 feet long by 100 feet wide and serves traffic departing to and arriving from the northeast and southwest. Currently, Runway 5-23 is a visual runway and has no published approach procedures. The runway system is served by a full length 50 foot wide parallel taxiway system.

The Airport Facility Directory indicates that both runways at CRG can support an aircraft with a single wheel weight of 30,000 lbs. (S 30). The weight carrying capacity restricts aircraft with landing configurations that exceed this limitation. Additionally, the Airport has an Airport Reference Code (ARC) of C-II. The ARC alpha character describes the approach speed and profile the runway can support and numeric character indicates wingspan that can be accommodated at the Airport. The C-II airport classification indicates that airfield is designed to provide for use by aircraft with approach speeds of up to 140 knots and wing spans up to 78 feet.

Navigational Aids (NAVAIDS)

NAVAIDS assist pilots in navigating to and from the Airport and can assist a pilot up to the point of touch-down on a given runway. CRG has a variety of NAVAIDS to assist pilots in poor visibility conditions. These NAVAIDS include:

MALSR - Medium Intensity Approach Lighting System - **Runway 32**
REIL - Runway Edge Identifier Lights - **Runway 14 & Runway 23**



SOURCE: Federal Aviation Administration, National Aeronautical Charting Office

Exhibit 3-1

Existing Airport Diagram

VORTAC-	Very-high frequency Omni-directional Receiver with distance measuring capabilities – **Airport Navigation & Runway 14**
ILS-	Instrument Landing System – **Runway 32**
PAPI-	Precision Approach Path Indicator – **All Runways**
NDB-	Non-Directional Radio Beacon – **Airport Navigation /Approach**
GPS-	Global Positioning System - **Airport Navigation /Approach**

The ILS provides the most precise approach guidance to pilots by sensing the vertical and lateral position of an aircraft in relationship to the approach path to the runway. Of the navigation aids available at CRG, the location of the ILS is an important consideration when developing noise abatement measures.

General Aviation Facilities

General aviation (GA) includes all facets of aviation flying excluding military and scheduled commercial passenger air carriers. A common misconception is that general aviation is "non-commercial" aviation. This is not always true. Many commercial activities do occur under the definition of general aviation. Some of the major categories of general aviation include business/corporate aviation, commuter and air taxi operations, flight training, personal flying, crop dusting and traffic/news reporting.

Currently, there are two fixed based operators (FBO) that provide support to general aviation aircraft and pilots at CRG. Avitat Sky Harbor and Craig Air Center provide services, which include fuel, oxygen, hangar leasing, air tours, charters, maintenance, parts, and flight training. There are also other aeronautical services available at CRG. These include Bragg Aviation Electronics that provides specialized avionics service, while Sterling Flight Services and North Florida Flight Center provide flight training, charter service, and aircraft rentals.

Other Aviation Related Facilities or Activities

In addition to the general aviation facilities, a number of other aviation related facilities are located on airport property. These facilities include:

- **Federal Aviation Administration** - maintains offices in a building near the Air Traffic Control Tower that once housed a Flight Service Station and a Flight Standards District Office. There is now only a small contingent of FAA employees on the airfield.

- **Duval County Sheriff's Department** - maintains a fleet of fixed wing and rotary-wing aircraft at the Airport. Aircraft operations for the Sheriff's Department can occur at any hour of the day and night.

- **Delta Connection Academy** - in conjunction with Jacksonville University, trains student pilots at CRG. Students of Delta Connection Academy are being trained to become First Officers flying the Company's commuter service routes. Delta Connection operates single and twin engine aircraft.

- **Jacksonville/Duval County Mosquito Control** - aircraft are based at CRG. Mosquito control's aerial spraying operations occur at various times throughout the day and night. Flights are conducted at low altitude and at various locations around the City.

- **Airline Transport Professionals (ATP)** - operates a Flight Training Program at CRG. The business provides twin engine training to students.

- **Sterling Aviation** – operates a flight training program at the airport that includes single and twin aircraft.

- **North Florida Flight School** – operates a flight training program at CRG that includes single and twin aircraft.

B. FUTURE AIRPORT DEVELOPMENT

It is important to review the planned projects at CRG in order to assess the potential for changes in the airport facilities that might result in new or re-oriented noise impacts. The 2001 Airport Master Plan outlines the proposed future development projects as part of the Capital Improvement Plan (CIP). A total of approximately $62,935,000 (2001 Dollars) worth of improvements was identified between the years 2001 through 2020. The major improvements are listed in Table 3-1 through 3-3 and are outlined relative to the short, intermediate and long term timeframes.

Table 3-1
CIP Projects Phase I (2001-2004)
Craig FAR Part 150 Study

Project Description	Cost
Taxiway Improvements Runway 5-23 and 14-32	5,600,000
West Landside Development	1,200,000
West Landside Development – Phase 2	1,400,000
Fuel Storage (West Landside)	30,000
Land Acquisition	400,000
T-Hanger Replacement – Phase 1	1,500,000
Apron Pavement Overlay (both FBO's)	1,000,000
Northwest Access Road Development	500,000
Northwest Taxiway Connector	200,000
Northwest Corporate Hangar No. 47	300,000
Northwest Conventional Hangar No. 45	1,800,000
Street Signage and Lighting	100,000
Wash Pad Area – Craig Air Center	100,000
Wash Pad Area – Sky Harbor	100,000
Administrative/Maintenance Blvd. (extension)	200,000
Vehicle Parking (new) – Parking for Admin Blvd.	200,000
West Roadway Development	300,000
West Site Preparation	700,000
West Conventional Hangar No. 50	3,500,000
West Conventional Hangar No. 51	1,700,000
East Corporate Hangar No. 61	900,000
Fuel Storage (near ATCT)	30,000
TOTAL	**$21,800,000**

Source:
Master Plan Update, October 2001, Prosser & Hallock, Inc.

Table 3-2
CIP Projects Phase II (2005-2009)
Craig FAR Part 150 Study

Project Description	Cost
Land/Easement Acquisition	1,400,000
Runway 14-32 Pavement Overlay	600,000
Runway 5-23 Pavement Overlay	600,000
East Corporate Hangar No. 62	1,300,000
Runway 5-23 Shift to Southwest	2,800,000
Northwest Connecting Roadway	300,000
Northwest Taxiway Extension	100,000
Northwest Conventional Hangar No. 46	1,500,000
West Conventional Hangar No. 52	1,200,000
West Conventional Hangar No. 53	400,000
West Conventional Hangar No. 54	500,000
West Conventional Hangar No. 55	500,000
Fuel Storage	200,000
T-Hangar Replacement – Ph. 2	2,500,000
TOTAL	**$13,900,000**

Source:
Master Plan Update, October 2001, Prosser & Hallock, Inc.

Table 3-3
CIP Projects Phase III (2010-2020)
Craig FAR Part 150 Study

Project Description	Cost
Environmental Assessment	400,000
Roadway/Parking Pavement Overlay	200,000
Taxiway Pavement Overlay	2,400,000
Runway 32 Extension **(Note 1)**	11,600,000
Northwest Corporate Hangar No. 48	400,000
Northwest Corporate Hangar No. 49	400,000
Fuel Storage (Northwest)	100,000
South Side Parallel Taxiway	3,900,000
South Side Roadway Access	2,400,000
Fuel Storage (South Side)	100,000
South T-Hangar No. 70	1,200,000
South T-Hangar No. 71	600,000
South T-Hangar No. 72	500,000
South Corporate Hangar No. 73	300,000
South Corporate Hangar No. 74	300,000
South Corporate Hangar No. 75	500,000
South Corporate Hangar No. 76	500,000
South Conventional Hangar No. 77	1,500,000
TOTAL	**$27,400,000**

Source:
Master Plan Update, October 2001, Prosser & Hallock, Inc.
Note 1: A change to the City of Jacksonville comprehensive Plan may be required before the Runway 32 Extension can be constructed.

In reviewing the list of projects, it appears that no projects scheduled during the period 2001-2004 should have any impact on noise or the operation of the airport. During the second phase of development, 2005-2009, three projects have the potential to alter noise at the airport. Two of the projects, the Runway 14-32 pavement overlay and Runway 5-23 pavement overlay will likely have some temporary impact on airport noise while these projects are under construction. The Runway 5-23 shift to the southwest would result in a permanent shift in the noise associated with the runway in the same direction. This project was originally programmed to occur by 2009. However, when reviewing the actual FDOT CIP budget and in consulting with the airport it was determined that this project will not likely be implemented until after 2010 due to funding constraints. The third and final phase of development occurs beyond this study's existing and 5 year baseline analysis period and is identified as the period 2010-2020. Projects outlined during this period include the extension of the Runway 32 end and the displacement of the landing thresholds for both the Runway 14 and 32 ends. These changes would result in a permanent change to the noise conditions at the airport that will result in decreasing the residences impacted by 65 DNL average noise exposure. It should be noted that regardless of the time period these projects are identified in, a number of permitting, review, approvals and funding considerations will need to be addressed to allow actual implementation.

C. LOCAL AIRSPACE

Air Traffic Control

The Air Traffic Control Tower (ATCT) at CRG is operated by a private air traffic controller organization contracted by the Federal Aviation Administration (FAA) to provide air traffic operational services. The tower is operational from 6 am to 11 pm Monday through Friday and from 6 am to 10 pm on Saturday and Sunday. Aircraft approaching CRG, in JAX airspace, are worked through the airspace by Jacksonville Approach/Departure, then handled by Craig Tower for arrival. The departures from CRG are handled similarly.

Airspace Classification

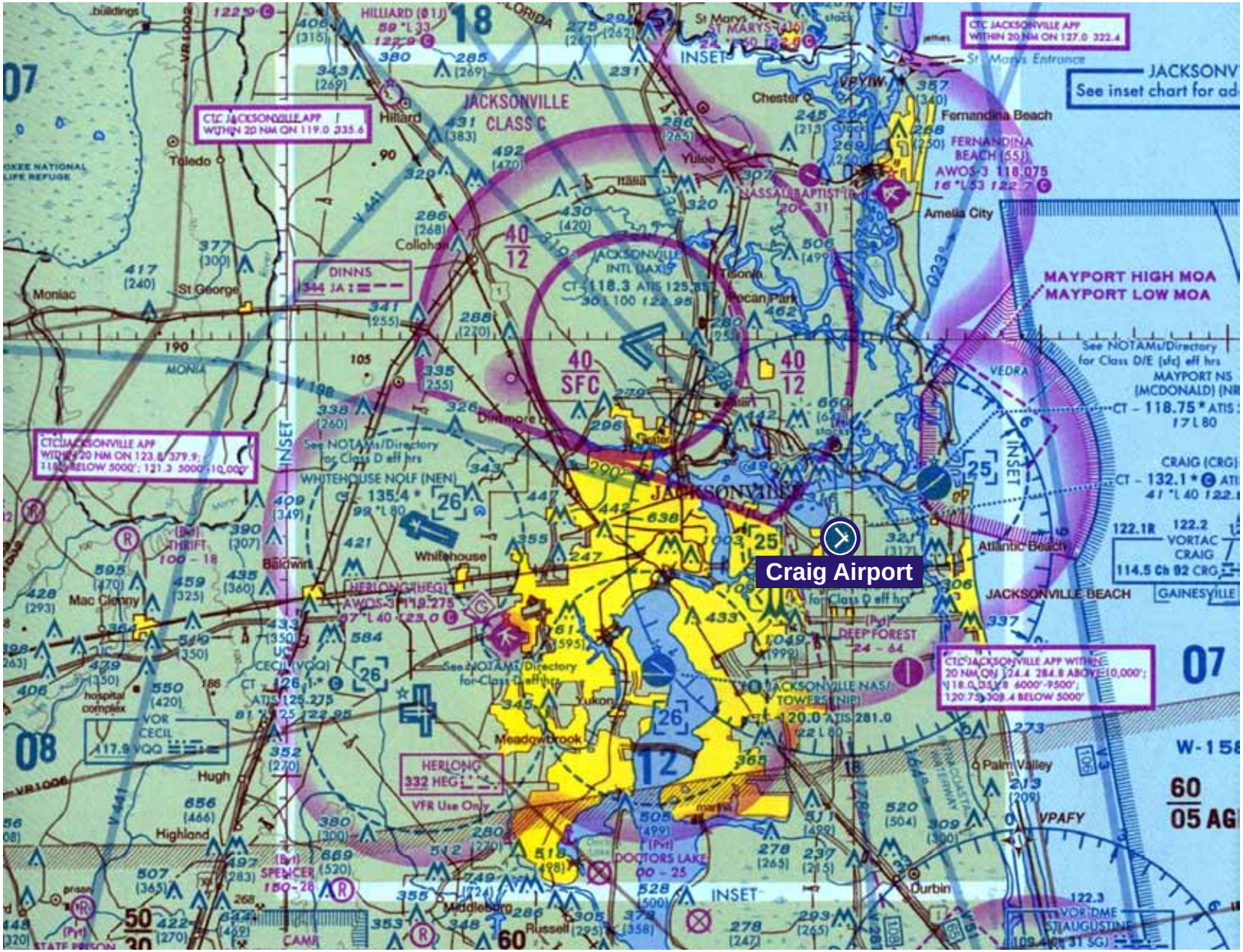
The airspace classifications around the Jacksonville area including CRG airport are shown in **Exhibit 3-2**. Craig Airport lies within Class D airspace which extends from the surface up to 2,500 feet (MSL). To operate in Class D airspace all aircraft must establish two way radio communication with Air Traffic Control (ATC). A portion of the Class D airspace to the northwest of CRG airport lies within the outer tier of the Class C airspace associated with Jacksonville International Airport. Jacksonville Approach is responsible for controlling aircraft in this area between 1,200 feet MSL to 4,000 feet MSL.

All aircraft arriving under instrument flight rules are controlled by the TRACON at JAX. Aircraft nearing CRG receive minimal clearances from Craig ATCT. The TRACON also handles instrument traffic during the hours when Craig ATCT is not operational. Visual Flight Rules (VFR) traffic operates at CRG during the periods that ATCT is closed by broadcasting their intentions to other traffic operating in the area. During these times, workload permitting, JAX TRACON provides advisory services to the VFR aircraft.

Published Instrument Approach Procedures

There are four instrument approach procedures published for CRG (see **Appendix B**). These procedures provide the pilots with close-in landing guidance under poor visibility conditions. The lower the “ceiling” and “visibility” minimums the approach is certified for, the closer to the airport the aircraft can travel under poor weather conditions before aborting the landing. The approach procedures at CRG include both precision and non-precision approaches. The single precision approach is a Category I Instrument Landing System (ILS) approach to Runway 32. Very High Omni Directional Radio Range (VOR), Global Positioning System (GPS), and Airport Surveillance Radar (ASR) equipment provide four non-precision approaches to either one or both of the runway ends.

The Runway 32 Category I ILS provides the lowest approach minima for straight-in instrument approaches to the airport. The ILS equipment provides vertical, horizontal and distance location to arriving aircraft that are established on the Runway 32 approach corridor at least 5.5 miles from the airport. This approach allows pilots to operate under the poorest visibility conditions at the airport.



SOURCE: ESA Airports

Exhibit 3-2
Local Airspace

The CRG VOR provides a non-precision approach to Runway 14 and to Runway 32 for aircraft that are also equipped with Distance Measuring (DME) equipment. This equipment provides both horizontal (azimuth) and distance information to pilots.

Non-precision GPS approaches are provided for both Runway 14 and Runway 32 as overlays of the VOR approaches outlined above. While GPS can provide the same types of information as ILS equipment, the accuracy of the equipment does not allow for a "precision" category of approach minimums.

ASR approaches are also available for Runway 32. Air traffic controllers assist pilots in conducting this type of approach by providing pilots with course guidance based on a controllers monitoring of the aircraft's position and elevation relative to the radar facility.

Standard Terminal Arrival Route (STAR)

A Standard Terminal Arrival Route (STAR) is an ATC IFR arrival route established to simplify clearance delivery and assist in the transition between enroute travel and instrument approach procedures. A single STAR may serve more than one airport. There are four STARs available for use at CRG:

- ALMA TWO ARRIVAL (AMG.AMG2) - routes aircraft arriving from the northwest directly over Jacksonville International as they transit the airspace to CRG.
- BRUNSWICK THREE ARRIVAL (SSI.SSI3) - routes aircraft from the northeast down the coast and into CRG.
- POGIE ONE ARRIVAL (POGIE.POGIE1) – routes aircraft from the south northward up through the CRG.
- TAYLOR TWO ARRIVAL (TAY.TAY2) – routes aircraft from the west through the state to CRG.

Each of the above STARS also serve as many as six other airports.

Instrument Departure Procedures (IDP)

An Instrument Departure Procedure (IDP) is an ATC departure procedure that has been established at certain airports to simplify clearance delivery procedures. SIDS also assist pilots conducting IFR flight in avoiding obstacles during climb out to Minimum Enroute Altitudes (MEA) and reduces impacts to noise sensitive areas. The pilot follows the procedures without requiring vectors from ATC. There are currently no published SIDs for operations at CRG.

Takeoff Minimums and Obstacle Departure Procedures

Establishment of takeoff minimums and obstacle departure procedures for certain runway ends helps ensure that pilots can see and avoid known obstacles in the vicinity of the airport or are routed such that the obstacles are not a concern for the departing aircraft. One runway end at CRG has takeoff minimums associated with it and two runway ends have obstacle departure procedures:

- Runway 23 Takeoff Minimums – Visibility conditions for departures on Runway 23 must have a ceiling of at least 1,100 feet msl and 3 miles or the aircraft must climb 320 feet per nautical mile until it reaches 1,300 feet msl.

- Runway 5 Departure Procedure – Aircraft must climb on the runway heading to at least 800 feet msl before turning south.

- Runway 14 Departure Procedure - Aircraft must climb on the runway heading to at least 1,000 feet msl before turning right.

CHAPTER 4

COORDINATION

CHAPTER 4
COORDINATION

The FAR Part 150 study involves coordination with a wide variety of interested parties. Input took place through representatives of the Technical Advisory Committee and Craig Airport Citizens Advisory Committee. Additional input was received through the public meeting/ hearing process from elected and appointed officials; local planning and zoning departments; citizens and community interest groups; and Federal and State agencies.

A. TECHNICAL ADVISORY COMMITTEE

The Technical Advisory Committee (TAC) consists of a group of individuals with technical expertise in key areas of concern relative to the FAR Part 150 Study. The TAC participants represent various organizations with the ability to provide key input into the operational of the airport or local and regional development. The purpose of the TAC is to ensure that appropriate technical input is incorporated into the study to ensure that the analysis accurately reflects the local conditions. Members of the Technical Advisory Committee include representatives of the following organizations:

- City of Jacksonville Planning and Development
- Craig Airport Management
- Craig Air Traffic Control Tower
- Craig Airport Fixed Based Operator
- Craig Airport Flight Training
- Jacksonville Airport Authority
- Metropolitan Planning Organization
- Northeast Florida Regional Council

In addition to the above, the FDOT and FAA are encouraged to attend and participate in technical discussions.

B. PUBLIC INVOLVEMENT AND ACCESS

The JAA public involvement approach was designed to ensure that the public will have ample opportunity to provide input into the Part 150 process. This approach includes use of the existing Craig Airport Citizens Advisory Committee as well as a number of workshops during the study to educate the community on the purpose of the study and gain input.

Craig Airport Citizens Advisory Committee (CACAC)

This committee is made up of representatives of the surrounding community and represents a forum in which issues associated with Craig Airport are discussed in a public forum. The JAA interacts closely with this committee to keep them apprised of the airports activities as well as to try to resolve any potential concerns. The Craig Part 150 study was discussed during two meetings and continued to be a conduit to reach out to interested parties throughout the completion of the study.

Public Workshops/Hearings

A public workshop was held after completing the draft noise exposure maps. This meeting took place on Monday, April 25, 2005. The purpose of this workshop was to allow interested citizens the opportunity to discuss noise issues and the study elements with the consultant and JAA staff in a one on one forum. Attendees of the workshop primarily consisted of Regional Planning Council members and CACAC members. A copy of the advertisement, certification and sign-in sheet are included in Appendix C along with a copy of the public information brochure and handouts prepared for the workshop.

The public hearing was be held to present the final NEM/NCP report in November 2005. A transcript of the hearing and public comments are provided in Appendix D along with a with a certified copy of the advertisement. A second public information brochure was prepared for this meeting which outlined the findings of the study. While written comment forms were available for those who did not wish to speak at the hearing or those wanting to submit their comments later, no written comments were provided in the 30 day period that was provided following the hearing. Furthermore, none of the comments received during the hearing related to the actual recommendation presented in the study and as such, no changes were made in the technical foundation of the report prior to submittal of the consolidated report to the FAA for review.

C. MEETING SCHEDULE

The following is a list of public meetings where the consultant has presented material or briefed the committees on the FAR Part 150 study and process.

July 9, 2004 – TAC - The consultant briefed the committee on the process and purpose of the FAR Part 150 Study.

August 2004 – CAC Meeting - Airport staff notified the CACAC of the initiation of the FAR Part 150 Study.

November 15th, 2004 – Airport staff briefed the CACAC on the Part 150 Status and presented an overview of the study.

April 25th, 2005 – The Public Workshop was held.

July 14th, 2005 – TAC – The consultant discussed NCP recommendations and defined additional NCP alternatives for consideration.

November 7th 2005 – The Public Hearing was held.

D. WEB SITE

The JAA hosts a website that provides information about the facilities and activities at CRG. This website is located at www.jaa.aero/as/craig.asp.

E. NOISE HOTLINE

The JAA also has a Noise Abatement Hotline that citizens can call 24 hours. The phone number to the hotline is 904-641-3606. Information concerning the Hotline is provided on the Airport Website at www.jaa.aero/as/craig_na.asp. Citizens are encouraged to use this number to provide input into the Part 150 process.

CHAPTER 5

NOISE COMPLAINT REVIEW

CHAPTER 5

NOISE COMPLAINT REVIEW

To pro-actively address aircraft noise complaints in the communities surrounding Craig Airport (CRG), the Jacksonville Airport Authority (JAA) has initiated various efforts to respond to noise complaints and to promote aircraft operations that are compatible with the communities surrounding the airport. In addition to the establishment of VFR noise abatement flight tracks, these efforts have included installing a noise complaint hotline, establishment of the Craig Airport Citizen Advisory Committee and tracking and monitoring the noise complaint data.

A. NOISE COMPLAINT HOTLINE

Over the years a number of complaints have been registered by citizens in the vicinity of CRG concerning aircraft noise. The noise complaints are typically received through CRG's noise hotline at 904-641-3606. This hotline is linked to an automated recording device that allows the residents to voice their noise complaints 24-hours a day. The JAA reviews all calls received on this hotline and maintains a written log of noise complaints identifying the name of the person who registered the complaint, his/her address, the date and time the noise event occurred, and the reason for the complaint. When complaints can be correlated to a specific event or operator, the airport proactively contacts that operator to remind them that CRG is a noise sensitive airport and provides them with a copy of the airport's VFR noise abatement flight tracks. The airport also makes a follow-up call to the person filing the complaint to discuss the activity that resulted in the complaint.

B. CRAIG AIRPORT CITIZEN ADVISORY COMMITTEE

The JAA has established the Craig Airport Citizens Advisory Committee as a means to provide better communication with the communities surrounding the airport. A variety of topics are discussed at the regularly scheduled meetings including noise concerns and issues related to development and operation of the airport. The communities surrounding the airport are shown in **Exhibit 5-1**.

C. NOISE COMPLAINT DATA

The JAA compiles the individual noise complaint information into a monthly complaint summary and monitors the complaints relative to monthly and annual operational data.

AERIAL SOURCE: City of Jacksonville, 2004

SOURCE: ESA Airports

Craig FAR Part 150 Study . 203086

Exhibit 5-1

Neighborhoods Around Craig Airport

Annual Noise Complaint Summary

Annual noise complaints recorded at CRG fluctuated between 32 and 61 during the period 2000 through 2004 as outlined in Table 5-1. During this period, annual operations ranged between just under 138,000 operations to just under 175,000 operations. It should be noted that 2001, the year with the most noise complaints, is not the year with the most operations. In 2002 and 2003, the airport experienced 50 percent more operations for each complaint than was experienced in 2000 and in 2004, more than 100 percent more.

TABLE 5-1
Annual Noise Complaints
Craig Airport FAR Part 150 Study

Year	Annual Operations	Registered Complaints	Operations/ Complaint
2000	137,856	58	2,377
2001	158,456	61	2,598
2002	163,114	45	3,625
2003	170,643	48	3,631
2004	162,115	32	5,066

Source:
JAA Noise Complaint Summary

Conditions were reviewed for the 2000/2001 timeframe to determine if there was anything that may have resulted in the higher level of noise complaints. It was generally determined that the higher number of noise complaints likely resulted from a number of factors:

- Air National Guard moved Apache helicopter activities to Cecil Field in November 2002. This likely resulted in some reduction in noise exposure around the airport.
- The previous noise study and Master Plan Update were underway in the 1999 through 2001 timeframe. Increased awareness of activities at the airport typically results in an increase in noise complaints.
- The drop in noise complaints in 2002 could be the result of implementation of the recommendations of the previous noise study. However, there is inadequate information to conclude that this alone is directly correlated to the drop.

Monthly Noise Complaint Summary – (January 2000 – December 2004)

Noise complaints were reviewed on a monthly basis to determine if there were seasonal trends that influenced complaints. The monthly noise complaints for the years 2000 through 2004 are outlined in Table 5-2.

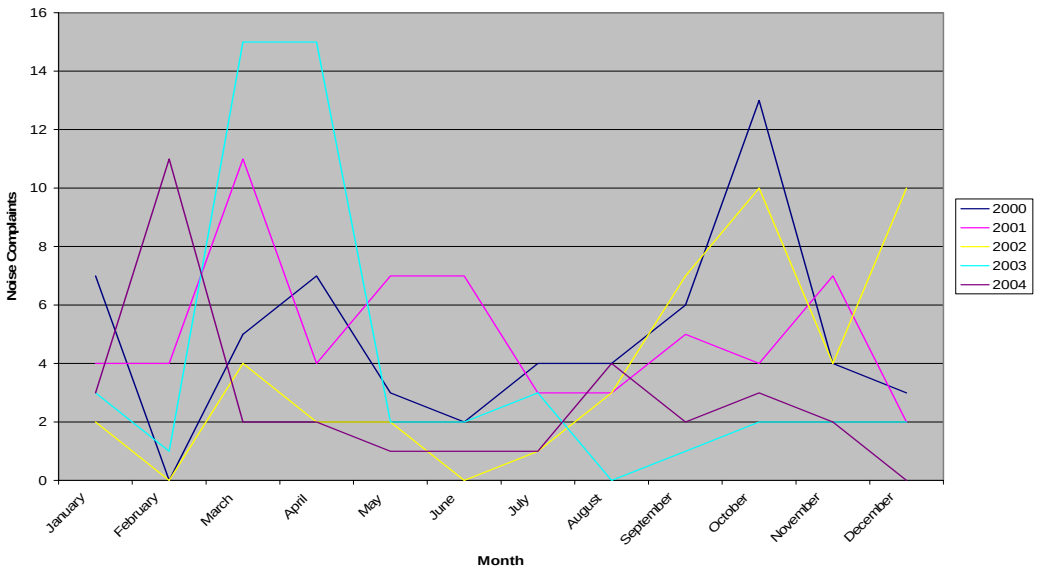
TABLE 5-2
Monthly Noise Complaints
Craig Airport FAR Part 150 Study

Year	2000	2001	2002	2003	2004
January	7	4	2	3	3
February	0	4	0	1	**11**
March	5	**11**	4	**15**	2
April	7	4	2	**15**	2
May	3	7	2	2	1
June	2	7	0	2	1
July	4	3	1	3	1
August	4	3	3	0	4
September	6	5	7	1	2
October	**13**	4	**10**	2	3
November	4	7	4	2	2
December	3	2	**10**	2	0
Total	58	61	45	48	32

Indicates month with highest number of noise complaints for that year.
Source:
JAA Noise Complaint Summary

March and April of 2003 had the highest number of noise complaints with 15 each. Although not consistent on an annual basis, March, April and October represent the top three months for noise complaints for the period 2000 through 2003. Figure 5-1 reflects the considerable variance in complaints from month to month on an annual basis.

FIGURE 5-1
Monthly Noise Complaints



Generally, noise complaints appear to peak during the heavy flight training months, September through November, or the during the spring seasonal activity, March through April. The summer months of July, August, and September have generally but not always accounted for the least number of overall complaints. This is most likely due to windows being closed and air conditioning being on throughout the summer months. Considering the large variance in complaints on an annual basis at CRG, correlating complaint data to specific causes requires considerably more analysis of specific operational conditions at the airport.

Detailed Noise Complaint Review – January 2003 through December 2004

To better understand current condition and activities resulting in noise complaints at CRG a detailed analysis of the individual logged complaints was conducted for the period from January 2003 through December 2004. However, it should be noted when reviewing noise complaints, that while they can often be indicators of problems, many times the data available isn't detailed enough to allow specific issues to be identified. In the case of CRG, it was determined that while the complaints were helpful, a large number did not provide enough detail to accurately determine the specific activity that triggered the complaint.

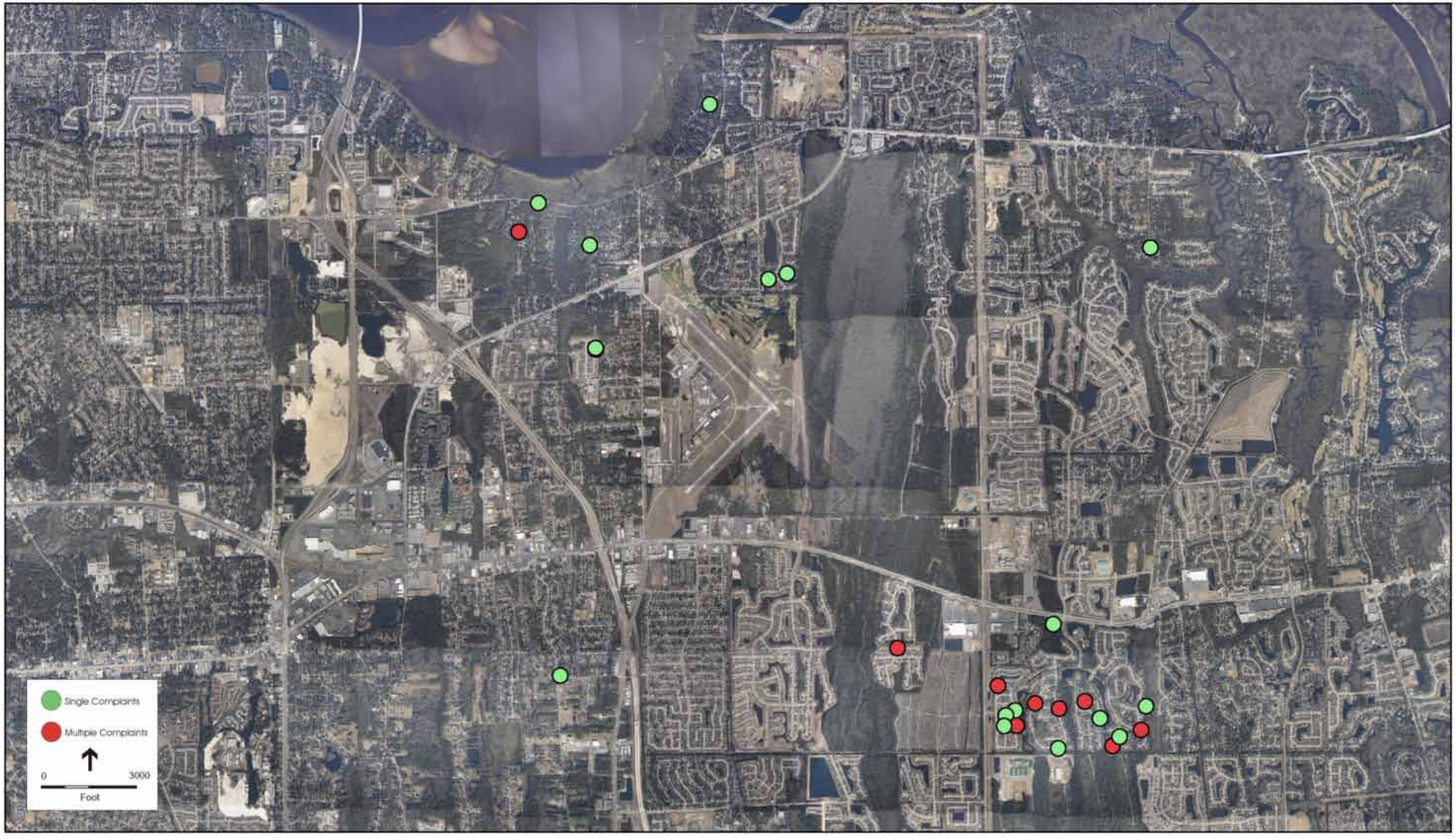
As outlined in Table 5-3 there were 48 complaints in 2003 filed by 16 households. However, 15 of the 48 complaints did not provide enough information to determine if the complaint was being called in by a previous caller or a new one. In 2004, there were 32 complaints recorded by 20 households with 4 of these being unidentified. "Unknown" in the table indicates that no location information was reported with the call. "Other" in the table indicates that the neighborhood was identified but insufficient information was provided to determine if the complaint was made by a previous or new caller.

TABLE 5-3
Annual Noise Complaints
Craig Airport FAR Part 150 Study

Year	Complaints	Households	Unknown	Other
2003	48	16	10	5
2004	32	20	3	1

Source:
JAA Noise Complaint Summary

Table 5-4 outlines the noise complaints by neighborhood. An aerial photo depicting the location of each noise complaint is provided in **Exhibit 5-2**. Households that registered a single complaint are shown in yellow, while households that registered multiple complaints are shown in red.



SOURCE: Environmental Science Associates

Craig FAR Part 150 Study . 203086

Exhibit 5-2

Aircraft Noise Complaints - 2003 & 2004

TABLE 5-4
Noise Complaints By Neighborhood
Craig Airport FAR Part 150 Study

	2003			2004		
Neighborhood	**Complaints**	**Households**	**Other**	**Complaints**	**Households**	**Other**
Brookwood Forest	1	1		1	1	
Cortez Road				1	1	
Deerwood C.C.				1	1	
Ft. Caroline	2	2		3	3	
Gately Oaks				1	1	
Hawkins Cove	1	1		2	1	
Holly Oaks	6	4		3	2	
Hollywood Lakes				2	1	
Kensington	21	8	5	15	9	1
Sutton Lakes	2	1				
Unknown	10			3		
Total	43	17	5	32	20	1

Source:
JAA Noise Complaint Summary
Unknown refers to callers who left either little or no information regarding their location, name, etc.

As shown in **Exhibit 5-2**, residents living in two communities, Kensington, located southeast of the airport and Holly Oaks, located northwest of the airport, filed the majority of the complaints. Nearly half of the 48 complaints in 2003 came from the Kensington area which also accounted for 8 of the 17 households that recorded complaints. Holly Oaks accounted for an additional 6 complaints and 4 households. Five of the fifteen complaints classified as "other" came from within the Kensington area while the remaining ten provided no location information whatsoever. In 2004, nearly half the complaints once again came from Kensington. The balance of the complaints came from 8 other neighborhoods with 3 complaints lacking adequate information to determine the location.

In reviewing the cause of the complaints for 2003 it was noted that 8 of the complaints were attributed to jet aircraft that included a Navy DC-9 and an F-18 doing ILS approaches to Runway 32. A number of complaints referred to aircraft on ILS approach and nighttime flight activities. More than half of the complaints were not specific enough to determine type of aircraft, runway, or type of operation resulting in the complaint.

In 2004, many of the complaints during the early part of the year (through March) were associated with late night flight activities. One complaint appeared to be associated with activities at NAS/JAX while a number of complaints were associated with mosquito control. Similar to 2003, more than half of the complaints were not specific enough to determine type of aircraft, runway, or type of operation resulting in the complaint.

CHAPTER 6

AVIATION NOISE FUNDAMENTALS

CHAPTER 6

AVIATION NOISE FUNDAMENTALS

Numerous studies have been conducted to describe the impact of noise on people. Three documents in particular have been published which are widely used in the documentation of the effects of aircraft noise on people. These are the U.S. Department of Transportation Federal Aviation Administration's report Aviation Noise Effects, the report prepared by the Federal Interagency Committee on Noise (FICON) entitled Selected Airport Noise Analysis Issues (FICON report) and the June 1997 paper entitled Effects of Aviation Noise on Awakenings From Sleep prepared by the Federal Interagency on Aviation Noise (FICAN). The following information is taken primarily from these studies.

A. AVIATION NOISE FUNDAMENTALS

While a great deal is known about aircraft noise, the methods for calculating noise exposure can be difficult to understand. The following describes what noise is and explains how certain measures of noise relate to one another.

Sound and Noise Definitions

Sound is a complex vibration transmitted through the air, which, upon reaching our ears, may be perceived as being beautiful, desirable or unwanted. Sound moves outward from its point of origin in waves just as ripples move outward from the point at which a pebble enters a pond.

Noise is generally defined as any unwanted sound. For example, sound that is music to one person can be "noise" to another person. In the case of the sound of aircraft arriving and departing an airport, the aircraft sound is almost always unwanted and intrusive enough to be considered noise.

The process of quantifying the effects of sound exposure begins with establishing a unit of measure that accurately compares levels of sound. The physical unit most commonly used to describe sound levels is the decibel (dB). The dB represents a relative measure or ratio to a reference pressure. This reference pressure is a sound that approximates the weakest sound that can be heard by a person with very good hearing in an extremely quiet room. If a scale in dB is established with zero as the threshold of hearing for the weakest sound, then the strongest sound within the range of the human ear would be around 130 dB.

The dB scale is a logarithmic scale increasing by the power of ten which means that 10 dB has ten times greater energy than 1 dB, 20 dB is one hundred times more energy than 1 dB and 30 dB is a thousand times greater. However, for this study, the differences between relative sound energy and perceived loudness are more meaningful than the differences in sound power levels. For example, a single event noise of 70 dB is perceived to be twice as loud as 60 dB and 80 dB is four times louder than 60 dB. Again, using 60 as the reference noise level, 50 dB is perceived by the listener to be half as loud.

Throughout this section, four noise metrics are used in describing noise exposure – dBA, SEL, Lmax, and DNL. These noise descriptors are included because the studies referenced above describe the impacts of aircraft noise by one or more of these units. For example, in this study the dBA metric is used to describe peak noise levels of aircraft flyovers as they relate to speech interference, the SEL is used to present impacts related to sleep disturbance and the DNL forms the basis for cumulative aircraft noise exposure. Definitions of each of these descriptors are described below.

A-Weighted Sound Level (dBA)- A-weighted sound is a sound pressure level, which has been filtered or weighted to reduce the influence of the low and high extremes. Unweighted sound pressure levels do not correlate well with human assessment and response to noise loudness. As a result, a variety of techniques to filter sound have been developed. A-weighting has been found to correlate well with the human hearing response and with a person's subjective judgment of the loudness of sounds. A-weighting gives greater emphasis to the sounds in the speech important frequency bands and less emphasis to the lower and higher frequencies. A-weighting is widely used and almost universally accepted in analyzing noise and its affects on people.

Sound Exposure Level (SEL) - SEL is a noise metric derived from the noise energy dose of a single sound event such as a single aircraft overflight or a single vehicle or train compressed to a single second of exposure. As such, the SEL reflects both the maximum sound level and the duration, or length of time, of the sound event.

Lmax - This value represents the maximum sound level detected by an aircraft overflight or over the course of a noise monitoring session.

Equivalent Sound Level (Leq) - Leq, is the energy average noise level over a specified time. This approach is normally employed for durations of 1 hour, 8 hours or a 24 hour period. Equivalent signifies that the total acoustical energy associated with the fluctuating sound (during the specified time period) is equal to the total acoustical energy associated with the steady sound level of Leq for the same specified period of time. The purpose of Leq is to provide a single number measure of noise averaged over a set time period.

Day Night Average Sound Level (DNL) – DNL was developed as a single number measure of community noise exposure. DNL was introduced as a simple method for predicting the effects on a population of the average long-term exposure to noise. DNL is an enhancement of the Equivalent Sound Level (Leq) metric through the addition of a 10

dB penalty for nighttime (10 p.m. to 7 a.m.) noise intrusions. The incorporation of the 10 dB penalty is in recognition of the increased annoyance that is generally associated with noise during the late night and early morning. DNL employs the same energy equivalent concept as Leq and uses a 24 hour time integration period. DNL was developed under Environmental Protection Agency (EPA) auspices, and embodies extensive information regarding the physical description of noise as related to human acceptability in residential areas. The basic elements and concepts of DNL are as follows:

- Frequency Weighting - Use of the standard A-weighting, which most closely reflects the response to the human ear.

- Time-of-Day Weighting - The 10 dB nighttime penalty accounts for greater sensitivity to noise and/or lower background levels at night.

- Energy Averaging - The energy-mean is the best general single-number description of sound level that varies with time, in terms of average community response.

Computation of DNL - In calculating DNL, the Leq level is used as the hourly equivalent sound level. The hourly noise figures are summed for the 15 hours of daylight (7 a.m. to 10 p.m.) and added to the sum of Leq hourly figures for the remaining 9 hours of nighttime with a 10 dB penalty added to the nighttime figures (to reflect added human sensitivity to nighttime noise). The result is the DNL noise level or a 24 hour summary of noise levels for a given location. When aircraft noise contours are calculated, however, the noise levels are solely due to the aircraft and do not include background or ambient noise levels. In 1981, the FAA formally adopted DNL as the single system for determining exposure of individuals to aircraft noise. The use of DNL as the most appropriate measure of noise and its affect on persons was reconfirmed in the early 1990's after careful re-consideration by the Federal Interagency Committee on Urban Noise. (FICON) DNL is the most widely accepted descriptor for aviation noise because of the following characteristics:

- DNL is a measurable quantity.

- DNL provides a simple method to compare the effectiveness of alternative airport scenarios.

- DNL can be understood by those who are not familiar with acoustics or acoustical theory.

- DNL is a measure that can describe a community's reactions to environmental noise.

The emergence of DNL as the standard descriptor of aviation noise in land use compatibility planning is due chiefly to the efforts of the EPA. In the spring of 1973, in an effort to comply with the Noise Control Act of 1972, EPA convened a task group with

the function to "consider the characterization of the impact of airport community noise and to develop a community noise exposure measure." To accomplish this, the task group had to: determine the merits and shortcomings of methods to characterize the impact of the noise of present or proposed airport operations on the public health and welfare; determine which of such methods is most suitable for adoption by the Federal Government; and determine the implications of issuing Federal regulations establishing a standard method of characterizing the aviation noise, and of specifying maximum permissible levels for public health and welfare.

In 1976, the EPA formally recommended that FAA adopt DNL as the standard aircraft noise descriptor. FAA's decision to adopt DNL was also based on a number of other factors. In 1980, the Federal Interagency Committee on Urban Noise consolidated Federal guidance on the incorporation of noise considerations in local land planning and site review "to encourage noise sensitive development, such as housing, to be located away from major noise sources." The Committee adopted DNL as the best descriptor of noise for land use planning and established related land use compatibility guidelines. In the same year, the Acoustical Society of America developed an American National Standard (ANSI S3.23) which specified DNL as the acoustical measure to be used in assessing compatibility between various land uses and the outdoor noise environment. In addition, Congress established a voluntary program of airport noise compatibility planning and directed FAA to issue regulations. In 1981, the FAA issued FAR Part 150, Airport Noise Compatibility Planning. As part of this regulation, the FAA formally adopted DNL. All Federally funded airport noise studies now use DNL as the primary metric.

Comparative dBA Sound Levels

Table 6-1, taken from the Aviation Noise Effects report, provides a general comparison of dBA noise levels experienced in daily life and industry situations. The table indicates ranges of from 20 to over 100 dBA.

TABLE 6-1
Typical Decibel (dBA) Values Encountered in Daily Life and Industry
Craig Airport FAR Part 150 Study

Activity	dBA
Room in a quiet dwelling at midnight	32
Soft whispers at 5 feet	34
Men’s clothing department of large store	53
Window air conditioner	55
Conversational speech	60
Household department of large store	62
Busy restaurant	65

TABLE 6-1
Typical Decibel (dBA) Values Encountered in Daily Life and Industry
Craig Airport FAR Part 150 Study

Activity	dBA
Vacuum cleaner in private residence (at 10 feet)	69
Ringing alarm clock (at 2 feet)	80
Loudly reproduced orchestral music in large room	82
Printing press plant	86
Heavy city traffic	92
Heavy diesel-propelled vehicle (about 25 feet away)	92
Air grinder	95
Cut-off saw	97
Home lawn mower	98
Turbine condenser	98
150 cubic foot air compressor	100
Banging of steel plate	104
Air hammer	107

* When distances are not specified, sound levels are the value at the typical location of the machine operator.
Source: Aviation Noise Effects Report No. FAA-EE-85-2

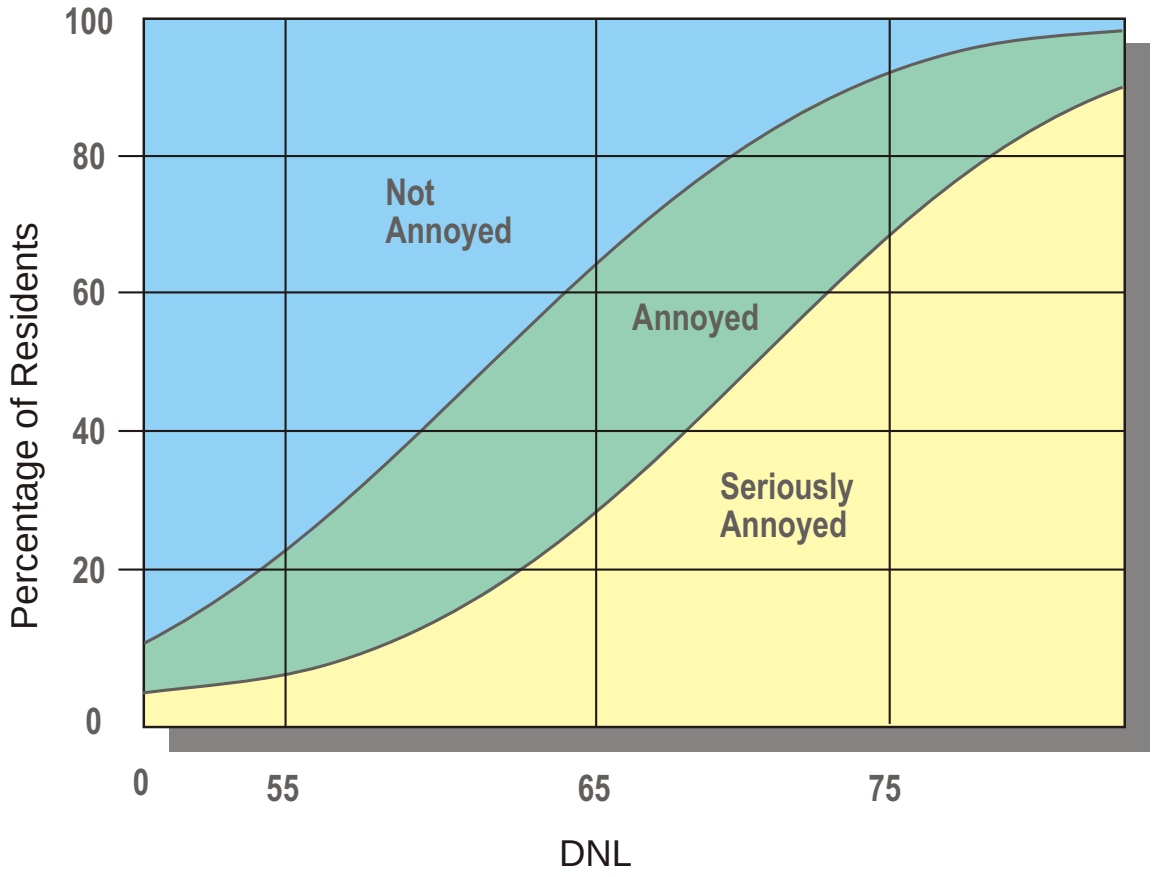
B. EFFECTS OF AVIATION NOISE

As indicated in the Aviation Noise Effects report, annoyance is the most prevalent effect of aircraft noise. The report indicates that while the overall, or average, community attitude about a noise level is usually what is reported, some individuals will be much more and others much less upset with the sound in question. **Exhibit 6-1** shows this typical response pattern. This variation is what makes the science of measuring community response a rather complicated matter. For example, **Exhibit 6-1** shows that at a 55 DNL, approximately 20% of the people are annoyed and 80% are not. Similarly, at the 75 DNL, 90% of the people are annoyed but 10% are not. In the middle range, the 65 DNL, about 60 percent of the people are annoyed and 40% are not. Thus, the amount of noise exposure that is considered objectionable varies greatly by an individual's reaction to noise. This is why when dealing with criteria and guidelines related to noise we hear some say "it's a lot worse than that" and others at the same location say, "I'm not bothered by it."

C. PRINCIPAL CAUSES OF ANNOYANCE

As indicated in the Aviation Noise Effects report, the two principal causes of annoyance are sleep interference and speech interference.

Annoyance Caused by Aircraft Noise in Residential Communities Near Major Airports



SOURCE: FAA Report EE-85-2-Aviation Noise Effects

Exhibit 6-1

Residential Noise Annoyance Levels

Sleep Interference

The effect of aircraft noise on sleep interference was presented in the June 1997 paper entitled Effects of Aviation Noise on Awakenings from Sleep prepared by FICAN. The results were based on the SEL metric and are shown in **Exhibit 6-2**. The dots in the figure (which represent actual case studies) show that there is a wide variance of sensitivity to noise relative to sleep interference. The overall noise impact shows that as the indoor SEL increases, the potential for sleep interference increases. The sleep interference curve, FICAN developed and shown on **Exhibit 6-2**, indicates that with an indoor SEL value of 60 SEL, approximately 3% of the people would be awakened, and at 80 SEL approximately 9% would awake.

Since **Exhibit 6-2** relates to interior SEL values, it is important to understand the effects home construction has on reducing exterior SEL values. Table 6-2, taken from the FICON report, shows that in warm climates, such as Lee County, the typical home with the windows open would reduce the exterior noise level by about 12 dB and with the windows shut, an additional 12 dB reduction would occur. Thus, as an example, the interior noise level resulting from an aircraft generating an exterior value of 92 SEL would be about 80 SEL with the windows open and about 68 SEL with the windows closed. This relationship is important to keep in mind since the SEL noise curves generated for this analysis are exterior SEL values.

Speech Interference

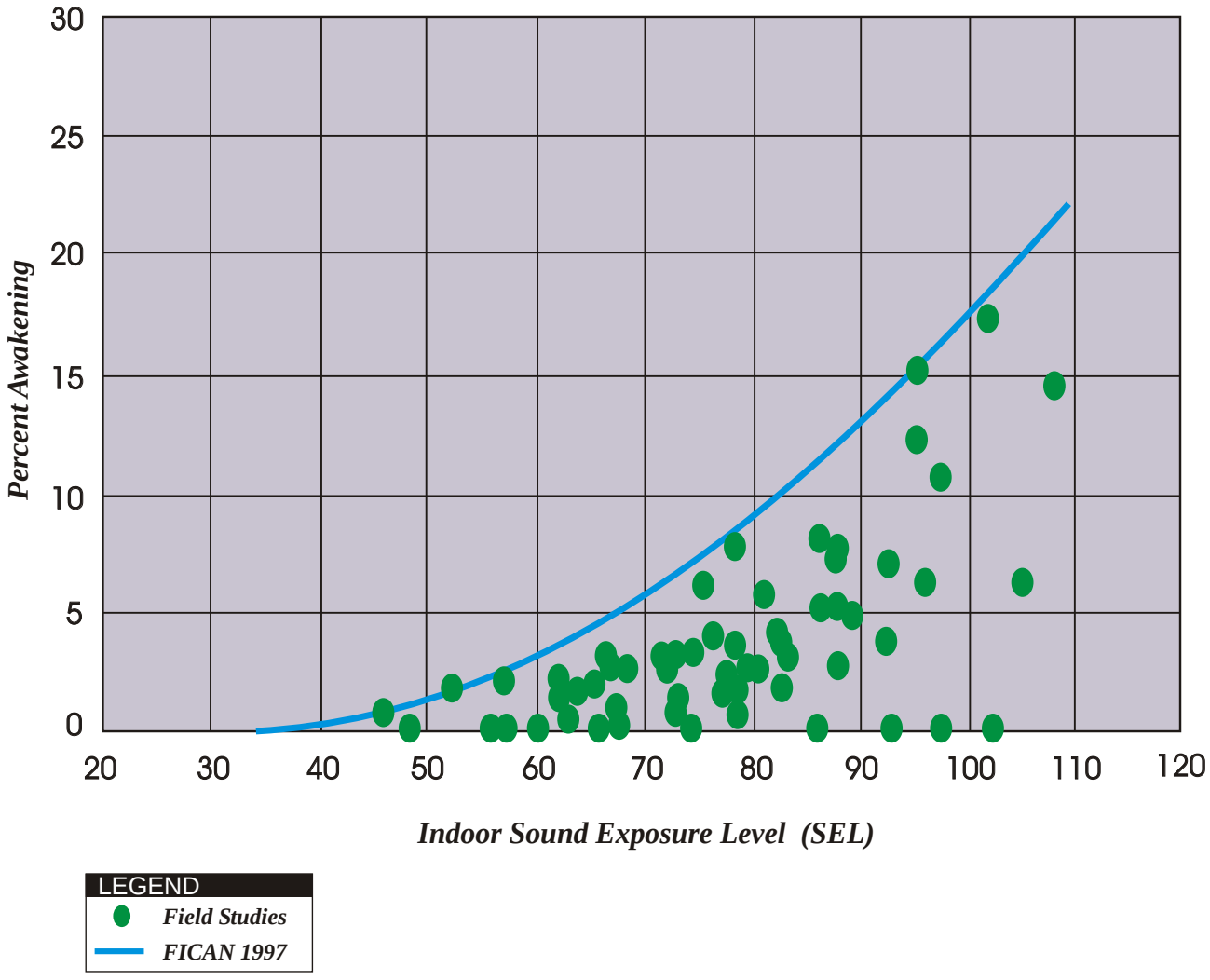
Exhibit 6-3 taken from the FICON report, provides speech interference relationships with various levels of noise interference and speaker/listener distances. The Exhibit, based on the dBA metric, shows that at distances up to six feet (distance between the speaker and listener) communication becomes slightly difficult between 60 and 70 dBA and very difficult above 80 dBA. When this distance increases to 10 feet, communication between 60 and 70 dBA requires a raised voice to a very loud voice, and at 80 dBA a maximum sustained voice (shout) is needed for any communication. Table 6-3, taken from the Aviation Noise Effects report, provides a consolidation of **Exhibit 6-3** for various speech interference levels.

TABLE 6-2
Sound Level Reduction For Typical Residential Structures
Craig Airport FAR Part 150 Study

Climate	Windows Open	Windows Closed
Warm Climate	12 dB	24 dB
Cold Climate	17 dB	27 dB
Approximate National Average	15 dB	25 dB

Source: FICON

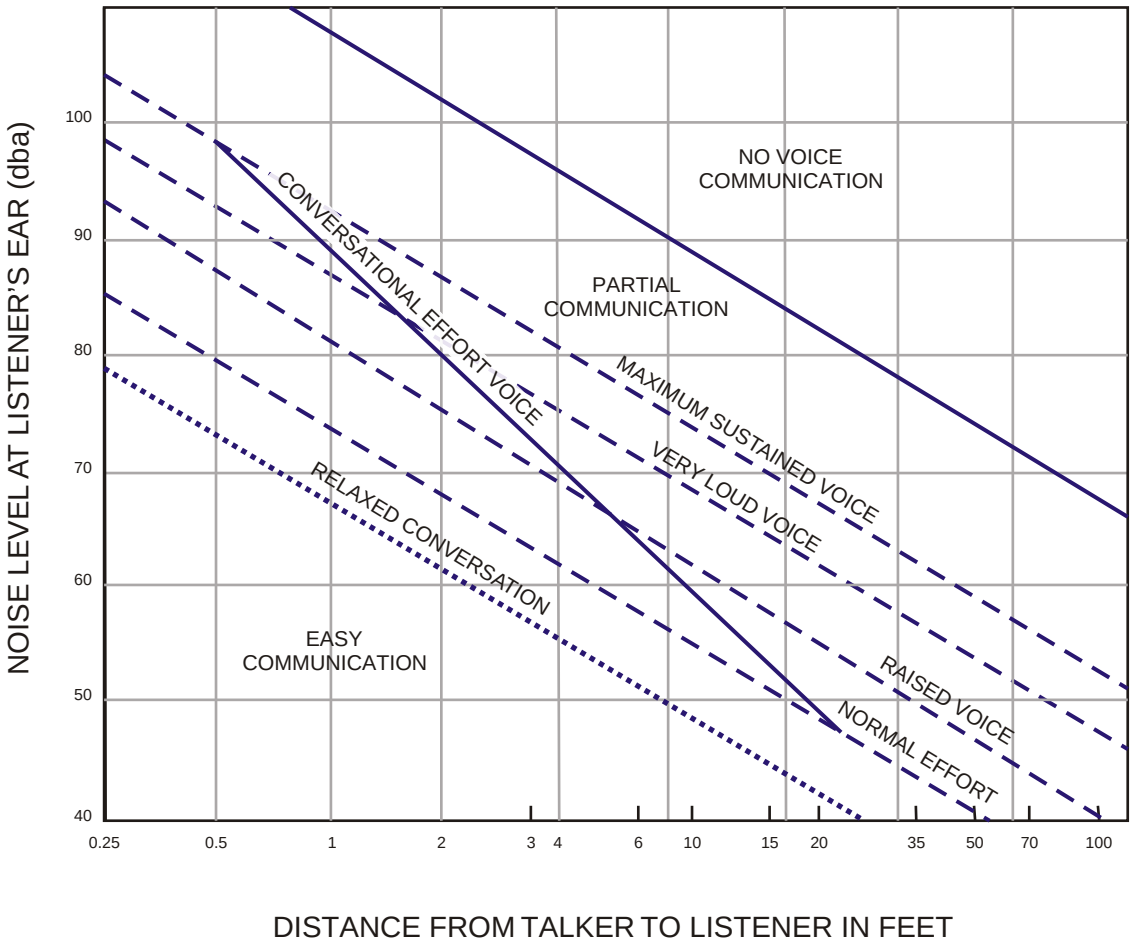
Recommended Sleep Disturbance Dose-Response Relationship



SOURCE: Federal Interagency Committee On Aviation Noise (FICAN)
Effects of Aviatino Noise on Awakenings from Sleep June 1997

Exhibit 6-2
Recommended Sleep Disturbance
Dose-Response Relationship

Speech Interference Relationships



SOURCE: Federal Interagency Committee On Noise (FICON)
Federal Agency Review of Selected Airport Noise Analysis Issues
August 1992 and the U.S. Environmental Protection Agency

Exhibit 6-3
Speech Interference Relationships

TABLE 6-3
Effectiveness of Communication
Craig Airport FAR Part 150 Study

Speech Interference Level (dB)	Person-To-Person Communication
40-50	Communication satisfactory in normal voice 3 to 6 ft, and raised voice 6 to 12 feet. Telephone use satisfactory to slightly difficult.
50-60	Communication satisfactory in normal voice 1 to 2 ft, and raised voice 3 to 6 feet. Telephone use slightly difficult.
60-70	Communication with raised voice satisfactory 1 to 2 ft; slightly difficult, 3 to 6 feet. Telephone use difficult.
70-80	Communication slightly difficult with raised voice 1 to 2 ft; slightly difficult with shouting 3 to 6 feet. Telephone use very difficult.
80-85	Communication slightly difficult with shouting 1 to 2 ft; Telephone use unsatisfactory.

Source:
Aviation Noise Affects, Federal Aviation Administration

Variability of Human Responses to Noise

Exhibits provided in this section indicate that two people are quite likely to respond differently to the same noise event. The extent of annoyance caused by a specific noise event may be extreme for one person and non-existent for another person exposed to the exact same event at the same time. Thus, if there is one given about noise analysis, it is that human response to noise is subject to considerable natural variability. Extensive research has been conducted over the past 35 years to try to identify factors that contribute to the variation in human reaction to noise. Knowing what these variables are helps explain why it is not possible to simply state that a given noise level from a given noise source will result in a particular reaction by an individual. What the research has revealed is that an individual's attitude, beliefs, mood and values may greatly influence whether a particular person perceives a particular sound to be annoying or not. The following list provides a number of the emotional variables that have been found to influence a person's reaction to noise.

- Feelings about the Necessity or Preventability of the Noise If people feel that their needs and concerns are being ignored, they are more likely to feel hostile towards the noise source. If people feel that those creating the noise care about their welfare and are doing what they can to mitigate the noise, they are usually more tolerant of the

noise and able to accommodate higher noise levels.

- Judgment of the Importance and Value of the Activity Producing the Noise If the noise is produced by an activity which people feel is vital, they are often less bothered by it as they would be if the noise-producing activity is considered superfluous. For example, high noise levels of emergency vehicles is acceptable while high noise from a car stereo boom box is perceived as an annoyance.

- Feeling of Fear Associated with the Noise The extent to which an individual fears physical harm from a source of noise will affect the person's attitude toward the source of noise.

- General Sensitivity to Noise People vary in their ability to hear sound, their physiological predisposition to noise and their emotional experience of annoyance to a given noise.

- Predictability of the Noise Individuals exposed to unpredictable noise have a lower tolerance than those exposed to predictable noise.

- Control over the Noise Source A person who has no control over the noise source will be more annoyed than one who is able to exercise some control.

All of the items listed need to be kept in mind when considering the response of persons to noise. It needs to be noted that in some cases the actual concern may not even be the noise source, but may be associated with one or more of the emotional variables that influence a person's mood or attitude at the time of a noise event.

CHAPTER 7

AVIATION ACTIVITY FORECASTS

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AVIATION ACTIVITY FORECASTS

Current and projected activity levels are a key input into the development of Noise Exposure Maps (NEM) for a FAR Part 150 Study. The existing baseline condition scenario is based on analysis of recent actual airport activity and represents one of the two standard scenarios outlined in an NEM report. The second scenario outlines the contours associated with projected conditions five years into the future. Both scenarios are considered baseline scenarios against which operational modifications and other noise reduction alternatives will be assessed during the Noise Compatibility Program (NCP) phase of the study.

For the CRG FAR Part 150 Study, a third scenario will also be developed that addresses conditions at the airport in the long term. The long range 2020 DNL contours will be developed and included as part of the NCP Report to assist in addressing off-airport land use options.

The existing baseline conditions are referred to as the 2004 DNL Noise Contours for the purposes of the CRG NEM Report. This scenario corresponds to actual activity at the airport that occurred between January and December 2004. The five-year scenario, referenced as the 2009 DNL Noise Contours, was based on the projections presented in the FAA's 2005 Terminal Area Forecast (TAF).

A. FORECAST ACTIVITY LEVEL CONSIDERATIONS

The 2001 CRG Master Plan Update included development of short, medium and long term forecasts reflecting the projected activity levels in 2005, 2010, 2015 and 2020, respectively. In reviewing these activity levels it was noted that the forecasts were developed and approved by the FAA prior to the September 11th attacks on the World Trade Center. This is mentioned here because many airports in the United States experienced a sharp reduction in aircraft operations following the attacks. However, comparing current actual activity at CRG to that projected in the master plan, it was noted that the actual activity is tracking closely to those levels projected in the master plan. Additionally, comparing the FAA's 1999 Terminal Area Forecast (TAF) used in the Master Plan Update dated October 2001 to the January 2005 TAF, it was noted that the FAA has actually adjusted operations upward at CRG since the events of September 11th.

Table 7-1 compares the actual activity levels (historic) with the FAA's 2005 TAF and the Master Plan projected activity levels. In reviewing this information it is important to

keep in mind the FAA's directive for airports in developing their own forecast levels of activity. Based on the most recent FAA memorandum from the Director of Airport Planning and Programming to all FAA Regional Airport Division Managers, dated December 23, 2004, the FAA is to consider forecasts to be consistent with the FAA's TAF if the forecasts developed differs from the TAF by less than 10 percent during the first five years and by less than 15 percent in the 10 year timeframe.

TABLE 7-1
Historic and Projected Aircraft Operations

Year	Actual	Master Plan	FAA TAF (2005)	% Actual vs. Master Plan	% Master Plan vs. TAF
1997	135,489	135,489	135,685	0.00%	-.14%
1998	135,791	135,791	130,770	0.00%	3.70%
1999	141,867	141,867	146,102	0.00%	-2.99%
2000	137,856	*155,741	131,210	-12.97%	*15.75%
2001	158,456	*158,856	140,839	-.25%	*11.34%
2002	163,114	*162,033	168,485	-.66%	*-3.98%
2003	170,643	*165,273	165,559	3.15%	*-.17%
2004	**174,114**	*168,579	170,076	3.28%	*-.88%
2005		*171,950	*173,616		*-.97%
2006		*175,389	*177,155		*-1.01%
2007		*178,897	*180,279		*-.77%
2008		*182,475	*183,461		*-.54%
2009		*186,125	***186,703**		*-.31%
2020		*231,423	*226,704		*2.04%

Source: 2001 Master Plan Update, FAA TAF January 2005 (downloaded February 2005), FAA ATADS Database
Note: * indicates projected values.
Note: TAF relates US Government Fiscal Year (October through September) while master plan forecast and "actual" relate to calendar year.
Numbers in bold reflect the unadjusted baseline activity levels for 2004 and 2009.

It was noted that the operational activity levels at CRG actually increased significantly following September 11th, 2001:

- The activity levels projected for 2001 were only .25% less than those projected in the master plan.
- In 2002 and 2003 total operations grew 2.8% and 4.4% respectively.
- Since 2001, the Master Plan forecasts have tracked close to actual total operations through 2004 differing by only -.25% in 2001, 3.15% in 2003, and 3.28% in 2004.
- Over the next 5 years the Master Plan forecast is projected to mirror the 2004 TAF differing only by -.88% in 2004 to -.31% in 2009.

Since the projections outlined in the Master Plan Update deviate little from the 2005 TAF significantly, the Master Plan forecasts were initially considered reasonable for use in projecting total future operations for the purposes of this study. However, while the total aircraft operations outlined in the Master Plan forecast track the latest TAF very closely, an important observation was made as to how operations are currently recorded at the airport. It was determined based on initial observations of airport activity and later confirmed by the tower that aircraft operations reported as military itinerant are actually aircraft that transition the airspace approximately 4 miles north of the airport between Mayport and NavyJAX. These aircraft do not approach, land or depart from CRG airport and, for the purposes of this study, are not considered airport operations. Therefore, for the purpose of noise modeling an operational adjustment is required to reflect only those aircraft that are arriving to or departing from the airport. This adjustment is discussed further in the following section.

B. CRG BASELINE ACTIVITY ADJUSTMENT

This section outlines the baseline activity adjustments made to reflect only those aircraft which arrive to and depart from the airport.

2004 Baseline - January through December 2004

Table 7-2 outlines the annual operations recorded by the CRG tower from January 2004 through December 2004. While 174,114 operations were recorded by the tower, it was determined that activity recorded as military itinerant did not actually land at or depart from the airport (see previous section). Therefore, for the purposes of this study 162,115 total operations was used to establish the baseline 2004 noise contour.

TABLE 7-2
2004 Activity Profile
Craig Airport FAR Part 150 Study

Year	Itinerant			Local			Total
	GA	Military	Total	GA	Military	Total	
2004	92,762	**11,999**	104,761	68,913	440	69,353	174,114
2004 Adjusted	92,762	*	92,762	68,913	440	69,353	**162,115**

Source:
Jacksonville Aviation Authority, 2005 FAA TAF and ESA Airports
** Indicates minimal activity*

2009 Baseline

In reviewing the details of the master plan forecast, it was determined that while these forecasts closely mirror the TAF from an overall operational standpoint, the profile of activity does not accurately reflect what is occurring at the airport.

The master plan estimated that local activity would account for 34 percent of total activity at the airport in both 2004 and 2009. Local activity actually accounted for 42.8 percent of total activity in 2004 and has hovered around 40% since 2002. The 2005 TAF projection better reflects the relationship between local and itinerant aircraft.

Both the master plan and the TAF included a number of military itinerant aircraft in the projections of total activity. However, the TAF simply projects a flat line level of military itinerant operations based on historically recorded activity. This makes it much easier to simply remove that portion of the airport's activity from the total projected activity level. Table 7-3 outlines the results of this adjustment. As reflected in the table, the baseline 2009 adjusted activity level is 174,561 total operations.

TABLE 7-3
2009 Activity Profile
Craig Airport FAR Part 150 Study

Year	Itinerant			Local			Total
	GA	Military	Total	GA	Military	Total	
2009	101,911	**12,141**	114,052	72,159	491	72,650	186,703
2009 Adjusted	101,911	*	101,911	72,159	491	72,650	**174,561**

Source:
Jacksonville Aviation Authority, 2005 FAA TAF and ESA Airports
** Indicates minimal activity*

CHAPTER 8

NOISE EXPOSURE MAPS

CHAPTER 8

NOISE EXPOSURE MAPS

The methodology for calculating the existing baseline (2004) and future (2009) DNL contours for CRG is described in this chapter. The methodology includes the use of an FAA approved computer simulation model and airport specific data including the types of aircraft operating at the airport, runway use, primary flight track utilization, aircraft stage lengths, and the time of day for the aircraft operations.

A. INTEGRATED NOISE MODEL (INM)

The standard methodology for analyzing the noise conditions at airports involves the use of a computer simulation model. The FAA has approved two models for use in FAR Part 150 Noise Compatibility Studies -- NOISEMAP and the INM. NOISEMAP is used most often at military airports, while the INM is most commonly used at civilian airports.

The INM was developed by the Transportation Systems Center of the United States Department of Transportation (USDOT) at Cambridge, Massachusetts and is undergoing continuous refinement. The model is designed as a conservative planning tool, and is periodically updated based on the philosophy that each version should present a conservative approach to noise prediction. Version 6.1 is the most current version of the model at this time and was used for the noise analysis described in this report.

Methodology

The INM works by defining a network of grid points at ground level around an airport. It then selects the shortest distance from each grid point to each flight track and computes the noise exposure generated by each aircraft operation, by aircraft type and engine thrust level, along each flight track. Corrections are applied for atmospheric acoustical attenuation, acoustical shielding of the aircraft engines by the aircraft itself, and aircraft speed variations. The noise exposure levels for each aircraft are then summed at each grid location. The cumulative noise exposure levels at all grid points are then used to develop noise exposure contours for selected values (e.g. 60, 65, 70, and 75 DNL). DNL noise contours of equal noise exposure can then be plotted.

INM Input Data

In order to develop DNL noise contours, the INM uses a series of input factors. Some of these factors are included in the database for the model (such as engine noise levels, thrust settings, aircraft profiles and aircraft speeds) and others are Airport-specific and need to be determined for each condition analyzed. This Airport-specific data includes the airport

elevation, average annual temperature, runway layout, the mathematical description of ground tracks above which aircraft fly, and the assignment of specific aircraft with specific engine types at specific takeoff weights to individual flight tracks. Other INM input factors specific to CRG for this analysis include:

- Runway orientation and use
- Existing aircraft operations and fleet mix
- Future aircraft operations and fleet mix
- Time of day/night of operations
- Stage lengths of aircraft

For GA airports, the split of itinerant and local activity are key factors that must be considered in the noise modeling effort. Local activity is generally described as an aircraft that remains in the local airspace within sight of the local air traffic control tower or within the tower's immediate area of control. These flights are often associated with training activities. Itinerant operations encompass the remainder of the flight activities at an airport and include transient aircraft activities.

Noise Curve Data

In addition to the mathematical procedures defined in the model, the INM has another very important element. This is a database containing tables correlating noise, thrust settings, and flight profiles for most of the civilian aircraft, and many common military aircraft, operating in the United States. This database, often referred to as the noise curve data, has been developed under FAA guidance based on thousands of actual noise measurements in controlled settings for each aircraft type.

The database also includes performance data for each aircraft type. This data allows the model to compute airport-specific flight profiles (rates of climb and descent) for each aircraft type, providing an accurate representation of actual procedures. The model also includes a number of FAA approved substitute aircraft. The tables contained in this chapter identify the actual aircraft type operating at CRG and, when necessary, the FAA approved INM substitute aircraft type.

B. CRG FLEET MIX INPUT

The 2004 fleet mix was determined through the use of various sources, including: analysis of more than 5,500 flight strips, data provided by the airport operations department and discussions with FAA air traffic control tower personnel and fix based operators located at the airport. For 2009, the specific mix of aircraft identified in the Master Plan update was modified to reflect the changes in CRG's aircraft fleet since completion of the update. Industry trends were also reviewed and the fleet was adjusted as required to reflect a reasonable representation of the airport's future activity.

Military Operations

Tables 8-1 and 8-2 present the operations and fleet mix of military aircraft for 2004 and 2009, respectively.

TABLE 8-1
2004 Military Operations and Fleet Mix
Craig Airport FAR Part 150 Study

Aircraft	INM Aircraft	Operations	Operations/ Day	Percent of Fleet
Coast Guard	S70	220	0.60	50.0
Navy	A109	220	0.60	50.0
Total		***440***	***1.20***	***100.0***

Source:
ESA Airports

TABLE 8-2
2009 Military Operations and Fleet Mix
Craig Airport FAR Part 150 Study

Aircraft	INM Aircraft	Operations	Operations/ Day	Percent of Fleet
Coast Guard	S70	246	0.68	50.4
Navy	A109	245	0.67	49.6
Total		***491***	***1.35***	***100.0***

Source:
ESA Airports

General Aviation Operations

Tables 8-3 and 8-4 present the 2004 itinerant and local general aviation operations and fleet mix. The 2009 general aviation operations and fleet mix is presented in Tables 8-5 and 8-6.

TABLE 8-3
2004 Itinerant General Aviation Operations and Fleet Mix
Craig Airport FAR Part 150 Study

Aircraft Category	INM Aircraft	Aircraft Type	Operations	Operations / Day	Percent of Fleet
Single-Engine	CNA172	Cessna 150/152/172/177	22423	61.43	24.17
Piston	CNA206	Cessna 182/185/205/206	10279	28.16	11.08
	CNA20T	Cessna 207	1330	3.64	1.43
	GASEPF	Beechcraft 23/24	6962	19.07	7.51
	GASEPV	Piper 28R/32R/46	10296	28.21	11.10
Multi-Engine Piston	BEC58P	Beechcraft 55/58/65/76/95	22769	62.38	24.55
Turboprop	CNA441	Cessna 421/425/441	5839	16.00	6.29
	DHC6	Beech Super King Air 200/300	5476	15.00	5.90
	EMB120	Embrair 120	35	0.09	0.04
	HS748A	Fairchild Merlin	484	1.33	0.52
Jet	CNA500	Cessna Citation I	987	2.70	1.06
	CNA55B	Cessna Citation II	1346	3.69	1.45
	CNA750	Cessna Citation V	35	0.09	0.04
	CIT3	Cessna Citation VII	62	0.17	0.07
	LEAR25	Lear 25, Saberliner	173	0.47	0.19
	LEAR35	Lear 31/35/36	863	2.36	0.93
	MU3001	Cessna 550/560/56X	1277	3.50	1.38
	IA1125	Astra 1125	14	0.04	0.01
Helicopter	EC130	Eurocopter EC130	655	1.79	0.71
	B206L	Bell 206L	1460	4.00	1.57
Total			***92,762***	***254.14***	***100.00***

Source:
ESA Airports

TABLE 8-4
2004 Local General Aviation Operations and Fleet Mix
Craig Airport FAR Part 150 Study

Aircraft Category	INM Aircraft	Aircraft Type	Operations	Operations/ Day	Percent of Fleet
Single-Engine	CNA172	Cessna 150/152/172/177	24102	66.03	34.97
Piston	CNA206	Cessna 182/185/205/206	11048	30.27	16.03
	CNA20T	Cessna 207	1430	3.92	2.08
	GASEPF	Beechcraft 23/24	7483	20.50	10.86
	GASEPV	Piper 28R/32R/46	11067	30.32	16.06
Multi-Engine Piston	BEC58P	Beechcraft 55/58/65/76/95	9069	24.85	13.16
Turboprop	CNA441	Cessna 421/425/441	2326	6.37	3.38
	DHC6	Beech Super King Air 200/300	2181	5.98	3.16
	EMB120	Embrair 120	14	0.04	0.02
	HS748A	Fairchild Merlin	193	0.53	0.28
Total			***68,913***	***188.80***	***100.00***

Source:
ESA Airports

TABLE 8-5
2009 Itinerant General Aviation Operations and Fleet Mix
Craig Airport FAR Part 150 Study

Aircraft Category	INM Aircraft	Aircraft Type	Operations	Operations/ Day	Percent of Fleet
Single-Engine	CNA172	Cessna 150/152/172/177	24635	67.49	24.17
Piston	CNA206	Cessna 182/185/205/206	11293	30.94	11.08
	CNA20T	Cessna 207	1461	4.00	1.43
	GASEPF	Beechcraft 23/24	7649	20.96	7.51
	GASEPV	Piper 28R/32R/46	11312	30.99	11.10
Multi-Engine Piston	BEC58P	Beechcraft 55/58/65/76/95	25015	68.53	24.55
Turboprop	CNA441	Cessna 421/425/441	6415	17.58	6.29
	DHC6	Beech Super King Air 200/300	6016	16.48	5.90
	EMB120	Embrair 120	38	0.10	0.04
	HS748A	Fairchild Merlin	531	1.46	0.52
Jet	CNA500	Cessna Citation I	1084	2.97	1.06
	CNA55B	Cessna Citation II	1478	4.05	1.45
	CNA750	Cessna Citation V	38	0.10	0.04
	CIT3	Cessna Citation VII	68	0.19	0.07
	LEAR25	Lear 25, Saberliner	190	0.52	0.19
	LEAR35	Lear 31/35/36	948	2.60	0.93
	MU3001	Cessna 550/560/56X	1402	3.84	1.38
	IA1125	Astra 1125	15	0.04	0.01
Helicopter	EC130	Eurocopter EC130	720	1.97	0.71
	B206L	Bell 206L	1604	4.39	1.57
Total			***101,911***	***279.21***	***100.00***

Source:
ESA Airports

TABLE 8-6
2009 Local General Aviation Operations and Fleet Mix
Craig Airport FAR Part 150 Study

Aircraft Category	INM Aircraft	Aircraft Type	Operations	Operations/ Day	Percent of Fleet
Single-Engine	CNA172	Cessna 150/152/172/177	25238	69.15	34.98
Piston	CNA206	Cessna 182/185/205/206	11569	31.70	16.03
	CNA20T	Cessna 207	1497	4.10	2.07
	GASEPF	Beechcraft 23/24	7836	21.47	10.86
	GASEPV	Piper 28R/32R/46	11588	31.75	16.06
Multi-Engine Piston	BEC58P	Beechcraft 55/58/65/76/95	9496	26.02	13.16
Turboprop	CNA441	Cessna 421/425/441	2435	6.67	3.37
	DHC6	Beech Super King Air 200/300	2284	6.26	3.17
	EMB120	Embrair 120	14	0.04	0.02
	HS748A	Fairchild Merlin	202	0.55	0.28
Total			***72,159***	***197.70***	***100.00***

Source:
ESA Airports

Time of Day

For the purposes of noise modeling, the percentages of aircraft that operate during the daytime (7a.m.-10p.m.) and nighttime (10p.m.-7a.m.) are required. The separation of aircraft activity into daytime and nighttime activities is important because the Integrated Noise Model (INM) includes a 10 decibel penalty for aircraft noise during the nighttime hours. Currently, the day night split is estimated to be 92 percent during the daytime and 8 percent during the nighttime. This same split will be used for 2009.

Stage Length

An aircraft's "stage length" (or trip length) refers to the distance an aircraft flies to its next destination after departing an airport. The stage length is important in noise modeling, since the longer the distance an aircraft will travel to its next destination the greater its fuel load and overall weight and, as a result, the lower its departure profile will be. Stage lengths used in the INM include the following ranges:

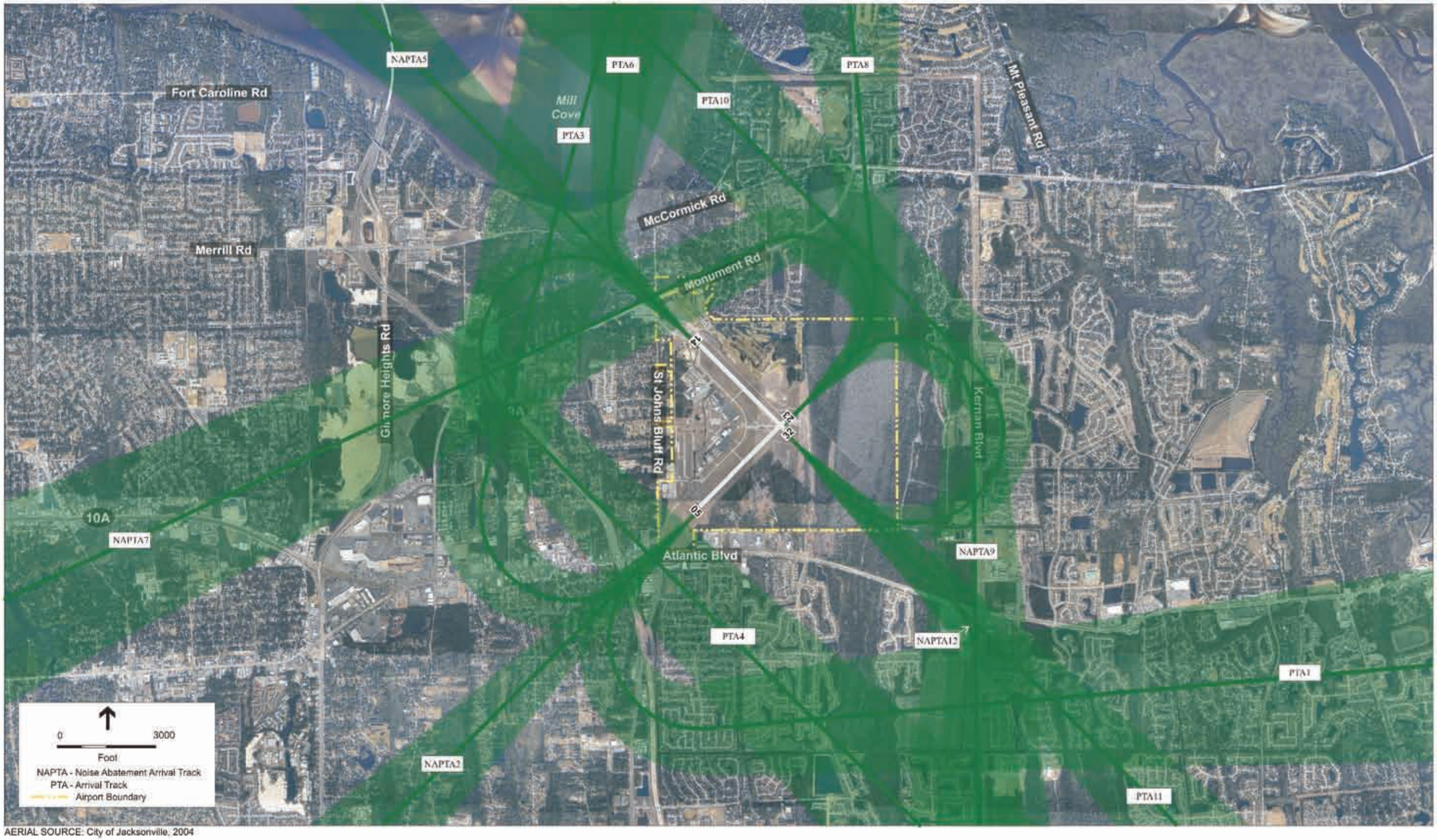
Stage length 1 – 0 to 500 miles	Stage length 2 – 500 to 1000 miles
Stage length 3 – 1000 to 1500 miles	Stage length 4 – 1500 to 2500 miles
Stage length 5 – 2500 to 3500 miles	Stage length 6 – 3500 to 4500 miles

For GA aircraft, the INM automatically uses Stage length 1.

Flight Tracks

The location of flight tracks and corridors is an important factor in determining the geographic distribution of noise contours on the ground. Flight corridors utilized by arriving and departing aircraft in all flow conditions were reviewed and a series of centerlines of flight corridors (flight tracks) were established for each condition. These flight tracks were splayed within the INM in order to distribute the aircraft within each of the primary flight corridors. The aircraft arrival flight tracks are shown in **Exhibit 8-1** and the departure flight tracks are shown on **Exhibit 8-2**.

The runway and flight track use percentages by aircraft group are presented in Tables 8-7 and 8-8. Runway 14-32 is the primary runway and accounts for 58 percent of activity while Runway 5-23 accounts for the remaining 42 percent. Local pattern flight track usage is outlined in Table 8-9.



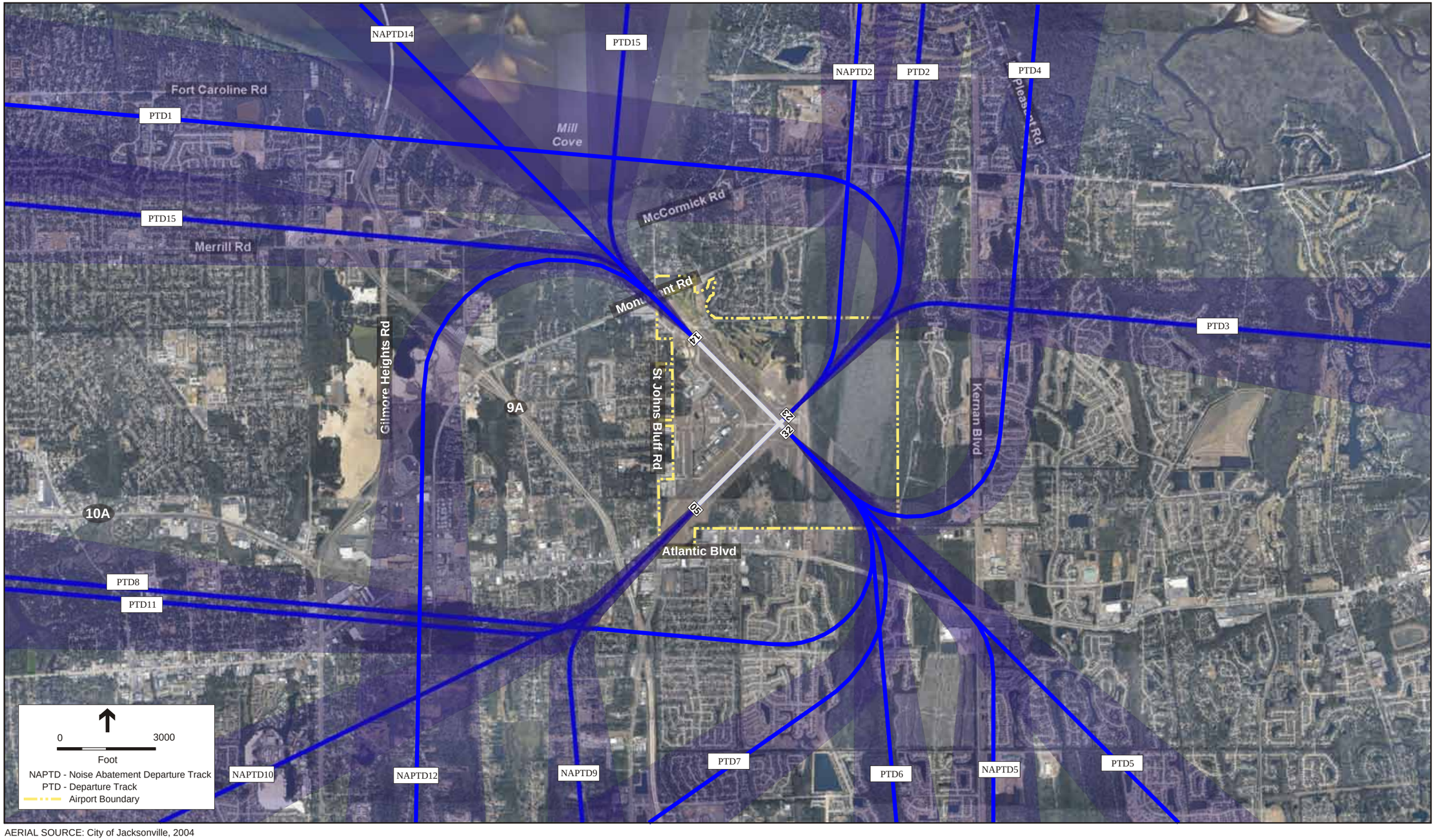
AERIAL SOURCE: City of Jacksonville, 2004

SOURCE: ESA Airports

Craig FAR Part 150 Study . 203086

Exhibit 8-1

Aircraft Flight Tracks - Arrivals



AERIAL SOURCE: City of Jacksonville, 2004

SOURCE: ESA Airports

Craig FAR Part 150 Study . 203086

Exhibit 8-2

Aircraft Flight Tracks - Departures

TABLE 8-7
2004 and 2009 Propeller Aircraft Flight Track Usage
Craig Airport FAR Part 150 Study

Runway	Departure Runway Use %	Departure Track	% of Flight Activity	Arrival Runway Use %	Arrival Track	Percentage of Flight Activity
Runway 5	20%	D1	40%	22%	A1	60%
		D2	5%		A2	20%
		D3	35%		A3	20%
		D3A	20%			
Runway 14	22%	D4	25%	28%		
		D5	50%		A4	40%
		D6	5%		A5	45%
		D7	15%		A6	15%
		D8	5%			
Runway 23	28%	D9	60%	20%	A7	20%
		D10	5%		A8	20%
		D11	35%		A9	60%
Runway 32	30%	D12	40%	30%	A10	15%
		D13	18%		A11	60%
		D14	2%		A12	25%
		D15	40%			

Source:
FAA Air Traffic Control and ESA Airports

TABLE 8-8
2004 and 2009 Jet Aircraft Flight Track Usage
Craig Airport FAR Part 150 Study

Runway	Departure Runway Use %	Departure Track	% of Flight Activity	Arrival Runway Use %	Arrival Track	Percentage of Flight Activity
Runway 5	20%	D2	100%	22%	A2	100%
Runway 14	22%	D5	60%	28%	A5	100%
		D7	40%			
Runway 23	28%	D10	50%	20%	A8	100%
		D11	50%			
Runway 32	30%	D13	10%	30%	A11	100%
		D14	60%			
		D15	30%			

Source:
FAA Air Traffic Control and ESA Airports

TABLE 8-9
2004 and 2009 Local Pattern Flight Track Usage
Craig Airport FAR Part 150 Study

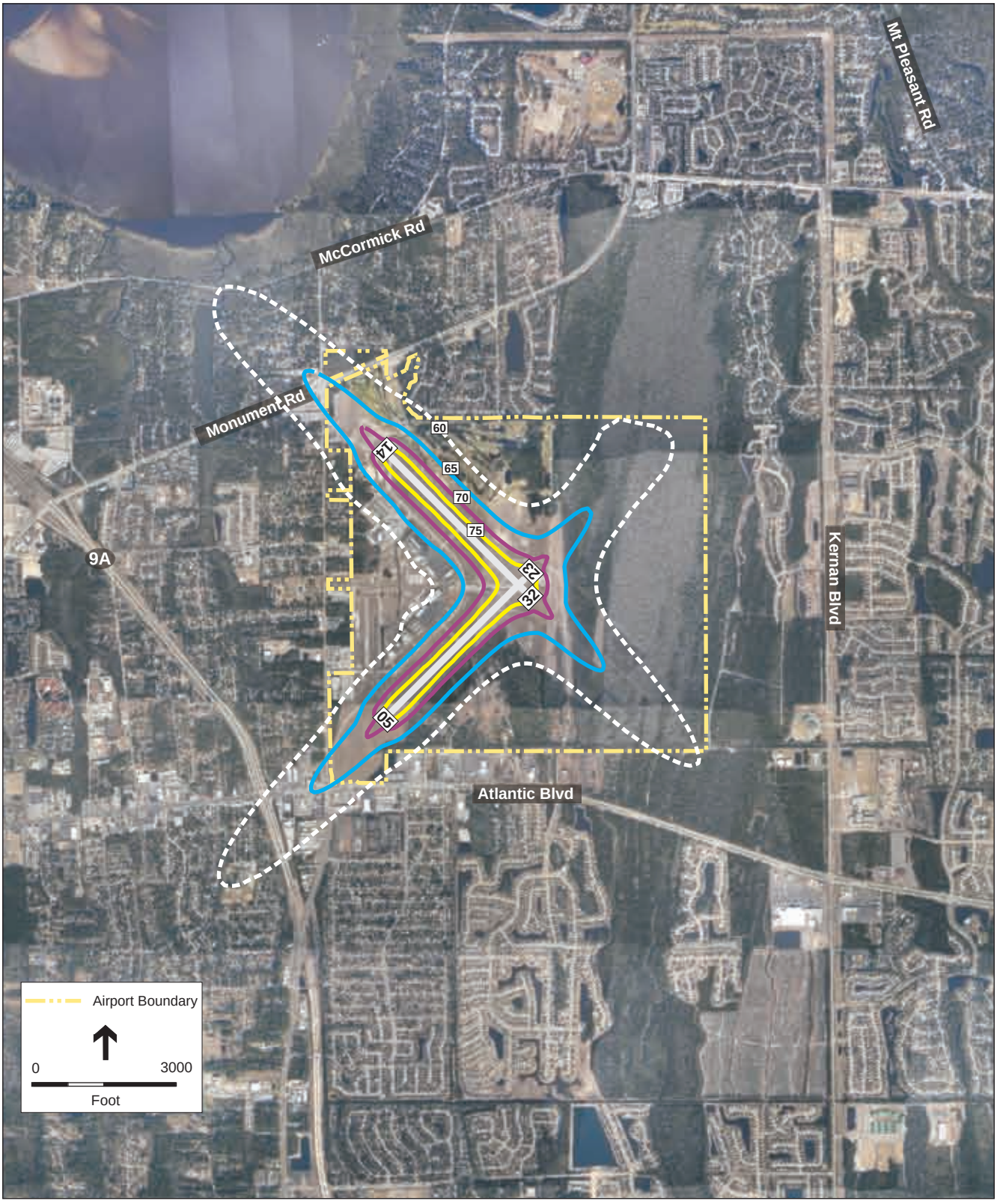
Runway	Touch and Go use Percentage	Track	Prop / Turboprop GA Jet Military
5	22	T1	95%
		T2	5%
14	28	T3	5%
		T4	95%
23	20	T5	95%
		T6	5%
32	30	T7	95%
		T8	5%

Source:
FAA Air Traffic Control and ESA Airports

C. 2004 DNL NOISE CONTOURS

The 2004 DNL noise contours are shown in **Exhibit 8-3**. As seen in the exhibit, the contours are largest to both the northwest and southwest, the two areas subjected to the greatest number of departures. When compared to departures, noise exposure associated with arrivals generates less sideline noise due to their lower power settings but increases the extent of the noise exposure along the centerline of the approach due to their lower altitudes. Departures, on the other hand, generate greater sideline noise due to higher thrust settings. The 2004 baseline contours are smaller than those in the 2000 noise study for two main reasons. These contours reflect the relocation of the National Guard to Cecil Field and a revision in the number of business jets currently utilizing the airfield. The previous noise analysis used an estimate of general aviation jets outlined in the Master Plan Update to generate the contours. The master plan noted that no real fleet data existed and that the future fleet was based on assumptions relative to based aircraft. Subsequent analysis of over 5,500 flight strips determined that this estimate of jet operations was roughly three times greater than that actually occurring at the airport. Therefore, the amount of jet activity modeled was modified to reflect the actual levels of jets operating at the airport.

As outlined in the exhibit, the 2004 70 and 75 DNL contours remain on airport property. The 65 DNL noise contour, which the FAA identifies as the level of significant impact, extends just west of St. Johns Bluff Road both to the north and to the south. The 60 DNL extends considerably further or roughly 3,000 feet off the property to the northwest and 3,000 feet off the property to the southwest. The total area within each noise contour is identified in Table 8-10. Land uses and population within each of the contours is described in the next section.



AERIAL SOURCE: City of Jacksonville, 2004

SOURCE: ESA Airports

Craig FAR Part 150 Study . 203086

Exhibit 8-3

2004 DNL Noise Contours

TABLE 8-10
2004 DNL Noise Contour Surface Areas
Craig Airport FAR Part 150 Study

Contour	Total Acres	Acres Within 5 DNL Range
60	992.4	629.5 (60-65 DNL)
65	362.9	209.7 (65-70 DNL)
70	153.2	81.2 (70-75 DNL)
75	72.0	72.0 (75+ DNL)

Source:
ESA Airports

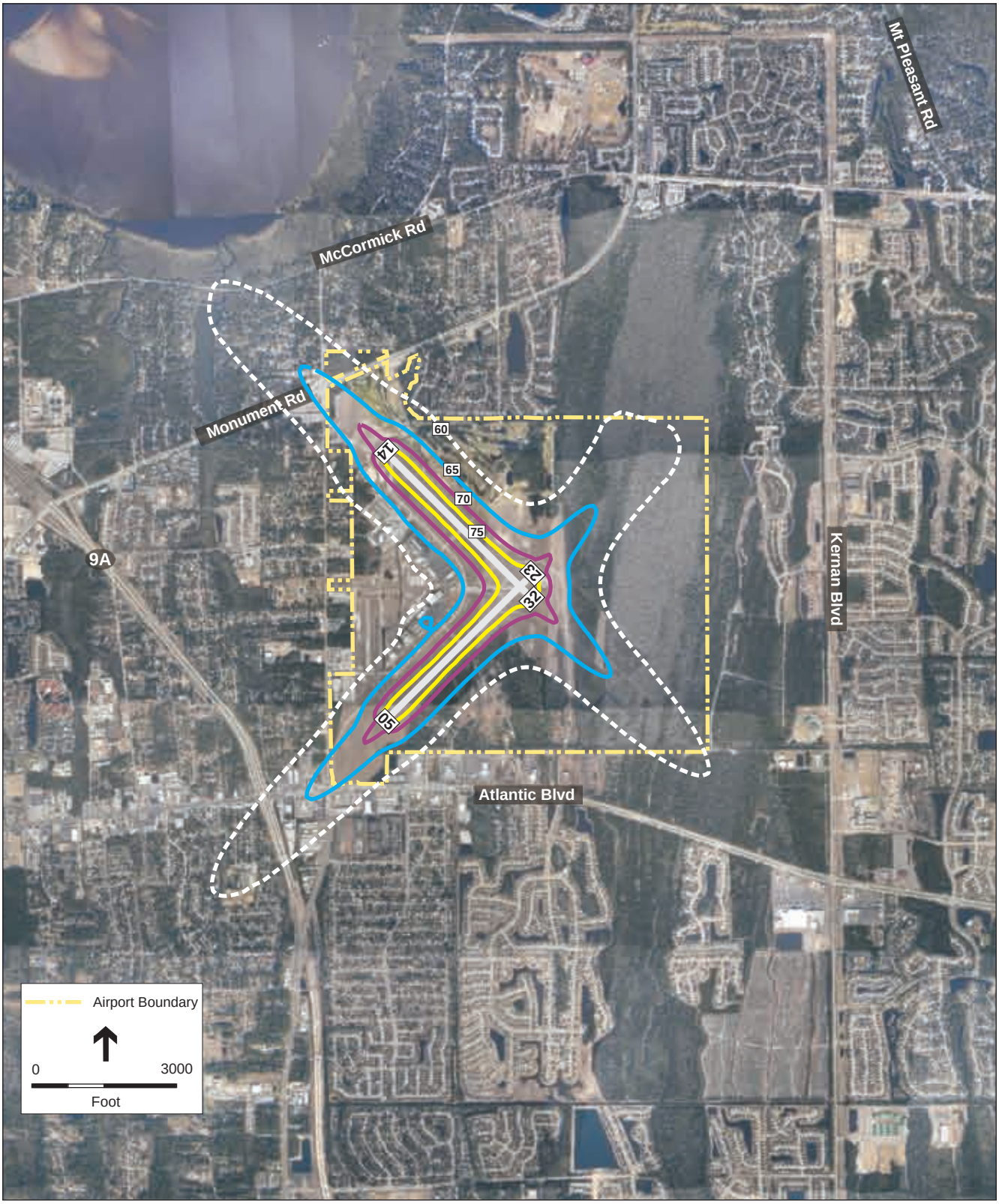
D. 2009 DNL NOISE CONTOURS

The 2009 DNL noise contours are shown in **Exhibit 8-4**. The overall shape of the contours is similar to that of the 2004 contours but the 2009 contours are larger. The larger contours are a result of the projected increase in operations at CRG by 2009. The 2009 70 and 75 DNL contours remain on airport property. The 65 DNL noise contour extends a bit further off airport property to the northwest and southwest than the 2004 contour. The noise contour surface areas are identified in Table 8-11. Land uses and population within each of the contours are described in the next section.

TABLE 8-11
2009 DNL Noise Contour Surface Areas
Craig Airport FAR Part 150 Study

Contour	Total Acres	Acres Within 5 DNL Range
60	1067.2	680.2 (60-65 DNL)
65	387	224.3 (65-70 DNL)
70	162.7	86.2 (70-75 DNL)
75	76.5	76.5 (75+ DNL)

Source:
ESA Airports



AERIAL SOURCE: City of Jacksonville, 2004

SOURCE: ESA Airports

Craig FAR Part 150 Study . 203086

Exhibit 8-4

2009 DNL Noise Contours

CHAPTER 9

DNL CONTOURS AND LAND USE IMPACTS

CHAPTER 9

DNL CONTOURS AND LAND USE IMPACTS

The FAA and FDOT have developed guidance which relates the compatibility of aircraft activity to areas surrounding airports. The Part 150 Federal Aviation Administration Land Use Guidelines, shown in Table 9-1 have identified certain specific uses in addition to residential as being incompatible with noise levels above 65 DNL. The Florida Department of Transportation Airport Land Use Guidelines are presented on Table 9-2. As shown in the tables, the FAA has indicated that lands outside the 65 DNL are compatible with aircraft noise, however they encourage local planning agencies to promote compatible development beyond the 65 DNL. The responsibility for identifying acceptable land uses rests with the local agencies. Information presented in Chapter 6 show that a significant number of people are annoyed with aircraft noise beyond the 65 DNL.

A. NOISE SENSITIVE SITES

As noted above, there are a number of uses in addition to residential that are considered to be noise sensitive. **Exhibit 9-1** and Table 9-3 outline 37 such sites in the Airport study area. These sites include such uses as schools, churches, parks, and cemeteries.

TABLE 9-3
Noise Sensitive Sites
Craig Airport FAR Part 150 Study

Site
Schools
1 – Don Brewer Elementary
2 – Merrill Road Elementary School
3 – Arlington Middle School
4 – Woodland Acres Elementary School
5 – Lonestar Elementary School
6 – Brookview Elementary School
7 – Kernan Elemantary
8 – Landmark Elementary
9 – Landmark Middle School
10 – Abbess Elementary School
11 – Sabal Palm Elementary School
Places of Worship
12 – The Father's House
13 – Christ Cares Alliance Church
14 – Highlands United Presbyterian Church
15 – Jacksonville Christian Center
16 – Alliance Bible Church

TABLE 9-1
FEDERAL AVIATION ADMINISTRATION COMPATIBLE LAND USE GUIDELINES

Land Use	Yearly Day-Night Average in Decibels: Below 65	65-70	70-75	75-80	80-85	Over 85
RESIDENTIAL	Y	N_1	N_1	N	N	N
Residential, other than mobile homes and transient lodgings						
Household units. (11)						
Single units - detached (11.11)						
Single units - semidetached (11.12)						
Single units - attached row (11.13)						
Two units - side-by-side (11.21)						
Two units - one above the other (11.22)						
Apartments - walk up (11.31)						
Apartments - elevator (11.32)						
Group quarters (12)						
Residential hotels (13)						
Other residential (19)						
Mobile home parks (14)	Y	N	N	N	N	N
Transient lodgings (15)	Y	N_1	N_1	N_1	N	N
PUBLIC USE:						
Schools	Y	N_1	N_1	N	N	N
Educational services (68)						
Hospitals and nursing homes	Y	25	30	N	N	N
Hospitals, nursing homes (65.13, 65.16)						
Churches, auditoriums and concert halls	Y	25	30	N	N	N
Cultural activities (including churches) (71)						
Auditoriums, concert halls (72.1)						
Government services (67)	Y	Y	25	30	N	N
Transportation	Y	Y	Y_2	Y_3	Y_4	Y_4
Railroad, rapid rail transit/street railway (41)						
Motor vehicle (42)						
Aircraft (43)						
Marine craft (44)						
Highway and street right-of-way (45)						
Parking (46)	Y	Y	Y_2	Y_3	Y_4	N
COMMERCIAL USE						
Offices, business, and professional	Y	Y	25	30	N	N
Finance, insurance and real estate services (61)						
Personal services (62)						
Business services (63)						
Professional services (65)						
Other medical facilities (65.1)						
Miscellaneous services (69)						
Wholesale and retail - building materials, hardware and farm equipment	Y	Y	Y_2	Y_3	Y_4	N
Wholesale trade (51)						
Retail trade - building materials, hardware and farm equipment (52)						
Repair services (64)						
Contract construction services (66)						
Retail trade - general	Y	Y	25	30	N	N
General merchandise (55)						
Food (54)						
Automotive, marine craft, aircraft and accessories (55)						
Apparel and accessories (56)						
Furniture, home furnishings and equipment (57)						
Eating and drinking establishments (58)						
Other retail trade (59)						
Utilities (48)	Y	Y	Y_2	Y_3	Y_4	N
Communication (47)	Y	Y	25	30	N	N

Land Use	Yearly Day-Night Average in Decibels: Below 65	65-70	70-75	75-80	80-85	Over 85
MANUFACTURING AND PRODUCTION						
Manufacturing, general	Y	Y	Y_2	Y_3	Y_4	N
Food and kindred products (21)						
Textile mill products (22)						
Apparel and other finished products - fabric leather and similar materials (23)						
Lumber and wood (except furniture) (24)						
Furniture and fixtures (25)						
Paper and allied products (26)						
Printing/publishing/allied industries (27)						
Chemicals and allied products (28)						
Petroleum refining/related industries (29)						
Rubber and misc. plastic products (31)						
Stone, clay and glass products (32)						
Primary metal industries (33)						
Fabricated metal products (34)						
Miscellaneous (39)						
Photographic and optical	Y	Y	25	30	N	N
Professional/scientific/controlling instruments photographic/optical goods; watches, clocks (35)						
Agriculture (except livestock) and forestry	Y	Y_6	Y_7	Y_8	Y_8	Y_8
Agriculture (except livestock) (81)						
Agricultural related activities (82)						
Forestry activities and related services (83)						
Livestock farming and breeding (81.5 to 81.7)	Y	Y_6	Y_7	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
Fishing activities and related services (84)						
Mining activities and related services (85)						
Other resource production and extraction (89)						
RECREATIONAL						
Outdoor sports arenas and spectator sports (72.2)	Y	Y_5	Y_5	N	N	N
Outdoor music shells, amphitheaters (72.11)	Y	N	N	N	N	N
Nature exhibits and zoos (71.2)	Y	Y	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	Y	N	N	N
Amusements (73)						
Parks (76)						
Public assembly (72)						
Resorts and group camps (75)						
Other cultural, entertainment and recreation (79)						
Golf courses, riding stables and water recreation (74)	Y	Y	25	30	N	N

Source: FAA Advisory Circular 150/5020-12
Y (Yes) = Land use and related structures compatible without restrictions.
N (No) = Land use and related structures are not compatible and should be prohibited.
25, 30 or 35 = Land use and related structures generally compatible; measures to achieve Noise Level Reduction (NLR), outdoor to indoor, of 25, 30 or 35 must be incorporated into design and construction of structure.
Number in ( ) = Standard Land Use Coding Manual (SLUCM).

1 Where the community determines that residential uses must be allowed, measures to achieve outdoor to indoor NLR of at least 25 and 30 dB should be incorporated into building codes and be considered in individual approvals.
2 Compatible where measures to achieve NLR of 25 are incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where normal noise level is low.
3 Compatible where measures to achieve NLR of 30 are incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where normal noise level is low.
4 Compatible where measures to achieve NLR of 35 are incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where normal noise level is low.
5 Land use compatible provided special sound reinforcement systems are installed.
6 Prime use only, any residential buildings require a NLR of 25 to be compatible.
7 Prime use only, any residential buildings require a NLR of 30 to be compatible.
8 Prime use only, NLR for residential buildings not normally feasible, and such uses should be prohibited.

TABLE 9-2
FLORIDA DEPARTMENT OF TRANSPORTATION - AIRPORT COMPATIBLE LAND USE GUIDELINES

Airport Noise Impacted Zones(DNL) / Land Uses and Activities	Overflight Zones 55-65	65-70	70-75	75-80	80-Up	Inner	Outer***
RESIDENTIAL DEVELOPMENT							
Single Units; row, semi- & detached	Y	I_1	I_2	N	N	N	I_{11}
Duplexes	Y	I_1	I_2	N	N	N	I_{11}
Multi-family units	Y	I_1	I_2	N	N	N	I_{11}
Residential hotels & motels	Y	I_1	I_2	N	N	N	I_{12}
Transient lodgings	Y	I_1	I_2	I_3	N	N	I_{12}
Mobile home parks & courts	Y	N	N	N	N	N	N
Recreational vehicle (RV) parks	Y	N	N	N	N	N	N
Other residential	Y	I_1	I_2	N	N	N	N
RELIGIOUS; CULTURAL; RECREATIONAL							
Outdoor Activities							
Religious services & assemblies	Y	N	N	N	N	N	I_{13}
Entertainment assemblies	Y	N	N	N	N	N	I_{13}
Sports event assemblies	Y	C_4	I_4	N	N	N	I_{13}
Sports arenas, courts, fields & tracks	Y	C_4	C_4	I_4	N	N	I_{16}
Circuses & carnivals	Y	C_4	I_4	N	N	N	$I_{12,13}$
Amusement & theme parks	Y	C_4	I_4	N	N	N	$I_{12,13}$
Playgrounds & neighborhood parks	Y	C_6	C_6	I_6	N	N	$I_{12,13}$
Community & regional parks	Y	I_6	I_6	N	N	N	$I_{12,13}$
Indoor Activities							
Churches, mosques, synagogues & temples	Y	I_2	I_3	N	N	N	I_{12}
Theaters & auditoriums	Y	$I_{2,4}$	$I_{3,4}$	N	N	N	I_{12}
Stadiums & arenas	Y	$C_{1,4}$	$I_{2,4}$	$I_{3,4}$	N	N	I_{12}
Gymnasiums & natatoriums	Y	C_1	I_2	$I_{3,4}$	N	N	I_{12}
SERVICES							
Hospitals & nursing homes	Y	I_2	N	N	N	N	I_{12}
Other medical facilities	Y	I_2	N	N	N	N	I_{12}
Day care facilities	Y	I_2	N	N	N	N	I_{12}
Educational facilities	Y	I_2	N	N	N	N	I_{17}
Government services	Y	C_1	C_2	I_3	N	N	I_{17}
Correctional institutions	Y	C_1	I_2	N	N	N	I_{12}
Cemeteries	Y	C_1	C_2	C_3	$C_{6,7}$	C_{15}	C_{15}
Professional, financial & insurance	Y	C_1	C_2	I_3	N	N	I_{12}
Business & real estate	Y	C_1	C_2	I_3	N	N	I_{12}
Repairs and contract construction	Y	C_1	C_2	I_3	N	N	I_{12}
Personal & miscellaneous	Y	C_1	C_2	I_3	N	N	I_{12}
TRANSPORTATION; COMMUNICATIONS; UTILITIES							
Passenger facilities	Y	C_1	C_2	C_3	N	N	I_{12}
Cargo-freight facilities	Y	Y	C_2	C_3	$C_{6,7}$	N	C_{12}
Road, rail and water transit ways	Y	Y	C_2	C_3	$C_{6,7}$	$C_{15,18}$	C_{12}
Vehicle parking	Y	Y	C_2	C_3	$C_{6,7}$	$C_{15,18}$	C_{12}
Vehicle storage	Y	Y	C_2	C_3	$C_{6,7}$	$C_{15,18}$	C_{12}
Telecommunications	Y	C_1	C_2	I_3	$C_{6,7}$	N	I_{12}
Broadcast communications	Y	C_1	C_2	I_3	N	N	I_{12}
Electric generating plants	Y	Y	C_1	C_2	$C_{6,7}$	I_{19}	C_{18}
Sewer-waste water treatment	Y	Y	C_1	C_2	$C_{6,7}$	I_{19}	C_{18}
Gas utility facilities	Y	Y	C_1	C_2	$C_{6,7}$	N	C_{18}
Electric utility facilities	Y	Y	C_1	C_2	$C_{6,7}$	I_{19}	C_{18}
RETAIL TRADE							
Building materials & hardware	Y	Y	C_1	C_2	$I_{3,7}$	N	C_{12}
Automotive, farm & marine craft	Y	C_1	C_2	C_3	N	N	C_{12}
Apparel and general merchandise	Y	C_1	C_2	C_3	N	N	I_{12}
Groceries & food stuff	Y	C_1	C_2	C_3	N	N	I_{12}
Eating & drinking establishments	Y	C_1	C_2	C_3	N	N	I_{12}
Shopping malls & centers	Y	C_1	C_2	C_3	N	N	N
Gasoline, diesel & heating oil	Y	Y	C_1	C_2	$I_{3,7}$	N	I_{12}
Liquified & bottled gas	Y	Y	C_1	C_2	$I_{3,7}$	N	I_{12}
WHOLESALE TRADE							
Home furnishings & building materials	Y	Y	C_1	C_2	$C_{3,7}$	N	C_{12}
Food products & general merchandise	Y	Y	C_1	C_2	$C_{3,7}$	N	C_{12}
Liquified gasses	Y	Y	C_1	C_2	$C_{3,7}$	N	$I_{18,19}$
Petroleum & distillate products	Y	Y	C_1	C_2	$C_{3,7}$	N	$I_{18,19}$
Industrial chemicals	Y	Y	C_1	C_2	$C_{3,7}$	N	$I_{18,19}$
Explosive & pyrotechnic products	Y	Y	C_1	C_2	$C_{3,7}$	N	$I_{18,19}$
Other wholesale trade	Y	Y	C_1	C_2	$C_{3,7}$	N	$C_{12,18}$
MANUFACTURING							
Food products & processing	Y	Y	C_1	C_2	$I_{3,7}$	N	C_{12}
Textiles & apparel	Y	Y	C_1	C_2	$I_{3,7}$	N	C_{12}
Lumber & wood products	Y	Y	C_1	C_2	$I_{3,7}$	N	C_{18}
Paper & allied products	Y	Y	C_1	C_2	$I_{3,7}$	N	$C_{18,19}$
Chemical & allied products	Y	Y	C_1	C_2	$I_{3,7}$	N	$I_{18,19}$
Petroleum refining & related products	Y	Y	C_1	C_2	$I_{3,7}$	N	N
Explosive & pyrotechnic products	Y	Y	C_1	C_2	$I_{3,7}$	N	N
Rubber & plastic products	Y	Y	C_1	C_2	$I_{3,7}$	N	I_{18}
Clay & glass products	Y	Y	C_1	C_2	$I_{3,7}$	N	I_{19}
Primary & fabricated metal products	Y	Y	C_1	C_2	$I_{3,7}$	N	I_{18}
Electronic & optic products	Y	C_1	C_2	I_3	N	N	I_{18}
Professional & scientific products	Y	C_1	C_2	I_3	N	N	I_{18}
Other manufacturing	Y	C_1	C_2	C_3	N	N	C_{18}
RESOURCE PRODUCTION & RECOVERY							
Livestock & poultry farming	Y	$C_{2,5}$	$I_{3,5}$	I_5	N	N	C_{20}
Animal & poultry breeding	Y	$I_{2,5}$	$I_{3,5}$	N	N	N	N
Crop & related agricultural production	Y	$C_{1,5}$	$C_{2,5}$	$C_{3,5}$	$I_{6,7}$	N	C_{20}
Fishing & aquaculture activities	Y	$C_{1,5}$	$C_{2,5}$	$C_{3,5}$	$C_{6,7}$	N	C_{19}
Forestry & timber production	Y	$C_{1,5}$	$C_{2,5}$	$C_{3,5}$	$C_{6,7}$	$I_{18,20}$	$C_{18,19}$
Oil & natural gas wells	Y	Y	C_2	C_3	$C_{6,7}$	N	N
Strip & open pit mining	Y	Y	C_2	C_3	$C_{6,7}$	N	N
Stone & mineral quarries	Y	Y	C_2	C_3	$C_{6,7}$	N	N
Other mining & resource recovery	Y	Y	C_2	C_3	$C_{6,7}$	$I_{18,19,20}$	$C_{18,19}$

Y (Yes) = Land use is normally compatible without restriction and should be allowed.

$C_{(1..20)}$ = Land use is generally compatible with some limitations or restrictions. The use should be allowed only if Condition Note $_{(1..20)}$ is met.

$I_{(1..20)}$ = Land is basically incompatible and should be discouraged. Where there is a demonstrated community need for the use and viable alternative options are not possible, the use may be allowed if Condition Note $_{(1..20)}$ is met. Condition Note $_{(1..20)}$ will not eliminate or alter the basis of the incompatibility but is intended to lessen or mitigate the potential for impact on the land use function, activity or occupants.

N (No) = Use is not compatible and should not be permitted.

NLR = Noise Level Reduction (outdoor to indoor) achieved through incorporation of sound attenuation into the design and construction of structures to lessen or mitigate a potential interior noise impact on occupants or activities. Achievement of 25, 30 or 35 decibel (dB) reductions, exterior to interior sound level, are the standard acceptable minima for mitigation of airport generated noise impact.

* = Federal guidelines in 14 CFR Part 150 consider all land uses below the 65 DNL contour to be compatible. This should not be misconstrued to imply that residents, occupants or users in lesser contour areas will not be adversely affected by airport generated noise. Where practical and feasible, communities should limit future residential development in airport noise impacted zones below the 65 DNL contour.

** = Residential uses and noise sensitive activities are not compatible in impacted areas exceeding 80 DNL.

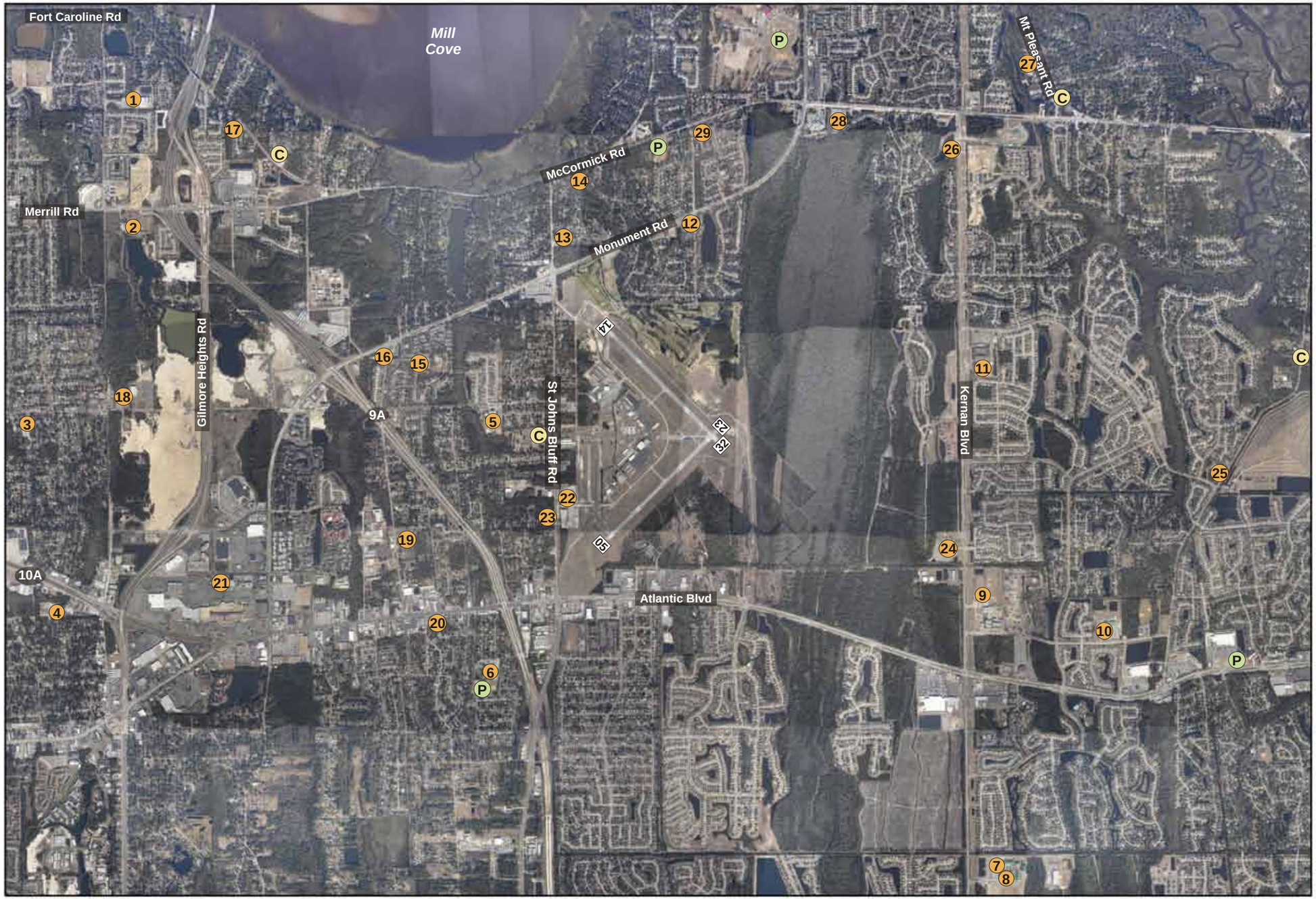
*** = Where the community determines uses must be allowed, structure/unit density, lot/land coverage, unit occupancy and population density must be limited to the lowest levels possible.

Noise Impacted Zones

1. Measures to achieve NLR of 25 dB must be included in the design and construction of the structures where occupants reside; the public is received; office areas are located; or noise sensitive activities or functions occur.
2. Measures to achieve NLR of 30 dB must be included in the design and construction of the structures where occupants reside; the public is received; office areas are located; or noise sensitive activities or functions. occur.
3. Measures to achieve NLR of 35 dB must be included in the design and construction of the structure where occupants reside; the public is received; office areas are located, or noise sensitive activities or functions occur.
4. Sound reinforcement or amplification systems must be installed.
5. Residential structures are not permitted.
6. Occupied structures are not permitted.
7. Individual hearing protection devises must be worn where structural or other forms of physical noise attenuation is not available.

Aircraft Overflight Zones

11. Density limited, 1-2 dwelling units per acre or 20% or less lot coverage for PUDs.
12. Density limited, 1-2 occupied structures per acre; occupancy 10 or less per structure.
13. Population density limited, 40 persons per acre or less.
14. Passenger terminals or facilities for staging, transfer or loading of passengers are not permitted.
15. Chapels or other occupied permanent structures are not permitted.
16. Spectator facilities, club house and locker rooms are not permitted.
17. Low labor/manning intensity offices uses only; meeting rooms, class rooms, lunch rooms and cafeterias are not permitted.
18. Above ground storage of volatile, explosive, toxic radioactive or other hazardous material is not permitted.
19. Open pits, excavations, ponds, dikes, levees, water courses and above ground pipes are not permitted.
20. Low labor/manning intensity uses only, permanent above ground structures are not permitted.



Legend

Schools

1. Don Brewer Elementary
2. Merrill Road Elementary
3. Arlington Middle School
4. Woodland Acres Elementary
5. Lone Star Elementary
6. Brookview Elementary
7. Kernan Middle
8. Kernan Elementary
9. Landmark Middle
10. Abess Blvd Elementary
11. Sabal Palm Elementary

Places of Worship

12. Father's House
13. Christ Cares Alliance Church
14. Highlands United Presbyterian
15. Jacksonville Christian Center
16. Alliance Bible Church
17. Jehovah's Witnesses
18. Faith Christian Center
19. Faith Chapel Free Will Baptist
20. Atlantic Blvd Baptist Church
21. Gyland Ministries
22. Bethel Renewal Church
23. Regency Assembly of God
24. East Point Baptist Church
25. Coastal Baptist Church
26. Hope Community Church
27. Monument Point Fellowship
28. Grace Lutheran Church
29. Ft Caroline Baptist Church

C Cemetery
P Park

0 3000
Foot

AERIAL MAP SOURCE: City of Jacksonville, 2004

SOURCE: City of Jacksonville

Craig FAR Part 150 Study . **203806**

Exhibit 9-1
Noise Sensitive Areas

Places of Worship (ctd.)

17 – Jehovah's Witnesses
18 – Faith Christian Center
19 – Faith Chapel Free Will Baptist
20 – Atlantic Blvd Baptist Church
21 – Gyland Ministries
22 – Bethel Renewal Church
23 – Regency Assembly of God
24 – East Point Baptist Church
25 – Coastal Baptist Church
26 – Hope Community Church
27 – Monument Point Fellowship
28 – Grace Lutheran Church
29 – Ft. Caroline Baptist Church

Parks

There are 4 parks in the vicinity of CRG.

Cemeteries

There are 4 cemeteries in the vicinity of CRG.

Source: ESA Airports/City of Jacksonville

It should be noted when reviewing these sites that none are located within the Airport's 65 DNL contour.

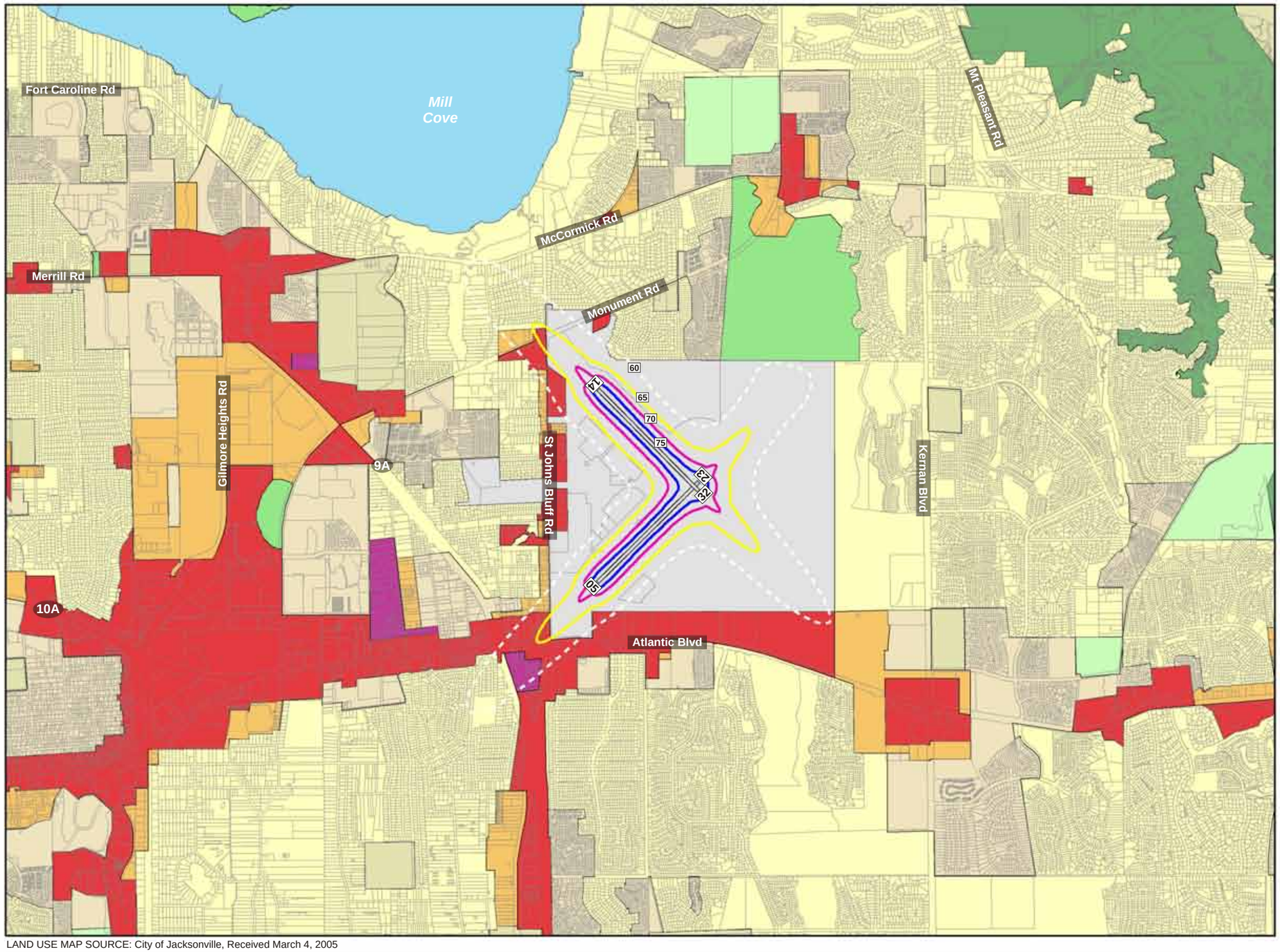
B. 2004 DNL NOISE CONTOURS

Exhibit 9-2 shows the 2004 DNL contours with land use, and **Exhibit 9-3** shows the same contours with existing zoning. As noted in the previous section, the 2004 70 and 75 DNL contours primarily remain on airport property although a sliver of this property is currently zoned "planned development" which falls within the airport property boundary. The planned development area is actually a golf course located on airport property. The 65 DNL contours extend just off the property to the northwest and southwest and further into the on airport golf course located to the north. To the southwest, the areas within the 65 DNL are commercial use. To the northwest, the area within the 65 DNL consists of commercial and mixed use and a very small area of residential.

As such, the only area of incompatible land uses within these DNL ranges based on the Federal guidelines is the sliver of residential falling within the 65 DNL to the northwest. The dashed line on the exhibits indicates the boundary of the 60 DNL. The 60 DNL extends considerably further off of airport property to both the northwest and southwest and just off airport property to the southeast. While the majority of the 60 DNL contour remains on airport or over commercial and mixed uses, the 60 DNL encompasses existing residential area to the northwest and southwest. It also includes a small area of residential to the north of the golf course.

C. 2009 DNL NOISE CONTOURS

Exhibit 9-4 shows the 2009 DNL contours with land use, and **Exhibit 9-5** shows the same contours with existing zoning. The contours depicted in these exhibits increase in



Legend

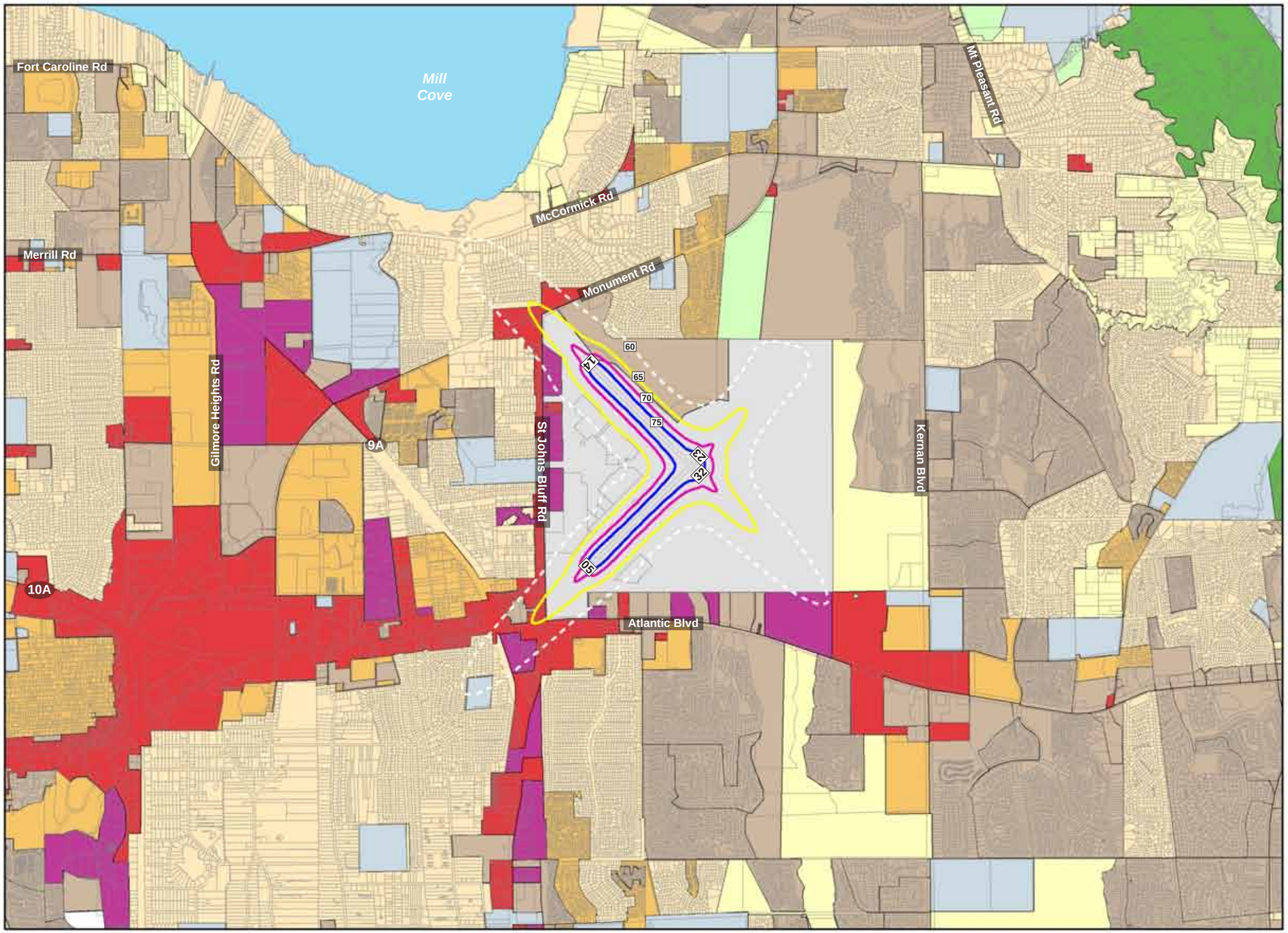
- Airport Property
- Agriculture
- Conservation
- Recreation and Open Space
- Rural Residential
- Low Density Residential
- Medium Density Residential
- High Density Residential
- Industrial
- Commercial
- Mixed Land Use
- Public Buildings and Facilities
- Water

0 3000
Foot

LAND USE MAP SOURCE: City of Jacksonville, Received March 4, 2005

SOURCE: ESA Airports

Exhibit 9-2
2004 DNL Noise Contours with Land Use



Legend

- Airport Property
- Agriculture
- Conservation
- Recreation and Open Space
- Rural Residential
- Low Density Residential
- Medium Density Residential
- Commercial
- Industrial
- Public Buildings and Facilities
- Planned Development
- Water

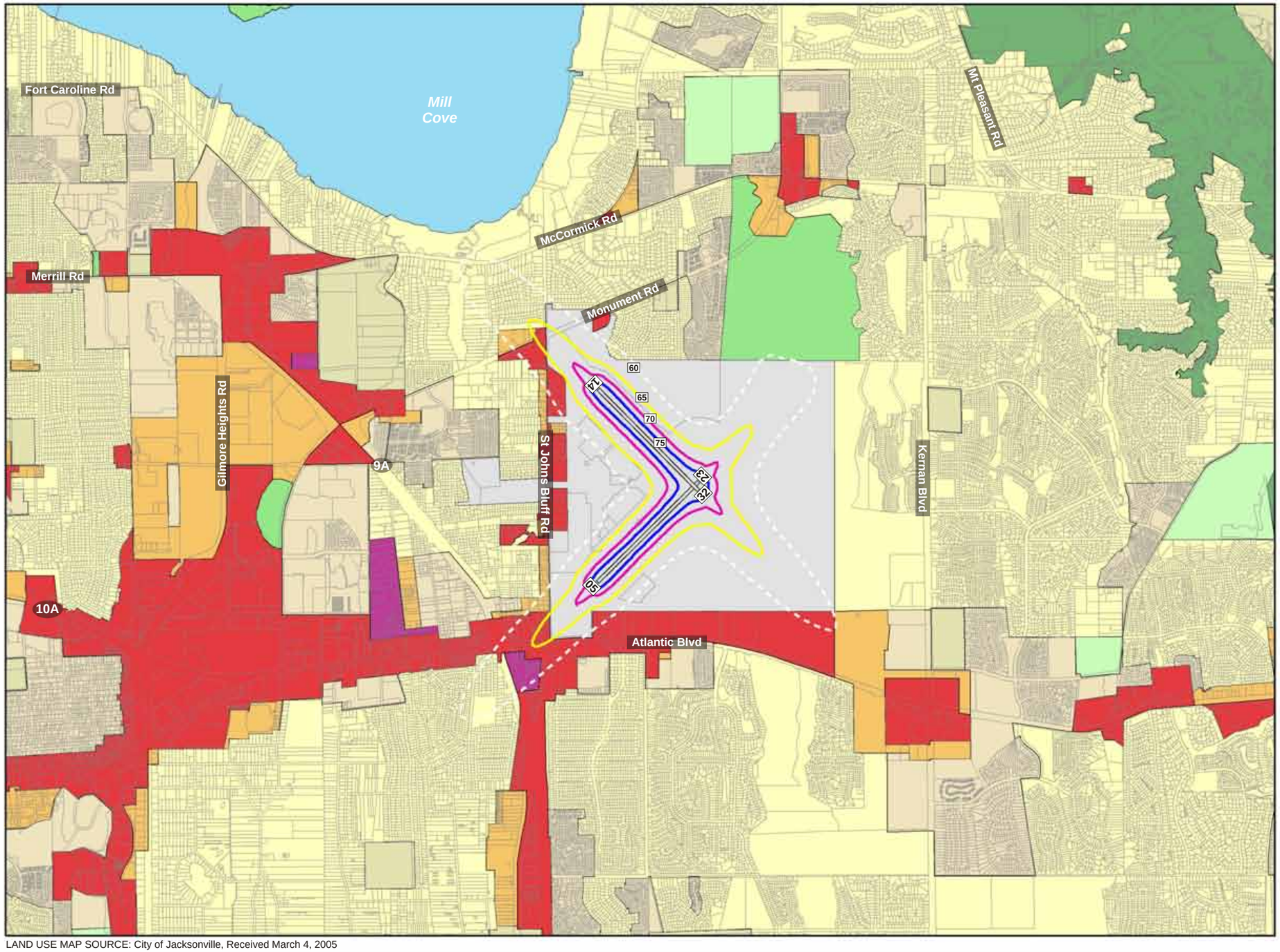
0 3000
Foot

ZONING MAP SOURCE: City of Jacksonville, Received March 4, 2005

SOURCE: ESA Airports

Exhibit 9-3

2004 DNL Noise Contours with Zoning



Legend

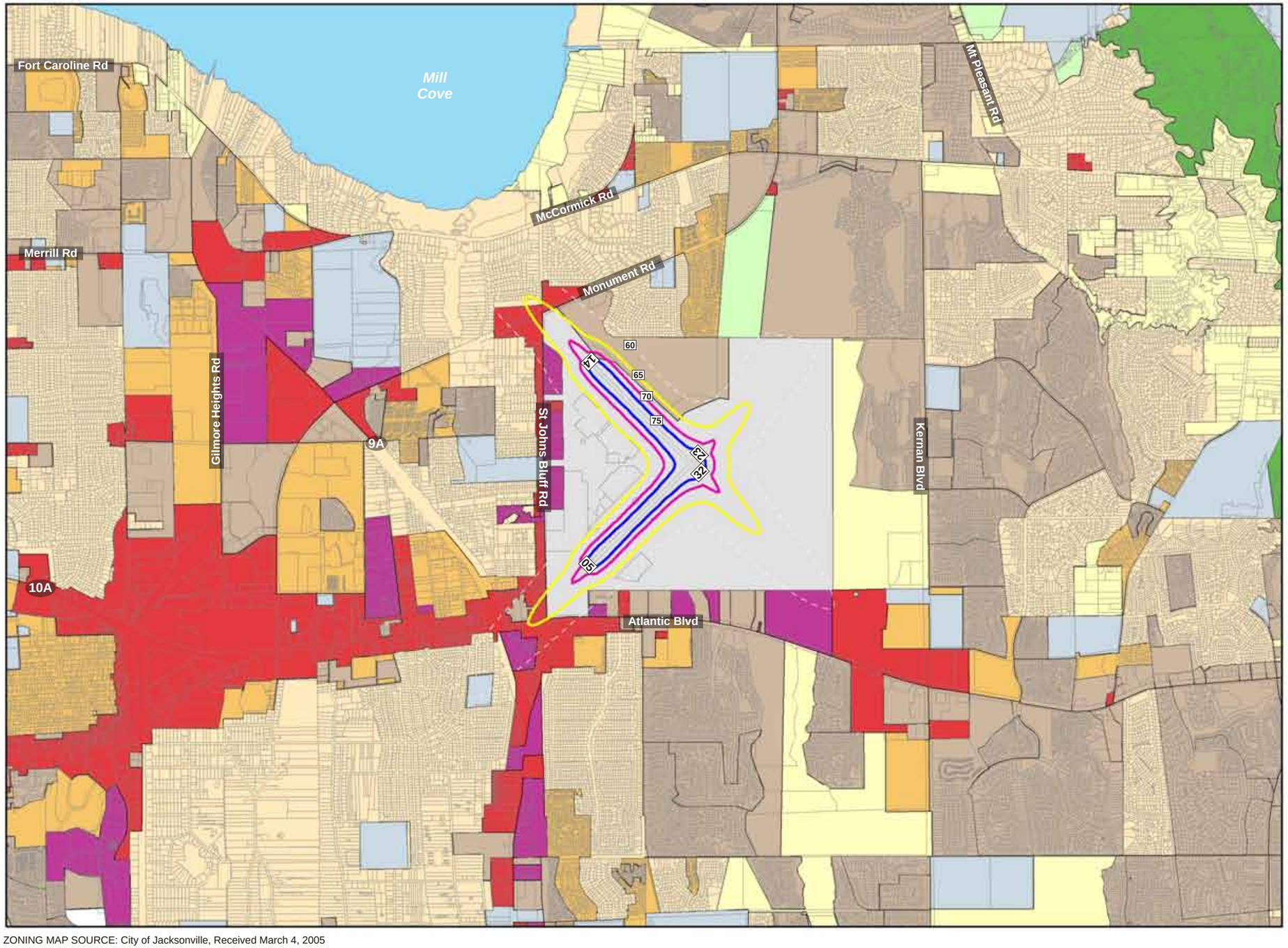
- Airport Property
- Agriculture
- Conservation
- Recreation and Open Space
- Rural Residential
- Low Density Residential
- Medium Density Residential
- High Density Residential
- Industrial
- Commercial
- Mixed Land Use
- Public Buildings and Facilities
- Water

0 3000
Foot

LAND USE MAP SOURCE: City of Jacksonville, Received March 4, 2005

SOURCE: ESA Airports

Exhibit 9-4
2009 DNL Noise Contours with Land Use



ZONING MAP SOURCE: City of Jacksonville, Received March 4, 2005

SOURCE: ESA Airports

Exhibit 9-5

2009 DNL Noise Contours with Zoning

size from those outlined for 2004. This is primarily due to the projected increase in activity at the airport. As noted in the previous section, the 2009 70 and 75 DNL contours remain on airport property. The 65 DNL contours extend off the property to the northwest and southwest and further into the on airport golf course located to the north. To the southwest, the areas within the 65 DNL are commercial use. To the northwest, the area within the 65 DNL consists of commercial and mixed use and a small area of residential.

Once again, the only area of incompatible land uses within these DNL ranges based on the Federal guidelines is the small area of residential falling within the 65 DNL to the northwest. The dashed line on the exhibits indicates the boundary of the 60 DNL. Similar to the 2004 contours, the 2009 60 DNL extends considerably further off of airport property to both the northwest and southwest and just off airport property to the southeast. In 2009, the 60 DNL contour also extends over an area zoned for planned development to the northeast. While the majority of the balance of the 60 DNL contour remains on airport or over commercial and mixed uses, the 60 DNL encompasses existing residential area to the northwest and southwest. It also includes a small area of residential to the north of the golf course.

D. POPULATION WITHIN DNL CONTOURS

Population data for Duval County was obtained from the United States Census Bureau. The GIS system that has been prepared for this project incorporates block data from the 2000 Census. The census data indicates that in 2000, Duval County had a total of 763,204 people in households. There are a total of 303,747 households within the County with an average of 2.51 persons per household. This average of 2.51 persons per household will be used to quantify impacts throughout this study. Table 9-4 presents the estimated population within the 2004 and 2009 DNL noise contours.

TABLE 9-4
Estimated Population Within 2004 and 2009 DNL Contours
Craig Airport
FAR Part 150 Study

Year	Residential Population Within DNL Contour Intervals		
	60-65	65-70	Over 70
2004	409	0	0
2009	449	5	0

Source:
ESA Airports

There are an estimated 163 residences located within the 2004 60 DNL contour. Of these, 119 are located northwest of the Airport with the remaining 44 located southwest of the Airport. There are approximately 409 people within the 60 DNL contour,

calculated by applying the average of 2.51 people per household within Duval County. It is estimated that no households are located within the 65 DNL contour, the FAA's threshold level of significant residential noise exposure.

There are an estimated 179 residences located within the 2009 60 DNL contour. There are 127 households located in the northwest quadrant and 52 households located to the southwest of the Airport. By applying the average of 2.51 people per household within Duval County, there are approximately 449 people within the 60 DNL contour. This is an increase of 40 people from the 2004 60 DNL contour. It is estimated that 2 households and 5 people are located within the 65 DNL contour.

CHAPTER 10

NOISE CERTIFICATION

CHAPTER 10

NOISE CERTIFICATION

CERTIFICATION

The Noise Exposure Maps and accompanying documents for Craig Airport are submitted in accordance with FAR Part 150. They were prepared with the best available information and are hereby certified as true and complete to the best of our knowledge and belief. Interested persons have had the opportunity to submit their views concerning the correctness and adequacy of the Noise Exposure Maps and forecasted operations. The Study has been conducted in consultation with state and local agencies whose area of jurisdiction is within the noise contours provided on the maps.

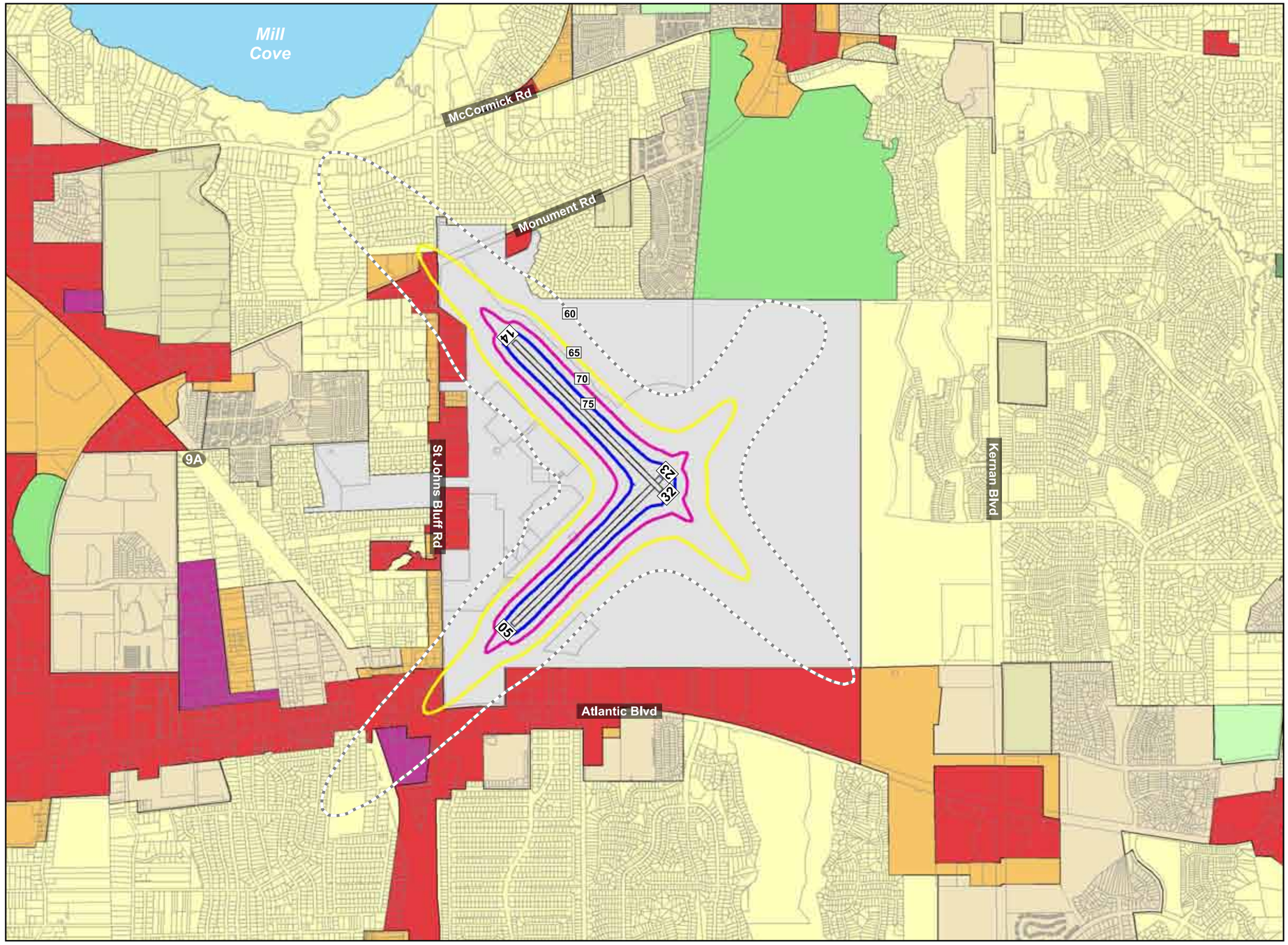
H. E. Seymour

Jacksonville Aviation Authority

2/16/06

Date

In reviewing the baseline noise exposure maps prepared for CRG, it should be noted that the maps were based on actual data recorded during the calendar year 2004. The total operations (without military itinerant - as discussed in the report) for this period were 162,115. Subsequently, airport operations were reviewed for the most recent 12 months to date, February 2005 through January 2006, to determine if the NEM contours were representative of current conditions. A total of 148,530 operations (without military itinerant) were experienced during this period. This represents a decrease in operations of roughly 8 percent. When reviewing the profile of activity during the most recent period it was determined that air taxi activity increased by nearly 21 percent while single engine GA decreased by roughly 10 percent. Since the volume of air taxi operations is much less than GA, the overall activity at the airport decreased. From a noise standpoint, the higher performance single and twin engine air taxi aircraft typically produce a greater noise footprint or contour than single engine GA aircraft. Therefore, while there has been an overall reduction in activity, the actual reduction in noise footprint/contour is likely somewhat less (if at all) than would be indicated based on the change in total operations. For the purposes of the Craig FAR Part 150, it is believed that the baseline contours are representative of the 2006 conditions at the airport. Furthermore, a change in contour will not have any impact on the recommendations outlined in the Noise Compatibility portion of the study. No recommendations have been made for land acquisition or sound insulation as a result of the study. As a result, no changes have been made to the NEM baseline contours. The 2006 noise map is designated Map A and the 2011 noise map is designated Map B.



Legend

- Airport Property
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- Conservation
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- Rural Residential
- Low Density Residential
- Medium Density Residential
- High Density Residential
- Industrial
- Commercial
- Mixed Land Use
- Public Buildings and Facilities
- Water

0 2000
Foot

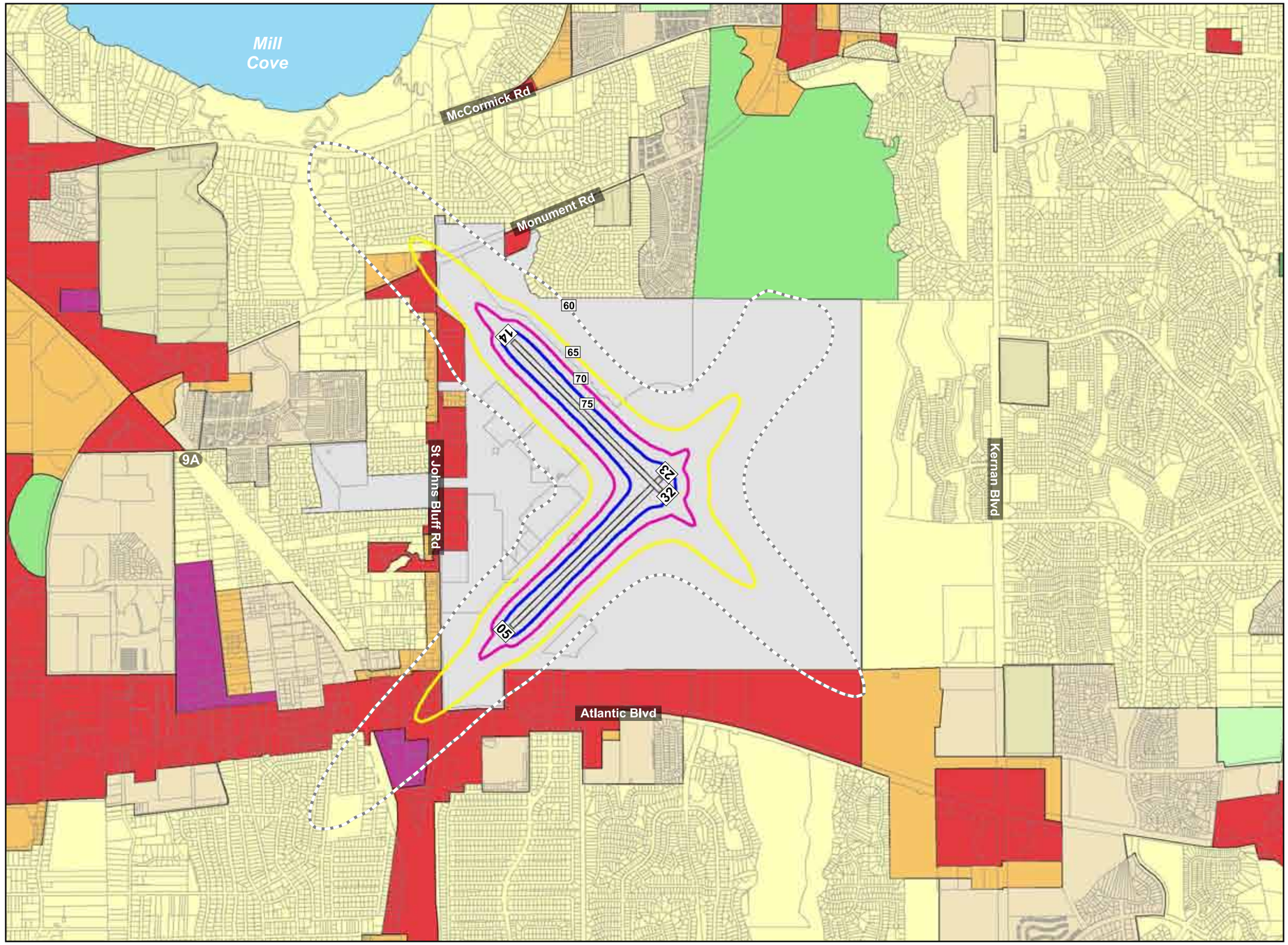
LAND USE MAP SOURCE: City of Jacksonville, Received March 4, 2005

SOURCE: ESA Airports

Craig FAR Part 150 Study . **203086**

Map A

2006 Noise Exposure Map



Legend

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0 2000
Foot

LAND USE MAP SOURCE: City of Jacksonville, Received March 4, 2005

SOURCE: ESA Airports

Map B

2011 Noise Exposure Map

CHAPTER 11

OPERATIONAL NOISE MITIGATION PROCEDURES

CHAPTER 11

OPERATIONAL NOISE MITIGATION PROCEDURES

A. INTRODUCTION

The Noise Exposure Maps presented in Chapter 10 identify the areas of noise exposure around Craig Airport. There are two primary ways to reduce aircraft noise exposure on noise sensitive areas surrounding an airport. The first includes modifications to how the aircraft are routed into and out of the airport in efforts to lessen the impact on these areas. The second is managing how property is developed around the airport and promoting development that is compatible with airport operations. This chapter outlines and reviews the existing operational noise abatement program and identifies the additional operational mitigation procedures that were evaluated during this study. It also identifies the mitigation procedures required for consideration by FAR Part 150 and indicates whether they are recommended for implementation at CRG. Finally, it presents a summary of the procedures and initiatives recommended for implementation, the costs associated with each measure and the timing and lead agency responsible for implementation. Land use management techniques are discussed in Chapter 12 of this report.

B. KEY ISSUES

The FAR Part 150 Study for CRG provides the opportunity for aviation representatives, local government officials and the public to address noise and land use compatibility issues related to the Airport. In order to be able to fully address these concerns, it must first be determined where the key areas related to noise impacts are located. The primary areas of noise sensitive uses falling within the existing or future five-year 60 and greater DNL contours are located to the northwest and southwest of the airport. However, areas outside these contours are subject to frequent aircraft overflights. Based on a review of the contours and the noise complaints it can be determined that concerns currently exist for three types of operations. These concerns were identified during the first workshop and through regular communication by the Airport Authority staff with citizens living around the Airport. The primary areas of concern that were identified are as follows:

- Aircraft departing Runway 32 and flying over the Holly Oaks area.
- Aircraft arriving to Runway 14 over the Holly Oaks area.
- Aircraft ILS arrivals to Runway 32 over the Kensington Area – Especially early morning arrivals.

Any modifications to flight tracks or other operational noise mitigation procedures to reduce the impacts to these areas will need the support of the local FAA ATCT. A number of procedures or initiatives are already in place that are designed to lessen the impact on the communities surrounding the Airport. These procedures are identified in the next section.

C. EXISTING OPERATIONAL NOISE MITIGATION PROCEDURES

The operational noise abatement program at CRG has become more comprehensive as a result of the previous noise study. As outlined in detail in Chapter 2, a number of voluntary measure were identified in efforts to better address aircraft noise. These were implemented by JAA in 1999 and, as determined in Chapter 2, have been in place ever since. As such, the communities around CRG are familiar with the operational characteristics associated with these procedures and expect their continued use. It should be noted that the FAA has raised a concern that one measure, the minimizing of turbojet instrument approach practice, as being considered a potential restriction. As no new flight restrictions can be put in place under the Airport Noise and Capacity Act of 1990 (ANCA) without undergoing a formal Part 161 process, the FAA has requested that this measure be removed from consideration. This is expected to have a limited impact on activities at CRG since a limited number of turbojet aircraft use the airport and only a fraction of those would typically be conducting training activities.

Once again, these measures have been in place since 1999 and represent the baseline conditions for the airport. The measures consist of procedures referenced in various materials such as the airport facilities directory or available as Jeppesen inserts for pilots, and are summarized below:

A. VFR Noise Abatement Departure Flight Tracks – Outlines six flight tracks that route departing aircraft over areas that are less noise sensitive.
Benefit: Routes departing fixed wing aircraft over less densely populated areas such as open land and roadway corridors.

B. VFR Noise Abatement Arrival Tracks – Outlines five flight tracks that route arriving aircraft over areas that are less noise sensitive.
Benefit: Routes arriving fixed wing aircraft over less densely populated areas such as open land and roadway corridors.

C. Aircraft Touch and Go Procedures – Identifies preferred local patterns for aircraft conducting training operations at the airport.
Benefit: Routes fixed wing training aircraft over less densely populated areas such as open land and roadway corridors.

D. Modification of Runway 5-23 Training Pattern – Identifies a shortened pattern for aircraft training operating on Runway 5-23.
Benefit: Routes fixed wing training aircraft over less densely populated areas such as open land and roadway corridors.

E. Helicopter Arrival and Departure Procedures – Establishes a series of arrival and departure tracks for helicopter activity at the airport.
Benefit: Routes helicopters over less densely populated areas such as open land and roadway corridors.

F. Control Ground Maintenance Run-ups – Identifies preferred location and times for engine and ground maintenance run-ups.
Benefit: Minimizes off airport noise impacts associated with aircraft maintenance procedures.

G. Maintain an Airport Noise Specialist Position at the Airport – Provides a key point of contact for pilots and citizens for addressing noise questions and concerns.
Benefit: Reduces potential for confusion in understanding noise issues.

H. Educate Operators on Procedures – Ensures maximum use of noise abatement procedures.
Benefit: Maximizes potential for use of voluntary procedures and increased awareness of noise sensitive areas.

I. Encourage Use of NBAA Noise Abatement Procedures – Identifies methods for minimizing noise impacts on surrounding communities.
Benefit: Encourages pilots of high performance business aircraft to follow industry established operation guidelines for noise reduction.

J. Preferential Runway Use Program – When conditions permit, Runway 5 is the preferred runway for arrivals and Runway 23 is the preferred runway for departures. As a result of discussions with the FAA and the Tower, this recommendation is amended to reference "Only when Tower is in Operation" or some similar language to ensure the tower is available to resolve any operational conflicts.
Benefit: Reduction in noise exposure of more densely populated areas to the northwest and southeast of the airport.

While each of the above has merit, some are much more effective than others in their ability to reduce noise. During the course of this study, a number of recommendations were noted relative to the existing measures:

Recommendation (1) – Comprehensive Noise Brochure and Update Noise Abatement Flight Track Exhibits
Develop a single handout that provides a summary of all components of CRG's voluntary operational noise abatement program. While various components are published in various locations, an overall summary of the program does not exist. This would be useful for educating both citizens and pilots. This brochure should also clearly indicate that operational noise abatement procedures are voluntary.
A number of changes have occurred around the airport since the noise abatement flight tracks were established. It is recommended that the graphics depicting these

tracks be updated to show existing conditions. Exhibits 11-1 and 11-2 reflect the updated graphics.

Benefit: Continued education of pilots and community on airport noise measures Updated graphics allow pilots to better determine their relative location to the recommended flight tracks and noise sensitive communities.

Recommendation (2) – New Pilot Education
Item 9: It was noted that pilot use of the procedures was generally good when operating conditions at the airport allow. All Fixed Based Operators are also aware of the Noise Abatement Procedures and have them clearly posted in their pilot lounges. However, it was also noted that the major flight schools have cycles during the year when groups of inexperienced pilots come through. During these periods, use of the noise abatement procedures decreases. It is recommended that the airport work with local operators to develop a strategy to ensure that noise procedure education occurs early in the training process and that it is taught in a consistent manner to new pilots.

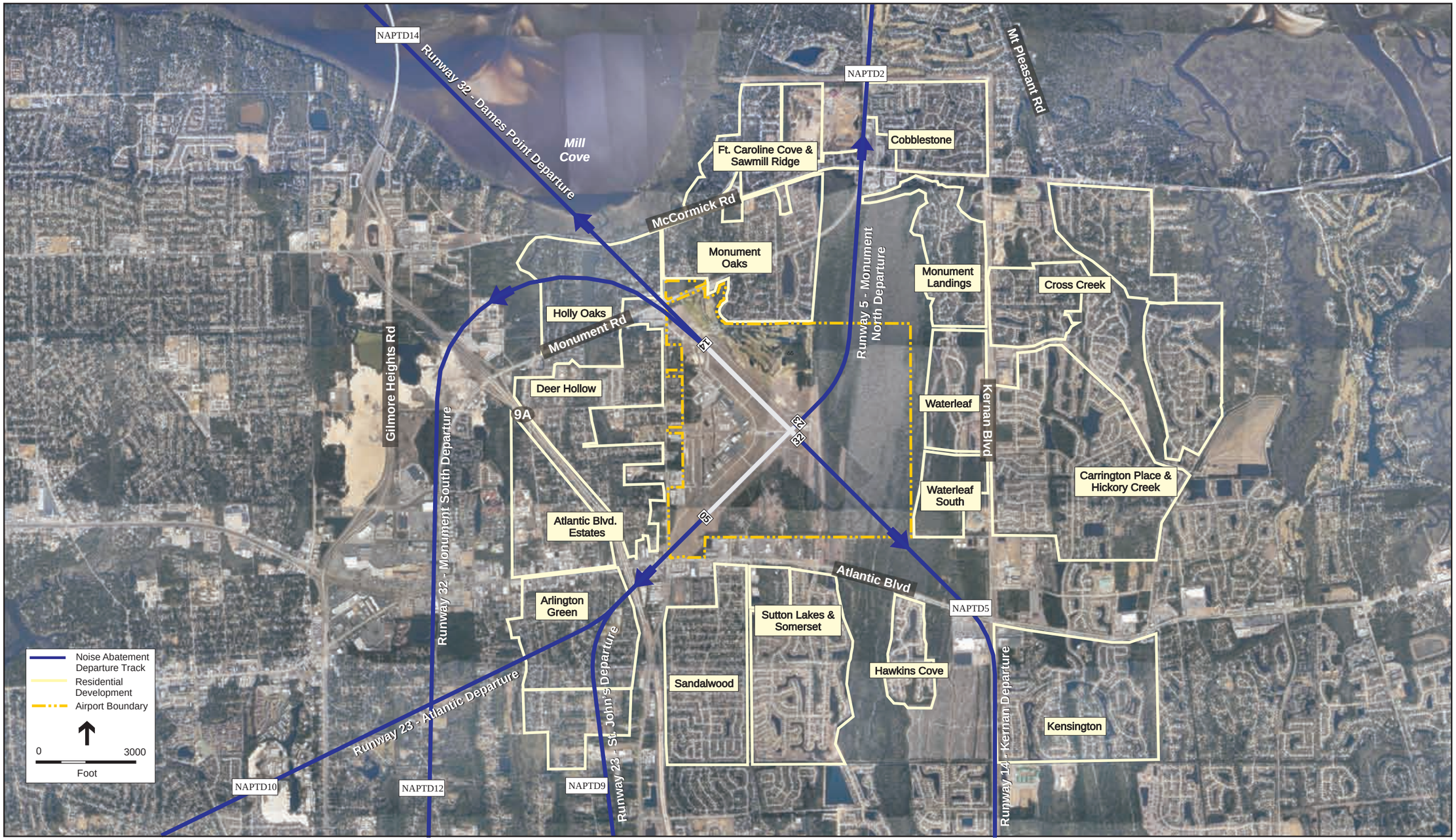
Benefit: Improved education of pilots new to operating at the airport.

D. EVALUATION OF NEW NOISE MITIGATION PROCEDURES

This section presents operational noise mitigation procedures which were considered to reduce noise impacts on communities surrounding CRG. The procedures were developed with input from Airport Authority staff, FAA's ATCT personnel, local agency representatives, and through review of current industry advancement efforts.

Included are procedures that are recommended for implementation and procedures considered but not recommended for implementation and the reasons for each. A procedure was rejected if it caused an unsafe condition, did not meet FAA criteria, or simply shifted noise from one community to another. All recommended procedures included in this section will be consistent with the safe operation of the Airport.

1. Runway 32 Instrument Departure Procedure (IDP) – The airport currently does not have any formal instrument departure procedures. For noise purposes, IDP's are often an effective means of routing aircraft over non-noise sensitive areas. The operation of the airport favors implementation of an IDP for Runway 32 which is the preferential departure runway end. However, two issues appear to influence the effectiveness of an IDP for noise abatement purposes. The first is that there are no noise compatible corridors northwest of the airport that would allow for the minimization of noise impacts to the surrounding communities. The second is that the airspace northwest of the airport is very complex due to the location of Jacksonville International Airport and various military bases and that an IDP procedure could be a challenge to implement.



AERIAL SOURCE: City of Jacksonville, 2004

SOURCE: ESA Airports

Exhibit 11-1

VFR Noise Abatement Departure Flight Tracks

AERIAL SOURCE: City of Jacksonville, 2004

SOURCE: ESA Airports

Craig FAR Part 150 Study . 203086

Exhibit 11-2

VFR Noise Abatement Arrival Flight Tracks

Recommendation:
Not recommended for implementation. The implementation of an IDP on Runway 32 is not be an effective means to reduce noise exposure to the residential areas northwest of the airport.

2. Increased Glide Slope Angle for ILS Approaches to Runway 32 - Modification of the Runway 32 glide slope angle was explored to determine its merit for reducing noise to the southeast. The Kensington neighborhood is located just over two statute miles southeast of the Runway 32 end and accounts for nearly 50 percent of the complaints received at the airport. Many of the past complaints have been attributed to nighttime or early morning activity by check haulers. The airport has been working in educating the check haul operators and complaints related to this type of activity have fallen off markedly in the last year. Based on the limited information available however, it does appear that there are still some complaints associated with other aircraft arrivals at locations along the extended aircraft centerline. These aircraft are believed to be utilizing the airport's instrument landing system (ILS) approach. Increasing the glide slope angle for the ILS approach was explored to determine the extent to which it may provide a noise benefit.

A standard ILS glide slope such as CRG's is a 3 degree slope. While this is preferred by the FAA, some airports have steeper glide slopes as a result of obstacles or other external factors. Up to a 3.5 degree glide slope angle will generally be considered by the FAA when a 3 degree slope can't be accommodated. However, some impact to the approach minimums at the airport may result from an glidepath angle in excess of 3 degrees. In very extreme conditions a glide path angle above 3.5 degrees may be used, but this typically results in severe impacts to the operational characteristics of the airport. When considering a change to the glidepath, the further a noise sensitive area is from the airport, the greater the reduction in noise. Aircraft flying over Kensington on the 3 degree glide path are currently between 650 and 850 feet above ground level. Implementing a 3.5 degree glidepath angle would increase the elevation of aircraft between 100 and 140 feet. Since the current 65 and 60 DNL noise contours barely extend off of airport property, a very minimal reduction in the noise contours and areas of higher noise exposure would occur from this change. Since Kensington is on the extended runway centerline but outside the city adopted noise exposure contours, the noise benefits provided by the increase in elevation would also be limited. However, because aircraft remain higher longer when approaching the airport with a 3.5 degree glidepath, they typically will require a longer distance for landing.

Recommendation:
Not recommended for implementation. A change to the glidepath would provide almost no reduction in noise to higher noise exposure areas that fall within the 60 DNL or greater noise contours. While aircraft would transit the Kensington neighborhood at a greater height, its near proximity to the airport limits the noticeable benefit of the glidepath angle change. The change in glidepath angle has the potential to negatively impact the minimums and operational capacity for the already constrained airfield. It should be noted however that this change could be used to help

mitigate potential noise impacts resulting from capacity improvements such as the proposed runway extension and may warrant further consideration if this project were to proceed.

E. OPTIONS REQUIRED FOR CONSIDERATION BY FAR PART 150

FAR Part 150 defines a number of noise mitigation measures that should be explored in every study. At a minimum, the operator shall analyze and report on the following alternatives, subject to the constraints that the strategies are appropriate to the specific airport:

1. Acquisition of land and interests therein, including, but not limited to air rights, easements, and development rights, to ensure the use of property for purposes which are compatible with airport operations.

Noise Overlay Zones are currently being revised by the City of Jacksonville that promote compatible development with airport operations. These overlay zones and the requirements therein are being updated concurrent to this study and are referenced in Chapter 12.

2. The construction of barriers and acoustical shielding, including the soundproofing of public buildings.

A noise barrier is a wall or earth berm located between the noise source (an aircraft) and the noise receiver (residence). To be most effective berms/barriers should be located very close to the source of the noise (the aircraft) and very close to the receiver of the noise (a residential area). An excellent example of this is along a highway where barriers are located between the roadway and the adjacent neighborhood. By being very close to both the source and receiver, the barrier in this case can be effective in reducing noise exposure from highway traffic.

Berms/Barriers can only be useful at airports under very unique circumstances. Due to height restrictions near the runways (FAR Part 77), berms/barriers cannot be located very close to runways and taxiways. The only potential location where a barrier may be effective is in the situation where a residential community (or other noise sensitive area) abuts the Airport property (to the side of the runway or taxiway area) and is in close proximity to a runway or taxiway. While the neighborhoods northwest of the airport appear to meet these criteria, they are primarily impacted by overflight noise which would not be blocked by a barrier or berm.

In addition, very few noise sensitive structures are located within the existing or future five–year 65 and greater DNL contours. Based on this, there are very few opportunity's to effectively reduce noise exposure through noise insulation (reference discussion in Chapter 12)**.**

Recommendation:
Barriers / berms are not recommended for further consideration at CRG because these measures would be ineffective (due to the extensive distance from the source to the receiver or the location) in reducing significant amounts of sound.

3. The implementation of a preferential runway system.

A preferential runway system for noise abatement has already been implemented at CRG. Runway 5 is the preferred runway for arrivals and Runway 23 is the preferred runway for departures when the wind, weather, and activity permit. While this is currently in place, it should be noted that subsequent to this study, the FAA raised questions as to how this was managed. The tower has clarified that procedure is only used when the tower is in operation. As a result, the existing voluntary measure has been amended to reference "Only when Tower is in Operation" or some similar language to ensure the tower is available to resolve any operational conflicts.

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4. The use of flight procedures (including the modifications of flight tracks) to control the operation of aircraft to reduce exposure of individuals (or specific noise sensitive areas) to noise in the area around the airport.

Noise abatement flight tracks are already in place and additional procedures have been explored. For turbojet aircraft, the use of NBAA noise abatement procedures has been recommended.

Recommendation (3 and 4) – AOPA Procedures and Signage
It is recommended that propeller aircraft be encouraged to use the Airline Owners and Pilot Associations (AOPA) recommended noise abatement procedures. It is also recommended that lighted signs be purchased and installed on the airfield to promote use of noise abatement procedures. These signs replace the existing non-lighted signs. These signs should designate "Voluntary Noise Abatement Procedures in Effect".

5. The implementation of any restriction on the use of airport by any type or class of aircraft based on the noise characteristics of those aircraft.

As a result of the 1990 Noise and Capacity Act, no new use-restrictions at Airport facilities can be implemented without a thorough demonstration of need, a detailed analysis of the restriction and its consequences, and approval by the FAA. Such restrictions could include partial or full curfews, restrictions in use based on the certified noise level of an aircraft, capacity limits on the number of aircraft that can use the facility or other similar measures.

If any form of use restriction is proposed, a FAR Part 161 process (entitled Notice and Approval of Airport Noise and Access Restrictions) would need to be accomplished. The

FAR Part 161 process requires that substantial evidence be presented that supports six statutory conditions. The conditions are that the proposed restriction:

1. is reasonable, not arbitrary and not discriminatory
2. does not create an undue burden on interstate or foreign commerce
3. maintains safe and efficient use of navigable airspace
4. does not conflict with any existing Federal statute or regulation
5. has been adequately provided for public comment
6. does not create an undue burden on the national aviation system.

The level of noise exposure surrounding CRG does not warrant access restrictions or curfews. The time and cost of implementing such restrictions are burdensome and noise benefits can typically be achieved more quickly and often just as effectively through use of voluntary procedures. Voluntary mitigation techniques to lessen the noise exposure on the communities surrounding the Airport have been implemented and are continuing to be updated.

Recommendation
Use restrictions are not recommended for further consideration at CRG because noise compatibility issues are being addressed through the continuing efforts of the JAA, the City of Jacksonville, and the FAA ATCT.

6. Other actions or combinations of actions which would have a beneficial noise control or abatement impact on the public.

It was noted during the study that little ability existed for the Airport to determine if the current noise abatement procedures were providing their maximum benefit or if they could be adjusted slightly to enhance noise compatibility. Many of the recommended flight track and procedures are expected to provide noise benefits. However, there is currently little means to identify the actual benefits provided by the procedures or ensure that the procedures are actually maximizing the desired noise reduction benefits.

With the above in mind, implementation of a radar tracking system could provide a number of benefits to the Airport and the citizens living in the surrounding areas. A tracking system would allow for more accurate identification and modeling of flight tracks. It would not only allow the Airport to better address specific noise issues but allow the Airport and the community to better understand the conditions under which noise impacts generally occur. It would allow for a better assessment of proposed changes relative to existing conditions and help to identify minor adjustments to procedures that might enhance noise compatibility. It would also provide a valuable tool in providing feedback to the local community regarding noise complaints or other noise concerns.

The information gathered by a flight tracking system would be used to encourage compliance with the voluntary procedures and not be used for mandatory enforcement. The system would need to be able to interface with FAA equipment and will comply with

FAA data download requirements. The specific proposed system and associated costs will be determined following FAA approval as an eligible item under this FAR Part 150 Study.

Recommendation (5) – Flight Tracking System
It is recommended that a radar flight tracking system be considered at CRG to assist the JAA in monitoring the voluntary noise mitigation procedures and to assist in the development of modifications to these procedures that will benefit the citizens living in proximity to the Airport. The flight track output would be useful in evaluating these procedures and recommending revisions during the next Part 150 update. The system will not be used for mandatory enforcement of the voluntary procedures.

F. SUMMARY OF OPERATIONAL RECOMMENDATIONS

Analysis of various operational mitigation procedures for CRG resulted in a number of recommended operational noise compatibility plan procedures. **Table 11-1** outlines each of the operational procedures recommended for approval by the FAA. Subsequent sections of this report provide information on the cost and timing for implementation of the proposed operational procedures.

The Noise Exposure Maps presented in Chapter 10 present a snapshot of the ever-changing level of noise exposure surrounding CRG. The 2009 DNL contours were prepared incorporating the existing operational noise mitigation procedures currently in place at the airport. While the operational noise mitigation procedures proposed in this study for FAA approval will provide some noise benefit to areas around the airport, they will have no significant change on the DNL contours projected in 2009. The recommendations outlined in this study are intended to maximize the use of the existing procedures, allow the Airport to provide better feedback to the community regarding specific events and provide a means of fine tuning, identifying, and/or assessing future noise abatement procedures. The benefits provided by each of the recommended procedures are outlined in **Table 11-1**.

TABLE 11-1
Summary of Operational Recommendations
Craig Airport FAR Part 150 Study

Noise Compatibility Program Measure		Noise Benefit
1.	Prepare a comprehensive noise brochure and update noise abatement flight track exhibits	Ensures that the pilots and the public understand all of the components of the airport voluntary noise program. Ensures pilots have the latest graphical information to assist them in following the tracks and avoiding noise sensitive areas.
2..	New Pilot Education - Work with operators to ensure that pilot education on noise abatement procedures is occurring early in the training process for student pilots.	Ensures a new pilot's understanding of the noise abatement procedures at the airport and minimizes the time during which more inexperienced pilots do not use them.
3.	Encourage propeller aircraft to use the Airline Owners and Pilot Associations (AOPA) recommended noise abatement procedures	Encourages pilots of propeller aircraft to follow industry established operational guidelines for minimizing noise and associated impacts.
4.	Purchase and install lighted airfield reminder signs that indicate "Voluntary Noise Abatement Procedures in Effect"	Carries airport's extensive landside signage initiative through to the airside. Replaces current non-lighted signs. Promotes use of noise abatement procedures.
5.	Purchase and install flight tracking equipment	Allows for better monitoring and tracking of actual operational characteristics. Allows Airport to provide better feedback to the community regarding specific events and provides a means of fine tuning, identifying, and/or assessing future noise abatement procedures. Assists in gathering data for the next update of the FAR Part 150 Study.

Source: ESA Airports, 2005

CHAPTER 12

OFF-AIRPORT LAND USE COMPATIBILITY PLANNING

CHAPTER 12

OFF-AIRPORT LAND USE COMPATIBILITY PLANNING

A. INTRODUCTION

The issue of aviation related noise and its impact on people continues to be a controversial topic in the vicinity of our nation's airports. Airports throughout the United States have been adversely affected by the encroachment of land uses that are not compatible with levels of sound generally associated with ground and flight operations by aircraft. In response to the increasing encroachment of these non-compatible land uses, airports, working through local units of government, have initiated land use management actions to facilitate the compatibility of development occurring in the airport environs across the United States.

This section presents the Federal initiatives and limitations related to land use control, addresses the relationships of the 2004 noise contours, and discusses land use related measures to enhance the long term land use compatibility in the environs of Craig.

B. FAA INITIATIVES AND LIMITATIONS IN OFF-AIRPORT LAND USE PLANNING

The following, taken primarily from the September, 1999 report Land Use Compatibility and Airports prepared by the FAA, presents the FAA actions related to land use planning.

While the FAA can provide assistance and funding (such as acquisition of eligible noise exposure property) to encourage compatible land development around airports, it has no regulatory authority for controlling land uses that would protect airport capacity and reduce noise exposure. The FAA recognizes that state and local governments are responsible for planning, zoning and regulation including that necessary to provide land use compatibility with airport operations.

However, pursuant to the Federal Airport and Airway Development Act, as a condition precedent to approval of an FAA-funded airport development project, the airport sponsor must provide the FAA with written assurances that "…appropriate action, including the adoption of zoning laws have been or will be taken, to the extent reasonable, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations including the landing and takeoff of aircraft…"

To assist in the compatible land use efforts, the FAA, local airport sponsors, and state aviation agencies have expended significant funds related to airport planning and off-airport noise and land use compatibility planning throughout the United States. Airport master plans have been prepared to identify the near-term and long-range projections for airport activity and the development necessary to meet these activity demands. In addition, noise and land use studies (FAR Part 150 studies) have been conducted to evaluate ways to minimize impacts of aircraft noise, and the FAA and airport sponsors have financed land acquisitions and other noise compatibility measures throughout the United States.

The FAA has developed land use guidelines that relate the compatibility of aircraft activity to areas surrounding an Airport. These guidelines, provided previously in Table 9-1, identify land use activities that are acceptable within the 65, 70 and 75 DNL contours. FAA guidance indicates that virtually all land uses below the 65 DNL are considered by them (the FAA) to be compatible with the affects of aircraft noise.

Attention is focused on areas within the 65 DNL because the FAA considers these to be the areas significantly exposed to noise and is the limit FAA uses for eligibility to fund noise abatement measures. It is recognized, however, that noise does not stop at the 65 DNL limit and is heard by those located in close proximity to approach, departure and training corridors. Thus, the FAA encourages airport sponsors and local governments to work together to establish land use controls within flight corridors and noise exposure areas beyond the 65 DNL. Numerous airports in the United States have adopted (or are in the process of adopting) land use related controls within the 60 DNL and some to the 55 DNL.

C. LAND PLANNING TECHNIQUES

There are a wide variety of land planning techniques that can be applied around airports. These are usually described through modifications to local Comprehensive Plans, Land Development Codes and Building Codes.

Techniques can include controls on new development such as land use restrictions, land use controls covering properties within the 60-65 DNL, requirements for sound insulation, avigation easements, notification of the existence of aircraft noise and overflight, special restrictions on the location of schools and others.

D. STATUS OF CITY OF JACKSONVILLE AIRPORT RELATED ZONING CODE

As indicated in Chapter 2, the City of Jacksonville is in the process of updating Part 10 of its Land Development Code (LDC) – the portion of the LDC related to off-airport planning around the four civilian and three military airports located within the City limits. At the time this FAR Part 150 study was being completed, the City had not finished the

revisions to Part 10. However the draft of the revisions, summarized in Chapter 2 of this study, indicates that the City is pursuing a more restrictive code than is currently identified in Part 10 of the LDC and is proposing to apply many of the techniques discussed in C above.

E. EXISTING AND FUTURE NOISE/LAND USE COMPATIBILITY

The DNL noise contours developed for the existing 2004 condition and overlaid on the existing land use map, shown on Exhibit 9-2, indicate that no incompatible land uses are located within the 65 DNL (the noise exposure level the FAA indicates to be significant). In addition virtually all of the surrounding area (within the 60 DNL and greater) is already developed or permitted for development. Thus, little can be done to improve land use compatibility through land use controls.

By 2009, the noise contours are projected to increase in size and the 65 DNL is projected to extend over a number of residential properties located north of Monument Road (see Exhibit 9-4). However, the basis used by the Federal Aviation Administration (FAA) for establishing noise funding eligibility is the 65 DNL as shown on the current contour (2004 NEM in the case of Craig). Thus, the residential areas shown to be included in the 65 DNL on the 2009 NEM cannot become eligible for noise funding (for acquisition or sound insulation) until it can be shown that the actual noise exposure at the Airport has expanded to include these areas. The FAA will however increase the size of the eligibility area when it can be shown that noise exposure has increased and the community is actually located within the 65 DNL.

The City of Jacksonville has been working on a revision to the existing Part 10 of the City's Land Development Code. The City is considering including future development in the 60-65 DNL contour as regulated areas requiring Avigation Easements and/or disclosure.

Recognizing these constraints, the following three land use related control measures are recommended.

1. Ensure Future Development Approvals are Consistent with the City of Jacksonville's Revision to Part 10 of the Land Development Code – The City of Jacksonville is working to revise Part 10 of its Land Development Code. Since nearly all of the areas surrounding Craig (within the 60 DNL or greater) have been developed, the changes to the Land Development Code will have limited effect on improving land use compatibility around the Airport. However, for any areas where redevelopment may occur in the future or infill occur within the limits of the 60 DNL and greater noise contours, the Draft Part 10 of the LDC provides greater protection than that currently being applied. .

Recommendation (6) – Community Overlay Zoning
It is recommended that the airport continue to work with the City to recognize the that property within the 60 DNL contour or greater is within the area that the community has determined should be regulated for local land use compatibility with aircraft noise.

Future development approvals issued by the City within the limits of the 60 DNL around Craig Airport should be consistent with the revisions identified in the Updated Part 10 of the City's LDC.

2. Identify Future Eligibility for Residential Areas Within the 65 DNL Limits - The noise analysis for the existing condition at Craig indicates that the 65 DNL contour falls immediately south of homes located north of Monument Road. However, by 2009, the 65 DNL noise contour is projected to extend over some residential properties.

Recommendation (7) – Future Insulation or Acquisition Eligibility
When it is documented (through the update to the noise contours) that residences are located within the 65 DNL, it is recommended that the FAA identify these homes as being eligible for a volunteer sound insulation or property acquisition program. The actual implementation of such a program would be based on the availability of Federal, State and local funding.

3. Noise Overlay Zone Brochures - Brochures can be prepared and distributed to describe the land use component of the noise abatement program being implemented at the Airport. A general brochure can be developed to address the broad range of mitigation actions including land use related recommendations. A brochure specifically focused on land use measures could be prepared or these measures could be incorporated into the Comprehensive Noise Brochure recommended in Chapter 12. This brochure would be available to the public as a whole and to the aviation interests flying into and out of the Airport.

Recommendation (8) – Overlay Zoning Brochure
It is recommended that a Noise Compatibility Program Brochure be developed which, through text and graphics, describes the noise abatement actions resulting from the land use portion of the FAR Part 150 Study. This publication should be available at the Airport for individuals and communities as requested. The brochure should also identify the noise contour areas and their general level of annoyance (significant within the 65 DNL or moderate for those within the 60-65 DNL).

4. Publish Noise Contours - As part of its program to educate pilots and citizens of the noise conditions surrounding Craig Airport a number of brochures and educational recommendations have been made. Broad scale media is also an effective source for raising community awareness.

Recommendation (9) – Contour Publication
It is recommended that the existing and future noise contours be published twice annually in the local newspaper to increase awareness of the noise conditions around Craig.

CHAPTER 13

IMPLEMENTATION OF STUDY RECOMMENDATIONS

CHAPTER 13

RECOMMENDATIONS SUBMITTEDFOR FAA APPROVAL

This chapter summarizes all of the recommended NCP elements that resulted from the Part 150 study. In order to implement the recommendations of the noise compatibility program, it is important to understand who is responsible for carrying out the recommended action, how much the action will cost, and the timeframe for carrying out the action. **Table 13-1** provides a summary of these factors as they relate to the FAR Part 150 Study recommendations for CRG.

As indicated in Table 13-1, the Jacksonville Airport Authority (JAA) will have either a primary or shared role in carrying out each of the operational noise mitigation procedures. The total cost of all of the noise procedures is estimated at $480,000 and it is anticipated that they will all be implemented during 2007. Actual timing however, is subject to funding availability.

It is important to note that noise mitigation is an ongoing process and at which time changes warrant, the JAA will prepare a noise exposure map (NEM) update to reflect the change in conditions.. The JAA has maintained continuing efforts in identifying noise mitigation opportunities since the late 1990's. Future efforts will include identifying homes and land eligible for acquisition or sound insulation. If a runway extension is proceeded with, a future Part 150 study should focus on how to maximize the potential noise benefits that result while minimizing any increases in noise exposure. New technologies, whether RNAV or other, should continue to be monitored to determine if additional noise mitigation opportunities are available. Future FAR Part 150 updates will need to review and identify the potential benefits of employing these new technologies. Finally, the flight tracking system recommended herein will allow for a means to measure minor adjustments to the existing procedures to maximize noise reduction benefits as well as ensure future noise reduction procedures are having their intended effect. It is recommended that the flight tracking system output be used to review all recommended operational procedures during the next Part 150 update.

TABLE 13-1
Recommendations Submitted for FAA Approval
Craig Airport FAR Part 150 Study

	Noise Compatibility Program Measure	Lead Entity	Cost	Timing	Benefits
1.	Prepare a comprehensive noise brochure and update noise abatement flight track exhibits	JAA	$11,500	Upon approval of NCP (est. 2007)	Ensures that the pilots and the public understand all of the components of the airport voluntary noise program. Ensures pilots have the latest graphical information to assist them in following the tracks and avoiding noise sensitive areas.
2.	New Pilot Education - Work with operators to ensure that pilot education on noise abatement procedures is occurring early in the training process for student pilots.	JAA	$10,000	Upon approval of NCP (est. 2007)	Ensures that new pilots understand what areas are noise sensitive and how to minimize noise impacts through use of voluntary noise abatement procedures.
3..	Encourage propeller aircraft to use the Airline Owners and Pilot Associations (AOPA) recommended noise abatement procedures	JAA	No associated cost	Upon approval of NCP (est. 2007)	Encourages pilots of propeller aircraft to follow industry established operational guidelines for minimizing noise and associated impacts.
4..	Purchase and install lighted airfield reminder signs that indicate "Voluntary Noise Abatement Procedures in Effect"	JAA	$65,000 (3)	Upon approval of NCP (est. 2007)	Carries airport's extensive landside signage initiative through to the airside. Replaces current non-lighted signs. Promotes use of noise abatement procedures.
5.	Purchase and install flight tracking equipment	JAA	Approximately $375,000 initial cost and monthly maintenance costs of $2,000 to $3,000	Upon approval of NCP and FAA funding availability (est. 2007)	Allows for better monitoring and tracking of actual operational characteristics. Allows Airport to provide better feedback to the community regarding specific events and provides a means of fine tuning, identifying, and/or assessing future noise abatement procedures. Assists in gathering data for the next update of the FAR Part 150 Study.
6.	Ensure future development approvals are consistent with the City of Jacksonville's revision to Part 10 of the Land Development Code to the extent which they exceed FAA guidelines	JAA	No associated cost	Upon approval of NCP (est. 2007) and incorporation into the LDC	Supports local community efforts to institute and implement land use controls that consider areas beyond Federal guidelines.
7.	If during a future NEM update it is determined that residential units fall within the 65 or greater DNL contour, it is recommended that the NCP be updated to include a acquisition/ sound insulation program.	JAA/FAA	No associated cost	When appropriate (est. 2010)	Raises awareness that community that future updates may result in the eligibility of certain properties for voluntary sound insulation or property acquisition.
8.	Publish noise overlay zone brochures	JAA	$6,500	Upon approval of NCP (est. 2007) and incorporation into the LDC	Raises awareness of community regarding potential for noise associated with activities at Craig.
9.	Publish noise contours twice annually in local newspaper	JAA	$7,500	Upon approval of NCP (est. 2007)	Raises awareness of community regarding potential for noise associated with activities at Craig.

Source: ESA Airports, 2006, JAA – Jacksonville Airport Authority, FAA – Federal Aviation Administration

CHAPTER 14

LONG TERM NOISE EXPOSURE

CHAPTER 14

LONG TERM NOISE EXPOSURE

This section outlines the long term noise exposure levels for areas surrounding CRG including the implications of the projects outlined in the Master Plan's capital improvement program. With limited areas of significant noise exposure projected through 2009, a longer term assessment of noise was conducted to determine if opportunities exist for noise reduction through 2020. It was noted in Chapter 3 that the Master Plan update recommended a 500 foot southward shift of Runway 5-23 along with an extension to Runway 14-32. It was also noted that a change to the comprehensive plan is required to move forward with any extension to this runway. Future conditions both with and without the runway extension were explored in assessing long term noise exposure.

A. LONG TERM CRG 2020 ACTIVITY LEVELS

The 2005 FAA Terminal Area Forecast (TAF) 2020 forecast (226,704) almost exactly mirrors the Master Plan forecast for the 60,000 lb load limit scenario (227,819). This scenario assumed that Runway 14-32 would be extended as outlined in the Master Plan but activity by aircraft weighing more than 60,000 lbs would be restricted from using the Airport. Alternate forecasts were developed in the Master Plan that estimate future activity levels without the runway extension and future activity levels with the runway extension but without the weight restriction. For the purpose of this analysis, the 2005 TAF is anticipated to be representative of the 60,000 lb load limit scenario for future activity levels at the Airport with this restriction in place and remains the basis for developing the long term projection of activity at CRG. This is referred to as the "unconstrained" activity level for the purpose of this study. The unconstrained forecast was then adjusted to reflect an approach similar to that in the Master Plan update which assumed that if no extension were constructed, some of the projected demand would fail to be met. This is referred to as the "constrained" forecast.

CRG 2020 Activity Level – Unconstrained

Similar to the adjustments outlined in Chapter 7, the 2020 TAF requires adjustment to address the discrepancies in the counting of military itinerant aircraft at the Airport. **Table 14-1** outlines the projected activity profile for the unconstrained condition. As reflected in the table, the 2020 adjusted activity level is 214,564 total operations.

TABLE 14-1
2020 Activity Profile – Unconstrained
Craig Airport FAR Part 150 Study

Year	Itinerant			Local			Total
	GA	Military	Total	GA	Military	Total	
2020 TAF	125,463	**12,141**	137,605	88,608	491	89,099	226,704
2020 Adjusted	125,463	*	125,463	88,608	491	89,099	**214,562**

Source:
Jacksonville Aviation Authority, 2005 FAA TAF and ESA Airports
** Indicates minimal activity*

CRG 2020 Activity Level – Constrained

Without construction of the runway extension the Master Plan update determined that future operational demand would be inhibited or "constrained". In the Master Plan, the difference between the 60,000 lb restricted activity level and the no runway extension or "constrained" activity level was roughly 2.3 percent in 2020. Assuming a similar reduction relative to the TAF projections, a constrained activity level projection was developed for the purpose of noise modeling. **Table 14-2** outlines the activity profile for the constrained condition.

TABLE 14-2
2020 Activity Profile - Constrained
Craig Airport FAR Part 150 Study

Year	Itinerant			Local			Total
	GA	Military	Total	GA	Military	Total	
2020 TAF	125,463	**12,141**	137,605	88,608	491	89,099	226,704
2020 Adjusted	120,467	*	120,467	88,608	491	89,099	**209,566**

Source:
Jacksonville Aviation Authority, 2005 FAA TAF and ESA Airports
** Indicates minimal activity*

It should be noted that the difference between the constrained and the unconstrained forecast is 4,996 annual operations or 13.8 operations per day (roughly 7 additional landings and 7 additional departures per day). For the purposes of modeling future noise conditions it was assumed that this differential ~~consists purely of business jet~~was spread throughout the fleet of aircraft. It should also be noted that there are numerous factors that could occur through 2020 that could reduce this differential (see discussion on Very Light Jets provided later in this chapter).

B. CRG 2020 NOISE CONTOUR

Modeling of the 2020 Existing Airfield scenario allows estimation of the long term noise exposure for the areas around CRG if the airfield remains in its existing configuration. The only change, reflected in all the scenarios analyzed, is the inclusion of the 500 foot southward shift of Runway 5-23. Based on the projections of future activity outlined earlier, a future development scenario that includes no extension to the runway represents a constrained operational condition. Therefore, determining the long term noise exposure for the existing airfield with only the 500 foot shift to Runway 5-23 requires the use of the constrained forecast. In modeling this future case it was assumed that the runway utilization remains the same through 2020 and that the aircraft activity profile remains similar. **Exhibit 14-1** reflects the long term noise exposure for the existing airfield conditions. The population implications of this future condition are outlined later in this section.

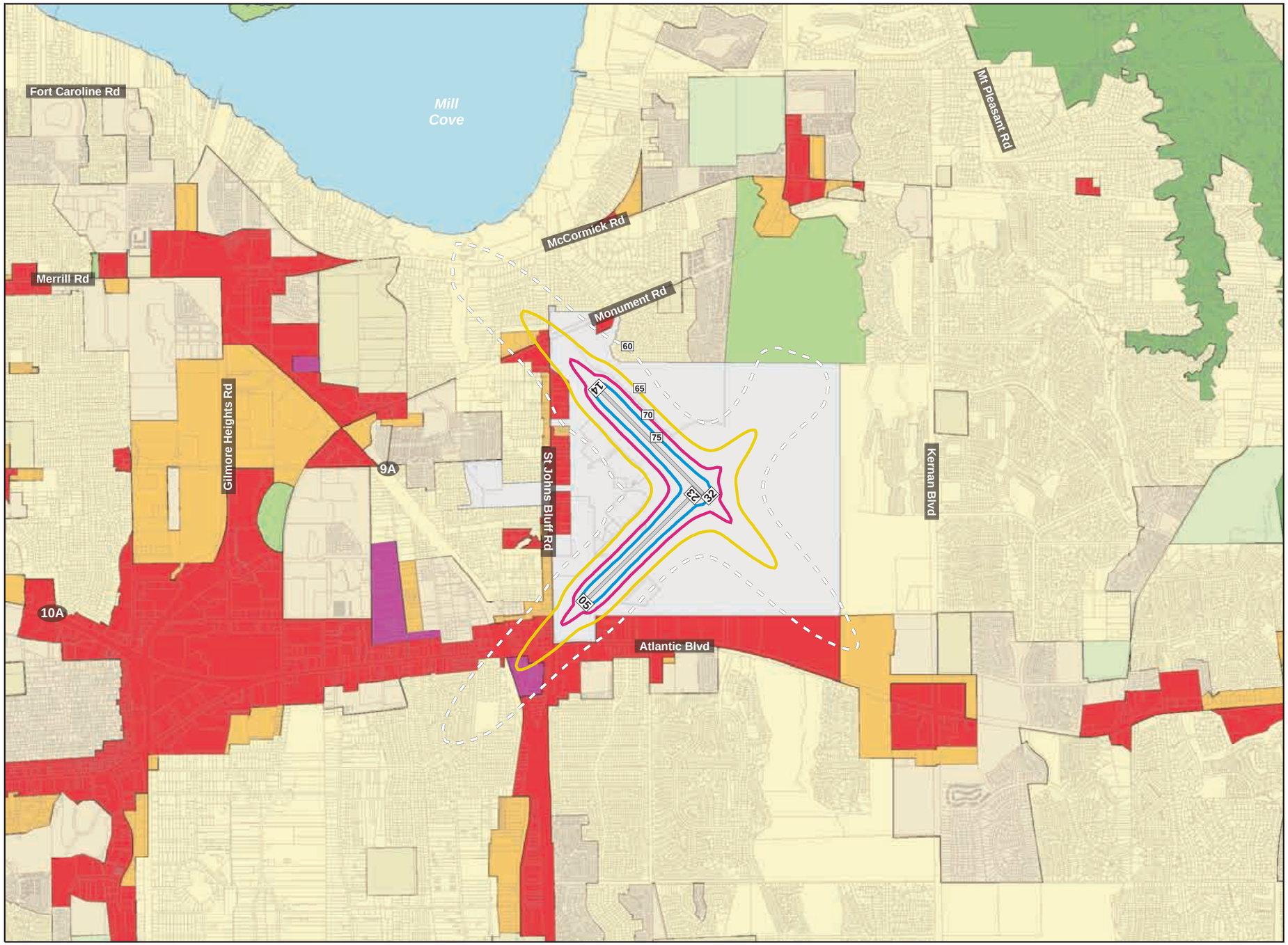
Exhibit 14-2 compares the 2020 noise contours to the 2004 baseline contours. As indicated the noise exposure at Craig is projected to increase with future increases in activity levels. Areas highlighted in red indicate where the noise contour limits would expand. Areas highlighted in green reflect were the noise contour limits would reduce.

C. CRG 2020 NOISE CONTOURS – WITH RUNWAY EXTENSION

It should be noted that it is not the purpose of this study to evaluate the need for an extension to Runway 14-32. However, since the Master Plan for CRG included a runway extension as part of the long range development of the airport, this study did evaluate the noise consequences of a number of Runway 14-32 configurations. While a runway extension is not typically considered solely for noise purposes, an extension in combination with the use of displaced landing thresholds can often be an effective means of mitigating noise exposure while also enhancing the operational characteristics of an airfield. A runway extension or threshold relocation affects the areas surrounding an airport in the following ways:

- An extension to one end of a runway typically reduces noise off the opposite end of the runway since it allows aircraft to climb to higher altitudes before departing airport property. If both ends of the runway are extended then areas off both ends of the runway receive the benefit of increased departure altitudes.
- Relocation of a runway landing threshold toward the property boundary typically increases the noise in the direction that it is relocated since aircraft will be lower as they arrive to the Airport. Conversely relocation of a landing threshold away from the boundary typically reduces off-airport noise since aircraft will be higher as they enter airport property.

With this in mind, a number of scenarios were explored to determine what configurations had the greatest potential for long term noise relief to the surrounding communities.



Legend

- Airport Property
- Agriculture
- Conservation
- Recreation and Open Space
- Rural Residential
- Low Density Residential
- Medium Density Residential
- High Density Residential
- Industrial
- Commercial
- Mixed Land Use
- Public Buildings and Facilities
- Water

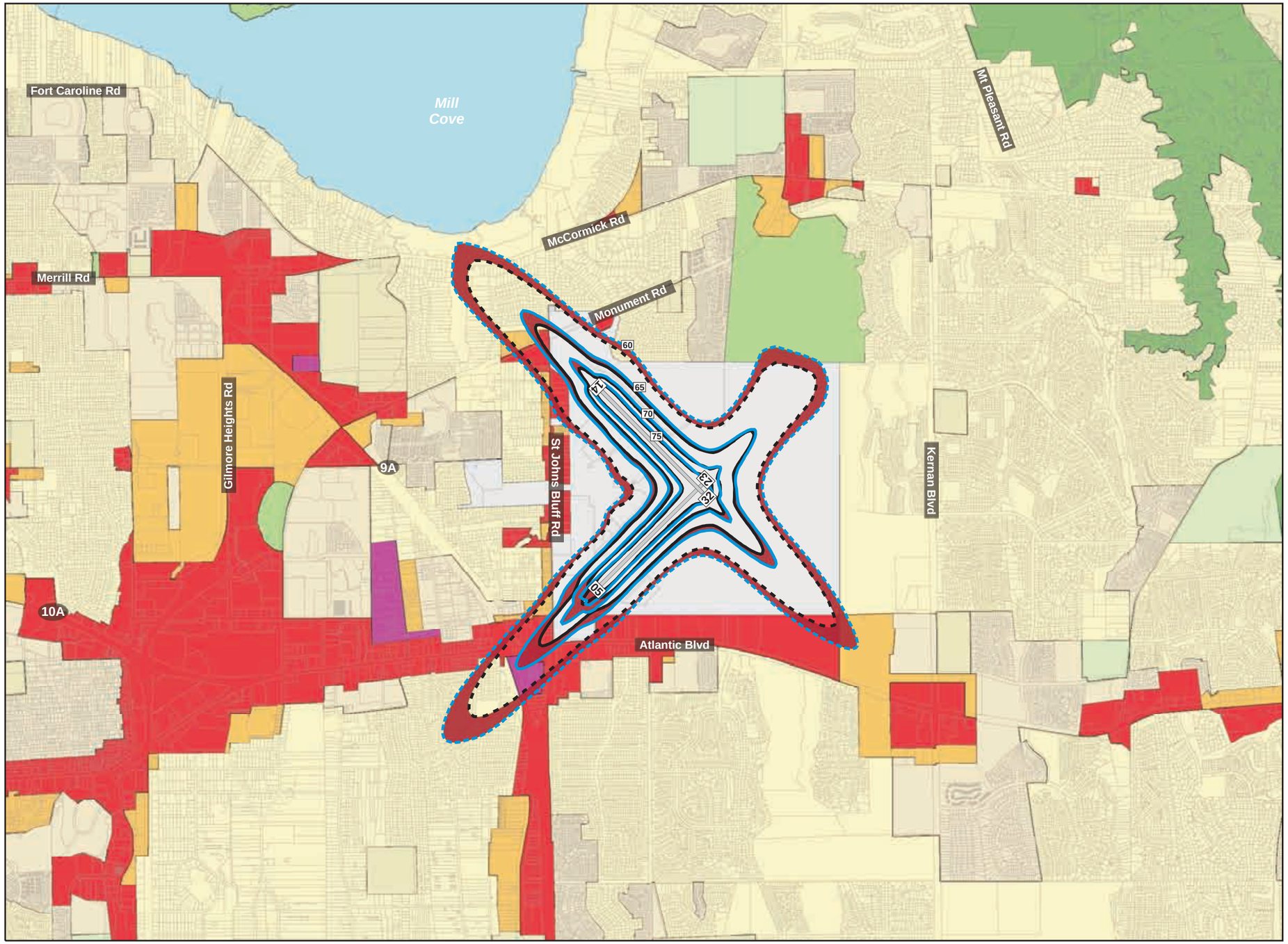
0 3000
Foot

LAND USE MAP SOURCE: City of Jacksonville, Received March 4, 2005

SOURCE: ESA Airports

Exhibit 14-1

2020 DNL Noise Contours - Existing Airfield



Legend

- Airport Property
- Agriculture
- Conservation
- Recreation and Open Space
- Rural Residential
- Low Density Residential
- Medium Density Residential
- High Density Residential
- Industrial
- Commercial
- Mixed Land Use
- Public Buildings and Facilities
- Water
- 2005 Existing Airfield
- 2020 Existing Airfield
- Areas of Decrease Compared to Existing Airfield
- Areas of Increase Compared to Existing Airfield

0 3000
Foot

LAND USE MAP SOURCE: City of Jacksonville, Received March 4, 2005

SOURCE: ESA Airports

Exhibit 14-2

2020 DNL Noise Contour Comparison - 2020 Existing Airfield vs. 2005

In the event that an extension to Runway 14-32 were implemented, it is anticipated that runway use would shift for jet aircraft as indicated in **Table 14-3**.

TABLE 14-3
2020 Jet Aircraft Flight Track Usage
Craig Airport FAR Part 150 Study

Runway	Departure Runway Use %	Departure Track	% of Flight Activity	Arrival Runway Use %	Arrival Track	Percentage of Flight Activity
Runway 5	5%	D2	100%	5%	A2	100%
Runway 14	30%	D5 D7	60% 40%	30%	A5	100%
Runway 23	5%	D10 D11	50% 50%	5%	A8	100%
Runway 32	60%	D13 D14 D15	10% 60% 30%	60%	A11	100%

Source:
FAA Air Traffic Control and ESA Airports

Utilizing the revised runway use table along with the unconstrained forecast, a number of runway extension scenarios were analyzed.

Master Plan Configuration
- 2000 foot extension to Runway 32
- 1000 ft displacement to both ends of Runway 14-32

Configuration A
- 500 foot extension and displacement to Runway 14
- 2000 foot extension and displacement to Runway 32

Configuration B
- 500 foot extension and displacement to both ends of Runway 14-32

Configuration C
- 500 foot extension and displacement to Runway 14
- 1000 foot extension and displacement to Runway 32

Configuration D
- 250 foot extension and displacement to Runway 14
- 1250 foot extension and displacement to Runway 32

Based on this analysis, it was concluded that a runway extension could reduce levels of noise exposure both in terms of area and population. All of the runway extension alternatives analyzed reduced the noise exposure to the northeast and southwest as compared to the 2020 constrained activity levels and existing airfield conditions. The Master Plan configuration also reduced the noise exposure to the northwest. The Master Plan configuration allows aircraft departing on Runway 32 to reach a given altitude 2,000 feet sooner while aircraft landing on Runway 14 would descend at higher altitudes over the community and ultimately touch down 1,000 feet later. With this configuration,

landings on Runway 32 would descend 1,000 feet earlier. All other configurations analyzed either provided a reduced noise benefit or an increase in noise exposure to the northwest. Ultimately, it was determined that of all the configurations analyzed the Master Plan update provided the greatest potential reduction in noise exposure.

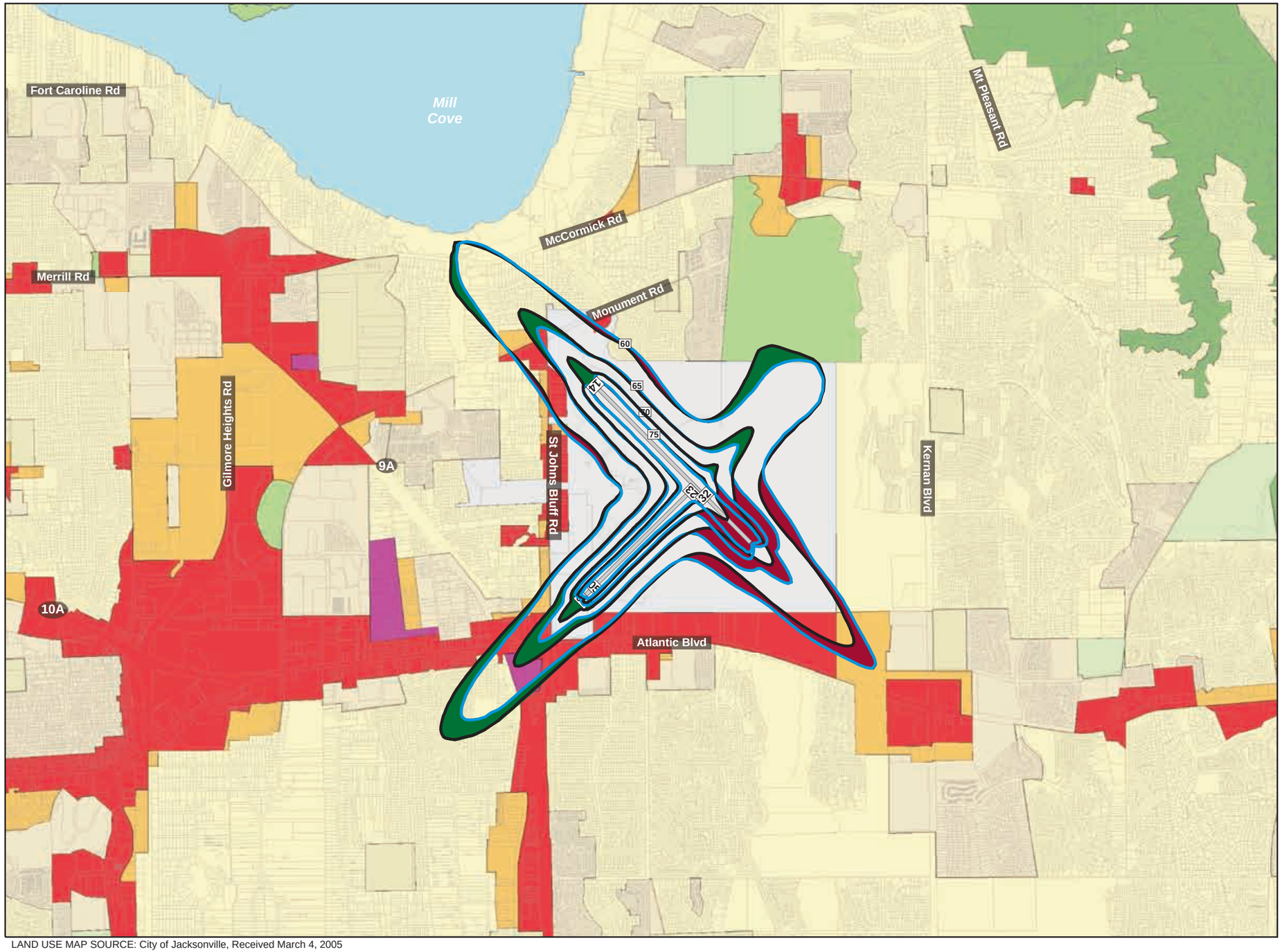
Exhibit 14-3 reflects the long term noise exposure conditions for the airfield configuration identified in the Master Plan update. It also outlines the difference in noise exposure for the future demand levels for both the existing airfield and Master Plan configurations. Areas highlighted in red indicate where the noise contour limits would expand. Areas highlighted in green reflect were the noise contour limits would reduce. As indicated, the areas primarily receiving the noise reduction benefits are to the northwest, northeast and southwest of the Airport.

If an extension were to move forward at CRG, each of the alternatives outlined herein should be further examined during the environmental process and along with other alternatives that might be identified for their noise reduction potential.

D. LONG TERM – AREA AND POPULATION WITHIN THE DNL CONTOURS

The different long term noise exposure scenarios analyzed at CRG have a varying effect on the acreage of the noise contours as well as the number of residents affected. The CRG 2020 noise contour (without the runway extension) creates the largest noise contour both on and off airport property of any of the future scenarios analyzed. The increased acreage of the contour also correlates to a greater number of individuals impacted. A comparison of the acreage in each contour interval both on and off airport property as well as the number of individuals can be found in **Tables 14-4** and **14-5**.

The acreage of the noise contours for each scenario was determined using the Integrated Noise Model in combination with GIS software. The noise exposure maps were then overlaid on an aerial photograph and the number of households and apartment units were tabulated and verified through the City of Jacksonville Property Appraisers website. Each parcel affected was verified to have an existing structure and tallied. The tallied numbers were then multiplied by 2.51, the average number of residents per dwelling in Duval County.



Legend

- Airport Property
- Agriculture
- Conservation
- Recreation and Open Space
- Rural Residential
- Low Density Residential
- Medium Density Residential
- High Density Residential
- Industrial
- Commercial
- Mixed Land Use
- Public Buildings and Facilities
- Water
- 2020 Existing Airfield
- 2020 Master Plan
- Areas of Decrease Compared to Existing Airfield
- Areas of Increase Compared to Existing Airfield

0 3000
Foot

LAND USE MAP SOURCE: City of Jacksonville, Received March 4, 2005

SOURCE: ESA Airports

Exhibit 14-3

2020 DNL Noise Contour Comparison - Existing Airfield vs. MP Runway Extension

TABLE 14-4
Long Term - Area within DNL Contours
Craig Airport FAR Part 150 Study

Year	Acreage Within DNL Contour Intervals							
	60-65		65-70		Over 70		60 or greater	
	Total Area	Off Airport	Total Area	Off Airport	Total Area	Off Airport	Total Area	Off Airport
2004	629.5	222.7	209.7	13.8	153.2	0	992.4	236.5
2009	680.2	258.6	224.3	18.8	162.7	0	1067.2	277.4
2020	813.7	361.7	262.7	39.9	190.7	0	1267.1	401.6
2020 MP Airfield Configuration	799.8	339.9	239.1	9.4	202.0	0	1240.9	349.3

Source:
ESA Airports

TABLE 14-5
Long Term - Estimated Population DNL Contours
Craig Airport FAR Part 150 Study

Year	Residential Population Within DNL Contour Intervals			
	60-65	65-70	Over 70	60 or greater
2004	409	0	0	409
2009	449	5	0	454
2020	1104	33	0	1137
2020 MP Airfield Configuration	894	0	0	894

Source:
ESA Airports

The information in Table 14-4, shows that the total acreage within the 60 DNL and higher contour will increase by 26 percent from 992 acres to 1267 acres by 2020. Off airport area within this same range is projected to increase 70 percent from 237 acres to 402 acres. Most notably, off-airport area within the FAA's defined level of significant noise exposure, the 65 DNL contour, will increase 189 percent from 13.8 acres to 39.9 acres. The Master Plan configuration (which includes a runway extension) reduces the off airport area exposed to these contour limits to 9.4 acres even with higher activity levels and greater use of Runway 14-32. This represents a 31 percent reduction from the 2004 levels.

Table 14-5, indicates that the population within the 60 DNL contour is projected to nearly triple between 2004 and 2020 and the people within the 65 DNL contour will increase from 5 to 33. Conversely, the Master Plan configuration reduces the population level within the 2020 60 DNL contour by nearly 20 percent and by 100 percent within the 65 DNL contour.

As outlined herein, an extension to Runway 14-32 would reduce long term noise exposure. In the near term, reductions in noise would be provided in areas beyond the noise threshold levels the FAA deems as significant (i.e., the 65 DNL contour). However, recognizing that the City of Jacksonville has identified new land use measures that will address areas down to the 60 DNL contour, a runway extension would be a means to reduce noise exposure within the 60-65 DNL range in the nearer term as well as long term.

E. LONG TERM SENSITIVITY TO MILITARY ITINERANT ACTIVITY

As noted earlier, military itinerant activity was removed from the projections when it was determined that little if any of this type of activity was actually occurring at CRG. Rather, the operations recorded as military itinerant for CRG are actually military aircraft transitioning between Mayport and NavyJAX to the north of CRG. While the CRG Tower is providing traffic services to this activity, it is not actually making an approach to or departing from CRG Airport.

To determine how military aircraft would influence the long term contours at CRG in the event that the Airport were to experience some of this type of activity in the future, a sensitivity analysis was conducted. One operation per day of a US Military C130 aircraft was added to the 2020 existing airfield scenario. The aircraft was assumed to operate only on Runway 14/32 utilizing straight in and out flight tracks, simulating an ILS approach and a straight out departure.

The impact from these itinerant military operations was determined to be minimal. Very few, if any additional homes were included in the 60 DNL noise contour and no additional homes in the 65 DNL noise contour due to this activity.

F. LONG TERM IMPLICATIONS OF VERY LIGHT JETS

Currently in development is a new class of jet aircraft referred to as very light jets (VLJ). Very light jets are turbine powered aircraft with a maximum certificated takeoff weight of 10,000 lbs. or less and are certified for single pilot operations. This type of operation has become possible through the use of advanced cockpit instrumentation and automation of aircraft systems. Several uses for VLJ's have been considered including, but not limited to, air taxi, charter, corporate operations, pilot training, and private use. Several startup companies, such as Eclipse Aviation, are currently developing very light jet aircraft with the first aircraft expecting certification in the second quarter of 2006. Existing aircraft manufacturers, such as Cessna and Embraer, are also making an effort to

put their mark on the VLJ market. Honda has also announced their entry in to the aircraft manufacturing industry with their own VLJ.

The nature of the VLJ being a lighter aircraft, requiring less thrust to operate, implies that they will not typically be the driver with regards to noise at airports with existing jet activity. However, no empirical data yet exists for these aircraft and there is no standardized method of estimating their future noise implications. The takeoff and landing capabilities of VLJ aircraft, which require less than 3,500 feet of runway, allow them to operate at runway length constrained airports that normally experience a very limited number of jet aircraft operations or no jet activity at all. For these types of airports, the potential exists for the surrounding lands to see an increase with regards to noise. There exists a significant amount of jet operational activity at CRG and the most optimistic of VLJ projections predict approximately 8,000 aircraft in operation worldwide by the year 2020. Thus, the potential noise impact due to VLJ aircraft is expected to be minimal. However, due to the entry of these aircraft into the aviation fleet, it is unlikely the difference between constrained and unconstrained activity will be as great as projected. As such, it is likely that the long term existing airfield noise footprint will be larger and the difference between the amount of jet activity with and without a runway extension will be reduced.

From a capacity standpoint, VLJ aircraft are not poised to have a significant impact on airports such as CRG. They make approaches into the airport environment at comparable speeds to existing jet aircraft and their ability to utilize shorter runways than today's class of jet aircraft give air traffic controllers more options for sequencing approaches and departures. A massive influx of any aircraft into an airport poses a challenge to the current capacity and operations of that airport, however no evidence suggests that would be the case at CRG.

CHAPTER 15

SUMMARY OF FINDINGS

CHAPTER 15
SUMMARY OF FINDINGS

This section summarizes the findings of the analysis outlined in the noise compatibility plan. It also summarizes key considerations, recommendations, and conclusions resulting from the analysis. A summary of findings is as follows:

1. Close-in residential areas located are located in the northwest, southwest, northeast and southeast. Residential areas to the northwest have been shown to have the greatest overall noise exposure. Residential areas to the southwest have the second greatest noise exposure followed by residences to the southeast and northeast.
2. A number of voluntary noise mitigation procedures and initiatives are in place and are actively being promoted and followed. An additional four noise mitigations initiatives were identified and recommended in this study that enhance the effectiveness of these procedures.
3. Implementation of an instrument departure procedure or a glide slope angle adjustment are not recommended due to either the lack of noise benefit or limited noise benefit provided.
4. Construction of barriers and/or berms are not recommended due to the distance between or location of the noise source (aircraft) and the receivers (noise sensitive sites).
5. Use of the Aircraft Owners and Pilots Association (AOPA) recommended noise procedures and the installation lighted airfield noise abatement signage were recommended as operational measures that could help improve noise conditions.
6. Implementation of an aircraft flight tracking system is recommended to allow the JAA to better assess and refine current operational procedures. It will also allow a better understanding of what pilot education needs to be targeted.
7. No homes currently fall within the 65 DNL contour which is the FAA's defined level of significant noise exposure. Therefore, no homes are currently eligible for voluntary acquisition or sound insulation. Some homes are projected to be within the 65 DNL contour by 2009 and could become eligible for sound insulation or acquisition once they are documented to be within the 65 DNL contour.
8. The City of Jacksonville is currently rewriting Part 10 of the Land Development Code which defines land use compatibility around all airports located within the

city. This rewrite will create overlay zones for compatibility down to the 60 DNL contour.

9. Preparation of an overlay zone brochure and the publication of the noise contours in the local newspaper are recommended to increase the public's awareness of noise exposure around Craig Airport.
10. By 2020, the total area within the 60 DNL or greater contour is projected to increase by more than 26 percent for the existing airfield configuration.
11. The population within the 60 DNL contour is projected to more than double between 2009 and 2020 and the people within the 65 DNL contour are projected to increase from 5 to 33 for the existing airfield configuration.
12. All of the runway extension scenarios analyzed in this study would have a smaller overall noise impact (total area within the 60 or greater contours DNL) when compared to the existing airfield configuration.
13. The Master Plan runway configuration contours encompass the smallest overall impact area as well as the fewest number of individuals when compared with the existing runway configuration and other runway alternatives reviewed. This configuration would remove all people from the 65 DNL contour, the FAA's defined level of significant noise exposure.
14. New aircraft such as the very light jets (VLJ) will likely increase the long term existing airfield noise footprint due to the short airfield operating characteristics of the aircraft. This would increase the differential between noise exposure with and without a runway extension (the comparative noise benefits resulting from an extension would be greater).
15. The noise sensitivity analysis regarding military aircraft indicates that the addition of one operation a day by military itinerant aircraft would have a limited impact on the long term contours.

U.S. Department
of Transportation
**Federal Aviation
Administration**

ORLANDO AIRPORTS DISTRICT OFFICE
5950 Hazeltine National Drive, Suite 400
Orlando, Florida 32822-5024
Phone: 407-812-6331 Fax: 407-812-6978

May 22, 2007

Mr. H.E. (Chip) Seymour
Aviation Planning Manager
Jacksonville Airport Authority
PO Box 18018
Jacksonville, Florida 32220-4018

Received
MAY 29 2007
Planning and Development

Dear Mr. Seymour:

RE: Craig Municipal Airport, Jacksonville, Florida
Noise Compatibility Program Record of Decision

The Federal Aviation Administration (FAA) has evaluated the Noise Compatibility Program for Craig Municipal Airport contained in the Craig Airport FAR Part 150 Noise and Land Use Compatibility Study and related documents submitted to this office under the provisions of 49 U.S.C., Section 47504. The recommended Noise Compatibility Program proposed by the Jacksonville Port Authority is identified by action element number on page 13-2 of the Craig Airport FAR Part 150 Noise and Land Use Compatibility Study. I am pleased to inform you that the Regional Airports Division Manager has approved eight of the nine proposed action measures in the Noise Compatibility Program in full and one measure in part. The specific FAA action for each Noise Compatibility Program measures is set forth in the enclosed Record of Approval. The effective date of this approval is May 14, 2007.

Operational measure number five was approved in part and does not extend to the use of monitoring equipment for enforcement of any voluntary measure. All of the approval actions are more fully explained in the enclosed Record of Approval.

Each airport Noise Compatibility Program developed in accordance with FAR Part 150 is a local program, not a Federal program. The FAA does not substitute its judgment for that of the airport operator with respect to which measures should be recommended for action. The FAA's approval or disapproval of FAR Part 150 Program recommendations is measured according to the standards expressed in FAR Part 150 and the Aviation Safety and Noise Abatement Act of 1979, (49 U.S.C. 47501-47507) and is limited to the following determinations:

The Noise Compatibility Program was developed in accordance with the provisions and procedures of FAR Part 150;

Program measures are reasonably consistent with achieving the goals of reducing existing noncompatible land uses around the airport and preventing the introduction of additional noncompatible land uses;

Program measures would not create an undue burden on interstate or foreign commerce, unjustly discriminate against types or classes of aeronautical uses, violate the terms of airport grant agreements, or intrude into areas preempted by the Federal Government; and

Program measures relating to the use of flight procedures can be implemented within the period covered by the Program without derogating safety, adversely affecting the efficient use and management of the Navigable Airspace and Air Traffic Control Systems, or adversely affecting other powers and responsibilities of the Administrator prescribed by law.

Specific limitations with respect to FAA's approval of an airport Noise Compatibility Program are delineated in FAR Part 150, Section 150.5. Approval is not a determination concerning the acceptability of land uses under Federal, state, or local law. Approval does not by itself constitute a commitment by FAA to implement specific noise compatibility measures. FAA approval of some measures may require preparation of an environmental assessment. Further, approval of a plan does not commit FAA to financially assist in the implementation of the program nor are all measures covered by the program necessarily eligible for grant-in-aid funding from the FAA under the Airport and Airway Improvement Act of 1982. Where Federal funding is sought, requests for project grants should be submitted to the FAA Airports District Office.

Sincerely,

W. Dean Stringer, Manager
Orlando Airports District Office

1 Enclosure

cc:
APP-400
ASO-610
ASO-7

RECORD OF APPROVAL
CRAIG MUNICIPAL AIRPORT
JACKSONVILLE, FLORIDA

The approvals listed herein include approvals of actions that the airport recommends be taken by the Federal Aviation Administration (FAA). It should be noted that these approvals indicate only that the actions would, if implemented, be consistent with the purposes of FAR Part 150. The FAA has provided technical advice and assistance to the airport to ensure that the operational elements are feasible (see 14 CFR 150.23(c)). These approvals do not constitute decisions to implement the actions. Later decisions concerning possible implementation of measures in this ROA will be subject to applicable environmental or other procedures or requirements, including Section 106 of the National Historic Preservation Act (NHPA).

The operational and land use control management measures below summarize as closely as possible the airport operator's recommendations in the Noise Compatibility Program (NCP) and are cross-referenced to the program. The statements contained within the summarized measures and before the indicated FAA approval, disapproval, or other determination do not represent the opinions or decisions of the FAA.

OPERATIONAL MEASURES

No new air traffic operational measures were recommended for approval. The following measures, referred to as "Operational Measures" by the sponsor, were recommended for approval.

1. Prepare a comprehensive noise brochure and update noise abatement flight track exhibits.

Ensures that the pilots and the public understand all of the components of the airport voluntary noise program. Ensures pilots have the latest graphical information to assist them in following the tracks and avoiding noise sensitive areas. (NCP, pages 11-3, 11-4; Exhibits 11-1, 11-2; and Tables 11-1, 13-1)

FAA Action: Approved. Inserts or other information must not be construed as mandatory air traffic procedures. Prior to release, language in the brochure shall be reviewed for wording and content by the appropriate FAA office. The content of the brochure is subject to specific approval by appropriate FAA officials outside of the FAR Part 150 process and is not approved in advance by this determination.

2. New Pilot Education – Work with operators to ensure that pilot education on noise abatement procedures is occurring early in the training process for student pilots.

Ensures that new pilots understand what areas are noise sensitive and how to minimize noise impacts through use of voluntary noise abatement procedures. (NCP, page 11-1; and Tables 11-1, 13-1)

FAA Action: Approved as it applies to the identified level of significance identified by the Sponsor as DNL 65 dB.

3. Encourage propeller aircraft to use the Airline Owners and Pilot Associations (AOPA) recommended noise abatement procedures.

Encourages pilots of propeller aircraft to follow industry established operational guidelines for minimizing noise and associated impacts. (NCP, page 11-7; and Tables 11-1, 13-1)

FAA Action: Approved.

4. Purchase and install lighted airfield reminder signs that indicate "Voluntary Noise Abatement Procedures in Effect."

Carries airport's extensive landside signage initiative through to the airside. Replaces current non-lighted signs. Promotes use of noise abatement procedures. (NCP, page 11-7; and Tables 11-1, 11-13)

FAA Action: **Approved.** Signage information must not be construed as mandatory air traffic procedures; signage language is subject to specific approval by appropriate FAA officials outside of the FAR Part 150 process and is not approved in advance by this determination. Approval of this measure does not commit the FAA to future Federal funding assistance.

5. Purchase and install flight tracking equipment.

Allows for better monitoring and tracking of actual operational characteristics. Allows Airport to provide better feedback to the community regarding specific events and provides a means of fine-tuning, identifying, and/or assessing future noise abatement procedures. Assists in gathering data for the next update of the FAR Part 150 Study. (NCP, pages 11-8, 11-9; and Tables 11-1, 13-1)

FAA Action: **Approved in part.** Approved with respect to monitoring to determine if operational increases or other changes at the airport occur that are of sufficient magnitude to significantly affect the 5-year NEM DNL 65 dB noise contour. The airport sponsor adopted the Federal guidelines designating DNL 65 dB as the level at which aircraft noise is compatible with residential land uses and the local jurisdiction has not adopted local land use compatibility standard below the DNL 65 dB contour. For purposes of aviation safety, this approval does not extend to the use of monitoring equipment for enforcement purposes by in-situ measurement of any preset noise thresholds and shall not be used for mandatory enforcement of any voluntary measure.

LAND USE MEASURES

The NEMs show the 65 DNL contour located primarily on airport property. The NCP makes recommendations for land use measures to improve existing noise-sensitive land use impacts and prevent future impacts. Since the airport sponsor adopted the Federal guidelines designating 65 DNL as the level at which aircraft noise is non-compatible with residential land uses, FAA's Part 150 approval is limited to potential non-compatible uses within the 65 DNL. Outside the 65 DNL, FAA as a matter of policy encourages local effort to prevent new non-compatible development immediately abutting the 65 DNL and to provide a buffer for possible growth in noise contours beyond the forecast period. Table 9-4 indicates there are no people located within the existing 65-70 DNL contour.

1. **Ensure future development approvals are consistent with the City of Jacksonville's revision to Part 10 of the Land Development Code to the extent which they exceed FAA guidelines.**

Supports local community efforts to institute and implement land use controls that consider areas beyond Federal guidelines. (NCP, pages 12-3, 12-4; and Table 13-1)

FAA Action: Approved. The Federal government has no authority to control local land use; the local government has the authority to implement this measure. Approval of this measure does not commit the FAA to future Federal funding assistance.

2. **If during a future NEM update it is determined that residential units fall within the 65 or greater DNL contour, it is recommended that the NCP be updated to include an acquisition/sound insulation program.**

Raises community awareness that future updates may result in the eligibility of certain properties for voluntary sound insulation or property acquisition. (NCP, page 12-4)

FAA Action: Approved. If made necessary by NEM changes, an update to the NCP would address requirements of 150.23(e)(9). Section 150.21(d), as amended, states that the NEM should be updated if there is either a substantial new noncompatible use within the DNL 65 dB contour, or if there is a significant reduction in noise over existing noncompatible land uses [69 FR 57622, dated 9/24/04].

3. **Publish noise overlay zone brochures.**

Raises awareness of community regarding potential for noise associated activities at Craig. (NCP, page 12-4; and Table 13-1)

FAA Action: Approved. Elements recommending publication of the noise contours, and distributing and explaining the meaning of the noise contours to the public, are

approved. The DNL 65 dB noise contour falls primarily on airport property. Outside the DNL 65 dB contour, FAA as a matter of policy encourages local efforts to prevent new noncompatible development immediately abutting the DNL 65 dB contour and to provide a buffer for possible growth in noise contours beyond the forecast period. The federal government has no authority to control land use. The local governments have the authority to implement this measure.

4. Publish noise contours twice annually in local newspaper.

Raises community awareness regarding potential for noise associated activities at Craig. (NCP, page 12-4; and Table 13-1)

FAA Action: Approved.

FEDERAL AVIATION ADMINISTRATION

RECORD OF APPROVAL
FAR PART 150
NOISE COMPATIBILITY PROGRAM

Craig Municipal Airport
Jacksonville, Florida

Regional Counsel, ASO-7

X
CONCUR NONCONCUR

5/14/07
Date

Robert B. Chapman

Airports Division Manager
Southern Region

X
APPROVED DISAPPROVED

5/14/07
Date

JAA Jacksonville Aviation Authority
14201 Pecan Park Road
Jacksonville, Florida 32218

MEMORANDUM

TO: Statement to File

FROM: Rusty Chandler – Chief; Industrial Airports and General Aviation

SUBJECT: Jacksonville Executive at Craig Part 150 Noise Compatibility Study

DATE: March 15, 2019

Background

In February of 2019, the Jacksonville Aviation Authority began an internal review of the FAR Part 150 Noise Compatibility Plan (NCP) for Jacksonville Executive at Craig Airport. The original NCP was created in December 2006 and evaluated the airport's noise conditions at that time and created a strategy for the JAA to implement noise abatement procedures and land use controls. After the recent JAA staff review of the NCP, the recommendation was to not undergo an entire update of the plan however, the focus will be placed on revising current operational items within the plan to the current airport environment.

Recommendations

Following the review of the 2006 NCP, the following operational recommendations were made by the Jacksonville Aviation Authority.

1. VFR noise abatement arrival and departure procedures will remain voluntary and published to the Jacksonville Executive at Craig website at www.flyjaxex.com. Additionally, instructions for submitting noise complaints and questions can be completed under the "reporting procedures" tab of the website.

2. The task of airport noise compliance including monitoring the noise hotline, and responding to noise complaints will be completed by the GA Specialist.

3. JAA staff will continue to remind tenants on noise abatement procedures identified on JaxEx's website at the quarterly airport tenant meeting and will share recent noise complaints.

4. JAA staff will continue to update the public on current airport operations during annual Greater Arlington/Beaches CPAC meetings.

5. CRG Air Traffic Controllers do not utilize a "preferred runway," rather controllers operate air traffic on the runway suitable with the prevailing wind. Typically, this is runway 32 due to the instrument approach procedures to that runway.

6. Night Time Engine Run-ups are managed by the air traffic control tower and do not require airport management approval.

7. The pilot pledge will be removed from JaxEx's website. The pilot pledge is a personal commitment by each pilot and not one to be filed and evaluated by the Jacksonville Aviation Authority.

Final Summary

Moving forward, the Jacksonville Aviation Authority will continue to operate under the 2006 NCP without a formal modification. Within the 2006 NCP constrained traffic numbers were forecast to be 209,566 total aircraft operations. As of the end of year 2018, total air traffic operations were 153,092 at JaxEx. Even with increased flight training and transient general aviation traffic, aircraft operations have not yet met the forecasted numbers. The JAA continues to monitor flight tracks via Harris tracking software, to determine impacts within the defined noise contours of the NCP. This document will be added to the 2006 NCP and published to the JaxEx website.

NCP Review Committee Members

Rusty Chandler – Chief; Industrial Airports and General Aviation
Tony Cugno – Chief Operating Officer
Rolf Riechmann – Director; General Aviation
Bob Molle – Director; Planning and Engineering
Michael Stewart – Director; External Affairs
Brad Martin – Operations and Facilities Manager
Kimberly Howard – Senior Manager Planning
Ashley Shorter – Planning and Grants Administrator
Justin Fletcher – General Aviation Development and Marketing
Greg Poole – Manager; CRG Air Traffic (Interviewed for operational procedures)

Rusty Chandler
Chief; Industrial Airports and General Aviation