Naples Municipal Airport
2010 and 2015 Noise Exposure Maps
August 2010

Prepared for:
City of Naples Airport Authority

Prepared by:
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in association with:
ICF / SH&E, Inc.
Montgomery Consulting Group, Inc.
Naples Municipal Airport
Part 150 Update

2010 and 2015 NOISE EXPOSURE MAPS

HMMH Report No. 302720.001
August 2010

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CERTIFICATION

This is to certify the following:

(1) The revised Noise Exposure Maps, and associated documentation for Naples Municipal Airport submitted in this volume to the Federal Aviation Administration under Federal Aviation Regulations Part 150, Subpart B, Section 150.21, are true and complete.

(2) Pursuant to Part 150, Subpart B, Section 150.21(b), all interested parties have been afforded adequate opportunity to submit their views, data, and comments concerning the correctness and adequacy of the draft noise exposure map, and of the descriptions of forecast aircraft operations.

(3) The “2010 Existing Condition Noise Exposure Map” (Figure 43 on page 91) accurately represents conditions for calendar year 2010.

(4) The “2015 Five-Year Forecast Condition Noise Exposure Map” (Figure 44 on page 93) accurately represents forecast conditions for calendar year 2015.

By:  

Title:  

Date:  

Airport Name:  Naples Municipal Airport  

Airport Owner/Operator:  Naples Airport Authority  

Address:  160 Aviation Drive North, Naples, FL  34104-3568
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1 INTRODUCTION

Part 150\(^1\) of the Federal Aviation Regulations (FAR) “Airport Noise Compatibility Planning”\(^2\) sets standards for airport operators to use in documenting noise exposure in the airport environs and establishing programs to minimize noise-related land use incompatibilities. A formal submission to the Federal Aviation Administration (FAA) under Part 150 includes documentation for two principal elements: (1) the Noise Exposure Map (NEM) and (2) the Noise Compatibility Program (NCP).

The Naples Airport Authority (NAA) has conducted four previous Part 150 study efforts for Naples Municipal Airport (APF):

- 1987 Noise Exposure Map and Noise Compatibility Program submission\(^3\)
- 1997 Noise Exposure Map and Noise Compatibility Program submission\(^4\)
- 1998 Noise Exposure Map and Noise Compatibility Program submission\(^5\)
- 2000 Noise Exposure Map submission\(^6\)

The 1997 submission presented a complete update to the original Noise Compatibility Program submission. The 1998 submission added a single new program measure – a 24-hour ban on operations in older, noisier “Stage 1” jet aircraft.\(^7\) Appendix A and Appendix B present copies of the FAA Records of Approval for the 1997 and 1998 Noise Compatibility Programs, respectively.

In addition to these Part 150 study processes, in 2000, the Authority completed a related noise compatibility effort under FAR Part 161, “Notice and Approval of Airport Noise and Access Restrictions,” which ultimately led the Authority to adopt and implement a 24-hour ban on Part 36 Stage 2 jet aircraft.\(^8\)

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\(^1\) All abbreviations and acronyms used in this document are listed in the “Table of Acronyms” on page xii.
\(^2\) Codified as Title 14 Code of Federal Regulations (CFR) Part 150.
\(^5\) Harris Miller Miller & Hanson, Inc., “Amendment of Noise Exposure Maps and Noise Compatibility Program to Extend Nighttime Stage 1 Use Restriction to 24 Hours,” February 1998.
\(^7\) The FAA has established aircraft noise criteria in 14 CFR Part 36, “Noise Standards: Aircraft Type and Airworthiness Certification.” For transport category “large” aircraft (with maximum takeoff weights of 12,500 pounds or more) and all turbojet-powered aircraft, Part 36 identifies four aircraft noisiness “stages.” Stage 1 aircraft have never been shown to meet any noise standards, either because they have never been tested or because they have been tested and failed; Stage 2 aircraft meet original noise limits, set in 1969; Stage 3 aircraft meet more stringent limits, established in 1977; and Stage 4 aircraft meet the most stringent limits, established in 2005. Appendix C of this document provides additional information on stage classification.
These prior efforts reflect the Authority’s commitment to continuous monitoring, evaluation, and refinement of its noise-related efforts, to ensure they appropriately reflect and address current and anticipated conditions and needs. Consistent with this commitment, in 2008, the Authority retained Harris Miller Miller & Hanson Inc. (HMMH), in association with the Montgomery Consulting Group, Inc. (MCG) and Simat, Helliesen & Eichner, Inc. (SH&E), to prepare an update to the Part 150 Study.

This document presents the updated Noise Exposure Map submission, with noise contours and related documentation for 2010 existing conditions, and 2015 and 2020 forecast conditions. Consistent with Part 150 requirements to include a single “official” forecast map, the 2015 map represents the official forecast case Noise Exposure Map. The 2020 map, which meets all Part 150 technical, documentation, and consultation requirements, is presented for informational purposes only. The Authority will submit the updated Noise Compatibility Program in a separate volume. To the extent that proposed revisions to the Noise Compatibility Program might affect existing or future Noise Exposure Map elements, the Noise Compatibility Program volume will include updated Noise Exposure Map documentation, consistent with Part 150 requirements.

The NAA is paying for all costs associated with this Part 150 update with its own funds; it is not receiving any state or federal grant support.

1.1 FAR Part 150 Overview

Part 150 sets forth a process for airport proprietors to follow in developing and obtaining FAA approval of programs to reduce or eliminate incompatibilities between aircraft noise and surrounding land uses. Part 150 prescribes specific standards and systems for:

- Measuring noise
- Estimating cumulative noise exposure
- Describing noise exposure (including instantaneous, single event and cumulative levels)
- Coordinating Noise Compatibility Program development with local land use officials and other interested parties
- Documenting the analytical process and development of the compatibility program
- Submitting documentation to the FAA
- FAA and public review processes
- FAA approval or disapproval of the submission

1.1.1 Noise Exposure Maps

The Noise Exposure Map documentation describes the airport layout and operation, aircraft-related noise exposure, land uses in the airport environs and the resulting noise/land use compatibility situation. The Noise Exposure Map documentation must address two time frames: (1) data representing the year of submission (the “existing conditions”) and (2) a forecast year that is at least five years following the year of submission (the “forecast conditions”). Part 150 requires more than simple “maps” to provide all the necessary information in a Noise Exposure Map. In addition to the graphics, requirements include extensive tabulated information and text discussion. At most airports, even the necessary graphic information is too extensive to present in a single figure. Therefore, the Noise Exposure Map documentation includes graphic depiction of existing and future noise exposure...
resulting from aircraft operations and of land uses in the airport environs. The Noise Exposure Map documentation must describe the data collection and analysis undertaken in its development.

The anticipated year of submission for this update is 2010, with an existing conditions “map” for that year, and a five-year forecast case map for 2015. Chapter 5 presents the updated existing and forecast case Noise Exposure Maps, with the existing Noise Compatibility Program.

While the graphics and documentation for 2015 represent the official forecast conditions Noise Exposure Map, the Authority also has opted to include operational, noise, and land use documentation and graphics for three additional time periods, for informational purposes only:

- 2020 ten-year forecast conditions, to provide a longer-term compatible land use planning perspective
- March 2010 forecast conditions, to provide a basis for considering noise exposure and land use compatibility during the “peak” annual activity period
- August 2010 forecast conditions, to provide a basis for considering noise exposure and land use compatibility during the “off-peak” annual activity period

1.1.2 Noise Compatibility Program

The Noise Compatibility Program is essentially a list of the actions the airport proprietor proposes to undertake to minimize existing and future noise/land use incompatibilities. The Noise Compatibility Program documentation must recount the development of the program, including a description of all measures considered, the reasons that individual measures were accepted or rejected, how measures will be implemented and funded, and the predicted effectiveness of individual measures and the overall program.

Official FAA acceptance of the Part 150 submission and approval of the Noise Compatibility Program does not eliminate requirements for formal environmental assessment of any proposed actions pursuant to requirements of the National Environmental Policy Act (NEPA). However, acceptance of the submission is a prerequisite to application for funding of implementation actions.

1.2 Project Roles and Responsibilities

Several groups were involved in the Part 150 update; primary groups included the Authority, the APF Noise Compatibility Committee (NCC), the Part 150 Study Technical Advisory Committee (TAC), the FAA, and the consulting team.

1.2.1 Naples Airport Authority (NAA)

As the airport operator, the Authority has overall responsibility for all Part 150 related actions at APF, including ultimate responsibility for determining what elements will be included in the revised Noise Compatibility Program when it is submitted to the FAA for review. The Authority is responsible for pursuing implementation of adopted measures.

The Authority retained a team of consultants to conduct the technical work required to fulfill Part 150 analysis and documentation requirements, and to assist in public outreach and consultation.

The Authority established a Part 150 Study Technical Advisory Committee (TAC) to ensure that the appropriate outside entities and groups are given official representation in the study process. The
committee is the key element of a comprehensive public involvement program that the Authority conducted over the course of the update, as described in Section 1.2.3.

1.2.2 **Noise Compatibility Committee (NCC)**

In 1997, the Authority established an airport Noise Compatibility Committee (NCC). All NCC members are local residents and volunteers who donate their time and expertise to help maintain a high quality of life in Naples. The committee bylaws define the committee’s purpose as follows:

*The purpose of this Committee is to make recommendations to the Board of Commissioners (“Board”) of the City of Naples Airport Authority (“Authority”) for noise compatibility procedures and to assist in monitoring and implementing the approved recommendations of the Naples Municipal Airport’s Federal Aviation Regulation (F.A.R.) Part 150 Noise Compatibility Study.*

The Part 150 Technical Advisory Committee discussed in the following subsection reported to the NCC.

1.2.3 **Part 150 Study Technical Advisory Committee (TAC)**

The Technical Advisory Committee included representatives from a broad spectrum of entities with interest in the Part 150 update process and its products, including government agencies with aviation and land use responsibilities, private sector interests, particularly in the aviation industry, and representatives of the affected communities in the airport’s environs. TAC membership was open to all persons who responded to an Authority request for expressions of interest in participating.

The Technical Advisory Committee members were responsible for representing their constituents throughout the study process, including commenting on the adequacy and accuracy of collected data, simplifying assumptions, and technical analyses. The Technical Advisory Committee also served as a forum for the varied interest groups to discuss complex issues and share their differing perspectives on aircraft noise issues.

The Technical Advisory Committee reported to the Noise Compatibility Committee, which forwarded recommendations to the Authority’s Board of Airport Commissioners.

Chapter 6 presents documentation on the Technical Advisory Committee and other public participation actions that the Authority and consulting team pursued in the preparation of the updated Noise Exposure Map.

Appendix D presents the Technical Advisory Committee membership.

1.2.4 **Federal Aviation Administration**

The FAA has ultimate review authority over the Noise Compatibility Program submitted under Part 150. Their review encompasses the details of technical documentation as well as broader issues of safety and constitutionality of recommended noise abatement alternatives.

FAA involvement includes participation by staff from several agency offices.

The airport’s **Air Traffic Control Tower (ATCT or Tower)** provides significant input in several areas, including: operational data from their files, judgment regarding safety and capacity effects of noise abatement measures, and input on implementation requirements. The Naples Tower also may
solicit input from other FAA air traffic control entities with which it coordinates regularly, such as the facilities at Southwest Florida International Airport and Miami International Airport.

On a regional level, either the FAA’s Orlando Airports District Office or Atlanta Regional Office, depending on the extent of delegation by the Regional Office to the District Office, will review Noise Exposure Map and Noise Compatibility Program submissions for compliance with Part 150, notify the Authority of their determinations, evaluate Noise Compatibility Program proposals, prepare a formal Record of Approval for the Noise Compatibility Program, publish related notices in the Federal Register, and provide opportunity for public comment.

The Regional Office may solicit review and input on more complex technical, regulatory, legal, or other matters from FAA’s Washington headquarters.

1.2.5 Consulting Team

The consulting firm of Harris Miller Miller & Hanson Inc. (HMMH) was the prime contractor for the Part 150 update and had overall project management, technical, and public consultation responsibility. Two subcontractors assisted HMMH: Montgomery Consulting Group (MCG) provided airport-planning, land-use inventory, other data-collection, and public-outreach assistance, and Simat, Helliesen & Eichner (SH&E) conducted forecasts and economic-impact analyses.

1.3 FAA Noise Exposure Map Checklist

The FAA provides advice to airports and other interested parties to consider in preparing a Part 150 study, in Advisory Circular (AC) 150/5020, “Airport Noise and Land Use Compatibility Planning.” The Advisory Circular includes checklists for FAA’s internal use in reviewing Noise Exposure Map and Noise Compatibility Program submissions. The FAA prefers that Part 150 documentation include completed copies of the checklists. Table 1 presents a copy of the Noise Exposure Map checklist. The Noise Compatibility Program update documentation volume will include the comparable Noise Compatibility Program checklist.
Table 1  Part 150 Noise Exposure Map Checklist

<table>
<thead>
<tr>
<th>FAR PART 150 NOISE EXPOSURE MAP CHECKLIST-PART I</th>
<th>Airport Name: Naples Municipal Airport</th>
<th>Reviewer:</th>
<th>Page/Other Reference</th>
<th>Notes/Comments</th>
</tr>
</thead>
</table>

**I. IDENTIFICATION AND SUBMISSION OF MAP DOCUMENT**

A. Is this submittal appropriately identified as one of the following, submitted under Part 150:
   1. a Noise Exposure Map only
      Yes Section 1 As discussed, this document updates 2000 and 2005 maps submitted in 2000.
   2. a Noise Exposure Map and Noise Compatibility Program
      No
   3. a revision to Noise Exposure Maps that have previously been determined by FAA to be in compliance with Part 150?
      Yes

B. Is the airport name and the qualified airport operator identified?
   Yes Certification, page iii

C. Is there a dated cover letter from the airport operator which indicates the documents are submitted under Part 150 for appropriate FAA determinations?
   Yes Cover letter

**II. CONSULTATION: [150.21(B), A150.105(A)]**

A. Is there a narrative description of the consultation accomplished, including opportunities for public review and comment during map development?
   Yes Section 6

B. Identification:
   1. Are the consulted parties identified?
      Yes Section 6, Appendix I, Appendix J, Appendix K, and Appendix L
   2. Do they include all those required by 150.21(b) and 150.105(a)?
      Yes Section 6

C. Does the documentation include the airport operator’s certification, and evidence to support it, that interested persons have been afforded adequate opportunity to submit their views data, and comments during map development and in accordance with 150.21(b)?
   Yes Section 6 and Certification, page iii

D. Does the document indicate whether written comments were received during consultation and, if there were comments, that they are on file with the FAA region?
   Yes Section 6 Copies of comments are presented in Appendix L

**III. GENERAL REQUIREMENTS: (150.21)**

A. Are there two maps, each clearly labeled on the face with year (existing condition year and 5-year)?
   Yes Figure 43 and Figure 44

B. Map currency:
   1. Does the existing condition map year match the year on the airport operator’s submittal letter?
      Yes Figure 43 2010
   2. Is the 5-year map based on reasonable forecasts and other planning assumptions and is it for the fifth calendar year after the year of submission?
      Yes Figure 44 2015
   3. If the answer to 1 and 2 above is no, has the airport operator verified in writing that data in the documentation are representative of existing conditions and 5-year forecast conditions as of the date of submission?
      NA NA

C. If the Noise Exposure Map and Noise Compatibility Program are submitted together:
   NA NA
### FAR PART 150
**NOISE EXPOSURE MAP CHECKLIST-PART I**

<table>
<thead>
<tr>
<th>Airport Name: Naples Municipal Airport</th>
<th>Reviewer: Yes/No/NA</th>
<th>Page/Other Reference</th>
<th>Notes/Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Has the airport operator indicated whether the 5-year map is based on 5-year contours without the program vs. contours if the program is implemented?</td>
<td>NA</td>
<td>NA</td>
<td>Maps reflect implementation of the previously approved program, as discussed in Section 4.</td>
</tr>
<tr>
<td>2. If the five year map is based on program implementation:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. are the specific program measures which are reflected on the map identified?</td>
<td>NA</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>b. does the documentation specifically describe how these measures affect land use compatibilities depicted on the map?</td>
<td>NA</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>3. If the 5-year Noise Exposure Map does not incorporate program implementation, has the airport operator included an additional Noise Exposure Map for FAA determination after the program is approved which shows program implementation conditions and which is intended to replace the 5-year Noise Exposure Map as the new official 5-year map?</td>
<td>NA</td>
<td>NA</td>
<td></td>
</tr>
</tbody>
</table>

#### IV. MAP SCALE, GRAPHICS, AND DATA REQUIREMENTS: [A150.101, A150.103, A150.105, 150.21(A)]

<p>| A. Are the maps of sufficient scale to be clear and readable (they must not be less than 1&quot; to 2,000'), and is the scale indicated on the maps? | Yes | 1&quot; to 1,500' | Exceeds minimum scale by 78% on an area basis |
| B. Is the quality of the graphics such that required information is clear and readable? | Yes | All official graphics. | |
| C. Depiction of the airport and its environs. | | | |
| 1. Is the following graphically depicted to scale on both the existing condition and 5-year maps: | Yes | All official graphics. | |
| a. airport boundaries | Yes | All official graphics. | |
| b. runway configurations with runway and numbers | Yes | All official graphics. | |
| 2. Does the depiction of the off-airport data include: | | | |
| a. a land use base map depicting streets and other identifiable geographic features | Yes | All official graphics. | |
| b. area within 65 DNL (or beyond, at local discretion.) | Yes | All official graphics. | 60 DNL |
| c. clear delineation of geographic boundaries and the names of all jurisdictions with planning and land use control authority within the 65 DNL (or beyond, at local discretion). | Yes | All official graphics. | |
| D. 1. Continuous contours for at least DNL 65, 70, and 75? | Yes | All official graphics. | And 60 DNL |
| 2. Based on current airport and operational data for the existing condition year Noise Exposure Map, and forecast data for the 5-year Noise Exposure Map? | Yes | 2010 - Figure 43, 2015 - Figure 44 | |
| E. Flight tracks for the existing condition and 5-year forecast time frames (these may be on supplemental graphics which must use the same land use base map as the existing condition and 5-year Noise Exposure Map), which are numbered to correspond to accompanying narrative? | Yes | Figure 50 through Figure 55 | A large scale graphic will be provided with the final submission to FAA. |
| F. Locations of any noise monitoring sites (these may be on supplemental graphics which must use the same land use base map as the official Noise Exposure Maps) | Yes | Figure 11 | Not used in contour development. |</p>
<table>
<thead>
<tr>
<th>G. Noncompatible land use identification:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Are noncompatible land uses within at least the 65 DNL depicted on the maps?</td>
</tr>
<tr>
<td>Yes 2010 - Figure 43, 2015 - Figure 44 60 DNL</td>
</tr>
<tr>
<td>2. Are noise sensitive public buildings identified?</td>
</tr>
<tr>
<td>3. Are the noncompatible uses and noise sensitive public buildings readily identifiable and explained on the map legend?</td>
</tr>
<tr>
<td>Yes Section 2.4 Local jurisdictions have adopted 60 DNL</td>
</tr>
<tr>
<td>4. Are compatible land uses, which would normally be considered noncompatible, explained in the accompanying narrative?</td>
</tr>
<tr>
<td>V. NARRATIVE SUPPORT OF MAP DATA: [150.21(A), A150.1, A150.101, A150.103]</td>
</tr>
<tr>
<td>A. Are the technical data, including data sources, on which the Noise Exposure Maps are based, adequately described in the narrative?</td>
</tr>
<tr>
<td>Yes Section 5.6</td>
</tr>
<tr>
<td>2. Are the underlying technical data and planning assumptions reasonable?</td>
</tr>
<tr>
<td>Yes Section 5.6</td>
</tr>
<tr>
<td>B. Calculation of Noise Contours:</td>
</tr>
<tr>
<td>1. Is the methodology indicated?</td>
</tr>
<tr>
<td>a. is it FAA approved?</td>
</tr>
<tr>
<td>Yes Section 5.6</td>
</tr>
<tr>
<td>b. was the same model used for both maps?</td>
</tr>
<tr>
<td>Yes Section 5.6</td>
</tr>
<tr>
<td>c. has AEE approval been obtained for use of a model other than those with previous blanket FAA approval?</td>
</tr>
<tr>
<td>NA NA</td>
</tr>
<tr>
<td>2. Correct use of noise models:</td>
</tr>
<tr>
<td>a. does the documentation indicate the airport operator has adjusted or calibrated FAA-approved noise models or substituted one aircraft type for another?</td>
</tr>
<tr>
<td>Yes No calibration. Substitutions and one user-defined aircraft approved as discussed in Section 5.6.2 and further documented in Appendix N and Appendix O.</td>
</tr>
<tr>
<td>b. if so, does this have written approval from AEE?</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>3. If noise monitoring was used, does the narrative indicate that Part 150 guidelines were followed?</td>
</tr>
<tr>
<td>NA Measurements were for informational purposes only. FAA guidelines were followed, as discussed in Section 3.1.2.</td>
</tr>
<tr>
<td>4. For noise contours below 65 DNL, does the supporting documentation include explanation of local reasons? (Narrative explanation is desirable but not required.)</td>
</tr>
<tr>
<td>Yes Section 2.4 Local jurisdictions have adopted 60 DNL</td>
</tr>
<tr>
<td>C. Noncompatible Land Use Information:</td>
</tr>
<tr>
<td>1. Does the narrative give estimates of the number of people residing in each of the contours (DNL 65, 70 and 75, at a minimum) for both the existing condition and 5-year maps?</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>2. Does the documentation indicate whether Table 1 of Part 150 was used by the airport operator?</td>
</tr>
<tr>
<td>a. If a local variation to Table 1 was used:</td>
</tr>
<tr>
<td>(1) does the narrative clearly indicated which adjustments were made and the local reasons for doing so?</td>
</tr>
<tr>
<td>Yes Section 2.4 Local jurisdictions have adopted 60 DNL</td>
</tr>
<tr>
<td>(2) does the narrative include the airport operator's complete substitution for Table 1?</td>
</tr>
<tr>
<td>Yes Table 2 Local jurisdictions have adopted 60 DNL</td>
</tr>
<tr>
<td>FAR PART 150 NOISE EXPOSURE MAP CHECKLIST-PART I</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Airport Name: Naples Municipal Airport</td>
</tr>
<tr>
<td>Reviewer:</td>
</tr>
<tr>
<td>Yes/No/NA</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>3. Does the narrative include information on self-generated or ambient noise where compatible/noncompatible land use identifications consider non-airport/aircraft sources?</td>
</tr>
<tr>
<td>4. Where normally noncompatible land uses are not depicted as such on the Noise Exposure Maps, does the narrative satisfactorily explain why, with reference to the specific geographic areas?</td>
</tr>
<tr>
<td>5. Does the narrative describe how forecasts will affect land use compatibility?</td>
</tr>
<tr>
<td>VI. MAP CERTIFICATIONS: [150.21(B), 150.21(E)]</td>
</tr>
<tr>
<td>A. Has the operator certified in writing that interested persons have been afforded adequate opportunity to submit views, data, and comments concerning the correctness and adequacy of the draft maps and forecasts?</td>
</tr>
<tr>
<td>B. Has the operator certified in writing that each map and description of consultation and opportunity for public comment are true and complete?</td>
</tr>
</tbody>
</table>
2 INTRODUCTION TO NOISE EVALUATION

Noise is a very complex physical quantity. The properties, measurement, and presentation of noise involve specialized terminology that is often difficult to understand. Throughout the Part 150 update, we will use graphics and everyday comparisons to communicate information on noise measurements, calculations of existing and forecast noise levels based on noise models, the effects of noise, and benefits of noise abatement measures.

To provide a basic reference on these technical issues, this chapter introduces fundamentals of acoustics and noise terminology (Section 2.1), the effects of noise on human activity (2.2), community annoyance (2.3), and currently accepted noise-land use compatibility guidelines (2.4).

2.1 Introduction to Acoustics and Noise Terminology

Part 150 relies largely on a measure of cumulative noise exposure over an entire calendar year, in terms of a metric called the day-night average sound level (DNL). However, DNL does not provide an adequate description of noise for many purposes. A variety of other measures are available to address essentially any issue of concern.

This chapter introduces the following acoustic metrics, which are all related to DNL, but provide bases for evaluating a broad range of noise situations.

- decibel, dB
- A-weighted decibel, dBA
- sound exposure level, SEL
- equivalent sound level, $L_{eq}$
- day-night average sound level, DNL, or $L_{dn}$

In addition, at the request of a TAC member, Section 2.1.7 discusses two sound propagation issues.

2.1.1 The Decibel, dB

All sounds come from a sound source – a musical instrument, a voice speaking, or an airplane that passes overhead. It takes energy to produce sound. The sound energy produced by any sound source is transmitted through the air in sound waves – tiny, quick oscillations of pressure just above and just below atmospheric pressure. These oscillations, or sound pressures, impinge on the ear, creating the sound we hear.

Our ears are sensitive to a wide range of sound pressures. The loudest sounds that we hear without pain have about one million times more energy than the quietest sounds we hear. But our ears are incapable of detecting small differences in these pressures. Thus, to better match how we hear this sound energy, we compress the total range of sound pressures to a more meaningful range by introducing the concept of sound pressure level (SPL). Sound pressure level is a measure of the sound pressure of a given noise source relative to a standard reference value (typically the quietest sound that a young person with good hearing can detect). Sound pressure levels are measured in decibels (abbreviated dB). Decibels are logarithmic quantities – logarithms of the squared ratio of two pressures, the numerator being the pressure of the sound source of interest, and the denominator being the reference pressure (the quietest sound we can hear).
The logarithmic conversion of sound pressure to sound pressure level means that the quietest sound we can hear (the reference pressure) has a sound pressure level of about zero decibels, while the loudest sounds we hear without pain have sound pressure levels of about 120 dB. Most sounds in our day-to-day environment have sound pressure levels from 30 to 100 dB.

Because decibels are logarithmic quantities, they do not behave like regular numbers with which we are more familiar. For example, if two sound sources each produce 100 dB and they are operated together, they produce only 103 dB – not 200 dB as we might expect. Four equal sources operating simultaneously result in a total sound pressure level of 106 dB. In fact, for every doubling of the number of equal sources, the sound pressure level goes up another three decibels. A tenfold increase in the number of sources makes the sound pressure level go up 10 dB. A hundredfold increase makes the level go up 20 dB, and it takes a thousand equal sources to increase the level 30 dB!

If one source is much louder than another, the two sources together will produce the same sound pressure level (and sound to our ears) as if the louder source were operating alone. For example, a 100 dB source plus an 80 dB source produce 100 dB when operating together. The louder source "masks" the quieter one, but if the quieter source gets louder, it will have an increasing effect on the total sound pressure level. When the two sources are equal, as described above, they produce a level three decibels above the sound of either one by itself.

From these basic concepts, note that one hundred 80 dB sources will produce a combined level of 100 dB; if a single 100 dB source is added, the group will produce a total sound pressure level of 103 dB. Clearly, the loudest source has the greatest effect on the total.

2.1.2 A-Weighted Decibel, dBA

Another important characteristic of sound is its frequency, or "pitch". This is the rate of repetition of the sound pressure oscillations as they reach our ear. Formerly expressed in cycles per second, frequency is now expressed in units known as Hertz (Hz).

Most people hear from about 20 Hz to about 10,000 to 15,000 Hz. People respond to sound most readily when the predominant frequency is in the range of normal conversation, around 1,000 to 2,000 Hz. Acousticians have developed "filters" to match our ears' sensitivity and help us to judge the relative loudness of sounds made up of different frequencies. The so-called "A" filter does the best job of matching the sensitivity of our ears to most environmental noises. Sound pressure levels measured through this filter are referred to as A-weighted levels (dBA). A-weighting significantly de-emphasizes noise at low and high frequencies (below about 500 Hz and above about 10,000 Hz) where we do not hear as well. Because this filter generally matches our ears' sensitivity, sounds having higher A-weighted sound levels are usually judged to be louder than those with lower A-weighted sound levels, a relationship which does not always hold true for unweighted levels. It is for these reasons that A-weighted sound levels are normally used to evaluate environmental noise.

Other weighting filters include the B, C, and D filters. They correspond to four different level ranges of the ear. The rarely used B-weighting attenuates low frequencies (those less than 500 Hz), but to a lesser degree than A-weighting. C weighting is nearly flat throughout the audible frequency range, hardly de-emphasizing low frequency noise. C-weighted levels can be preferable in evaluating sounds whose low-frequency components are responsible for secondary effects such as the shaking of a building, window rattle, or perceptible vibrations. Uses include the evaluation of blasting noise, artillery fire, and in some cases, aircraft noise inside buildings.

Figure 1 compares these various weighting filters.
Because of the correlation with our hearing, the A-weighted level has been adopted as the basic measure of environmental noise by the U.S. Environmental Protection Agency (EPA) and by nearly every other federal and state agency concerned with community noise. Part 150 requires airports to use A-weighted noise metrics.

Figure 2 presents typical A-weighted sound levels of several common environmental sources.
Figure 2  Common Environmental Sound Levels, in dBA
Source: HMMH (Aircraft noise levels from FAA Advisory Circular 36-3G and H)

<table>
<thead>
<tr>
<th>Outdoor</th>
<th>Typical Sound Levels</th>
<th>Indoor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concorde, Landing 1000 m. From Runway End [Note]</td>
<td>110</td>
<td>Rock Band</td>
</tr>
<tr>
<td>727-100 Takeoff 6500 m. From Start of Takeoff [Note]</td>
<td>100</td>
<td>Inside Subway Train (New York)</td>
</tr>
<tr>
<td>747-200 6500 m. From Start of Takeoff [Note]</td>
<td>90</td>
<td>Food Blender at 3 ft.</td>
</tr>
<tr>
<td>Diesel Truck at 50 ft.</td>
<td>80</td>
<td>Garbage Disposal at 3 ft.</td>
</tr>
<tr>
<td>Lear 35 Landing 1000 m. from End of Runway</td>
<td>70</td>
<td>Shouting at 3 ft.</td>
</tr>
<tr>
<td>737-300 Takeoff 6500 m. From Start-of-Takeoff [Note]</td>
<td>70</td>
<td>Vacuum Cleaner at 10 ft.</td>
</tr>
<tr>
<td>Light Twin Prop. Landing 1000 m. from Runway End or Takeoff 6500 m. from Start of Takeoff Roll</td>
<td>60</td>
<td>Normal Speech at 3 ft.</td>
</tr>
<tr>
<td>Lear 35 Takeoff 6500 m. from Start of Takeoff Roll</td>
<td>60</td>
<td>Large Business Office</td>
</tr>
<tr>
<td>Commercial Area Single Prop. Landing 1000 m. from Runway End or Takeoff 6500 m. from Start of Takeoff Roll</td>
<td>60</td>
<td>Dishwasher Next Room</td>
</tr>
<tr>
<td>Quiet Urban Daytime</td>
<td>50</td>
<td>Quiet Urban Daytime</td>
</tr>
<tr>
<td>Quiet Urban Nighttime</td>
<td>40</td>
<td>Quiet Urban Nighttime</td>
</tr>
<tr>
<td>Quiet Suburban Nighttime</td>
<td>30</td>
<td>Quiet Suburban Nighttime</td>
</tr>
<tr>
<td>Quiet Rural Nighttime</td>
<td>20</td>
<td>Quiet Rural Nighttime</td>
</tr>
<tr>
<td>Note: Concorde, Boeing 747, 737, and 727 are examples of airliner aircraft that cannot operate at Naples. They are included for comparative purposes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Broadcast &amp; Recording Studio</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>Threshold of Hearing</td>
</tr>
</tbody>
</table>

Note: Concorde, Boeing 747, 737, and 727 are examples of airliner aircraft that cannot operate at Naples. They are included for comparative purposes.
An additional dimension to environmental noise is that A-weighted levels vary with time. For example, the sound level increases as an aircraft approaches, then falls and blends into the background as the aircraft recedes into the distance (though even the background varies as birds chirp or the wind blows or a vehicle passes by). Figure 3 illustrates this concept.

![Figure 3 Variations in the A-Weighted Sound Level Over Time](image)

Source: HMMH

### 2.1.3 Maximum A-Weighted Sound Level, $L_{\text{max}}$

The variation in noise level over time often makes it convenient to describe a particular noise "event" by its maximum sound level, abbreviated as $L_{\text{max}}$. In the figure above, it is approximately 85 dBA.

The maximum level describes only one dimension of an event; it provides no information on the cumulative noise exposure. In fact, two events with identical maxima may produce very different total exposures. One may be of very short duration, while the other may continue for an extended period and be judged much more annoying. The next measure corrects for this deficiency.

### 2.1.4 Sound Exposure Level, SEL

The most frequently used measure of noise exposure for an individual aircraft noise event (and the measure that Part 150 specifies for this purpose) is the sound exposure level, or SEL. SEL is a measure of the total noise energy produced during an event, from the time when the A-weighted sound level first exceeds a threshold level (normally just above the background or ambient noise) to the time that the sound level drops back down below the threshold. To allow comparison of noise events with very different durations, SEL “normalizes” the duration in every case to one second; that is, it is expressed as the steady noise level with just a one-second duration that includes the same amount of noise energy as the actual longer duration, time-varying noise. In lay terms, SEL “squeezes” the entire noise event into one second.
Figure 4 depicts this transformation. The shaded area represents the energy included in an SEL measurement for the noise event, where the threshold is set to 60 dBA. The darkly shaded vertical bar, which is 90 dBA high and just one second long (wide), contains exactly the same sound energy as the full event.

![Figure 4 Sound Exposure Level](image.png)

Because the SEL is normalized to one second, it will always be larger than the $L_{\text{max}}$ for an event longer than one second. In this case, the SEL is 90 dB; the $L_{\text{max}}$ is approximately 85 dBA. For most aircraft overflights, the SEL is normally on the order of 7 to 12 dB higher than $L_{\text{max}}$. Because SEL takes duration into account, longer exposure to relatively slow, quiet aircraft, such as propeller models, can have the same or higher SEL than shorter exposure to faster, louder planes, such as corporate jets.

Aircraft noise models use SEL as the basis for computing exposure from multiple events. The original Part 150 study used SEL contours as a basis for analyzing the single event benefits of noise abatement measures. This study will also study SEL contours in this manner.

### 2.1.5 Equivalent Sound Level, $L_{\text{eq}}$

The $L_{\text{max}}$ and SEL quantify the noise associated with individual events. The remaining metrics in this section describe longer-term cumulative noise exposure that can include many events.

The equivalent sound level ($L_{\text{eq}}$), is a measure of exposure resulting from the accumulation of A-weighted sound levels over a particular period of interest; for example, an hour, an eight hour school day, nighttime, or a full 24-hour day. Because the length of the period can differ, the applicable period should always be identified or clearly understood when discussing the metric. Such durations are often identified through a subscript, for example $L_{\text{eq}(8)}$ or $L_{\text{eq}(24)}$.

$L_{\text{eq}}$ is equivalent to the constant sound level over the period of interest that contains as much sound energy as the actual time-varying level. This is illustrated in Figure 5. Both the solid and striped shaded areas have a one-minute $L_{\text{eq}}$ value of 76 dB. It is important to recognize, however, that the two signals (the constant one and the time-varying one) would sound very different in real life. Also, be aware that the “average” sound level suggested by $L_{\text{eq}}$ is not an arithmetic value, but a logarithmic, or “energy-averaged” sound level. Thus, loud events dominate $L_{\text{eq}}$ measurements.
In airport noise studies, $L_{eq}$ is often presented for consecutive one-hour periods to illustrate how the exposure rises and falls throughout a 24-hour period, and how individual hours are affected by unusual activity, such as rush hour traffic or a few loud aircraft.

### 2.1.6 Day-Night Average Sound Level, DNL

Part 150 requires that airports use a slightly more complicated measure of noise exposure to describe cumulative noise exposure during an average annual day: the day-night average sound level, DNL. The U.S. Environmental Protection Agency identified DNL as the most appropriate means of evaluating airport noise based on the following considerations (from "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety," U. S. EPA Report No. 550/9-74-004, March 1974):

1. The measure should be applicable to the evaluation of pervasive long-term noise in various defined areas and under various conditions over long periods of time.
2. The measure should correlate well with known effects of the noise environment and on individuals and the public.
3. The measure should be simple, practical, and accurate. In principal, it should be useful for planning as well as for enforcement or monitoring purposes.
4. The required measurement equipment, with standard characteristics, should be commercially available.
5. The measure should be closely related to existing methods currently in use.
6. The single measure of noise at a given location should be predictable, within an acceptable tolerance, from knowledge of the physical events producing the noise.
7. The measure should lend itself to small, simple monitors, which can be left unattended in public areas for long periods of time.

Most federal agencies dealing with noise have formally adopted DNL. The Federal Interagency Committee on Noise (FICON) reaffirmed the appropriateness of DNL in 1992. The FICON summary report stated; “There are no new descriptors or metrics of sufficient scientific standing to substitute for the present DNL cumulative noise exposure metric.”
In simple terms, DNL is the average noise level over a 24-hour period except that noises occurring at night (defined as 10:00 p.m. through 7:00 a.m.) are artificially increased by 10 dB. This weighting reflects the added intrusiveness of nighttime noise events attributable to the fact that community background noise levels decrease at night.

DNL can be measured or estimated. Measurements are practical only for obtaining DNL values for relatively limited numbers of points, and, in the absence of a permanently installed monitoring system, only for relatively short time periods. Most airport noise studies are based on computer-generated DNL estimates depicted in terms of equal-exposure noise contours (much as topographic maps have contours of equal elevation). Part 150 requires that the 65, 70, and 75 dB DNL contours be modeled and depicted. Figure 6 depicts typical DNL values for a variety of noise environments.

![Figure 6 Examples of Day-Night Average Sound Levels, DNL](image)


2.1.7 Note on Propagation Effects

A TAC member requested that this section of the document present a brief discussion of two effects: (1) propagation of sound over water and (2) the effects of increased aircraft altitude on sound levels.
Over-the-Water Propagation

Unless the INM user opts to enter terrain data and enable terrain-modeling capabilities, the model makes the very conservative assumption that an airport is surrounded by flat ground, with no natural or man-made physical barriers to the physical propagation of aircraft sound levels.

People often observe that sounds propagate particularly well when a listener is separated from a sound source by an open body of water. For example, across a lake it often seems the sound is louder than when heard across open dry ground. This observation is correct; it occurs when the water is cooler than the ambient air, which can result in a boundary layer immediately above the water that is cooler than the air above it. This boundary layer creates a “channel” that improves the propagation of sound. However, the effect only applies to noise sources on or close to the ground.

Studies at airports show that for aircraft within 100 feet of the ground, the SEL can increase by approximately six decibels for observers directly exposed across open water to aircraft ground roll. Wind or weather conditions can increase or decrease these effects. However, once the aircraft is above 100’ there is no evidence of any significant effect.

While there is open water separating the airport from communities to the southwest at Naples, the exposure is dominated by direct overflights of aircraft at least 100 feet above the ground. Therefore, over-the-water propagation would not have a significant effect on the noise contours.

Effect of Change in Aircraft Altitude

People often ask how increased or decreased distance from an aircraft to the listener – in particular, increased or decreased altitude – affect sound levels. The answer is a bit complex, because distance affects the propagation of sound in several ways.

The principal effect is the “spherical spreading of sound.” This effect is related to the fact that any emitted sound expands in a spherical fashion – like a balloon – as the distance from the source increases, resulting in the sound energy being spread out over a larger and larger volume. With each doubling of distance, spherical spreading reduces instantaneous or maximum level by approximately six decibels, and SEL by approximately three decibels.

“Atmospheric absorption” is a secondary effect, which can add one to three decibels of additional attenuation for 1,000’ to 3,000’ increases in distance under meteorological conditions that are typical at Naples. This absorption effect drops off relatively rapidly with distance.

As an overall example, increasing the aircraft-to-listener distance from 2,000’ to 3,000’ could produce reductions on the order of four to five decibels for instantaneous or maximum levels, and on the order of two to four decibels for SEL, under average annual weather conditions in Naples.

The INM takes these reductions into account.

2.2 The Effects of Aircraft Noise on People

To residents around airports, aircraft noise can be an annoyance and a nuisance. It can interfere with conversation and listening to television, it can disrupt classroom activities in schools, and it can disrupt sleep. Relating these effects to specific noise metrics helps in the understanding of how and why people react to their environment.
2.2.1 Speech Interference

A primary effect of aircraft noise is its tendency to drown out or "mask" speech, making it difficult to carry on a normal conversation. The sound level of speech decreases as the distance between a talker and listener increases. As the background sound level increases, it becomes harder to hear speech. Figure 1 presents typical distances between talker and listener for satisfactory outdoor conversations, in the presence of different steady A-weighted background noise levels for raised, normal, and relaxed voice effort. As the background level increases, the talker must raise his/her voice, or the individuals must get closer together to continue talking.

![Figure 7 Outdoor Speech Intelligibility](source: United States Environmental Protection Agency, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, March 1974, p. D-5.)

As indicated in the figure, "satisfactory conversation" does not always require hearing every word; 95% intelligibility is acceptable for many conversations. Listeners can infer a few unheard words when they occur in a familiar context. However, in relaxed conversation, we have higher expectations of hearing speech and require generally require closer to 100% intelligibility. Any combination of talker-listener distances and background noise that falls below the bottom line in Figure 1.7 (thus assuring 100% intelligibility) represents an ideal environment for outdoor speech communication and is considered necessary for acceptable indoor conversation as well.

One implication of the relationships in Figure 7 is that for typical communication distances of 3 or 4 feet (1 to 1.5 meters), acceptable outdoor conversations can be carried on in a normal voice as long as the background noise outdoors is less than about 65 dBA. If the noise exceeds this level, as might occur when an aircraft passes overhead, intelligibility would be lost unless vocal effort were increased or communication distance were decreased.
Indoors, typical distances, voice levels, and intelligibility expectations generally require a background level less than 45 dBA. With windows partly open, housing generally provides about 12 dBA of interior-to-exterior noise level reduction. Thus, if the outdoor sound level is 60 dBA or less, there a reasonable chance that the resulting indoor sound level will afford acceptable conversation inside. With windows closed, 24 dB of attenuation is typical.

### 2.2.2 Sleep Interference

Research on sleep disruption from noise has led to widely varying observations. In part, this is because (1) sleep can be disturbed without awakening, (2) the deeper the sleep the more noise it takes to cause arousal, (3) the tendency to awaken increases with age, and other factors.

Figure 8 shows a recent summary of findings on the topic.

![Figure 8 Sleep Interference](image)


Figure 8 uses indoor SEL as the measure of noise exposure; recent work supports the use of this metric in assessing sleep disruption. An indoor SEL of 80 dB results in a maximum of 10% awakening. Assuming the typical windows-open interior-to-exterior noise level reduction of approximately 12 dB and a typical L_{max} value for an aircraft flyover 12 dB lower than the SEL value, an interior SEL of 80 dB roughly translates into an exterior L_{max} of the same value.

### 2.3 Community Annoyance

Social survey data make it clear that individual reactions to noise vary widely for a given noise level. Nevertheless, as a group, people's aggregate response is predictable and relates well to measures of cumulative noise exposure such as DNL. Figure 9 shows the most widely recognized relationship between environmental noise and annoyance.
Based on data from 18 surveys conducted worldwide, the curve indicates that at levels as low as DNL 55, approximately five percent of the people will still be highly annoyed, with the percentage increasing more rapidly as exposure increases above DNL 65.

Separate work by the EPA has shown that overall community reaction to a noise environment is also dependent on DNL. This relationship is shown in Figure 10. Levels have been normalized to the same set of exposure conditions to permit valid comparisons between ambient noise environments. Data summarized in that figure suggest that little reaction would be expected for intrusive noise levels five decibels below the ambient, while widespread complaints can be expected as intruding noise exceeds background levels by about five decibels. Vigorous action is likely when the background is exceeded by 20 dB.
2.4 Noise / Land Use Compatibility Guidelines

DNL estimates have two principal uses in a Part 150 study:

1. Provide a basis for comparing existing noise conditions to the effects of noise abatement procedures and/or forecast changes in airport activity.
2. Provide a quantitative basis for identifying potential noise impacts.

Both of these functions require the application of objective criteria for evaluating noise impacts. Part 150 Appendix A, Table 1 presents land use compatibility guidelines as a function of DNL values. Those guidelines suggest that all land uses are compatible outside of 65 dB DNL. However, the table includes a footnote stating the following:

The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable or unacceptable under Federal, State, or local law. The responsibility for determining the acceptable and perishable land uses and the relationship between specific properties and specific noise contours rests with the local land use authorities. FAA determinations under Part 150 are not intended to substitute federally...
determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.9

The City of Naples and Collier County are the local entities that regulate land use in the environs of the airport. These two jurisdictions have formally adopted land use compatibility criteria that reflect locally determined needs and values. Both the City and County have formally modified their land use compatibility criteria to protect residential use within the 60 to 65 dB DNL contour interval, as discussed below.

2.4.1 City of Naples Land Use Compatibility Threshold

The City adopted 60 dB DNL as the threshold of land use compatibility by City Ordinance No. 98-8165 on January 21, 1998. Appendix E presents a copy of the Ordinance and related material. Although the City has not prohibited development within the 60 dB DNL contour, extraordinary City Council approval must be obtained for such projects. The City’s 1998 ordinance requires the City Council to grant General Development Site Plan (GDSP) approval for development of non-airport land uses within the 60 dB DNL contour. Section 86-202 of the City’s “Requirements for Site Plan Review” states that the GDSP review process is designed to make certain that the proposed development is compatible with its surrounding area and incorporates adequate buffers between the project and adjoining dissimilar uses. Although the Authority does not have independent control over non-airport use, the City’s Planning Advisory Board consults with the Authority during the GDSP review process before City Council hearings on proposed development. The City has not approved any residential development within the 60 dB DNL since the land use compatibility standards were changed in 1998.

The city ordinance will be reviewed in the Noise Compatibility Program phase of this Part 150 update study to determine areas where revisions to policy matters, such as compatibility criteria, might be appropriate, and areas where factual matters must be updated, such as noise contours and FAA-defined protections “zones,” “surfaces,” and “heights.”

2.4.2 Collier County Land Use Compatibility Threshold

Collier County designated the 60 dB DNL contour as the outer boundary of the airport noise zone, by County Ordinance No. 2000-43, on June 14, 2000. The Ordinance revised Section 2.2.23.4.2 of the County Land Development Code to add Airport Noise Zone D, which extends from the 65 dB DNL contour to the 60 dB DNL contour. Within Zone D, sound level reduction measures are required for residential structures and transient lodging (e.g., hotels or motels). Appendix F presents a copy of the ordinance.

The county ordinance and code will be reviewed in the Noise Compatibility Program phase of this Part 150 update study to determine areas where revisions to policy matters, such as compatibility criteria, might be appropriate, and areas where factual matters must be updated, such as noise contours and FAA-defined protections “zones,” “surfaces,” and “heights.”

2.4.3 Naples Municipal Airport Land Use Compatibility Criteria

In compliance with the FAA direction (in Part 150) that airport proprietors must defer to local authorities in determining land use compatibility, the Authority considers residential land within the

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9 Ibid., Appendix A, Table 1, “Land Use Compatibility Planning with Yearly Day-Night Average Sound Levels.”
60 dB DNL contour to be incompatible with airport noise. Consistent with Part 150 guidance, the Authority submitted, and the FAA accepted, a “substitute” land use compatibility table with the 2000 Noise Exposure Map update that reflect the local criteria that both the City of Naples and Collier County have formally adopted. Table 2 presents a revised version of the Part 150 guideline table, which reflects these revised land use compatibility criteria. This Noise Exposure Map update uses these criteria, as will the Noise Compatibility Program update that follows.
Table 2  Naples Municipal Airport Noise / Land Use Compatibility Guidelines

Source: Naples Airport Authority, City of Naples, and Collier County

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Yearly Day-Night Average Sound Level, DNL, in Decibels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;60</td>
</tr>
<tr>
<td>Residential Use</td>
<td></td>
</tr>
<tr>
<td>Residential other than mobile homes and transient lodgings</td>
<td>Y</td>
</tr>
<tr>
<td>Mobile home park</td>
<td>Y</td>
</tr>
<tr>
<td>Transient lodgings</td>
<td>Y</td>
</tr>
<tr>
<td>Public Use</td>
<td></td>
</tr>
<tr>
<td>Schools</td>
<td>Y</td>
</tr>
<tr>
<td>Hospitals and nursing homes</td>
<td>Y</td>
</tr>
<tr>
<td>Churches, auditoriums, and concert halls</td>
<td>Y</td>
</tr>
<tr>
<td>Governmental services</td>
<td>Y</td>
</tr>
<tr>
<td>Transportation</td>
<td>Y</td>
</tr>
<tr>
<td>Parking</td>
<td>Y</td>
</tr>
<tr>
<td>Commercial Use</td>
<td></td>
</tr>
<tr>
<td>Offices, business and professional</td>
<td>Y</td>
</tr>
<tr>
<td>Wholesale and retail—building materials, hardware and farm equipment</td>
<td>Y</td>
</tr>
<tr>
<td>Retail trade—general</td>
<td>Y</td>
</tr>
<tr>
<td>Utilities</td>
<td>Y</td>
</tr>
<tr>
<td>Communication</td>
<td>Y</td>
</tr>
<tr>
<td>Manufacturing and Production</td>
<td></td>
</tr>
<tr>
<td>Manufacturing general</td>
<td>Y</td>
</tr>
<tr>
<td>Photographic and optical</td>
<td>Y</td>
</tr>
<tr>
<td>Agriculture (except livestock) and forestry</td>
<td>Y</td>
</tr>
<tr>
<td>Livestock farming and breeding</td>
<td>Y</td>
</tr>
<tr>
<td>Mining and fishing, resource production and extraction</td>
<td>Y</td>
</tr>
<tr>
<td>Recreational</td>
<td></td>
</tr>
<tr>
<td>Outdoor sports arenas and spectator sports</td>
<td>Y</td>
</tr>
<tr>
<td>Outdoor music shells, amphitheaters</td>
<td>Y</td>
</tr>
<tr>
<td>Nature exhibits and zoos</td>
<td>Y</td>
</tr>
<tr>
<td>Amusements, parks, resorts and camps</td>
<td>Y</td>
</tr>
<tr>
<td>Golf courses, riding stables, and water recreation</td>
<td>Y</td>
</tr>
</tbody>
</table>

Key to Table 2 – Notes are presented on the following page.

Y (Yes): Land use and related structures compatible without restrictions.
N (No): Land use and related structures are not compatible and should be prohibited.
NLR: Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
25, 30, or 35: Land use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structure.
Notes for Table 2

The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable or unacceptable under Federal, State, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.

(1) Residential land use is generally noncompatible in the 60-65, 65-70, and 70-75 dB DNL contour intervals. However, the City of Naples or Collier County (as relevant) may provide development approval if measures to achieve the specified minimum noise level reduction of 25 or 30 dB are incorporated into the design and construction of structures used for residential purposes.

(2) Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

(3) Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

(4) Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

(5) Land use compatible provided special sound reinforcement systems are installed.

(6) Residential buildings require an NLR of 25.

(7) Residential buildings require an NLR of 30

(8) Residential buildings not permitted.
3 NOISE MEASUREMENTS

This chapter summarizes the portable noise measurement program conducted in the Noise Exposure Map phase of this Part 150 update study. Section 3.1 summarizes the measurement program design and execution. Section 3.2 presents a summary of the DNL measurements. Section 3.3 presents site-by-site single event and cumulative exposure results.

It should be noted that Part 150 does not require airport operators to measure noise levels. Moreover, the FAA does not permit airports to use noise measurements to “adjust” or calibrate” the noise modeling process.10

3.1 Measurement Program and Execution

The Noise Exposure Map phase of the Part 150 update study included measurements to provide a basis for assessing the reasonableness of modeled estimates, illustrating the effect of existing operations and potential alternatives, comparing aircraft and non-aircraft noise levels, and other issues of interest to the Authority and the Technical Advisory Committee related to the development of the Noise Exposure Map.11 To accomplish these objectives, HMMH and Authority staff conducted noise measurements on February 11 – 17, 2009 at the 11 locations shown on Figure 11.

3.1.1 Measurement Site Selection

Measurement locations were selected in consultation with the Technical Advisory Committee, through discussions at committee meetings prior to the measurements, and through input provided by committee members in follow-up emails and letters. Actual flight operations (“radar”) data were obtained for February 15 - 29, 2008, which includes Presidents’ Day weekend, typically the busiest weekend of the year, to provide factual input on actual flight path geometry for consideration in the site selection process.12 These flight operations data included information on aircraft tracks over the ground and aircraft altitudes. The data also included flight identification information (such as aircraft type, flight origin or destination, tail number, etc.) for aircraft operating under a flight plan filed with the FAA.

Major site-selection criteria included:

- Sites were selected in residential areas, to focus on the most sensitive land use.
- Sites were selected near major flight corridors, to maximize the number of operations monitored.
- Sites were selected under existing noise abatement flight tracks and under areas frequently overflown by “non-compliant” operations, to assess desirable and undesirable activity.

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11 A second round of noise measurements is scheduled to be conducted during the Noise Compatibility Program phase of the study, to focus on measuring the effectiveness of noise abatement alternatives.
12 The operations data were purchased from PASSUR Aerospace. See: http://www.passur.com/. These data also were used in development of flight track noise modeling inputs, as discussed in Section 0.
Sites were selected at a variety of distances from the airport, to assist in assessing variation associated with aircraft altitude.

Once a general measurement area was identified, specific sites were selected for pragmatic reasons, such as: (1) reasonable isolation from unusual non-aircraft levels, (2) equipment security, (3) access for measurement staff, and (4) line-of-sight views from the microphone to the most common overflight paths, to avoid acoustic shielding and to permit the measurement staff to observe and log the activity.

Overall, the group of sites was selected to provide representative data on the broadest range of aircraft operations and geographic areas surrounding the airport.

### 3.1.2 Measurement Procedures and Equipment

All measurements were conducted in accordance with requirements set forth in Part 150 Section A150.5 "Noise measurement procedures and equipment."

Measurements were conducted with HMMH-owned Larson-Davis Model 870 ("LD 870") and Authority-owned Larson-Davis Model 820 ("LD 820") monitors. These instruments are portable devices capable of long-term unattended operation, and meet American National Standards Institute (ANSI) S1.4-1983 standards for Type I “precision” sound level meters, that exceed Part 150 (Section A150.5) accuracy requirements. HMMH staff calibrated every monitor in the field before and after each of the measurements. These calibrations are traceable to the United States National Institute of Standards and Technology ("NIST", formerly the National Bureau of Standards).

The monitors were programmed to measure cumulative exposure levels, such as hourly equivalent sound level ($L_{eq}$) and the 24-hour day-night average sound level (DNL), and noise levels associated with individual aircraft events, including maximum sound level ($L_{max}$) and sound exposure level (SEL). Section 2.1 introduced these metrics. All measurements were A-weighted, as discussed in Section 2.1.2, and as required in Part 150 Section A150.5.

The units operated on a 24-hour basis during the six-day measurement session, with breaks for relocation, battery changes, calibrations, and other maintenance requirements. Two HMMH staff, assisted at times by airport staff, conducted the measurements. To the extent feasible during daylight hours, the staff spent time at the monitoring locations, on a rotating basis, to observe and log aircraft and non-aircraft noise-producing events, weather data, and other relevant information.

The clocks on each of the noise monitors were time-synchronized to facilitate the correlation of aircraft noise events measured at multiple sites and of aircraft noise events with flight events. To maximize the number of aircraft operations associated with measured noise levels, the primary basis for identifying aircraft-related noise events was aircraft operations data (flight tracks, altitudes, and identification) obtained from a flight operations data collection installation at Southwest Florida International Airport, in Fort Myers, Florida. As discussed in Section 0, these flight operations data addressed many Noise Exposure Map data requirements. They were valuable for noise monitoring purposes, because they provided a continuous source of operations data throughout the measurement session, so noise measurements from each monitor could be correlated with aircraft operations on a 24-hour a day basis.

Table 3 lists the measurement locations, the dates and times of measurements, the number of hours of monitoring, and the number of hours of observations. Over 530 hours of measurements and 64 hours of observations were conducted at the 11 locations.
Figure 11
Portable Noise Monitoring Sites
February 11-17, 2009

1. 222 Bay Point
2. Conservancy of Southwest Florida
3. 3709 Springwood Drive
4. Lot 61 - Rock Creek Trailer Park
5. 741 3rd Street South
6. 960 Aqua Circle
7. 25 2nd Avenue South
8. 199 Edgemere Way South
9. Wyndemere Country Club
10. 408 16th Avenue South
11. 400 Block, 10th Avenue South
### Table 3  Summary of Noise Measurement Site Visits, February 11 – 17, 2009

Source: HMMH, February 2009

<table>
<thead>
<tr>
<th>Site #</th>
<th>Address</th>
<th>Start Date/Time</th>
<th>End Date/Time</th>
<th>Approximate Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>222 Bay Point</td>
<td>02/11/09 3:19 PM</td>
<td>02/12/09 11:44 AM</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>Conservancy of Southwest Florida</td>
<td>02/11/09 5:00 PM</td>
<td>02/12/09 11:12 AM</td>
<td>18</td>
</tr>
<tr>
<td>3</td>
<td>3709 Springwood Drive</td>
<td>02/11/09 4:33 PM</td>
<td>02/12/09 12:40 PM</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>Lot 61 Rock Creek Trailer Park</td>
<td>02/11/09 5:40 PM</td>
<td>02/12/09 11:20 AM</td>
<td>7(^1)</td>
</tr>
<tr>
<td>5</td>
<td>741 3rd Street South</td>
<td>02/12/09 2:28 PM</td>
<td>02/16/09 2:17 PM</td>
<td>96</td>
</tr>
<tr>
<td>6</td>
<td>960 Aqua Circle</td>
<td>02/12/09 3:27 PM</td>
<td>02/13/09 3:28 PM</td>
<td>24</td>
</tr>
<tr>
<td>7</td>
<td>25 2nd Avenue South</td>
<td>02/12/09 4:14 PM</td>
<td>02/15/09 12:50 PM</td>
<td>69</td>
</tr>
<tr>
<td>8</td>
<td>199 Edgemere Way South</td>
<td>02/12/09 5:42 PM</td>
<td>02/16/09 1:00 PM</td>
<td>91</td>
</tr>
<tr>
<td>9</td>
<td>Wyndemere Country Club</td>
<td>02/13/09 10:39 AM</td>
<td>02/16/09 1:36 PM</td>
<td>75</td>
</tr>
<tr>
<td>10</td>
<td>408 16th Avenue South</td>
<td>02/13/09 5:24 PM</td>
<td>02/16/09 2:39 PM</td>
<td>69</td>
</tr>
<tr>
<td>11</td>
<td>400 block 10th Avenue South</td>
<td>02/15/09 1:58 PM</td>
<td>02/17/09 10:10 AM</td>
<td>44</td>
</tr>
</tbody>
</table>

\(^1\) Monitor powered down through the night due to battery malfunction

### 3.2  Day-Night Average Sound Level Results

Table 4 summarizes the DNL measurement results at the 10 measurement locations where sufficient data were obtained for an estimation of the daily DNL values.

#### Table 4  Summary of Day-Night Average Sound Level (DNL) Measurements

Source: HMMH, February 2009

<table>
<thead>
<tr>
<th>Site #</th>
<th>Daily DNL (dBA)</th>
<th>Avg. DNL (dBA)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wed. 2/11</td>
<td>Thu. 2/12</td>
</tr>
<tr>
<td>1</td>
<td>54(^1)</td>
<td>52(^2)</td>
</tr>
<tr>
<td>2</td>
<td>54(^1)</td>
<td>51(^1)</td>
</tr>
<tr>
<td>3</td>
<td>57(^1)</td>
<td>58(^1)</td>
</tr>
<tr>
<td>5</td>
<td>-</td>
<td>56(^1)</td>
</tr>
<tr>
<td>6</td>
<td>-</td>
<td>51(^1)</td>
</tr>
<tr>
<td>7</td>
<td>-</td>
<td>60(^1)</td>
</tr>
<tr>
<td>8</td>
<td>-</td>
<td>53(^1)</td>
</tr>
<tr>
<td>9</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>10</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

\(^1\) Estimated Partial DNL calculated using weighted average day and nighttime energies

Measurements at Site 4 covered only approximately seven daytime hours, so a proper estimation of the daily DNL was not feasible. As discussed in Section 3.3.6, the primary purpose of Site 4 was to measure single event levels.

Section 5.4 presents a comparison of modeled DNL for a peak month in 2010 to the short-term measurements.
3.3 Site-by-Site Results

This section provides site-by-site discussions of the measurement results. The summaries present the maximum A-weighted sound level, $L_{\text{max}}$, and hourly equivalent sound level, $L_{\text{eq}}$, results in graphical form, as described below.

### 3.3.1 Presentation of $L_{\text{max}}$ Measurements

$L_{\text{max}}$ measurements provide a basis for comparing noise produced by aircraft and non-aircraft sources at a site, and for comparing single event levels among sites. For each measurement location, there is a figure that presents $L_{\text{max}}$ data in a “thermometer” form. Representative sound levels from illustrative non-aircraft sources are on the left of the thermometer. The ranges of $L_{\text{max}}$ values for observed aircraft operations are on the right. These figures provide a visual basis for comparing levels caused by different aircraft types and different types of aircraft operations, and for comparing sound levels at different sites. The figures group the aircraft data by major aircraft type and operation categories.

The aircraft type categories include:

- “Corporate Jet” – Corporate jet aircraft
- “Twin Engine Turbo Prop” – Twin engine, turbine-powered, propeller-driven aircraft
- “Twin Engine Piston Prop” – Twin engine, piston-powered, propeller-driven aircraft
- “Twin Engine Prop” – Twin engine, propeller-driven aircraft (unknown powerplant)
- “Single Engine Turbo Prop” – Single engine, turbine-powered, propeller-driven aircraft
- “Single Engine Piston Prop” – Single engine, piston-powered, propeller-driven aircraft
- “Single Engine Prop” – Single engine, propeller-driven aircraft (unknown powerplant)
- “Unknown”

As discussed previously, aircraft operations were correlated with measured levels based on flight operations data from a data source that provided flight track information throughout the monitoring period. The data source also provided identification information for aircraft operating under an Instrument Flight Rules (IFR) “flight plan” filed with the FAA. That identification information generally included aircraft type, which was the primary basis for identification of the aircraft type category. Many light single and twin-engine propeller aircraft operate without a flight plan, under “Visual Flight Rules” (VFR). The flight operations system identifies these aircraft using a single, common code (“1200”), resulting in the need for an “unknown” aircraft type category.

Operations type categories included arrival, departure, and unknown. “Unknown” operations were those for which the flight operations data were not complete enough to definitively identify the flight as an arrival or departure.

The monitors were set to automatically identify a “noise event” – regardless of source – when the measured level exceeded a preset decibel threshold for at least five seconds. The decibel threshold was set at 60 dBA at Sites 1, 2, 5, 7, 8, 9, and 11, and at 65 dBA at Sites 3, 4, 6, and 10. These thresholds were selected on a site-specific basis to capture as many noise events as feasible; i.e., as low as possible without being so low that background noise would cause events to merge together.

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13 “Reverse Thrust” – The noise from reverse thrust of arriving corporate jets was included as a subset of this aircraft type.
14 At the request of the Technical Advisory Committee, noise levels associated with Piaggio P180 “Avanti” twin-engine turboprop operations are specifically called out in the text discussions.
During periods when an observer was logging events at a site, the maximum level was read directly from the monitor display regardless of duration; i.e., for events which never exceeded 60 or 65 dBA. In some cases, the observers could not identify the type of powerplant (i.e., piston or turbine), resulting in the two “unknown powerplant” categories.

3.3.2 Presentation of Hourly $L_{eq}$ Results

Each site discussion also includes figures that graphically present hourly equivalent sound level ($L_{eq}$) results in two formats: (1) for the full period of measurement and (2) for each calendar day. The calendar day figures identify the DNL value. For any days with less than 24 hours of data, the DNL was calculated based on the properly weighted average of the available day and night hours. The hours indicated on the figures represent the starting time of the measurement interval; e.g., hour 10 is the hour starting at 10 a.m. The figures use a 24-hour clock (“military time”), where the hour starting at 1 p.m. is hour 13; 2 p.m. is hour 14, through the hour starting at 11 p.m., which is hour 23.

3.3.3 Site 1: 222 Bay Point

Site 1 is located approximately 400 feet southwest of the extended centerline of Runway 14/32, approximately 2.6 miles out from the approach end of Runway 14. The monitor was situated in the pool area in the rear yard of a single family dwelling unit, open to a waterway on the other side. It was largely shielded from local street traffic. Boat traffic could affect the site. However, no unusual boat activity was noted.

Runway 14 was the primary runway in use during the measurements at this site. The principal aircraft operations affecting the site during the measurements were approaches to Runway 14. During the measurement period, arrivals of corporate jets were most common, constituting approximately half of the operations of known aircraft types that correlated with automatically identified aircraft noise events; i.e., those that exceeded 60 dBA for at least five seconds. As shown in Figure 12, the arrival of a twin-engine turboprop aircraft, specifically a Piaggio P180 “Avanti,” was the loudest identified aircraft event, with a maximum level of 82.3 dBA. A second Piaggio arrival measured at the site had a nearly identical maximum level of 82.2 dBA, and was the second loudest measured event overall.

Approximately twenty hours of measurements were conducted at Site 1; 19 of these were full hours. As shown in Figure 13, the hourly $L_{eq}$ ranged from 41 to 59 dBA. The levels followed a typical daily pattern, with the lowest levels during the late night hours, with levels increasing in the morning, during the hour starting at 7 a.m., and remaining high until the early evening, through the hour starting at 7 p.m. (1900). This type of pattern is very common at locations affected by human activity – whether related to aircraft operations, surface traffic, or other community sources. The highest hourly $L_{eq}$ was for the hour starting at 6 p.m. (1800) on the night of February 11th. The relatively high levels for that hour are likely due to aircraft noise since over half of the correlated noise events were either corporate jet or turboprop arrivals. These operations were also captured by the monitor located at Site 2, which was also in the flight path of Runway 14 arrivals.

The overall measured DNL for Site 1 was 53 dBA, equal to the level measured at Sites 2 and 9, only one decibel higher than the DNL measured at Sites 6 and 8 (the two sites with the lowest overall DNL), and only one decibel lower than the DNL measured at Sites 10 and 11.
Figure 12  Site 1 Maximum A-Weighted Levels
Source: HMMH February 2009
Figure 13  Site 1 Measured Hourly Noise Levels ($L_{eq}$), Full Duration
Source: HMMH February 2009
Figure 14  Site 1 Measured Hourly Noise Levels (L_{eq}), Calendar Days
Source: HMMH February 2009

Site 1 Measured Hourly Equivalent Noise Levels (L_{eq})
February 11, 2009

Hourly L_{eq} (dBA)

Hour Beginning
DNL = 54 dBA

Site 1 Measured Hourly Equivalent Noise Levels (L_{eq})
February 12, 2009

Hourly L_{eq} (dBA)

Hour Beginning
DNL = 52 dBA
3.3.4 **Site 2: Conservancy of Southwest Florida**

Site 2 is located approximately 700 feet northeast of the extended centerline of Runway 14/32, approximately three-quarters of a mile out from the approach end of Runway 14. The monitor was situated in a sheltered area of this nature center, a significant distance from any local street traffic and largely shielded from high human activity levels in the Conservancy.

The primary runway in use during the measurements at this site was Runway 14. The only identified aircraft operations affecting the site during the measurements were approaches to Runway 14. During the measurement period, arrivals of corporate jets were most common, constituting approximately half of the operations of known aircraft types that correlated with automatically identified aircraft noise events; i.e., those that exceeded 60 dBA for at least five seconds.

As shown in Figure 15, a corporate jet arrival produced the loudest event, with an \( L_{\text{max}} \) of 84.6 dBA. However, arrivals of twin engine turboprop aircraft had the loudest median level. The two highest turboprop maximum levels at Site 2 were produced by the same two Piaggio P180 Avanti operations that produced the highest turboprop (and overall) arrival levels at Site 1. At Site 2, the two arrivals had maximum levels of 78.2 and 76.5 dBA, compared to 82.3 and 82.2 dBA at Site 1. The lower levels at Site 2 might reflect the fact that the site is very close to the runway end, so that pilots have reduced thrust compared to Site 1. It also may relate to the fact that the site is further from the extended runway centerline.

Eighteen full hours of monitoring were conducted at Site 2. As shown in Figure 16, the hourly \( L_{\text{eq}} \) ranged from 37 to 60 dBA. Once again, the hourly levels followed a typical daily pattern, with the lowest levels during the late night and early morning hours. The highest hourly \( L_{\text{eq}} \) was for the hour starting at 5 p.m. (1700) on the evening of February 11th. The relatively high levels for that hour are likely due to sources other than aircraft noise since some noise events did not correlate with operations data. During the second loudest hour, starting at 6 p.m. (1800) on the 11th, with a measured \( L_{\text{eq}} \) of approximately 55 dBA, over half the correlated noise events were either corporate jet or turboprop arrivals. As discussed previously, that was the hour with the highest \( L_{\text{eq}} \) at Site 1, which many aircraft arrivals fly over on their way in to Site 2.

The overall measured DNL for Site 2 was 53 dBA, equal to the level measured at Sites 1 and 9, only one decibel higher than the DNL measured at Sites 6 and 8 (the two sites with the lowest overall DNL), and only one decibel lower than the DNL measured at Sites 10 and 11.
Figure 15   Site 2 Maximum A-Weighted Levels
Source: HMMH February 2009

Some Common Levels

Sound Level dBA

Rock Band 110
Gas Lawnmower at 3 ft 100
Diesel Truck at 50 ft 90
Shouting at 3 ft 80
Auto at 50 ft, 55 mph 70
Normal Speech at 3 ft 60

Key:
- Maximum
- Median
- Minimum
- # Number of Events

Ray 14 Arr
Unknown Type of Operation

Corporate Jet
Twin Engine Turbo Prop
Twin Engine Piston Prop
Single Engine Prop
Single Engine Piston Prop
Unknown Aircraft Type
Figure 16  Site 2 Measured Hourly Noise Levels ($L_{eq}$), Full Duration

Source: HMMH February 2009

![Graph showing hourly noise levels from February 11 to 12, 2009, with a legend indicating L eq values from 20 to 70 dBA.](image)
Figure 17  Site 2 Measured Hourly Noise Levels ($L_{eq}$), Calendar Days
Source: HMMH February 2009

Site 2 Measured Hourly Equivalent Noise Levels ($L_{eq}$)
February 11, 2009

Site 2 Measured Hourly Equivalent Noise Levels ($L_{eq}$)
February 12, 2009

Hourly $L_{eq}$ (dBA)

Hour Beginning
DNL = 54 dBA

Hour Beginning
DNL = 51 dBA
3.3.5 **Site 3: 3709 Springwood Drive**

Site 3 is located approximately 400 feet southwest of the extended centerline of Runway 14/32, approximately three-quarters of a mile from the departure end of Runway 14. The monitor was situated in an open space area adjacent to a cul-de-sac in this condominium development, shielded from local street traffic, except the loudest vehicle passbys on neighboring roads.

The primary runway in use during the measurements at this site was Runway 14 and the principal aircraft operations affecting the site were Runway 14 departures. During the measurement period, departures of corporate jets and twin-engine piston-propeller aircraft were most common; constituting approximately two-thirds of the operations of known aircraft types that correlated with automatically identified aircraft noise events; i.e., those that exceeded 65 dBA for at least five seconds. An individual twin-engine piston-propeller departure caused the loudest event, with an $L_{\text{max}}$ of 88.8 dBA. However, as shown in Figure 18, corporate jets departures had the highest with median $L_{\text{max}}$ of 79.7 dBA. The sole twin-engine turboprop departure correlated with a noise event was a Piaggio P180 Avanti, with a measured maximum level of 80.7 dBA. This same operation produced a maximum level of 86.1 dBA at Site 4, which is very close to the runway end and that Runway 14 departures fly past – at lower altitudes – prior to reaching Site 3.

Several single-engine piston-propeller arrivals on Runway 32 were measured. With a median $L_{\text{max}}$ value of 76.1 dBA, these events were slightly louder on average than departures of similar aircraft on Runway 14, with a median $L_{\text{max}}$ of 74.8 dBA.

Approximately 20 hours of monitoring were conducted at Site 3; 19 of these were full hours. As shown in Figure 19, the hourly $L_{\text{eq}}$ ranged from approximately 40 to 63 dBA. The levels followed a normal daily pattern, with the lowest levels during the late night and early morning hours. The hours starting at 5 p.m. (1700) on the evening of February 11th and 9 a.m. on the morning of February 12th had the highest hourly $L_{\text{eq}}$ values, of approximately 61 and 63 dBA respectively. The relatively high levels for those hours appear to be due to non-aircraft sources, since most noise events during those hours did not correlate with aircraft operations. One noise event in each of these hours was nearly 60 seconds in duration, which is substantially longer than typical aircraft noise event durations. During the third loudest hour, starting at 10 a.m. on February 12th, with a measured $L_{\text{eq}}$ of 60 dBA, half of the correlated noise events were either corporate jet or single engine turboprop departures. For that hour, the $L_{\text{eq}}$ at Site 4 was slightly higher at 63 dBA, which is consistent with a site closer to the departure runway end.

A Piaggio P180 Avanti departure on Runway 14 produced an $L_{\text{max}}$ of 80.7 dBA at this site during the hour starting at 7 p.m. (1900) on the evening of February 11th, the fourth loudest hour during the measurement period. Comparatively, the same operation produced an $L_{\text{max}}$ of 86.1 at Site 4.

The overall measured DNL for Site 3 was 57 dBA; the highest overall of all the measurement sites at which DNL was measured.
Figure 18  Site 3 Maximum A-Weighted Sound Levels
Source: HMMH February 2009

- Some Common Levels
  - Rock Band: 110 dBa
  - Gas Lawnmower at 3 ft: 100 dBa
  - Diesel Truck at 50 ft: 90 dBa
  - Shouting at 3 ft: 80 dBa
  - Auto at 50 ft, 55 mph: 70 dBa
  - Normal Speech at 3 ft: 50 dBa

Key:
- Maximum
- Median
- Minimum
- # Number of Events

Rwy 14 Dep
Rwy 32 Arr
Unknown Type of Operation

Unknown Aircraft Type
Single Engine Piston Prop
Single Engine Piston Prop
Twin Engine Piston Prop
Twin Engine Turbo Prop
Corporate Jet

HARRIS MILLER MILLER & HANSON INC.
G:\PROJECTS\302720_APF_P150_Update\Task_7_Documentation\NEM\final_nem_update.doc
Figure 19  Site 3 Measured Hourly Noise Levels ($L_{eq}$), Full Duration
Source: HMMH February 2009
Figure 20  Site 3 Measured Hourly Noise Levels (Leq), Calendar Days
Source: HMMH February 2009

Site 3 Measured Hourly Equivalent Noise Levels (L_{eq})
February 11, 2009

Site 3 Measured Hourly Equivalent Noise Levels (L_{eq})
February 12, 2009
3.3.6 Site 4: Lot 61, Rock Creek Trailer Park

Site 4 is located approximately 600 feet southwest of the extended centerline of Runway 14/32, approximately 900 feet from the departure end of Runway 14. The monitor was situated in a central area of this densely developed mobile home and trailer park, and was directly exposed to normal residential activity. However, the site was shielded from any major street traffic and its proximity to the airport resulted in sufficiently loud aircraft events to permit reasonable correlation with measurements.

The primary runway in use during the measurements at this site was Runway 14 and the principal aircraft operations affecting the site during the measurements were Runway 14 departures. Departures of twin-engine piston-propeller aircraft caused approximately one-third of the noise events (i.e., those that exceeded 65 dBA for at least five seconds) that correlated with known aircraft types. As shown in Figure 21, departures of corporate jets and twin-engine piston-propeller aircraft, with median maximum levels of 78.6 and 78.0 dBA respectively, yielded comparable levels and produced the loudest events. The only twin-engine turboprop aircraft event, correlated with a Piaggio P180 Avanti turboprop departure on Runway 14, produced the highest maximum level of 86.1 dBA. Comparatively, the same operation produced a maximum level of 80.7 when it passed by the more distant Site 3.

Because of a battery failure when the monitor was unattended, hourly data were available for only five full hours, broken into one four-hour session and one single hour, with partial hours before and after; too few to plot in a meaningful manner. The values were as follow:

- February 11, 2009, 5:40 - 6 p.m.: 61.3 dBA
- February 11, 2009, 6 - 7 p.m.: 59.7 dBA
- February 11, 2009, 7 - 8 p.m.: 62.9 dBA
- February 11, 2009, 8 - 9 p.m.: 62.7 dBA
- February 11, 2009, 9 - 10 p.m.: 47.6 dBA
- February 11, 2009, 10 - 10:42 p.m.: 46.5 dBA
- February 12, 2009, 9:53 - 10 a.m.: 70.0 dBA
- February 12, 2009, 10 - 11 a.m.: 62.6 dBA
- February 12, 2009, 11 - 11:21 a.m.: 56.4 dBA

There were not enough hours of measurements to calculate a DNL value.
Figure 21  Site 4 Maximum A-Weighted Levels
Source: HMMH, February 2009
3.3.7 Site 5: 741 3rd Street South

Site 5 is located approximately one-half mile northwest of the extended centerline of Runway 5/23, approximately 1.3 miles out from the departure end of Runway 23. The monitor was situated in an open pool area behind a five-unit condominium structure, largely shielded from local street traffic.

As shown in Figure 22, Runway 23 departures were the principal operations affecting the site during the measurements. A substantial number of Runway 5 arrivals were monitored as well. Corporate jets were responsible for nearly 60% of the automatically identified noise events (i.e., that exceeded 60 dBA for at least five seconds and that correlated with known aircraft types), and produced the highest median $L_{max}$ values for both arrivals and departures.

Because of the lower levels produced by arrivals and the site’s distance from the most common straight-in approach course, many audible arrivals did not trigger automatic noise events. During the time that an observer was stationed at this site, maximum levels were read directly from the monitor display for these events, and reported separately on Figure 22, by aircraft type, and noted with asterisks. As would be expected, the median values for events measured in this manner were lower than for the corresponding operations that were loud enough to trigger automatic noise events.

During the periods of observations, two thrust reversals from jet aircraft arriving on Runway 23 (i.e., from the northeast) produced noise events with a median $L_{max}$ value of 65.9 dBA.

Six Piaggio P180 Avanti twin turboprop operations were correlated with noise events. Of those six events, two were arrivals, with $L_{max}$ values of 65.3 and 66.7 dBA. The four departure $L_{max}$ values ranged from 63.9 to 68.7 dBA. The distance from Site 5 to the extended runway centerline is the likely reason the Piaggio $L_{max}$ values are less than those for sites 1 through 4.

Approximately 96 hours of monitoring were conducted at Site 5, including 95 full hours. As shown in Figure 23, the hourly $L_{eq}$ values ranged from 46 to 62 dBA. The general trend for a 24-hour cycle at the site during the measurement survey included hourly $L_{eq}$ values that started to rise at approximately 5 a.m., peaking around noon, and then declining until approximately 10 p.m. (2200). The variation in hourly $L_{eq}$ is consistent with activity at the airport and normal patterns of non-aircraft activities in a residential setting. On some days, noise levels increased over several hours in the afternoon and evening; these increases were likely due to sources such as residential activity, insect noise, or pool equipment, in addition to aircraft activity.

Site 5 $L_{eq}$ plots show several peaks. On February 12th, the $L_{eq}$ for the hour starting at 6 p.m. (1800), with a value of 56.6 dBA, is likely attributable to aircraft with a westward heading because an increase in hourly $L_{eq}$ at Site 7 to the north is also shown (see Figure 29). During the hours starting at 1 p.m. through 7 p.m. (1300 – 1900) on February 13th, Site 5 experienced relatively high hourly $L_{eq}$ levels, including the maximum for the measurement period (the hour starting at 1 p.m. (1300), with an $L_{eq}$ of 61.7 dBA. Observations during these hours, as well as relatively high levels at Sites 6 and 7 for the same time period (displayed in Figure 26 and Figure 29 respectively), are evidence that the major contributor to the noise environment was Runway 23 departure operations. Similar site-to-site correlations were found during the daytime hours of February 14th and 15th between sites 5, 7 and 10, and on February 16th between sites 5, 10, and 11. (Figure 38 and Figure 41 display the hourly $L_{eq}$ values for the full measurement period for sites 10 and 11, respectively.)

The overall measured DNL for Site 5 was 56 dBA. The daily DNL values for this site were very consistent, and only varied by approximately one decibel.
Figure 22  Site 5 Maximum A-Weighted Levels
Source: HMMH, February 2009

Note: *, **, and *** denote plots of maximum levels for the aircraft operations identified above that did not trigger a noise event; i.e., for which the noise level did not exceed 60 dBA for at least 5 seconds. Observers read the maximum levels for these events directly from the noise monitor display.
Figure 23  Site 5 Measured Hourly Noise Levels ($L_{eq}$), Full Duration
Source: HMMH, February 2009
Figure 24  Site 5 Measured Hourly Noise Levels ($L_{eq}$), Calendar Days

Source:  HMMH, February 2009

Site 5 Measured Hourly Equivalent Noise Levels ($L_{eq}$)
February 12, 2009

Site 5 Measured Hourly Equivalent Noise Levels ($L_{eq}$)
February 13, 2009
Site 5 Measured Hourly Equivalent Noise Levels ($L_{eq}$)
February 14, 2009

Hourly $L_{eq}$ (dBA)
Hour Beginning
DNL = 56 dBA

Site 5 Measured Hourly Equivalent Noise Levels ($L_{eq}$)
February 15, 2009

Hourly $L_{eq}$ (dBA)
Hour Beginning
DNL = 55 dBA
Site 5 Measured Hourly Equivalent Noise Levels ($L_{eq}$)
February 16, 2009

Hourly $L_{eq}$ (dBA)

DNL = 55 dBA
3.3.8 Site 6: 960 Aqua Circle

Site 6 is located approximately one half-mile southeast of the extended centerline of Runway 5/23, approximately 1.4 miles out from the departure end of Runway 23. The site was on a large open lot at the end of a cul-de-sac, facing Naples Bay. The runway use during the measurements at this site was split between Runway 5 and 23, with each flow occurring approximately fifty percent of the time. Many boat operations caused automatically triggered noise events or were logged by the observer.

Many audible arrivals did not trigger noise events the monitor could automatically distinguish, based on the 65 dBA threshold and five-second minimum duration. However, during the time that an observer was stationed at this site, maximum levels were read directly from the monitor display for these events, and reported separately on Figure 25 by aircraft type, and noted with asterisks. As would be expected, the median values for the events measured in this manner were lower than those for the corresponding aircraft operations that triggered automatic noise events.

Departures on Runway 23 were the principal aircraft operations affecting the site during the measurements. Corporate jet operations were associated with over sixty percent of the noise events correlated with known aircraft types. As shown in Figure 25, corporate jet departures had the highest median $L_{max}$ of 69.5 dBA, though the median departure $L_{max}$ values in the other aircraft categories were comparable.

Relatively few arrivals triggered noise events on the monitor, because of the somewhat lower noise levels produced by arrivals, and the site’s distance from the airport and to the side of the centerline approach track. However, over the course of the sessions of observation at this site, twenty corporate jet arrivals with a median $L_{max}$ of approximately 57 dBA were logged by the observer. Two thrust reverser applications by arriving jet aircraft, one arriving from the southwest on Runway 5 and the other from the northeast on Runway 23, were logged with $L_{max}$ values of 56 and 61 dBA respectively.

Noise from watercraft on the bay produced the highest $L_{max}$ values. An individual boat pass-by was nearly four decibels louder than the loudest corporate jet departure.

Twenty-four hours of monitoring were conducted at Site 6.\textsuperscript{15} As shown in Figure 26, the hourly $L_{eq}$ ranged from 30 to 57 dBA. The lowest levels were recorded during the late night and early morning hours. The highest hourly $L_{eq}$ was for the hour starting at 1 p.m. (1300) on the afternoon of February 13th. The relatively high levels for that hour are likely due to aircraft noise since the operations were observed to reach their peak during this period. These high levels were generally matched by the monitors operating at sites 5 and 7 which also are near to the flight path of Runway 5 arrivals and, more significantly, Runway 23 departures.

The overall DNL of approximately 52 dBA was equal to the overall measured level at Site 8. These two sites had the lowest measured overall DNL of the 10 sites at which DNL measurements were obtained. However, it should be noted that the measured DNL levels were only one-decibel higher at Sites 1, 2, and 9, and only two-decibels higher at Sites 10 and 11.

\textsuperscript{15} As shown in Figure 26, this 24-hour duration is made up of 23 full hours and two partial hours, shaded gray on the figure. These partial hours were included in this site’s description because with their inclusion, an exact DNL for a full 24-hour period is available.
Figure 25  Site 6 Maximum A-Weighted Levels
Source: HMMH, February 2009

Note: *, **, and *** denote plots of maximum levels for the aircraft operations identified above that did not trigger a noise event; i.e., for which the noise level did not exceed 65 dBA for at least 5 seconds. Observers read the maximum levels for these events directly from the noise monitor display.
Figure 26  Site 6 Measured Hourly Noise Levels ($L_{eq}$), Full Duration

Source: HMMH, February 2009

Note: Columns shaded in gray represent partial levels for a portion of an hour.
Figure 27  Site 6 Measured Hourly Noise Levels (L_{eq}), Calendar Days
Source: HMMH, February 2009

Note: Columns shaded in gray represent partial levels for a portion of an hour.
3.3.9 Site 7: 25 2nd Avenue South

Site 7 is located approximately one mile northwest of the extended centerline of Runway 5/23, approximately 1.3 miles out from the departure end of Runway 23. The monitor was installed in the rear yard of a residence located on the beach, well shielded from any local automobile traffic noise, but exposed at times to relatively high background noise associated with the surf.

Runway 23 was the primary runway in use during the measurements at this site. The principal aircraft operations affecting the site during the measurements were departures on Runway 23. As shown on Figure 28, corporate jets were responsible for over 80% of the automatically identified noise events (i.e., that exceeded 60 dBA for at least five seconds) that correlated with known aircraft types. An individual twin engine turboprop departure produced an $L_{\text{max}}$ of 74.5 dBA. However, the median $L_{\text{max}}$ of the corporate jets, at 67.6 dBA, was the highest value for any of the aircraft types. Many of the minimum, median, and maximum $L_{\text{max}}$ values are comparable between aircraft groups.

Many audible arrivals did not trigger noise events the monitor could automatically distinguish. However, during the time that an observer was stationed at this site, maximum levels were read directly from the monitor display for these events, and reported separately on Figure 28 by aircraft type, and noted with asterisks. As would be expected, the median values for the events measured in this manner were lower than those for the corresponding aircraft operations that triggered automatic noise events.

No Piaggio P180 Avanti operations were observed or correlated with noise events.

Approximately 69 hours of monitoring were conducted at the site; 67 of these were full hours. As shown in Figure 29, the hourly $L_{\text{eq}}$ ranged from approximately 40 to 60 dBA, and generally displayed less variation over the day than other sites. The general trend for a 24-hour cycle included a five to ten decibel increase in levels during the morning, midday, and late afternoon hours. This variation corresponded well with general trends in aircraft activity. The lowest levels occurred during the early morning hours when it appeared the surf was dominating the noise environment.

The measurements at Site 7 resulted in several peaks in hourly $L_{\text{eq}}$ levels. On February 12th, the $L_{\text{eq}}$ for the hour starting at 6 p.m. (1800), with a value of 52.1 dBA, is likely attributable to aircraft with a westward heading because a similar increase was observed at Site 5 to the south (see Figure 23). From 1 to 4 p.m. (hours starting at 1300 to 1500) on February 13th, the hourly levels were relatively high, including the maximum of the entire measurement period, 60.0 dBA, during the hour starting at 3 p.m. (1500). The observations during these hours, as well as relatively high levels at Sites 5 and 6 (displayed in Figure 23 and Figure 26, respectively) are evidence that Runway 23 departures were a major contributor to the noise environment. Similar site-to-site correlations were found during the daytime hours of February 14th among sites 5, 7, and 10. (Figure 38 displays the hourly $L_{\text{eq}}$s for the full measurement period for Site 10.)

The overall measured DNL for Site 7 was approximately 57 dBA, which matched Site 3, and represented the highest overall of the measurement sites. However, unlike Site 3, a substantial component of the cumulative noise exposure for this site is not aircraft operations but noise from the surf dominating the background. The DNL levels at Site 7 ranged from 52 to 60 dBA over four calendar days from February 12th through February 15th. Aircraft operations were relatively high on the 12th, and peaked on the 13th, as reflected by the DNL value of 59 dBA on that day. The DNL of 55 dBA reflects lessened activity at the airport on February 14th.
Figure 28  Site 7 Maximum A-Weighted Levels

Source: HMMH, February 2009

<table>
<thead>
<tr>
<th>Some Common Levels</th>
<th>Sound Level dBA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rock Band</td>
<td>110</td>
</tr>
<tr>
<td>Gas Lawnmower at 3 ft</td>
<td>90</td>
</tr>
<tr>
<td>Diesel Truck at 50 ft</td>
<td>70</td>
</tr>
<tr>
<td>Shouting at 3 ft</td>
<td>55</td>
</tr>
<tr>
<td>Auto at 50 ft, 55 mph</td>
<td>40</td>
</tr>
<tr>
<td>Normal Speech at 3 ft</td>
<td>25</td>
</tr>
</tbody>
</table>

Note: *, **, and *** denote plots of maximum levels for the aircraft operations identified above that did not trigger a noise event; i.e., for which the noise level did not exceed 60 dBA for at least 5 seconds. Observers read the maximum levels for these events directly from the noise monitor display.
Figure 29  Site 7 Measured Hourly Noise Levels ($L_{eq}$), Full Duration
Source: HMMH, February 2009
Figure 30  Site 7 Measured Hourly Noise Levels ($L_{eq}$), Calendar Days  
Source: HMMH, February 2009

Site 7 Measured Hourly Equivalent Noise Levels ($L_{eq}$)  
February 12, 2009

Site 7 Measured Hourly Equivalent Noise Levels ($L_{eq}$)  
February 13, 2009
3.3.10  Site 8: 199 Edgemere Way South

Site 8 was approximately 500 feet southeast of the extended Runway 5/23 centerline, approximately 2.5 miles from the departure end of Runway 5. The site was in the rear of an open lot in a large condominium complex, well away from significant local traffic or unusual community noise sources.

Runway use during the measurements was split between Runways 5 and 23, with each flow occurring approximately fifty percent of the time. Runway 23 arrivals were the principal aircraft operations affecting the site during the measurements, because most jet departures made a right turn on takeoff and passed further south of the site than arrivals. Corporate jets were the source of over seventy percent of the noise events correlated with known aircraft types. As shown in Figure 31, the median L_{max} values for arrivals that triggered automatic noise events (i.e., that exceeded 60 dBA for at least five seconds) were roughly comparable for most aircraft groups, at approximately 70 dBA, with the exception of single engine piston-powered propeller aircraft, with a median L_{max} of 64.3 dBA. The maximum levels of the corporate jet and twin-engine piston-powered propeller aircraft were nearly equal, at 77.3 and 77.2 dBA, respectively. A Piaggio P180 Avanti twin-engine turboprop produced the loudest arrival, with an L_{max} of 79.9 dBA.

Many audible arrivals did not trigger noise events the monitor could automatically distinguish, based on the 60 dBA threshold and five-second minimum duration. However, during the time that an observer was stationed at this site, maximum levels were read directly from the monitor display for these events, and reported separately on Figure 31, by aircraft type, and noted with asterisks. As would be expected, the median values for the events measured in this manner were lower than those for the corresponding aircraft operations that triggered automatic noise events.

Departure operations on Runway 5 also contributed to the noise environment at Site 8. Similar to the arrivals on Runway 23, for those operations that triggered noise events on the monitor, corporate jets were the most common, responsible for over sixty percent of the noise events correlated with known aircraft types. An individual corporate jet arrival yielded the loudest event, with an L_{max} of 80 dBA. However, the median L_{max} values for the twin- and single engine piston-powered propeller groups, at 72.1 and 70.3 dBA respectively, were higher than the median for jets. This is likely due to the fact that the piston-powered aircraft tended to maintain runway heading and fly closer to the site than the jets which, as noted previously, tended to turn to the right, away from the site, on departure.

Noise from sources other than aircraft was present during the measurement period. Route 75 contributed to the background level, at times reaching approximately 53 dBA. Common sources associated with a residential area – including wind in the trees, light construction, and human activity – ranged from 51 to 65.5 dBA. Lawn equipment proved to be the loudest non-aircraft source, producing levels comparable to the loudest aircraft events at 83.9 dBA.

Slightly over 91 hours of monitoring were conducted at Site 8. As shown in Figure 32, the daily variation in hourly L_{eq} ranged from approximately 30 to 62 dBA. The general trend for a 24-hour cycle includes an increase in hourly L_{eq} starting at approximately 5 a.m. and peaking during the midday hours and then declining around approximately 4 p.m. (1600), when the hourly L_{eq} typically dropped approximately five to seven decibels. The hourly levels remain relatively consistent until midnight, when the level lowers and reaches the daily minimum during the early morning hours.

---

16 This observed turn is consistent with current FAA Air Traffic Control practice of assigning Runway 5 jet departures a turn to 60° magnetic, which is approximately a ten-degree right turn.
The variation in $L_{eq}$ correlates well with aircraft operations and a normal pattern of daily residential human activity.

The measurements at Site 8 resulted in several peaks in hourly $L_{eq}$ levels. On February 13th, the $L_{eq}$ for the hour starting at 10 a.m., with a value of 62 dBA, is not likely attributable to aircraft since on-site observations revealed a high level of lawn equipment use at the time. The second loudest hour, starting at 11 a.m. on February 16th, with a value of 60.3 dBA, is likely not attributable to aircraft since there is no peak during that hour for adjacent Site 9. Furthermore, there were several events within that hour that had durations of longer than 100 seconds, which are much longer than typical aircraft flyovers and were likely attributable to lawn equipment. During the hour starting at 2 p.m. (1400) on February 13th, the hourly level was a relatively high 59.2 dBA. The observations during this hour, as well as comparably high levels at Site 9 (displayed in Figure 35), are evidence that the major contributor to the noise environment were arrival operations on Runway 23.

The overall DNL of approximately 52 dBA was equal to the overall measured level at Site 6. These two sites had the lowest measured overall DNL of the 10 sites at which DNL measurements were obtained. However, it should be noted that the measured DNL levels were only one-decibel higher at Sites 1, 2, and 9, and only two-decibels higher at Sites 10 and 11.
Figure 31 Site 8 Maximum A-Weighted Levels  
Source: HMMH, February 2009

<table>
<thead>
<tr>
<th>Aircraft Operations</th>
<th>Maximum Levels (dBA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rock Band</td>
<td>110</td>
</tr>
<tr>
<td>Gas Lawnmower at 3 ft</td>
<td>100</td>
</tr>
<tr>
<td>Diesel Truck at 50 ft</td>
<td>90</td>
</tr>
<tr>
<td>Shouting at 3 ft</td>
<td>80</td>
</tr>
<tr>
<td>Auto at 50 ft, 55 mph</td>
<td>70</td>
</tr>
<tr>
<td>Normal Speech at 3 ft</td>
<td>60</td>
</tr>
<tr>
<td>Unknown Aircraft Type</td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td></td>
</tr>
<tr>
<td>Lawn Equipment</td>
<td></td>
</tr>
<tr>
<td>Route 75</td>
<td></td>
</tr>
<tr>
<td>Wind</td>
<td></td>
</tr>
<tr>
<td>Woman Yelling</td>
<td></td>
</tr>
</tbody>
</table>

Note: *, **, and *** denote plots of maximum levels for the aircraft operations identified above that did not trigger a noise event; i.e., for which the noise level did not exceed 60 dBA for at least 5 seconds. Observers read the maximum levels for these events directly from the noise monitor display.
Figure 32  Site 8 Measured Hourly Noise Levels (Leq), Full Duration

Source: HMMH, February 2009
Figure 33  Site 8 Measured Hourly Noise Levels ($L_{eq}$), Calendar Days

Source:  HMMH, February 2009

Site 8 Measured Hourly Equivalent Noise Levels ($L_{eq}$)
February 12, 2009

![Graph showing hourly equivalent noise levels on February 12, 2009.]

Site 8 Measured Hourly Equivalent Noise Levels ($L_{eq}$)
February 13, 2009

![Graph showing hourly equivalent noise levels on February 13, 2009.]

Hourly $L_{eq}$ (dBA)

Hour Beginning

DNL = 53 dBA
Site 8 Measured Hourly Equivalent Noise Levels ($L_{eq}$)
February 14, 2009

Hourly $L_{eq}$ (dBA)

DNL = 52 dBA

Hour Beginning

Site 8 Measured Hourly Equivalent Noise Levels ($L_{eq}$)
February 15, 2009

Hourly $L_{eq}$ (dBA)

DNL = 49 dBA

Hour Beginning
Site 8 Measured Hourly Equivalent Noise Levels ($L_{eq}$)
February 16, 2009

Hourly $L_{eq}$ (dBA)

DNL = 56 dBA
3.3.11 Site 9: Wyndemere Country Club

Site 9 is located approximately 1,500 feet northwest of the extended centerline of Runway 5/23, approximately 2.6 miles out from the departure end of Runway 5. The site was in a lightly wooded area adjacent to the golf course, near the pro shop, in the approximate center of this large condominium complex.

The runway use during the measurements at this site was split between Runway 5 and 23, with each flow occurring approximately fifty percent of the time.

Runway 23 arrivals were the principal aircraft operations affecting the site during the measurements. Corporate jets were the source of approximately seventy percent of the noise events correlated with known aircraft types. As shown in Figure 34, the median $L_{\text{max}}$ values were roughly comparable for arrivals of all aircraft groups, for automatically identified noise events (i.e., that exceeded 60 dBA for at least five seconds), ranging from 64.4 to 68.5 dBA. A Piaggio P180 Avanti twin-engine turboprop arrival produced an $L_{\text{max}}$ of 71.7 dBA.

Runway 5 departures also contributed to the noise environment at the site. Similar to Runway 23 arrivals, the corporate jet operations were the most common source of noise events correlated with known aircraft types. The median $L_{\text{max}}$ values were comparable for departures in all aircraft type groups, ranging from 63.7 to 67.2 dBA. Single engine propeller-driven aircraft produced relatively high maximum levels. As at Site 8, this is likely due to the fact that the piston-powered aircraft tended to maintain runway heading and fly closer to the site than the jets which, as noted previously, tended to turn to the right, away from the site, on departure.

Many audible arrivals did not trigger noise events the monitor could automatically distinguish, based on the 60 dBA threshold and five-second minimum duration. However, during the time that an observer was stationed at this site, maximum levels were read directly from the monitor display for these events, and reported separately on Figure 34 by aircraft type, and noted with asterisks. As would be expected, the median values for the events measured in this manner were lower than those for the corresponding aircraft operations that triggered automatic noise events. The observer logged four reverse thrust occurrences associated with Runway 23 arrivals, with $L_{\text{max}}$ values ranging from approximately 45 to 55 dBA.

Noise from sources other than aircraft was present during the measurement period. Several sources associated with a recreational area, including wind in the trees, birds, and maintenance carts, produced $L_{\text{max}}$ values from 50.0 to 67.7 dBA with the gas-powered maintenance carts producing the loudest non-aircraft events.

Approximately 75 hours of monitoring were conducted at the site, including 74 full hours. As shown in Figure 35, the daily variation in hourly $L_{\text{eq}}$ ranged from 37 to 57 dBA. The general trend for a 24-hour cycle at the site began with hourly levels increasing around the hour starting at 5 a.m., peaking in the midday hours, then declining into the evening, and reaching a minimum in the early morning. The variation in $L_{\text{eq}}$ is due, in part, to aircraft operations. A normal pattern of daily recreational human activity, including lawn maintenance, also contributes to a louder noise environment during the daytime hours. The site’s location among several trees resulted in some contributions from wind and birds, particularly during the daytime hours.

The overall measured DNL for Site 9 was 53 dBA, equal to the level measured at Sites 1 and 2, only one decibel higher than the DNL measured at Sites 6 and 8 (the two sites with the lowest overall DNL), and only one decibel lower than the DNL measured at Sites 10 and 11.
Figure 34  Site 9 Maximum A-Weighted Levels
Source: HMMH, February 2009

Note: *, **, and *** denote plots of maximum levels for the aircraft operations identified above that did not trigger a noise event; i.e., for which the noise level did not exceed 60 dBA for at least 5 seconds. Observers read the maximum levels for these events directly from the noise monitor display.
Figure 35  Site 9 Measured Hourly Noise Levels ($L_{eq}$), Full Duration
Source: HMMH, February 2009
Figure 36  Site 9 Measured Hourly Noise Levels ($L_{eq}$), Calendar Days

Source: HMMH, February 2009

Site 9 Measured Hourly Equivalent Noise Levels ($L_{eq}$)
February 13, 2009

Hourly $L_{eq}$ (dBA)

Hour Beginning
DNL = 50 dBA

Site 9 Measured Hourly Equivalent Noise Levels ($L_{eq}$)
February 14, 2009

Hourly $L_{eq}$ (dBA)

Hour Beginning
DNL = 53 dBA
Site 9 Measured Hourly Equivalent Noise Levels ($L_{eq}$)
February 15, 2009

Hourly $L_{eq}$ (dBA)

DNL = 50 dBA

Site 9 Measured Hourly Equivalent Noise Levels ($L_{eq}$)
February 16, 2009

Hourly $L_{eq}$ (dBA)

DNL = 57 dBA
3.3.12 Site 10: 408 16th Avenue South

Site 10 is located approximately 700 feet southeast of the extended centerline of Runway 5/23, approximately 1.8 miles out from the departure end of Runway 23. The site was located in the rear side yard of a residence, at the end of a cul-de-sac, away from significant surface road traffic. The site was adjacent to the end of a canal, which resulted in very modest contributions from boat traffic.

Runway use during the measurements at this site was split between Runway 5 and 23, with each flow occurring approximately fifty percent of the time. Runway 5 arrivals were the principal aircraft operations affecting the site. Corporate jets were the source of over half the automatically identified noise events (i.e., that exceeded 65 dBA for at least five seconds) that correlated with known aircraft types. An individual corporate jet arrival resulted in an $L_{max}$ of 89.2 dBA. However, twin-engine turboprops had the highest median for arrivals, at 75.8 dBA. Two Piaggio P180 Avanti twin-engine turboprop arrivals were correlated with noise events during the measurement period, with maximum levels of 79.4 and 83.5 dBA, with the louder event representing the highest $L_{max}$ for this aircraft type category.

Departures on Runway 23 also affected the noise environment. Similar to the arrivals on Runway 5, corporate jets were responsible for the majority of departures that triggered noise events, constituting almost seventy percent of the noise events correlated with known aircraft types. An individual jet departure produced an $L_{max}$ value of 80.0 dBA.

Many audible arrivals did not trigger noise events the monitor could automatically distinguish, based on the 65 dBA threshold and five-second minimum duration. However, during the time that an observer was stationed at this site, maximum levels were read directly from the monitor display for these events, and reported separately on Figure 37 by aircraft type, and noted with asterisks. As would be expected, the median values for the events measured in this manner were lower than those for the corresponding aircraft operations that triggered automatic noise events.

Approximately 69 hours of monitoring were conducted at the site, including 68 full hours. As shown in Figure 38, the daily hourly $L_{eq}$ varied relatively significantly, from approximately 30 to 65 dBA. The general trend for a 24-hour cycle at the site during the measurements included increasing levels starting at approximately 6 a.m., reaching a peak at midday, and then declining until late afternoon. Another increase of lesser magnitude generally occurred in the evening. Both of these increases in hourly $L_{eq}$ levels are likely due to aircraft activity. The lowest levels occurred during the early morning hours. The loudest hour, displayed in Figure 38, was for the hour starting at 3 p.m. (1500) on February 14th with an $L_{eq}$ of 65.4 dBA, when lawn maintenance was conducted at the property. The second loudest hour, starting at 11 a.m. (1100) on February 16th, with an $L_{eq}$ of 62.4 dBA, likely included a major contribution from aircraft operations since some other sites also had relative peaks during this hour.

The overall measured DNL for Site 10 was 54 dBA, equal to the DNL measured at Site 11, only one decibel higher measured at Sites 1, 2, and 9, and only two decibels higher than the measured DNL at Sites 6 and 8 (the two sites with the lowest overall DNL).
Figure 37  Site 10 Maximum A-Weighted Levels
Source: HMMH, February 2009

Note: *, **, and *** denote plots of maximum levels for the aircraft operations identified above that did not trigger a noise event; i.e., for which the noise level did not exceed 65 dBA for at least 5 seconds. Observers read the maximum levels for these events directly from the noise monitor display.
Figure 38  Site 10 Measured Hourly Noise Levels (L_{eq}), Full Duration

Source: HMMH, February 2009
Figure 39  Site 10 Measured Hourly Noise Levels ($L_{eq}$), Calendar Days
Source: HMMH, February 2009

Site 10 Measured Hourly Equivalent Noise Levels ($L_{eq}$)
February 13, 2009

Site 10 Measured Hourly Equivalent Noise Levels ($L_{eq}$)
February 14, 2009
Site 10 Measured Hourly Equivalent Noise Levels ($L_{eq}$)
February 15, 2009

hour Beginning
DNL = 53 dBA

Site 10 Measured Hourly Equivalent Noise Levels ($L_{eq}$)
February 16, 2009

hour Beginning
DNL = 56 dBA
3.3.13 Site 11: 400 Block, 10th Avenue South

Site 11 is located approximately 1,500 feet northwest of the extended centerline of Runway 5/23, approximately 1.4 miles out from the departure end of Runway 23. The site was in the enclosed courtyard of an attached townhouse.

Runway use during the measurements at this site was split between Runway 5 and 23, with each flow occurring approximately fifty percent of the time. Runway 23 departures were the principal aircraft operations affecting the site during the measurements. Corporate jet departures were responsible for over 80% of the automatically identified noise events (i.e., that exceeded 60 dBA for at least five seconds) that correlated with known aircraft types. The median L$_{\text{max}}$ for corporate jet departures was 75.4 dBA, nearly two decibels higher than any other aircraft group.

Arrivals on Runway 05 also affected the noise environment. Similar to the Runway 23 departures, corporate jets were the source of the noise events correlated with known aircraft types. An individual jet departure produced an L$_{\text{max}}$ of 75.3 dBA, and a Piaggio P180 Avanti arrival produced an L$_{\text{max}}$ that was just three decibels quieter, at 72.3 dBA.

Figure 40 shows the median L$_{\text{max}}$ for corporate jet departures was nearly 12 dBA louder than for corporate jet arrivals.

Many audible arrivals did not trigger noise events the monitor could automatically distinguish. However, during the time that an observer was stationed at this site, maximum levels were read directly from the monitor display for these events, and reported separately on Figure 40 by aircraft type, and noted with asterisks. As would be expected, the median values for the events measured in this manner were lower than those for the corresponding aircraft operations that triggered automatic noise events.

Slightly over 44 full hours of monitoring were conducted at Site 11. As shown in Figure 41, the daily variation in hourly L$_{\text{eq}}$ ranged from approximately 34 to 63 dBA. The general trend for a 24-hour cycle included increasing hourly levels beginning round 6 a.m. (0600), peaking during the afternoon, and then declining through the evening. The lowest levels occurred during the early morning hours. The loudest hour, displayed in Figure 41, was for the hour starting at 2 p.m. (1400) on February 16th, with an L$_{\text{eq}}$ of 62.7 dBA. Although no other monitoring sites were in operation during this hour, it is likely that the levels can be attributed to aircraft operations, since many noise events correlated with aircraft departures during this time period, which was the end of the holiday weekend when many flights were leaving Naples.

The overall measured DNL for Site 11 was 54 dBA.
Figure 40  Site 11 Maximum A-Weighted Levels
Source: HMMH, February 2009

Note: *, **, and *** denote plots of maximum levels for the aircraft operations identified above that did not trigger a noise event; i.e., for which the noise level did not exceed 60 dBA for at least 5 seconds. Observers read the maximum levels for these events directly from the noise monitor display.
Figure 41  Site 11 Measured Hourly Noise Levels ($L_{eq}$), Full Duration

Source: HMMH, February 2009
Figure 42  Site 11 Measured Hourly Noise Levels (L_{eq}), Calendar Days
Source: HMMH, February 2009

Site 11 Measured Hourly Equivalent Noise Levels (L_{eq})
February 15, 2009

Site 11 Measured Hourly Equivalent Noise Levels (L_{eq})
February 16, 2009

DNL = 51 dBA

DNL = 54 dBA
Site 11 Measured Hourly Equivalent Noise Levels ($L_{eq}$)
February 17, 2009

Hourly $L_{eq}$ (dBA)

Hour Beginning
DNL = 54 dBA

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
4 EXISTING NOISE COMPATIBILITY PROGRAM

This Part 150 Update builds on the previous noise compatibility planning at Naples Municipal Airport. The airport’s existing Noise Compatibility Program includes 15 FAA-approved measures, based on Authority Part 150 Update submissions in 1997 and 1998;

■ In the 1997 Noise Compatibility Program update, the Authority requested FAA approval of 15 recommended measures. The FAA approved implementation of 13 of these measures in full, disapproved one,17 and approved one in part.18 Appendix A presents a copy of the FAA Record of Approval for this update.

■ In the 1998 Noise Compatibility Program update, the Authority requested and received FAA approval of one additional measure. The 1998 Update reviewed the implementation status of the 14 previously approved measures, but did not request any change to these measures, nor any FAA actions related to them. Appendix B presents a copy of the FAA Record of Approval for this update.

The airport’s noise abatement program also includes a major element the Authority pursued outside of the Part 150 process; i.e., the Stage 2 ban, which was the subject of the 2000 Part 161 submission, as required by federal law.

Table 5 lists the full list of 17 measures proposed in the two Part 150 submissions and the Part 161 submission, including a description, the year of the applicable submission, the FAA approval or disapproval action, and the implementation status of each.

The Authority aggressively advertises the noise abatement procedures through communications with based and itinerant pilots, posters in pilot lounges and flight planning areas, and through distribution of informational material, including two-sided summaries of noise abatement procedures for jet, propeller-driven fixed-wing, and helicopter aircraft. Appendix H presents copies of these handouts.

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17 The disapproved measure requested that the FAA eliminate the existing practice that restricts initial departure climb clearances to 2,000' above mean sea level. The FAA disapproved this measure on the basis that there was insufficient noise benefit within the 65 dBA DNL contour. See item 2 in Table 2.

18 The partially approved measure related to use restrictions. The FAA approved a restriction on nighttime (10 p.m. - 7 a.m.) Stage 1 jet operations, but disapproved a voluntary curfew on nighttime Stage 2 and 3 jet operations, and a future restriction of nighttime Stage 2 operations. See item 6 in Table 2.
### Table 5  Noise Compatibility Program and Stage 2 Ban Status

Sources: 1997 and 1998 Part 150 Updates and FAA Records of Approval, and Authority staff

<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>Part 150 Operational Measures</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Preferential Runway (1997)</td>
<td>Maximize use of Runway 5 for departures</td>
<td>Approved</td>
<td>Implemented</td>
</tr>
<tr>
<td>3. Takeoff Flight Paths (1997)</td>
<td>3.1 Runway 5: straight</td>
<td>Approved</td>
<td>Implemented</td>
</tr>
<tr>
<td></td>
<td>3.2 Runway 23: right turn</td>
<td>Approved</td>
<td>Implemented</td>
</tr>
<tr>
<td></td>
<td>3.3 Runway 14: left turn</td>
<td>Approved</td>
<td>Implemented [5]</td>
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<tr>
<td></td>
<td>3.4 Runway 32: right turn</td>
<td>Approved</td>
<td>Implemented</td>
</tr>
<tr>
<td>5. Ground Noise (1997)</td>
<td>Ban night maintenance runups, and designate runup locations and orientations</td>
<td>Approved</td>
<td>Implemented</td>
</tr>
<tr>
<td>6. Use Restrictions (1997)</td>
<td>6.1 Restrict night Stage 1 jet operations</td>
<td>Approved</td>
<td>Implemented</td>
</tr>
<tr>
<td></td>
<td>6.2 Voluntary Stage 2 and 3 night curfew</td>
<td>Disapproved</td>
<td>Implemented as voluntary measure</td>
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<td></td>
<td>6.3 Future Stage 2 night curfew</td>
<td>Disapproved</td>
<td>Implemented through Part 161</td>
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<td>7. Use Restriction (1998)</td>
<td>24-hour Stage 1 jet restriction</td>
<td>Approved</td>
<td>Implemented</td>
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<tr>
<td><strong>Part 150 Land Use Measures</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>8. Land Acquisition (1997)</td>
<td>Acquisition in Rock Creek Campground and Naples Villas to develop buffer</td>
<td>Approved</td>
<td>No action to date</td>
</tr>
<tr>
<td>10. Zoning and Land Use Planning (1997)</td>
<td>Adoption of DNL 60 dB for zoning and land use planning</td>
<td>Approved</td>
<td>Implemented</td>
</tr>
<tr>
<td><strong>Part 150 Continuing Program Measures</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Public Information (1997)</td>
<td>Implement public information program.</td>
<td>Approved</td>
<td>Implemented</td>
</tr>
<tr>
<td>16. NCP Update (1997)</td>
<td>Regular or as needed NCP updates</td>
<td>Approved</td>
<td>Implemented</td>
</tr>
<tr>
<td><strong>Part 161 Use Restriction</strong></td>
<td></td>
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</tbody>
</table>

**Table Notes**

[1] The year of submission to the FAA is noted. The 1997 and 1998 submissions were Part 150 updates; the 2000 submission was a Part 161 submission.

[2] As indicated in other notes, the degree of implementation varies. The Noise Compatibility Program phase of this study will include detailed review of the specific implementation status of each measure.

[3] This prior recommendation will be investigated in the Noise Compatibility Program phase of this study.

[4] FAA modified the procedure in 2008 to implement a right turn to 060°.

[5] Radar data suggest approximately 50% of departures turn left as a result of a change in FAA procedures.

[6] Easements acquired on a case-by-case basis as opportunities arise and include fair disclosure provision.

[7] Stage 2 restrictions do not require FAA approval; however, the Authority successfully defended the ban against multiple legal challenges, and FAA administrative action related to grant assurances.
5 UPDATED EXISTING AND FORECAST CONDITIONS NOISE EXPOSURE MAPS WITH EXISTING NOISE COMPATIBILITY PROGRAM

The fundamental noise elements of an Noise Exposure Map are DNL contours for existing and forecast conditions (2010 and 2015 in this update), presented over base maps depicting the airport layout, local land use control jurisdictions, major land use categories, discrete noise-sensitive “receptors,” and other information required by Part 150.

Section 5.1 presents the official 2010 and 2015 Noise Exposure Map contour graphics. For historical perspective, Section 5.2 compares the 2010 existing conditions contours to the 2005 five-year forecast conditions contours from the previous FAA-accepted Noise Exposure Map (November 2000).

As discussed in Section 1.1.1, the Authority has opted to include noise contours for 2020 ten-year forecast conditions, and for March 2010 and August 2010 “peak” and “off-peak” season conditions, for informational purposes. Section 5.3 presents these contours.

Section 5.4 compares the modeled DNL for March 2010 to the February 2009 short-term measurement results presented in Section 3.2.

Section 5.5 presents land use compatibility statistics for the official 2010 and 2015 Noise Exposure Maps. For comparative purposes, the section also presents this information for the 2020 ten-year forecast conditions contours, and March 2010 and August 2010 “peak” and “off-peak” season conditions contours.

5.1 2010 and 2015 Noise Exposure Maps

Figure 43 presents the existing conditions Noise Exposure Map for 2010 operations. Figure 44 presents the five-year forecast conditions Noise Exposure Map for 2015 operations. These are the official Noise Exposure Maps that the Authority is submitting under Part 150 for appropriate FAA review and determination of compliance, pursuant to §150.21(c).

The figures present noise contours for 2010 and 2015 annual-average-day operations on a map depicting land uses, in generalized Part 150 land use categories. The land uses are colored on a parcel-by-parcel basis within the contours, based on detailed field verification.19 Consistent with Part 150 requirements, the figures also depict airport, municipal, and county boundaries, and discrete sensitive receptors (e.g., schools and houses of worship). For clarity, Figure 49 presents the FAA Airport Diagram for Naples Municipal Airport. It depicts the runway layout data in a graphic format. The displaced landing thresholds on Runways 5 (landing from the southwest), 14 (landing from the northwest), and 32 (landing from the southeast) are shown with ellipses across the runway. These thresholds are the first points at which aircraft can touch down, except in emergency conditions. There is no displacement on the Runway 23 end (landing from the northeast); the landing threshold is the physical end of that runway. Pilots are given visual guidance to approach

19 Appendix G summarizes the steps undertaken in preparing the land use base map, including sources and field verification steps.
these thresholds at a safe angle and cross them at a safe height by “precision approach path indicator” light installations at each runway end. Table 7 lists the applicable approach angles and threshold crossing heights. Takeoffs start at the physical ends of the runways.

Figure 49, depicts the airport layout and property, without the noise contours or colored land uses for clarity. Figures 50 through 55 show the modeling flight tracks separately, for further clarity.

Both Noise Exposure Maps reflect continuation of the noise abatement elements of the existing Noise Compatibility Program as currently implemented (as summarized in Section 4) and the existing airport layout (as shown in Figure 49). Consistent with Part 150 requirements, the Authority will submit revised Noise Exposure Maps should either of these assumptions change, or should “any change in the operation of the airport would create any ‘substantial, new noncompatible use’ in any area depicted on the map beyond that which is forecast for the fifth calendar year after the date of submission”.20 The Authority will submit a separate document presenting proposed revisions to the Noise Compatibility Program. That submission will present revised Noise Exposure Maps reflecting the effect that any proposed revisions to the Noise Compatibility Program affect the noise contours, the compatibility status of land uses, and eligibility for proposed mitigation.

20 In §150.21(d).
Figure 43
2010 Existing Conditions Noise Exposure Map

- 2010 Existing Conditions DNL Contour
- Existing Runways
- Airport Property
- City of Naples / Collier County Jurisdictional Boundary
- Single Family Residential (See note 1)
- Multi Family Residential (See note 1)
- Condo/ Home Owners Assoc. (See note 1)
- Mobile Home (See note 1)
- Transient Lodging (See note 1)
- Commercial / Industrial
- Place of Worship
- Hospital / Nursing Home
- School
- Agricultural / Non Agricultural / Wetland
- Open Space / Recreation / Golf
- Government / Transportation / Other Public Use
- Water

Note 1: These five residential land uses are noncompatible inside the 60 dB DNL and higher contours. All other land uses shown on this figure inside the 60 dB DNL contour are compatible with the level of noise exposure.

Data Source: Collier County GIS, United States Department of Agriculture (USDA) Geospatial Data gateway, Environmental Systems Research Institute (ESRI)
Figure 44
2015 Five-Year Forecast Conditions
Noise Exposure Map

- 2015 Five-Year Forecast Conditions DNL Contour
- Existing Runways
- Airport Property
- City of Naples / Collier County Jurisdictional Boundary

- Single Family Residential (See note 1)
- Multi Family Residential (See note 1)
- Condo/ Home Owners Assoc. (See note 1)
- Mobile Home (See note 1)
- Transient Lodging (See note 1)
- Commercial / Industrial
- Place of Worship
- Hospital / Nursing Home
- School
- Agricultural / Non Agricultural / Wetland
- Open Space / Recreation / Golf
- Government / Transportation / Other Public Use
- Water

Note 1: These five residential land uses are noncompatible inside the 60 dB DNL and higher contours. All other land uses shown on this figure inside the 60 dB DNL contour are compatible with the level of noise exposure.

Data Source: Collier County GIS, United States Department of Agriculture (USDA) Geospatial Data gateway, Environmental Systems Research Institute (ESRI)
5.2 Comparison of 2010 Existing Conditions Noise Contours to 2005 Forecast Case Noise Contours from 2000 Noise Exposure Map Update

Figure 45 compares the 2010 existing conditions contour to the 2005 forecast case contour from the most recent, FAA-approved Noise Exposure Map submission (November 2000). Outside of airport property, the contours are roughly similar in size off the approach ends of Runways 5, 14, and 32; i.e., to the southwest, northwest, and southeast. The contours are approximately three decibels smaller to the northeast, off the approach end of Runway 23. This reduction is due to differences between the forecast 2005 and 2010 fleet mixes, in particular fewer general aviation jets in 2010 than were forecast in 2005; i.e., approximately 47 per day in 2010 versus approximately 57 per day in 2005. The FAA also has made substantial improvements to the Integrated Noise Model since 2000. The 2010 contours were developed using the most recent release (version 7.0b). The 2005 contours were developed using the most current version available in 2000 (6.0). Version 7.0b includes data for more general aviation aircraft models, permitting more precise modeling. Version 6.0 required use of more surrogates (as discussed in Section 5.6.2), which tended to be selected in a conservative fashion, resulting in overprediction of noise levels. Other Integrated Noise Model improvements made in the past ten years contributed to multiple subtle effects on the contours. There also are changes in the shapes in the “tips” of the 2010 contours resulting from the more detailed flight track development undertaken for this update (as discussed in Section 5.6.5).

This figure is at the same scale as the 2010 and 2015 Noise Exposure Map figures, and includes the same land use information. The base map also includes aerial photography that reveals specific detail about structures, roadways, and other natural and man-made features. This detail was not included on the Noise Exposure Map figures for clarity and consistency with Part 150 regulations and FAA policies.
Figure 45
Comparison of 60 and 65 dB DNL Contours for 2010 Existing Conditions and 2005 Forecast Case from 2000 Part 150 Study

Existing Runways
Airport Property

- 2010 Existing Conditions DNL Contour
- 2005 Forecast Case from 2000 Part 150 DNL Contour

Note 1: These five residential land uses are non-compatible inside the 60 dB DNL and higher contours. All other land uses shown on this figure inside the 60 dB DNL contour are compatible with the level of noise exposure.

Data Source: Collier County GIS, United States Department of Agriculture (USDA) Geospatial Data gateway, Environmental Systems Research Institute (ESRI)
5.3 2020 Ten-Year Forecast Conditions Contours, and March and August 2010 Peak and Off-Peak Season Contours

As discussed previously, Figure 46 presents the ten-year forecast conditions contours for 2020 operations, and Figure 47 and Figure 48 present the March 2010 and August 2010 “peak” and “off-peak” season contours, respectively. Consistent with FAA policy and the Part 150 regulation, these figures are provided for informational purposes only; they are not official Noise Exposure Map figures. These figures are presented at the same scale as the 2010 and 2015 Noise Exposure Map figures, and include the same land use information. As in the case of Figure 46, the base map for these figures also includes aerial photography reveal specific detail about structures, roadways, and other natural and man-made features.
Figure 46
2020 Ten-Year Forecast Conditions Noise Contours

- 2020 Ten-Year Forecast Conditions DNL Contour
- Existing Runways
- Airport Property
- Single Family Residential (See note 1)
- Multi Family Residential (See note 1)
- Condo/ Home Owners Assoc. (See note 1)
- Mobile Home (See note 1)
- Transient Lodging (See note 1)
- Commercial / Industrial
- Place of Worship
- Hospital / Nursing Home
- School
- Open Space / Recreation / Golf
- Agricultural / Non Agricultural / Wetland
- Government / Transportation / Other Public Use
- Water

Note 1: These five residential land uses are noncompatible inside the 60 dB DNL and higher contours. All other land uses shown on this figure inside the 60 dB DNL contour are compatible with the level of noise exposure.

Data Source: Collier County GIS, United States Department of Agriculture (USDA) Geospatial Data gateway, Environmental Systems Research Institute (ESRI)
Figure 47
March 2010 Peak-Season Noise Contours

Note 1: These five residential land uses are noncompatible inside the 60 dB DNL and higher contours. All other land uses shown on this figure inside the 60 dB DNL contour are compatible with the level of noise exposure.

Data Source: Collier County GIS, United States Department of Agriculture (USDA) Geospatial Data gateway, Environmental Systems Research Institute (ESRI)
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Figure 48
August 2010 Off-Peak Season Noise Contours

- 2010 Off-Peak Season DNL Noise Contours
- Existing Runways
- Airport Property
- Single Family Residential (See note 1)
- Multi Family Residential (See note 1)
- Condo/ Home Owners Assoc. (See note 1)
- Mobile Home (See note 1)
- Transient Lodging (See note 1)
- Commercial / Industrial
- Place of Worship
- Hospital / Nursing Home
- School
- Open Space / Recreation / Golf
- Agricultural / Non Agricultural / Wetland
- Government / Transportation / Other Public Use
- Water

Note 1: These five residential land uses are noncompatible inside the 60 dB DNL and higher contours. All other land uses shown on this figure inside the 60 dB DNL contour are compatible with the level of noise exposure.

Data Source: Collier County GIS, United States Department of Agriculture (USDA) Geospatial Data gateway, Environmental Systems Research Institute (ESRI)
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5.4 Comparison of Measured and Modeled DNL

FAA strongly discourages comparisons of short-duration measurements (e.g., a day, week, or month) to Integrated Noise Model estimates of existing DNL, because short-term observations do not reflect the full scope and range of modeled operations.\(^{21}\) With that caveat in mind, Table 6 compares March 2010 peak season DNL from the Integrated Noise Model estimates depicted in Figure 47 to the DNL measurements made at 10 sites in February 2009, as discussed in Section 3.2.\(^{22}\) This comparison presents measured and modeled DNL values for the peak season at Naples, albeit for February 2009 and March 2010, respectively.

**Table 6 Comparison of February 2009 Short-Term DNL Measurements to March 2010 Modeled DNL Estimates**

<table>
<thead>
<tr>
<th>Site</th>
<th>Number of Hours</th>
<th>DNL, dB</th>
<th>March 2010 DNL Estimate, dB</th>
</tr>
</thead>
<tbody>
<tr>
<td>222 Bay Point</td>
<td>20</td>
<td>53</td>
<td>47</td>
</tr>
<tr>
<td>Conservancy of Southwest Florida</td>
<td>18</td>
<td>53</td>
<td>56</td>
</tr>
<tr>
<td>3709 Springwood Drive</td>
<td>20</td>
<td>57</td>
<td>56</td>
</tr>
<tr>
<td>Lot 61 Rock Creek Trailer Park</td>
<td>7</td>
<td>n.a.</td>
<td>59</td>
</tr>
<tr>
<td>741 3rd Street South</td>
<td>96</td>
<td>52</td>
<td>53</td>
</tr>
<tr>
<td>960 Aqua Circle</td>
<td>24</td>
<td>57</td>
<td>49</td>
</tr>
<tr>
<td>25 2nd Avenue South</td>
<td>69</td>
<td>52</td>
<td>50</td>
</tr>
<tr>
<td>199 Edgemere Way South</td>
<td>91</td>
<td>53</td>
<td>51</td>
</tr>
<tr>
<td>Wyndemere Country Club</td>
<td>75</td>
<td>54</td>
<td>49</td>
</tr>
<tr>
<td>408 16th Avenue South</td>
<td>69</td>
<td>54</td>
<td>52</td>
</tr>
<tr>
<td>400 block 10th Avenue South</td>
<td>44</td>
<td>53</td>
<td>54</td>
</tr>
</tbody>
</table>

The measured and modeled levels do not differ sufficiently to raise any questions about the modeling results, considering the following factors:

- The measurements were for relatively short durations; it is unlikely the activity, runway use, and flight tracks affecting the site during the visits would closely match long-term averages.
- The measured DNL includes noise from all sources – not just aircraft, as in the case of the modeled estimates. This situation might lead to the expectation that the modeled estimates should always be lower than the measured values. However, countering this effect is the fact that measurement visits were deliberately scheduled, to the extent feasible, to take place during time periods when a runway was in use that affected each site.
- The measured and estimated values agree to within two decibels at six of the sites, and to within three decibels at eight of the sites, which represents reasonably high agreement, considering the previous factors.

As noted in Section 3, Part 150 does not require airport operators to measure noise levels and FAA does not permit airports to use noise measurements to “adjust” or calibrate” the noise modeling process. The factors listed above reflect primary bases for this FAA policy.


\(^{22}\) The measurement duration was too short at Site 4 to obtain a measured DNL value.
5.5 Potential Noncompatible Land Uses within the Noise Contours

The figures presented in Sections 5.1, 5.2, and 5.3 depict land uses within the noise contours. As noted in the figure legends, the only potentially non-compatible land uses encompassed within the contours are residential, based on the land use compatibility criteria presented in Table 2, which reflect local criteria that the Airport Authority, the City of Naples, and Collier County have formally adopted and enforced. The figures identify the residential uses in the following categories:

- Single family
- Multi family
- Condominium / homeowners association
- Mobile home
- Transient lodging

The official existing conditions and five-year forecast conditions Noise Exposure Maps presented in Figure 43 and Figure 44, respectively, encompass residential uses in the first four categories; the 2020 and March 2010 contours presented in Figure 46 and Figure 47, respectively, include a portion of a single transient lodging facility (hotel) off the southwest end of Runway 5/23. The August 2010 contours presented in Figure 48 encompass only a portion of a condominium complex. Table 7 presents the estimated dwelling units and residential population within the 60 dB DNL contours for each of the contour cases, estimated using the data and procedures discussed in Appendix G.4.23

23 The table also lists numbers of residential parcels falling wholly or partially within the 60 dB DNL contours that are the basis for estimating the numbers of encompassed dwelling units and residents.
## Table 7  Estimated Residential Population within 60 dB DNL Contours
Source: HMMH, 2009

<table>
<thead>
<tr>
<th>Case</th>
<th>Residential Land Use</th>
<th>Encompassed Residential Uses (Note 1)</th>
<th>Parcels</th>
<th>Dwelling Units</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010 Existing Conditions Noise Exposure Map</td>
<td>Condominium / Home Owners Association</td>
<td></td>
<td>5</td>
<td>46</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>Transient Lodging</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Mobile Home</td>
<td></td>
<td>2</td>
<td>14</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Single-Family</td>
<td></td>
<td>5</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Multi-Family</td>
<td></td>
<td>7</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>19</td>
<td>73</td>
<td>106</td>
</tr>
<tr>
<td>2015 Five-Year Forecast Conditions Noise Exposure Map</td>
<td>Condominium / Home Owners Association</td>
<td></td>
<td>7</td>
<td>90</td>
<td>127</td>
</tr>
<tr>
<td></td>
<td>Transient Lodging</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Mobile Home</td>
<td></td>
<td>3</td>
<td>22</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Single-Family</td>
<td></td>
<td>12</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Multi-Family</td>
<td></td>
<td>9</td>
<td>18</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>31</td>
<td>137</td>
<td>198</td>
</tr>
<tr>
<td>March 2010 (Note 2)</td>
<td>Condominium / Home Owners Association</td>
<td></td>
<td>15</td>
<td>315</td>
<td>444</td>
</tr>
<tr>
<td></td>
<td>Transient Lodging</td>
<td></td>
<td>1</td>
<td>22</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>Mobile Home</td>
<td></td>
<td>3</td>
<td>60</td>
<td>96</td>
</tr>
<tr>
<td></td>
<td>Single-Family</td>
<td></td>
<td>34</td>
<td>23</td>
<td>37</td>
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<tr>
<td></td>
<td>Multi-Family</td>
<td></td>
<td>16</td>
<td>36</td>
<td>51</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>69</td>
<td>456</td>
<td>672</td>
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<tr>
<td>August 2010 (Note 2)</td>
<td>Condominium / Home Owners Association</td>
<td>(No population in other categories)</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2020 10-Year Forecast (Note 2)</td>
<td>Condominium / Home Owners Association</td>
<td></td>
<td>15</td>
<td>317</td>
<td>447</td>
</tr>
<tr>
<td></td>
<td>Transient Lodging</td>
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<td>1</td>
<td>16</td>
<td>32</td>
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<tr>
<td></td>
<td>Mobile Home</td>
<td></td>
<td>3</td>
<td>59</td>
<td>94</td>
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<tr>
<td></td>
<td>Single-Family</td>
<td></td>
<td>33</td>
<td>22</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Multi-Family</td>
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<td>16</td>
<td>35</td>
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<tr>
<td>Total</td>
<td></td>
<td></td>
<td>68</td>
<td>449</td>
<td>657</td>
</tr>
</tbody>
</table>

### Table Notes:
1. Estimated using data and procedures discussed in Appendix G.3.
2. The March and August 2010, and 2020 population data are provided for informational purposes only.
5.6 Development of Noise Contours

The DNL contours for this study were prepared using the most recent release of the FAA’s Integrated Noise Model (INM) that was available at the time the contours were prepared, “Version 7.0b.” Consistent with FAA requirements, the model will be used without any unauthorized “calibration” or “adjustment”.

The INM requires inputs in the following categories:

- Number and mix of aircraft operations
- Aircraft noise and performance characteristics
- Physical description of the airport layout
- Runway utilization rates
- Prototypical flight track descriptions and accompanying utilization rates.

Sections 5.6.1 through 5.6.5 present this information in order, for the noise contours presented in the preceding figures.

5.6.1 Aircraft Operations

Appendix M presents a detailed Working Paper prepared by SH&E that documents the preparation of aircraft activity and fleet mix forecasts for the five noise contour cases presented in 5.1 and 5.3; i.e., 2010, 2015, 2020, 2010 Peak Month, and 2010 Off-Peak Month. The appendix also presents a copy of the FAA letter approving the 2010 and 2015 existing conditions and five-year forecast-case Noise Exposure Map forecasts. The following five tables present the detailed aircraft modeling fleet mixes for the five modeling time periods:

- Table 8 Forecast 2010 Average Annual Day Operations
- Table 9 Forecast 2015 Average Annual Day Operations
- Table 10 Forecast 2020 Average Annual Day Operations
- Table 11 Forecast March 2010 Average Day Operations
- Table 12 Forecast 2010 August Average Day Operations

The tables present fleet mix detail broken down by type of operation (departures, arrivals, and touch-and-go cycles), the DNL “day” and “night” time periods (as discussed in Section 2.1.6), and INM database aircraft types.

24 The FAA approval was based on an earlier version of the Working Paper. The Working Paper presented in Appendix M differs only in that it includes Section 6, which discusses an alternate version of the 2020 forecast. That forecast and the associate contours are provided for unofficial, informational purposes only, and have no relationship to the official Noise Exposure Map contours, so there was no need to obtain FAA approval of it.
### Table 8  Forecast 2010 Average Annual Day Operations

**Source:** SH&E and HMMH, 2009

<table>
<thead>
<tr>
<th>Aircraft Category</th>
<th>INM Aircraft Type</th>
<th>Departures</th>
<th>Arrivals</th>
<th>Touch &amp; Go Cycles (1)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Day</td>
<td>Night</td>
<td>Day</td>
<td>Night</td>
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<tr>
<td>Jet</td>
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<td></td>
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<td>Total</td>
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<td></td>
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<td>Total</td>
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<tr>
<td>Twin Piston</td>
<td>BEC58P</td>
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</tr>
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<td>0.0</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
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<td></td>
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</tr>
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<td>Single Piston</td>
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<td>GASEPP(*)</td>
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<td>15.7</td>
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<td></td>
<td>GASEPY(*)</td>
<td>24.2</td>
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<td>23.7</td>
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<td>4.1</td>
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<td>CNA182(*)</td>
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Notes:  
1. Totals and subtotals may not match due to rounding.  
2. New INM type in version INM7.0b.  
3. FAA approved user-defined aircraft.
### Table 9  Forecast 2015 Average Annual Day Operations

Source: SH&E and HMMH, 2009

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Notes: Totals and subtotals may not match due to rounding.

(1) Touch-and-go cycles are two operations.
(2) New INM type in version INM7.0b.
(3) FAA approved user-defined aircraft.
Table 10 Forecast 2020 Average Annual Day Operations
Source: SH&E and HMMH, 2009

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Notes: Totals and subtotals may not match due to rounding. (1) Touch-and-go cycles are two operations. (2) New INM type in version INM7.0b. (3) FAA approved user-defined aircraft.
### Table 11 Forecast March 2010 Average Day Operations

Source: SH&E and HMMH, 2009

<table>
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<tr>
<th>Aircraft Category</th>
<th>INM Aircraft Type</th>
<th>Departures</th>
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<th>Touch &amp; Go Cycles (1)</th>
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Notes: Totals and subtotals may not match due to rounding. (1) Touch-and-go cycles are two operations. (2) New INM type in version INM7.0b. (3) FAA approved user-defined aircraft.
Table 12 Forecast 2010 August Average Day Operations

Source: SH&E and HMMH, 2009

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Jet Subtotal: 10.1 0.6 10.4 0.3 -- -- 21.5

| Turboprop | DHC6  | 1.3 | 0.1   | 1.3 | 0.1   | --  | --    |   2.8 |
|           | CNA441| 1.1 | 0.1   | 1.1 | 0.1   | --  | --    |   2.4 |
|           | 1900D | 0.4 | 0.1   | 0.5 | 0.0   | --  | --    |   1.0 |
|           | SD330 | 0.3 | 0.0   | 0.3 | 0.0   | --  | --    |   0.6 |
|           | CNA208| 0.1 | 0.0   | 0.1 | 0.0   | --  | --    |   0.3 |
|           | PA42  | 0.1 | 0.0   | 0.1 | 0.0   | --  | --    |   0.1 |
|           | PA31  | 0.0 | 0.0   | 0.0 | 0.0   | --  | --    |   0.0 |

Turboprop Subtotal: 3.4 0.3 3.4 0.2 -- -- 7.3

| Twin Piston | BEC58P | 20.8 | 0.2   | 20.2 | 0.8   | --  | --    |   42.0 |
|            | PA31   | 1.1  | 0.0   | 1.1  | 0.0   | --  | --    |   2.3  |
|            | PA30   | 0.3  | 0.0   | 0.3  | 0.0   | --  | --    |   0.7  |

Twin Piston Subtotal: 22.3 0.2 21.6 0.9 -- -- 45.0

| Single Piston | CNA172 | 25.7 | 0.3   | 25.2 | 0.7   | --  | --    |  51.8 |
|              | GASEPF(4) | 14.0 | 0.1   | 14.1 | 0.0   | 11.5 | 0.1   |  39.8 |
|              | GASEPV(4) | 22.1 | 0.2   | 21.6 | 0.8   | 11.3 | 0.3   |  56.3 |
|              | PA28   | 3.8  | 0.0   | 3.8  | 0.0   | --  | --    |   7.7 |
|              | CNA182(4) | 0.6  | 0.0   | 0.6  | 0.0   | 11.2 | 0.3   |  12.7 |
|              | CNA206 | 1.6  | 0.0   | 1.6  | 0.0   | --  | --    |   3.2 |

Single Piston Subtotal: 67.8 0.7 66.9 1.5 34.1 0.7 171.7

| Piston Subtotal | 90.1  | 0.9   | 88.5 | 2.4   | 34.1 | 0.7   | 216.7 |

| Helicopters | S76    | 3.7  | 0.3   | 3.7  | 0.3   | --  | --    |   8.0 |
|            | S70    | 1.6  | 0.2   | 1.6  | 0.2   | --  | --    |   3.6 |
|            | SA365N | 1.7  | 0.0   | 1.7  | 0.0   | --  | --    |   3.5 |
|            | SA330J | 0.9  | 0.1   | 0.9  | 0.1   | --  | --    |   2.1 |
|            | A109   | 0.7  | 0.0   | 0.7  | 0.0   | --  | --    |   1.4 |
|            | R22    | 0.6  | 0.1   | 0.6  | 0.1   | --  | --    |   1.4 |
|            | B222   | 0.6  | 0.1   | 0.6  | 0.1   | --  | --    |   1.4 |
|            | H500D  | 0.8  | 0.1   | 0.8  | 0.1   | --  | --    |   1.7 |
|            | R44    | 0.3  | 0.0   | 0.3  | 0.0   | --  | --    |   0.7 |
|            | EC130  | 0.5  | 0.1   | 0.5  | 0.1   | --  | --    |   1.0 |
|            | B206L  | 0.5  | 0.1   | 0.5  | 0.1   | --  | --    |   1.0 |

Helicopter Subtotal: 11.9 1.1 11.9 1.1 -- -- 25.8

Total: 115.5 2.9 114.2 4.0 34.1 0.7 271.3

Notes: Totals and subtotals may not match due to rounding. (1) Touch-and-go cycles are two operations. (2) New INM type in version INM7.0b. (3) FAA approved user-defined aircraft.
5.6.2 Aircraft Noise and Performance Characteristics

The INM database contains noise and performance data for over one hundred different aircraft types. The program automatically accesses the applicable noise and performance data for operations by those aircraft. Noise data is in the form of SEL (see Section 2.1.4) at a range of distances (from 200 feet to 25,000 feet) from a particular aircraft with engines at a specific thrust level. Performance data includes thrust, speed, and altitude profiles for takeoff and landing operations.

The aircraft types listed in the tables in Section 5.6.1 identify operations according to INM aircraft types. Many of these types represent multiple aircraft models with comparable noise and performance characteristics. For some aircraft models for which the database does not include type-specific data, the FAA has identified “standard” substitutes; i.e., pre-approved surrogates to use from among models in the database. For models not included in the database and for which there is not standard substitute, the FAA works with the INM user to identify appropriate “non-standard substitutes.” Appendix N includes correspondence between HMMH and the FAA for this purpose, including two requests for determinations and the FAA letter identifying the approved substitutes.

One of the jet aircraft types listed in the tables is the “GIIB_HKA.” This is a “user-defined aircraft” that HMMH developed to model Stage 3 “hushkitted” Gulfstream GIIB and GIII aircraft that owners have modified (or “hushkitted”) to meet Stage 3 standards, which permit them to operate at Naples under the Stage 2 ban that the Authority adopted through a Part 161 process, as discussed in Section 4. Appendix O presents documentation that HMMH submitted to the FAA to request agency approval for use of this non-standard input, as well as the FAA response approving use of the input.

5.6.3 Airport Physical Parameters

Naples Municipal Airport (APF) has two operational paved runways: Runway 05/23 and Runway 14/32. The INM requires detailed inputs on the runway layout, including runway end points, runway end elevations, start-of-takeoff roll points, landing thresholds, threshold crossing heights, and approach angles. These inputs define the starting and ending points of modeled operations in three dimensions. These data were obtained from the most current, official published sources, and verified with the Authority staff. The airport layout data sources used in this process include:

- “AirNav.com” web page entry for APF
- FAA “airport diagram” for APF
- FAA Form 5010-1 “Airport Master Record” for APF
- Naples Airport Authority staff

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25 The standard GIIB in the INM database is used to model the Stage 2 version of both the GIIB and GIII; similarly, the user-defined GIIB_HKA is used to model the Stage 3 hushkit versions of both types.

26 AirNav is a private company that is considered a reliable source of airport information, regularly used by pilots to obtain information about an airport prior to operating at it. AirNav obtains the information that it posts on its website from FAA sources. See: [www.AirNav.com](http://www.AirNav.com).


Table 13 summarizes the runway data required by the INM and the source(s) used for each item.

### Table 13 Runway Dimensions

Source: HMMH, 2009

<table>
<thead>
<tr>
<th>Runway</th>
<th>Latitude (degrees)</th>
<th>Longitude (degrees)</th>
<th>Length x Width (feet)</th>
<th>End Elevation (feet MSL)</th>
<th>Displaced Landing Threshold (ft.)</th>
<th>Approach Slope (degrees)</th>
<th>Threshold Crossing Height (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>05</td>
<td>26-08.833040N</td>
<td>081-46.883612W</td>
<td>5,290 x 150</td>
<td>6.2</td>
<td>290</td>
<td>3.5</td>
<td>30.0</td>
</tr>
<tr>
<td>14</td>
<td>26-09.457122N</td>
<td>081-46.815172W</td>
<td>5,000 x 100</td>
<td>6.3</td>
<td>128</td>
<td>3.5</td>
<td>40.0</td>
</tr>
<tr>
<td>23</td>
<td>26-09.458662N</td>
<td>081-46.208737W</td>
<td>5,290 x 150</td>
<td>7.8</td>
<td>0</td>
<td>3.0</td>
<td>43.0</td>
</tr>
<tr>
<td>32</td>
<td>26-08.881495N</td>
<td>081-46.159958W</td>
<td>5,000 x 100</td>
<td>7.0</td>
<td>450</td>
<td>3.0</td>
<td>38.0</td>
</tr>
</tbody>
</table>

**Data Sources:**
- AirNav, FAA Form 5010
- AirNav, FAA Form 5010
- APF staff
- AirNav FAA Form 5010
- AirNav FAA Form 5010
- AirNav FAA Form 5010
- FAA Form 5010

Airport elevation: Eight feet above mean sea level (MSL). Sources: AirNav and FAA Airport Diagram.

Figure 49 presents the FAA Airport Diagram for Naples Municipal Airport. It depicts the runway layout data in a graphic format. The displaced landing thresholds on Runways 5 (landing from the southwest), 14 (landing from the northwest), and 32 (landing from the southeast) are shown with ellipses across the runway. These thresholds are the first points at which aircraft can touch down, except in emergency conditions. There is no displacement on the runway 23 end (landing from the northeast); the landing threshold is the physical end of that runway. Pilots are given visual guidance to approach these thresholds at a safe angle and cross them at a safe height by “precision approach path indicator” (PAPI) light installations at each runway end. Table 13 lists the applicable approach angles and threshold crossing heights. Aircraft are permitted to start their take-off roll at the physical ends of the runways.
Figure 49  FAA Airport Diagram for Naples Municipal Airport

Note: The 75' width shown for Runway 14/32 is in error. Airport staff are working with the FAA to revise this figure to show the correct 100' width.
5.6.4 Runway Utilization

Table 14 summarizes the runway data required by the INM and the source(s) used for each item.

### Table 14 Runway Use

| Source: See following discussion |
| Runway | Time of Day | 05 | 23 | 14 | 32 |
| Day     | 48.3%      | 31.0% | 8.0% | 12.7% |
| Night   | 87.4%      | 6.1%  | 1.5%  | 5.0%  |

HMMH developed these runway use rates for the 2000 Part 150 Noise Exposure Map and Part 161 studies from airport logs of the active runway in use for September 1998, and for March, April, May, and August 1999. FAA Air Traffic Control Tower (ATCT) hourly activity records were then used to adjust this runway use sample to reflect annual activity, by weighting the data according to each month’s share of total annual operations.

To assess the continued validity of these runway use estimates, Table 15 compares the annual average daytime runway use estimates from Table 14 to more recent estimates available from two other sources: (1) the airport’s engineering consultant, Kimley-Horn and Associates (KHA), and the (2) FAA ATCT Manager.

### Table 15 Comparison of Available Runway Use Estimates

| Source: See following discussion |
| Runway | Time Period | 05 | 23 | 14 | 32 |
| 1. Prior Studies [see Table 14] | Annual Average Day Daytime | 48.3% | 31.0% | 8.0% | 12.7% |
| 2. KHA, October 2008 [Note 1] | Annual Average Day, 24 Hours | 45.0% | 30.0% | 15.0% | 10.0% |
| 3. ATCT Manager, April 2009 [Note 2] | Annual Average Day, Daytime | 54.9% | 28.5% | 8.8% | 7.8% |
| 4. ATCT Manager, April 2009 [Note 3] | Oct. – March “Peak Season” Daytime | 65.0% | 17.7% | 8.7% | 8.6% |
| 5. ATCT Manager, April 2009 [Note 4] | April – September “Off-Peak” Daytime | 44.8% | 39.4% | 8.9% | 6.9% |

Note 1: | From October 2008 KHA "Naples Municipal Airport Taxiway Traffic Distribution Technical Report" that cited a conversation with the ATCT Manager in July 2008 as the primary basis for the estimates. |

Note 2: | Based on arithmetic mean of peak and off-peak season estimates discussed in Notes 3 and 4. |

Note 3: | Developed by ATCT Manager based on thorough analysis of all hours that the ATCT was open from October 2008 – March 2009. |

Note 4: | Developed by ATCT Manager based on analysis of hours that the ATCT was open in the first four weeks of April 2009, adjusted based on his professional judgment to represent six-month off-peak period. |

As Table 15 shows, the different sources present significant variation in daytime runway use estimates. The prior studies’ assumptions in the first line were based on the most thorough analysis of operations data, properly weighted to reflect the balance of operations through the entire year.

The KHA estimates presented in the second line are reasonably close to the prior studies’ estimates with regard to the split between 5/23 and 14/32 (75% / 25% for the KHA estimates, versus 79.3% / 20.7% from the prior studies). The KHA and prior studies’ estimates also reflect a very similar split between 5 and 23 (45% / 30% for the KHA estimates, versus 48.3% / 31.0% from the prior studies).

The ATCT Manager’s annual average day estimates presented in the third line differ significantly from the other two annual average day sources. These estimates are less reliable, because they are based on a straightforward arithmetic averaging of peak and off-peak season estimates (lines 4 and 5), without weighting those estimates for differences in activity level.
Based on this comparison, the estimates developed for the prior studies appear most reliable for use in preparing annual average day contours for the official Noise Exposure Map contour, for the following primary reasons:

1. They were based on the largest data sample.
2. They were based on the most careful annualization process.
3. They agree reasonably well with the KHA-reported estimates.

5.6.5 Flight Track Geometry and Utilization

To maximize the accuracy of the flight track modeling inputs, actual flight operations (“radar”) data were obtained for February 1 through March 3, 2009, which includes Presidents’ Day weekend, typically the busiest weekend of the year. These data were obtained from a vendor with a monitoring installation at Southwest Florida International Airport, the closest such installation to Naples Municipal Airport. These flight operations data included information on aircraft tracks over the ground and aircraft altitudes. The data also included flight identification information (such as aircraft type, flight origin or destination, tail number, etc.) for aircraft operating under a flight plan filed with the FAA.

The flight track data thus obtained were used to develop both flight track geometry and percent utilization of each track. The utilization rates were calculated on a runway end basis; i.e., for each type of operations, the track utilization rates add up to 100% for each runway end. Therefore, the analysis is not skewed by any differences between annual runway use and runway use during the sampling period.

The approximate 40-mile distance from the data sensor to Naples resulted in some roughness, breaks, and discontinuities in the observed tracks. The dispersion of tracks near the runway ends is an artifact of the distant data source; clearly aircraft actually fly directly along the runway centerline immediately off the runway ends. Tracking near the ground is particularly difficult from a distance. Overall, however, the tracking data was of higher-than-expected quality for such a remote source and provided a solid basis for developing modeling flight tracks that exceeds Part 150 requirements. This is the first time that actual tracking data have been available for noise modeling and analysis at the airport.

The following six figures present the observed and modeling flight tracks and utilization rates for the following combinations of aircraft type and operations type:

- Figure 50 - Comparison of Modeling Flight Tracks to Observed February 1 – March 3, 2009 PASSUR Tracks, for Jet Departures
- Figure 51 - Comparison of Modeling Flight Tracks to Observed February 1 – March 3, 2009 PASSUR Tracks, for Jet Arrivals
- Figure 52 - Comparison of Modeling Flight Tracks to Observed February 1 – March 3, 2009 PASSUR Tracks, for Propeller Departures
- Figure 53 - Comparison of Modeling Flight Tracks to Observed February 1 – March 3, 2009 PASSUR Tracks, for Propeller Arrivals

The operations data were purchased from PASSUR Aerospace. See: http://www.passur.com/
Figure 54 - Comparison of Touch-and-Go Modeling Flight Tracks to Observed February 1 – March 3, 2009 PASSUR Local Operations Tracks Below 2,000’ MSL (mean sea level)

Figure 55 - Helicopter Modeled Departure and Arrival Tracks

As required by Part 150, these figures depict the modeled flight tracks out to at least 30,000 feet from brake release. However, to fit on an 11” by 17” page, they are at the scale of 1” to 7,500’. Part 150 requires that the modeled flight tracks be presented at a scale of no smaller than 1” to 2,000. FAA guidelines permit airports to present the flight tracks either on a separate, unbound figure at this scale or on a compact disk, to accompany the Noise Exposure Map document. One of these mechanisms will be utilized in the final NEM submission to the FAA.
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Figure 50
Comparison of Modeling Flight Tracks to Observed February 1 – March 3, 2009
PASSUR Tracks, for Jet Departures

Radar tracks obtained from PASSUR™ installation at Southwest Florida International Airport

- Departure Model Track
- Departure Radar Track
- Airport Property
- Naples City Boundary
- Water

Percentage use of each track is indicated with the corresponding track label. Track use adds to 100% for each runway end, subject to minor rounding variation.

Data Source: Collier County GIS, United States Department of Agriculture (USDA) Geospatial Data gateway, Environmental Systems Research Institute (ESRI)
Figure 51
Comparison of Modeling Flight Tracks to Observed February 1 – March 3, 2009
PASSUR Tracks, for Jet Arrivals

Radar tracks obtained from PASSUR™ installation at Southwest Florida International Airport

- Arrival Model Track
- Arrival Radar Track
- Airport Property
- Naples City Boundary
- Water

Percentage use of each track is indicated with the corresponding track label. Track use adds to 100% for each runway end, subject to minor rounding variation.

Data Source: Collier County GIS, United States Department of Agriculture (USDA) Geospatial Data gateway, Environmental Systems Research Institute (ESRI)
Figure 52
Comparison of Modeling Flight Tracks to Observed February 1 – March 3, 2009
PASSUR Tracks, for Propeller Departures

Radar tracks obtained from PASSUR™ installation at Southwest Florida International Airport

- Departure Model Track
- Departure Radar Track

Airport Property
Naples City Boundary
Water

Percentage use of each track is indicated with the corresponding track label. Track use adds to 100% for each runway end, subject to minor rounding variation.

Data Source: Collier County GIS, United States Department of Agriculture (USDA) Geospatial Data gateway, Environmental Systems Research Institute (ESRI)
Figure 53
Comparison of Modeling Flight Tracks to Observed February 1 – March 3, 2009 PASSUR Tracks, for Propeller Arrivals

Radar tracks obtained from PASSUR™ installation at Southwest Florida International Airport

- Arrival Model Track
- Arrival Radar Track
- Airport Property
- Naples City Boundary
- Water

Percentage use of each track is indicated with the corresponding track label. Track use adds to 100% for each runway end, subject to minor rounding variation.

Data Source: Collier County GIS, United States Department of Agriculture (USDA) Geospatial Data gateway, Environmental Systems Research Institute (ESRI)

HARRIS MILLER MILLER & HANSON INC.
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Figure 54
Comparison of Touch-and-Go Modeling Flight Tracks to Observed February 1 – March 3, 2009
PASSUR Tracks, Local Operations Tracks Below 2,000'

Radar tracks obtained from PASSUR™ installation at Southwest Florida International Airport

Since only one touch-and-go is modeled for each runway, the use of each track is 100% for that runway.

Data Source: Collier County GIS, United States Department of Agriculture (USDA) Geospatial Data gateway, Environmental Systems Research Institute (ESRI)
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Figure 55
Helicopter Modeled Departure and Arrival Tracks

Radar tracks obtained from PASSUR™ installation at Southwest Florida International Airport

Percentage use of each track is indicated with the corresponding track label and takes into account "runway" use, so that the percentage use of all arrival tracks adds to 100% and the percentage use of all departure tracks adds to 100%.

Data Source: Collier County GIS, United States Department of Agriculture (USDA) Geospatial Data gateway, Environmental Systems Research Institute (ESRI)
6 PUBLIC CONSULTATION

The Authority prepared this Noise Exposure Map update with extensive public consultation that substantially exceeded Part 150 requirements, including the following principal elements:

- The Authority established a “Part 150 Study Technical Advisory Committee” (TAC) reporting to the established “Noise Compatibility Committee” (NCC), as discussed in Sections 1.2.3 and 1.2.2, respectively. The Authority ran a newspaper advertisement to invite interested parties to join the committee. Members also were sought through announcements at NCC meetings. TAC membership was open to all interested parties, by self-nomination. Appendix D provides the TAC membership list.

- Multiple meetings were held with the TAC, with relevant printed briefing materials, staff and consultant presentations; handouts, and other appropriate communications materials. These meetings provided the TAC with opportunity to review, comment on, and provide input to study assumptions; provide recommendations for study goals and objectives; and in other appropriate ways interact with the staff and consultants to guide the study process and develop recommendations for the Authority to consider in taking official action. The Advisory Group operated on a consensus basis. Appendix I presents copies of agendas and minutes for TAC meetings related to the Noise Exposure Map phase of the study.

- The Draft Noise Exposure Map was presented at a public workshop. The workshop was held from 5 to 8 p.m., on March 2, 2010, at the airport’s Commercial Airline Terminal – a central location with ample free parking and space for the meeting. The workshop was in “open house” format, so that interested parties could come at any time. Five primary “stations” were set up covering: (1) welcome and overview, (2) noise terminology overview, (3) noise measurement elements of the study, (4) existing and forecast noise exposure, and (5) public involvement and comment opportunities. The stations were staffed by consulting team and Authority staff. TAC and NCC members also attended to assist in communicating study results to their constituents and other attendees. Appendix J presents copies of the boards used at the workshop; these boards also were made available to attendees in a handout. Appendix J also presents a copy of the sign-in sheets from the workshop. Twenty one attendees signed in. Three of those who signed in were consulting team members and one was an Authority staff member; the others were local interested parties, including TAC and NCC members, residents, airport users, and other interested parties.

- Copies of the draft Noise Exposure Map were sent to the City of Naples and Collier County planning departments, with a request for comment and an invitation to the workshop. Copies of the cover letters are provided in Appendix K.

- The workshop and draft Noise Exposure Map public review and comment period were advertised through a very extensive notice process summarized in Appendix K, including: newspaper advertisements and legal notices; notices posted at multiple airport locations, mailings to homeowner associations, tenants, the City of Naples, Collier County, and NCC and TAC members; notices to local media outlets; notices to the Economic Development Council of Collier County and the Greater Naples Chamber of Commerce. In total, over 525 individual addresses received notices; and the published and posted notices, and media coverage reached the beyond the City of Naples and Collier County limits.
Copies of the draft Noise Exposure Map were provided for attendees to review at the workshop and comment sheets were provided for the reviewers to fill out and submit to the NAA, at the meeting or by the March 19 comment deadline.

A month-long, February 19 – March 19, 2010, opportunity was provided for public review and comment of the draft Noise Exposure Map. Copies of the draft document were available for public review at the Authority offices throughout this period and comment sheets were provided for the reviewers to fill out and submit to the NAA, on-site or by the March 19 comment deadline; comments were accepted in any written, hard-copy form. Nine attendees submitted comment sheets at the workshop and one additional letter was received prior to the March 19, 2010 comment deadline. None of the written comments identified any deficiencies in or asked questions about the Noise Exposure Map, or otherwise raised any issues requiring that they be addressed in this document. Several comments provided positive feedback about the workshop and the study process. The majority of comments suggested noise compatibility actions for consideration; those suggestions will be reviewed with the TAC and evaluated in the Noise Compatibility Program phase of the Part 150 update. Appendix L presents copies of these ten comments.

In the spirit of Part 150 requirements copies of any further “written comments received during consultation” 30 will be filed with the FAA, including comments received after the deadline.

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30 In 150.21(b).
APPENDIX A  FAA RECORD OF APPROVAL ON 1997 PART 150
NOISE COMPATIBILITY PROGRAM UPDATE
Subject: ACTION: Recommendation for Approval of Naples Municipal Airport, Florida, NCP Update

From: Director, Office of Airport Planning and Programming, APP-1

To: Associate Administrator for Airports

Attached for your action is the Noise Compatibility Program (NCP) for Naples Municipal Airport (APP). The Southern Region has evaluated the NCP and recommends action as set forth in the attached Record of Approval (ROA).

On April 2, 1997, the FAA determined that the Noise Exposure Maps (NEM) complied with applicable requirements of 14 CFR Part 150. At the same time, FAA announced the start of the 180-day Federal review period for the NCP. The formal 180-day review period ends September 29, 1997. If the NCP is not acted on by that date, it will automatically be approved by law (Aviation Safety and Noise Abatement Act), with the exception of flight procedures.

The NEMs depict the DNL contours to the 65dB; the airport operator has adopted the Federal standard of DNL 65dB as contained in Table 1 of 14 CFR part 150. Fifteen measures have been submitted for FAA approval. Some of the measures include several subelements. We are recommending approval of program measures with the following exceptions and qualifications.

One flight procedure is recommended for disapproval due to the lack of noise benefits and potential air traffic safety and efficiency impacts. One of five subelements under "Flight Paths" is recommended for disapproval for purposes of Part 150. It recommends use of technology not yet available at the airport, and the noise benefits of implementing that portion of the measure have not yet been shown.

Three subelements are presented under "use restrictions." These subelements have generated interest and some controversy with aircraft operators, as represented by the NBAA. FAA headquarters, regional, and ADD staff have met with representatives of both the airport and the NBAA. The
recommendations set forth in the NCP portray the FAA’s position after careful consideration of the data presented to date, and were reached after consideration of applicable laws and regulations. Two of the three measures are not recommended for approval. The Stage 1 nighttime curfew has been evaluated for both noise benefits under Part 150 and grants compliance. ANCA and Part 161 do not apply to measures affecting Stage 1 aircraft operations. The second measure, a voluntary Stage 2 and Stage 3 nighttime curfew, lacks noise benefits data. No penalties would be imposed if an aircraft operator cannot comply with this voluntary measure; thus, ANCA and Part 161 do not apply. Lastly, the phaseout of all Stage 2 aircraft by the year 2000, regardless of size, has not been sufficiently analyzed in accordance with the requirements of Part 150, and additionally requires compliance with ANCA and Part 161. The ROA recommends disapproval of this recommendation pending compliance with applicable law and regulation.

All three use restrictions were adopted by ordinance in May of 1996. The airport sponsor was advised at a meeting on July 27, 1997, that it would be in violation of ANCA and Part 161 if the Stage 2 phaseout goes into effect without first complying with applicable portions of Part 161.

All zoning and continuing program measures are recommended for approval.

The Assistant Administrator for Policy, Planning and International Aviation and the Chief Counsel have concurred with the recommendations of the Southern Region. If you agree with the recommended FAA determinations, you should sign the “approved” line on the attached memorandum. I recommend your approval.

Paul L. Galis

Attachment
RECORD OF APPROVAL
NAPLES MUNICIPAL AIRPORT
NAPLES, 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 14 CFR Part 150. The FAA has provided technical advise 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 Record of Approval (ROA) may be subject to applicable environmental or other procedures or requirements.

The operational, land use and continuing program 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

7.2.1 Preferential Runway.

It is recommended that the existing preferential runway measure to maximize the use of Runway 4 for departures and Runway 22 for arrivals for aircraft with departure noise levels exceeding 76.4 EPNdB be continued in order to take advantage of the low sensitivity to noise of the commercial/industrial development located northeast of the airport. Implementation is based on pilot education and preferential runway assignment by the air traffic controllers when the tower is open. (pages 3-3 to 3-8 and 7-1; Tables 3-1 to 3-3, 3-15, 7-1 and 7-2; and Figures 3-1 and 3-2).

FAA Action: Approved.

7.2.2 Flight Procedures.

This measure recommends elimination of the existing restriction to initial climb altitudes on departure from Naples Municipal Airport (APF) to 2,000' above sea level (ASL). (pages 3-12, 3-13, and 7-3; Figure 3-4; and Tables 3-6, 3-16 and 7-2).
FAA Action: Disapproved. This measure will not have a significant noise reduction. In addition, it could interfere with air traffic safety and efficiency because the altitude limit is initially necessary to ensure separation from other traffic in the area and is removed by the controller when the aircraft is radar identified and separation is assured.

7.2.3 Flight Paths.

Revised Visual Flight Rules (VFR) noise abatement departure flight paths have been proposed for each runway at the airport to reduce noise by moving traffic away from developed areas.

Runway 4 - early left turn. Aircraft would fly just to the east of Airport-Pulling Road and would avoid the residential communities in the area.

Runway 22 - right turn. Aircraft would move away from the majority of the residential dwellings which are located southwest of the airport.

Runway 13 - early left turn. This track turns aircraft just north of Davis Boulevard, away from the residential development south of Davis.

Runway 31 - the existing departure, with a right turn, would impact the least number of people due to the fact that the aircraft do not overfly the coastline with its densely packed residential units.

The FAA must also develop procedures which allow the pilots to fly these preferred flight paths. This is typically accomplished through SIDs or STARs, which are departure or arrival paths defined by radio navigation aids. Current systems such as the VOR, located on and off the airport, already provide this capability, but newer technology has even greater promise. Two newer systems, the Global Positioning System (GPS) and Transponder Landing System (TLS) could be used to define complex curved approach or departure paths which could be used to keep aircraft away from densely populated residential areas. The FAA has applied for state grants to install the TLS system by the end of fiscal year 1997. (pages 3-16 to 3-31, 7-3 and 7-4; Tables 3-8 to 3-11, 3-16 and 7-2; and Figures 3-5 to 3-15).

FAA Action: Approved in part as a voluntary measure. The recommended noise abatement departure flight paths are approved as voluntary.

The measure is disapproved in part, for purposes of Part 150, for that portion of the proposal which recommends use of the GPS and TLS to define complex curved approach and departure paths, pending submission of additional information describing
the noise benefits of these techniques when technology becomes available.

7.2.4 Helicopters.

It is recommended that the existing noise abatement measures for helicopters be continued including modification of take-off areas to implement common centralized departure areas and education of helicopter pilots. Helicopter pilots have agreed to depart from midfield, rather than runway ends, in order to obtain as much altitude as possible before departing the airport and helicopters will follow the fixed wing routes on the crosswind runway. The Naples Airport Authority (NAA) will maintain contact with pilot operators to modify these procedures, if necessary, and work out additional issues as they arise. (pages 3-31, 3-32 and 7-4; and Tables 3-7, 3-16, 7-1 and 7-2).

FAA Action: Approved as a voluntary measure.

7.2.5 Use Restrictions.

The following measures were adopted by ordinance effective May 15, 1996, and are proposed for FAA approval in this Part 150 document. The measures include:

a. nighttime elimination of Stage 1 aircraft use of the airport;

b. voluntary curfew of Stage 2 and 3 jets during nighttime hours;

c. future nighttime elimination of Stage 2 aircraft after the beginning of the year 2000, which is the target for the federal phase-out of Stage 2 aircraft weighing greater than 75,000 pounds.

These restrictions would not apply to emergency flights, medical or government flights, or other flights which are for the benefit of public health, safety, and welfare. A Part 161 study may be appropriate or required. (pages 3-32 to 3-42 and 7-4; Tables 3-12 to 3-14, 3-16 and 7-4; and Figures 3-16 and 3-17; supplemental information submitted from NAA by letter dated July 31, 1997).

FAA Action:

a. Approved, with respect to the Stage 1 ban. The airport operator has submitted supplemental information by letter dated July 31, 1997, which has been made part of this ROA, to support that Stage 1 operators have been successfully able to comply with this measure. The MCP states that this measure would reduce the population impacted within the DNL 65dB noise
contour from 150 to 0 for the 6-year time frame. This measure has been in effect since May 1996 with no apparent concern by affected operators regarding undue burden on interstate or foreign commerce (see supplemental information submitted by airport operator). However, should impacts on air commerce occur which cannot be foreseen at the time of this approval, the FAA will reevaluate this determination in view of new factual information to ascertain whether it still meets the standards for Part 150 approval or whether approval should be withdrawn in accordance with section 150.35(d)(6).

b. Disapproved for purposes of Part 150 pending submission of sufficient information to make an informed analysis with respect to the voluntary curfew of Stage 2 and Stage 3 jets during nighttime hours. Although noise benefits of the voluntary curfew may be “intuitive”, the NCP does not provide noise benefits for this measure. Truly voluntary operational measures affecting Stage 2 and Stage 3 aircraft are not subject to 14 CFR Part 161. However, any changes to the method of implementation which may affect whether this measure is voluntary would be subject to applicable procedures contained in 14 CFR Part 161.

c. Disapproved with regard to the mandatory Stage 2 phaseout to begin the year 2000, pending satisfactory compliance with 14 CFR Part 161, and pending submittal of additional information to make an informed analysis. The Federal phaseout applies to aircraft weighing greater than 75,000 pounds. The NCP states that “Significantly less than 1 percent of all corporate jet operations at APF are in aircraft with maximum gross takeoff weights over 75,000 pounds.” Part 161 requires separate analysis of restrictions on Stage 2 aircraft weighing less than 75,000 pounds; in addition, the burden on commerce has not been presented nor are the noise impacts versus the benefits of this measure presented.

7.2.6 Ground Noise.

It is recommended that the existing ban on nighttime (between 10:00 p.m. and 7:00 a.m.) maintenance runups, effective May 15, 1996, and the designated locations and orientations recommended for maintenance and pre-flight runups for turboprop aircraft be continued. Operators may request permission from airport management to conduct a maintenance runup during the restricted hours under exceptional circumstances. For example, an operator may require the aircraft for an early morning departure, which would have to incur a substantial delay if the runup could not be conducted until after 7:00 a.m. For such approval, management may set limits on exactly when and where the runup would be conducted, and limit duration of the runup and the power settings used. Maintenance or pre-flight runups for turboprop aircraft should be conducted at one of the locations shown on Figure 3-19 in the NCP document and, as wind conditions permit, should be oriented to the north or
northeast. This will abate ground noise levels in the community, especially at times when background noise levels are very low. (pages 3-43 to 3-45; Tables 3-15, 7-1 and 7-2; and Figures 3-18 and 3-17).

**FAA Action:** Approved. FAA approval is given in consideration of the exceptions available to aircraft operators. This measure has been in effect since May 1995. New information which may become available to the FAA which demonstrates that this measure could impact total number or hours of Stage 2 or Stage 3 aircraft operations may make this measure subject to applicable requirements of 14 CFR Part 161.

**LAND USE MEASURES**

7.3.1 Land Acquisition.

This measure recommends land acquisition in Rock Creek Campground and residential or vacant uses in the Naples Villas area to develop a compatible buffer when no other land use strategy is appropriate. (pages 5-2 to 5-5 and 7-3; Tables 5-2 and 7-3; and Figures 4-2 and 5-1).

**FAA Action:** Approved under 14 CFR Part 150 with respect to noncompatible land uses within the noise contours of the official noise exposure maps as provided in the Aviation Safety and Noise Abatement Act and 14 CFR Part 150. Some of these areas may be outside of the noise contours, in which case they would be outside the parameters of this Part 150 approval. However, the FAA would encourage local government to exercise its prerogative to establish noise buffers that meet locally determined needs. Vacant land is deemed compatible under 14 CFR Part 150 unless it is demonstrated that there is imminent danger of it being developed noncompatibly.

7.3.2 Easements.

This measure recommends the purchase of easements for homes in the Naples Villas area and the consideration of easements for Rock Creek Campground to provide an adequate buffer of compatible uses around the airport. (pages 5-7, 5-8 and 7-5; Tables 5-2 and 7-3; and Figures 4-2 and 5-1).

**FAA Action:** Approved under 14 CFR Part 150 with respect to noncompatible land uses within the noise contours of the official noise exposure maps as provided in the Aviation Safety and Noise Abatement Act and 14 CFR Part 150. Some of these areas may be outside of the noise contours, in which case they would be outside the parameters of this Part 150 approval. However, the FAA would encourage local government to exercise...
its prerogative to establish noise buffers that meet locally determined needs. Vacant land is deemed compatible under 14 CFR Part 150 unless it is demonstrated that there is imminent danger of it being developed noncompatibly.

7.3.3 Zoning/Land Use Planning.

The NAA has adopted the DNL 65dB noise contour as the threshold of incompatibility for residential areas, but for zoning and land use planning this measure recommends that the area within the DNL 65dB noise contour apply the same standards as Part 150 recommends for the DNL 65dB noise contour as a buffer to ensure that residential and noise sensitive uses are not developed too close to the Airport. (pages 5-10 to 5-12 and 7-5; Tables 5-2 and 7-3; and Figure 5-2).

FAA Action: Approved. This is within the authority of the local land use planning jurisdictions.

7.3.4 Fair Disclosure

It is recommended that a Fair Disclosure Program be developed to educate potential home buyers of the airport and its flight paths through voluntary cooperation from realtors, lenders, property managers, and local government staff so all potential residents who would be located along the flight paths for the runways would be aware of their location. This measure includes the development, publication and distribution of information regarding airport noise and operations. (pages 5-13, 5-14 and 7-5; and Tables 5-2 and 7-3).

FAA Action: Approved.

CONTINUING PROGRAM MEASURES

7.4.1 Noise Abatement Officer.

It is recommended that the Noise Abatement Officer position currently being filled by staff with additional responsibilities at the Airport be continued. This person's responsibilities include oversight of the implementation of all noise abatement/land use compatibility programs as well as investigation of noise complaints. (pages 2-3, 6-1 and 7-6; and Table 7-4).

FAA Action: Approved.
7.4.2 Noise Compatibility Advisory Committee.

This measure recommends the implementation of a noise compatibility advisory committee with membership consisting of representatives of airport users and tenants, local officials, area businesses, area residents, and Airport management. This will be an advisory committee to provide feedback regarding noise issues and represent all interests on and around the airport. (pages 6-1 and 7-6; and Table 7-4).

FAA Action: Approved.

7.4.3 Noise Monitoring Program.

This measure recommends the implementation of a noise monitoring program and the purchase (or rental) of a portable noise monitor and associated computer software and hardware. Residents surrounding the Airport can assist the noise abatement officer by providing sites for noise monitoring. (pages 6-2 and 7-6; and Table 7-4).

FAA Action: Approved.

7.4.4 Public Information Program.

The development and implementation of a public information program is recommended to provide the public with information which makes them aware of the efforts of the Airport management to address their concerns. One measure which would continue is the newsletter which is routinely published by the NAA. (pages 6-2 and 7-6; and Table 7-4).

FAA Action: Approved.

7.4.5 NCP Review, Evaluation, and Revision.

This measure recommends that the Noise Compatibility Program be reviewed and evaluated on a regular basis to measure performance against goals. The Part 150 will be updated every five years or sooner if applicable. (pages 6-2 and 7-6; and Table 7-4).

FAA Action: Approved.
APPENDIX B  FAA RECORD OF APPROVAL ON 1998 PART 150 
NOISE COMPATIBILITY PROGRAM UPDATE
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Memorandum

Subject: ACTION: Record of Approval for Naples Municipal Airport (APF), Naples, Florida

Date: MAR 2 1999

From: Director, Office of Airport Planning

And Programming

To: Associate Administrator for Airports

Attached for your action is an update to the Noise Compatibility Program for Naples Municipal Airport (APF). On September 3, 1996, the FAA announced its intention to approve or disapprove the proposed update within 180 days. The last day for such action is March 2, 1999.

While the airport sponsor, the Naples Airport Authority (NAA), was developing a Noise Compatibility Program (NCP), it adopted by ordinance (1) a nighttime curfew on Stage 1 operations, (2) a voluntary curfew on Stage 2 and 3 operations, and (3) a plan to phase out use of the airport by Stage 1 aircraft by January 1, 1997. The ordinance was effective May 15, 1996. In February 1997, NAA submitted these measures along with other recommendations to the FAA for approval as part of its NCP. In July 1997, the FAA advised the airport sponsor that it must comply with the Airport Noise and Capacity Act and 14 CFR Part 161 to implement a proposed Stage 2 phase out. In September 1997, the FAA issued a Record of Approval in which FAA approved the nighttime curfew and most other measures. FAA disapproved a voluntary curfew on Stage 2 and 3 operations, and the mandatory Stage 2 phase out.

NAA collected extensive operational and noise data and prepared an update to its NCP dated February 1998 in which it now proposes to ban Stage 1 aircraft operations. NAA would amend its Airport Rules and Regulations, Section 5.069, upon FAA approval of the recommendation. This measure has generated some controversy, as reflected in two letters objecting to the proposal that were submitted by the National Business Aviation Association (NBAA) on the grounds that it is unreasonable, unjustly discriminatory, and federally preempted. It should also be noted that the 1998 NCP Update indicates that the airport sponsor has taken no action to date to implement the purchase of avigation easements or the land acquisition measures that FAA approved in the September 1997 ROA.
The FAA has undertaken consultation and extensive review, and the airport sponsor has submitted clarifying information, resulting in the attached recommendation for approval. The FAA’s decision is explained in detail in the attached Record of Approval. The FAA has also carefully considered the letters submitted by the NBAA and has prepared a memorandum that responds to each major issue raised by NBAA.

The Assistant Administrator for Policy, Planning and International Aviation and the Chief Counsel have concurred with the recommendations of the Southern Region. If you agree with the recommended FAA determinations, you should sign the “approved” line on the attached memorandum. I recommend your approval.

Paul L. Galle

Attachments
FEDERAL AVIATION ADMINISTRATION

RECORD OF APPROVAL
PART 150 NOISE COMPATIBILITY
PROGRAM REVISION

Naples Municipal Airport
Naples, Florida

CONCUR
NONCONCUR

David Taylor
Assistant Administrator for
Policy, Planning, and
International Aviation, API-1

3/1/77
Date

CONCUR
NONCONCUR

Naples, Florida

3/9/79
Date

Chief Counsel, AGC-1

APPROVED
DISAPPROVED

Assistant Administrator
for Airports, ARP-1

3/2/79
Date
RECORD OF APPROVAL

NAPLES MUNICIPAL AIRPORT

NAPLES, FLORIDA

The approval listed herein includes approval of an action that the airport recommends be taken by the Federal Aviation Administration (FAA). It should be noted that this approval indicates only that the action would, if implemented, be consistent with the purposes of 14 C.F.R., Part 150.

The operational measure below summarizes as closely as possible the airport operator’s recommendation in the Noise Compatibility Program (NCP) Update and is cross-referenced to the program. The statements contained within the summarized operational measure and before the indicated FAA approval do not represent the opinions or decisions of the FAA.

BACKGROUND

In February 1997, the Naples Airport Authority (NAA) submitted to the FAA an Update to the Part 150 Noise Compatibility Program (NCP) for Naples Municipal Airport (APF). The Update consisted of 15 measures, one which would allow operations by Stage I aircraft (weighing less than 75,000) only between the hours of 7 a.m. to 10 p.m. The FAA approved the nighttime curfew and most of the other measures submitted by the airport sponsor. In March of 1998, the NAA submitted a second Update to its Part 150 NCP. In that Update, the NAA proposed extending the current Stage I curfew to a full 24-hour ban, thereby prohibiting the operation of any Stage I aircraft weighing less than 75,000 pounds at APF.

On September 18, 1998, the FAA published a notice in the Federal Register announcing that it would be reviewing the NCP submitted by Naples and requesting comments. 63 FR 49942. The FAA received one letter, from the National Business Aviation Association (NBAA), dated March 27, 1998. That letter indicated that it supplemented its earlier May 28, 1997, comments on the 1997 NCP for Naples, objecting to restrictions on Stage I aircraft operations. The March 27 letter summarized NBAA’s earlier comments, objecting to the Stage I ban. As grounds for its objection, the NBAA argues that: (1) the terms of the 24-hour ban deprives public access on unfair and unreasonable terms, (2) the terms of the ban are unjustly discriminatory, and (3) the ban is preempted by federal law. In July of 1998, the NAA provided additional clarification through its consultant, Harris Miller Miller and Hanson, Inc. (HMMH), in response to issues raised during FAA’s preliminary review. The analysis and July supplement include evidence of the noise benefit that will accrue to neighboring communities as a result of the ban, statistics on the number of Stage I aircraft operating nationally as well as the number operating at Naples, and information about the existence of other nearby airports available for use by Stage I operators.
OPERATIONAL MEASURES

1. Extend Existing Nighttime Stage 1 Use Restriction to 24 Hours.

The Naples Airport Authority (NAA) requests that the FAA approve extension of the existing nighttime curfew on operations by Stage 1 aircraft (10 p.m. to 7 a.m.) to a 24 hour ban. "Emergency, medical, or government flights or other flights which are for the benefit of public health, safety, and welfare would be exempt from the ban." (NCP Update, February 1998; Amendment to NEM and NCP prepared by HMMH, Report 295500, July 24, 1998).

APPROVED. The NCP demonstrates that the recommended Stage 1 ban provides a noise benefit both in the short term and in the five year planning timeframes. In 1998, the Stage 1 ban is predicted to reduce the number of residential dwelling units within the 65 dB DNL from 184 to 77 dwelling units, and to remove 120 individuals from the 65 dB DNL contour. In 2003, the number of residences significantly impacted by noise would be reduced from 185 to 146, and the number of individuals impacted would be reduced by 195. In addition, the ban is reasonable because there are no Stage I aircraft based at the Airport and less than two operations per day are affected by the ban. There are seven companies operating Stage I aircraft at APF; two companies use the aircraft primarily for ambulance services, two other companies have alternate non-Stage I aircraft they can utilize, two companies operating only Stage I aircraft offered no objection to the ban, and only one company indicated that the ban would impose an inconvenience but not a financial hardship. For those who do not own alternative aircraft, the impact will be minimal because there are two other airports located within 30 miles of the city of Naples that can accommodate the affected aircraft.

As a matter of policy, FAA does not consider the use of aircraft stage designations to be unjustly discriminatory per se. Moreover, the ban is unjustly discriminatory because Stage 1 aircraft are the loudest type of aircraft operating at Naples.

The exemptions to further public health, safety, and welfare, which were applied in 1997 to the Stage 1 nighttime curfew, are being extended to this 24-hour ban. The FAA commented in September 1997 that the exception of emergency medical flights is a justifiable exception.

The ban on operations by Stage 1 aircraft weighing less than 75,000 pounds is not federally preempted because the scheme of federal regulation of Stage I aircraft is not so pervasive as to make reasonable the inference that FAA left no room for airport proprietors to supplement it. The FAA’s interest in Stage 1 aircraft is not so dominant that the federal system should be assumed to preclude enforcement of local rules on the same subject, and because the goals of FAA regulation and obligations imposed by FAA do not reveal any purpose to preclude the exercise of State authority. See Rice v. Santa Fe Elevator Corp., 331 U.S. 218, 230 (1947). See Pacific Gas & Electric Co. v. State Energy Resources Conservation and Development Comm’n, 461 U.S. 190, 203-204 (1983).
By stating its intent to conduct further study and actions as may be appropriate when it required the gradual elimination of operations by Stage 1 aircraft weighing more than 75,000 pounds, FAA did not intend or ordain complete preemption of regulations of operations by all Stage 1 aircraft. In the preamble of the final rule that phased out operations by Stage 1 aircraft weighing more than 75,000 pounds, FAA stated "...operating noise limits for turbojet airplanes weighing 75,000 pounds or less cannot be adopted in a manner consistent with the constraints in...the Act. However, the FAA is proceeding in keeping with the comprehensive analysis of the public impact of aircraft noise. As the results of this study become available over the next two years, FAA will undertake such actions as may be appropriate." 41 FR 96055 (December 23, 1976). Since 1976, the FAA has not conducted the contemplated study and has not undertaken further action, with the result that the use of such aircraft is being gradually eliminated through attrition. Although FAA Advisory Circular 150-5020-1, Airport Noise Compatibility Planning, dated August 5, 1983, and the 1976 Department of Transportation Aviation Noise Abatement Policy warn about conflicts between local airport rules and the federal scheme concerning deadlines for retrofit or replacement of Stage 1 aircraft, when these statements are read in context it is clear that the FAA is speaking only about Stage 1 aircraft weighing more than 75,000 pounds. These guidance documents are silent about Stage 1 aircraft weighing less than 75,000 pounds. Neither document clearly manifests FAA intent to supersede the exercise of proprietary power.

Given FAA's exercise of a detailed and supervisory role over Stage 1 aircraft weighing more than 75,000 pounds, FAA's silence in these circumstances should not be presumed to be or construed as a barrier to action by Naples Airport Authority to establish requirements as to the permissible level of noise created by Stage 1 aircraft weighing less than 75,000 pounds using its airport. Based upon the small number of such aircraft left in the total U.S. fleet, estimated by NAA's reported research as less than 50, FAA has determined that further action is not appropriate because there are no federal concerns requiring national regulation. There do not appear to be any expanding risks of disruption in traffic to and from airports or economic distress among carriers that require a federal policy to balance the goal of noise reduction with economic and technological difficulties.

Additionally, this is not a case where preemption results from actual conflict between state and federal law. As there is no federal requirement concerning the pace of elimination of operations by Stage 1 aircraft weighing less than 75,000 pounds, aircraft operators may comply with this local ban on such operations. Based upon the record before us, it does not appear that the Stage 1 ban at Naples Airport would stand as an obstacle to the accomplishment and execution of purposes and objectives of Congress and the FAA. The small number of such aircraft, the fact that none are based at or used by air carriers at the airport, and the role of Naples Airport indicate that the ban would impose a minimal burden on interstate commerce. Should impacts on air commerce occur which are unforeseeable at the time of this approval, or should the FAA receive significant new information such as that the exemptions are granted in an unjust manner, the FAA will reevaluate this determination upon receipt of new information to ascertain whether it still meets the standards for Part 150 approval.
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APPENDIX C  OVERVIEW OF PART 36 STAGE CLASSIFICATIONS
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C.1 Introduction

The Federal Aviation Administration (FAA) has established limits on allowable levels of aircraft noise emissions, under 14 CFR Part 36, "Noise Standards: Aircraft Type and Airworthiness Certification," that sets noise standards airplanes must meet to receive new or revised "type" or "airworthiness" certificates, to operate in the U.S. The standards, measurement locations, and procedures, and noise limits vary according combinations of aircraft “design” criteria, including, but not limited to, factors such as subsonic versus supersonic speed capabilities, type of propulsion (e.g. turbojet- or propeller-driven), weight categories (e.g., “small” aircraft with maximum gross takeoff weights less than 12,500 pounds, and “large” aircraft with maximum takeoff weights of 12,500 pounds or more), helicopter versus fixed-wing aircraft, operating category (e.g., “agricultural”, “transport”, and “commuter”), date of initial fight, and, in limited cases, even specific engine manufacturer and model or specific characteristics of turbojet engines. In general, permissible noise levels, in terms of Effective Perceived Noise decibels (EPNdB), increase with maximum gross takeoff weight.

C.2 Initial Rule: 1969 - Establishment of Initial Certification Standards

When first promulgated in 1969, Part 36 only applied to “transport-category” large aircraft and all turbojet-powered aircraft. Transport category includes all jets with 10 or more seats or greater than 12,500 pound maximum takeoff weights, and all propeller-driven airplanes with greater than 19 seats or greater than 19,000 pound maximum takeoff weight. The regulation set separate measurement requirements and limits for takeoff, sideline, and approach locations. Also when promulgated in 1969, the regulation categorized aircraft as “certificated” or “uncertificated”, to reflect whether the aircraft type had passed testing or not.

C.3 1974 Amendment - Application of Part 36 to Propeller-Driven Aircraft

The FAA added noise standards for “propeller driven small aircraft” in 1974, prior to the creation of the “stage” terminology. They continue to be termed either “certificated” or “uncertificated”, with no stage references.

C.4 1977 Amendment - Introduction of Stage Classifications

In 1977, the FAA amended Part 36 to define more stringent noise limits for transport-category large aircraft and all turbojet-powered aircraft types, and introduced the concept of certification “stages”, to provide terminology to differentiate between the original and revised standards. For “transport category” large airplanes and all turbojet-powered airplanes, this amendment created three stages:

- “Stage 1” aircraft have never been shown to meet any noise standards, either because they have never been tested, or because they have been tested and failed.
- “Stage 2” aircraft meet original noise limits, set in 1969.
- “Stage 3” aircraft meet more stringent limits, established in 1977.
C.5 1988 Amendment - Addition of Certification Standards for Helicopters

The FAA amended Part 36 to incorporate standards for helicopters in 1988, after the creation of stage terminology. Part 36 uses two stage classifications for helicopters. Stage 1 helicopters are uncertificated, either because they have never been tested for compliance with noise standards, or because they have been tested and failed to meet the standards. Stage 2 helicopters are certificated, because they have passed the prescribed tests. The segregation of helicopters into only two Part 36 classifications is equivalent to the manner in which the regulation treats “propeller driven small aircraft”. Stage 2 does not have the same meaning for helicopters as for transport-category large aircraft and turbojet-powered aircraft, for which it reflects compliance with less stringent limits. For helicopters, it reflects compliance with the highest standards the FAA has issued to date. Measurement locations and testing requirements differ significantly for helicopters and propeller-driven small airplanes, compared to each other, and to transport-category large aircraft and turbojet-powered aircraft.

C.6 2005 Amendment - Addition of Stage 4 Certification Standards

In 2005, FAA amended Part 36 to adopt a Stage 4 classification. The Stage 4 noise limits are a cumulative 10 EPNdB less than those for Stage 3. All subsonic turbojet-powered and transport-category airplanes with maximum gross takeoff weights of 12,500 pounds or more for which application of a new type design is submitted on or after January 1, 2006, must meet new noise certification levels.

It should be noted that the new Stage 4 standard applies only to application for a new airplane type design on and after January 1, 2006. It does not initiate any FAA process to phase out the production or operation of current aircraft models. Stage 1, 2, and 3 aircraft under 75,000 pounds and Stage 3 aircraft of 75,000 pounds or more may continue to operate in the U.S. However, it also should be noted that most, if not all, civil subsonic turbojet aircraft under 75,000 pounds in production today meet Stage 4 standards.
APPENDIX D  TECHNICAL ADVISORY COMMITTEE MEMBERSHIP
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### FAR PART 150 STUDY UPDATE
#### TECHNICAL ADVISORY COMMITTEE

<table>
<thead>
<tr>
<th>Noise Compatibility Committee Members</th>
<th>Community Members</th>
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APPENDIX E  CITY OF NAPLES ORDINANCE NO. 98-81652

Note: The city ordinance will be reviewed in the Noise Compatibility Program phase of this Part 150 update study to determine areas where revisions to policy matters, such as compatibility criteria, might be appropriate, and areas where factual matters must be updated, such as noise contours and FAA-defined protections “zones,” “surfaces,” and “heights.”
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Future Land Use Element
F.L.U.E. 33

Constitution of the State of Florida and as described in Section 196.1997, F.S.

Policy 6-16: Publicize the incentives and assistance programs which are available for the protection and preservation of historic resources.

Policy 6-17: The Planning Department shall review demolition permits prior to issuance to determine consistency with guidelines in the Support Document for historic resources.

Objective 7: Assure the Naples Municipal Airport is managed in a manner which will best serve the overall interests of the community.

Policy 7-1: Prevent potential incompatibilities in land use surrounding the airport through zoning and land use planning.

Policy 7-1.1: Land outside of the airport site, and located within the 60 LDN contour area shall require CDSP approval by City Council.

Policy 7-1.2: The Naples Airport Authority and City Council will meet quarterly for review and comment on proposed airport development.

Policy 7-1.3: Prohibit any construction within the runway safety areas off of the airport property which would create potential safety hazards.

Policy 7-2: Protect the water quality of Naples Bay by reducing the effects of runoff.

Policy 7-2.1: Utilize a combination of existing wetlands, created wetlands, and other stormwater management technology, as appropriate, to manage stormwater runoff consistent with South Florida Water Management District regulations.

Adopted 1/21/98; Ordinance 98-8165
Amended by Stipulated Settlement Agreement 6/17/98; Ordinance 98-8284
AN ORDINANCE ADOPTING THE 1997 COMPREHENSIVE PLAN: MODERNIZING THE 1989 COMPREHENSIVE PLAN AND SUBSEQUENT AMENDMENTS THERETO; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the City Council of the City of Naples adopted the Evaluation and Appraisal Report (EAR) on December 20, 1995, pursuant to Chapter 163.3192, Florida Statutes, and Chapter 93-5.0053, Florida Administrative Code; and

WHEREAS, the adopted EAR contains two fundamental recommendations: (1) the Comprehensive Plan needs to be more strategic, and (2) detailed neighborhood planning is needed; and

WHEREAS, based on the EAR recommendations, the City initiated the VISION 2005 process and neighborhood planning efforts; and

WHEREAS, the City Council of the City of Naples approved the VISION 2005 Statement on October 2, 1996; and

WHEREAS, the approved VISION 2005 statement and neighborhood plans form the basis for the Comprehensive Plan; and

WHEREAS, the Comprehensive Plan was prepared in accordance with Chapter 163.3177, Florida Statutes, and Chapter 90-5, Florida Administrative Code; and

WHEREAS, the City of Naples adopted Public Participation procedures in accordance with Chapter 163.3181, Florida Statutes, and provided for public participation according to these procedures; and

WHEREAS, the Planning Advisory Board voted 6-0 to adopt the Comprehensive Plan as amended following a public hearing held on May 14, 1997; and

WHEREAS, the City of Naples held public hearings on June 15, 1997 and January 21, 1998, prior to transmitting the Comprehensive Plan to the Department of Community Affairs; and

WHEREAS, said public hearings were advertised in accordance with Chapter 163.3194(15), Florida Statutes; and

WHEREAS, the City Council of the City of Naples, Florida, hereby finds it to be in the best interest of the public health, safety and welfare of the citizens to adopt the Comprehensive Plan.

NOW, THEREFORE, BE IT ORDAINED BY THE COUNCIL OF THE CITY OF NAPLES, FLORIDA:

Section 1. That the Comprehensive Plan is hereby adopted, attached hereto and incorporated herein.

Section 2. The following ordinances adopting and amending the 1999 Comprehensive Plan are hereby repealed:

89-3713
89-3900
90-6034
90-6037
90-6230
90-6251
Ordinance 98-6165

Section 3. The effective date of this plan amendment, as set forth in section 1 above, and the effective date of the repeal of the Comprehensive Plan provisions set forth in section 2 above, shall be the date a final order is issued by the Department of Community Affairs or the date on which the Administration Commission finds the amendment in compliance in accordance with Section 163.3184, Florida Statutes, whichever occurs first. No development orders, development permits, or land use dependent on this amendment may be issued or commence before it has become effective. If a final order of noncompliance is issued by the Administration Commission, this amendment may nevertheless be made effective by adoption of a resolution affirming its effective status, a copy of which resolutions shall be sent to the Department of Community Affairs, Bureau of Local Planning, 2555 Shumard Oak Boulevard, Tallahassee, Florida 32399-2100.

APPROVED AT FIRST READING THIS 19 DAY OF JUNE, 1997.

Bill Barnett, Mayor

Attest:

Kenneth S. Cowles, City Attorney

Approved as to form and legality:

[Signature]

For the attachment listed above, please see Ordinances and Resolutions Book 109 (A)
AN ORDINANCE ADOPTING TEXT AMENDMENTS TO THE FUTURE LAND USE, COASTAL CONSERVATION, AND TRANSPORTATION ELEMENTS OF THE ADOPTED COMPREHENSIVE PLAN; PROVIDING A REPEALABILITY CLAUSE; A REPEALER PROVISION; AND AN EFFECTIVE DATE.

WHEREAS, on January 21, 1998 the City Council adopted Ordinance 98-8165 adopting the 1997 Comprehensive Plans and

WHEREAS, on March 12, 1998 the Department of Community Affairs issued a notice of intent to find the City's Comprehensive Plan not in compliance; and

WHEREAS, the City has executed a Stipulated Settlement Agreement with the Department of Community Affairs that renders the City's Comprehensive Plan in compliance; and

WHEREAS, the Stipulated Settlement Agreement outlines text amendments to the Future Land Use, Coastal Conservation, and Transportation Elements of the adopted Comprehensive Plan; and

WHEREAS, the City Council of the City of Naples, Florida, hereby finds it to be in the best interest of the public health, safety, and welfare to adopt the proposed Comprehensive Plan amendments;

NOW THEREFORE, BE IT ORDAINED by the Council of the City of Naples, Florida:

Section 1. That text amendments to the future land use, coastal conservation, and transportation elements of the adopted comprehensive plan are hereby adopted as detailed in Attachment "A", attached hereto and incorporated herein.

Section 2. If any word, phrase, clause, subsection or section of this ordinance is for any reason held unconstitutional or invalid, the invalidity thereof shall not affect the validity of any remaining portions of this ordinance.

Section 3. That all sections or parts of sections of the Code of Municipal Ordinances, all ordinances or parts of ordinances, and all resolutions or parts of resolutions in conflict herewith, be and the same are hereby repealed to the extent of such conflict.

Section 4. This ordinance shall take effect immediately upon adoption at second reading.

APPROVED AT FIRST READING THIS 3RD DAY OF JUNE 1998.

PASSED AND ADOPTED AT SECOND READING AND PUBLIC HEARING IN OPEN AND REGULAR SESSION
### Future Land Use Element

#### A. Inconsistent Provisions

The inconsistent provisions of the plan amendment under this subject heading are as follows:

1. The densities permitted for the land use categories High Density Residential Tower and Mobile Home are reflective of existing, approved developments, and are not expressed in terms of an objective measurement of the number of people or residential units allowed per unit of land as required.

**Response**

Policy 1-1: The permitted intensity/density in each land use designation is as follows:

<table>
<thead>
<tr>
<th>LAND USE CATEGORY</th>
<th>INTENSITY/DENSITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beach Front Estates</td>
<td>1 dwelling unit per 1.5 acres</td>
</tr>
<tr>
<td>Low Density Residential</td>
<td>0-6 dwelling units per acre</td>
</tr>
<tr>
<td>Medium Density Residential</td>
<td>0-12 dwelling units per acre</td>
</tr>
<tr>
<td>High Density Residential Low Rise</td>
<td>0-15 dwelling units per acre</td>
</tr>
<tr>
<td>High Density Residential Low Rise</td>
<td>0-15 dwelling units per acre</td>
</tr>
<tr>
<td>High Density Residential Mid Rise</td>
<td>15-18 dwelling units per acre</td>
</tr>
<tr>
<td>High Density Residential High Rise</td>
<td>0-18 dwelling units per acre</td>
</tr>
<tr>
<td>High Density Residential Tower</td>
<td>0-23 units per acre and further limited by pre-approved PD/Developer’s Agreement</td>
</tr>
</tbody>
</table>

| Mobile Home Residential           | Total units canned at 1+1 mobile homes and 31 recreational vehicle spaces per approved Planned Development (Ordinance #7-6778 dated 10/21/82) |
| Limited Commercial                | 50% building coverage              |
| Highway Commercial                | 50% building coverage              |
| Airport Commercial                | 40% building coverage              |
| Downtown Mixed Use                | Floor Area Ratio = 3               |
| Waterfront Mixed Use              | Marinas or marine research; development and testing 50%; other 40% building coverage |

| Public, Semi-Public and Private Recreation | N/A |
| Public, Semi-Public Institutional    | 25% building coverage              |
| Conservation                         | 0.1 unit per 2 net acres (determined through the DSEI) |
2. The comprehensive plan does not define the proportionate mix allowed within the mixed use categories of Downtown Mixed Use and Waterfront Mixed Use.

Response

“Waterfront Mixed Use” areas designated on the Future Land Use Map are provided for flexibility in allowing different types of land uses within close proximity to one another. The intent of this district is to guide the redevelopment of bayfront property to allow for water-related and dependent uses as well as innovative waterfront development which provides public benefits in the redevelopment of this area. This area circles the north bay area from the Thirteenth Avenue South bayfront to U.S. 41 and east to the City limits.

Development and redevelopment in these areas should be reviewed through the General Development Site Plan Review process. The primary factors for approval of waterfront areas should consider the degree of water dependent or related use, public waterfront access, and adequate parking.

The ground floor of buildings in this district may only be used for commercial, office or retail. All of the permitted uses within this district are allowed on the remaining stories.

The “Downtown Mixed Use District” currently contains a mixture of uses including commercial, heavy commercial, office, cultural, and institutional. The permitted uses in this district will continue to be mixed use with emphasis on residential and commercial uses within the same structure. The dwelling units within this district are primarily intended for employees who work at businesses within the City, retirees and seasonal residents. By providing housing for employees, travel time and vehicle trips will be reduced, traffic impacts minimized, and the quality of life of the residents enhanced. The primary function of this district is to encourage redevelopment, improve the aesthetics and physical appearance, and provide for a prosperous, viable downtown.

Redevelopment themes for this area shall include:

(1) Enhance building aesthetics and appearance.
(2) Encourage a cohesive and integrated district.
(3) Promote pedestrian access and activity.
(4) Encourage mixed uses.
(5) Emphasize an orderly pattern of circulation for both vehicular and pedestrian traffic.
(6) Enhance streetscape in the rights-of-way and medians.
(7) Encourage quality urban design including street lighting, landscaping, and consistent signage.
Implementation of the themes will be completed through a separate master plan for the 41-10 redevelopment area and creation of zoning overlay districts.

The ground floor of buildings in this district may only be used for commercial office or retail. All of the permitted uses within this district are allowed on the remaining stories.

3. Policy 3-5 allows increases in population growth in known or predicted coastal high hazard areas for mixed use projects which further economic development efforts in the Downtown Mixed Use and Limited Commercial designations and residential development. Thus, it does not direct new growth away from the coastal high hazard area.

Response

Policy 3-5: Direct new population growth away from known or predicted coastal high hazard areas except: (1) mixed use projects which further economic development and revitalization efforts in the Downtown Mixed Use and Limited Commercial designations and (2) for residential development in compliance with the Future Land Use Map and as may be further limited by the Code of Ordinances. New structures located within the Downtown Mixed Use and Limited Commercial designations shall be constructed to building standards to permit vertical evacuation for a category 3 storm.

4. Policies 1-7.6, 1-11, and 5.2 do not establish meaningful and predictable standards for the use and development of land nor do they provide meaningful guidelines for the consent of more detailed land development and use regulations. Instead they defer the standards to the land development regulations.

Response

Policy 1-7.6: Sites shall provide adequate parking. The Code of Ordinances shall provide standards which address in accordance with the schedule outlined in the Code of Ordinances that regulate the construction standards, location, design, configuration, dimension, and number of parking spaces. However, fewer parking spaces are encouraged if it can be demonstrated that the amount provided will meet the parking demand of the facility. The reduction in parking shall result in a commensurate increase in green/open space.

Policy 1-11: To protect, preserve and enhance areas having significant ecological, hydrological, physical or socioeconomic importance to the public, new development or redevelopment located in areas of environmental sensitivity shall be consistent with the provisions of the Conservation and Coastal Management Element and the Code of Ordinances shall include development standards based on habitat types, visibility, storm protection, clearing, and submersion. A Development of Significant
Environmental impact Assessment, required to be developed under the Conservation District provisions of the Code of Ordinances, that protect, preserve and enhance areas having significant ecological, hydrological, physical or socioeconomic importance to the public. Preserving the integrity of these areas enhances the aesthetics and quality of life for city residents and visitors, provides a degree of natural protection against storms, helps maintain air and water quality, promotes marine fish and wildlife and habitat diversification and productivity, and promotes soil stabilization.

Policy 5-2: Development shall be consistent with standards for be consistent with regulations outlined in the Code of Ordinances for subdivisions (regulating planting, design standards and improvement requirements), signs (regulating size, height, location and number), and stormwater management (regulating quantity and quality of stormwater runoff).
II. COASTAL AND CONSERVATION ELEMENT

A. Inconsistent Provisions. The inconsistent provisions of the plan amendment under this subject heading are as follows:

1. Objective 1 is vague, does not provide a specific measurable, intermediate end that is achievable and marks progress toward a goal. Additionally, it defers standards to the land development code and does not establish predictable standards within the objective.

Response

Objective 1: Consistent with Section 163.3205, F.S., the City’s Code of Ordinances contains provisions that In order to protect, enhance, and conserve environmentally-sensitive natural areas and resources, the City shall maintain development. These standards which identify addresses permitted activities impact and require minimization of impacts, mitigation for unavoidable impacts, habitat restoration, and the requirements for buffer or transition zones for all development within areas designated Conservation on the Future Land Use Map. All development proposals in conservation areas shall be reviewed for compliance with this Conservation Zoning District which was established to protect, preserve, and enhance areas having significant ecological, hydrological, physical or socioeconomic importance to the Public. Preserving the integrity of these areas enhances the aesthetics and quality of life for City residents and visitors, provides a degree of natural protection against storms, helps maintain air and water quality, promotes marine fish and wildlife and habitat diversification and productivity, and promotes soil stabilization.

2. Objective 3, which relates to waterfront development, does not provide a specific measurable, intermediate end that is achievable and marks progress toward a goal. Additionally, it defers standards to the land development code and does not establish predictable standards within the objective.

Response

Objective 3: In order to balance the need to provide public access to the waterfront and to protect natural resources and private property, development and redevelopment of Gordon River and Naples Bay waterfront properties shall be consistent with the standards of the Coastal Commercial zoning district which is designed to promote water-related and water-dependent activities, encourage the retention and development of marine service facilities, and offer incentives for the provision of public access to Naples Bay.
3. Policy 1-2, providing for the protection of environmentally sensitive vegetative communities, does not establish meaningful and predictable standards for the use and development of land nor does it provide meaningful guidelines for the content of more detailed land development and use regulations. Instead the policy defers the standards to the land development regulations and therefore does not provide the required protection.

Response

Policy 1-2: The Conservation Zoning District and the tree protection article protect Conservation Areas and environmentally sensitive native vegetative communities, as defined in the "Habitats of Special Concern" inventory, shall be protected from development that would diminish their environmental functions or significance, as a natural resource. The Code of Ordinances shall contain a minimum standard that require the removal of exotic vegetation these habitats and require open space ratios for clearing based on the individual habitat types. The areas are to be protected in future. The aim and intent of the Conservation Zoning District is the preservation of the natural functions and benefits of areas having significant ecological and hydrological importance while allowing natural uses and low intensity development. The aim and intent of the tree protection article is to establish. Additionally, protective measures for cypress trees and the sand pine/dwarf oak scrub community because they provide habitat for various communities of plants and animals including threatened and endangered species shall be implemented through the tree protection application process that establishes standards for alterations and trimming.

4. Policy 1-7, providing protection for listed species, does not establish meaningful and predictable standards for the use and development of land nor does it provide meaningful guidelines for the content of more detailed land development and use regulations. Instead the policy defers the standards to the land development regulations and therefore does not provide the required protection.

Response

Policy 1-7 Continue to protect endangered, threatened, and species of special concern and their habitats within its boundaries through the protection of environmentally sensitive native vegetative communities as defined in the "Habitats of Special Concern" inventory. The City shall require an analysis of the potential adverse impact on endangered, threatened, and species of special concern and their habitats. A Development of Significant Impact Assessment shall be required for all proposed development and shall demonstrate compliance with all applicable state and federal guidelines and regulations. The City will confer with the Florida Game and Freshwater Fish Commission and the U.S. Fish and Wildlife Service prior to approving an assessment. The City became a bird sanctuary in 1857. It shall continue to be a sanctuary in which all avifauna, including migratory species, are
protected. By virtue of locally more restrictive vessel speed controls, The City shall continue to afford better protection for the West Indian manatee than the state-approved manatee protection plan through more restrictive controls of vessel speed within its jurisdiction. Enforcement activities of the Florida Game and Freshwater Fish Commission and the U.S. Fish and Wildlife Service protect endangered, threatened, and species of special concern within the City.

5. Policy 3-1, which relates to protection of shoreline resources, does not establish meaningful and predictable standards for the use and development of land nor does it provide meaningful guidelines for the content of more detailed land development and use regulations. Instead the policy defers the standards to the land development regulations and therefore does not provide the required protection.

Response

Policy 3-1: Development along all shorelines must be consistent with zoning as delineated in Chapter 151 of the Code of Ordinances and the resource protection standards set forth in Chapter 114 shall be designed to protect the natural and manmade resources within the City necessary for the protection of the health, safety and general welfare of the citizens of the City. The Code of Ordinances shall require, at a minimum, standards for armor, draining, construction of piers, seawalls, other erosion control structures, public access, pier construction, and dredge and fill activities. Such development is discouraged and may only be permitted if consistent with the protection of natural resources.

6. Policy 13-2 permits development within the Conservation category on the Future Land Use Map. Policy 1-1 of the Future Land Use Element states that a density and intensity standard does not apply to this category. Thus, Policy 1-1 is inconsistent with Policy 13-2 which permits development. Additionally, neither category defines the uses or densities or intensities for the land use category. Further, the policy defers the protection of natural resources from development impacts to the land development regulations. Policy 13-2 instead defers the uses and standards to the land development regulations.

Response

A. See changes in density/intensity for Conservation District in FLUE policy 1-1

B. Policy 13-2: New developments or redevelopment proposed to take place within areas identified as "Conserving" on the Future Land Use Map shall be consistent with the provisions of the Conservation and Coastal Management Element. The Code of Ordinances shall include standards for development based on habitat uses, suitability, storm protection, clearing and protection of a Development of Significant Environmental Impact Assessment consistent with the Conservation District provision of the Code of Ordinances. The intent of the Conservation District provision is
elaborated-in-Objective-4. In addition, a Development of Significant Environmental Impact (DEIS) assessment and a mitigation plan shall be submitted. The DEIS Assessment is a comprehensive study, which provides analyses of the probable impacts, direct and indirect, short-term, long-term and cumulative, of the proposed development on affected natural resources, and an analysis of alternatives to avoid or minimize the aforesaid impacts.

III. TRANSPORTATION ELEMENT

A. Inconsistent Provisions. The inconsistent provisions of the plan amendment under this subject heading are as follows:

1. Objective 3, as it relates to the protection of rights-of-way, does not provide a specific measurable, intermediate end that is achievable and marks progress toward a goal. Additionally, it defers standards to the land development code and does not establish predictable standards within the objective.

Response

Objective 3: Annually improve the condition and appearance of the City’s streets, alleys, public parking areas and related traffic control signs, and trash containers as identified in the Capital Improvement Program. Require the City shall protection of existing and future rights-of-way from building encroachment, through the Code of Ordinances (that prohibits building encroachment into existing and future rights-of-way).
INTRODUCTION

Naples, Florida, is clearly one of the high quality small cities in the nation. As a city striving for excellence, it offers a higher level of services, quiet, safety, and overall quality of life than does the typical city. Its climate, beaches and small town ambiance make it a prime residential area, a preferred retirement/second home location and a vacation destination. In addition, the community’s assets provide a desirable environment for families with children of all ages.

In recent years population growth has increased external demands on the City. The numbers of non-City residents working, shopping, actively recreating, or passively visiting have exceeded or are near to exceeding the carrying capacity of the City’s resources. Continued uncontrolled use of City resources by residents and non-residents alike will bring a subtle yet real decline in the quality of life in the City. A new set of strategies is required, not just to manage Naples’ internal growth, but also to manage the impact of regional growth on the City. Only deliberate and thoughtful management of city resources can prevent destructive overuse or provide for an extension of the carrying capacity.

The attempt to plan and manage a city as an ecosystem represents a relatively new approach to comprehensive planning and strategic positioning. The ultimate value lies in whether it helps one think about the challenge in new ways and therefore create new solutions. The ecosystem approach highlights certain challenges and problems. For Naples, the particularly critical issues an ecosystem approach highlights are presented below.

Critical Challenges

- Continuing the high quality appearance of the City and maintaining Naples’ historic small town character.
- Attracting quality residential development while maintaining the current variety of residential neighborhoods for people of different economic means.
- Balancing neighborhood needs and preferences with City-wide goals.
- Providing a safe, secure community for residents and visitors.
- Balancing neighborhood character with private property rights.
- Improving and protecting environmental quality.
- Dealing with the impacts from growth in Collier County and the surrounding region.
- Building a more interdependent relationship with the County.
Managing traffic effectively to avoid congestion, gridlock and impacts on residential neighborhoods.

Achieving a balance of activities, services and intensity of uses so that the Naples downtown is accessible to its residents while serving as a focal point for selected functions of interest to the region.

Creating a quality pedestrian environment.

Achieving a viable and diverse economic base which provides quality year-round jobs.

Managing the impacts of commercial areas on adjacent residential property.

Redeveloping certain areas of the City to allow for a high level of consistent quality in all parts of the City.

Encouraging a local economic network between the schools and businesses to encourage young people to remain in the community.

Reconciling differing visions for the future of Naples.

STRATEGIES

To remain a quality city, Naples must develop strategies to meet the needs and expectations of four constituencies: the current residents, the future residents, the targeted vacation market, and the local business owners.

Current Residents

Current residents, both full-time and seasonal, are the current "owners" and taxpayers of the City. They have invested both their money and their time in the City and clearly have a vital stake in its future. As the owners, it is their decision as to the future of the City. Residents in each of the neighborhoods have special interests and concerns, some of which are specific to their neighborhood and others of which are City-wide in scope. The residents in the Old Naples neighborhood have particularly unique concerns primarily because of the land use mix, beach access points and being the primary focal point of activities in the City.
Future Residents

While potential residents have no legal vote on the future direction of the City, they cast a very critical vote with their money and where they ultimately choose to live. If the City goes in directions which they find either unappealing or less appealing than other quality communities, the potential residents vote by not residing in Naples. The results of this vote are never public, always open to interpretation and rarely dramatic. Yet its impact will subtly, and over time dramatically, impact the quality of life in the City. While it is highly unlikely that real estate values will drop, they may not rise to the level they could have had the targeted resident relocated to Naples. Some opportunities for cultural or business development may not occur.

Targeted Vacation Market

While the benefits of tourism are great, there is the downside of traffic, crowded facilities, and other people impacts.

Naples should focus on quality residential development, and professional and medical services as the basis for its economy. Naples will always be a vacation destination for its weather and beaches. The question is not whether to attract vacationers or not. The critical issue is attracting the vacation market that is consistent with the lifestyle and values of Naples.

Local Business

Local business owners, including retail, office, service, and industrial business owners, have special needs. These business owners have experienced a shift in the locational focus of the commercial community. At one time, the downtown of Naples was the only business center. Now, there are many competing centers.

Business owners need the assurance that the future development of the City will continue to provide an atmosphere in which they can successfully compete with other businesses both in the City and in the County. Business owners in the City will find it more of a challenge to be successful because new businesses are opening in the County that compete for the same customer and there is a significant amount of vacant property zoned for commercial use in the County which continues to develop.

The commercial areas are part of neighborhoods. In certain parts of the City, the commercial areas are an integral part of the neighborhood, while in other parts of the City, the commercial areas are on the fringe of the neighborhood. It
is important for all of the commercial areas to be viable and attractive while being compatible with the adjacent residential areas.

There are a number of strategies which the City can pursue to remain a high quality City. It is important to note that there are some common principles to strategy implementation. These are:

☐ Engage the appropriate stakeholder groups for each strategy in strategy development and implementation.

☐ View strategies as opportunities which are open-ended and dynamic. Strategies should evolve with new information.
Master Plan Update and adopt the Master Plan as a part of the City’s Comprehensive Plan.

b. Assist the Naples Airport Authority in working with the County to adopt those portions of the plan that relate to County land use and development.

c. It is a goal of the City to have the Naples Airport Authority define an acceptable “carrying capacity” of the community in terms of airport growth, noise levels, hours of operation, and number and type of airport operations. Specific actions necessary to achieve this will be included in the Airport Master Plan. The City’s approval of the Airport Master Plan will be contingent upon the adequacy of the specified actions.

d. The Naples Airport Authority will take immediate action to implement and enforce all safe and lawful noise control measures.

2) ENHANCED PROGRAMMING RECOMMENDATIONS

a. The Naples City Council and Naples Airport Authority will meet no less than quarterly to review the impact of operations on the City and continue regular communications.

b. Continue to identify ways to reduce airport noise levels, including curfews and limitations on types of planes.

c. Establish a citizens’ advisory board appointed by City Council that will make recommendations to the Naples Airport Authority on the adoption of any safe and legal noise abatement procedures.

d. Work with the Naples Airport Authority (NAA) to implement and enforce all safe and lawful noise control measures in accordance with the Federal aviation regulation part 150 noise compatibility plan.

e. Work with the Naples Airport Authority in the development of an F.A.A. Regulation Part 161 Plan (curfew or other aircraft operating restrictions).

f. The City reserves the right to support or oppose future implementation and use of all modern technologies for the airport’s air transportation facilities based upon a thorough review of their merits at the time they are identified.
Master Plan Update and adopt the Master Plan as a part of the City’s Comprehensive Plan.

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b. Continue to identify ways to reduce airport noise levels, including curfews and limitations on types of planes.

c. Establish a citizens’ advisory board appointed by City Council that will make recommendations to the Naples Airport Authority on the adoption of any safe and legal noise abatement procedures.

d. Work with the Naples Airport Authority (NAA) to implement and enforce all safe and lawful noise control measures in accordance with the Federal aviation regulation part 130 noise compatibility plan.

e. Work with the Naples Airport Authority in the development of an F.A.A. Regulation Part 161 Plan (curfew or other aircraft operating restrictions).

f. The City reserves the right to support or oppose future implementation and use of all modern technologies for the airport’s air transportation facilities based upon a thorough review of their merits at the time they are identified.
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APPENDIX F  COLLIER COUNTY ORDINANCE NO. 2000-43

Note: The county ordinance will be reviewed in the Noise Compatibility Program phase of this Part 150 update study to determine areas where revisions to policy matters, such as compatibility criteria, might be appropriate, and areas where factual matters must be updated, such as noise contours and FAA-defined protections “zones,” “surfaces,” and “heights.”
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ORDINANCE NO. 2000-63

AN ORDINANCE AMENDING ORDINANCE NUMBER 91-102, AS AMENDED, THE COLLIER COUNTY LAND DEVELOPMENT CODE, WHICH INCLUDES THE COMPREHENSIVE ZONING REGULATIONS FOR THE UNINCORPORATED AREA OF COLLIER COUNTY, FLORIDA, BY PROVIDING FOR: SECTION ONE, RECITALS; SECTION TWO, FINDINGS OF FACT; SECTION THREE, ADOPTION OF AMENDMENTS TO THE LAND DEVELOPMENT CODE, MORE SPECIFICALLY AMENDING THE FOLLOWING: ARTICLE 1, GENERAL PROVISIONS; DIVISION 1.5, ENFORCEMENT; ARTICLE 2, ZONING; DIVISION 2.1, GENERAL; DIVISION 2.2, ZONING DISTRICTS, PERMITTED USES, CONDITIONAL USES, DIMENSIONAL STANDARDS, DIVISION 2.3, OFF-STREET PARKING AND LOADING; DIVISION 2.4, LANDSCAPING AND BUFFERING; DIVISION 2.5, SIGNS; DIVISION 2.6, SUPPLEMENTAL DISTRICT REGULATIONS; ARTICLE 3, DIVISION 3.2, SUBDIVISIONS; DIVISION 3.5, EXCAVATION; DIVISION 3.9, VEGETATION REMOVAL, PROTECTION AND PRESERVATION; 3.11, ENDANGERED, THREATENED, OR LISTED SPECIES PROTECTION; ARTICLE 6, DIVISION 6.3, DEFINITIONS, INCLUDING, BUT NOT LIMITED TO THE DEFINITIONS OF DOCK FACILITY, FLOOR AREA RATIO AND COMMERCIAL EQUIPMENT; APPENDIX D, AIRPORT ZONING; SECTION FOUR, CONFLICT AND SEVERABILITY; SECTION FIVE, INCLUSION IN THE COLLIER COUNTY LAND DEVELOPMENT CODE; AND SECTION SIX, EFFECTIVE DATE.

WHEREAS, on October 30, 1991, the Collier County Board of County Commissioners adopted Ordinance No. 91-102, the Collier County Land Development Code (hereinafter LDC), which has been subsequently amended; and

WHEREAS, the LDC may not be amended more than two times in each calendar year pursuant to Section 1.19.1. LDC, and

WHEREAS, this is the first amendment to the LDC, Ordinance 91-102, commencing in calendar year 2000; and

WHEREAS, on March 18, 1997, the Board of County Commissioners adopted Resolution 97-177 establishing local requirements and procedures for amending the LDC; and

WHEREAS, all requirements of Resolution 97-177 have been met; and

WHEREAS, the Board of County Commissioners, in a manner prescribed by law, did hold advertised public hearings on May 31, 2000 and June 14, 2000, and did take action concerning these amendments to the LDC; and

WHEREAS, all applicable substantive and procedural requirements of the law have been met.

NOW, THEREFORE BE IT ORDAINED by the Board of County Commissioners of Collier County, Florida, that:

SECTION ONE: RECITALS

The foregoing recitals are true and correct and incorporated by reference herein as if fully set forth.
SECTION TWO: FINDINGS OF FACT

The Board of County Commissioners of Collier County, Florida, hereby makes the following findings of fact:

1. Collier County, pursuant to Sec. 163.3161, et seq., Fla. Stat., the Florida Local Government Comprehensive Planning and Land Development Regulations Act (hereinafter the “Act”), is required to prepare and adopt a Comprehensive Plan.

2. After adoption of the Comprehensive Plan, the Act and in particular Sec. 163.3202(1), Fla. Stat., mandates that Collier County adopt land development regulations that are consistent with and implement the adopted comprehensive plan.

3. Sec. 163.3201, Fla. Stat., provides that it is the intent of the Act that this adoption and enforcement by Collier County of land development regulations for the total unincorporated area shall be based on, be related to, and be a means of implementation for, the adopted Comprehensive Plan as required by the Act.

4. Sec. 163.3194(1)(b), Fla. Stat., requires that all land development regulations enacted or amended by Collier County be consistent with the adopted Comprehensive Plan or element or portion thereof, and any land development regulations existing at the time of adoption which are not consistent with the adopted Comprehensive Plan, or element or portion thereof, shall be amended so as to be consistent.

5. Sec. 163.3202(3), Fla. Stat., states that the Act shall be construed to encourage the use of innovative land development regulations.

6. On January 10, 1989, Collier County adopted the Collier County Growth Management Plan (hereinafter the “Growth Management Plan” or “CMP”) as its Comprehensive Plan pursuant to the requirements of Sec. 163.3161 et seq., Fla. Stat., and Rule 92-5, F.A.C.

7. Sec. 163.3194(1)(a), Fla. Stat., mandates that after a Comprehensive Plan, or element or portion thereof, has been adopted in conformity with the Act, all development undertaken by, and all actions taken in regard to development orders by, governmental agencies in regard to land covered by such Comprehensive Plan or element or portion thereof shall be consistent with such Comprehensive Plan or element or portion thereof.

8. Pursuant to Sec. 163.3194(1)(a), Fla. Stat., a development order or land development regulations shall be consistent with the Comprehensive Plan if the land uses, densities or intensities, in the Comprehensive Plan and if it meets all other criteria enumerated by the local government.

9. Section 163.3194(1)(b), Fla. Stat., requires that a development approved or undertaken by a local government shall be consistent with the Comprehensive Plan if the land uses, densities or intensities, capacity or size, timing, and other aspects of development are compatible with, and further the objectives, policies, land uses, densities or intensities in the Comprehensive Plan and if it meets all other criteria enumerated by the local government.

10. On October 30, 1991, Collier County adopted the Collier County Land Development Code, which became effective on November 13, 1991 and may be amended twice annually.

11. Collier County finds that the Land Development Code is intended and necessary to preserve and enhance the present advantages that exist in Collier County; encourage the most appropriate use of land, water and resources, consistent with the public interest; overcome present landscape and deal effectively with future problems that may result from the use and development of land within the total unincorporated area of Collier County and it is intended that this Land Development Code preserve, promote, protect, and improve the public health, safety, comfort, good order, appearance, convenience, and general welfare of Collier County; prevent the overcrowding of land and avoid the undue concentration of population; facilitate the adequate and efficient provision of transportation, water, sewage, schools, parks, recreational facilities, housing, and other requirements and services, conserve, develop, utilize, and protect natural resources within the jurisdiction of Collier County; and protect houses, environmental, social, and economic resources, and maintain through orderly growth and development, the character and stability of present and future land uses and development in Collier County.
12. It is the intent of the Board of County Commissioners of Collier County to implement the Land Development Code in accordance with the provisions of the Collier County Comprehensive Plan, Chapter 125, Fla. Stat., and Chapter 163, Fla. Stat., and through these amendments to the Code.

SECTION THREE: ADOPTION OF AMENDMENTS TO THE LAND DEVELOPMENT CODE

SUBSECTION 3.A. AMENDMENTS TO DIVISION 1.9, ENFORCEMENT

Division 1.9, Enforcement, of Ordinance 91-102, as amended, the Collier County Land Development Code, is hereby amended to read as follows:

DIVISION 1.9 ENFORCEMENT

Sec. 1.9.8 Other remedies.

1.9.8.6. Requiring replacement by the property owner of any vegetation removed in violation of the land alteration and landscaping regulations or in violation of any permit issued under the code, including corrective measures pursuant to section 3.9.6.9. Replacement trees shall be of sufficient size and quantity to replace the ddb (diameter at breast height) of inches removed. At the time of planting, a replacement tree shall have a minimum eolithic ddb of 14.0 inches and a minimum height of seven to eight feet above ground; and

SUBSECTION 3.B. AMENDMENTS TO ZONING DISTRICTS, PERMITTED USES CONDITIONAL USES, DIMENSIONAL STANDARD DIVISION

Division 2.2, Zoning Districts, Permitted Uses, Conditional Uses, Dimensional Standards, of Ordinance 91-102, as amended, the Collier County Land Development Code, is hereby amended to read as follows:

DIVISION 2.2 ZONING DISTRICTS, PERMITTED USES, CONDITIONAL USES, DIMENSIONAL STANDARDS

Sec. 2.2.2. Rural agricultural district (A).

2.2.2.3. Conditional uses. The following uses are permitted as conditional uses in the rural agricultural district (A), subject to the standards and procedures established in division 2.7.3.

21. Retail plant nurseries subject to the following conditions:

a. Retail sales shall be limited primarily to the sale of plants, decorative products such as mulch or stone, fertilizers, pesticides, and other products and tools accessory to or required for the planting or maintenance of said plants.

b. Additionally, the sale of fresh produce is permissible at retail plant nurseries as an incidental use of the property as a retail plant nursery.

c. The sale of large power equipment such as lawn mowers, tractors, and the like shall not be permitted in association with a retail plant nursery in the rural agricultural district.

Sec. 2.2.8. Minimum yard requirements.

2.2.8.4.3. Minimum yard requirements.

Words struck through are deleted, words underlined are added.
4. **Unified plan of development and common ownership.** The neighborhood village center shall be a unified, architecturally integrated, plan of development with common ownership of all of the property that comprises the neighborhood village center.

5. **Locational criteria and functional operation.** The following locational criteria and functional operating characteristics shall characterize the neighborhood village center:

   a. The neighborhood village center must be internally located within the PUD such that the site has no direct access to roads external to the PUD. The center must be located a minimum of 600 feet from the nearest external roadway providing access to the PUD. The center must be located a minimum of 335 feet from the perimeter boundaries of the PUD.

   b. The neighborhood village center shall be located within a 1,760 foot radius (10 mile) of at least 80% of the total number of approved residential units.

   c. The neighborhood village center shall be pedestrian-friendly ensuring minimal dependency upon access by automobiles and with location and design to accommodate pedestrian access, which shall be reflected in the pedestrian walkway system for the entire PUD.

6. **Off-street parking and design.** In recognition of the pedestrian-friendly design of the neighborhood village center, as required in section 22.20.14.5.e., the number of required off-street parking spaces shall not be fifty (50) percent of that required by section 22.16 of the land development code. However, the number of off-street parking spaces provided shall not exceed 75% of that required by section 22.13. In all other respects, off-street parking areas shall be designed in accordance with the provisions of divisions 2.3 and 2.4 of the land development code.

7. **Design guidelines.** The neighborhood village center shall be subject to, and in compliance with, the design guidelines identified in division 3.8 of the land development code except as otherwise excepted or required herein.

8. **Signs.** A unified sign plan shall be submitted and made a part of the approval for the neighborhood village center site development plan. The approved unified sign plan will establish signage specifications and will therefore become the sign regulations that will apply to the neighborhood village center. The unified sign plan shall adhere to section 22.3.6.2.1 of this code, except that pole signs are prohibited. Signs shall be designed so that their size and location are pedestrian-oriented.

9. **Planning of development.** No commercial building construction in the neighborhood village center shall be allowed until building construction has commenced on at least 10% of the residential dwelling units in the PUD.

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Sec. 2.23.23. Airport Overlay Districts (APO): special regulations for specified areas in and around the airports in Collier County.

2.23.23.1. **Purpose and intent.** Certain areas in Collier County, Florida, require special regulation to prevent hazards which endanger the lives and property of users of the airport and of occupants of land in their vicinity and which, if of the obstruction type, reduce the size of the area available for the taking off, maneuvering and landing of aircraft, thus tending to destroy or impair the utility of the airport or local airport facilities.
of the airports and the public investment therein. Accordingly, it is hereby declared that the purpose and intent of these rules and regulations is to provide both airspace protection and land use compatibility in relation to the normal operation of public-use airports located within Collier County, including the Naples Municipal Airport, Everglades City Airport, Marco Island Executive Airport, Immokalee Regional Airport, and all existing and future public-use airports and heliports in the County. The purpose and intent of these regulations shall be as follows:

2.2.23.1.1. That the creation or establishment of airport hazards and obstructions are a public nuisance and an injury to the county. To attempt to promote maximum safety of aircraft arriving at and departing from all public-use airports located within Collier County;

2.2.23.1.2. That it is necessary, in the interest of public health, public safety, and general welfare, that the creation of airport obstructions, hazards, and structures be prevented. To attempt to promote maximum safety of residents and property within areas surrounding public-use airports located within Collier County;

2.2.23.1.3. That it is necessary in the interest of public health and welfare that the establishment of incompatible land uses be prevented in the areas defined as the airport noise areas (NRA), and the incidental potential hazard areas. To attempt to promote full utility of the public-use airports within Collier County;

2.2.23.1.4. That the prevention of these obstructions, hazards, and incompatible land uses should be accomplished, to the extent legally possible, by the exercise of the police power without compensation and To provide development standards for land uses within prescribed noise zones associated with the normal operation of public-use county airports;

2.2.23.1.5. To provide building height standards for use within the approach, transitional, horizontal, and conical zones so as to encourage and promote proper development beneath such areas;

2.2.23.1.6. To provide administrative and enforcement procedures for the efficient and uniform regulation of all development proposals within such areas;

2.2.23.1.7. That in addition to the regulations applicable to land zoned, as indicated in the official zoning atlas, the following regulations are additionally applicable to lands in the county in the vicinity of the Naples Municipal, Everglades, Marco Island and Immokalee (Old Sest-Airfield) Airports as indicated on the airport zoning maps of Collier County. Lands lying within various zones as indicated on the airport zoning maps are subject to the additional regulations set out in this section.

2.2.23.1.8. The regulations set out in this code are adopted pursuant to the authority conferred by § 333.01, F.S. It is hereby determined that an airport obstruction has the potential for being hazardous to aircraft operations as well as to persons and property on the ground in the vicinity of the obstruction. An obstruction may affect land use in its vicinity and may reduce the size of areas available for the taking-off, maneuvering, and landing of aircraft, thus tending to impair or destroy the utility of airports within Collier County and the public investment therein. It is hereby found that excessive aircraft noise may be an annoyance or may be objectionable to residents in the county. Accordingly, it is declared that:

1. The creation or establishment of an airport obstruction which may be hazardous to aircraft operations, or which reduces the size of the area available for such operations, or which inhibits the safe and efficient use of airspace surrounding a county airport, is a public nuisance and an injury to Collier County and no variance by the county shall be granted to authorize any such obstruction.

Words struck-through are deleted, words underlined are added.
2. It is necessary in the interest of the public health, safety and general welfare that the creation of airport hazards and incompatible use of land within the designated airport noise zones be prevented, and

3. The prevention of these hazards and incompatible land uses should be accomplished, to the extent legally possible, by the exercise of police powers without compensation.

2.2.23.1. It is further declared that the prevention of the creation of airport hazards and incompatible land uses, and the elimination, removal, alteration, mitigation or marking and lighting of existing airport obstructions are public purposes for which the political subdivision may raise and expend public funds and acquire land or interests in land.

2.2.23.2. Airport zones and airspace height limitations. In order to carry out the provisions of this zoning code, there are hereby created and established certain surfaces which include all of the land lying beneath the approach, transitional, primary, horizontal and vertical surfaces as they apply to a particular airport. Such zones are shown on the Naples Municipal, Marco Island Executive, Everglades City, and Immokalee Regional Airport zoning maps and declared to be made a part of this zoning code. These maps are incorporated as follows:

Zoning Map A: Naples Municipal Airport.
Zoning Map B: Marco Island Executive Airport.
Zoning Map C: Everglades City Airport Airport.
Zoning Map D: Immokalee Regional Airport (Ed Scott Airfield).

An area located in more than one of the described height zones is considered to be only in the zone with the most restrictive height limitation. The various zones are hereby established and defined as follows:

2.2.23.2.1. Primary zone surface. An area longitudinally centered aligned along the runway centerline on a runway, extending 200 feet beyond each end of the runway with the width as specified for each runway for the most precise approach existing or planned for either end of the runway. The width of each primary zone surface is as follows:

<table>
<thead>
<tr>
<th>Airports</th>
<th>Runway</th>
<th>Type</th>
<th>Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naples Municipal</td>
<td>14-32</td>
<td>Other than utility/precision instrument</td>
<td>500</td>
</tr>
<tr>
<td></td>
<td>5-32</td>
<td>Other than utility/precision instrument</td>
<td>1,000</td>
</tr>
<tr>
<td>Marco Island Executive</td>
<td>17-35</td>
<td>Other than utility/precision instrument</td>
<td>300</td>
</tr>
<tr>
<td>Everglades City Airport</td>
<td>15-33</td>
<td>Utility/visual</td>
<td>250</td>
</tr>
<tr>
<td>Immokalee Regional Airport</td>
<td>9-27</td>
<td>Other than utility/precision instrument</td>
<td>1,000</td>
</tr>
<tr>
<td></td>
<td>18-36</td>
<td>Other than utility/precision instrument</td>
<td>500</td>
</tr>
<tr>
<td></td>
<td>4-22</td>
<td>Utility/visual</td>
<td>250</td>
</tr>
</tbody>
</table>

Words struck through are deleted, words underlined are added.
1. **Primary zone surface height.** No structure or obstruction will be permitted within the primary zone surface area that is not part of the landing and takeoff area and is of greater height than the nearest point on the runway centerline, with the exception of FAA approved navigation aids.

2.2.23.2. **Horizontal zone.** The area around each public use airport with an outer boundary, the perimeter of which is constructed by swing lines from the center of each end of the primary zone of each airport's runways and connecting the adjacent area by lines tangent to these arcs. A horizontal plane 150 feet above the established airport elevation, the perimeter of which is constructed by swing lines for specified radial from the center of each end of the primary surface of each runway of each airport and connecting the adjacent area by lines tangent to those areas. The radius of each arc is as follows:

<table>
<thead>
<tr>
<th>Airport</th>
<th>Runway</th>
<th>Type</th>
<th>Radius</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naples Municipal</td>
<td>14-32</td>
<td>Other than utility/precision</td>
<td>10,000</td>
</tr>
<tr>
<td>Naples Municipal</td>
<td>5-25</td>
<td>Other than utility/precision</td>
<td>10,000</td>
</tr>
<tr>
<td>Marco Island</td>
<td>13-35</td>
<td>Other than utility/precision</td>
<td>10,000</td>
</tr>
<tr>
<td>Naples City</td>
<td>15-33</td>
<td>Utility/visual</td>
<td>5,000</td>
</tr>
<tr>
<td>Immokalee Regional</td>
<td>9-27</td>
<td>Other than utility/precision</td>
<td>10,000</td>
</tr>
<tr>
<td>Immokalee Regional</td>
<td>18-36</td>
<td>Other than utility/precision</td>
<td>10,000</td>
</tr>
<tr>
<td>Immokalee Regional</td>
<td>4-22</td>
<td>Utility/visual</td>
<td>5,000</td>
</tr>
</tbody>
</table>

1. **Horizontal zone height.** No structure or obstruction will be permitted in the horizontal zone that has a height greater than 150 feet above the airport height, unless a Federal Aviation Administration Determination of FAA Hazard To Air Navigation has been issued.

2.2.23.2.3. **Conical zone.** The area extending outward and upward from the perimeter of the horizontal zone for a distance of 4,000 feet.

1. **Conical zone height.** Height limitations for structures in the conical zone are 150 feet above airport height at the inner boundary with permitted height increasing one foot vertically for every 20 feet of horizontal distance measured outward from the inner boundary to a height of 3,500 feet above airport height at the outer boundary.

2.2.23.2.4. **Approach zone.** An area longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach zone is designated for the end of each runway based upon the type of approach available or planned for that runway end.

1. **Approach zone width.** The inner edge of the approach zone is the same width as the primary surface zone. The outer width of the approach zone is prescribed for the most precise approach existing or planned for that runway end expanding uniformly to the following widths:

*Words struck-through are deleted, words underlined are added.*
### Approach Zone Width (Feet)

<table>
<thead>
<tr>
<th>Airport</th>
<th>Runway</th>
<th>Type</th>
<th>Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naples Municipal</td>
<td>14-32</td>
<td>Other than utility/non-precision instrument</td>
<td>3,500</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Other than utility/precision instrument</td>
<td>10,000</td>
</tr>
<tr>
<td></td>
<td>23</td>
<td>Other than utility/precision instrument</td>
<td>10,000</td>
</tr>
<tr>
<td>Marco Island</td>
<td>17-33</td>
<td>Other than utility/non-precision instrument</td>
<td>3,500</td>
</tr>
<tr>
<td>Executive Airport</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Everglades City</td>
<td>15-33</td>
<td>Utility/visual</td>
<td>1,250</td>
</tr>
<tr>
<td>Airport</td>
<td>9</td>
<td>Other than utility/precision instrument</td>
<td>10,000</td>
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<tr>
<td></td>
<td>27</td>
<td>Other than utility/non-precision instrument</td>
<td>3,500</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>Other than utility/non-precision instrument</td>
<td>3,500</td>
</tr>
<tr>
<td></td>
<td>34</td>
<td>Other than utility/visual</td>
<td>1,500</td>
</tr>
<tr>
<td>Immokalee Regional Airport</td>
<td>4-22</td>
<td>Utility/visual</td>
<td>1,250</td>
</tr>
</tbody>
</table>

2. **Approach Zone Length.** The approach zone extends for the applicable horizontal distance as follows:

<table>
<thead>
<tr>
<th>Airport</th>
<th>Runway</th>
<th>Type</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naples Municipal</td>
<td>14-32</td>
<td>Other than utility/non-precision instrument</td>
<td>10,000</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Other than utility/precision instrument</td>
<td>10,000</td>
</tr>
<tr>
<td></td>
<td>23</td>
<td>Other than utility/precision instrument</td>
<td>50,000</td>
</tr>
<tr>
<td>Marco Island</td>
<td>17-33</td>
<td>Other than utility/non-precision instrument</td>
<td>10,000</td>
</tr>
<tr>
<td>Executive Airport</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Everglades City</td>
<td>15-33</td>
<td>Utility/visual</td>
<td>5,000</td>
</tr>
<tr>
<td>Airport</td>
<td>9</td>
<td>Other than utility/precision instrument</td>
<td>50,000</td>
</tr>
<tr>
<td></td>
<td>27</td>
<td>Other than utility/non-precision instrument</td>
<td>10,000</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>Other than utility/non-precision instrument</td>
<td>50,000</td>
</tr>
<tr>
<td></td>
<td>34</td>
<td>Other than utility/visual</td>
<td>5,000</td>
</tr>
<tr>
<td>Immokalee Regional Airport</td>
<td>4-22</td>
<td>Utility/visual</td>
<td>5,000</td>
</tr>
</tbody>
</table>

3. **Approach Zone Height.** Permitted height limitation within the approach zone shall not exceed the runway height at the inner edge and increases uniformly with horizontal distance outward from the inner edge as follows:

<table>
<thead>
<tr>
<th>Airport</th>
<th>Runway</th>
<th>Type</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naples Municipal</td>
<td>14-32</td>
<td>Other than utility/non-precision instrument</td>
<td>34:1</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Other than utility/precision instrument</td>
<td>30:1/4:1</td>
</tr>
<tr>
<td></td>
<td>23</td>
<td>Other than utility/precision instrument</td>
<td>30:1/4:1</td>
</tr>
</tbody>
</table>

*Words struck through are deleted, words underlined are added.*
<table>
<thead>
<tr>
<th>Airport</th>
<th>Category</th>
<th>Minimum Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naples - Henderson</td>
<td>Other than utility/visual</td>
<td>20.1</td>
</tr>
<tr>
<td>Everglades City Airport</td>
<td>Utility/visual</td>
<td>20.1</td>
</tr>
<tr>
<td>Immokalee Regional Airport</td>
<td>Other than utility/visual</td>
<td>50.1/46.1</td>
</tr>
<tr>
<td></td>
<td>Other than utility/visual</td>
<td>34.1</td>
</tr>
<tr>
<td></td>
<td>Other than utility/visual</td>
<td>34.1</td>
</tr>
<tr>
<td></td>
<td>Utility/visual</td>
<td>20.1</td>
</tr>
<tr>
<td></td>
<td>Utility/visual</td>
<td>20.1</td>
</tr>
</tbody>
</table>

4.4 **Precision instrument runways.** One foot vertically for every 50 feet horizontally for the first 10,000 feet increasing to one foot vertically for every 40 feet horizontally for additional 40,000 feet.

4.5 **Non-precision instrument runways.** One foot vertically for every 34 feet horizontally.

4.6 **Visual runways.** One foot vertically for every 20 feet horizontally.

2.2.23.2.5. **Transitional zones.** The area extending outward from the sides of the primary surface area and approach zones connecting them to the horizontal zone or for a horizontal distance of 5,000 feet from the side of the part of the precision approach zone that extends beyond the conical zone.

1. **Transitional zone height.** Height limits within the transitional zone are the same as the primary surface area or approach zone at the boundary line where it adjuts and increases at a rate of one foot vertically for every seven feet horizontally, with the horizontal distance measured at right angles to the runway centerline and extended centerline until the height matches the height of the horizontal zone or for a horizontal distance of 5,000 feet from the side of the part of the precision approach zone that extends beyond the conical zone.

2.2.23.2.6. **Heliport primary zones.** The area of the primary zone coincides in size and shape with the designated take-off and landing area of a heliport. This surface is a horizontal plane at the established heliport elevation.

1. **Heliport approach zone.** The approach zone begins at each end of the heliport primary zone with the same width as the primary zone, and extends outward and upward for a horizontal distance of 4,000 feet where its width is 500 feet. The slope of the approach zone is 3 to 1 (one foot vertically for every eight feet horizontally.)

2. **Heliport transitional zone.** These zones extend outward and upward from the lateral boundaries of the heliport primary zone and from the approach zone at a slope of 7 to 1 (one foot vertically for every two feet horizontally) for a distance of 250 feet measured horizontally from the centerline of the Heliport Primary and Approach Zone.

2.2.23.2.7. **Other areas.** In addition to the height limitations imposed in sections 2.2.23.2.1 through 2.2.23.2.6 above, no structure or obstruction will be permitted within Collier County that would cause a minimum obstruction clearance altitude (MOCA), a minimum descent altitude (MDA), decision height (DH) or a minimum vectoring altitude (MVA) to be raised nor which would impose either the establishment of restrictive minimum climb gradients or nonstandard takeoff minimums. All development proposals within the unincorporated area around the

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*Words struck through are deleted, words underlined are added.*
Naples Airport that include construction over 200 feet above ground level or construction at a height greater than a slope of 100 to one for a horizontal distance of 20,000 feet from a runway will be submitted to the Naples Airport Authority for review at building permit stage. The horizontal distance of 20,000 feet is depicted in appendix A (appendix D), map A of this code.

1. Except as expressly provided in these AFO regulations, no structure or object of natural growth shall be erected, altered, allowed to grow, or be maintained at a height which exceeds the height of any zone created in these AFO regulations.

2. Except as otherwise provided in these AFO regulations, no structure or object of natural growth shall be erected, altered, allowed to grow or be maintained, which is or would be an obstruction to air navigation within Collier County or of a height greater than any of the following:
   a. A height of 500 feet above ground level at the site of the object.
   b. A height that is 200 feet above ground level or above the established airport elevation, whichever is higher, within 3 nautical miles of the established reference point of an airport, excluding balloons, with its lowest run 1,200 feet in actual length, and that height increases in the proportion of 100 feet for each additional nautical mile of distance from the airport up to a maximum of 500 feet.
   c. A height within a terminal obstacle clearance area, including an initial approach segment, a departure area, and a circling approach area, which would result in the vertical distance between any point on the object and an established minimum instrument flight altitude within that area or segment to be less than the required obstacle clearance. (Refer to FAR 73.23(a)(2)).

Exemptions:

1. Development of the Marco Shores Golf Course Community that complies with the location and height requirements of Ordinance 81-6, as amended by Ordinance 85-56 and Ordinance 84-41, is exempted from the provisions of Section 2.2.23.2, by virtue of the following:

i. An agreement between Johnson Bay Development Corporation Collier County Airport Authority and the Board of County Commissioners, dated August 8, 1995.

ii. Prior issuance of a Federal Aviation Administration “Determination Of No Hazard To Air Navigation.”

Airport land use restrictions:

2.2.23.3.

Notwithstanding any other provision of this code, no use may be made of land or water within any zone established by this code in such a manner as to interfere with the operation of an airborne aircraft. The following special requirements shall apply to each permitted use:

1. All lights or illumination used in conjunction with street, parking, signs or use of land or structures shall be arranged and operated in such a manner that it is not misleading to pilots or dangerous to aircraft operating from a public use airport or the vicinity thereof.

Words stricken are deleted, words undefined are added.
2. All flood lights, spot lights, or any type of pulsating, flashing, rotating or oscillating light shall be modified or prohibited if determined by the Executive Director who has authority over that public airport to be a possible risk to safety of aircraft operation.

3. No operations of any type shall produce smoke, glare, or other visual impairment to pilots within three miles of any usable runway of a public airport.

4. No operations of any type shall produce electronic interference with navigation signals or radio communication between the airport and aircraft, or other air traffic control facility.

5. Land within accident potential hazardous areas (runway clear zones) runway clear zones (runway protection zones) shall be prohibited from use for high density residential use, schools, hospitals, storage of explosives or flammable material, assemblage of large groups of people or any other use that could produce a major catastrophe as a result of an aircraft crash.

6. Based on the possibility that beneficial solid waste management facilities may attract birds, any beneficial solid waste management facility located so that it places the runways and/or approach and departure pattern of an airport between bird feeding, water or roosting areas shall be considered as an incompatible use and is therefore prohibited in and around the airports in Collier County.

7. Any type of tethered dirigible, balloon, or other type of hovering or floating object the height of which exceeds the airspace notification limits outlined in Section 2.2.23.2 shall be limited as provided in Section 2.2.23.2.

8. No structure of any height, type or material shall be constructed or altered which could possibly cause interference to any Airport Surveillance Radar System as determined by the Federal Aviation Administration, or by the Executive Director who has jurisdiction over the Airport deemed to be affected.

2.2.23.2. Obstruction marking and lighting. Any permit or variance granted pursuant to section 2.7.6, this code shall require, as a specific condition, that the owner erect and light the structure to indicate to pilots the presence of the obstruction. Such marking and lighting shall conform to the then existing specific standards of Chapter 333.07, Florida Statutes, and in accordance with FAA Advisory Circular 70/7460-1H, or subsequent revisions thereto or both. The permit may also be conditioned to permit Collier County, at its own expense, to install, operate and maintain such markers and lights as may be necessary to indicate to pilots the presence of an airspace obstruction if special conditions so warrant.

2.2.23.3. Variances. Any person desiring to erect or increase the height of any structure or use his property not in accordance with the regulations prescribed in this ordinance may apply to the Board of Zoning Appeals for a variance from such regulation pursuant to Section 2.7.5 of this code, except for provisions herein or by Chapter 333, F.S., that are not variable.

2.2.23.4. Nonconforming uses; regulations not retroactive. The regulations prescribed by this section shall not be construed to require the removal, lowering or other changes or alteration of any structure not conforming to the regulations as of the effective date of this section as amended, or to otherwise interfere with the continuance of any nonconforming use. Nothing herein contained shall require any change in the construction, alteration, or intended use of any structure, the construction or alteration of which was begun prior to the effective date of the amendment of this ordinance, and which has been issued a building permit which is diligently pursued.

Words struck through are deleted, words underlined are added.
2.2.23.3.5. Future use. Except as specifically provided herein, no material change shall be made in the use of land and no structure or tree shall be erected, altered, planted or otherwise established in any zone hereby created except in compliance with the requirements of these AEROS.

2.2.23.3.6. Existing use. No building permit shall be granted that would allow the establishment or creation of any airport hazard or permit a nonconforming use or structure to be made or become higher, or to become a greater hazard to air navigation than it was on the initial effective date of this section Section 2.2.23.

2.2.23.4. Naples Municipal Airport noise zones, land use restrictions, sound level requirements (SLR) for buildings or structures, and SLR design requirements.

2.2.23.4.1. Purpose. The purpose of this section (2.2.23) is to establish standards for land use and for sound level reduction requirements with respect to exterior noise resulting from the legal and normal operations at the airports within Collier County. This section establishes noise surfaces zones of differing intensities and land use in the vicinity of the Naples Municipal Airport, as identified in the most recent Naples Airport FAA Part 150 Study; establishes permitted land uses in the noise surfaces zones; establishes soundproofing requirements for residential development within the noise surfaces zones; and establishes notification procedures to prospective purchasers of real estate within the noise zones.

2.2.23.4.2. Airport noise zones.

1. Noise zones. In addition to the prior three noise zones, there is a fourth zone hereby created and established. There are now noise zones A, zone B, and zones C, and D. Such zones are shown on the Naples Airport noise zone map(s) which are incorporated and made a part herein and are described in section 2.2.23.4.2.2 below. The noise zones shown herein are based on a projection of future noise environments arising from aircraft flight operations at the Naples Municipal Airport. The purpose of these noise zones is to define and set forth specific regulations for all properties within the described areas.

2. Noise zone boundaries.

   a. Zone A. That area commencing at the boundary indicated on the noise zone map as the outer boundary of noise zone B and extending outward therefrom to the farthest boundary indicated on the noise zone map as "A." The outer contour of noise zone A approximates a noise level of 53 Ldn. and is established as the Naples Airport noise zone.

   b. Zone B. This new noise zone commences at the boundary indicated on the noise zone map as the outer boundary of noise zone C and extending outward therefrom to the farthest boundary indicated on the noise zone map. The outer contour of noise zone B approximates a noise level of 50 Ldn and is the Naples Airport noise zone (This area is referenced in the 1994 Naples Airport FAA Part 150 Study).

3. Application.

   a. Where boundaries of a described noise zone are shown to extend over a portion, but not all of a platted lot or un-platted property, the owner or owners of the entire property will be notified of potential noise impact in accordance with section 2.2.23.5.

Words struck through are deleted, words underlined are added.
2.2.23.4.3. Land use restrictions.

1. Permitted and restricted activities. All land uses shall be permitted in the noise zone pursuant to the applicable zoning district and as provided in the activities and/or land use guidance chart made a part hereof. Those activities and land uses not specifically listed in the land use guidance chart are permitted or restricted in the noise zone based on their similarity to noise tolerance as exhibited by the activities and land uses which are listed in the guidance chart.

2. Nonconforming uses. The regulations prescribed by this section shall not be construed to require the sound conditioning or other changes or alteration of any preexisting structure not conforming to this part as of the first effective date of this section or to otherwise interfere with the continuance of any such preexisting nonconforming use. Nothing herein contained shall require any such change in the construction of or alteration of a structure which has commenced construction prior to the effective date of this section and which is diligently pursued.

2.2.23.4.4. Sound level requirements (SLR) for buildings or structures.

1. Scope of requirements. The provisions of this section shall apply to the construction, alteration, moving, demolition, repair and use of any building or structure within unincorporated Collin County except work located primarily in a public right-of-way, or public utility towers, poles and mechanical equipment not specifically regulated in this section.

2. Existing buildings or structures. Buildings or structures constructed prior to the initial adoption of this amended section, to which additions, alterations, or repairs are made to the exterior walls or ceilings of rooms having one or more exterior walls or ceilings shall be required to meet the SLR requirements of this section.

a. Alterations or repairs which are constructive and do not affect the exterior walls or ceilings of an existing building or structure may be made with the same materials of which the building or structure is constructed and shall not be required to meet SLR requirements.

b. Buildings in existence at the time of the initial adoption of this section may have their existing use or occupancy continued if such use or occupancy was legal at the time of the initial adoption of this section. These buildings may have their existing use or occupancy continued use is not dangerous to life. A change in the use of a structure may require additional sound level reduction.

3. Moved buildings. Buildings or structures moved into or within the vicinity of the established noise zone must comply with applicable provisions of this section.

4. Approval of types of construction. The development services director, or his designee, may approve any type construction that complies with the SLR requirements of the activities and/or land use guidance chart (appendix III of this section). The SLR requirements specified in appendix III of this section shall be achieved by the use of assemblies having the South Transmission Class Ratings specified in table 405.2, Minimum Sound...
2.2.23.4.5.  SLR design requirements.

1. General requirements. The SLR requirements of the land use guidance chart at appendix III may be achieved by any suitable combination of building design, choice of building materials and execution of construction details in accordance with established architectural and acoustical principles. The SLR requirements shall apply to the exterior walls and ceilings only of all rooms having one or more exterior walls or ceilings. Regulations to achieve the SLR requirements specified in appendix III shall be found in appendix IV of this amendment and shall be used by the development services director or his designee, during the building plan review process.

2. Meeting SLR requirements. No building or structure for which an SLR 25, SLR 30, or SLR 35 is required by appendix III of this amendment may be constructed, altered, moved, demolished, or repaired unless and until a building permit has been issued. No such permit shall be issued unless and until the requirements contained in appendix III are met as indicated by plans and specifications for the building or structure. Such plans and specifications shall result in a sound level reduction for the applicable exterior walls and ceilings only of room(s) having one or more exterior walls or ceilings, at least as great as the SLR value specified in appendix III for the particular usage involved. These plans and specifications shall be reviewed during the building plan review process in accordance with the sound transmission ratings specified in table 403.2 of appendix IV of this amendment.

2.2.23.4.6.  Administration and enforcement.

1. General responsibilities. The development services director, or his designee, prior to granting final approval must verify that the sound level reduction (SLR) of the building complies with sections 2.2.23.4.4–2.2.23.4.5.

2.2.23.5.  Notification of potential noise impact.

1. Public notice of the existence of maps depicting noise impacted areas shall be published at least three times in a newspaper of general circulation in Collier County, as provided in Public Law 55-153 (49 USC 3107).

2. The Naples Airport noise zones shall be identified on Collier County’s zoning maps (95255S, 95255N, 95255E, 95255W, 95255C, 95255G, 95255H, 95255I, 95255J, 95255K, 95255L, 95255M, 95255N, 95255O, 95255P, 95255Q, 95255R, 95255S, 95255T, 95255U, 95255V, 95255W, 95255X, 95255Y, 95255Z, 95255AA, 95255AB, 95255AC, 95255AD, 95255AE, 95255AF, 95255AG, 95255AH, 95255AI, 95255AJ, 95255AK, 95255AL, 95255AM, 95255AN, 95255AO, 95255AP, 95255AQ, 95255AR, 95255AS, 95255AT, 95255AU, 95255AV, 95255AW, 95255AX, 95255AY, 95255AZ, 95255BA, 95255BB, 95255BC, 95255BD, 95255BE, 95255BF, 95255BG, 95255BH, 95255BI, 95255BJ, 95255BK, 95255BL, 95255BM, 95255BN, 95255BO, 95255BP, 95255BQ, 95255BR, 95255BS, 95255BT, 95255BU, 95255BV, 95255BW, 95255BX, 95255BY, 95255BZ, 95255CA, 95255CB, 95255CC, 95255CD, 95255CE, 95255CF, 95255CG, 95255CH, 95255CI, 95255CJ, 95255CK, 95255CL, 95255CM, 95255CN, 95255CO, 95255CP, 95255CQ, 95255CR, 95255CS, 95255CT, 95255CU, 95255CV, 95255CW, 95255CX, 95255CY, 95255CZ, 95255DA, 95255DB, 95255DC, 95255DD, 95255DE, 95255DF, 95255DG, 95255DH, 95255DI, 95255DJ, 95255DK, 95255DL, 95255DM, 95255DN, 95255DO, 95255DP, 95255DQ, 95255DR, 95255DS, 95255DT, 95255DU, 95255DV, 95255DW, 95255DX, 95255DY, 95255DZ, 95255EA, 95255EB, 95255EC, 95255ED, 95255EE, 95255EF, 95255EG, 95255EH, 95255EI, 95255EJ, 95255EK, 95255EL, 95255EM, 95255EN, 95255EO, 95255EP, 95255EQ, 95255ER, 95255ES, 95255ET, 95255EU, 95255EV, 95255EW, 95255EX, 95255EY, 95255EZ, 95255FA, 95255FB, 95255FC, 95255FD, 95255FE, 95255FF, 95255FG, 95255FH, 95255FI, 95255FJ, 95255FK, 95255FL, 95255FM, 95255FN, 95255FO, 95255FP, 95255FQ, 95255FR, 95255FS, 95255FT, 95255FU, 95255FV, 95255FW, 95255FX, 95255FY, 95255FZ, 95255GA, 95255GB, 95255GC, 95255GD, 95255GE, 95255GF, 95255GG, 95255GH, 95255GI, 95255GJ, 95255GK, 95255GL, 95255GM, 95255GN, 95255GO, 95255GP, 95255GQ, 95255GR, 95255GS, 95255GT, 95255GU, 95255GV, 95255GW, 95255GX, 95255GY, 95255GZ, 95255HA, 95255HB, 95255HC, 95255HD, 95255HE, 95255HF, 95255HG, 95255HJ, 95255HK, 95255HL, 95255HM, 95255HN, 95255HO, 95255HP, 95255HQ, 95255HR, 95255HS, 95255HT, 95255HU, 95255HV, 95255HW, 95255HX, 95255HY, 95255HZ) and any revisions or reconfigurations thereof, and shall be available to the public at the Collier County Community Development and Environmental Services Division.

3. Upon adoption of this code or any subsequent revision of the maps and legal descriptions depicting potential noise impacted areas, the county manager or his designees shall record in the Public Records of Collier County a notice of potential noise impacted areas together with maps depicting the noise impacted areas and legal descriptions of the noise contours shown therein. This Notice shall be utilized to provide constructive notice to existing and prospective purchasers of property within the noise impacted areas and elsewhere. Upon amendment of the noise zones, subsequent notices shall be provided recorded.

Words struck-through are deleted, words underlined are added.

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4. Notice of potential noise impact along with maps depicting noise impacted areas must be furnished to the Collier County Bar Association, Board of Realtors and to others upon request.

2.2.23.6. Prohibited public or private educational facilities at either end of publicly owned, publicly used airports. The construction of an educational facility or public or private school at either end of a runway of a publicly owned, publicly used airport shall be prohibited within an area which extends five miles in a direct line along the centerline of the runway, and which has a width measuring one-half the length of the runway. Exceptions approving construction of an educational facility within the delineated area shall only be granted when specific findings detailing how the public policy reasons for allowing the construction outweigh health and safety concerns prohibiting such location and pursuant to section 2.7.5.

2.2.23.6.1. The procedures outlined above for the adoption of such regulations are supplemental to section 2.2.23.

2.2.23.6.2. Nothing in section 4.0.22 2.2.23.6.2 shall be construed to require the removal, alteration, sound conditioning, or other change, or to interfere with the continued use or adjacent expansion of any educational structure or site in existence prior to the original effective date of this amendment Section 2.2.23.6.2 or be construed to prohibit the construction of any new structure for which a site has been determined, as of the that effective date of this amendment.

2.2.23.6.3. Notice and hearing.

1. No airport zoning regulations shall be adopted, amended, or changed under this section these APDs except by action of the Board of County Commissioners and set forth, after a public hearing in relation thereto, at which parties in interest and citizens shall have an opportunity to be heard. Notice of the hearing shall be published at least once a week for two consecutive weeks in a paper of general circulation in Collier County.

Sec. 2.3.32. Santa Barbara Commercial Overlay District (SBCO).

2.3.32. Santa Barbara Commercial Overlay District (SBCO): Special conditions for properties abutting the east side of Santa Barbara Boulevard as referenced in the Santa Barbara Commercial Subdistrict Map (Map 4-A) of the Golden Gate Area Master Plan.

2.3.32.1. Purpose and intent. The purpose and intent of this district is to provide Golden Gate City with additional opportunities for small scale commercial development to serve the surrounding neighborhoods and those traveling nearby. This district is intended to: contain low intensity uses which generate relatively low traffic volumes; be appropriately landscaped and buffered to protect nearby residential areas; be architecturally designed so as to be compatible with nearby residential areas; and limit access to promote public safety and lessen interruptions to traffic flow on Santa Barbara Boulevard. Appraisal of lots is strongly encouraged so as to allow greater flexibility in site design and ease in compliance with existing requirements and other development standards. The types of uses permitted are low intensity retail, offices, personal services, and institutional uses.

In order to reduce the potential conflicts that may result from residential and commercial uses being located in this district, existing residential uses other than owner-occupied dwellings, are required to cease to exist within a specified time period. This does not require the removal of the residential structures if they can be, and are, converted to uses permitted in this district.
THE FOLLOWING ARE ADDITIONS, DELETIONS, AND CHANGES TO APPENDIX D OF THE LDC


APPENDIX D

AIRPORT ZONING*

Appendix I. [Airport Zoning Maps]
Appendix II. Naples Municipal Airport Noise Zone Map
Appendix III. Activities and/or Land Use Guidance Chart with Soundproofing Requirements
Appendix IV. Required Sound Transmission Class Ratings

*Editor's note—Appendices I through IV have been designated as "Appendix D, Airport Zoning" at the discretion of the editor.
Appendix D - Airport Zoning

Appendix I (Airport Zoning Maps)
(See Section 2.2.23)

Zoning Map A. Naples Municipal Airport

Replace Appendix I [Airport Zoning Maps] with this Drawing

Words crossed through are deleted, words underlined are added.
degree, 25 minutes, 35 seconds, west 475.98 feet, south 66 degrees, 45 minutes, 5 seconds, west 322.46 feet, south 71 degrees, 35 minutes, 41 seconds, west 133.90 feet, south 45 degrees, 32 minutes, 41 seconds, west 659.36 feet, south 45 degrees, west 410.76 feet, north 60 degrees, 16 minutes, 47 seconds, west 415.01 feet, south 52 degrees, 7 minutes, 30 seconds, west 341.31 feet, north 60 degrees, 45 minutes, 43 seconds, west 217.07 feet, south 57 degrees, 5 minutes, 41 seconds, west 428.68 feet, north 45 degrees, west 170.64 feet, north 45 degrees, west 508.92 feet, north 35 degrees, 32 minutes, 16 seconds, west 183.12 feet, north 31 degrees, 15 minutes, 54 seconds, west 334.74 feet, north 45 degrees, west 470.04 feet, north 48 degrees, 15 minutes, 51 seconds, west 459.10 feet, south 83 degrees, 3 minutes, 26 seconds, west 333.07 feet, south 81 degrees, 50 minutes, 17 seconds, east 45.79 feet, south 9 degrees, 32 minutes, 35 seconds, west 36.42 feet, south 6 degrees, 50 minutes, 54 seconds, west 332.02 feet, south 41 degrees, 11 minutes, 9 seconds, east 190.10 feet, south 45 degrees, west 470.04 feet, south 18 degrees, 26 seconds, east 314.74 feet, south 54 degrees, 27 minutes, 44 seconds, east 315.12 feet, south 45 degrees, west 508.82 feet, south 45 degrees, west 179.64 feet, south 37 degrees, 24 minutes, 19 seconds, west 451.08 feet, south 29 degrees, 3 minutes, 17 seconds, east 217.62 feet, south 45 degrees, west 200.58 feet, south 31 degrees, 20 minutes, 46 seconds, east 454.09 feet, south 45 degrees, west 93.92 feet, south 47 degrees, 23 minutes, 2 seconds, west 716.15 feet, south 45 degrees, west 46.83 feet, south 47 degrees, 14 minutes, 16 seconds, west 374.44 feet, south 45 degrees, 43 minutes, 35 seconds, west 620.45 feet, south 33 degrees, 28 minutes, 14 seconds, west 542.07 feet, south 37 degrees, 53 minutes, 10 seconds, west 241.38 feet, south 4 degrees, 31 minutes, 41 seconds, west 856.21 feet, south 81 degrees, 28 minutes, 9 seconds, west 856.21 feet, south 82 degrees, 7 minutes, 10 seconds, west 241.38 feet, north 57 degrees, 31 minutes, 14 seconds, east 522.67 feet, south 45 degrees, 16 minutes, 35 seconds, east 629.45 feet, north 75 degrees, 57 minutes, 50 seconds, east 174.52 feet, north 45 degrees, east 109.81 feet, north 42 degrees, 36 minutes, 51 seconds, east 719.25 feet, north 45 degrees, east 45.82 feet, north 44 degrees, 39 minutes, 14 seconds, east 445.09 feet, north 44 degrees, east 209.58 feet, south 60 degrees, 45 minutes, 43 seconds, east 317.07 feet, north 66 degrees, 18 minutes, 36 seconds, east 458.00 feet, south 33 degrees, 45 minutes, 17 seconds, east 152.67 feet, south 45 degrees, east 628.34 feet, east 45 degrees, west 140.70 feet, south 66 degrees, 45 minutes, 8 seconds, east 332.46 feet, south 38 degrees, 3 minutes, 35 seconds, east 470.58 feet, south 57 degrees, 3 minutes, 41 seconds, east 438.65 feet, north 87 degrees, 42 minutes, 31 seconds, east 425.69 feet, north 2 degrees, 17 minutes, 35 seconds, east 255.69 feet, north 2 degrees, 14 minutes, 19 seconds, west 428.65 feet, south 41 degrees, 35 minutes, 17 seconds, west 428.65 feet, north 23 degrees, 11 minutes, 55 seconds, west 332.46 feet, north 45 degrees, west 140.70 feet, north 45 degrees, west 628.74 feet, north 44 degrees, west 182.12 feet, north 33 degrees, 41 minutes, 24 seconds, east 458.00 feet, north 30 degrees, 43 minutes, 12 seconds, west 241.38 feet, north 45 degrees, west 230.22 feet, north 39 degrees, 4 minutes, 7 seconds, west 461.80 feet, north 45 degrees, west 110.76 feet, north 47 degrees, 26 minutes, 9 seconds, west 659.36 feet, north 18 degrees, 26 minutes, 6 seconds, east 153.00 feet, north 23 degrees, 11 minutes, 53 seconds, east 232.46 feet, north 45 degrees, 33 seconds, east 470.58 feet, north 45 degrees, west 208.25 feet, north 39 degrees, 3 minutes, 17 seconds, east 651.00 feet, north 45 degrees, east 140.70 feet, north 45 degrees, west 179.64 feet, north 14 degrees, 3 minutes, 10 seconds, west 319.16 feet, to the point of beginning.

Airport Noise Zone-B

Legal Description

Commencing at northeast corner, Section 36, Township 49, Range 26, west 2,772.66 feet 4 along north section line of Section 36, south 420.93 feet 4 to the point of beginning, thence west 453.34 feet, south 87 degrees, 45 minutes, 8 seconds, west 226.69 feet, south 57 degrees, 45 minutes, 4 seconds, west 209.45 feet, south 60 degrees, 56 minutes, 43 seconds, west 371.87 feet, south 40 degrees, 45 minutes, 40 seconds, west 731.05 feet, south 45 degrees, west 498.84 feet, south 47 degrees, 20 minutes, 23 seconds, west 428.65 feet, south 45 degrees, 16 seconds, west 428.65 feet, south 45 degrees, west 459.95 feet, south 45 degrees, west 179.64 feet, south 45 degrees, 47 minutes, 51 seconds, west 775.03 feet, south 45 degrees, west 20.04 feet, north 62 degrees, 21 minutes, 14 seconds, west 501.85 feet, south 45 degrees, west 169.32 feet, north 16 degrees, 18 seconds, west 152.67 feet, south 45 degrees, 30 minutes, 16 seconds, west 209.45 feet, south 45 degrees, west 140.70 feet, north 45 degrees, west 90.88 feet, south 24 degrees, 54 minutes, west 113.64 feet, south 47 degrees, 36 minutes, 9 seconds, west 659.36 feet, north 45 degrees, west 428.74 feet, south 80 degrees, 33 minutes, 16 seconds, west 217.62 feet, south 41 degrees, 25 minutes, 33 seconds, west 520.54 feet, north 45 degrees, west 269.46 feet, north 45 degrees, west 299.40 feet, north 55 degrees, 32 seconds, west 511.62 feet, north 65 degrees, 17 minutes, 49 seconds, west 267.72 feet, south 28 degrees, 18 minutes, 3 seconds, west 256.75 feet, south 30 degrees, 36 minutes, 30 seconds, west 525.54 feet, south 38 degrees,
### APPENDIX III ACTIVITIES AND/OR LAND USES GUIDANCE CHART WITH SOUNDPROOFING REQUIREMENTS

(See Section 2.2.23)

<table>
<thead>
<tr>
<th>Land Use Noise Zones</th>
<th>A 75 Leq</th>
<th>B 75-70 Leq</th>
<th>C 70-75 Leq</th>
<th>D 65-70 Leq</th>
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<td>NR</td>
<td>SLR-35</td>
<td>SLR-35</td>
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<tr>
<td>Townhouses—Attached</td>
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<tr>
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<td>Mobile homes</td>
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**NR** Not recommended, the land-use is not compatible within the identified noise zone. However, if the applicant chooses to develop within the identified noise zone, a sound level reduction (SLR) of 35 must be incorporated into the design and construction of the structure.

**SLR** Sound level reduction.

**35, 30, or 25** The land-use is generally compatible, however, a sound level reduction (SLR) of 35, 30 or 25 must be incorporated into the design and construction of the structure.

**Permitted** No sound level requirement required.

---

**Land Use Noise Zones**

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<thead>
<tr>
<th></th>
<th>A 75 Leq</th>
<th>B 75-70 Leq</th>
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<td>Other residential</td>
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<td>SLR-10</td>
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</tr>
</tbody>
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**NR** Not recommended, the land use is not compatible within the identified noise zone. However, if the applicant chooses to develop within the identified noise zone, a sound level reduction (SLR) of 35 must be incorporated into the design and construction of the structure.

**SLR** Sound level reduction.

**35, 30, or 25** The land use is generally compatible, however, a sound level reduction (SLR) of 35, 30 or 25 must be incorporated into the design and construction of the structure.

**Permitted** No sound level requirement required.

Note: This table is a general guide. The responsibility for determining the acceptability and permissible land uses remains with the authority of the board of county commissioners. All other land uses not specified above shall be permitted in the noise zones pursuant to the applicable zoning district and shall not be required to meet SLR requirements.
STATE OF FLORIDA,
COUNTY OF COLLIER

I, DWIGHT R. BROCK, Clerk of Courts in and for the
Twentieth Judicial Circuit, Collier County, Florida, do hereby
certify that the foregoing is a true original of:

ORDINANCE NO. 2000-43

Which was approved by the Board of County Commissioners
the 14th day of June, 2000, during Special Session.

WITNESS my hand and the official seal of the Board
of County Commissioners of Collier County, Florida, this 16th day of

DWIGHT R. BROCK
Clerk of Courts and Clerk
Ex-officio to Board of
County Commissioners

By: Karen Schock
Deputy Clerk
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APPENDIX G DEVELOPMENT OF LAND USE MAP AND POPULATION ESTIMATES
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G.1 Introduction

In developing the scope of work for this study, the Technical Advisory Committee requested that the Airport Authority require the consulting team to update and verify the land uses in as accurate a manner as economically feasible. The land uses depicted on figures in the body of this document reflect the results of a careful land use inventory and base map development process that took advantage of all prior Authority and consultant efforts, and information available from the City of Naples, Collier County, and other publicly available sources. In response to the Technical Advisory Committee request, this process significantly exceeded Part 150 requirements.

Section G.2 addresses the land use study area definition. Section G.3 summarizes the land use inventory, verification, and update process. Section G.4 summarizes the population estimation process.

G.2 Land Use Study Area

In anticipation that this study would include consideration of noise exposure on a single event basis, a land use study area was identified based on the combined limits of the 85 decibel (dB) Sound Exposure Level (SEL) contours for Lear 35 departures presented in Figures 3-5 through 3-15 of the February 1997 “Naples Municipal Airport Revised Noise Compatibility Program 1996, Final Report.” This study area is significantly larger than required under Part 150, which only calls for the study area to encompass the 60 decibel (dB) Day-Night Average Sound Level (DNL) contours that are the outer limit of the area potentially considered incompatible with aircraft noise by the Naples Airport Authority, the City of Naples, and Collier County. Figure G.1 depicts the study area boundary.

The starting point for the land use definition was land use data obtained from Collier County. Within the land use study area, existing land uses were verified on a parcel-by-parcel basis through comprehensive street-by-street inspection visits. For residential parcels, this included field identification of the number of residential dwelling units.

Figure G.2 depicts the final land use base map, reflecting the field-verified corrections within the study area. The land uses outside the study area reflect the raw data obtained from Collier County.

Figure G.3 depicts the revised land uses of parcels within the study area where the use was revised based on field verification.

Figure G.4 depicts the original land uses of parcels within the study area where the use was revised based on field verification.

Post, Buckley, Schuh & Jernigan, Inc., and Harris Miller Miller & Hanson, Inc., “Revised Noise Compatibility Program 1996, Final Report,” February 1997. These SEL figures were used in that study to compare the effects of alternative noise abatement flight tracks. Similar analyses will be used in the Noise Compatibility Program update phase of this study.

Some land use corrections also were made in areas immediately contiguous to the study area boundary and in areas that straddled the boundary. Figures G.3 and G.4 depict these exceptions.
Figure G.1 Land Use Study Area Boundary Compared to Outer Limit of Combined 85 Decibel (dB) Sound Exposure Level (SEL) Contours for Lear 35 Departures from February 1997 “Naples Municipal Airport Revised Noise Compatibility Program 1996, Final Report”
Figure G.2

Land Use Base Map, Including Field Verified Land Uses within the Study Area

Data Source: Collier County GIS, United States Department of Agriculture (USDA) Geospatial Data gateway, Environmental Systems Research Institute (ESRI)
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Figure G.3
Revised Land Uses of Parcels within the Study Area Whose Use Was Revised Based on Field Verification

Airport Property
Study Area
Single Family Residential
Multi Family Residential
Condo/ Home Owners Assoc
Mobile Home
Transient Lodging
Commercial / Industrial
Place of Worship
Hospital / Nursing Home
School
Agricultural / Non Agricultural / Wetland
Open Space / Recreation / Golf
Government / Transportation / Utility
Water

Data Source: Collier County GIS, United States Department of Agriculture (USDA) Geospatial Data gateway, Environmental Systems Research Institute (ESRI)
Figure G.4
Original Land Uses of Parcels within the Study Area Whose Use Was Revised Based on Field Verification

Data Source: Collier County GIS, United States Department of Agriculture (USDA) Geospatial Data gateway, Environmental Systems Research Institute (ESRI)
G.3 Land Use Inventory, Verification, and Update Process

G.3.1 Initial Data Sources

The following geographic information system (GIS) data sets were obtained from the Collier County Property Appraiser’s office:

- 2008 planemetrics
- Parcel shapefile
- Tax roll data
- Aerial imagery
- 2008 urban six inch (1:100) with index
- 2007 rural two feet (1:400) with index

The following shapefiles were downloaded from Collier County’s geographic information system data download website:

- Address Points
- Airports
- Building Permits
- Census Blocks
- Census Block Groups
- Census Tracts
- Certificate of Occupancy
- Future Land Use
- Land Use
- Libraries
- Parks
- Planning Communities
- Planned Unit Developments
- Roads
- Schools
- Zoning

All geographic information system data sets and shapefiles obtained from County sources were in the Florida State Plane East North American Datum 1983 (NAD83) coordinate system projection.

Land “Use Code” numbers and an associated “Use Description” table also were downloaded from the County’s geographic information system data download website.

G.3.2 Definition of the Land Use Study Area

As previously discussed, the land use study area was based on the combined outer limits of the eleven 85 decibel (dB) Sound Exposure Level (SEL) contours for Lear 35 departures depicted in Figures 3-5 through 3-15 of the February 1997 “Naples Municipal Airport Revised Noise Compatibility Program 1996, Final Report.” These eleven noise contours were digitized and combined into a single, unified shapefile. For ease of data processing and presentation, the study area boundary was extended to follow parcel boundaries and roads outside of the combined contour.

33 http://gis.colliergov.net/Portal2007/Downloads.aspx
boundary, resulting in a slightly larger study area, as shown in Figure G.1. The shapefile included parcel boundaries and a table of parcel identification numbers, among other information, as shown in the following sample:

**Figure G.5 Example of Study Area Parcel Data Structure**
Source: Collier County, Montgomery Consulting Group

<table>
<thead>
<tr>
<th>FID</th>
<th>Shape</th>
<th>FLN</th>
<th>CALC_ACRE</th>
<th>PARCELTYPE</th>
<th>FLH_HUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Polygon</td>
<td>47790016309</td>
<td>0.6969363</td>
<td>101</td>
<td>47790016309</td>
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<td>1</td>
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<td>47790016354</td>
<td>0.5943578</td>
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<tr>
<td>2</td>
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<td>4779001343</td>
<td>0.6026093</td>
<td>101</td>
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<tr>
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<td>4779001440</td>
<td>0.6948303</td>
<td>101</td>
<td>4779001440</td>
</tr>
<tr>
<td>4</td>
<td>Polygon</td>
<td>47790023062</td>
<td>0.2466196</td>
<td>101</td>
<td>47790023062</td>
</tr>
<tr>
<td>5</td>
<td>Polygon</td>
<td>4779001505</td>
<td>0.6901504</td>
<td>101</td>
<td>4779001505</td>
</tr>
<tr>
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<td>Polygon</td>
<td>47790022047</td>
<td>0.1118297</td>
<td>101</td>
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</tr>
<tr>
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<td>4779001161</td>
<td>0.6060194</td>
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<td>4779001107</td>
<td>0.5775239</td>
<td>101</td>
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</tr>
<tr>
<td>9</td>
<td>Polygon</td>
<td>47790023185</td>
<td>0.5429177</td>
<td>101</td>
<td>47790023185</td>
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<td>10</td>
<td>Polygon</td>
<td>4779001068</td>
<td>0.6075187</td>
<td>101</td>
<td>4779001068</td>
</tr>
</tbody>
</table>

**G.3.3 Data Correlation**

The study area shapefile only identified the parcel boundaries, areas, and locations; it did not include information on each parcel’s land use. A two-step process was undertaken to develop a composite data table that integrated that information, obtained from County’s tax roll and geographic information system data download website.

The County tax roll data set provided by the Property Appraiser included a “use code” field for each parcel, as shown in the following sample from that data set:34

**Figure G.6 Example of Collier County Tax Roll Data Structure**
Source: Collier County, Montgomery Consulting Group

The first step was to “join” the study area shapefile data table to the tax roll data table using the parcel identification number as the basis for correlation (the “FLN” field shown in Figure G.5 and the “PARCEL_ID” field in Figure G.6).

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34 The tax roll data from the appraiser was in text (“.txt”) format. It was converted to geographic information system readable format by importing it into the Microsoft Access database application.
The second step was to “join” the use code description table from the County’s geographic information system data download website using the “Use_Code” field that also was contained in the tax roll shapefile data table, as shown in Figure G.7:

**Figure G.7 Example of Original County Land Use Code Data Structure**  
Source: Collier County, Montgomery Consulting Group

In a final step, two new data fields were added to this composite data table, for use in entering observations of actual land uses determined in the field survey work:

- **“USE_DESC”** – for entry of the surveyed land use description in each parcel
- **“DU_COUNT”** – for entry of the surveyed number of dwelling units in each parcel

Figure G.8 depicts a portion of the final composite land use data table that contained all the attribute information from the three original tables.35

**Figure G.8 Example of Composite Land Use Data Table Structure**  
Source: Montgomery Consulting Group

### G.3.4 Field Survey

With this data structure prepared, the study area was divided into eleven segments for ease of data collection purposes. Land use information obtained from the “Use Description” field was overlaid on an aerial background for ease of data verification. Large format maps of the overlaid land use for each of the eleven segments were printed for field data collection purposes. In December 2008, Montgomery Consulting Group staff visited Naples to conduct a survey of the existing land use for all parcels within the study area. Land use information for each parcel was recorded on the printed maps by hand. For parcels containing both commercial and residential land uses, the dwelling unit count was recorded in order to obtain accurate demographic information.

The field-surveyed land use and dwelling unit count information was incorporated into the study area shapefile composite data table after completion of the field survey.

Vacant parcels were assigned their underlying land use, as identified by the property appraiser.

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35 Not all of the original tables’ attributes are shown because of space limitations.
G.4 Population Estimation Process

Both Collier County and the City of Naples use 2000 census data for all their demographic data needs. There are no available updated data.

Geographic information system (GIS) tools were used to estimate dwelling units and residential populations within each noise contour interval considered in this study, including single event noise contours (in terms of sound exposure level or maximum A-weighted decibel level) and cumulative exposure contours (in terms of day-night average sound level). The estimates utilize the 2000 census data applied to the field-verified land uses, using the smallest census enumeration division; i.e., census “blocks.” Average per-unit “population factors” (residents per unit) were determined for single and multi-family dwelling types in each census block by comparing the total population residing in that dwelling unit type to the total number of dwelling units of that type in the block in 2000, as follow:

- Single family dwelling units – 1.6
- Multi-family dwelling units – 1.4

The census counts dwelling units in condominiums as multi-family.

The contours were overlaid on the parcel-level, field-verified land use data to determine the number of dwelling units encompassed within each contour interval. The encompassed residents were estimated by applying the population factors for each dwelling unit type to the estimated number of dwelling units. When a noise contour line bisects a parcel, the entire population was attributed to the higher of the two contour intervals. This approach provides a conservatively high estimate of exposed population. It also takes into account all development as of the date of the December 2008 field survey work. The only “dated” data are the per-unit population factors. However, these factors should not have changed significantly from 2000. If there has been a change, it is likely to a lower per-unit population, since most new development in Naples has been for “mature” residents and not families. Once again, this situation tends to result in conservatively high estimates of encompassed population.

Transient lodging (i.e., hotel and motel) assumes two persons per room and full occupancy.
APPENDIX H  NOISE ABATEMENT HANDOUTS
Page intentionally left blank.
H.1 Recommended Jet Noise Abatement Procedures
H.2 Recommended Fixed-Wing Noise Abatement Procedures

Naples is an extremely noise sensitive airport in all regards. Voluntary restriction from flying and touch & go operations between the hours of 10pm and 7am local requested. Utilize quiet departure and arrival techniques. Avoid flying low over residential or other densely populated areas. Whenever possible,iflower NEIGHBORLY - MAINTAIN 2000 feet above ground level over residential neighborhoods.

APF NAPRAW
Entry VOR/LOC: 185.5 (Located on the field.)
For Parking and Line Services call: ARINC: 138.925

APF - NAPLES, FLORIDA
OPERATIONS & NOISE ABATEMENT PROCEDURES
RECOMMENDED ARRIVAL & DEPARTURE ROUTES FOR MULTI ENGINE AND SINGLE ENGINE FIXED WING AIRCRAFT

This procedure has been prepared to help General Aviation pilots operate their aircraft in the air space area in a manner consistent with the intent of this study. The Naples Municipal Airport Noise Management Program focuses on an education and cooperation. Compliance with noise abatement procedures is requested unless operations are necessary by law, medical emergency or other exigency.

Please ask your next of Naples Management Program. The request remains in effect until otherwise notified.

The Naples Municipal Airport Noise Management Program focuses on an education and cooperation. Compliance with noise abatement procedures is requested unless operations are necessary by law, medical emergency or other exigency.

These procedures are not intended to prevent the capabilities of the pilot-in-command for safe aircraft operations. Recommended procedures are not intended to conflict with instructions from ATC or those which are the exclusive authority of the FAA.
H.3  Recommended Helicopter Noise Abatement Procedures

Naples Municipal Airport Part 150 Update Study
2010 and 2015 Noise Exposure Maps

August 2010
page H-5
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APPENDIX I  TECHNICAL ADVISORY COMMITTEE AGENDAS
AND MINUTES FROM MEETINGS RELATED TO
NOISE EXPOSURE MAP UPDATE DEVELOPMENT
Page intentionally left blank.
NAPLES SOUTH FORT MYERS AIRPORT
PART 150 STUDY
TECHNICAL ADVISORY COMMITTEE

MEETING AGENDA
Airport Office Building - 200 Aviation Drive North, Naples, FL
9:00 AM 1 February 2008

A. INTRODUCTIONS OF PARTICIPANTS
B. SUNSHINE LAW PRESENTATION BY NAA COUNSEL JOE MCMACKIN
C. HMMH PRESENTATION
   1. Summary of HMMH consulting team composition and roles
   2. Basic introduction to Part 150
   3. Overview of prior noise compatibility planning at APF
   4. Review and discussion of study design outline
   5. Preliminary identification of key items for inclusion in study
   6. Discussion of first-round noise measurements
   7. Follow-up responsibilities and next steps

D. SELECTION OF CHAIR FOR TAC COMMITTEE
E. PUBLIC COMMENTS
E. ADJOURNMENT

NOTICE: Two or more Airport Authority Board Commissioners or members of NAA committees may be in attendance.

Florida Statutes 288.011 states, “any gathering, whether formal or casual, of two or more members of the same board or commission to discuss some matter on which foreseeable action will be taken by the public board or commission must be conducted in accordance with the Sunshine Law”.

Any person who decides to appeal any decision made by this Committee with respect to any matter considered at this meeting will need to ensure that a verbatim record of the proceedings is made, which record includes the testimony and evidence upon which the appeal is to be heard.
Minutes
01 February 2008
Part 150 Study
Technical Advisory Committee

A. INTRODUCTION OF PARTICIPANTS

Meeting was called to order by Chairman Schmidt at 9:00 a.m. in the Airport Office Building Conference Room. Present were: Commissioner Hobgood, Mr. McMackin, Mr. Confoy, Mr. Tweedie, Mr. Zarroli, Mr. Davidian, Mr. Wood, Mr. Laughlin, Mr. Nelson, Mr. Parker, Mr. Schultz and Mr. Baldwin with the firm of Harris Miller Miller & Hanson (HMMH). Also present were Ms. Foster, Mr. Richardson, Ms. Tullo and Ms. Hart.

B. SUNSHINE LAW PRESENTATION BY NAA COUNSEL JOE McMACKIN

Mr. McMackin provided an overview of the Florida Sunshine Law and its applicability to agency subcommittees. (See attached Memorandum). Following discussion, the participants that were present decided to remain on the Committee and assume the obligations imposed by the government-in-the-sunshine-laws.

Commissioner Hobgood thanked the Committee for their attendance at the meeting and for their voluntary participation in this process.

Discussion followed regarding establishing the members of the Committee. Mr. Parker made the motion that Members of the Committee be constituted from the attached list. Mr. Wood seconded. Motion passed unanimously.

C. HMMH PRESENTATION

Mr. Ted Baldwin provided an overview of his firm and the team that will be working with HMMH to complete the Part 150 Study. He described the design and implementation of the process, explaining why citizen input is critical and offering insights on the history of the previous studies.

Mr. Baldwin stated his team will focus on noise abatement issues such as the effectiveness of the voluntary curfew, the 2,000 foot departure climb restriction, noise abatement operating procedures, and ground operations. In addition, noise analysis will include noise measurements, seasonality of the airport, traffic flow, tower procedures, the impact of possible displaced thresholds that would allow longer runs for aircraft on take-off and over-water propagation. Other Committee suggestions were welcomed.

Commissioner Hobgood left the meeting at approximately 10:45 a.m.
Over the next meetings, the group will learn how the Tower is communicating with aircraft, traffic mix, pilot experience, tower workload, etc.

Mr. Baldwin asked the Committee to review the scoping outline and their meeting notes and email comments to him or Mr. Richardson by noon on February 8, 2008. Mr. Baldwin anticipates addressing the Board of Commissioners of City of Naples Airport Authority at the 21 February 2008 meeting regarding the Scope of Work for the Part 150 Study Update. Mr. Baldwin also suggested the Committee visit the Van Nuys website at www.vnypart161.com to further familiarize themselves with how the airport uses the site to provide information on their Part 161 Study process.

It is anticipated the Committee will meet at least nine (9) more times over the course of the Study, anticipating meeting on Wednesdays in Council Chambers at City Hall, although the exact schedule was not determined at this time. All meetings are open to the public and public input regarding this Study is encouraged. It was also decided that approximately 1500 newsletters would be budgeted for distribution to the community regarding the Study and its progress.

D. SELECTION OF CHAIR FOR TAC COMMITTEE

Due to the length of the meeting, a Chairman was not selected.

E. PUBLIC COMMENTS

None.

F. ADJOURN

With no further business, meeting was adjourned at approximately 1:30 p.m.

Curtis Richardson
Secretary
MEETING AGENDA
Airport Office Building – 200 Aviation Drive North, Naples, FL
9:00 AM 19 March 2008

A. INTRODUCTIONS OF PARTICIPANTS

B. SELECTION OF CHAIR FOR TAC COMMITTEE

C. HMMH

1. Summary of comments received on Part 150 Update Study Design
2. Overview of Part 150 Update Study Design
3. Discussion and Further Comments from TAC
4. Preliminary Discussion of First-Round Noise Measurement Program Design

D. PUBLIC COMMENTS

E. ADJOURNMENT

NOTICE: Two or more Airport Authority Board Commissioners or members of NAA committees may be in attendance.

Florida Statutes 286.011 states, “any gathering, whether formal or casual, of two or more members of the same board or commission to discuss some matter on which foreseeable action will be taken by the public board or commission must be conducted in accordance with the Sunshine Law”.

Any person who decides to appeal any decision made by this Committee with respect to any matter considered at this meeting will need to ensure that a verbatim record of the proceedings is made, which record includes the testimony and evidence upon which the appeal is to be heard.
Minutes
19 March 2008
Part 150 Study
Technical Advisory Committee

A. INTRODUCTION

Meeting was called to order by Chairman Schmidt at 9:00 a.m. in the Airport Office Building Conference Room. Present were: Mr. Nelson, Mr. Conboy, Mr. Tweedy, Mr. Zarrollo, Mr. Parker, Mr. Schultz, Mr. Davidian, Mr. Laughlin, Mr. Goddard and Mr. Baldwin with the firm of Harris Miller Miller & Hanson (HMMH). Also present were Commissioner Linneman, Commissioner Leanne, Mr. Soliday, Ms. Foster, Mr. Richardson, Ms. Tullo and Ms. Hart.

Absent were Mr. Haycraft, Mr. Cecil, Mr. Meade and Mr. Wood. A motion was made to contact absent TAC members regarding their intention to serve on the Committee by Mr. Schmidt. It was seconded by Mr. Laughlin. The motion passed unanimously.

B. SELECTION OF CHAIR FOR TAC COMMITTEE

Mr. Soliday outlined the duties of the Chairperson, explaining the process for moving items forward from Committee level to the Board of Commissioners.

Following discussion, Mr. Schultz nominated Mr. Parker as Chairman of the Technical Advisory Committee (TAC). Mr. Laughlin seconded. Motion passed unanimously.

Mr. Schmidt volunteered to serve as Vice-Chairman. Mr. Tweedy made the motion to elect Mr. Schmidt to serve as Vice-Chairman of the Technical Advisory Committee. Mr. Laughlin seconded. The motion passed unanimously.

C. HMMH

Mr. Soliday discussed highlights of the Conferences he recently attended in Washington, D.C. He explained that Congress has not yet selected an FAA Administrator nor have they approved funding or any legislation relative to the aviation industry. Two senators from New Jersey are blocking any action on the floor to discuss or consider or interview the acting administrator that has been designated by the President.

The benefits of ADSB, which is the latest in flight tracking equipment, were discussed.

The definition of the Technical Advisory Committee was read by Mr. Schmidt.

The Committee further discussed the Sunshine Law and its impact on the Committee.
Mr. Parker requested the email addresses of all members. Mr. Schultz proposed a 2 meeting rule. Mr. Parker motioned to table the rule making. Mr. Schmidt seconded. Motion passed unanimously.

Mr. Soliday left the meeting at approximately 9:35 a.m.

Commissioner Lennane arrived at the meeting at approximately 9:45 a.m.

1. Summary of Comments Received on Part 150 Update Study Design
2. Overview of Part 150 Update Study Design
3. Discussion and Further Comments from TAC
4. Preliminary Discussion of First-Round Noise Measurement Program Design

Mr. Baldwin reviewed the Study schedule. He discussed how a land use base map will be created starting with the US Census data and supplemented with city and county data. The Noise Exposure Map will include three sets of contours for 2009 base case conditions: (1) annual average day, (2) average day peak month, and (3) average day off-peak month. Annual average day contours will be prepared for the 2014 forecast case. Locations such as parks, hospitals, schools and beaches will also be included.

Dealing with departure altitude holds, which are determined by Miami’s Tower were discussed in detail, as well as the 2,000 ft. restriction. The Committee will review departure procedures. Staff will arrange to have the tower manager present at the next committee meeting.

It was noted that all Emails from Committee Members to staff or Mr. Baldwin should be routed to Mr. Richardson. (crichardson@flynaples.com)

Radar information will be requested from Fort Myers by using the Freedom of Information Act. The FAA website that has the tower count for aircraft activity is aspm.faa.gov/main/ataes.asp. Mr. Baldwin stated the contours will be a main focus.

Commissioner Lennane left the meeting at approximately 12:00pm.

Mr. Baldwin stated two rounds of measurements will be done. The first round will be a base, the second round, looking at alternatives, will be more focused. General consensus was to have as many noise testing sites as possible. Arrival noise has also become an issue, as well as twin and turbo props. The study will also look into a preferential runway program. The use of runway 5/23 will be reevaluated, as well as increasing the length. Day and night usage will be reviewed.

Unbiased recommendations for locations for measuring will be provided by Mr. Baldwin, for discussion with the TAC.

Mr. Alan Parker pointed out the importance of public outreach. He suggested the NAA website be updated. Staff is working on updating the website and work should be completed in the near future.
It was discussed when measurement taking will begin. Mr. Baldwin suggested beginning the measurement exercise in the fall time frame. Collecting data will be the first step of the process. Radar data, runway use and flight track data will also be part of the process.

Mr. Baldwin will prepare and distribute a revised schedule for meetings in the near future.

Any Committee Member that would like a tour of the tower was encouraged to contact Mr. Richardson.

F. PUBLIC COMMENTS

None

G. ADJOURNMENT

With no further business, meeting adjourned at approximately 1:15 p.m.

Curtis Richardson
Secretary
NAPLES AIRPORT AUTHORITY
PART 150 STUDY
TECHNICAL ADVISORY COMMITTEE

MEETING AGENDA
Airport Office Building – 200 Aviation Drive North, Naples, FL
2:00 PM  2 October 2008

A.  INTRODUCTIONS

B.  UPDATE OF PROGRESS ON THE PART 150 STUDY
   1. Status of base map development, study area definition and land use data collection
   2. Status of Fleet mix and forecast data collection
   3. Status of flight operations (e.g., tracks, altitudes, runway use, etc.) data collection and analysis
   4. Follow-up to March 19, 2008 TAC discussion of measurement locations and schedule

C.  ADS-B UPDATE

D.  SOUTHWEST FLORIDA AIRSPACE REDESIGN

E.  DISCUSSION ON THE IMPACT OF ITEM C & D ON THE PART 150 STUDY

F.  PUBLIC COMMENTS

G.  RECOMMENDATIONS TO THE NOISE COMPATIBILITY COMMITTEE REGARDING THE PART 150 STUDY

H.  PUBLIC COMMENTS

I.  ADJOURNMENT

NOTICE: Two or more Airport Authority Board Commissioners or members of NAA committees may be in attendance.
Florida Statutes 286.011 states, “any gathering, whether formal or casual, of two or more members of the same board or commission to discuss some matter on which foreseeable action will be taken by the public body or commission must be conducted in accordance with the Sunshine Law”.

Any person who decides to appeal any decision made by this Committee with respect to any matter considered at this meeting will need to ensure that a verbatim record of the proceedings is made, which record includes the testimony and evidence upon which the appeal is to be heard.

THE PUBLIC IS INVITED TO ATTEND
Minutes
2 October 2008
Part 150 Study
Technical Advisory Committee

A. INTRODUCTION

Meeting was called to order by Chairman Parker at 2:00 p.m. in the Airport Office Building Conference Room. Present were Mr. Schmidt, Mr. Cecil, Mr. Laughlin, Mr. Nelson and Mr. Zarroli. Also present were Mr. Baldwin with the firm of Harris Miller Miller & Hanson (HMMH) and Commissioner Lineman, Mr. Soliday, Mr. Richardson, Mr. Dehn and Ms. Hart.

Mr. Wood attended by teleconference.

Absent were Mr. Confoy, Mr. Davidian, Mr. Goodard, Mr. Haycraft, Mr. Levine, Mr. Piascik, Mr. Schultz and Mr. Tweedie.

There were not enough committee members to constitute a quorum.

Chairman Parker distributed “Introduction to Part 150 Study, Technical Advisory Committee Meeting #3.”

The Agenda was revised to have Mike Gable of ITT, the overall contractor of the ADS-B program, be first on the agenda and Todd Elmer from Fort Myers Approach be second on the agenda, followed by the Part 150 update.

B. ADS-B UPDATE

Mike Gable of ITT, Surveillance & Broadcast Services Program, gave a presentation on ADS-B. See attachment “ITT, ADS-B Introduction and Status.”

The presentation was broken down into 4 parts; (Part 1,) Auto Dependent Surveillance and Broadcast, (Part 2,) Re-Broadcast, (Part 3,) Traffic Info Service Broadcast (TIS-B) and (Part 4,) Flight Info Service Broadcast (FIS-B). The focus was on the installation plan at AFF.

It was noted by Mr. Gable that some of the benefits of the ADS-B are an accurate means of gathering data on flight paths and routings, approaches, departures, landings, take-offs, etc. and airport noise monitoring applications. It was determined that the enhanced radar data will be useful for the Part 150 Study but not critical to the analysis of existing flight data.

Mr. Gable’s presentation completed at 3:15 p.m., at which time a 5 minute break was called.
C. SOUTHWEST FLORIDA AIRSPACE REDESIGN

Tom Elmer, the support specialist from Fort Myers Approach gave a presentation on the Southwest Florida Airspace Redesign Project. He stated that the airspace redesign project was started on September 30 and all the traffic east of Columbia, South Carolina that is traveling to RSW or APF would be coming down through central Florida.

Mr. Zarroli stated he had recently met with 3 FAA representatives, Lee Grover of the Naples Tower, Steve Bushy from Fort Myers Approach, and Mark Ward with the FAA Southern Region in Atlanta. The meeting took place in August at the Wyndemere Homeowners Association. It was reported that a departure and hold altitude change from 2,000 ft. to 3,000 ft. was made. APF did not receive confirmation of this change. Mr. Zarroli was asked to provide a letter from the FAA representatives confirming these statements.

Mr. Nelson requested an NAFCA representative be invited to speak at a future TAC meeting.

Mr. Zarroli stated he will provide a report regarding the official position on the hold level.

Commissioner Linneman left the meeting at 4:00 p.m.

D. UPDATE OF PROGRESS ON THE PART 150 STUDY

Mr. Ted Baldwin discussed the status of the progress on the Study. He provided data of take-offs and arrivals that were collected from February 15 to 29 2008, which included President’s Day. See attachment “Part 150 Update, Consulting Team Progress”.

Mr. Baldwin recommended collecting data at a busy traffic time during our next round of data collection. He recommended using the same time period that was used in 2008 which will include President’s Day. This will result in a delay from the original timeline. The impact of this change to the schedule will be analyzed by Mr. Baldwin. He will also provide a revised schedule to Mr. Soliday.

Mr. Baldwin said the FAA will not base decisions on our measurement data. We must use the FAA noise model.
E. PUBLIC COMMENTS

Mr. Robert Roof, a resident of Wyndemere, commented on the ADS-B Data Collection System relative to runway headings.

F. DISCUSSION ON THE IMPACT OF ITEM C & D ON THE PART 150 STUDY

It was decided by the TAC members who were present that airspace redesign would not have any significant impact on the Study at this time.

Any questions, comments or feedback on the proposal should be sent by email to Mr. Richardson.

G. RECOMMENDATIONS TO THE NOISE COMPATIBILITY COMMITTEE REGARDING THE PART 150 STUDY

Since there was no quorum, no official recommendations were made.

Two five day noise collection sessions were suggested for a total of 12 to 14 full days of measurements. It was suggested to use the same time period as the 2008 noise collection, which will include President’s Day.

The consensus of the TAC members who were present was to move forward with the Part 150 Study taking into account FAA actions and other events if and when they impact the Study.

Mr. Schmidt suggested TAC Members take an airplane ride in order to view the airport from a pilots’ perspective. He also recommended a visit to the Control Tower.

The Committee was asked to comment on boxed items provided in Mr. Baldwin’s handout and return the comments to Mr. Richardson.

H. ADJOURNMENT

A motion was made by Mr. Parker to adjourn. It was seconded by Mr. Nelson. With no further business, the meeting adjourned at 6:00 p.m.

Curtis Richardson
Secretary
MEETING AGENDA
Airport Office Building – 200 Aviation Drive North, Naples, FL
10:00 AM 14 November 2008

A. INTRODUCTIONS
B. APPROVAL OF 2 OCTOBER 2008 MEETING MINUTES
C. DISCUSSION OF THE IMPACT OF THE FOLLOWING ITEMS ON THE PROGRESS ON THE PART 150 STUDY
   1. ADS-B
   2. Southwest Florida Airspace Redesign
   3. New FAA Part 150 Study Regulations
D. PUBLIC COMMENTS
E. RECOMMENDATIONS TO THE NOISE COMPATIBILITY COMMITTEE REGARDING THE PART 150 STUDY
F. PUBLIC COMMENTS
G. ADJOURNMENT

NOTICE: Two or more Airport Authority Board Commissioners or members of NAA committees may be in attendance.

Florida Statutes 286.011 states, “any gathering, whether formal or casual, of two or more members of the same board or commission to discuss any matter on which foreseeable action will be taken by the public board or commission must be conducted in accordance with the Sunshine Law”.

Any person who decides to appeal any decision made by this Committee with respect to any matter considered at this meeting shall need to ensure that a verbatim record of the proceedings is made, which record includes the testimony and evidence upon which the appeal is to be heard.

THE PUBLIC IS INVITED TO ATTEND
Minutes
14 November 2008
Part 150 Study
Technical Advisory Committee

A. INTRODUCTION

Meeting was called to order by Chairman Parker at 10:13 a.m. in the Airport Office Building Conference Room. Present were Mr. Davidian, Mr. Goddard, Mr. Schultz, Mr. Schmidt and Mr. Zaroli. Also present were Commissioner Limneman, Mr. Soliday, Mr. Dehn, Mr. Richardson and Ms. Hart.

Absent were: Mr. Cecil, Mr. Confoy, Mr. Haycraft, Mr. Laughin, Mr. Levine, Mr. Nelson, Mr. Piscik, Mr. Tweedie and Mr. Wood.

There were not enough committee members to constitute a quorum.

B. APPROVAL OF 2 OCTOBER 2008 MEETING MINUTES

Mr. Goddard noted that he was present at the meeting but was listed as absent. Staff will correct the Minutes to reflect this fact. Mr. Zaroli requested that a reference to him providing a letter or report on the departure and hold altitude be struck on page 2. Due to the lack of a quorum, the Minutes were not motioned for approval.

Staff will work with Mr. Parker on a letter to be distributed to those Members who have not attended recent meetings. Staff will also contact those Members by telephone or email.

It was suggested that the total number on the Committee be reduced so it will be easier to reach a quorum.

C. DISCUSSION OF THE IMPACT OF THE FOLLOWING ITEMS ON THE PROGRESS ON THE PART 150 STUDY

1. ADS-B
   Was not discussed.

2. Southwest Florida Airspace Redesign
   The redesign of airspace was implemented on September 30, 2008 without notification to APF.

3. New FAA Part 150 Study Regulations
   Was not discussed.
The Study is moving forward and there is no anticipation of a delay even if there are not enough members to vote and make recommendations. Staff recommended to the Board at the October 16, 2008 Meeting, that the Noise Study move forward.

Comments for Mr. Baldwin on measuring sites should be submitted to Mr. Richardson no later than December 14.

We have not scheduled the next TAC meeting. The next meeting will be based on comments submitted to Mr. Baldwin.

D. PUBLIC COMMENTS

None.

E. RECOMMENDATIONS TO THE NOISE COMPATIBILITY COMMITTEE REGARDING THE PART 150 STUDY

The TAC report has been distributed to the NCC members present at the October 7, 2008 meeting.

F. PUBLIC COMMENTS

None.

G. ADJOURNMENT

With no further business, the meeting was adjourned at approximately 11:15 a.m.

Curtis Richardson
Secretary
I. ADJOURNMENT

Mr. Goddard made the Motion to adjourn. Mr. Confy seconded. With no further business, the meeting was adjourned at approximately 10:40 a.m.

Ervin Dehn
Director of Airport Development
BOARD OF COMMISSIONERS OF
CITY OF NAPLES AIRPORT AUTHORITY
Chairman: John N. Allen
Commissioners: Peter Manion, Ernest Linneman, Bobby Sullivan, Cormac Giblin
Executive Director: Theodore D. Soliday Executive Assistant: Karen Tullo
Authority Attorney: F. Joseph McMackin, III, Esq. of Bond, Schoeneck & King, P.A.

NOTICE OF TECHNICAL ADVISORY COMMITTEE OF
CITY OF NAPLES AIRPORT AUTHORITY
TUESDAY, APRIL 14, 2009
9:00 A.M.
AIRPORT OFFICE BUILDING CONFERENCE ROOM
NAPLES, FLORIDA

NOTICE: Formal action may be taken on any item listed on the Agenda below, or added to the Agenda before or during the meeting, or discussed during the meeting without being added to the Agenda. Also, the sequence of items may be changed as the meeting progresses. Any person who decides to appeal a decision made by the Board of Commissioners with respect to any matter considered at this meeting (or hearing) will need a record of the proceeding and may need to ensure that a verbatim record of the proceeding is made, which record includes the testimony and evidence upon which the appeal is to be heard.

NOTICE: Any person with a disability requiring auxiliary aids or services for meetings at the City Council Chamber may call the City Clerk’s Office at 213-1015, or for meetings at the Airport Office Building, the NAA Executive Assistant’s Office at 643-0733, with requests at least two business days before the meeting.

SPEAKERS: Welcome. If you wish to address the Board of Commissioners regarding an item listed on the Agenda, please complete a Speaker Registration form (available at the rear of the room) and hand it to the Executive Assistant prior to consideration of that item. We ask that speakers limit comments to 5 minutes and that large group’s name a spokesperson whenever possible. All written, audio-visual, and other materials distributed to the Board or staff during this meeting will become the property of NAA and will be a public record. Thank you for your interest and participation.

A. ROLL CALL
B. PLEDGE OF ALLEGIANCE
C. AGENDA (Add, delete or re-sequence items)
D. PUBLIC COMMENTS (Public comments accepted for items not otherwise listed on the Agenda; 5 minute limit)
E. ACTION ITEMS (Public comments accepted for each item; 5 minute limit)
   1. Preliminary results of February noise measurements and associated radar track information
   2. Status and findings of population verification project
3. Next noise measurement session
   a. Objectives
   b. Plan

4. Part 150 AC revision status and potential impact on Naples study

5. Revised Part 150 Study schedule including:
   a. HMMH work plan
   b. Schedule of TAC, NCC and NAA meetings
   c. Target timing for public meetings
   d. Public information/awareness plan
   e. Presentation/submission to the FAA
   f. Follow-up FAA contact plan

H. NEW BUSINESS

I. OLD BUSINESS

M. PUBLIC COMMENTS (5 minute limit)

O. ADJOURN

Information on Action Items and other items which have been provided in advance of this meeting may be inspected at the office of the Executive Assistant, General Aviation Terminal Building, 2nd Floor, 160 Aviation Drive North or at the office of the City Clerk, Room B, 1st Floor, City Hall. Minutes of this meeting will be prepared for Board approval, usually at the next Regular Meeting.

NOTICE: Two or more Airport Authority Commissioners may be in attendance

Florida Statute 286.011 states, “any gathering, whether formal or casual, of two or more members of the same Board or commission to discuss some matter on which foreseeable action will be taken by the public Board or Commission must be conducted in accordance with the Sunshine Law.”
A. ROLL CALL

Meeting was called to order by Chairman Parker at 9:00 a.m. in the Airport Office Building Conference Room. Present were Mr. Confoy, Mr. Goddard, Mr. Laughlin, Mr. Fiascik, Mr. Schmidt, Mr. Schultz, Mr. Wood and Mr. Zarrow. Also present were Commissioner Linneman, Commissioner Sullivan, Mr. Soliday, Mr. McMackin, Mr. Dehn, Ms. Dugan, Ms. Vandersluis and Ms. Hart.

Absent were Mr. Cecil, Mr. Nelson and Mr. Tweedie.

It was noted that Mr. Davidian has resigned from the Committee.

B. PLEDGE OF ALLEGIANCE

C. AGENDA

There were no changes to the agenda.

D. PUBLIC COMMENTS

None.

E. ACTION ITEMS

1. Preliminary results of February noise measurements and associated radar track information.

Nine (9) to twelve (12) sites were selected and high calibrated equipment was used to collect the data. The track data that was obtained was radar based. The data was reviewed and processed by HMMH, however it is still too early in the process to make conclusions. We are still gathering data and getting base cases established.

2. Status and findings of population verification project.

The goal is to identify flight paths and implement procedures which will expose the fewest number of people to the least amount of noise. The Committee would like Mr. Baldwin to describe this process at the next meeting.

Mr. Wood made a Motion to have a detailed presentation of the population verification project at the next meeting. Mr. Laughlin seconded. The Motion passed unanimously.

3. Next noise measurement session.
a. Objectives
The need to advance the Study to a point where recommendations can be made is the objective. One way of doing that is to have aircraft fly patterns that we define so we can measure them. Mr. Parker suggested Phase Two noise measurement for two levels. The first level is at a 2,000 ft. ceiling which is the existing altitude, and the second level is at a 3,000 ft. ceiling, which is the desired ceiling.

b. Plan
Mr. Parker suggested a sub-committee of TAC be formed to conduct workshops with the public to recommend a list of alternative flight paths. This should be integrated with Ted Baldwin and expert pilots. We will request to have an FAA staff person at this meeting.

TELECONFERENCE WITH TED BALDWIN & JIM FERGUSON at 9:45 a.m.
A teleconference occurred with Ted Baldwin and Jim Ferguson. Jim Ferguson accompanied Ted Baldwin when he was here in February gathering noise measurements.

The list of alternative flight paths and departure procedures are defined in the scope of the work. The matrix is a great start. The next step is getting a clear definition of existing conditions and a description of the problem to refine the list. At the next (5th) TAC meeting, Mr. Baldwin will go over detailed reports & modeling assumptions. It will cover everything but the contours. This will give us a basis for selecting the first round of contours. We will also develop our noise modeling assumptions. At the sixth (6th) meeting, we will go over the noise exposure map which will include 15 baseline single event contours to reflect specific operations of concern today.

At the seventh (7th) meeting, the alternatives will be reviewed. The alternatives are not being looked at now because noise exposure maps and data collection have to be done first as stated in the Part 150 process.

Mr. Parker pointed out that the dates of the Study have been moved out six (6) to nine (9) months. The project was scheduled for completion 2nd qtr. 2010, now it has been moved to 4th qtr. 2010.

Mr. Baldwin went over the reasons why we are behind. The measurements were delayed. The decision to delay them was made in consultation with the TAC. The federal process is delaying the ADSB installation which would have given us more data. There was technical effort to match radar to data due to monitors running 24 hours and observers covering 8 hours a day.

It is anticipated that the draft will be ready in early May. The data can be given to NAA and TAC at same time, with NAA having the right to give input and make sure the data is correct.

The next TAC meeting will be tentatively scheduled before the end of May. Discussion will include baselines and alternatives.
Verification of land use was done by a subcontractor. They were able to collect a good baseline by doing a “windshield” survey. The data base is currently being updated. Current census data is also being reviewed. All single family houses are counted. Condominium complexes and hotels will also be counted. Population verification will be described in the noise exposure documentation.

4. Part 150 TAC revision status and potential impact on Naples study
The Naples Part 150 Schedule was distributed.

5. Revised Part 150 Study schedule including:
   a. HMMH work plan
      See comments above in teleconference section.
   b. Schedule of TAC, NCC and NAA meetings
      No specific dates have been set for TAC and NCC. There will be a special TAC meeting before the end of May. The next NAA meeting is April 16.
   c. Target timing for public meetings
      Public workshop will be held when a full noise exposure map is completed.
   d. Public information/awareness plan
      Not discussed at this time.
   e. Presentation/submission to the FAA
      Not discussed at this time.
   f. Follow-up FAA contact plan
      Not discussed at this time.

F. NEW BUSINESS
None.

G. OLD BUSINESS
See section on teleconference.

H. PUBLIC COMMENTS
None.
requested that committee members provide comments and feedback to Mr. Dehn as soon as feasible.

Measurements were taken at 11 locations in February. The condo association at Kings Lake did not allow measurements to be taken on their property, so Springwood Drive was used as an alternative location. Runway 14 was used the first few days. Overall, the data gathering was a success.

The second round of noise measurements will be based on the modeling analysis. We will work with cooperative aircraft owners and FBO’s on a voluntary basis to use for testing. This will also help in developing cockpit procedures.

Mr. Zarroli has obtained copies of the noise abatement take off and landing procedures that the Delta Connection regional jets used at Naples. He agreed to forward them to Mr. Dehn for distribution to the board members.

Mr. Baldwin provided a very brief overview of the noise modeling assumptions presented in the partial NEM draft. The changes in flight tracks from 2008 to 2009 were partly due to the FAA airspace redesign causing changes in air routings.

For recent noise complaints, the Aquafane Shores area reported the most complaints and they were reported by a one person.

Committee members agreed to send input for SEL cases and comments on the draft NEM to Mr. Dehn. The deadline for comments is 2 weeks from today (i.e., September 16th).

H. NEW BUSINESS
None.

I. OLD BUSINESS
The Part 150 Study proposed schedule will be updated after the data base report is completed.

With respect to noise issues, special events and the beach area are still a concern.

M. PUBLIC COMMENTS
None.

O. ADJOURN
With no further business, the meeting was adjourned at 12:30 p.m.

Erv Dehn, Secretary
BOARD OF COMMISSIONERS OF
CITY OF NAPLES AIRPORT AUTHORITY
Chairman: John N. Allen
Commissioners: Peter Manion, Ernest Linneman, Bobby Sullivan, Cormac Giblin
Executive Director: Theodore D. Soliday Executive Assistant: Karen Tullo
Authority Attorney: F. Joseph McMackin, III, Esq. of Bond, Schoeneck & King, P.A.

NOTICE OF TECHNICAL ADVISORY COMMITTEE OF
CITY OF NAPLES AIRPORT AUTHORITY
WEDNESDAY, SEPTEMBER 2, 2009
10:00 A.M.
AIRPORT OFFICE BUILDING CONFERENCE ROOM
NAPLES, FLORIDA

NOTICE: Formal action may be taken on any item listed on the Agenda below, or added to the
Agenda before or during the meeting, or discussed during the meeting without being added to the Agenda.
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decision made by the Board of Commissioners with respect to any matter considered at this meeting (or
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proceeding is made, which record includes the testimony and evidence upon which the appeal is to be
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Building, the NAA Executive Assistant’s Office at 643-0733, with requests at least two business days before
the meeting.

SPEAKERS: Welcome. If you wish to address the Board of Commissioners regarding an item listed on
the Agenda, please complete a Speaker Registration form (available at the rear of the room) and hand it to
the Executive Assistant prior to consideration of that item. We ask that speakers limit comments to 5
minutes and that large group’s name a spokesperson whenever possible. All written, audio-visual, and
other materials distributed to the Board or staff during this meeting will become the property of NAA and
will be a public record. Thank you for your interest and participation.

A. ROLL CALL

B. PLEDGE OF ALLEGIANCE

C. AGENDA (Add, delete or re-sequence items)

D. PUBLIC COMMENTS (Public comments accepted for items not otherwise
   listed on the Agenda; 5 minute limit)

E. ACTION ITEMS (Public comments accepted for each item; 5 minute limit)
   1. Presentation by Ted Baldwin of HHH/HHI of FAR Part 150 Study Update

H. NEW BUSINESS
I. OLD BUSINESS

M. PUBLIC COMMENTS (5 minute limit)

O. ADJOURN

Information on Action Items and other items which has been provided in advance of this meeting may be inspected at the office of the Executive Assistant, London Aviation Building, 2nd Floor, 150 Aviation Drive South, Suite 200 or at the office of the City Clerk, Room B, 1st Floor, City Hall. Minutes of this meeting will be prepared for Board approval, usually at the next Regular Meeting.

NOTICE: Two or more Airport Authority Commissioners may be in attendance.

Florida Statute 286.011 states, "any gathering, whether formal or casual, of two or more members of the same Board or commission to discuss some matter on which foreseeable action will be taken by the public Board or Commission must be conducted in accordance with the Sunshine Law."
**Minutes**

2 September 2009

Part 150 Study

Technical Advisory Committee

A. **ROLL CALL**

Meeting was called to order by Chairman Gene Schmidt at 10:00 a.m. in the Airport Office Building Conference Room. Present were Mr. Goddard, Mr. Laughlin, Mr. Piascik, Mr. Tweedle and Mr. Zarrolli. Also present were Mr. Baldwin with the firm of Harris Miller Miller & Hanson, Commissioner Linneman, Commissioner Sullivan, Mr. Solday, Mr. Dehn, Ms. Dugan, Mr. Meade, Ms. Vandersluis, Mr. La Fever and Ms. Hart.

Attending the meeting by teleconference were Mr. Nelson, Mr. Parker and Mr. Schultz.

Absent were Mr. Cecil and Mr. Confoy.

B. **PLEDGE OF ALLEGIANCE**

C. **AGENDA (Add, delete or re-sequence items)**

No changes. The only agenda item for this meeting is the presentation on the progress of the Study.

D. **PUBLIC COMMENTS**

None.

E. **ACTION ITEMS**

1. Presentation by Ted Baldwin of HMMH of FAR Part 150 Study Update

Mr. Baldwin started the presentation with a brief review and overview of the July 2009 Partial Draft Documentation.

The seven major elements of the project were reviewed.
1. Design and conduct public participation program (underway)
2. Technical phase, develop the database (largely complete)
3. Identify, analyze and evaluate abatement alternatives (part of the project that has the most interest)
4. Look at other half of the program to identify, analyze and evaluate land use strategies
5. Select the preferred abatement and land use alternatives
6. Develop implementation systems

1. **
7. Prepare and present the noise compatibility program to the FAA for approval

The remaining steps in the noise exposure map phase of Element 2 were discussed. This involves preparing noise contours for the official FAA submission for 3 calendar years and 2 seasonal conditions. The FAA will review 2 of the calendar year submissions.

DNL contours for 2010 are required by the FAA. We can select one forecast year to submit, usually the 5th calendar year from the submission year. It was suggested we submit 2015 but also have 2020 available for informational purposes for our records and forecast. It was noted that the FAA does not look at noise measurements; however they do look at DNL contours.

At Mr. Soliday’s suggestion, the Committee reached consensus that the 2020 long-term forecast contours would be based on a total level of activity that reflected the peak level of activity reached in the Calendar Year 2005.

Mr. Baldwin noted that the noise contour analysis was on hold pending receipt of input from the FAA regarding two items: (1) approval of HMMH’s proposed “user-defined inputs” for modeling huskitted Stage 3 Gulfstream IIIs, and (2) designation of substitute aircraft to use in modeling aircraft types not included in the INM database. He stated that HMMH was contacting the FAA regularly to push for this input as soon as feasible and would request assistance from the airport staff if it appeared that it would be useful.

Single Event Contours will be done at 85, 90 & 95 dB to compile 15 baseline combinations of aircraft type, flight track and type of operation.

The Committee reached consensus that Ted Baldwin should recommend the aircraft and specific flight tracks to be used. Mr. Baldwin offered to make an independent recommendation and then have feedback. All members were in agreement to have Mr. Baldwin make recommendations. It was suggested that the Piaggio Avanti be included. Mr. Baldwin agreed to prepare recommendations, once the FAA provided the aircraft type substitution information discussed previously.

At least 2 working sessions will be devoted to identify noise abatement alternatives. HMMH is currently working on the baseline and existing operations of interest. Solutions will be looked at the next session. The fifteen (15) combinations of traffic patterns and profiles will assist in identifying problem areas.

Operational alternatives are important. They will be addressed in Element 3. There will be another 10 sets of DNL and 10 SEL contours. The data HMMH collects will be used to develop alternatives.

Mr. Baldwin reviewed the overall organization and content of the partial draft “2010 and 2015 Noise Exposure Maps” (NEM) report, which the committee members received prior to the meeting. He pointed out that it reflected the status of the data collection, analysis, and documentation to date, and also reflected the organization of the remaining NEM elements. He
Workshop Meeting Minutes
17 December 2009
Part 150 Study
Technical Advisory Committee

A. ROLL CALL

Meeting was called to order by Chairman Parker at 1:00 p.m. in the Airport Office Building Conference Room. Present were Mr. Conn, Mr. Goddard, Mr. Nelson, Mr. Tweedie and Mr. Zarroli. Mr. Schultz attended the meeting by teleconference.

Also in attendance were Mr. Konn, Mr. Lohmann and Mr. Repp from the Noise Compatibility Committee and Commissioner Sullivan, Mr. Soliday, Ms. Dugan, Mr. LaFever, Ms. Vandersluis and Ms. Hart.

B. PLEDGE OF ALLEGIANCE

C. AGENDA

There were no changes to the agenda.

There were no changes to minutes.

D. ACTION ITEMS

1. Interactive presentation by Ted Baldwin, Senior Vice President, Harris Miller Miller & Hanson Inc. concerning the following topics:

   a) FAA feedback on the forecast, user-defined hush-kitted GIII, and aircraft modeling substitutes

   b) The TAC feedback received on the “partial draft” Noise Exposure Model (NEM) documentation and Ted Baldwin’s responses to it.

   c) HMMII suggestions for the 15 baseline single event contour cases, which may or may not include Flight Path Alternatives, Flight Profile Alternatives, 3,000 foot Departure, and SIDS and SARS.

   d) The draft NEM figures and population counts.

   e) Scheduling the first public workshop to present the draft NEM and other progress to date.

Page 1 of 4
Mr. Baldwin gave an interactive presentation starting with “City of Naples Airport Authority, FAR Part 150 Study Update/ Committee Member Workbook.”

The completed DNL contours, and associated dwelling unit and population counts, were reviewed and discussed, including the 2010 base and 2015 forecast five-year Noise Exposure Map cases, and the three cases being prepared for informational purposes only: (1) 2020 “long-term” forecast with the revised operations forecast assuming overall operations will recover to 2005 “peak year” levels, (2) March 2010 “peak month,” and August 2010 “off-peak month.” These materials have been provided to the committee in background material for the meeting.

The project’s scope of services calls for preparation of 15 single event contours for “baseline” operations. At the September TAC meeting, the committee reached consensus that Mr. Baldwin should recommend the combinations of aircraft type, type of operation, and flight track to model. Mr. Baldwin presented his recommendations, as listed in background materials distributed prior to the meeting, and the Committee reached consensus that these were the appropriate baseline contours to prepare.

Mr. Baldwin summarized information that has been received from the FAA that has permitted completion of the full draft Noise Exposure Map, including the DNL contours discussed earlier in the meeting, including:

1. The FAA approved HMMH’s proposed “user-defined inputs” for modeling including Stage 3 “bush kitted” for Gulfstream III aircraft.

2. The FAA identified INM substitutes for modeling aircraft, including use of the DeHavilland DHC-6 Twin Otter as a substitute for the Piaggio P180 Avanti.

3. The FAA approved the 2010 and 2015 forecasts that are the basis for the official Noise Exposure Map contours.

Mr. Baldwin noted that the remaining steps related to completing the Noise Exposure Map phase of the study, which will culminate with the Authority submitting it to the FAA include:

1. Airport Authority staff approving the full draft document, which HMMH has provided for their review.

2. HMMH making final revisions to the document and providing a reproducible master to the Authority staff for reproduction, for distribution to TAC members and to make available in several public locations to permit interested parties to review it.

3. Publicizing the notice of availability of the draft Noise Exposure Map for review.

4. Arranging, scheduling, and publicizing the first public workshop for the study, to introduce the study, its scope, schedule, progress to date, and upcoming activities, and to
request public input on noise compatibility issues of concern and potential compatibility actions to consider.

It was decided to have a public workshop the end of January or beginning of February to answer questions from the public. Information will be provided in both an introductory and a detailed manner. Included in this workshop will be DNL contours. The TAC will be asked to be involved. City Council Chambers was suggested for the location of the workshop. It was suggested to put informational ads in the local newspapers.

TAC members prefer the information in hard copy, but also have a PDF file and information on CD as well. Hard copies will be provided to local libraries to be available for the public to view.

Mr. Baldwin noted that we are starting the next project phase, which is to identify, analyze and evaluate abatement alternatives. Mr. Baldwin requested committee input on the 10 single event contours to consider in this phase of the study. After extensive discussion, the following preliminary recommendations were received:

(1) Lear 35 Runway 23 departure down Naples Bay.

(2) Lear 35 Runway 23 departure flying the “Fifth Avenue” track using the National Business Aviation Association (NBAA) “close-in” departure procedure.

(3) Lear 35 Runway 23 departure flying the “Fifth Avenue” track using the NBAA “standard” departure procedure.

(4) Lear 35 Runway 23 departure flying the “Fifth Avenue” track reflecting the average slow climb observed in radar data for Naples operations.

(5) Lear 35 Runway 32 departure flying Track 32JD2, the “Fifth Avenue” track using the National Business Aviation Association (NBAA) “close-in” departure procedure.

Mr. Baldwin requested that committee members send recommendations for additional single event cases to consider to Mr. Dehn at the Authority (and copy him on the message.)

In response to Mr. Parker’s request, Mr. Baldwin agreed to provide the TAC with the following information:

(1) Integrated Noise Model (INM) assumptions regarding the departure procedure used by the Lear 35.

(2) Scanned copies of the single event contours prepared in the 1996 Part 150 study.

The committee also discussed interest in preferential runway use. Mr. Baldwin agreed to conduct a “wind-rose” analysis and use it to prepare DNL contours showing the effect of revised runway use.
The length of the runway was discussed. Mr. Soliday noted that the Authority wants objective technical analysis of the potential benefits. There was discussion regarding the base of runway 5/23 being 5290 ft., with 290 ft. for displaced threshold vs. the landing legal definition of 5,000 ft.

It was suggested to have another committee meeting in early February. At that meeting, the 15 baseline contours should be done and alternatives will be discussed. It was agreed that the next TAC meeting should be scheduled in conjunction with the public workshop, if possible, either the day before or after. Also a pre-workshop session will be scheduled the day of the workshop, to assist in making last-minute arrangements. It was agreed the workshop should run from 5 to 8 p.m.

Mr. Parker voiced concern that this Study doesn’t evolve into support document for new commercial service to the terminal. He said this Study must be as objective as possible.

E. **NEW BUSINESS**

F. **OLD BUSINESS**

G. **PUBLIC COMMENTS**

None.

H. **ADJOURN**

The date of the next meeting was not set.

Mr. Goddard made the Motion to adjourn. Mr. Nelson seconded. With no further business, the meeting adjourned at 4:00 p.m.

Ervin Dehn  
Director of Airport Development
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APPENDIX J  FIRST PUBLIC WORKSHOP BOARDS AND SIGN-IN SHEETS
Welcome to the Naples Municipal Airport Part 150 Update Public Workshop

Workshop Overview

- Introduction
  - Part 150 overview
  - Prior Naples Part 150 studies
  - Scope and status of this update
- Noise terminology overview
- Noise measurement elements of the study
  - Completed and upcoming
- Existing and forecast noise exposure
  - Cumulative and single event noise
  - Overview of data sources and analyses
- Public involvement and comment opportunities
  - Public input and participation are strongly encouraged

The following topics are covered in individual workshop "stations:"

**FAR Part 150, “Airport Noise Compatibility Planning”**

- **Voluntary** FAA-defined process for airport noise studies
  - Increases likelihood FAA will cooperate with implementation
  - Provides access to FAA funding of some approved measures
- **Includes two major elements:**
  - Noise Exposure Map – FAA “accepts”
    - Detailed description of airport layout, operations, noise exposure, land uses, and noise/land use compatibility for at least two years
    - This study goes significantly beyond FAA’s Part 150 requirements
      - Addresses 2010, 2015, and 2020, and “peak” and “off-peak” season
      - Addresses “single event” noise of particular local concern
  - Noise Compatibility Program – FAA “approves” individual measures
    - Noise abatement measures to reduce noise exposure
    - Compatible land use measures to prevent new non-compatible land uses
- **Comprehensive public involvement is equally important**
  - *Input is sought from all interested parties*

---

**Part 150 Study Elements and Current Status**

*Three study elements are underway or complete:*

1. **Design and Conduct a Public Participation Program**
   - **Status:** The Technical Advisory Committee has met 7 times and will continue to meet throughout the study. All TAC meetings are open to the public.
   - This meeting is the first of three public workshops.

2. **Develop Operational, Noise, and Land Use Database**
   - **Status:** Complete. Major results are presented in other stations. Full results are presented in the “Draft Noise Exposure Map” that is available for public review at this meeting and other accessible community locations.

3. **Identify, Analyze, and Evaluate Abatement Alternatives**
   - **Status:** Recently initiated. Public input is actively sought.

*The remaining study elements that will follow include:*

4. **Identify, Analyze, and Evaluate Land Use Strategies**
5. **Select Preferred Abatement and Land Use Alternatives**
6. **Develop Implementation Systems**
7. **Prepare and Present Noise Compatibility Program**
**Previous Naples Part 150 Study Processes**

- Previous Naples Part 150 Study processes include:
  - 1987 Noise Exposure Map and Noise Compatibility Program
  - 1997 Noise Exposure Map and Noise Compatibility Program
  - 1998 Noise Exposure Map and Noise Compatibility Program
  - 2000 Noise Exposure Map

- The studies have led to a comprehensive noise program, including:
  - Noise abatement measures
  - Compatible land use measures
  - Implementation measures

- These measures and their implementation status are described in the Draft Noise Exposure Map volume that is available for public review

- The current study is reevaluating all of these measures

- The Naples Airport Authority also conducted a precedent-setting “Part 161” study, which led to a ban on operation of older, noisier “Stage 2” jet aircraft at the airport

---

**The Naples Airport Authority has banned operations in the noisiest “Stage 2” general aviation jets**

- **Common Unrestricted Models**
  - Twin turbopropeller (Non-jet, provided for comparative purposes only)
  - Larger Stage 3 g.a. jet
  - Typical Stage 3 regional jet
  - Smaller Stage 3 g.a. jet

- **Common Restricted Models**
  - Smaller Stage 2 g.a. jet
  - Larger Stage 2 g.a. jet

*No other airport operator in the U.S. has adopted a restriction on noisy aircraft since 1990.*
Noise Terminology

- **A-weighted decibel (dBA)**
  - Reflects the manner humans hear different pitches of sound
  - All federal agencies have adopted dBA for environmental studies

- **Single event metrics are most relevant at Naples**
  - Maximum sound level (Lmax)
    - Easiest to understand
    - “How loud did it get?”
  - Time-Above threshold (TA)
    - “How long will it affect me?”
  - Outdoor speech interference starts at about 65 dBA
  - Sound Exposure Level (SEL)
    - Noise “dose” over entire event
    - Compresses noise into one second

  - **FAA will not base Part 150 approvals on single event metrics**

---

Day-Night Average Sound Level ("DNL" or "Ldn")

- Cumulative noise measure
- Equal to steady level that contains same energy as the actual time-varying sound
- Increases sounds from 10 p.m. to 7 a.m. 10-fold
- Used by all federal agencies that deal with aviation noise
- Basis for FAA approval of noise abatement measures
- The City of Naples, Collier County, and the Airport Authority have adopted a 60 dB DNL compatibility standard – 5 dB lower than federal standard
The Draft Noise Exposure Map includes detailed documentation of single event and cumulative noise exposure results for the initial monitoring in February 2008. Additional measurements will be conducted to test noise abatement procedures, with Technical Advisory Committee oversight.

The Draft Noise Exposure Map volume includes contours for 2010, 2015, and 2020 annual exposure, and for 2010 "peak" and "off-peak" seasons.
Noise Analysis is Based on Actual Flight Tracks

The Draft Noise Exposure Map volume includes flight tracks for jet, propeller and helicopter arrivals, departures, and training pattern operations.

Database Development

- Noise Exposure Map provides detailed documentation of data sources, analyses, and assumptions
  - Airport layout, flight tracks, runway use, land uses, etc.
- Up-to-date sources were sought and field-verified
- FAA approved forecasts and modeling assumptions
  - 2020 forecast based on “peak” operations in 2005

Forecast Operations Summary

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<td>Total</td>
<td>160,670</td>
<td>129,551</td>
<td>115,396</td>
<td>129,226</td>
<td>160,670</td>
<td>1.8%</td>
</tr>
</tbody>
</table>
Baseline Single Event Contour Analyses

The Technical Advisory Committee also is considering single event contours for jet arrivals, and for noisy turboprop arrivals.

The noise abatement analysis will utilize single event contours to evaluate alternatives, such as revised flight tracks or departure climb profiles.

Do you have any alternatives to suggest?

Public Input and Comment Opportunities

- Technical Advisory Committee meetings are advertised and open to the public
- Draft Noise Exposure Map volume is available for public review and comment
  - Ask workshop staff for information on review locations, and on comment deadline and submission address
  - Comments will be accepted in any written format
  - Comment sheets are available, if desired
- Next two workshops will address noise abatement and land use control alternatives
- The final workshop will include a public hearing session
- Please sign up to receive notice of upcoming TAC meetings and workshops

Thank you for attending!
## Naples Municipal Airport Part 150 Update

### First Public Workshop – March 2, 2010 - Attendee Sign-In Sheet

<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
<th>Email (optional)</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monty Gettoys</td>
<td>841 W. Motiford Ave, Motiford FL 33705</td>
<td><a href="mailto:monty.gettoys@mji-us.com">monty.gettoys@mji-us.com</a></td>
<td>407-589-7030</td>
</tr>
<tr>
<td>Bob Doss</td>
<td>249 Bambuseri Rd, Naples, FL 33410</td>
<td><a href="mailto:bob.doss@verizon.net">bob.doss@verizon.net</a></td>
<td>239-430-9471</td>
</tr>
<tr>
<td>Bill Goddard</td>
<td>2847 Airport Rd, Naples, FL 34112</td>
<td><a href="mailto:goddard@verizon.net">goddard@verizon.net</a></td>
<td>239-585-7280</td>
</tr>
<tr>
<td>Bill Konn</td>
<td>938 Carrick Bend Cir, Naples, FL 34110</td>
<td><a href="mailto:bitt2000@yahoo.com">bitt2000@yahoo.com</a></td>
<td>593-5517</td>
</tr>
<tr>
<td>Ted Brown</td>
<td>878 Wyndemere Ave, Naples, FL 34105</td>
<td><a href="mailto:tedbrown@juno.com">tedbrown@juno.com</a></td>
<td>239-723-0783</td>
</tr>
<tr>
<td>Cam Zarroli</td>
<td>560 9th Ave S, Naples, FL 34102</td>
<td><a href="mailto:camzaranoli@gmail.com">camzaranoli@gmail.com</a></td>
<td>239-723-0783</td>
</tr>
<tr>
<td>Jesse Pollam</td>
<td>104th Ave S, Naples, FL 34104</td>
<td><a href="mailto:jessie.pollam@gmail.com">jessie.pollam@gmail.com</a></td>
<td>239-723-0783</td>
</tr>
<tr>
<td>Allen Nelson</td>
<td>486 15th Ave S, Naples, FL 34104</td>
<td><a href="mailto:alene.nelson@nfl.com">alene.nelson@nfl.com</a></td>
<td>239-723-0783</td>
</tr>
<tr>
<td>Ron Fronglici</td>
<td>13631 11th Ct N, Naples, FL 34102</td>
<td><a href="mailto:ronfronglici@nfl.com">ronfronglici@nfl.com</a></td>
<td>239-723-0783</td>
</tr>
<tr>
<td>Sam Samadi</td>
<td>440 9th Ave S, Naples, FL 34102</td>
<td><a href="mailto:samsamadi@nfl.com">samsamadi@nfl.com</a></td>
<td>239-723-0783</td>
</tr>
<tr>
<td>E.W. Wahl</td>
<td>156 Edgewood St, Naples, FL 34105</td>
<td><a href="mailto:edwardwah111@gmail.com">edwardwah111@gmail.com</a></td>
<td>239-723-0783</td>
</tr>
</tbody>
</table>
### Naples Municipal Airport Part 150 Update
First Public Workshop – March 2, 2010 - Attendee Sign-In Sheet

<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
<th>Email (optional)</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duane Repp</td>
<td>300 Edgewater Dr.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>John Sorensen</td>
<td>220 Guthrie Blvd, Naples, FL 34102</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Larry Schulte</td>
<td>468 16th Ave, Naples</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nicole Toranto</td>
<td>335 Skelly Rd, Naples, FL 34104</td>
<td><a href="mailto:noreply@naples.com">noreply@naples.com</a></td>
<td></td>
</tr>
<tr>
<td>Sadowska Joe</td>
<td>803 Knollwood Dr, Naples, FL 34108</td>
<td>c.h.sadowska@ comcast.net</td>
<td></td>
</tr>
<tr>
<td>Tom Miller</td>
<td>20810427 Naples, FL 34101</td>
<td><a href="mailto:themax60@yahoo.com">themax60@yahoo.com</a></td>
<td></td>
</tr>
<tr>
<td>Doug Finley</td>
<td>3630 60th St, Naples, FL 34105</td>
<td>djfinley@ comcast.com</td>
<td>407-442-3522</td>
</tr>
<tr>
<td>Peter Smith</td>
<td>63710 Main St, Cambridge, MA 02142</td>
<td>psmithe@ comcast.com</td>
<td>617-286-3522</td>
</tr>
<tr>
<td>W. Vanderslice</td>
<td>NAA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX K  NEWSPAPER ADVERTISEMENTS, NOTICES
POSTED AT THE AIRPORT, NOTICES PROVIDED TO
THE MEDIA, AND NOTICES MAILED TO TENANTS,
technical advisory committee and noise
compatibility committee members, other
airport stakeholders, and homeowners
associations
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PUBLIC NOTICE


The Naples Airport Authority is conducting a "Part 150" Noise Compatibility Study. Part 150 is a voluntary Federal Aviation Administration program that sets guidelines for airports to follow to document aircraft noise exposure, and to establish noise abatement and compatible land use programs.

The Authority is holding a public workshop to introduce the study, review progress to date, present the draft "Noise Exposure Map," and seek input.

The workshop will be from 5 to 8 p.m., Tuesday, March 2, 2010, at the Commercial Airline Terminal, Naples Municipal Airport, 500 Terminal Drive (off North Road at Airport-Pulling Road). The meeting is in "open house" format – please come any time.

Public feedback is invited on the draft Noise Exposure Map. The draft report will be available for review at the workshop and also is available for review at the Naples Airport Administrative Offices, 160 Aviation Drive North (2nd floor). Comments on the draft are due by Friday, March 19, 2010. Comments may be submitted in any written format in one of the following ways:

- In person at the workshop
- By mail to: Part 150 Comments, Naples Municipal Airport, 160 Aviation Drive North, Naples, FL 34104

If you have any questions about the Part 150 Study, please contact the Naples Airport Authority in one of the preceding ways, or by calling (239) 943-0733. No. 231159558

February 19, 2010
Notice for posting mailed to 134 Homeowners Associations and posted in the airport’s pilot lounge, lobbies of the commercial airline and general aviation terminals, both floors of the airport office building, and at the NAA offices.

Naples Municipal Airport Noise Study Public Workshop
and Opportunity for Public Review of Draft Noise Exposure Map Report

The Naples Airport Authority is conducting a “Part 150” Noise Compatibility Study. Part 150 is a voluntary Federal Aviation Administration program that sets guidelines for airports to follow to document aircraft noise exposure, and to establish noise abatement and compatible land use programs.

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* In person at the workshop
* By mail to: Part 150 Comments, Naples Municipal Airport, 160 Aviation Drive North, Naples, FL 34104

If you have any questions about the Part 150 Study, please contact the Naples Airport Authority in one of the preceding ways, or by calling (259) 643-0733.
Cover memorandum sent with preceding public notice to TAC and NCC members.

Facsimile copies were sent to the Economic Development Council of Collier County, the Greater Naples Chamber of Commerce, the Naples Daily News, the Southwest Florida News Press, The Marco Eagle, WINK (television and radio), and WFTX (television).
Cover memorandum sent with preceding public notice to 134 homeowners associations.

*****MEMORANDUM*****

TO: Homeowners Association President
FROM: City of Naples Airport Authority
DATE: 25 February, 2010
RE: Part 150 Study Draft Noise Exposure Maps Public Workshop

The Naples Airport Authority is in the process of conducting an updated noise study under Federal Aviation Regulation Part 150 “Airport Noise Compatibility Planning.” Part 150 sets standards for airport operators to use in documenting noise exposure and in establishing programs to minimize noise-related land use incompatibilities.

On March 2, 2010 we will be holding an open public workshop to introduce the study, summarize its scope, review the progress to date, and present the draft “Noise Exposure Map” report. The workshop will be from 5 to 8 pm, at the Commercial Airline Terminal, Naples Municipal Airport, 500 Terminal Drive, Naples (accessed via North Road off of Airport-Pulling Road). It will be in “open house” format, so interested parties may come at any time. We will run newspaper advertisements and distribute other notices to alert the public to the workshop, and to the review and comment opportunities.

Please place for viewing the enclosed Notice of the Public Workshop.

We have made copies of the draft Noise Exposure Map Report available for general public review at the Authority’s offices in the Naples Municipal Airport General Aviation Terminal, located at 160 Aviation Drive North, Naples Florida 34104. The public comment period ends on March 19, 2010.
Postcard mailed to 371 airport tenants (enlarged).

Naples Municipal Airport
Noise Study Public Workshop
and Opportunity for Public Review of
Draft Noise Exposure Map Report

The Naples Airport Authority is conducting a “Part 150” Noise Compatibility Study. Part 150 is a voluntary Federal Aviation Administration program that sets guidelines for airports to follow to document aircraft noise exposure, and to establish noise abatement and compatible land use programs.

The Authority is holding a public workshop to introduce the study, review progress to date, present the draft “Noise Exposure Map,” and seek input.

The workshop will be from 5 to 8 p.m., Tuesday, March 2, 2010, at the Commercial Airline Terminal, Naples Municipal Airport, 500 Terminal Drive (off North Road at Airport-Pulling Road).

The meeting is in “open house” format – please come any time. Public feedback is invited on the draft Noise Exposure Map. The draft report will be available for review at the workshop and also is available for review at the Naples Airport Administrative Offices, 160 Aviation Drive North (2nd floor). Comments on the draft are due by Friday, March 19, 2010. Comments may be submitted in any written format in one of the following ways:
- In person at the workshop
- By mail to: Part 150 Comments, Naples Municipal Airport, 160 Aviation Drive North, Naples, FL 34104

If you have any questions about the Part 150 Study, please contact the Naples Airport Authority in one of the preceding ways, or by calling (239) 843-0733.
Cover letters transmitting review copies of the Draft Noise Exposure Map to the City of Naples and Collier County Planning Departments
February 18, 2010

Robin Singer
Director City Planning
City of Naples Florida
295 Riverside Circle
Naples, FL 34102


Dear Ms. Singer,

The Naples Airport Authority is in the process of conducting an updated noise study under Federal Aviation Regulation Part 150 “Airport Noise Compatibility Planning.” Part 150 sets standards for airport operators to use in documenting noise exposure and in establishing programs to minimize noise-related land use incompatibilities.

A formal Part 150 submission to the Federal Aviation Administration (FAA) includes two principal documents: (1) a Noise Exposure Map and (2) a Noise Compatibility Program. The Noise Exposure Map is a detailed description of the current and future airport layout, operations, and associated land use compatibility situation under existing noise abatement and land use regulations. The Noise Compatibility Program evaluates and proposes revisions to those regulations to minimize current and future incompatibilities.

On behalf of the Naples Airport Authority, I am pleased to provide you with the enclosed draft of the first of those two documents, the “Naples Municipal Airport 2010 and 2015 Noise Exposure Maps.” We request that you provide us with comments on this draft for us to address prior to submitting it to the FAA for its review. We are interested in your thoughts about all elements of the report.

The City provided similar input to Part 150 studies the Authority undertook in 1987, 1997, 1998, and 2000. The City also has been an active partner in the successful implementation of the land use compatibility measures that resulted from those studies, as discussed in Section 2.4 of the enclosed document. Other elements of the report address a broad range of land use information, in particular the noise contour graphics and demographic statistics presented in Section 5, and the land use database documentation presented in Appendix G.

We have made copies of the draft available for general public review at the Authority’s offices in the general aviation terminal. The public comment period ends March 19. We request that you provide any comments by the end of the comment period.
On March 2, 2010 we will be holding an open public workshop to introduce the study, summarize its scope, review the progress to date, and present the draft “Noise Exposure Map” report. The workshop will be from 5 to 8 pm, at the Commercial Airline Terminal, Naples Municipal Airport, 500 Terminal Drive, Naples (accessed via North Road off of Airport-Pulling Road). It will be in “open house” format, so interested parties may come at any time. We will run newspaper advertisements and distribute other notices to alert the public to the workshop, and to the review and comment opportunities.

The Authority greatly appreciates your continuing cooperation in this important local effort.

Please do not hesitate to contact me with any questions.

Regards,

Ervin N. Dehn, Jr.
Director of Airport Development
City of Naples Airport Authority

Enclosure
February 18, 2010

Nick Casalanguida
Interim Administrator, Collier County CDES
2800 N. Horseshoe Drive
Naples, FL 34104

RE: Naples Municipal Airport "Part 150" Noise Compatibility Study
Draft Noise Compatibility Report

Dear Mr. Casalanguida,

The Naples Airport Authority is in the process of conducting an updated noise study under Federal Aviation Regulation Part 150 "Airport Noise Compatibility Planning." Part 150 sets standards for airport operators to use in documenting noise exposure and in establishing programs to minimize noise-related land use incompatibilities.

A formal Part 150 submission to the Federal Aviation Administration (FAA) includes two principal documents: (1) a Noise Exposure Map and (2) a Noise Compatibility Program. The Noise Exposure Map is a detailed description of the current and future airport layout, operations, and associated land use compatibility situation under existing noise abatement and land use regulations. The Noise Compatibility Program evaluates and proposes revisions to those regulations to minimize current and future incompatibilities.

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The County provided similar input to Part 150 studies the Authority undertook in 1987, 1997, 1998, and 2000. The County also has been an active partner in the successful implementation of the land use compatibility measures that resulted from those studies, as discussed in Section 2.4 of the enclosed document. Other elements of the report address a broad range of land use information, in particular the noise contour graphics and demographic statistics presented in Section 5, and the land use database documentation presented in Appendix G.

We have made copies of the draft available for general public review at the Authority's offices in the general aviation terminal. The public comment period ends March 19. We request that you provide any comments by the end of the comment period.
On March 2, 2010 we will be holding an open public workshop to introduce the study, summarize its scope, review the progress to date, and present the draft "Noise Exposure Map" report. The workshop will be from 5 to 8 pm, at the Commercial Airline Terminal, Naples Municipal Airport, 500 Terminal Drive, Naples (accessed via North Road off of Airport-Pulling Road). It will be in "open house" format, so interested parties may come at any time. We will run newspaper advertisements and distribute other notices to alert the public to the workshop, and to the review and comment opportunities.

The Authority greatly appreciates your continuing cooperation in this important local effort.

Please do not hesitate to contact me with any questions.

Regards,

Ervin N. Dehn, Jr.
Director of Airport Development
City of Naples Airport Authority

Enclosure
APPENDIX L  PUBLIC COMMENTS RECEIVED AT FIRST PUBLIC WORKSHOP AND DURING FEBRUARY 19 – MARCH 19, 2010 COMMENT PERIOD (NINE COMMENT SHEETS AND ONE LETTER)
Naples Municipal Airport Part 150 Update Comment Form

The Naples Airport Authority seeks comments from all interested parties on the "Naples Municipal Airport 2010 and 2015 Noise Exposure Maps, Draft – February 2010." The Authority will consider all comments received in preparing the final draft of the report and will provide copies to the Federal Aviation Administration for its consideration in reviewing the document.

This form is provided for your convenience. You may submit comments in any written format in one of the following ways:

- In person at the First Public Workshop, that is scheduled for 5 to 8 p.m., on Tuesday, March 2, 2010, at the Commercial Airline Terminal, 500 Terminal Drive, Naples (off North Road at Airport-Pulling Road).
- In person or by mail: Part 150 Comments, Naples Municipal Airport, 160 Aviation Drive North, Naples, FL 34104

If you have any question about the Part 150 study, please contact the Naples Airport Authority in one of the preceding ways, or by calling (239) 643-0733

Thank you for your participation!

Date: 3-2-2010 Name: CAROZIAK, JOSEPH
Address: 8077 KNOXWOOD City: NAPLES zip: 34108
Phone (optional): 578-1976 Email (optional):
Location at which draft document was viewed: "ADF"
Did you attend the workshop? Yes [ ] No [ ]

Comments:

"Carozia Park should be monitored to produce a schedule of events that is given to Tower. When possible, the tower could change runways to reduce noise during concerts."

[signature]

Please continue on the reverse side of this form, if necessary.
Naples Municipal Airport Part 150 Update Comment Form

The Naples Airport Authority seeks comments from all interested parties on the "Naples Municipal Airport 2010 and 2015 Noise Exposure Maps, Draft – February 2010." The Authority will consider all comments received in preparing the final draft of the report and will provide copies to the Federal Aviation Administration for its consideration in reviewing the document.

This form is provided for your convenience. You may submit comments in any written format in one of the following ways:

- In person at the First Public Workshop, that is scheduled for 6 to 8 p.m., on Tuesday, March 2, 2010, at the Commercial Airline Terminal, 500 Terminal Drive, Naples (off North Road at Airport-Pulling Road).
- In person or by mail: Part 150 Comments, Naples Municipal Airport, 160 Aviation Drive North, Naples, FL 34104

If you have any question about the Part 150 study, please contact the Naples Airport Authority in one of the preceding ways, or by calling (239) 643-0733

Thank you for your participation!

Date: 3/10
Name: R. KEITH CULLUMN

Address: 110 Q III Ave S
City: Naples
Zip: 34101

Phone (optional): Email (optional):

Location at which draft document was reviewed: Naples

Did you attend the workshop?: Yes No

Comments:

"Good job and I hope the effect continues. Our neighbors suggested a limit was to make 14-3V the primary runway, not 5-23, so "calm" continues.

Could you e-mail me with follow-up:

1) How many of the plans listed at APF are owned by Naples and/or Collier County residents?
2) Has an EPA study been done to reviewed emissions raised on Old Naples?
3) The noise tracking looks like a criss cross.

Please continue on the reverse side of this form, if necessary.

..."
Naples Municipal Airport Part 150 Update Comment Form

Comments, continued from the front page:

1. Should the noise abatement zones be increased or decreased to include the "buffer zone"?
2. Should the noise abatement zones be increased to include the "buffer zone"?
3. Should the noise abatement zones be increased to include the "buffer zone"?
4. Should the noise abatement zones be increased to include the "buffer zone"?

Please feel free to use multiple forms or additional sheets of paper, if necessary.
Thank you for commenting!
Naples Municipal Airport Part 150 Update Comment Form

The Naples Airport Authority seeks comments from all interested parties on the "Naples Municipal Airport 2010 and 2015 Noise Exposure Maps, Draft – February 2010." The Authority will consider all comments received in preparing the final draft of the report and will provide copies to the Federal Aviation Administration for its consideration in reviewing the document.

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- In person or by mail: Part 150 Comments, Naples Municipal Airport, 160 Aviation Drive North, Naples, FL 34104.

If you have any question about the Part 150 study, please contact the Naples Airport Authority in one of the preceding ways, or by calling (239) 643-0733.

Thank you for your participation!

Date: 3-2-10  
Name: Robert Davis

Address: 24 Bramblewood Pl  
City: Naples  
State: FL  
Zip: 34105

Phone (optional): 239-435-9471  
Email (optional): noemail

Location at which draft document was reviewed: Naples Airport

Did you attend the workshop? Yes [ ] No [ ]

Comments:

So happy the Noise Issue is being addressed. I live at Wyndham (11 yrs) and the Noise from planes flying overhead has been so annoying. We have to make phone calls because of the noise. Especially, it is bad in the morning.  

Please continue on the reverse side of this form, if necessary.
# Naples Municipal Airport Part 150 Update Comment Form

The Naples Airport Authority seeks comments from all interested parties on the "Naples Municipal Airport 2010 and 2015 Noise Exposure Maps, Draft - February 2010." The Authority will consider all comments received in preparing the final draft of the report and will provide copies to the Federal Aviation Administration for its consideration in reviewing the document.

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- In person or by mail: Part 150 Comments, Naples Municipal Airport, 160 Aviation Drive North, Naples, FL 34104

If you have any question about the Part 150 study, please contact the Naples Airport Authority through the preceding ways, or by calling (239) 643-0733

Thank you for your participation!

<table>
<thead>
<tr>
<th>Date</th>
<th>3/21/10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Douglas Finch</td>
</tr>
<tr>
<td>Address</td>
<td>3430 Gulf Home Circle, Naples FL 34105</td>
</tr>
<tr>
<td>Phone (optional)</td>
<td>403-4496</td>
</tr>
<tr>
<td>Email (optional)</td>
<td></td>
</tr>
<tr>
<td>Location at which draft document was reviewed</td>
<td>Airport - Commercial Terminal</td>
</tr>
<tr>
<td>Did you attend the workshop?</td>
<td>Yes X No</td>
</tr>
</tbody>
</table>

**Comments:**

- Very informative, knowledgeable
- Person to talk too, 2 NAA Board members were there
- Based on my research with
- Options will need considerable
- From RSU continued to
- Make meaningful progress on
- Noise impact to direct aircraft properties

Please continue on the reverse side of this form, if necessary.
Naples Municipal Airport Part 150 Update Comment Form

The Naples Airport Authority seeks comments from all interested parties on the “Naples Municipal Airport 2010 and 2015 Noise Exposure Maps, Draft – February 2010.” The Authority will consider all comments received in preparing the final draft of the report and will provide copies to the Federal Aviation Administration for its consideration in reviewing the document.

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* In person or by mail: Part 150 Comments, Naples Municipal Airport, 160 Aviation Drive North, Naples, FL 34104

If you have any question about the Part 150 study, please contact the Naples Airport Authority in one of the preceding ways, or by calling (239) 643-0733

Thank you for your participation!

Date: [ ] Name: [ ]
Address: [ ] City: [ ] Zip: [ ]
Phone (optional) [ ] Email (optional) [ ]
Location at which draft document was reviewed: [ ]
Did you attend the workshop? [ ] Yes [ ] No

Comments:

[ ]

Please continue on the reverse side of this form, if necessary.
Naples Municipal Airport Part 150 Update Comment Form

The Naples Airport Authority seeks comments from all interested parties on the "Naples Municipal Airport 2010 and 2015 Noise Exposure Maps, Draft – February 2010." The Authority will consider all comments received in preparing the final draft of the report and will provide copies to the Federal Aviation Administration for its consideration in reviewing the document.

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- In person or by mail: Part 150 Comments, Naples Municipal Airport, 160 Aviation Drive North, Naples, FL 34104

If you have any question about the Part 160 study, please contact the Naples Airport Authority in one of the preceding ways, or by calling (239) 643-0733

Thank you for your participation!

Date: 3/2/10 Name: JAN miller
Address: P.O. 10427 City: Naples FL Zip: 34101
Phone (optional): Email (optional):
Location at which draft document was reviewed: Naples Airport
Did you attend the workshop? Yes [ ] No [x]

Comments:
- Occasionally small planes landing appear to be too low over Broad Ave. & 6th Ave. Consider this should be reviewed
- Thanks for considering our noise issue.
- Also pollution air

Please continue on the reverse side of this form, if necessary.
Naples Municipal Airport Part 150 Update Comment Form

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2. In person or by mail: Part 150 Comments, Naples Municipal Airport, 160 Aviation Drive North, Naples, FL 34104

If you have any question about the Part 150 study, please contact the Naples Airport Authority in one of the preceding ways, or by calling (239) 643-0733

Thank you for your participation!

Date: 3/2
Name: Dianne Regas
Address: 300 Edgemere Way, City: Naples, Zip: 34105
Phone (optional): __________________________ Email (optional): __________________________

Location at which draft document was reviewed:

Did you attend the workshop? Yes [X] No

Comments:

Arrivals are our biggest problem in Wyncliffe. As an example, in one 3 hour period today 3/2, there were nine jet arrivals over our 7 home neighborhood. I.S. It seems larger jets are coming in at a lower altitude causing more noise!

Please continue on the reverse side of this form, if necessary.
## Naples Municipal Airport Part 150 Update Comment Form

The Naples Airport Authority seeks comments from all interested parties on the "Naples Municipal Airport 2010 and 2015 Noise Exposure Maps, Draft – February 2010." The Authority will consider all comments received in preparing the final draft of the report and will provide copies to the Federal Aviation Administration for its consideration in reviewing the document.

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If you have any question about the Part 150 study, please contact the Naples Airport Authority in one of the preceding ways, or by calling (239) 643-0733

Thank you for your participation!

<table>
<thead>
<tr>
<th>Date</th>
<th>03/02/10</th>
<th>Name</th>
<th>Nicole Taranto</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address</td>
<td>355 Skelly Road</td>
<td>City</td>
<td>Naples</td>
</tr>
<tr>
<td>Zip</td>
<td>34110</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Phone (optional): Email (optional): info@naplesairport.com

Location at which draft document was reviewed: __________________________

Did you attend the workshop?  Yes [X]  No [ ]

Comments: [Good info to have. I am a property manager for Rowman located about 4000 feet from the airport. Workshop was informative and good info to have for the residents of my community.]

Please continue on the reverse side of this form, if necessary.
Naples Municipal Airport Part 150 Update Comment Form

The Naples Airport Authority seeks comments from all interested parties on the "Naples Municipal Airport 2010 and 2015 Noise Exposure Maps, Draft – February 2010." The Authority will consider all comments received in preparing the final draft of the report and will provide copies to the Federal Aviation Administration for its consideration in reviewing the document.

This form is provided for your convenience. You may submit comments in any written format in one of the following ways:

- In person at the First Public Workshop, that is scheduled for 5 to 8 p.m., on Tuesday, March 2, 2010, at the Commercial Airline Terminal, 500 Terminal Drive, Naples (off North Road at Airport-Pulling Road).
- In person or by mail: Part 150 Comments, Naples Municipal Airport, 160 Aviation Drive North, Naples, FL 34104

If you have any question about the Part 150 study, please contact the Naples Airport Authority in one of the preceding ways, or by calling (239) 643-0733

Thank you for your participation!

Date 3/2/10 Name EDWARD L. WAIL
Address 156 EDGEWATER WAY S City NAPLES Zip 34105
Phone (optional) Email (optional) EDWARDWAIL@CONCAST.net
Location at which draft document was reviewed Naples Airport
Did you attend the workshop? Yes No

Comments:
- THERE APPEARS TO BE AN EXTREME AMOUNT OF
  ARRIVAL TRAFFIC DIRECTLY OVER OUR COMMUNITY
  ON A CONSISTENT BASIS – WHAT CAN BE DONE
  TO DISPERSE THE TRAFFIC?  

- ONE TYPE OF PLANE IS EXTREMELY LOUD
  (Plese get up.) WHAT CAN BE DONE TO DIRECT
  THESE PLANES ON AN ALTERNATIVE COURSE?

Please continue on the reverse side of this form, if necessary.
Naples Municipal Airport Part 150 Update Comment Form

Comments, continued from the front page:

There appears to be a wide difference in the level (altitude) on landing patterns. Many arrivals come in at the top level can this be better controlled?

Please feel free to use multiple forms or additional sheets of paper, if necessary.
Thank you for commenting!
February 15, 2010

Part 150 Comments
Naples Municipal Airport
160 Aviation Drive North
Naples, FL 34104

Gentlemen:

I understand you are considering public comments in connection with the "Part 150" study of possible revisions to operating policies and procedures at the Naples Municipal Airport.

I am a homeowner at 134 16th Avenue South, in the direct operations path of the SW/NE runway at the airport. Reasonable control of airport noise is a critical factor in our ability, and that of our neighbors, to enjoy our homes and the wonderful ambiance of Naples.

The decision of the Airport Authority to ban the intolerably noisy "Stage 2" jets, and its willingness to successfully litigate this ban through the Federal Court of Appeals, was the single most important public action for us in our 10 years in Naples, for which we sincerely thank and commend the Authority.

In the intervening time since that ban, however, the increase in volume of flights operating in the SW/NE flight path has again created a growing noise problem. This is particularly true in the case of aircraft which choose to ignore, with apparent impunity, the Airport's nighttime curfew. It is also particularly true of aircraft on approach to the airport which choose to fly at extremely low altitudes, exacerbating the noise impact on residences below. The fact that the aircraft using this low approach is a minority of those passing over our homes is evidence that maintaining a somewhat higher altitude and utilizing a moderately steeper rate of descent is indeed safe and practical.

Given the foregoing, I would like to make four specific suggestions to address the noise compatibility issue:

1) The Airport make the curfew hours mandatory, except in case of emergency or delay beyond the control of the operator. The extensive
record made in the Court of Appeals litigation to sustain the reasonable basis of the Stage 2 ban should also provide substantial and relevant support in the event of a challenge to the curfew. Even while the curfew remains "voluntary," I would urge the Airport to advise all operators that no airport facilities or services will be provided during curfew hours.

2) The Airport limit use of the SW/NE runway to wind or other conditions requiring use of that runway, and thereby make the other runway, which has far lower traffic and noise compatibility impacts, the "default" runway.

3) The Airport seek changes in the approach patterns to the SW/NE runway for noise abatement, including requiring approaches over coastal area home concentrations at the higher minimum altitudes already utilized by many operators.

4) The Airport weigh its heritage as a community airport owned by the citizens of Naples, and the social and environmental impact on the community, in considering the advisability of increasing the length of runways and expanding support facilities to accommodate additional traffic. While the Airport's economic and recreational benefit to Naples is well established, it is difficult to argue there is any net benefit to Naples in attracting the number of large jets which choose to land here as a matter of convenience, for example, in connection with a Super Bowl in Miami.

Thank you for your consideration of these views.

Sincerely,

Harold S Trimmer Jr
APPENDIX M  AIRCRAFT OPERATIONS FORECAST WORKING PAPER AND FAA FORECAST APPROVAL LETTER
NAPLES MUNICIPAL AIRPORT PART 150 UPDATE
WORKING PAPER 1A - AIRCRAFT OPERATIONS FORECAST

Prepared by:
SH&E, Inc.
An ICFI Company

October 1, 2009
1.0 Background and Summary of Findings

This working paper presents the draft aircraft operations forecast developed for the Naples Municipal Airport (APF) Part 150 Update and describes the approach used to prepare the forecast.

The Part 150 Update forecast utilizes airport records compiled in Quarterly Noise Reports, FAA Enhanced Traffic Management System Counts (ETMSC) data, and FAA Aircraft Situation Display to Industry (ASDI) data, and information supplied verbally by the APF air traffic control tower as its basis.

Airport Quarterly Noise Reports from the 1st quarter of 2002 through the 1st quarter of 2009 provide monthly data on total day and night operations, including detail on the types of operations during night hours.

FAA ETMSC data from January 2000 through June 2009 provides a measure of monthly IFR operations by aircraft type at APF. ETMSC data includes all flights that interact with the FAA en route navigation system and provides a good estimate of jet and turboprop operations, but has only limited coverage of piston and helicopter flights, many of which operate under VFR and are not included in this database.

Information from the APF air traffic control tower provides the basis for estimates of helicopter operations.

Estimates of total piston operations at APF are based on the difference between total aircraft operations from the Airport Quarterly Noise Reports and operations by jets, turboprops and helicopters based on ETMSC data and control tower information.

FAA ASDI data for calendar year 2006 compiled by FlightExplorer.com and further processed by the airport and by HMMH was used to estimate day and night shares of operations by aircraft type.
Forecast results include annual forecasts for 2010 (when findings are expected to be submitted to the FAA), 2015 and 2020 as well as peak and off-peak monthly forecasts for 2010. Exhibit 1 summarizes the Part 150 Update annual forecast results.

**Exhibit 1: APF Part 150 Update Forecast Summary**

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Jet</td>
<td>26,754</td>
<td>22,608</td>
<td>17,063</td>
<td>23,242</td>
<td>29,805</td>
<td>2.3%</td>
</tr>
<tr>
<td>Piston</td>
<td>119,141</td>
<td>91,548</td>
<td>84,887</td>
<td>91,888</td>
<td>96,586</td>
<td>0.4%</td>
</tr>
<tr>
<td>Turboprop</td>
<td>5,658</td>
<td>6,272</td>
<td>4,321</td>
<td>4,980</td>
<td>5,751</td>
<td>-0.7%</td>
</tr>
<tr>
<td>Rotor</td>
<td>9,125</td>
<td>9,125</td>
<td>9,125</td>
<td>9,125</td>
<td>9,125</td>
<td>0.0%</td>
</tr>
<tr>
<td>Total</td>
<td>160,670</td>
<td>129,551</td>
<td>115,396</td>
<td>129,226</td>
<td>141,267</td>
<td>0.7%</td>
</tr>
</tbody>
</table>

Source: SH&E analysis

Total airport operations dropped sharply from 2005 to 2008, decreasing by over 31,000 annual operations over the three year interval. Piston aircraft operations had the largest decline and jet operations fell by approximately 4,000 per year, while turboprop operations grew during this period. Information on helicopter operations is limited because the forecasting process relies heavily on flight plan data and plans are not filed for a large share of helicopter flights. Available information suggests that APF has an average of 25 helicopter operations per day, primarily business and public service flights.

Aircraft operations are projected to decrease to 115,400 in 2010, with all types of fixed wing operations falling. Total operations are projected to recover to 2008 levels by 2015, with jet and piston operations slightly higher than 2008 and turboprop operations lower. Helicopter operations are projected to remain constant throughout the forecast period.

Jet operations are projected to reach almost 30,000 per year by 2020. Piston operations will remain below 100,000, while turboprop operations are expected to grow at a moderate rate. Total airport operations are projected to grow at an average rate of 0.7% per year from 2008 to 2020, with jet operations averaging 2.3% annual growth.
2.0 Recent Trends in Aircraft Operations

Exhibit 2 shows annual fixed wing aircraft operations at Naples Municipal Airport from 2002 through 2008.

**Exhibit 2: Annual Fixed Wing Aircraft Operations at APF**

<table>
<thead>
<tr>
<th>Year</th>
<th>Jet</th>
<th>Piston</th>
<th>Turboprop</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>21,024</td>
<td>94,332</td>
<td>6,552</td>
<td>121,908</td>
</tr>
<tr>
<td>2003</td>
<td>22,040</td>
<td>80,853</td>
<td>5,108</td>
<td>107,801</td>
</tr>
<tr>
<td>2004</td>
<td>24,164</td>
<td>101,687</td>
<td>5,964</td>
<td>130,815</td>
</tr>
<tr>
<td>2005</td>
<td>26,754</td>
<td>119,141</td>
<td>5,850</td>
<td>151,665</td>
</tr>
<tr>
<td>2006</td>
<td>25,620</td>
<td>98,217</td>
<td>6,154</td>
<td>127,981</td>
</tr>
<tr>
<td>2007</td>
<td>25,402</td>
<td>90,287</td>
<td>6,108</td>
<td>121,797</td>
</tr>
<tr>
<td>2008</td>
<td>22,606</td>
<td>91,548</td>
<td>6,272</td>
<td>120,426</td>
</tr>
</tbody>
</table>

**Average Annual Growth**

<table>
<thead>
<tr>
<th>Year</th>
<th>Jet</th>
<th>Piston</th>
<th>Turboprop</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002-2005</td>
<td>8.4%</td>
<td>8.1%</td>
<td>-4.8%</td>
<td>7.5%</td>
</tr>
<tr>
<td>2005-2008</td>
<td>-5.5%</td>
<td>-8.4%</td>
<td>3.5%</td>
<td>-7.4%</td>
</tr>
</tbody>
</table>

Source: Airport Records, FAA ETMSC, SH&E analysis

Total fixed wing operations grew at an average rate of 7.5% per year from 2002 to 2005, peaking at 151,500 annual operations. Since then fixed wing operations have declined, and in 2008 were 1.2% lower than in 2002.

Annual jet aircraft operations at APF increased from approximately 21,000 in 2002 to 26,800 in 2005 and since then have declined. Piston operations, which account for about 80% of fixed wing operations at APF, peaked at 119,000 in 2005 and have now fallen to approximately 91,500. Turboprop operations represent a comparatively small share of fixed wing operations and have shown smaller fluctuations.
Exhibits 3 through 5 present monthly operations at APF by business jet, piston, and turboprop aircraft. Business jet operations at APF are highly seasonal, peaking in February and March and falling to the lowest levels in July and August.

Exhibit 3: Monthly GA Jet Aircraft Operations at APF

Source: Airport Records, FAA ETMSC, SH&E analysis
Monthly piston operations at APF have less seasonal variation than jet operations. As Exhibit 4 shows, the first five months of 2005 had substantially more piston activity than any subsequent year. Operations during 2006, 2007 and 2008 peaked in March and again in the fall. Piston operations during the first three months of 2009 were lower than previous years, but the decrease is less pronounced than the decrease in jet operations.

Exhibit 4: Monthly Piston Aircraft Operations at APF

Source: Airport Records, FAA ETMSC, SH&E analysis
Turboprop operations follow a seasonal pattern similar to business jets with a February-March peak and relatively little activity during summer months. Exhibit 5 shows that peak period turboprop operations grew sharply in 2008, with increased activity by Avantair, the Clearwater-based company that offers fractional ownership plans using Piaggio P-180 Avanti aircraft, contributing to this growth. Like jets, turboprop operations during the 2009 peak period were much lower than operations during the 2008 peak.

Exhibit 5: Monthly Turboprop Aircraft Operations at APF

Source: Airport Records, FAA ETMDC, SH&E analysis
3.0 Forecasting Approach

Aviation forecasters typically consider three types of forecasting approaches when preparing traffic forecasts for Part 150 studies and similar applications: econometric, time series, and market share.

Econometric forecasts require the forecaster to identify explanatory variables that explain past changes in the item to be forecast, and also require forecasts of the explanatory variables. No economic variable was found that could explain the unprecedented drop in APF business jet traffic during the February-March 2009 peak season. Even if explanatory variables could be identified, locating or developing credible forecasts of these explanatory variables would remain a challenge. Economists currently express great uncertainty about the future of the U.S. economy. For example, some believe that housing prices have hit bottom. Others predict that housing prices will continue to fall until 2011, producing a growing wave of foreclosures, stifling growth in personal consumption expenditures and undermining economic recovery.\(^1\)

The decision by the top executives of the Big Three automakers to use corporate jets to fly to Washington, D.C., to ask for federal support caused a strong public backlash against the use of private jets.\(^2\) A later article in the Wall Street Journal highlighted the use of corporate jets for travel to resort destinations.\(^3\) The degree to which public sentiment against private jets may have contributed to the decrease in jet operations at APF and other airports is not clear, further complicating the effort to use an econometric approach to quantify the impact of the economic downturn on traffic at APF.

The econometric approach to aircraft traffic forecasting is most effective in times of economic stability when the relationships between economic activity and traffic growth can be estimated with more confidence. This approach is unlikely to be successful in times of economic instability and uncertainty, especially when non-

---


\(^2\) "There is a delicious irony in seeing private luxury jets flying into Washington, D.C., and people coming off of them with tin cups in their hand, saying that they're going to be trimming down and streamlining their businesses," Rep. Gary Ackerman, D-New York, told the chief executive officers of Ford, Chrysler and General Motors at a hearing of the House Financial Services Committee.; Josh Levs, CNN November 19, 2008.

\(^3\) CEOs of Bailed-Out Banks Fly to Resorts on Firms' Jets, Wall Street Journal, June 19, 2009.
economic factors like the public sentiment against the use of corporate jets may affect the results.

Time series analysis, the second frequently used forecasting approach, also works best under stable conditions. GA jet operations at APF in March 2009 were 41% lower than operations in March 2008. With changes of this magnitude, time series analysis cannot be used effectively as a forecasting tool.

The market share forecasting approach was considered carefully, in part because it provides a means of viewing activity at APF in the context of nationwide trends. Exhibit 6 shows the APF share of total US annual business jet operations from 2000 through 2008. The APF share has risen from 0.38% in 2000 (3.8 operations at APF for every 1,000 US business jet operations) to 0.50% in 2008. Based on this data, it would seem reasonable to expect that the APF share of total US business jet operations would continue to increase in the future.

**Exhibit 6: APF Share of Annual US Business Jet Operations**

![Exhibit 6: APF Share of Annual US Business Jet Operations](image_url)

Source: FAA ETMSC, SH&E analysis
Because business jet activity at APF is highly seasonal, it is also useful to look at monthly traffic patterns. Exhibit 7 shows the APF share of total monthly US business jet operations.

**Exhibit 7: APF Share of Monthly US Business Jet Operations**

![Graph showing APF share of monthly US business jet operations]

Source: Airport Records, FAA ETM3C, SH&E analysis.

The APF shares during off-peak and shoulder season months have been steady since 2007, approximately 0.20% during the off-peak and ranging between 0.20% and 0.70% during the shoulder periods, but the APF share has declined during the peak months. February was the peak month at APF in 2007, and the airport handled 0.86% of total US business jet operations. March was the peak month in 2008, and the APF share rose to 0.89%. February was again the peak month in 2009, with the APF share falling to 0.82%. While these changes in APF share are fairly small, they do have a noticeable impact when multiplied by the US total to calculate the number of operations at APF. For example, if APF had maintained its 2008 peak month share of 0.89% in 2009, the airport would have had an additional 199 business jet operations during the peak month of February, an increase of 9.2% over the actual results.

Annual data through 2008 indicates that the APF share of US business jet traffic is increasing over time. Monthly data shows that the APF peak month share was lower in 2009 than it was in 2008 or 2007 and the off peak shares were fairly constant.
indicating no recent growth in APF share. As a result, using the market share approach to forecasting produces alternatives with substantially different growth rates depending on the importance given to the recent sharp drop in APF peak season business jet operations. The market share approach by itself provides no guidance regarding how to interpret this recent decrease in activity.

The recent rapid decline in peak season business jet operations at APF makes the standard forecasting approaches including econometric, time series, and market share analysis unsatisfactory for this study. Instead, the study uses a hybrid forecasting approach that manually produces a smoothed recovery from the present downturn returning to 2008 levels by December 2009, keeps APF operations at 2009 levels for the first six months of 2010, and then applies a modest 2.0% growth rate through 2015. This approach allows the forecast to reflect experience and judgment about future developments while avoiding the unrealistic forecast results that the more structured forecasting approaches produced.
3.0 Annual Forecasts

The forecasting process included preparing forecasts of total operations by type of aircraft (jet, turboprop, piston, and helicopter), estimating shares by aircraft model based on ETMSC data, and estimating day and night shares using ASDI data.

Factors that will greatly influence future levels of aircraft operations at APF include the general strength of the economy, the demand for pilot training, and public attitudes towards business aviation. The APF Part 150 Update forecast reflects several key assumptions regarding these factors.

The forecast assumes that the economy will stabilize in 2009 but remain weak until mid 2010 when a gradual recovery begins. The demand for pilot training will remain limited for at least several years as airlines continue to struggle with lower passenger demand and high fuel prices, and as prospective private pilots postpone training until their jobs are more secure and their investment portfolios have begun to recover. Populist sentiment against corporate aviation is likely to remain strong, but the inconveniences of commercial airline travel will persuade many businesses to use private aircraft more frequently as the economy recovers.
Exhibit 8 illustrates the approach used to estimate short term changes in operations at APF using business jets as an example.

### Exhibit 8: Approach Used to Forecast 2010 Jet Operations at APF

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
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</tr>
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<tbody>
<tr>
<td>Jan</td>
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<td>3,276</td>
<td>3,124</td>
<td>2,996</td>
<td>2,164</td>
<td>2,184</td>
<td>0.73</td>
<td>2,184</td>
<td></td>
</tr>
<tr>
<td>Feb</td>
<td>3,586</td>
<td>3,450</td>
<td>3,590</td>
<td>3,370</td>
<td>2,768</td>
<td>2,766</td>
<td>0.67</td>
<td>2,768</td>
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</tr>
<tr>
<td>Mar</td>
<td>3,850</td>
<td>3,430</td>
<td>3,592</td>
<td>3,768</td>
<td>2,272</td>
<td>2,272</td>
<td>0.60</td>
<td>2,272</td>
<td></td>
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<tr>
<td>Apr</td>
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<td>2,974</td>
<td>2,920</td>
<td>2,568</td>
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<td>1,662</td>
<td>0.65</td>
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<td></td>
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<tr>
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<td>1,848</td>
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<td>1,156</td>
<td>0.89</td>
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<td>1,180</td>
<td>1,118</td>
<td>1,032</td>
<td>759</td>
<td>759</td>
<td>0.74</td>
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</tr>
<tr>
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<td>882</td>
<td>912</td>
<td>722</td>
<td>563</td>
<td>574</td>
<td>0.78</td>
<td>574</td>
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<td>Aug</td>
<td>1,012</td>
<td>988</td>
<td>930</td>
<td>748</td>
<td>816</td>
<td>623</td>
<td>0.82</td>
<td>623</td>
<td></td>
</tr>
<tr>
<td>Sep</td>
<td>1,162</td>
<td>914</td>
<td>962</td>
<td>692</td>
<td>606</td>
<td>612</td>
<td>0.87</td>
<td>612</td>
<td></td>
</tr>
<tr>
<td>Oct</td>
<td>1,776</td>
<td>1,644</td>
<td>1,514</td>
<td>1,164</td>
<td>1,080</td>
<td>1,101</td>
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<tr>
<td>Nov</td>
<td>2,896</td>
<td>2,648</td>
<td>2,604</td>
<td>1,878</td>
<td>1,755</td>
<td>1,831</td>
<td>0.96</td>
<td>1,831</td>
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<tr>
<td>Dec</td>
<td>2,356</td>
<td>2,408</td>
<td>2,390</td>
<td>1,976</td>
<td>1,076</td>
<td>2,016</td>
<td>1.00</td>
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</tr>
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<td>Total</td>
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<td>25,620</td>
<td>25,402</td>
<td>22,608</td>
<td>16,930</td>
<td>17,063</td>
<td>0.75</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Airport records, SH&E analysis

The five columns labeled **Actual Monthly Operations** at the left of the worksheet show jet operations from January 2005 through March 2009. The column labeled **Ratio of 2009/2008 Operations** shows the actual month to month ratios for January to March in black and forecasts of the month to month ratios for April to December in red.

Actual jet operations at APF during the first three months of 2009 were at 73%, 67%, and 60% respectively of operations during the corresponding months of 2008. Reflecting the assumption that jet operations will begin to stabilize by the end of the year, the ratio of 2009 to 2008 jet operations is projected to begin increasing gradually from 65% in April to 100% by December 2009. Although jet operations in December 2009 are projected to recover to the level recorded in December 2008, total jet operations for 2009 are expected to be 25% below total 2008 jet operations.

The columns at the right labeled **Forecast** show the monthly jet operations forecast for April to December 2009 and all of 2010. The total for 2009 includes three months of actual operations as well as nine months of forecast operations.

During the first six months of 2010, jet operations at APF are projected to equal operations during the first six months of 2009. From July to December they are...
projected to begin growing slowly and total 17,063 for the year, a 0.8% increase over 2009.

Growth in jet operations is expected to accelerate between 2010 and 2015 as economic recovery unleashes pent up demand. The forecast calls for 23,242 jet operations in 2015, which represents an average growth rate of 6.4% per year from 2010 to 2015. Growth is expected to continue at a rate of 5.1% per year from 2015 to 2020, and APF is expected to have almost 30,000 annual jet operations by 2020.

Exhibit 9 shows the jet aircraft forecast listing the models that are projected to operate most frequently at APF.

Exhibit 9: Jet Aircraft Annual Operations Forecast

<table>
<thead>
<tr>
<th>Code</th>
<th>Model</th>
<th>2010</th>
<th>2015</th>
<th>2020</th>
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</thead>
<tbody>
<tr>
<td>C56X</td>
<td>560XL Citation Excel</td>
<td>2,427</td>
<td>3,877</td>
<td>5,540</td>
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<tr>
<td>C680</td>
<td>680 Citation Sovereign</td>
<td>903</td>
<td>1,732</td>
<td>2,783</td>
</tr>
<tr>
<td>BE40</td>
<td>400 Beechjet (T-1 Jayhawk, T-400, Hawker 400)</td>
<td>1,300</td>
<td>1,852</td>
<td>2,255</td>
</tr>
<tr>
<td>C25B</td>
<td>525B Citation CJ3</td>
<td>698</td>
<td>1,359</td>
<td>2,201</td>
</tr>
<tr>
<td>CL30</td>
<td>BD-100 Challenger 300</td>
<td>729</td>
<td>1,277</td>
<td>1,043</td>
</tr>
<tr>
<td>GALX</td>
<td>1128 Galaxy, Gulfstream 200</td>
<td>903</td>
<td>1,031</td>
<td>1,545</td>
</tr>
<tr>
<td>LJ45</td>
<td>Learjet 45</td>
<td>684</td>
<td>949</td>
<td>1,203</td>
</tr>
<tr>
<td>GLF5</td>
<td>G-11590 Gulfstream 5 (C-37)</td>
<td>480</td>
<td>808</td>
<td>1,198</td>
</tr>
<tr>
<td>LJ46</td>
<td>Learjet 46</td>
<td>363</td>
<td>738</td>
<td>1,171</td>
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<tr>
<td>ECL5</td>
<td>Eclipse 500</td>
<td>634</td>
<td>831</td>
<td>1,035</td>
</tr>
<tr>
<td>C500</td>
<td>560 Citation 560 Ultra/5 Ultra Encore</td>
<td>1,121</td>
<td>1,137</td>
<td>931</td>
</tr>
<tr>
<td>F2TH</td>
<td>Falcon 2000</td>
<td>470</td>
<td>672</td>
<td>876</td>
</tr>
<tr>
<td>GLF4</td>
<td>G-1159C Gulfstream 4/43P</td>
<td>461</td>
<td>604</td>
<td>722</td>
</tr>
<tr>
<td>C25A</td>
<td>525A Citation CJ2</td>
<td>285</td>
<td>478</td>
<td>708</td>
</tr>
<tr>
<td>C750</td>
<td>750 Citation 10</td>
<td>969</td>
<td>728</td>
<td>677</td>
</tr>
<tr>
<td>PRM1</td>
<td>Premier 1, 390</td>
<td>219</td>
<td>367</td>
<td>544</td>
</tr>
<tr>
<td>F900</td>
<td>Falcon 900, Mystère 900</td>
<td>290</td>
<td>400</td>
<td>594</td>
</tr>
<tr>
<td>All Other</td>
<td></td>
<td>4,607</td>
<td>4,402</td>
<td>3,969</td>
</tr>
<tr>
<td>Total Jet</td>
<td></td>
<td>17,063</td>
<td>23,242</td>
<td>29,805</td>
</tr>
</tbody>
</table>

Source: Airport Records, FAA ETMSC, SH&E analysis

The future shares that each model will have of total jet operations are based on recent trends at APF from ETMSC data, production status of each model, and judgment based on industry knowledge.
A wide variety of piston aircraft operate at APF. Exhibit 10 shows the ones expected to operate most frequently during the forecast period.

Exhibit 10: Piston Aircraft Annual Operations Forecast

<table>
<thead>
<tr>
<th>Code</th>
<th>Model</th>
<th>2010</th>
<th>2015</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>DA40</td>
<td>DA-40 Katana, Diamond Star</td>
<td>14,763</td>
<td>17,828</td>
<td>20,346</td>
</tr>
<tr>
<td>C172</td>
<td>Cessna 172</td>
<td>18,035</td>
<td>19,452</td>
<td>20,042</td>
</tr>
<tr>
<td>SR22</td>
<td>SR-22</td>
<td>8,452</td>
<td>10,333</td>
<td>11,912</td>
</tr>
<tr>
<td>DA42</td>
<td>DA-42 Twinstar</td>
<td>3,068</td>
<td>4,202</td>
<td>5,256</td>
</tr>
<tr>
<td>SR20</td>
<td>SR-20</td>
<td>2,966</td>
<td>3,884</td>
<td>4,742</td>
</tr>
<tr>
<td>PA44</td>
<td>PA-44 Senirole</td>
<td>3,693</td>
<td>4,014</td>
<td>4,161</td>
</tr>
<tr>
<td>C182</td>
<td>Cessna 182</td>
<td>4,732</td>
<td>4,571</td>
<td>4,157</td>
</tr>
<tr>
<td>C101L</td>
<td>LC-40, Columbia 300</td>
<td>1,904</td>
<td>2,438</td>
<td>2,805</td>
</tr>
<tr>
<td>C152</td>
<td>Cessna 152</td>
<td>1,904</td>
<td>2,326</td>
<td>2,679</td>
</tr>
<tr>
<td>C340</td>
<td>Cessna 340</td>
<td>2,628</td>
<td>2,704</td>
<td>2,651</td>
</tr>
<tr>
<td>P28A</td>
<td>PA-28-140/161/180/181 Archer, Cherokee</td>
<td>2,999</td>
<td>2,663</td>
<td>2,243</td>
</tr>
<tr>
<td>BE55</td>
<td>55 Baron (T-47 Cockeys, C-55, E-20)</td>
<td>1,404</td>
<td>1,504</td>
<td>1,438</td>
</tr>
<tr>
<td>P68</td>
<td>P-68, Victor, Observer</td>
<td>618</td>
<td>846</td>
<td>1,069</td>
</tr>
<tr>
<td>All Other</td>
<td></td>
<td>17,675</td>
<td>15,143</td>
<td>13,075</td>
</tr>
<tr>
<td>Total Piston</td>
<td></td>
<td>84,887</td>
<td>91,898</td>
<td>96,586</td>
</tr>
</tbody>
</table>

Source: Airport Records, FAA ETMSC, SH&E analysis

Exhibit 11 shows the turboprop aircraft expected to operate most frequently at APF.

Exhibit 11: Turboprop Aircraft Annual Operations Forecast

<table>
<thead>
<tr>
<th>Code</th>
<th>Model</th>
<th>2010</th>
<th>2015</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>P180</td>
<td>P-180 Avanti</td>
<td>840</td>
<td>1,015</td>
<td>1,235</td>
</tr>
<tr>
<td>PC12</td>
<td>PC-12, Eagle</td>
<td>459</td>
<td>536</td>
<td>630</td>
</tr>
<tr>
<td>BE10</td>
<td>100 King Air (U-21F Uke)</td>
<td>413</td>
<td>494</td>
<td>596</td>
</tr>
<tr>
<td>BE20</td>
<td>200, 1300 Super King Air, Commuter</td>
<td>471</td>
<td>502</td>
<td>536</td>
</tr>
<tr>
<td>P46T</td>
<td>Piper PA-46-500TP Malibu Meridian</td>
<td>372</td>
<td>442</td>
<td>529</td>
</tr>
<tr>
<td>BE9L</td>
<td>90, A90 to E90 King Air (T-44, VC-6)</td>
<td>367</td>
<td>392</td>
<td>420</td>
</tr>
<tr>
<td>B350</td>
<td>B300 Super King Air 350</td>
<td>244</td>
<td>278</td>
<td>319</td>
</tr>
<tr>
<td>All Other</td>
<td></td>
<td>1,155</td>
<td>1,302</td>
<td>1,486</td>
</tr>
<tr>
<td>Total Turboprop</td>
<td></td>
<td>4,321</td>
<td>4,961</td>
<td>5,751</td>
</tr>
</tbody>
</table>

Source: Airport Records, FAA ETMSC, SH&E analysis

Piaggio P-180 Avanti aircraft whose distinctive sound many observers find irritating are expected to remain the turboprops most frequently operated at APF. Aircraft
owned by Avantair, a fractional share provider that bases many of its P-180s in Clearwater Florida, account for a large share of the Piaggio operations at APF. From a user perspective these aircraft offer attractive features including a large cabin, excellent fuel economy, and comparatively high cruising speed for a non-jet aircraft.4 Avantair has agreed to purchase an additional 57 P-180 aircraft through 2013, and as a result P-180 operations at APF are expected to continue growing in the future.

Exhibit 12 shows projected helicopter operations at APF. No change is projected in the helicopter fleet mix or annual operations.

**Exhibit 12: Helicopter Annual Operations Forecast**

<table>
<thead>
<tr>
<th>Code</th>
<th>Model</th>
<th>2010</th>
<th>2015</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>S76</td>
<td>S-76, HH-76, AUH-76, Spirit, Eagle (HE-24)</td>
<td>1,615</td>
<td>1,615</td>
<td>1,615</td>
</tr>
<tr>
<td>H60</td>
<td>S-70 Seahawk</td>
<td>1,027</td>
<td>1,027</td>
<td>1,027</td>
</tr>
<tr>
<td>A805</td>
<td>SA-365N1/M/N1S, AS-365/366/365 Dauphin 2</td>
<td>1,223</td>
<td>1,223</td>
<td>1,223</td>
</tr>
<tr>
<td>B430</td>
<td>Bell 430</td>
<td>1,223</td>
<td>1,223</td>
<td>1,223</td>
</tr>
<tr>
<td>A139</td>
<td>AB-139</td>
<td>734</td>
<td>734</td>
<td>734</td>
</tr>
<tr>
<td>A109</td>
<td>A-109, Power</td>
<td>489</td>
<td>489</td>
<td>489</td>
</tr>
<tr>
<td>R22</td>
<td>R-22 Beta, Mariner</td>
<td>469</td>
<td>469</td>
<td>469</td>
</tr>
<tr>
<td>All Other</td>
<td></td>
<td>2,325</td>
<td>2,325</td>
<td>2,325</td>
</tr>
<tr>
<td>Total Helicopter</td>
<td></td>
<td>9,125</td>
<td>9,125</td>
<td>9,125</td>
</tr>
</tbody>
</table>

Source: Airport Records, FAA ETMSC. SH&E analysis

---

4 Piaggio P-180s have a cruise speed of approximately 368 mph, compared to 495 mph for a Citation Excel
Exhibit 13 shows the projected touch & go operations at APF. Each touch & go counts as two operations, and the touch & go share of total piston operations is projected to remain steady at approximately 15 percent. Diamond DA40, Cirrus SR22 and Cessna 182 aircraft are expected to account for most of the touch & go activity at APF.

**Exhibit 13: Touch & Go Forecast**

<table>
<thead>
<tr>
<th>Type of Operation</th>
<th>2010</th>
<th>2015</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrivals / Departures</td>
<td>72,388</td>
<td>78,345</td>
<td>82,341</td>
</tr>
<tr>
<td>Touch &amp; Go</td>
<td>12,519</td>
<td>13,553</td>
<td>14,245</td>
</tr>
<tr>
<td>Total Piston Operations</td>
<td>84,887</td>
<td>91,898</td>
<td>96,586</td>
</tr>
</tbody>
</table>

*Source: SH&E analysis, Naples Municipal Airport Part 150 Study*
4.0 Peak and Off-Peak Month Forecasts

Exhibit 14 shows average daily operations by aircraft type for 2010, for the peak month, and for an off peak month. For the year as a whole, APF is expected to have an average of 316 daily operations including 47 jet and 233 piston operations.

<table>
<thead>
<tr>
<th></th>
<th>Annual</th>
<th>Peak Month</th>
<th>Off Peak Month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jet</td>
<td>47</td>
<td>74</td>
<td>21</td>
</tr>
<tr>
<td>Piston</td>
<td>233</td>
<td>286</td>
<td>210</td>
</tr>
<tr>
<td>Turboprop</td>
<td>12</td>
<td>16</td>
<td>7</td>
</tr>
<tr>
<td>Rotor</td>
<td>25</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>316</td>
<td>401</td>
<td>262</td>
</tr>
</tbody>
</table>

Source: Airport Records, FAA ETMSC, SH&E analysis

During the peak month average daily operations are projected to increase to 401, including 74 jet and 286 piston operations. During off peak months average daily operations are expected to decrease to 262, including 21 jet and 210 piston operations. Jet operations show the greatest seasonal variation, while helicopter operations appear to remain fairly constant throughout the year.
5.0 Comparison to the TAF

In its June 2008 document entitled “Review and Approval of Aviation Forecasts”, the FAA describes its guidelines for comparing locally-prepared forecasts to the Terminal Area Forecast:

For all classes of airports, forecasts for total enplanements, based aircraft, and total operations are considered consistent with the TAF if they meet the following criterion:

- Forecasts differ by less than 10 percent in the 5-year forecast period, and 15 percent in the 10-year forecast period.

Exhibit 15 compares annual aircraft operations from the APF Part 150 Update draft forecast to the current FAA Terminal Area Forecast.

Exhibit 15: Annual Aircraft Operations from the Part 150 Update Forecast and the TAF

![Bar Chart]

Source: Airport Records, FAA ETMSC, SH&E analysis

The largest differences occur in 2009 and 2010. The TAF was prepared before the FAA had the opportunity to assess the full impact of the financial crisis on airports like APF. As a result, the TAF calls for a decrease in APF aircraft operations of less
than 1.0% per year in 2009 and 2010 compared to the 18.2% drop in operations that APF actually experienced during the first three months of 2009.

Differences between the Part 150 Update forecast and the TAF diminish over time. In 2015, annual operations from the Part 150 Update forecast are 6.2% lower than APF operations in the TAF, and in 2020 the Part 150 operations forecast is 5.3% lower than the TAF. Using these criteria, the Part 150 Update forecast can be considered consistent with the TAF.
6.0 Alternative 2020 Forecast

One question that arose during the forecasting process was what the airport would look like if by 2020 operations recovered to the peak level experienced in 2005. Exhibit 16 presents a view of that scenario.

### Exhibit 16: Comparing Base Case and Alternative 2020 Forecast Scenarios

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Jet</td>
<td>26,754</td>
<td>22,606</td>
<td>29,805</td>
<td>2.3%</td>
<td>33,899</td>
<td>3.4%</td>
</tr>
<tr>
<td>Piston</td>
<td>119,141</td>
<td>91,648</td>
<td>96,886</td>
<td>0.4%</td>
<td>109,852</td>
<td>1.5%</td>
</tr>
<tr>
<td>Turboprop</td>
<td>5,650</td>
<td>6,272</td>
<td>5,751</td>
<td>-0.7%</td>
<td>6,541</td>
<td>0.4%</td>
</tr>
<tr>
<td>Rotor</td>
<td>9,125</td>
<td>9,125</td>
<td>9,125</td>
<td>0.0%</td>
<td>10,378</td>
<td>1.1%</td>
</tr>
<tr>
<td>Total</td>
<td>160,670</td>
<td>129,551</td>
<td>141,267</td>
<td>0.7%</td>
<td>160,670</td>
<td>1.8%</td>
</tr>
</tbody>
</table>

Source: SH&E analysis

In 2008, the last full year for which data is available, APF had approximately 130,000 aircraft operations. Under the Base Case forecast, operations are projected to increase to 141,000 by 2020, growing slowly at an average of 0.7 percent per year. APF jet operations are expected to grow at an average rate of 2.3 percent per year.

Under the Alternate 2020 forecast, total operations return to the 2005 peak level of approximately 161,000, growing at an average rate of 1.8 percent per year. The fleet mix is expected to change with the jet share of total operations increasing from 17 to 21 percent, and the piston share decreasing from 74 to 68 percent.
August 25, 2009

Mr. Theodore D. Soliday
Executive Director
Naples Airport Authority
160 Aviation Drive North
Naples, Florida 34104

Dear Mr. Soliday,

RE: Naples Municipal Airport (APF) Naples, Florida
Approval of Part 150 Update Forecast

This letter responds to the Part 150 Update forecast forwarded under your consultant’s August 18, 2009 e-mail transmission. The forecasts are found to be consistent with the Federal Aviation Administration (FAA) Terminal Area Forecasts (TAF) dated December 2008. Therefore, these forecasts are approved for use in your on-going noise mitigation planning efforts.

If you have any questions, please feel free to contact me at (407) 812-6331, ext. 122.

Sincerely,

Rebecca R. Henry
Planning Specialist
APPENDIX N  CORRESPONDENCE TO AND FROM THE FAA REGARDING FAA IDENTIFICATION OF APPROVED “INM SUBSTITUTES” TO USE IN MODELING AIRCRAFT NOT INCLUDED IN THE DATABASE
Page intentionally left blank.
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July 31, 2009

Ms. Lindy McDowell
Federal Aviation Administration
Orlando Airports District Office
5950 Hazenline National Drive
Building 3, Room 400
Orlando, FL 32822

Subject: Request for INM 7.0a Aircraft Type Substitutions
Reference: APF Part 150 Update, HMMH Project No. 302720.001.002

Dear Ms. McDowell:

As we discussed over the telephone on June 16th, HMMH is assisting the Naples Airport Authority to prepare Part 150 Noise Exposure Map and Noise Compatibility Program updates for Naples Municipal Airport (APF). One of the topics we discussed was identification of appropriate aircraft types included in Version 7.0a of the Integrated Noise Model (INM) to use as modeling "substitutes" for aircraft types that operate at the airport but are not included in the model’s database. Consistent with Federal Aviation Administration (FAA) policies and procedures, I followed up that conversation with a written request, dated June 17, 2009, that identified the aircraft types of interest. Your email of July 23, 2009 indicated that Dr. He of the FAA Office of Environment and Energy (AAE) requested additional information to assist in determining the appropriate aircraft type substitutions.

This memorandum provides that additional information. It refers in some cases to recent guidance FAA provided HMMH for noise studies at Charlotte-Douglas International Airport and Van Nuys Airport. I have enclosed copies of that FAA guidance.

INM Aircraft Substitution Requests and Suggestions

We have identified the following aircraft types included in the Part 150 forecast for which an FAA approved substitute is required. In each case, we have identified a recommended substitute from the INM 7.0a database. The bases for the recommendations are discussed following the table.

Table 1 Aircraft Types and Recommended INM Substitutions

<table>
<thead>
<tr>
<th>#</th>
<th>Group</th>
<th>Aircraft Code</th>
<th>Represented Aircraft Models</th>
<th>Recommended INM Substitution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jet</td>
<td>C566K</td>
<td>560XL Citation Excel</td>
<td>LEAR35</td>
</tr>
<tr>
<td>2</td>
<td>Jet</td>
<td>L580</td>
<td>680 Citation Sovereign</td>
<td>LEAR35</td>
</tr>
<tr>
<td>3</td>
<td>Jet</td>
<td>CL30</td>
<td>BD-100 Challenger 300</td>
<td>CL600</td>
</tr>
<tr>
<td>4</td>
<td>Jet</td>
<td>ECL5</td>
<td>Eclipse 500</td>
<td>CNA610</td>
</tr>
<tr>
<td>5</td>
<td>Jet</td>
<td>G150</td>
<td>Gulfstream 150</td>
<td>LEAR35</td>
</tr>
<tr>
<td>6</td>
<td>Jet</td>
<td>GALX</td>
<td>Galaxy 1126, Gulfstream 200</td>
<td>CL601</td>
</tr>
<tr>
<td>7</td>
<td>Jet</td>
<td>GLEA</td>
<td>BD-700 Global 560</td>
<td>CV</td>
</tr>
<tr>
<td>8</td>
<td>Jet</td>
<td>HZSE</td>
<td>Beech 125-1000</td>
<td>LEAR35</td>
</tr>
<tr>
<td>9</td>
<td>Jet</td>
<td>PRM1</td>
<td>Premier 1, 390</td>
<td>CNA600</td>
</tr>
<tr>
<td>10</td>
<td>Piston</td>
<td>AA-1</td>
<td>Grumman AA-1 series</td>
<td>GASEPF</td>
</tr>
<tr>
<td>11</td>
<td>Piston</td>
<td>UA40</td>
<td>Diamond Aircraft DA-40 Diamond Star</td>
<td>GASEPF</td>
</tr>
<tr>
<td>12</td>
<td>Piston</td>
<td>M4</td>
<td>Maule M-4 Rocket</td>
<td>GASEPF</td>
</tr>
<tr>
<td>13</td>
<td>Piston</td>
<td>XL2</td>
<td>Liberty XL-2</td>
<td>GASEPF</td>
</tr>
<tr>
<td>14</td>
<td>Piston</td>
<td>BE16</td>
<td>90 Bonanza</td>
<td>GASEPV</td>
</tr>
<tr>
<td>15</td>
<td>Piston</td>
<td>CDL3</td>
<td>Lancair Columbia 350</td>
<td>GASEPV</td>
</tr>
<tr>
<td>16</td>
<td>Piston</td>
<td>CH20</td>
<td>CH-200 Zenith</td>
<td>GASEPV</td>
</tr>
<tr>
<td>17</td>
<td>Piston</td>
<td>RV7</td>
<td>Van RV-7</td>
<td>GASEPV</td>
</tr>
<tr>
<td>18</td>
<td>Piston</td>
<td>SR20</td>
<td>Cirrus SR-20</td>
<td>GASEPV</td>
</tr>
</tbody>
</table>
1. Cessna Citation Excel 560XL

We propose to model the C560XL operations with INM type LEAR35.

The Cessna 560 Citation V with JT15D-5A engines is mapped to the Mitsubishi 300-10 Diamond II (MU3001). The Citation Excel has PW545A power plants which are relatively quieter in the flyover and sideline levels. It is more closely aligned to the Cessna Citation Sovereign C680 aircraft discussed in the following section, for which the FAA recommended using the LEAR35.

Table 2 Noise Certification Data from Cessna 560XL, Cessna 560, Mitsubishi MU-300-10, and Learjet LEAR35

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Model</th>
<th>Max. Takeoff Weight (lb)</th>
<th>Max. Landing Weight (lb)</th>
<th>Powerplant</th>
<th>Noise Level (EPNdB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cessna</td>
<td>Cessna 560XL</td>
<td>20,000</td>
<td>18,700</td>
<td>PW545A</td>
<td>72.4</td>
</tr>
<tr>
<td>Cessna</td>
<td>Cessna 560</td>
<td>16,300</td>
<td>15,200</td>
<td>JT15D-5A</td>
<td>84.6</td>
</tr>
<tr>
<td>Mitsubishi</td>
<td>MU-300-10</td>
<td>15,780</td>
<td>14,220</td>
<td>PT6-410E</td>
<td>85.2</td>
</tr>
<tr>
<td>Learjet</td>
<td>Lear 36 A</td>
<td>18,000</td>
<td>14,300</td>
<td>TFE731-2B</td>
<td>83.6</td>
</tr>
</tbody>
</table>

Source: FAA AC 36-1H, as posted on
http://www.faa.gov/about/office_org/headquarters_offices/AFP/noise_levels/media/appendix_01/0151208.xls

2. Cessna Citation Sovereign C680

We propose to model the C680 operations with INM type LEAR35 as recommended for CLT.

In the Charlotte-Douglas International Airport (CLT) Part 150 the FAA recommended the LEAR35 as the substitution aircraft for the Cessna Citation Sovereign (Cessna model 680). This aircraft is relatively new (certification completed in 2004) with a maximum takeoff weight (MTOW) of 30,300lb, maximum landing weight (MLW) of 27,100 lb, and is powered by two Pratt & Whitney Canada PW206C turbofans rated at 5,770 pounds (lb) These weights are similar to INM types CL600 and CL601. Table 3 provides certification values for these three aircraft and the LEAR35.

---

1 Charlotte-Douglas International Airport Part 150 Study with INM 7.0a, HMMH Project No. 299170, FAA approval issued March 2, 2009.
3. BD-100 Challenger 300 CL30

We propose to model the CL30 with INM type CL600 as recommended for CLT.

The CLT submission also addressed this aircraft. The CL30\(^2\) is a relatively new twin-engine corporate jet with a MTOW of 38,500 lb. and MLW of 33,750 lb. The aircraft’s Honeywell HTF7000 (formerly AS907) engines are rated between 6,500 lb. to 8,050 lb. This is comparable to the INM type CL600 (MTOW 36,000 lb., MLW of 30,000 lb. and max. static thrust 7,500 lb. according to INM7.0a) and INM type CL601 (MTOW 43,100 lb, MLW of 36,000 lb. and max. static thrust 9,220 lb. according to INM 7.0a). In the CLT request for this project the case was made for using the CL601 as the match for the CL30; however, the FAA recommended the CL600.

4. Eclipse 500

We propose to model the Eclipse 500 with INM type CNA510 as recommended for CLT.

With inclusion of the Cessna Mustang in INM 7.0a as CNA510, it is deemed appropriate to also use the CNA510 INM aircraft to model the Eclipse 500. Both aircraft have the PW612X series engines.

5. Gulfstream 150

We propose to model the G150 operations with INM type LEAR35 as recommended for CLT.

The Gulfstream 150 is a relatively new aircraft and is sometimes described as a wide-body variant of the Galaxy Aerospace Astra (INM Type IA1125 with TFE731-3A engines). However the wing and engine have changed. The G150 has a MTOW of 26,100 lb., a MLW of 21,700 lb., and Honeywell

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HARRIS MILLER MILLER & HANSON INC.

Ms. Lindy McDowell, Federal Aviation Administration, Orlando Airports District Office
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TFE731-4A/R-209G engines rated at 4,420 lb. We compared the certification values for several aircraft with similar weights and engines. We found a best match with the Hawker 800, which is a standard INM substitution aircraft (HS125) mapped to the INM type LEAR35. The INM LEAR35 is louder than the IA1125. Table 5 presents the certification data for the aforementioned aircraft types based on certification levels. The comparison to the Hawker 800 and the corresponding LEAR35 is louder than the IA1125; we feel the LEAR35 is a conservative representation of the G150.

Table 5 Noise Certification Data from Gulfstream G150, Hawker 800 and Israel Aircraft 1125 Astra

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Model</th>
<th>Max. Takeoff Weight (lb)</th>
<th>Max. Landing Weight (lb)</th>
<th>Powerplant</th>
<th>Noise Level (EPNdB)</th>
<th>Takeoff</th>
<th>Sideline</th>
<th>Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gulfstream Aerospace LP</td>
<td>Gulfstream G150</td>
<td>26,101</td>
<td>21,700</td>
<td>Honeywell TFE31-4AR-209G</td>
<td>80.7</td>
<td>91.2</td>
<td>91.9</td>
<td></td>
</tr>
<tr>
<td>Hawker Beechcraft</td>
<td>Hawker 800</td>
<td>26,866</td>
<td>23,349</td>
<td>Garrett AiResearch TFE731-1R-1H</td>
<td>80.1</td>
<td>89.4</td>
<td>92.1</td>
<td></td>
</tr>
<tr>
<td>Corporation</td>
<td>U126A</td>
<td>23,500</td>
<td>20,700</td>
<td>TFE731-1R-209G</td>
<td>82.3</td>
<td>89.6</td>
<td>89.0</td>
<td></td>
</tr>
<tr>
<td>Israel Aircraft</td>
<td>1125 Astra</td>
<td>23,500</td>
<td>20,700</td>
<td>TFE731-1R-209G</td>
<td>82.3</td>
<td>89.6</td>
<td>89.0</td>
<td></td>
</tr>
</tbody>
</table>

Notes: All weights converted from certification data into pounds.
Source for G150 and Hawker 800: File "TCDSN Jets (HS071).xls" as posted 11/1/2009 on http://esaas.esa-aisa.org/wk_app05c hassle.xls EASE Record #A969 for the G150 and #A971 for the Hawker 800
Source for 1125.Astra: FAA AC 36-1H, as posted on http://www.faa.gov/about/office Ops/озд/office/AFP/Airport Noise Levels/Editable/airport_app-endlx_01_051006.xls

6. 1126 Galaxy Gulfstream 200

We propose to model the GALX operations with INM type CL601 as recommended for CLT.

The Israel Aircraft Industries (IAI) 1126 Galaxy was renamed the Gulfstream G200 shortly after Gulfstream's parent company, General Dynamics, purchased Galaxy Aerospace in 2001. The aircraft has a MTOW of 34,850 lb, a MLW of 28,000 lb, and powered by two Pratt & Whitney Canada PW306A turboprop engines rated at 6,040 lb each. This is comparable to the INM type CL600 (MTOW 36,000 lb, MLW of 33,000 lb, and max. static thrust 7,500 lb according to INM7.0a) and INM type CL601 (MTOW 43,100 lb, MLW of 36,000 lb, and max. static thrust 9,220 lb, according to INM 7.0a). Table 6 compares certification data for these three aircraft types. The CL601 matches slightly better than the CL600, especially on the sideline measurement.

Table 6 Noise Certification Data from IAI 1126 Galaxy/Gulfstream G200, Bombardier CL-601, and Bombardier CL-600

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Model</th>
<th>Max. Takeoff Weight (lb)</th>
<th>Max. Landing Weight (lb)</th>
<th>Powerplant</th>
<th>Noise Level (EPNdB)</th>
<th>Takeoff</th>
<th>Sideline</th>
<th>Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gulfstream</td>
<td>G200</td>
<td>34.85</td>
<td>28.00</td>
<td>PW306A</td>
<td>81.40</td>
<td>85.80</td>
<td>92.70</td>
<td></td>
</tr>
<tr>
<td>Israel Aircraft</td>
<td>G1126 Galaxy</td>
<td>34.85</td>
<td>28.00</td>
<td>PW306A</td>
<td>81.40</td>
<td>85.80</td>
<td>92.70</td>
<td></td>
</tr>
<tr>
<td>Gulfstream</td>
<td>G200</td>
<td>34.85</td>
<td>28.00</td>
<td>PW306A</td>
<td>81.40</td>
<td>85.80</td>
<td>90.90</td>
<td></td>
</tr>
<tr>
<td>Bombardier</td>
<td>CL-601-3R</td>
<td>45.10</td>
<td>36.00</td>
<td>CF-34-3A1</td>
<td>79.80</td>
<td>85.70</td>
<td>90.10</td>
<td></td>
</tr>
<tr>
<td>Bombardier</td>
<td>CL-600</td>
<td>36.00</td>
<td>33.00</td>
<td>ALF 502</td>
<td>81.90</td>
<td>89.20</td>
<td>91.20</td>
<td></td>
</tr>
</tbody>
</table>

Source: FAA AC 36-1H, as posted on http://www.faa.gov/about/office Ops/озд/office/AFP/Airport Noise Levels/Editable/airport_app-endlx_01_051208.xls

7. Bombardier BD-700 Global Express/Global 5000 (GL5/5GEX)

We propose to model the GLEX operations with INM type G7.

\footnote{Information for the G150 is from "Jane's All the World's Aircraft 2007-2008" Jane's Information Group Limited, Sentinel House, Coulsdon, Surrey, UK (ISBN-10 0 7106 2792 0, http://java.jarves.com) pp 766-767.}
\footnote{Data for this aircraft is from ACS6-1H, Appendix 1 (May 12, 2008).}
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The Bombardier BD-700 Global Express is similar to the Gulfstream V (INM 7.0a type GV). Both aircraft use variants of the Rolls-Royce BR710 engine and have similar maximum take-off weights, landing weights and noise levels. Table 7 compares the noise certification data for these aircraft.

Table 7: Noise Certification Data from Bombardier Global Express and Gulfstream G-V

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Model</th>
<th>Max. Takeoff Weight (lb.)</th>
<th>Max. Landing Weight (lb.)</th>
<th>Powerplant</th>
<th>Noise Level (EPNNlB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bombardier</td>
<td>BD-700-1A10 (Global Express)</td>
<td>96.0</td>
<td>78.5</td>
<td>BR700-710-A2-20</td>
<td>82.5</td>
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<td></td>
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<td>82.7</td>
<td>85.6</td>
<td>89.8</td>
<td></td>
</tr>
<tr>
<td>Bombardier</td>
<td>BD700-1A10 (Global Express)</td>
<td>75.0</td>
<td>75.0</td>
<td>Rolls Royce BR700-710-A2-20</td>
<td>75.6</td>
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<td></td>
<td></td>
<td>85.6</td>
<td>89.8</td>
<td>90.8</td>
<td></td>
</tr>
<tr>
<td>Gulfstream</td>
<td>G-V</td>
<td>92.6</td>
<td>75.3</td>
<td>BR700-710A1-10</td>
<td>89.1</td>
</tr>
</tbody>
</table>

Source: FAA AC 36-1H, as posted on http://www.faa.gov/about/office_org/headquarters_offices/ATP/airnoise_levels/media/tpcert_app-endx_01_051208.xls

In addition, the FAA approved modeling the GLEX with type GV for two previous projects.\(^6\)

8. BAE-125-1000

We propose to model the BAE-125-1000 operations with INM type LEAR35.

We compared the BAE-125-100 with the BAE-125-800 and LEAR35 aircraft shown in Table 8.

Based on the comparison, the LEAR35 appears to be a good match.

Table 8: Noise Certification Data from BAE-125-1000 and -800 and LEAR35

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Model</th>
<th>Max. Takeoff Weight (lb.)</th>
<th>Max. Landing Weight (lb.)</th>
<th>Powerplant</th>
<th>Noise Level (EPNNlB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hawker Beechcraft Corp.</td>
<td>BAE-125-1000</td>
<td>31,000</td>
<td>25,000</td>
<td>PW105</td>
<td>81.8</td>
</tr>
<tr>
<td>Hawker Beechcraft Corp.</td>
<td>BAE-125-800</td>
<td>27,400</td>
<td>23,350</td>
<td>TFE731-2R-1H</td>
<td>65.5</td>
</tr>
<tr>
<td>Learjet</td>
<td>LEAR 35 A</td>
<td>14,000</td>
<td>14,000</td>
<td>TFE731-2-3B</td>
<td>83.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>87.4</td>
</tr>
</tbody>
</table>

9. Premier I 390 PRM1

We propose to model the Beechcraft Premier I (PRM1) with INM type CNA500 as recommended for CLT.

The PRM1 is a relatively new light twin-engine corporate jet. The maximum take-off weight is 12,500 lb, and maximum landing weight is 11,600 lb. The aircraft is powered by two William FJ44-2A turbofans, each rated at 2,300 lb. The PRM1 is similar in weight and engines as the Cessna 525A (max take-off weight of 12,375 lb, max landing weight of 11,500 lb, powered by William FJ44-2C turbofans with max thrust of 2,400 lb), which has an INM standard substitution of CNA525 and is mapped to the CNA500. In addition, the Cessna 525A and the PRM1 have similar noise certification data as summarized in Table 9.

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\(^7\) Data presented here regarding the Beechcraft Premier 1 is from ""Jane's All the World's Aircraft 2005-2006"" pp 578-579 (see footnote 3 for full citation).

\(^8\) Data presented here regarding the Cessna 525a are from ""Jane's All the World's Aircraft 2005-2006"" pp 646-647 (see footnote 3 for full citation).
We propose to model these aircraft types as INM type GASEPF.

These aircraft are all small single-engine aircraft that would probably be best modeled as GASEPF.

14. Beechcraft Bonanza 36 BE36

We propose to model this aircraft type as INM type GASEPV.

This aircraft type is a version of the Bonanza 35 BE15 which is mapped to the GASEPV INM aircraft type. While there may be varying engine types, it is probably best to model the same as the BE35.


We propose to model these aircraft types as INM type GASEPV.

These aircraft types have a variety of different engine options and, as such, are difficult to characterize without having detailed specifications of the actual aircraft flying into APF. Therefore, a conservative grouping of these types with the GASEPV INM aircraft type is made.

20. Gippsland GA-8 Airvan

We propose to model this aircraft type as INM type CNA206.

This aircraft is produced in Australia where it was considered as a competitor for the Cessna 206. It has the same related engine (Lycoming IO-540) as the CNA206 INM aircraft type and therefore, the CNA206 is probably a good match for this aircraft type.

21-22. Diamond Aircraft Twinstar (DA-42) and Partenavia Victor (P-68)

We propose to model these aircraft types as INM type BEC58P.

These are both twin-engine piston aircraft that are similar in size and engine type to the INM aircraft type, Beech Baron (BEC58P).

23. Augusta AB-139

We propose to model this aircraft type as INM type SA330J.

This is a medium-sized helicopter with two power plants. It is along the same characteristics as the INM type SA330J Puma.

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9 http://en.wikipedia.org/wiki/GA8_Airvan
24. **Bell 430**
   We propose to model this aircraft type as INM type S76.
   The Bell 430 helicopter is a twin-engine light to medium helicopter comparable to the INM standard aircraft, Sikorsky S-76 Spirit.

25. **Eurocopter EC-135**
   We propose to model this aircraft type as INM type EC130.
   The EC-135 is a small light-weight helicopter with the fenestron tail rotor system where the tail rotor is integrated into the tailboom.

26. **Eurocopter EC-145**
   We propose to model this aircraft type as INM type B222.
   Based on its characteristics, this twin-engine light helicopter is believed to be comparable to the Bell 222 INM aircraft Type.

27-28. **Swissair 269 and Robinson 44**
   We propose to model these aircraft types as INM type H500D.
   These small light helicopters are slightly larger than the Robinson R22 and closer to the INM aircraft type Hughes 500D (H500D).

29. **Sikorsky S-92 Helibus**
   We propose to model this aircraft type as INM type S70.
   The S-92 was developed from the Sikorsky S-70 helicopter and shares some of the same components. Based on the limited data available, the S-70 INM aircraft type was selected to model the S-92.

30-32. **Turboprops (Piaggio P-180, Piper Malibu Meridian, Pilatus PC-12)**
   The Meridian and PC-12 were modeled at VNY for the Part 161 study based on FAA recommendation and approval. The Piaggio P-180 has two PT6A-66 turboprops which appear to be similar to the SD330 turboprops, PT6A-45. Therefore, this aircraft should be in the same category.
   We propose to model these aircraft types as INM type SD330.

33. **Socata TBM-700**
   We propose to model this aircraft type as INM type GASEPF.
   The FAA also approved the INM aircraft type GASEPF for this aircraft in the VNY study.

* * * * *

On behalf of the Naples Airport Authority, I request that the FAA approve these INM 7.0a substitutes for each of these aircraft models, for use in the APF Part 150 update. As you and Dr. He of AEE.

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suggested, I also will email him a copy directly, to expedite the review. I would be pleased to answer
any questions that either you or they have regarding this request.

Thank you for your assistance on this matter.

Sincerely yours,

Ted Baldwin
Senior Vice President
c: Dr. He, FAA AEE
    E. Dehn and T. Soliday, APF
    P. Stumpp, SH&E
    J. Ferguson, HMMH
March 23, 2009

Dana Perkins
Federal Aviation Administration
Atlanta Airports District Office
1701 Columbia Avenue
Campus Building, Suite 2-260
College Park, Georgia 30337

Dear Ms. Perkins,

The Office of Environment and Energy (AEE) has reviewed the proposed non-standard Integrated Noise Model (INM) aircraft substitutions for the FAR Part 150 Update for Charlotte-Douglas International Airport (CLT).

Harris Miller Miller & Hanson Inc. (HMMH), assisting Andrew S. Harris, Inc. and the City of Charlotte, North Carolina, has proposed substitutions for twelve aircraft types that currently do not have standard substitutions in the INM aircraft database. The proposed substitutions and the corresponding AEE recommendations are summarized in the table below.

<table>
<thead>
<tr>
<th>Aircraft</th>
<th>HMMH Proposed Substitution</th>
<th>AEE Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Embraer 170 RJ</td>
<td>A319-131</td>
<td>Concur</td>
</tr>
<tr>
<td>Embraer 190 RJ</td>
<td>A319-131</td>
<td>Concur</td>
</tr>
<tr>
<td>Fairchild/Dornier 328 RJ</td>
<td>CL600 w/ spectral class 102</td>
<td>Concur</td>
</tr>
<tr>
<td>McDonnell Douglas DC-8-60 (Stage 3)</td>
<td>DC86QN w/DC870</td>
<td>Concur</td>
</tr>
<tr>
<td>Dassault Falcon 7X</td>
<td>F10062</td>
<td>Concur</td>
</tr>
<tr>
<td>Bombardier Challenger 300</td>
<td>CL601</td>
<td>CL600</td>
</tr>
<tr>
<td>Cessna Citation Sovereign 680</td>
<td>CL601</td>
<td>LEAR35</td>
</tr>
<tr>
<td>Eclipse 500</td>
<td>CNA510</td>
<td>Concur</td>
</tr>
<tr>
<td>Bombardier Global Express</td>
<td>GV</td>
<td>Concur</td>
</tr>
<tr>
<td>Gulfstream 150</td>
<td>LEAR35</td>
<td>Concur</td>
</tr>
<tr>
<td>IAI 1126 Galaxy/Gulfstream 200</td>
<td>CL601</td>
<td>Concur</td>
</tr>
<tr>
<td>Beechcraft 390 Premier I</td>
<td>CNA300</td>
<td>Concur</td>
</tr>
</tbody>
</table>
AEE concurs with all but two of the proposed aircraft substitutions. AEE recommends the Bombardier Challenger 300 be modeled with the INM CL600, rather than the proposed CL601. Although the CL601 appears to be a better match when comparing noise data at all three certification points, it should be noted that both the CL601 and CL600 noise certification data at the flyover point are for full power takeoff. The Bombardier Challenger 300 data at the flyover point is for a takeoff with cutback, making it difficult to compare the aircraft at the flyover point. The sideline certification value for the CL600 is higher than that of the Challenger 300, whereas the CL601 sideline value is lower than the Challenger 300. AEE prefers to model aircraft substitutions conservatively, therefore we recommend the CL600.

AEE also recommends that the Cessna Citation Sovereign 680 be modeled with the INM LEAR35, rather than the proposed CL601. The Lear 35 (with cutback on the flyover point) is a better match than the CL601 on all three noise certification points.

Please understand that this approval is limited to this particular Part 150 update for CLT. Any additional projects or non-standard INM input at CLT or any other site will require separate approval.

Sincerely,

Raquel Girvin, Ph.D.
Manager
AEE/Noise Division

cc: Jake Plante
Mr. Robert D Behr Jr.
Harris Miller Miller & Hanson Inc.
945 University Avenue, Suite 201
Sacramento, CA 95825

Dear Mr. Behr:

The Office of Environment and Energy has reviewed the proposed substitutions submitted for aircraft modeling for Van Nuys Airport (VNY) in support of the Los Angeles World Airports (LAWA) FAA Part 161 Study.

Our office approves the following use of the INM standard types, and concurs with your proposals:

1. Use INM substitution aircraft CNA55B or CNA500 for modeling VLJ.
2. Use INM standard aircraft GV for modeling Bombardier CRJ-700 (CR7).
3. Use INM substitution aircraft CNA500B for modeling Raytheon/Beechcraft 390 Premier I (PRMI).
4. Use INM standard aircraft GV for modeling Bombardier BD-700 Global Express (GLEX).
5. Use INM standard aircraft DC3 for modeling Twin Piston Radial Engine Aircraft (B-25, B-26).

Our office recommends the following use of INM types for the noise modeling, which differ from your proposals:

1. Use INM standard aircraft T-38A for modeling L-39 Albatross
2. Use INM standard aircraft CNA210 for modeling Single-Engine Turboprop C10T.
3. Use INM substitution aircraft SD330 for modeling Single-Engine Turboprop P46T.
5. Use INM standard aircraft GASEPF for modeling Single-Engine Turboprop TBM7.
Please understand that approvals listed above are limited to this particular Part 151 Study. Any additional projects or non-standard INM input will require separate approval.

Sincerely,

[Signature]

Dr. Mehmet Marsan
Acting Manager
AEE/Noise Division
Ted Baldwin
Harris Miller Miller & Hanson Inc.
77 South Bedford Street
Burlington, Massachusetts 01803

Dear Mr. Baldwin,

The Office of Environment and Energy (AEE) has received on June 22, 2009 your memo dated June 17, 2009, referencing HMMH Project Number 302720.001.002 requesting approval for non-standard substitution of 34 aircraft of various types for noise modeling. This request is for the modeling of the Part 150 Noise Exposure Map and Noise Compatibility Program updates for Naples Municipal Airport (APF).

After an initial review of the proposed substitutions, AEE requested supplemental information including justifications for the aircraft chosen. An updated request with the supplemental information was received on July 31, 2009.

AEE concurs with 30 of the 34 proposed non-standard substitutions for this study. For Cessna 560XL Citation Excel, AEE would recommend the INM CNA55B because it uses the same type of engines (PW 500 series) and has similar noise certification level to that of 560XL. The proposed Lear35, on the other hand, seems to be too conservative for this study. For the Piaggio P-180 Avanti, AEE recommends INM DHC6 because it is a better match in both certified noise levels and aircraft size. For the Pilatus PC-12, the SD330 was previously recommended by AEE. However, now that the Beechcraft 1900D is part of the INM database, it should provide a better match for the Pilatus PC-12. AEE also recommends the 1900D as a substitution for the Socata TBM-700 for the same reason.

The table below summarizes the AEE approvals and recommendations.

Please understand that this approval is limited to this particular study. Any additional projects or non-standard INM input will require separate review and approval from AEE.
### Expanded Description of Aircraft Models

<table>
<thead>
<tr>
<th>Group</th>
<th>Aircraft Co</th>
<th>Represented Aircraft Model(s)</th>
<th>Proposed</th>
<th>AEE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jet</td>
<td>C56X</td>
<td>560XL Citation Excel</td>
<td>LEAR35</td>
<td>CNS55B</td>
</tr>
<tr>
<td>Jet</td>
<td>C680</td>
<td>680 Citation Sovereign</td>
<td>LEAR35</td>
<td>Concur</td>
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<td>Jet</td>
<td>CL30</td>
<td>BD-100 Challenger 300</td>
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<td>Eclipse 500</td>
<td>CNS510</td>
<td>Concur</td>
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<td>G150</td>
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<td>Jet</td>
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<td>Concur</td>
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<td>GL5T</td>
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<td>Jet</td>
<td>GLEX</td>
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<td>Concur</td>
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<tr>
<td>Jet</td>
<td>H25C</td>
<td>BAE-125-1000</td>
<td>LEAR35</td>
<td>Concur</td>
</tr>
<tr>
<td>Jet</td>
<td>PRM1</td>
<td>Premier 1, 390 (Raytheon)</td>
<td>CNS500</td>
<td>Concur</td>
</tr>
<tr>
<td>Piston</td>
<td>A11</td>
<td>AA-1 Yankee, Trainer, Tr2</td>
<td>GASEPF</td>
<td>Concur</td>
</tr>
<tr>
<td>Piston</td>
<td>BE36</td>
<td>36 Bonanza</td>
<td>GASEPV</td>
<td>Concur</td>
</tr>
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<td>Piston</td>
<td>CH20</td>
<td>CH-200 Zenith</td>
<td>GASEPV</td>
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<td>DA-40 Katana, Diamond Star</td>
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<td>Schweizer 269</td>
<td>H500D</td>
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<td>Robertson R-44 Astro, Clipper,</td>
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<tr>
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<td>DHC6</td>
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Sincerely,

Raquel Girvin, Ph.D.
Manager
AEE/Noise Division
APPENDIX O  CORRESPONDENCE TO AND FROM THE FAA REGARDING USER-DEFINED INPUTS TO MODEL PART 36 STAGE 3 “HUSHKITTED” GULFSTREAM III AIRCRAFT
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August 13, 2007

Ms. Lindy McDowell
Federal Aviation Administration
Orlando Airports District Office
5950 Hazeltine National Drive
Building 3, Room 400
Orlando, FL 32822

Subject: Request for Approval of User-defined Aircraft – Gulfstream III Aircraft with Hushkits
Reference: HMMH Project Number 302720.001.002

Dear Ms. McDowell:

As we discussed over the telephone on June 16th, HMMH is assisting the Naples Airport Authority to prepare Part 150 Noise Exposure Map and Noise Compatibility Program updates for Naples Municipal Airport (APF). We are using the Integrated Noise Model (INM) Version 7.0a for all aircraft noise modeling. This memorandum requests FAA approval of a user-defined aircraft for the Gulfstream III (GIII) recertified to 14 CFR Part Stage 3 via hushkit installations, since such aircraft currently operate at the airport and we forecast that increasing numbers will do so in the future.

The current INM identified aircraft substitution for the Stage 2 GII is the Gulfstream IIB (INM type GIIIB). HMMH submits this request for a user-defined aircraft that is basically the INM 7.0a standard GIIIB with modified noise-power-distance (npd) curves to reflect the effects of the hushkits. There are no changes to the standard GIIIB INM profiles. This request is essentially identical to the request we presented for a similar purpose at Van Nuys Airport (VNY), differing only to the extent that we were using INM 7.0 at VNY. The analyses presented in this request are based on calculations prepared using INM 7.0a at APF. In that case, FAA approved our proposed user defined aircraft for use in that study.Attachment 1 is a copy of the FAA approval letter (from Dr. Mehmet Marsan, August 29, 2007).

Attachment 2 is a spreadsheet that summarizes data from FAA AC 36-3H which displays estimated maximum A-weighted sound levels for Gulfstream aircraft. Also included in the spreadsheet is information we received from Mr. Jim Skailecky (FAA) on the latest data he had regarding estimated maximum A-weighted sound levels from hushkitted Gulfstream aircraft. Comparing these data, the hushkitted GIIIB has maximum A-weighted sound levels for takeoff that are approximately 7.3 dB less than the non-hushkitted GIIIB while the approach levels of both aircraft are nearly the same. Using these limited data and the existing INM 7.0a data, HMMH developed revised INM npd curves as detailed below. We do not have data (or a need) to create npd curves for the other INM metrics. Therefore our proposed user-defined aircraft only has Lmax and SEL npd curves.

In INM 7.0a, the GIIIB uses the SPEYHK noise curves. Attachment 2 reproduces the SPEYHK noise curves (INM file npd_curve.dbf) and shows that the arrival and departure noise curves have identical values for thrust settings from 1,000 to 10,000 lbs. We assumed the aircraft was approximately 394 feet above the certification measurement position on arrival, based on the aircraft certification procedures in 14 CFR Part 36 B36.3c. In addition, we assumed that there were no changes to performance profiles between the two aircraft. Our next step was to find the thrust in the Lmax npd curves associated with 394 feet and 89.7 dBA (89.7 dBA is arrival Lmax reported in AC36-3H for the unhushkitted GIII). Table 1 shows the interpolated Lmax values for a distance of 394 feet. The
interpolation indicates that the thrust level should be 3,228 lbs to produce an Lmax of 89.7 dBA at a distance of 394 feet.

<table>
<thead>
<tr>
<th>Thrust (lbs)</th>
<th>200 ft Lmax (dBA)</th>
<th>400 ft Lmax (dBA)</th>
<th>394 ft Lmax (dBA)</th>
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<tr>
<td>1,000</td>
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<td>80.4</td>
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<td>4,000</td>
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<td>8,000</td>
<td>113.5</td>
<td>107.4</td>
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<tr>
<td>10,000</td>
<td>119.4</td>
<td>113.3</td>
<td>113.5</td>
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</table>

Both data sources for the take-off maximum A-weighted values (Attachment 1) indicate that there was a thrust-cutback during the take-off certification measurements. However, the thrust was not reported for either aircraft. Without further information, we therefore assumed that:

- There is a linear relationship between thrust and maximum A-weighted value benefit for the hushkit
- There is a constant 0.2 dB benefit at and below 3,228 lb of thrust (as reported in the INM npd_curve.dbf)
- The hushkit provides a linear benefit, in terms of maximum A-weighted level, as a function of thrust
- The 7.3 dB reduction maximum A-weighted sound level occurred at maximum thrust. This is a conservative assumption that would under-predict the benefits of the hushkit because the 7.3 dB was actually measured at a thrust cut back setting and hushkits are typically designed to provide maximum benefit at maximum thrust.
- Aircraft performance for both aircraft is identical
- Estimates of the hushkit’s maximum A-weighted sound level benefit can also be directly applied to Sound Exposure Level npd curves.

Table 2 summarizes the two assumed data points for the two aircraft. In summary, the hushkitted GIIIB has a 0.2 dB reduction at 3,228 lb of thrust and 7.3 dB reduction at 10,000 lb of thrust compared to the unhushkitted version.

<table>
<thead>
<tr>
<th>Lmax (dBA) For Non-Hushkitted GIIIB AC36-3H GIIIB</th>
<th>Lmax (dBA) For Hushkitted GIIIB FAA provided</th>
<th>dB Difference</th>
<th>Assumed thrust (npd_curve.dbf)</th>
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<tbody>
<tr>
<td>Approach</td>
<td>89.7</td>
<td>89.5</td>
<td>-0.2</td>
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<tr>
<td>Departure</td>
<td>82.8</td>
<td>75.5</td>
<td>-7.3</td>
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</table>

Table 3 presents our proposed adjustment to the INM 7.0a npd curves as a function of thrust. We added the npd curve for 3,228 lb of thrust by interpolating between 2,000 and 4,000 lb of thrust. This
allows the INM to model a constant adjustment of -0.2 dB up to 3,228 lbs of thrust. As discussed previously, we assume a linear relationship for the benefit of the hushkit between 3,228 lb and 10,000 lb of thrust.

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<thead>
<tr>
<th>Curves</th>
<th>Thrust</th>
<th>Interpolated db adj</th>
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<td>A</td>
<td>1000</td>
<td>-0.2 from INM 7.0a npd</td>
</tr>
<tr>
<td>A</td>
<td>2000</td>
<td>-0.2 from INM 7.0a npd</td>
</tr>
<tr>
<td>A</td>
<td>3228</td>
<td>-0.2 Added to fix curve interpolation</td>
</tr>
<tr>
<td>A</td>
<td>4000</td>
<td>-1.0 from INM 7.0a npd</td>
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<td>A</td>
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<tr>
<td>A</td>
<td>10000</td>
<td>-7.3 from INM 7.0a npd</td>
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</table>

We created the proposed SPEYHK_HKA entries for npd_curve.dbf by applying these adjustments to the INM 7.0a SPEYHK npd curves Lmax (NOISE_TYPE = M) and SEL (NOISE_TYPE = S) (presented in Attachment 5). The proposed npd_curve.dbf entries are designated SPEYHK_HKA and are presented in Attachment 4. The proposed SPEYHK_HKA noise curves do not include entries for other metrics.

Table 4 presents a grid analysis of the resulting SEL values for both the GIB and proposed GIB_HKA aircraft on straight out departures. The GIB_HKA USER profile is the same as that for the GIB STANDARD. As discussed above, the only changes are to the npd curves. The INM output SEL contours for 85 dB, 90 dB, and 95 dB are shown in Attachment 5 (GIB_HKA in colors) for a standard day. The benefit of the proposed GIB_HKA is only 2.4 to 2.7 dB at a range of 1.5 to 5.0 nautical miles because the GIB STANDARD profile includes a thrust cut-back. Attachment 5 shows that the proposed aircraft has little benefit on arrival, which is expected. Attachment 5 and Table 4 show most benefit associated with the start-of-take-off roll.

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<th>Grid Points (nmi)</th>
<th>GIB (SEL, db)</th>
<th>GIB_HKA (SEL, db)</th>
<th>Difference (dB)</th>
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<td>-5.2</td>
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</table>
HARRIS MILLER MILLER & HANSON INC.

INM User-defined Aircraft Request – GIIB with Hushkits
June 19, 2009
Page 4

We have included a copy of the INM 7.0a study with the standard GIIB and GIIB_KA profiles and
npd curves.

On behalf of the Naples Airport Authority, I request your approval for use of these modified npd
curves to represent a GIIB recertified to 14 CFR Part 36 Stage 3 via a hushkit in the INM 7.0a analysis
for the Naples Part 150 update. I understand you will forward this material to FAA headquarters staff
for their consideration. I would be pleased to answer any questions that either you or they have
regarding this request.

Thank you for your assistance on this matter.

Sincerely yours,

HARRIS MILLER MILLER & HANSON INC.

Ted Baldwin
Senior Vice President

c: INM 7.0a Study
   FAA/AAE Letter of Approval for Van Nuys Airport, August 29, 2007
August 29, 2007 Letter from FAA (Dr. Mehmet Marsan) Approving User-Defined GIII Hushkit

Office of Environment and Energy
800 Independence Ave., S.W.
Washington, D.C. 20591

August 29, 2007

Mr. Robert Betir
Harris Miller Miller and Hanson Inc.
945 University Avenue, Suite 201
Sacramento, California 95825

Dear Mr. Betir,

The Office of Environment and Energy (OEE) has received the memo dated August 13, 2007, referencing BIMMII Project Number 307301 requesting approval for a user-defined aircraft type. OEE has reviewed the request for approval for INM user-defined aircraft for the Gulfstream III recertified to 14 CFR Part Stage 3 via hushkit installations (GIII) for the Part 161 Study at Van Nuys Airport (VNY).

After reviewing the assumptions and methodology used to develop the GIII user-defined aircraft, the use of the GIII is accepted for the Part 161 Study at VNY.

Sincerely,

Mehmet Marsan, Ph.D.
Acting Manager
AEE/Noise Division
**ATTACHMENT 2**

**ESTIMATED MAXIMUM A-WEIGHTED SOUND LEVELS**

**MEASUREMENT IN ACCORDANCE WITH PART-36 APPENDIX C - PROCEDURES**

(From AC 20-36H, April 25, 2002)

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**AC20-36H UPDATE INFORMATION**

**ESTIMATED MAXIMUM A-WEIGHTED SOUND LEVELS**

**MEASUREMENT IN ACCORDANCE WITH PART-36 APPENDIX C - PROCEDURES**

(From James Shakeley, FAX, July 6, 2007 email to Joseph Cardello, EIMM)

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15. Lined or manufacturer's data.
16. Equipped with hydraulic.

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HARRIS MILLER MILLER & HANSON INC.
## Naples Municipal Airport Part 150 Update Study

**August 2010**

**2010 and 2015 Noise Exposure Maps**

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### ATTACHMENT 4 Proposed INM 7.mnp_curve.dbf Entries for GHH Recertified to 14 CFR Part 36 Stage 3 via a Hushkit

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**HARRIS MILLER MILLER & HANSON INC.**

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September 3, 2009

Ted Baldwin
Harris Miller Miller and Hanson Inc.
77 South Bedford Street
Burlington, Massachusetts 01803

Dear Mr. Baldwin,

The Office of Environment and Energy (AEE) has received on June 22, 2009 your memo dated August 13, 2007, referencing HMMH Project Number 302720.001.002 requesting approval for a user-defined aircraft type a user-defined aircraft for the Gulfstream III (GIII) recertified to 14 CFR Part Stage 3 via hushkit installations. This request is related to Part 150 Noise Exposure Map and Noise Compatibility Program updates for Naples Municipal Airport (APF).

AEE reviewed the data used, the scaling basis and scaling method, the assumptions and results, and found the method and data used reasonable.

AEE would like to make two additional comments: (1) the assumed flap value in attachment 2 provided to HMMH on July 6, 2007 is confirmed to be flap 10, and thus consistent with the GIIB value in Table 2; (2) although it is acceptable to assume for this case that hushkit won’t significantly affect aircraft performance, the added weight associated with hushkit must be considered in the takeoff weight when modeling noise in this study.

Based on the above assessment, AEE approves the method proposed and the modified GIIB NPD for estimating GIII with hushkit.

Please understand that this approval is limited to this particular study. Any additional projects or non-standard INM input will require separate review and approval from AEE.

Sincerely,

Raquel Girvin, Ph.D.
Manager
AEE/Noise Division
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