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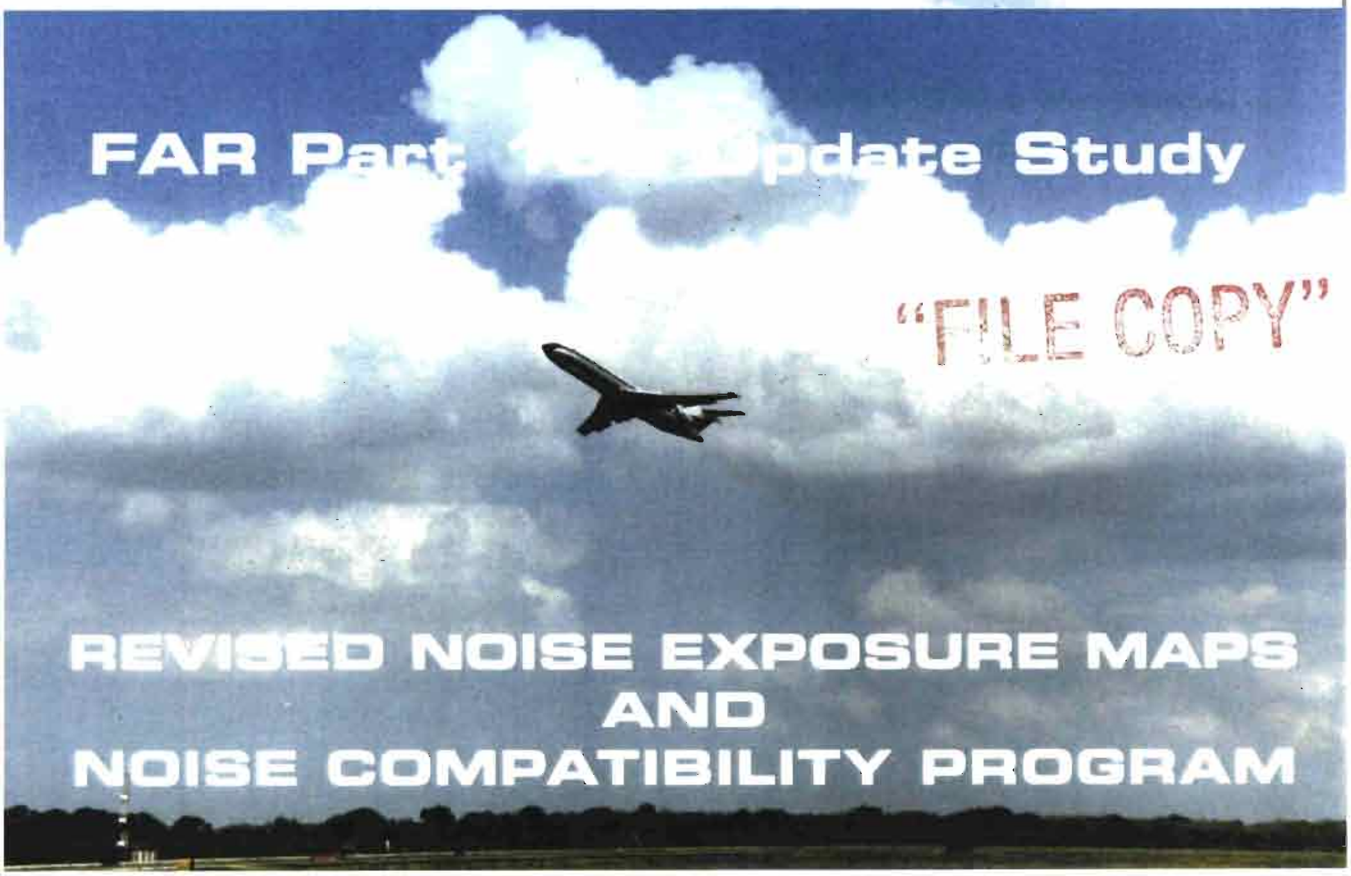

FAR Part 150 Update Study

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REVISED NOISE EXPOSURE MAPS AND NOISE COMPATIBILITY PROGRAM

Hillsborough County Aviation Authority

2000

HNTB

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TAMPA INTERNATIONAL AIRPORT

F.A.R. Part 150 Update

REVISED NOISE EXPOSURE MAP
and
NOISE COMPATIBILITY PROGRAM

Prepared for:

HILLSBOROUGH COUNTY AVIATION AUTHORITY

Prepared by:

HNTB Corporation

In association with:

Harris Miller Miller & Hanson Inc.   WilsonMiller

Date: 2000

CERTIFICATION

This is to certify the following:

(1) The Noise Exposure Maps and associated documentation for Tampa International 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 under penalty of 18 U.S.C Part 1001.

(2) All interested parties have been afforded opportunity to submit their views, data and comments concerning the correctness and adequacy of the revised existing and forecast conditions noise exposure map, and of the descriptions of forecast aircraft operations.

By: ______________________________
Louis E. Miller, Executive Director

Date: ______________________________

Airport Name:	Tampa International Airport
Airport Operator:	Hillsborough County Aviation Authority
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F.A.R. PART 150 UPDATE

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Chapter One
Overview

Tampa International Airport (TPA) has a long and successful history of noise compatibility planning. Previous efforts have established aircraft operational procedures and land use planning policies which substantially improve the compatibility of surrounding land uses with aircraft operations at TPA.

This document was developed in accordance with Federal Aviation Regulations (FAR) Part 150, "Airport Noise Compatibility Planning."[1] The Hillsborough County Aviation Authority (HCAA) completed its first Part 150 Study for TPA in 1987. In 1997, the HCAA retained a team of consulting firms to update both the existing Airport Master Plan (AMP) and the Part 150 noise compatibility plan.

This chapter provides an introduction to FAR Part 150 (Section 1.1), a summary of project organization (Section 1.2), and a summary of airport master planning and noise compatibility planning goals (Section 1.3).

The Federal Aviation Administration (FAA) has developed checklists for their use in review of Noise Exposure Map (NEM) and Noise Compatibility Program (NCP) Submittals. A copy of these checklists to be completed prior to submission of the complete NEM and NCP are provided in **Appendix A**. The checklists include specific page and section references indicating the locations where this document addresses the required items.

1.1 FAR PART 150

Part 150 sets forth standards for airport operators to use in documenting noise exposure in the airport environs and establishing programs to minimize noise-related land use incompatibilities. Part 150 prescribes specific standards for:

- measuring noise;
- estimating cumulative noise exposure using computer models;
- describing noise exposure (including instantaneous, single event, and cumulative levels);
- coordinating NCP development with local land use officials and other interested parties;
- documenting the analytical process and development of the compatibility program;
- submitting documentation to FAA;
- FAA and public review processes; and
- FAA approval or disapproval of the submission.

A full Part 150 submission to the FAA consists of two basic elements: a NEM and a NCP.

1.1.1 NEM

The NEM 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 NEM must address two time frames: the year of submission (the "existing conditions") and the fifth calendar year following the year of submission (the "forecast conditions"). It includes graphic depiction of existing and future noise exposure resulting from aircraft operations, and of land uses in the airport environs. The NEM documentation must describe the data collection and analysis undertaken in its development.

The submission year for this update is 2000, with existing conditions noise contours for that year, and 5-year forecast case contours for 2005.

The FAA requires airports to base the existing conditions NEM on "current data as of the date of submission (i.e., the year of submission)" and the 5-year forecast map on "forecast aircraft operations at the airport and on other reasonable planning assumptions ... for the fifth calendar year beginning after the year of submission."[2] Consistent with Part 150 requirements, this document labels the existing conditions contours "2000" and the 5-year forecast contours "2005."

FAA's Part 150 guidelines for Noise Exposure Map preparation recognize the difficulty of preparing an existing conditions map for the year of submission, which is still underway:

> If the maps are based on data generated for timeframes other than the current year of submission and the fifth year following the year of submission, the airport proprietor must verify that the data are representative of existing and 5-year forecast conditions (i.e., airport layout, runway use percentages, flight tracks, general aircraft mix and operational data, and non-compatible land uses are equivalent; total numbers of operations do not vary over 15% in the aggregate).[3]

HNTB estimated existing conditions and 5-year forecast activity based on current information during the data collection phase of the study, in 1998. Section 4.3.1 discusses the forecasts prepared for annual activity in 1998 and 2003. The 2000 and 2005 NEMs are based on the fleet mixes for those calendar years, since the forecast changes in activity from 1998 to 2000 and from 2003 to 2005 were substantially below the FAA's 15% threshold:

- The forecast 2-year increase in overall operations is approximately 3%.
- The forecast 2-year increase in air carrier jet operations is approximately 8%.
- The forecast 2-year increase in general aviation jet operations is approximately 10%.
- The forecast 2-year increase in non-jet operations is approximately 6%.

Therefore, under FAA guidelines, the NEM developed based on 1998 data accurately represents the year of submission (2000) and the forecast NEM developed base on 2003 data accurately represents the 5-year forecast (2005) conditions.

The Noise Exposure Maps replace previously approved maps for 1985 and 1990.

1.1.2 NCP

The NCP is essentially a list of the actions the airport proprietor, airport users, local governments, and the FAA propose to undertake to minimize existing and future noise/land use incompatibilities. The NCP 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 NCP 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 had major roles in the Part 150 process, including the HCAA, the consulting team, the Working and Input Groups, and the FAA.

1.2.1 HCAA

As the "airport operator," the HCAA has responsibility over the entire Part 150 update, including ultimate responsibility for determining what elements are included in the NCP when it is submitted to the FAA for review. The HCAA is also responsible for pursuing implementation of adopted measures.

1.2.2 Consulting Team

The HCAA retained a team of consultants to conduct the technical work required to fulfill Part 150 analysis and documentation requirements.

The Part 150 update is one element of a contract between the HCAA and HNTB Corporation. HNTB has overall responsibility for the Part 150 update. Harris Miller Miller & Hanson, Inc. (HMMH), a subcontractor to HNTB, has responsibility for all noise-related technical elements. HNTB has responsibility for the land use elements. WilsonMiller, another HNTB subcontractor, is responsible for coordinating public consultation efforts.

1.2.3 Working and Input Groups

The HCAA established three working and input groups to ensure that the project team had access to the information necessary to conduct the study, and to ensure that all interested parties have an opportunity to provide input. Appropriate exchange of information is the key element of a comprehensive public involvement program. Following are descriptions of the working and input groups and their contributions to the study.

The Technical Working Group (TWG) included representatives from the aviation community, including the FAA, The Florida Department of Transportation (FDOT), airlines, neighboring airports (MacDill Air Force Base and St. Petersburg/Clearwater International), and airport services providers (rental car, corporate pilot, food service, concessions, the hotel, FBOs, etc.). In particular, this group provided important input and feedback related to airport operation. The TWG was responsible for commenting on the adequacy and accuracy of collected data, simplifying assumptions, and technical analyses. The TWG also served as a forum for the varied interest groups to discuss complex issues and share their very different perspectives on the aircraft noise issue. **Appendix B** provides members of the TWG.

The Agency Working Group (AWG) included representatives from State, County, and local government and planning and transportation agencies, and local business organizations. This group provided important input and feedback related to local land use, planning, and business development issues. **Appendix B** provides members of the AWG.

The Community Input Group (CIG) included representatives from local civic, neighborhood, and community organizations. This group provided important input on specific issues of concern to residents of areas surrounding the Airport. **Appendix B** provides members of the CIG.

1.2.4 FAA

The FAA has ultimate review authority over the NCP 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 measures.

FAA involvement includes participation by staff from three levels in the agency: (1) local, (2) regional, and (3) national.

- The Airport's **Air Traffic Control Tower (ATCT)** provides significant input in several areas, including: operational data from their files, judgment regarding safety and capacity effects of alternative noise abatement measures, and input on implementation requirements.
- On a regional level, the FAA's **Southern Region** also has several roles. The **Air Traffic Division** staff will support the ATCT role, with final review and decision authority over changes in flight procedures. When the HCAA submits the Part 150 documentation to the FAA for review, the **Airports Division** will determine whether or not it satisfies all NEM and NCP requirements, and will conduct the initial FAA review of the NCP submission.
- On a national level, the FAA's Washington headquarters is responsible for the final review of the NEM and NCP documentation for adequacy in satisfying technical and legal requirements.

1.3 STUDY GOALS

A number of goals have been identified to guide the development of updated Master Plan and FAR Part 150 documents for TPA. This section outlines these master planning and noise compatibility goals. While Goals No. 6 through 8 and 11 most directly relate to noise compatibility (Part 150 Study), all of these goals should be considered in evaluating noise compatibility options.

GOAL NO. 1

Continue to meet and enhance the existing high level of service provided to all Airport users.

Objectives:

1.1 Promote passenger processing that is convenient for all segments of the traveling public, reduces unreasonable delay, is safe, and is a pleasant experience.

1.2 Provide adequate runway capacity for the estimated demand in terms of annual and hourly operations.

1.3 Provide adequate runway length to meet existing and forecast needs of all domestic and international departures (scheduled and non-scheduled).

1.4 Provide an international arrivals facility that is well-integrated with domestic terminal facilities and adequately sized to encourage airline development of international routes.

1.5 Provide facilities for regional airlines that maintain and enhance the airlines' functions as feeders to scheduled air carriers and as point-to-point carriers.

1.6 Locate designated regional aircraft parking spaces together with code-sharing air carriers.

1.7 Facilitate movement of passengers and baggage so that walking distances and connection times are minimized.

1.8 Provide opportunities for development of services for corporate-type general aviation (GA) activity that supports and interacts with air carrier operations at the Airport.

1.9 Provide other aviation-related support facilities needed to support a full range of aviation services, with a high level of service to the public to meet the forecasted demand levels.

1.10 Consolidate functions within specific land use areas where possible.

GOAL NO. 2

Provide an airport that is safe and reliable.

Objectives:

2.1 Provide navigational, landing aids, and meteorological facilities which enhance the safety and reliability of operations under all weather conditions.

2.2 To the maximum extent possible, protect FAA-mandated safety areas, runway protection zones, and other clear areas.

2.3 Provide Aircraft Rescue and Firefighting (ARFF) access roads and facilities to maintain specified response times under all weather conditions.

2.4 Ensure that terminal, parking, and support facilities meet all applicable security standards.

2.5 Ensure parking facilities are adequately sized and easy to negotiate. Provide a clear and easily understood locator system.

GOAL NO. 3

Minimize costs to all users (passengers, airlines, employees, etc.) of the Airport.

Objectives:

3.1 Minimize airside congestion through construction of runways and taxiways when the costs of providing the additional capacity are less than the additional operating costs associated with aircraft delays.

3.2 Minimize congestion and delay by designing terminal layouts which achieve unconstrained flows between the terminal areas and runways.

3.3 Minimize airspace congestion and delays for air carrier and GA aircraft operations through procedural changes and/or provision of additional navigational aids, as long as they do not unduly impact the environment.

GOAL NO. 4

Ensure adequate and convenient ground access to the Airport.

Objectives:

4.1 Continue to provide easy-to-follow signs to airport roadways and facilities.

4.2 Provide adequate lane capacity on roadways leading to the Airport to serve existing and future airport facilities.

4.3 Provide adequate lane capacity on internal circulation roadways serving all functional areas (terminal complex, GA, and cargo).

4.4 Provide parking facilities that are conveniently located and easily accessed.

4.5 Incorporate multi-modal opportunities into airport development concepts.

4.6 Maintain close coordination with FDOT, local Metropolitan Planning Organizations (MPOs), and other transportation groups.

GOAL NO. 5

Develop the Airport in a manner that is flexible and adaptable to changing conditions.

Objectives:

5.1 Develop airside facilities using concepts that provide flexibility to respond to changes in FAA standards and changes in the type or size of passenger carrier, cargo carrier, GA, or military aircraft.

5.2 Provide the short-term terminal upgrades needed to accommodate near-term demand.

5.3 Develop terminal facilities using concepts that permit ready responses to expansion or reductions in operations while maintaining passenger service and revenue flows.

5.4 Acquire adequate land to meet contingencies for future demand while minimizing disruption to the community and roadway system.

GOAL NO. 6

Minimize, to the extent feasible, the impact of aircraft noise on neighboring residents and noise-sensitive land uses through noise abatement and noise mitigation.

Objectives:

6.1 Design and select noise abatement measures that minimize the number of people exposed to noise above Day-Night Noise Level (DNL) 65 decibels (dB).

6.2 Ensure that no residential uses are exposed to aircraft noise above DNL 75 dB.

6.3 In selecting noise abatement actions, avoid those that would adversely affect airport capacity or result in significant delays, under current or forecast operations.

6.4 In selecting noise abatement actions, avoid imposing restrictions on airport use that would be discriminatory or interfere with interstate commerce.

6.5 In selecting noise abatement actions, avoid those that could erode prudent margins of safety.

6.6 Design and select land use mitigation measures for noise-sensitive land uses projected to be exposed to aircraft noise between 65 and DNL 65 and 75 dB through the 5-year forecast.

6.7 Ensure that mitigation projects are capable of being fully funded and implemented.

6.8 Maximize, to the extent practical, any mitigation projects are eligible for FAA funding assistance through the noise set-aside of the Airport Improvement Program.

GOAL NO. 7

Promote the development of compatible land uses in undeveloped areas in the Airport vicinity.

Objectives:

7.1 Promote the land use planning and development objectives of local governments in the Airport area to the extent that they are compatible with aircraft noise levels.

7.2 Promote long-term economic development in the Airport area consistent with the land use planning and development objectives of local governments.

7.3 Develop realistic plans for future land use, recognizing the development capacity of the land and economic feasibility.

7.4 Balance the need for compatible land use in the Airport vicinity regarding the potential impact to land owners.

7.5 Locate airport and access facilities so that growth of associated uses may best be controlled through land use planning and zoning.

GOAL NO. 8

Develop the Airport and its vicinity to minimize negative environmental impacts.

Objectives:

8.1 Identify the major environmental issues of concern regarding regulatory requirements at the Federal, State, regional, and local levels.

8.2 Minimize potential environmental impacts identified in the Airport Environmental Handbook by developing a plan to prevent, minimize, or mitigate impacts. Provide special attention to minimizing residential dislocation, air and water pollution, and wetland impacts.

8.3 Provide a facility which minimizes adverse effects on other environmental concerns (water quality, flora and fauna, etc.).

8.4 Develop an energy-efficient airport layout providing ease of air and ground access.

GOAL NO. 9

Develop an airport that supports local and regional economic goals and plans while providing the flexibility to accommodate new opportunities and shifts in development patterns.

Objectives:

9.1 Achieve a level of service and user convenience such that the Airport is a positive factor in regional economic development decisions.

9.2 Achieve capacities of the airfield and the terminal area systems so that the Airport is an attractive location for major airline maintenance, cargo, and other aviation-related activities.

9.3 Provide appropriate and achievable commercial opportunities at and near the Airport.

9.4 Investigate the opportunity for collateral commercial development to increase revenue.

9.5 To assure economic feasibility, identify an equitable distribution of user charges, and distribute the burden of capital investment, maintenance, and operating costs while keeping overall costs within acceptable limits.

9.6 Identify financial alternatives and funding sources available to implement the recommended plan for both aviation and non-aviation projects needed for the Airport.

9.7 Quantify financial resources available for funding projects identified in the analysis of alternatives, and identify the priority of project implementation for the recommended plan.

9.8 Establish an efficient airport layout integrated with the existing transportation infrastructure which will encourage continued economic development and diversification consistent with local and regional growth plans.

GOAL NO. 10

Develop an airport that is consistent with Federal, State, regional, and local plans.

Objectives:

10.1 Develop the Airport as the region's primary international air carrier airport consistent with the national, State, and metropolitan airport system plans.

10.2 Develop the Airport in accordance with metropolitan and local land use and transportation plans.

GOAL NO. 11

Build and maintain public confidence and support.

Objectives:

11.1 Establish and maintain an effective working relationship between the project team, Hillsborough County, the State, local metropolitan planning organizations, surrounding communities, the FAA, the aviation industry, and the private sector.

11.2 Coordinate continually with established working groups to ensure local issues are addressed in a timely and effective manner.

11.3 Encourage and utilize comments from all sectors of the aviation community, as well as the general public, in developing a Master Plan and NCP for the Airport.

11.4 Identify the implementation mechanisms for the plan, and determine implementation responsibilities for both the public and private sectors.

1.4 EXISTING NCP

The existing NCP contains 12 elements, including five noise abatement measures (i.e., measures that affect the size and shape of the noise contours) and seven land use measures (measures that address land use incompatibilities that remained after the implementation of the noise abatement measures).

1.4.1 Aircraft Noise Abatement Measures

The original NCP proposed the implementation of five noise abatement measures. The Authority has implemented all of these measures, which include the following:

1. Use southerly traffic flows whenever possible to reduce noise levels over the surrounding communities to the north.

2. Encourage operators of turbojet aircraft to use ATA recommended noise abatement arrival procedures to reduce noise levels under approach flight paths.

3. Designate engine run-up areas to limit run-up noise exposure on the surrounding communities.

4. Augment vegetation noise barrier along the western perimeter of the Airport to increase its noise attenuation qualities.

5. Establish a helipad on the east side of the Airport to help in separating helicopter traffic from fixed wing flows and thereby reduce unnecessary overflight of areas adjacent to the airport.

Chapter Seven reviews the implementation of these measures.

1.4.2 Compatible Land Use Measures

The 1987 FAR Part 150 Study recommended two remedial land use measures and five preventive land use measures to correct or enhance development within the vicinity of the Airport.

The recommended remedial land use measures are summarized below:

1. Acquisition of developed land with incompatible use for conversion to compatible land use.

2. Purchase of avigation easement from property owners in airport noise zones permitting overflight of aircraft and the associated noise.

The recommended preventive measures are summarized below:

1. Zoning for compatible use to promote compatible land use in airport noise zones and allow only low density uses in noise zones.

2. Overlay zoning to require noise reduction construction techniques for land uses permitted in noise zones.

3. Purchase of undeveloped land to prevent non-compatible land uses from developing.

4. Soundproofing of new construction to achieve recommended EPA interior noise level standards of 45 dBA.

5. Public information program that would provide information on aircraft noise zones and noise impacts.

Chapter Eight provides a more detailed discussion of the land use measures contained in the 1987 FAR Part 150 Study.

Chapter Two
Noise Analysis

FAR Part 150 is based largely on a description of airport noise exposure using Day-Night Average Sound Level (DNL) noise contours. This study also involves the use of supplemental noise measures where DNL does not provide an adequate basis for quantifying a specific situation. To assist reviewers in interpreting these complex noise measures, this chapter presents an introduction to relevant fundamentals of acoustics and noise terminology (Section 2.1), the effects of noise on human activity (Section 2.2), and currently accepted noise-land use compatibility guidelines (Section 2.3).

2.1 INTRODUCTION TO ACOUSTICS AND NOISE TERMINOLOGY

This chapter discusses the following acoustic metrics:

- Decibel, dB
- A-Weighted Decibel, dBA
- Maximum A-Weighted Sound Level, Lmax
- Sound Exposure Level, SEL
- Equivalent Sound Level, L_{eq}
- Day-Night Average Sound Level, DNL

2.1.1 The Decibel, dB

All sounds come from a sound source—a musical instrument, a speaking voice, an airplane passing 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).

SPL 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). SPLs are measured in decibels (abbreviated dB). Decibels are logarithmic quantities—logarithms of the ratio of the 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 3 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.

Two useful rules of thumb to remember when comparing sound pressure levels are: (1) most of us perceive a 6 to 10 dB increase in the sound pressure level to be an approximate doubling of loudness, and (2) changes in the sound pressure level of less than about 3 dB are not readily detectable outside of a laboratory environment.

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 or 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 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 decibels (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. The filter has little effect at intervening frequencies where our hearing is most efficient. 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 this reason that A-weighted sound levels are normally used to evaluate environmental noise.

Other weighting networks include the B, C, and D filters. They correspond to four different level ranges of the ear (see **Figure 2-1**). The rarely used B-weighting attenuates low frequencies (those less than 500 Hz), but to a lesser degree than A-weighting. The D-weighting network, also rarely used, is similar to the B-weighting network at low frequencies, but includes a significant amplification of the sound (up to about 10 dB) in the 2,000 to 8,000 Hz range.

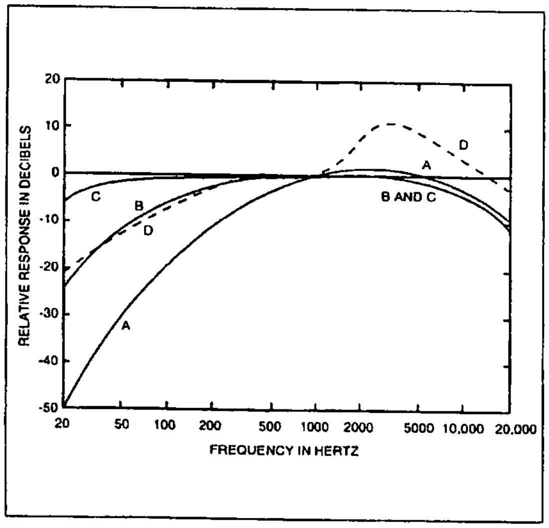


Figure 2-1
Frequency Response Characteristics of Various Weighting Networks
Source: Harris, Cyril M., editor; Handbook of Acoustical Measurements and Noise Control, (Chapter 5, "Acoustical Measurement Instruments"; Johnson, Daniel L.; Marsh, Alan H.; and Harris, Cyril M.); New York; McGraw-Hill, Inc.; 1991; p. 5.13.

C-weighting is nearly flat throughout the audible frequency range, hardly de-emphasizing the low frequency noise. C-weighted levels are not used as frequently as A-weighted levels, but they may be preferable in evaluating sounds whose low-frequency components are responsible for secondary effects such as the shaking of a building, window rattle, perceptible vibrations, or other factors that can cause annoyance and complaints. Uses include the evaluation of blasting noise, artillery fire, and, in some cases, aircraft noise inside buildings.

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. EPA and by nearly every other agency concerned with community noise throughout the United States. **Figure 2-2** presents typical A-weighted sound levels of several common environmental sources.

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 2-3** illustrates this concept.

2.1.3 Maximum A-Weighted Noise Level, L_{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_{max}. In Figure 2-3, it is approximately 85 dBA.

The maximum level describes only one dimension of an event; it provides no information on the cumulative noise exposure generated by a sound source. 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.

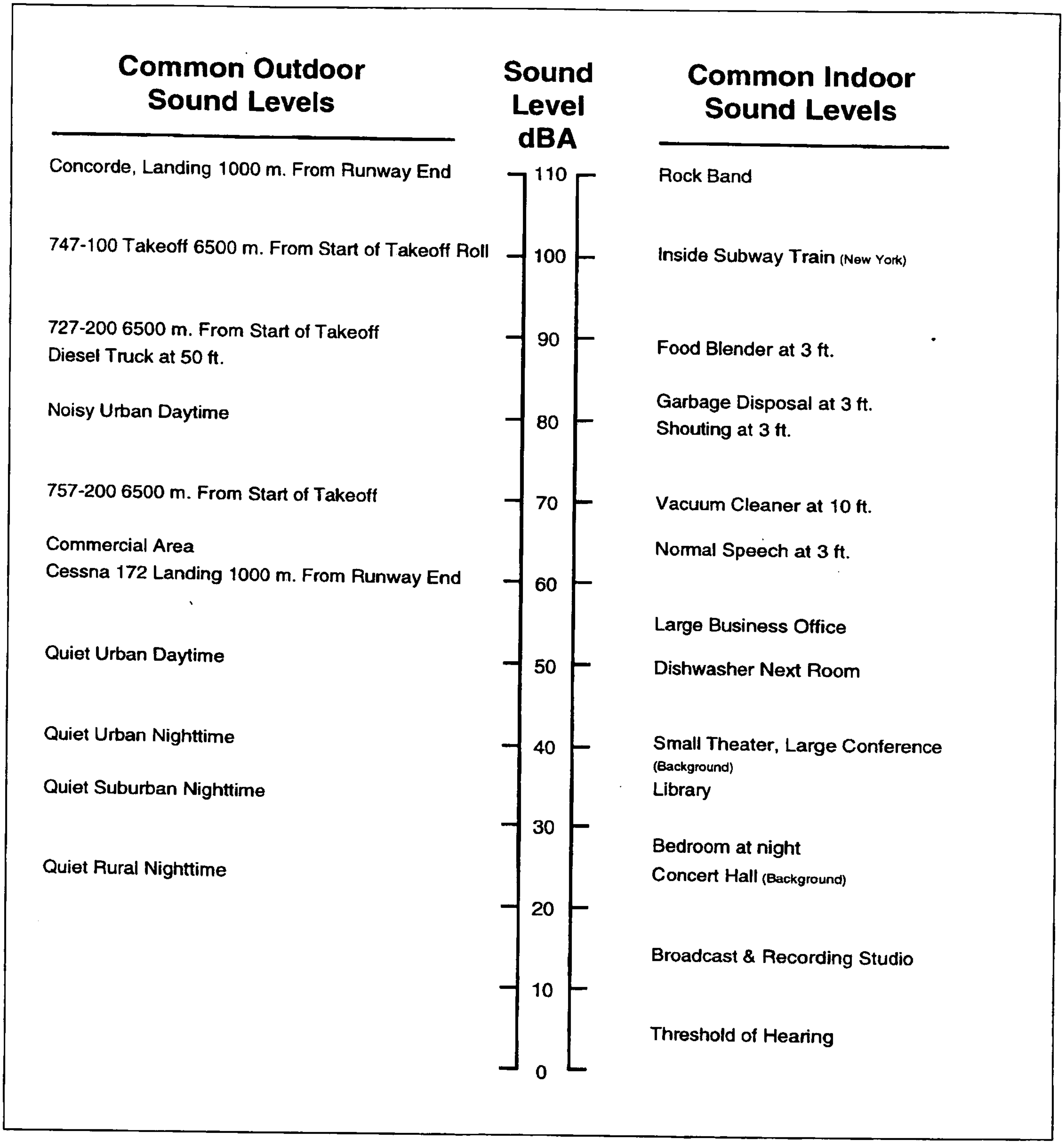


Figure 2-2
Common Environmental Sound Levels, in dBA
Source: Harris, A.S., and Miller, R.L., Airport Noise Seminars, documentation prepared for the Airports Division, Southern Region, Federal Aviation Administration, November 1977.

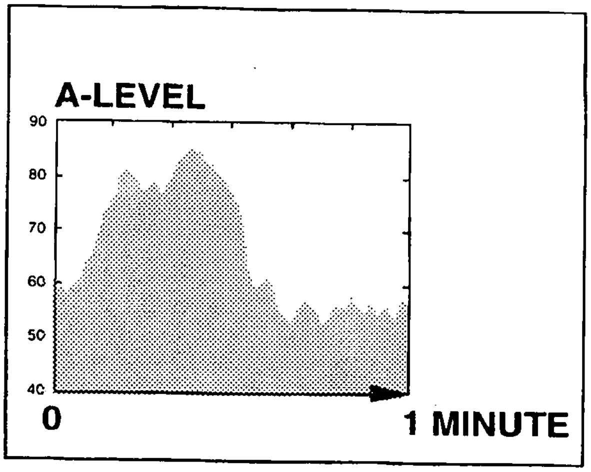


Figure 2-3
Variation in the A-Weighted Sound Level Over Time
Source: HMMH.

2.1.4 Sound Exposure Level, SEL

The most frequently used measure of noise exposure for a single aircraft flyover (and the measure that Part 150 specifies) is the Sound Exposure Level, or SEL. SEL can be thought of as an accumulation of the sound energy over the duration of an event, where duration is defined as the time, in seconds, 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[4]. The shaded area in **Figure 2-4** illustrates that portion of the sound energy included in this dose.

To account for the variety of durations that occur among different noise events, the dose is normalized (standardized) to a one-second duration. This "revised" dose is the SEL; it is shown as the shaded area in Figure 2-4. It has exactly the same sound energy as the actual event, though it is presumed to last for a much shorter (one-second) period. Note that because the SEL is normalized to one second, it will always be larger in magnitude than the maximum A-weighted level for an event which lasts longer than one second. In fact, for most aircraft overflights, the SEL is on the order of 7 to 12 dB higher than the L_{max}. The fact that it is a cumulative measure means that not only do louder flyovers have higher SELs than quieter ones, but longer flyovers also have greater SELs than shorter ones.

This metric provides a comprehensive basis for modeling a noise event in determining noise exposure.

2.1.5 Equivalent Sound Level, L_{eq}

Maximum A-weighted levels and SELs are used to measure the noise associated with individual events. The remaining metrics in this section describe longer-term cumulative noise exposure that often include many events.

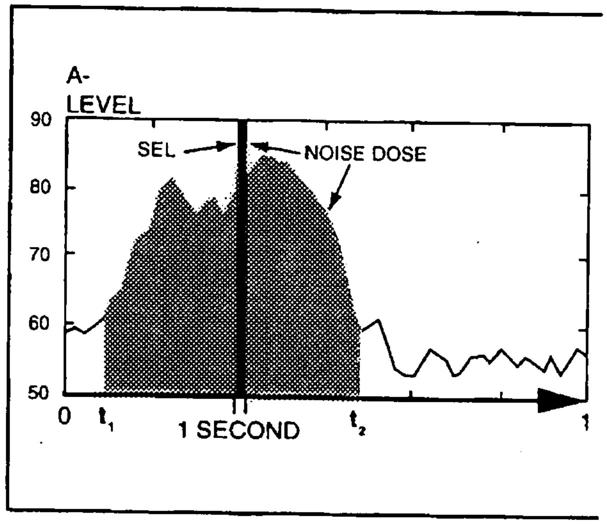


Figure 2-4
Sound Exposure Level
Source: HMMH.

The first, the Equivalent Sound Level (abbreviated L_{eq},) is a measure of the exposure resulting from the accumulation of A-weighted sound levels over a particular period of interest—for example, an hour, an 8-hour school day, nighttime, or a full

24-hour day. However, because the length of the period can be different depending on the time frame of interest, the applicable period should always be identified or clearly understood when discussing the metric. Such durations are often identified through a subscript, for example $L_{eq(8)}$ or $L_{eq(24)}$.

Conceptually, L_{eq} may be thought of as a constant sound level over the period of interest that contains as much sound energy as the actual time-varying sound level with its normal peaks and valleys. This is illustrated in **Figure 2-5**. It is important to recognize, however, that the two signals (the constant one and the time-varying one) would sound very different from each other if compared in real life. Also, be aware that the "average" sound level suggested by L_{eq} is not an arithmetic value, but a logarithmic, or "energy-averaged" sound level. Thus, loud events clearly dominate any noise environment described by the metric.

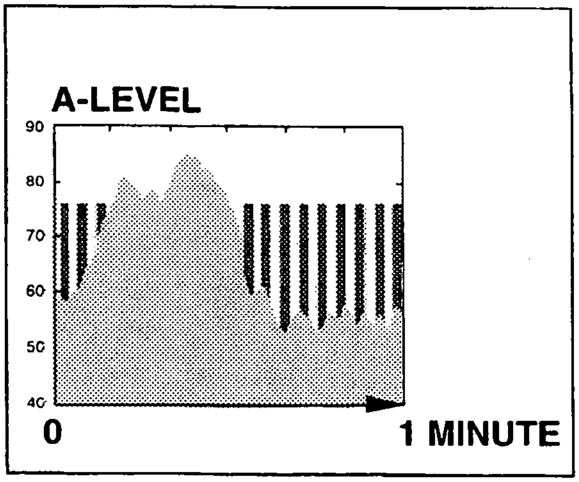


Figure 2-5
Example of a One-Minute Equivalent Sound Level
Source: HMMH.

As for its application to airport noise issues, L_{eq} is often presented for consecutive 1-hour periods to illustrate how the hourly noise dose rises and falls throughout a 24-hour period, as well as how certain hours are significantly affected by a few loud aircraft.

2.1.6 DNL

FAR Part 150 requires that a slightly more complicated measure of noise exposure be used to describe cumulative noise exposure during an average annual day: the DNL. The U.S. EPA 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, September 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 noise on the environment, on individuals, and on 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) 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.

DNL has been adopted formally by most Federal agencies dealing with noise exposure, including the FAA, the Department of Defense, and the Department of Housing and Urban Development (HUD). Part 150 requires that DNL be used in describing cumulative noise exposure and in identifying aircraft noise-land use compatibility issues.

In relatively simple terms, DNL is the average noise level over a 24-hour period, except that noises occurring at night (defined as 10 p.m. through 7 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 typically decrease about 10 dB at night. Typical DNL values for a variety of noise environments are shown in **Figure 2-6** to indicate the range of noise exposure levels usually encountered.

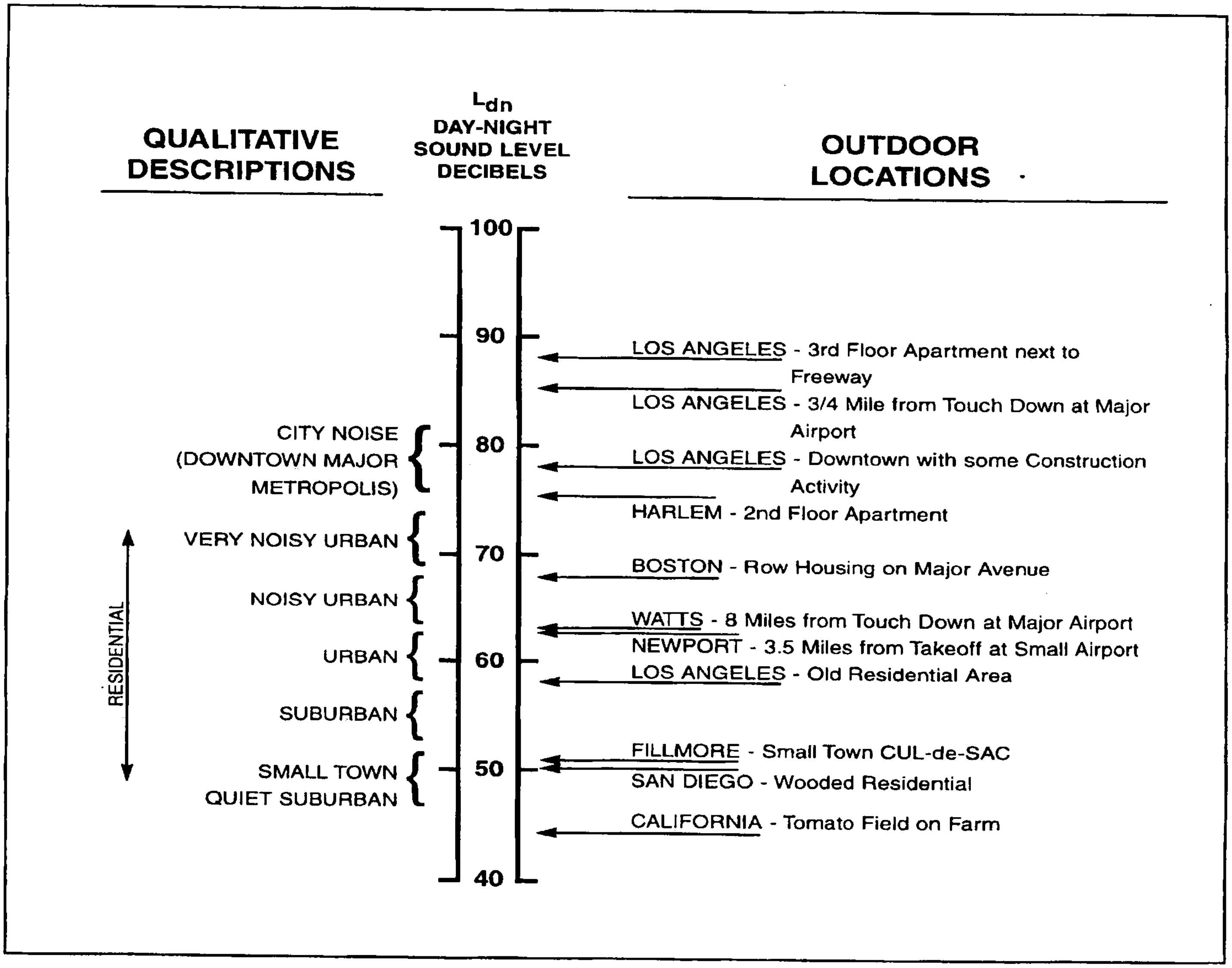


Figure 2-6
Examples of Day-Night Average Sound Levels, DNL
Source: United States Environmental Protection Agency, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, March 1974, p. 14.

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.

2.2 THE EFFECTS OF AIRPORT 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. This section addresses the various ways we are affected by airport noise.

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 2-7** presents typical distances between talker and listener for satisfactory outdoor conversations in the presence of different steady A-weighted background noise levels for three degrees of vocal effort: raised, normal, and relaxed. As the background level increases, the talker must raise his/her voice, or the individuals must get closer together to continue talking.

As indicated in the figure, "satisfactory conversation" does not always require hearing every word; 95 percent 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 generally require closer to 100 percent intelligibility. Any combination of talker-listener distances and background noise that falls below the bottom line in Figure 2-7 (thus assuring 100 percent 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 2-7 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 speech communication distances, comfortable voice levels, and expectations regarding intelligibility general-ly require a background level less than about 45 dBA. Therefore, an acceptable background level of 60 to 65 dBA outdoors does not guarantee an acceptable background level indoors. This is because, with windows partly open, housing construction typically provides about 15 decibels of sound attenuation (reduction) from outside to inside. Thus, only if the outdoor sound level is 60 dBA or less is there a reasonable chance that the resulting indoor sound level will afford acceptable conversation inside. With windows closed, 25 dB of attenuation is typical.

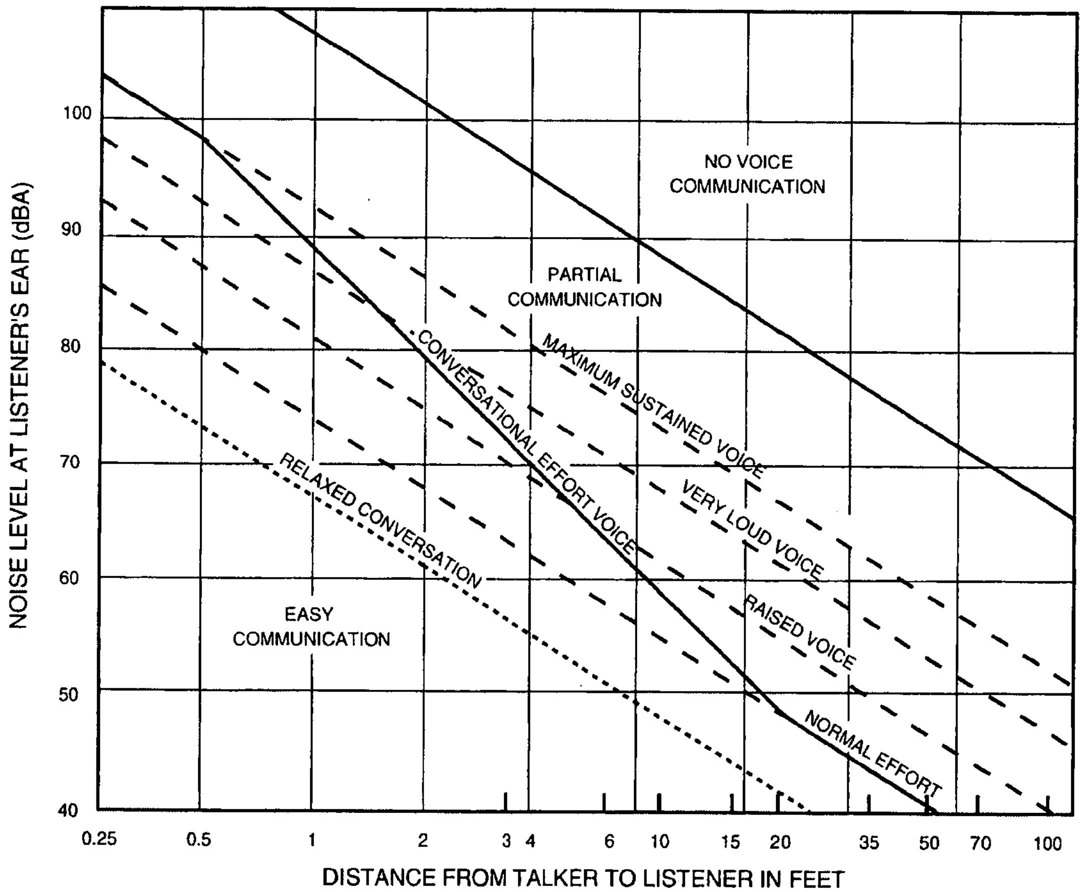


Figure 2-7
Outdoor Speech Intelligibility
Source: U.S. EPA, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, March 1974, p. D-5.

It follows, then, that the amount of time per day that aircraft noise exceeds either 60 or 65 dBA outdoors is indicative of the time during which speech interference can be expected. The U.S. EPA has used these same relationships to identify an outdoor criterion of DNL 60 as requisite to protect against speech interference indoors, and a criterion level 5 decibels less than that to provide for an additional "margin of safety."[5]

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 causing 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. The FAA reviewed literature on sleep disruption in a study of hospitals. That study[6] identified a maximum level of 40 dBA as a conservative threshold of sleep disturbance. Separately, the EPA identified 35 dBA L_{max} as a threshold of sleep disruption in the presence of steady noise, with maximum levels of 40 dBA resulting in a 5 percent probability of awakening.[7] Assuming an interior threshold level of 40 dBA requisite to maintain sleep (with windows open) and 15 dB of outside-to-inside noise reduction, this means that levels exceeding about 55 dBA outdoors have the potential to cause arousal.[8]

Figure 2-8 shows a summary of laboratory findings on the topic.

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 energy such as DNL. **Figure 2-9** shows the most widely recognized relationship between environmental noise and community annoyance.

Based on data from 18 surveys conducted worldwide, the curve indicates that at levels as low as DNL 55, approximately 5 percent of the people will still be highly annoyed, with the percentage increasing more rapidly as exposure increases above DNL 65.[9]

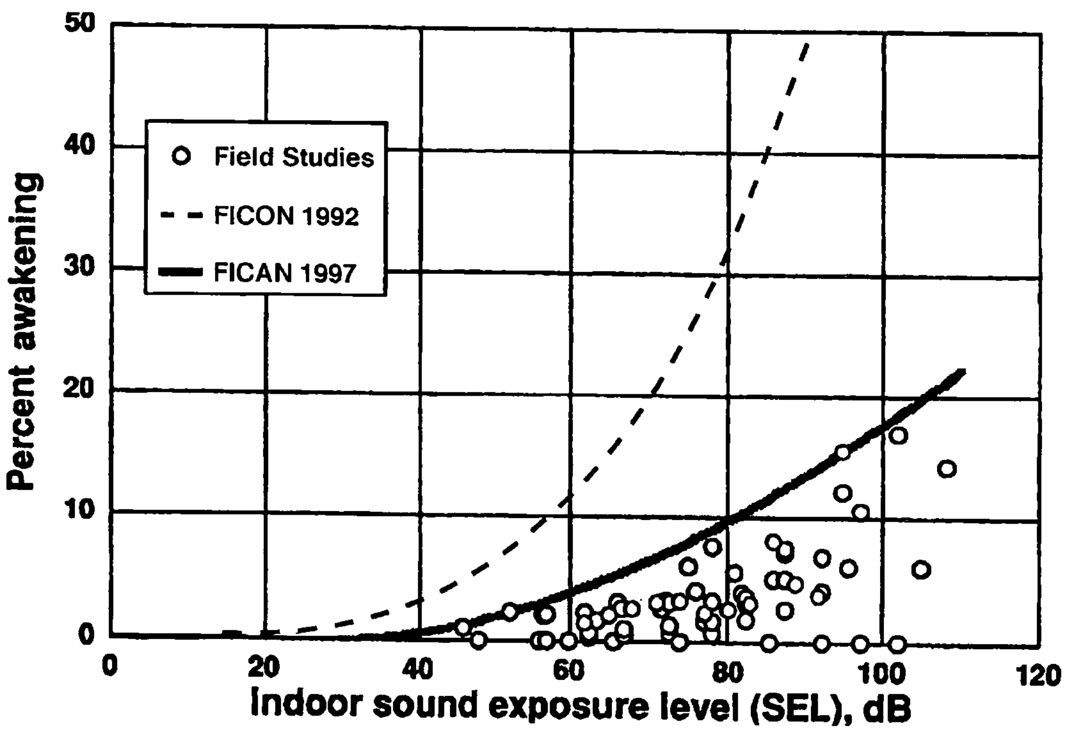
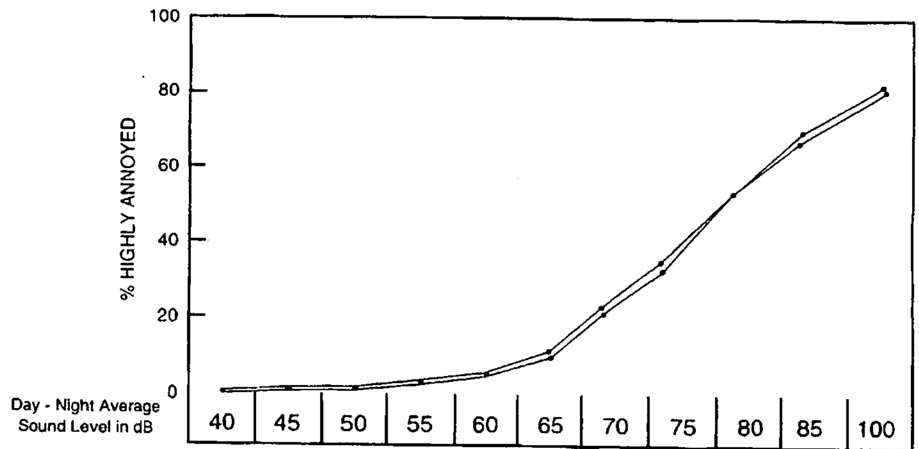


Figure 2-8
Sleep Interference
Source: Federal Interagency Committee on Aviation Noise (FICAN), " Effects of Aviation Noise on Awakenings from Sleep", June 1997, page 6.



Day - Night Average Sound Level in dB		40	45	50	55	60	65	70	75	80	85	100
Calculated %HA Points	USAF	0.41	0.831	1.66	3.31	6.48	12.29	22.1	36.47	53.74	70.16	82.64
	SCHULTZ	0.576	1.11	2.12	4.03	7.52	13.59	23.32	37.05	53.25	68.78	81

Figure 2-9
Percentage of People Highly Annoyed
Source: Federal Interagency Committee on Noise (FICON), "Federal Agency Review of Selected Airport Noise Analysis Issues". August 1992. (from data provided by USAF Armstrong Laboratory). p. 3-6.

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 2-10**. 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 5 decibels below the ambient, while widespread complaints can be expected as intruding noise exceeds background levels by about 5 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 provides the FAA's recommended guidelines for noise-land use compatibility evaluation. **Table 2.1** reproduces these guidelines.

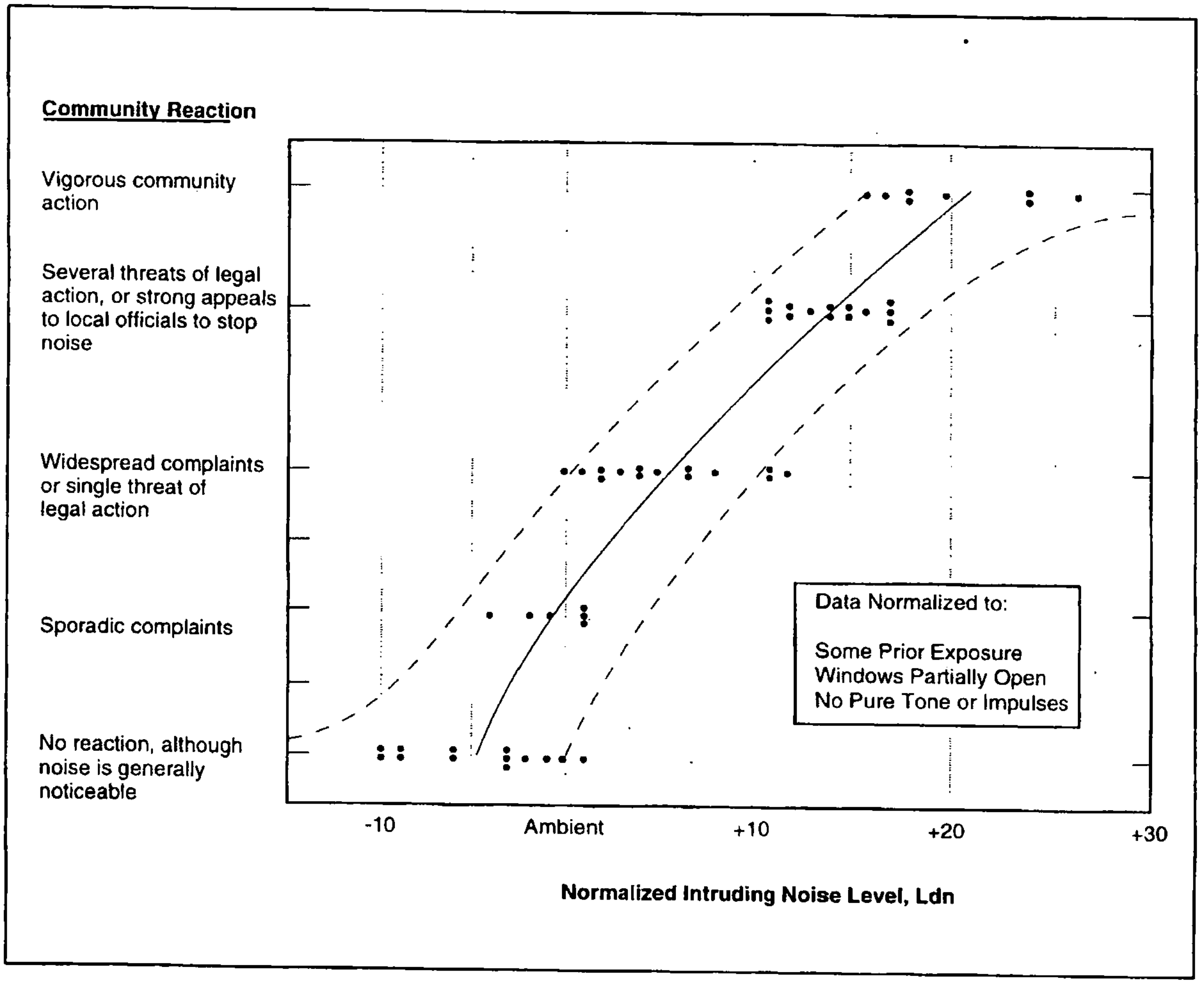


Figure 2-10
Community Reaction as a Function of Outdoor DNL
Source: Wyle Laboratories, Community Noise, Prepared for the U.S. EPA, Office of Noise Abatement and Control, Washington, D.C. 20406, December 1971, page 63.

These guidelines represent a compilation of the results of extensive scientific research into noise-related activity interference and attitudinal response. However, reviewers of DNL contours should recognize the highly subjective nature of response to noise, and that special circumstances can affect individuals' tolerances. For example, a high non-aircraft background noise level can reduce the significance of aircraft noise, such as in areas constantly exposed to relatively high levels of traffic noise.

Alternatively, residents of areas with unusually low background levels may find relatively low levels of aircraft noise annoying.

Response may also be affected by expectation and experience. People may get used to a level of exposure that guidelines indicate may be unacceptable, and changes in exposure may generate response that is far greater than that which the guidelines might suggest.

Table 2.1

FAR Part 150 Noise/Land Use Compatibility Guidelines

Land Use	Yearly Day-Night Average Sound Level, DNL, in Decibels (Key and notes on following page)					
	<65	65-70	70-75	75-80	80-85	>85
Residential Use						
Residential other than mobile homes and transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile home park	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
Public Use						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail--building materials, hardware and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade--general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N
Manufacturing and Production						
Manufacturing general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	Y	N	N	N
Golf courses, riding stables, and water recreation	Y	Y	25	30	N	N

See following page for Table Key and Notes.

Key to Table 2.1

SLCUM	Standard Land Use Coding Manual.
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 2.1

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) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.

(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.

Source: FAR Part 150.

The cumulative nature of DNL means that the same level of noise exposure can be achieved in an essentially infinite number of ways. For example, a reduction in a small number of relatively noisy operations may be counterbalanced by a much greater increase in relatively quiet flights, with no net change in DNL. Residents of the area may be highly annoyed by the increased frequency of operations, despite the seeming maintenance of the noise status quo.

With these cautions in mind, the Part 150 guidelines can be applied to the DNL contours to identify the potential types, degrees, and locations of incompatibility. Measurement of the land areas involved can provide a quantitative measure of impact that allows a comparison of at least the gross effects of existing or forecast operations.

Part 150 guidelines indicate that all uses are normally compatible with aircraft noise at exposure levels below DNL 65. This limit is supported in a formal way by standards adopted by HUD. The HUD standards address whether sites are eligible for Federal funding support. These standards, set forth in Part 51 of the Code of Federal Regulations, define areas with DNL exposure not exceeding 65 dB as acceptable for funding. Areas exposed to noise levels between DNL 65 and 75 are "normally unacceptable," and require special abatement measures and review. Those at 75 and above are "unacceptable" except under very limited circumstances.

This study will use the Part 150 Table 2.1 guidelines in identifying potential land use incompatibilities in the TPA environs. Chapter Four will provide a more detailed discussion of the land use compatibility guidelines recommended for the TPA environs.

Chapter Three
Noise Measurements

Part 150 does not require airport operators to measure noise levels. However, measurements provide important input to an understanding of the noise environment. Noise measurements were conducted in the TPA environs from October 14-21, 1997.

This chapter provides the noise measurement program (Section 3.1), a summary of weather during the measure-ment period (Section 3.2), a description of noise measurement instrumentation (Section 3.3), DNL results (Section 3.4), and the site-by-site results (Section 3.5).

3.1 MEASUREMENT PROGRAM OBJECTIVES, DESIGN, AND EXECUTION

The noise measurement program was conducted with these objectives as guidelines:

- To measure cumulative noise exposure for comparison with noise contours.
- To sample aircraft single event noise levels at representative community locations.
- To address specific community concerns regarding aircraft noise exposure.

To accomplish these objectives noise measurements were conducted at 17 temporary locations. At 11 of the locations, the measurements covered at least 24 hours, providing samples of DNL. Measurements at the remaining sites focused on single event levels, with shorter-term measurements of cumulative exposure.

Consultant staff observed and recorded noise-producing activity at each measurement location for several hours during the measurement period. The measurement locations were selected based on input received at the first Community Input Group meeting, held on September 9, 1997, taking into account the following site selection criteria:

- **Complement previous Part 150:** Some of the sites should provide a basis for comparing noise levels to those measured in January 1983 during the preparation of the original Part 150 Noise Exposure Map.
- **Under, or near to, major flight "corridors":** A majority of the sites should be near major flight corridors, to maximize the number of operations monitored.
- **Areas exposed to unusual sources:** Measurements are appropriate away from major flight corridors, to address special noise issues.
- **Within or near to 65 dB DNL contour:** It is appropriate to focus the measurements in the areas exposed to the highest noise levels, including areas within the noise contour areas which the FAA considers potentially incompatible with some land uses.

- **Security, low ambient:** Equipment security is a practical matter. Sites should also be isolated from unusual non-aircraft levels, such as high levels of traffic noise, barking dogs, etc. This does not mean that measurements should be avoided in neighborhoods near to major roads. Rather, the measurement site should be placed in a parcel that is representative of inner lots that do not directly abut the major roads.

- **Technical purposes:** The overall group of sites must provide representative data on the broadest possible range of aircraft operations and geographic areas around the Airport, to provide the most diverse and comprehensive information possible for use in the development of the updated Noise Exposure Map and Noise Compatibility Program.

HMMH and HNTB staff spent the daylight hours conducting observations at the monitoring locations, to log the noise-producing aircraft and non-aircraft activity.

Table 3.1 summarizes the measurement locations, dates, and times at each location. Overall, approximately 400 hours of measurements were conducted at 17 locations (numbered 1-16, with a 7 and 7A, to reflect the two sites within the Plantation subdivision).

Figure 3-1 depicts the measurement locations.

Section 3.2 summarizes weather conditions during the monitoring session.

Section 3.3 describes the measurement instrumentation.

Section 3.4 summarizes the DNL measurement results for all sites where sufficient hours of measurement were conducted to calculate that daily value.

Section 3.5 summarizes the site-by-site measurement results, including the measured hourly L_{eq} and the L_{max} for individual aircraft noise events.

3.2 WEATHER DURING MEASUREMENT PERIOD

The weather during the measurement period was largely clear and mild, with little overcast, and relatively light winds from the north. For approximately 12 hours on Saturday, October 18, there were periods of heavy rain.

The National Oceanic and Atmospheric Administration (NOAA) operates an automated weather observation station at TPA. **Figure 3-2** plots the daily average wind speed and highest sustained wind speed for October 1997 from that station.

Figure 3-3 plots the daily maximum and minimum temperatures for October 1997. The average temperature during the measurement period was approximately equal to the annual average of 72 degrees (the long-term average reported by the National Climatic Data Center).

3.3 NOISE MEASUREMENT INSTRUMENTATION

Measurements at Sites 1, 2, 3, 4 (on October 16-17 only), 5, 7, 8, 9, 10, 11, 13, 14, and 15 were conducted with Larson-Davis Model 870 (LD 870) noise monitors. The LD 870

Q:\27246-Tampa\Part-150_Figures\Noise-locations.dwg 2/8/00 11:00 am

Measurement Locations

Scale in Feet

0' 5,000' 10,000'

Source: HMMH, 1998

Figure 3-1

PROJECT NAME

MASTER PLAN UPDATE AND F.A.R. 150 STUDY

DRAWING TITLE

Noise Measurement Locations

HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA INTERNATIONAL AIRPORT
TAMPA – FLORIDA

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

DATE	REVISIONS	BY	AUTH.

DESIGN ________ SCALE ________
DRAWN ________ JOB NO. ________
CHECKED ________

Table 3.2

Summary of Day-Night Average Sound Level, DNL, Measurements

Site No.	Address	Daily DNL (dBA)								Average DNL at Site
		Tue. 10/14	**Wed. 10/15**	**Thu. 10/16**	**Fri. 10/17**	**Sat 10/18**	**Sun. 10/19**	**Mon. 10/20**	**Tue. 10/21**	
1	5833 Mariner St., Beach Park	77.4	74.1	75.3	72.7					74.9
2	5140 Longfellow Ave., Sunset Park	59.7	55.9	57.8						57.8
3	4923 St. Croix Dr., Culbreath Isles	60.1	57.8							59.0
4	13902 Pepperrell Dr., Carrollwood			61.1	62.3					61.7
5	4816 Sierra Madre Dr.				68.5	61.8				65.2
6	4610 Westford Cir., Village West	No cumulative exposure measurements.								
7	Clubhouse, Plantation				63.8	65.2				64.5
7A	10557 Park Crest, Plantation	No cumulative exposure measurements.								
8	6719 Twelve Oaks Boulevard				65.0	63.6	64.6			64.4
9	4613 D'Azzo Ave., Drew Park					60.3	62.6			61.5
10	6526 Johns Rd., Northwest Park					59.0	58.7	60.3		59.3
11	5215 West Laurel St.						67.3	69.6	69.3	68.7
12	North St./Occident Ave. Intersection	No cumulative exposure measurements.								
13	Leeward Dr., Watermill Village	No cumulative exposure measurements.								
14	3947 Doral Dr., Dana Shores							66.9		66.9
15	Cypress Point Park							78.3	72.0	69.4
16	3405 Aileen St.	No cumulative exposure measurements.								

Source: HMMH.

- "Twin Turbo Props" - Twin engine propeller driven aircraft with turbine engines.
- "Twin Piston" - Twin engine propeller aircraft, with piston engines.
- "Single Piston" - Single engine propeller driven aircraft, with piston engines.
- "Helicopter" - Helicopter operations.

Discussions of air carrier jets often raise the issue of their "Part 36" status, a term which merits introduction at this point. As a means of controlling noise at the source, the Federal government sets limits that aircraft must meet to be "certificated" for operation in the U.S. These noise limits are set out in Federal Aviation Regulation Part 36. New turbojet aircraft must meet the most stringent "Stage 3" limits. Older turbojet aircraft that meet certain minimum noise standards are "Stage 2." The oldest, noisiest category of jets, that do not meet any Part 36 limits, are "Stage 1."

Another Federal regulation "Part 91" prohibits operation in the U.S. of Stage 1 turbojets with maximum certificated gross takeoff weights over 75,000 pounds; it requires operators to cease Stage 2 operations by the year 2000, either by retiring their Stage 2 aircraft or modifying them to meet Stage 3 limits. Operators may apply for extensions to that phase out date, but only for very limited reasons, and only until 2003. There are no phase-out dates for Stage 1 or 2 jets under 75,000 pounds ("corporate jets"). Aircraft of similar size and configuration with differing Part 36 classifications can produce very different noise levels, as the single event measurements for several sites reveal. The Stage 2 phase out is a very important abatement action on a national and local level.

Presentation of Hourly Equivalent Sound Level (L_{eq}) Data

For those sites at which cumulative exposure measurements were conducted with the LD 870 monitors, the discussion also includes figures that graphically present the hourly L_{eq} results and states the DNL for each calendar day during which measurements were performed at the site. For any days with less than 24 hours of data, the DNL estimate is based on the proper weighting of the available day and night hours. The hours indicated on the figures represent the starting time of the measurement interval; e.g., hour "0" starts at midnight and hour "10" starts at 10 a.m. The figures use a 24-hour clock ("military time"), where the hour starting at 1 p.m. is "13," 2 p.m. is hour "14," through the hour starting at 11 p.m., which is "23."

Many of the measurement locations are near measurement sites from the 1983 Part 150 study. For those sites, the discussions also compare the current DNL measurements to measured and modeled DNL results from that study. A later chapter in this study's documentation will compare the measured DNL to the modeled 2000 base case exposure. Comparison of measured DNL from different dates must take into consideration the fact that operations can differ substantially because of changes in airport operating mode (i.e., north or south flow), variation in weather conditions, non-aircraft noise sources, and other uncontrollable factors. In addition, the DNL measurements in the previous study were all for a single day, whereas the current measurements had a variety of durations, mostly longer.

Another important factor to consider in reviewing the measurements is that most of the measurement locations are outside of the 65 dB DNL contour interval. In developed suburban areas, such as around TPA, background noise has a major effect on total noise exposure, particularly where the aircraft noise exposure is below 65 dB DNL. Above 75 dB DNL, aircraft noise generally dominates. However, the specific microphone siting, local traffic levels, and unusual noise sources must be considered for each location.

Comparison of any measurements to the previous study's modeled DNL must take into consideration the fact that the noise contours from that study represented projected activity for the "average annual day" in 1985 and 1990; that is, for hypothetical days in which overall airport operations, runway use, and flight track use are the same as the total annual activity divided by 365, and the temperature is equal to the average annual level. On any given day of measurements, actual activity will not match these hypothetical conditions. Because of day-to-day variation in operating conditions and airport activity, and the contributions of non-aircraft noise exposure sources, it would be very unusual for the modeled DNL to agree very closely with the result of relatively short-duration measurements.

3.5.1 Site 1: 5833 Mariner Street, Beach Park

Site 1 is located approximately 7,500 feet due south of the west parallel, Runway 18R/36L. Principal aircraft operations affecting noise levels at the site are Runway 36L arrivals and Runway 18R departures. The Airport was operating in the north flow throughout the measurement period, so arrivals were measured.

The residents at this site indicated that turbojet arrivals are generally much louder than departures. The noise from departing aircraft is diminished compared to arrivals, because departures are almost always higher than arrivals at the site, and because the existing noise abatement procedures call for turbojet departures on Runway 18R to execute turns to the west (to 200°) immediately upon departure.

The site faces north, toward the Howard Franklin Bridge (Route 275), which is less than 500 feet away. During most of the day, starting as early as 5 or 6 a.m. and running until as late as midnight, there was a fairly steady "drone" from the surface traffic. However, the loudest individual events are aircraft-related. As shown in **Figure 3-4**, measured maximum levels for aircraft ranged from approximately 62 dB, to as high as approximately 95 dBA. The loudest single events from surface traffic (normally from heavy trucks) ranged from only 60 to 65 dBA.

Measurements at the site included all or a portion of four days. As shown in **Figures 3-5 and 3-6**, the DNL values over the four days ranged from approximately 73 to 77 dB, with a mathematical average of approximately 75.

The measurement site is very close to measurement Site 12 in the original Part 150 study. The DNL measured over a single day at that site in 1983 was 72 dB. The previous Part 150 study included DNL contours for 1985 and 1990 contours. Site 1 was approximately under the 75 dB contour line in both cases.

3.5.2 Site 2: 5140 Longfellow Avenue, Sunset Park

Site 2 is located approximately 16,000 feet south of the Airport, approximately midway between the parallel runways. The site faces northwest onto Tampa Bay. It is directly on the water. Principal aircraft operations affecting noise levels at the site during the measurements were Runway 36L and 36R arrivals, since the Airport was operating in the north flow. The site is also affected by Runway 18R and 18L departures, although noise abatement flight paths direct a majority of the departures away from the site, particularly turbojets.

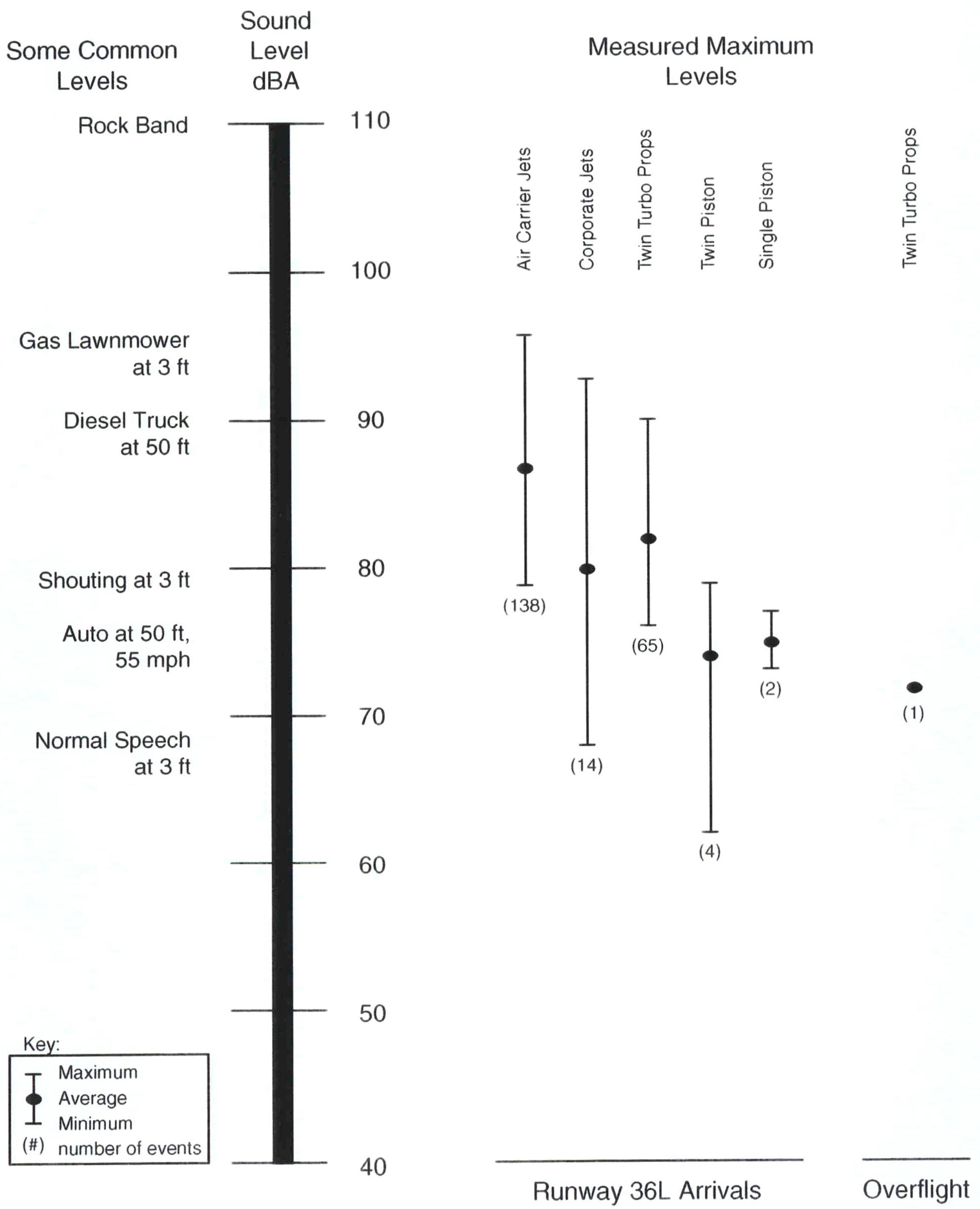
Measurements at the site included all or a portion of 3 days.

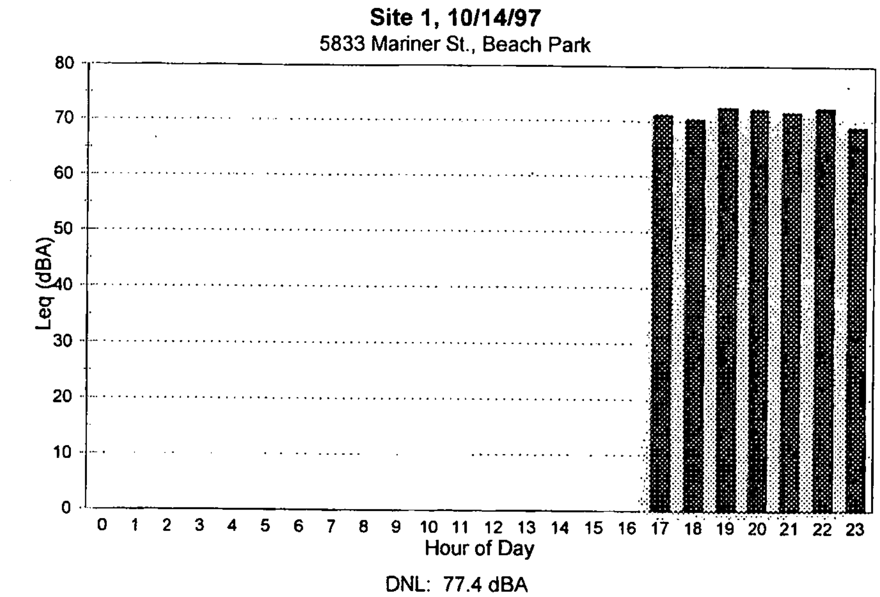
HILLSBOROUGH COUNTY AVIATION AUTHORITY

Lmax Measured at Site 1,
5833 Mariner Street, Beach Park

Figure 3-4

Source: HMMH, October 1997 Measurements





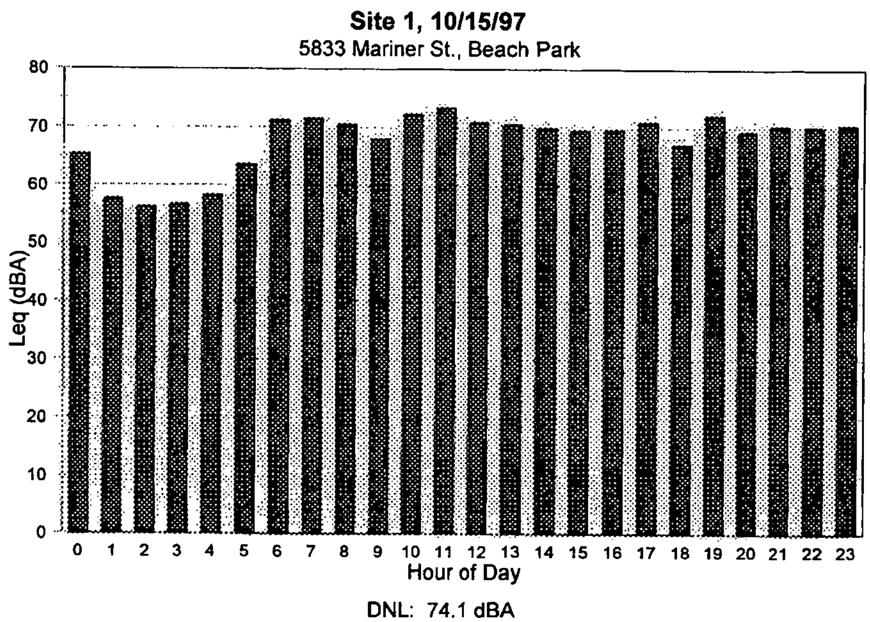
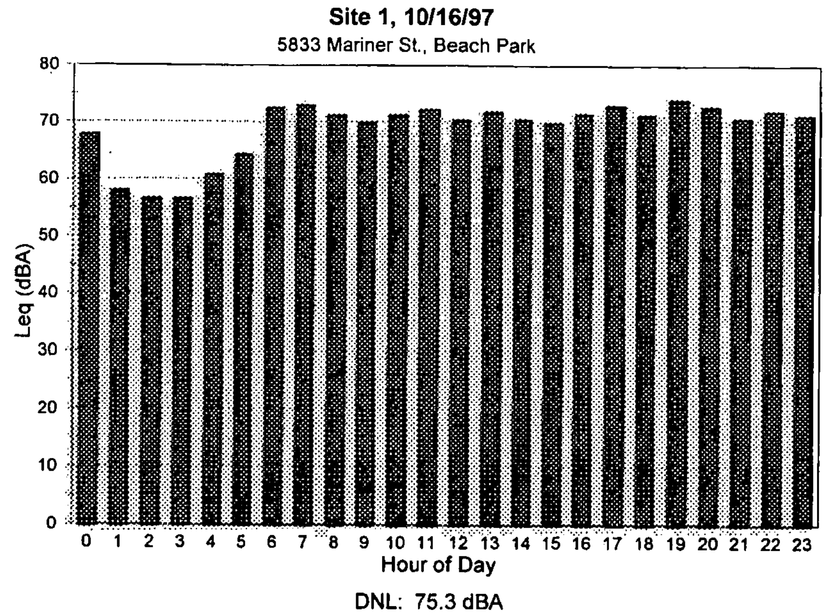


Figure 3-5
L_{eq} Measured at Site 1, 5833 Mariner Street, Beach Park, October 14 and 15, 1997
Source: HMMH, October 1997 Measurements



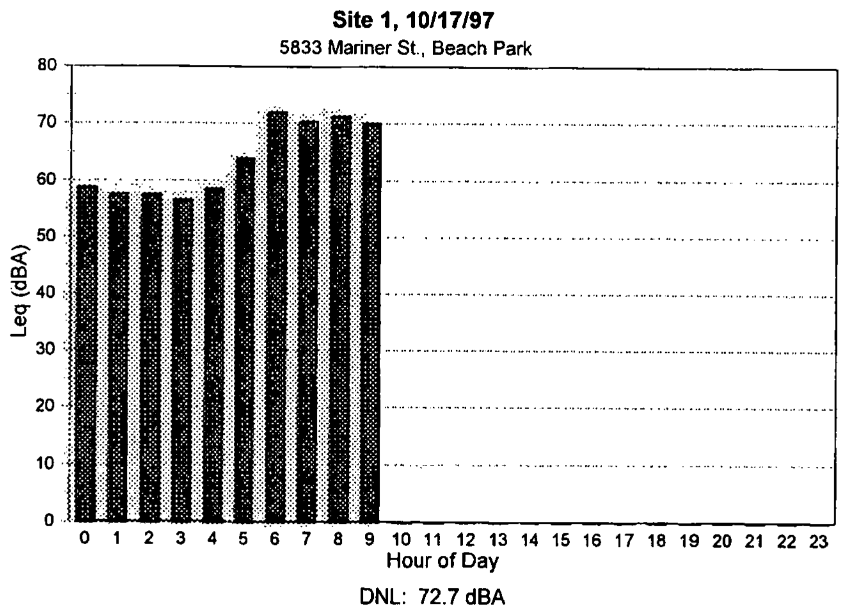


Figure 3-6
L_{eq} Measured at Site 1, 5833 Mariner Street, Beach Park, October 16 and 17, 1997
Source: HMMH, October 1997 Measurements

As shown in **Figure 3-7**, air carrier jets, corporate jets, and propeller-driven aircraft produced similar noise levels. Noise levels were similar for approaches to both runways, consistent with the central location of the site. The range of single event levels was approximately 20 dBA lower than at Site 1, reflecting higher aircraft altitudes at this greater distance from the Airport and the fact that most operations were to the right or left of the site, rather than directly overhead.

As shown in **Figures 3-8 and 3-9**, hourly noise levels were substantially lower at the site than at Site 1, reflecting both the lower aircraft noise level, and the absence of any unusual non-aircraft noise source. The measurement location was behind a residence on a cul-de-sac, with little traffic noise, and well shielded from neighboring residences.

The DNL values over the three days ranged from approximately 56 to 60 dB, with a mathematical average of approximately 58 dB.

The measurement site is approximately 4,500 feet north and west of measurement Site 14 in the original Part 150 study. The DNL measured over a single day at that site in 1983 was 55 dB. Site 2 was well outside the 65 dB DNL in both the 1985 and 1990 contour cases from that study.

3.5.3 Site 3: 4923 St. Croix Drive, Culbreath Isle

Site 3 is located approximately 12,000 feet south of the Airport, between the extended centerlines for the parallel runways, slightly closer to the east parallel. Principal aircraft operations affecting noise levels at the site during the measurements were Runway 36L and 36R arrivals, since the Airport was operating in the north flow. The site is also affected by Runway 18R and 18L departures, although noise abatement flight paths direct a majority of the departures away from the site, particularly turbojets.

As shown in **Figure 3-10**, arrivals on the east parallel (36R) are generally louder than those on the west parallel (36L), due to the site's closer proximity to the 36R approach course. Even propeller-driven aircraft approaches to the east runway were louder than jet approaches to the west runway.

Measurements at the site ran for 24 hours over two days. As shown in **Figure 3-11**, the measured DNL was approximately 60 dB.

Site 3 was well outside 65 dB DNL in both the 1985 and 1990 contour cases prepared for the original Part 150 study. No measurements were conducted near this site in that study.

3.5.4 Site 4: 13902 Pepperrell Drive, Carrollwood

Site 4 is located approximately 31,500 feet due north of the east parallel, Runway 18L/36R. Two rounds of measurements were conducted at the site, including a few hours of measurements using a hand-held monitor on October 15th, and then approximately 24 hours of measurements on October 16th and 17th. The Airport was operating in the north flow throughout the measurement period. Aircraft operations measured at the site were departures from Runways 36L and 36R. The site would also be affected by approaches to Runways 18R and 18L in south-flow operations.

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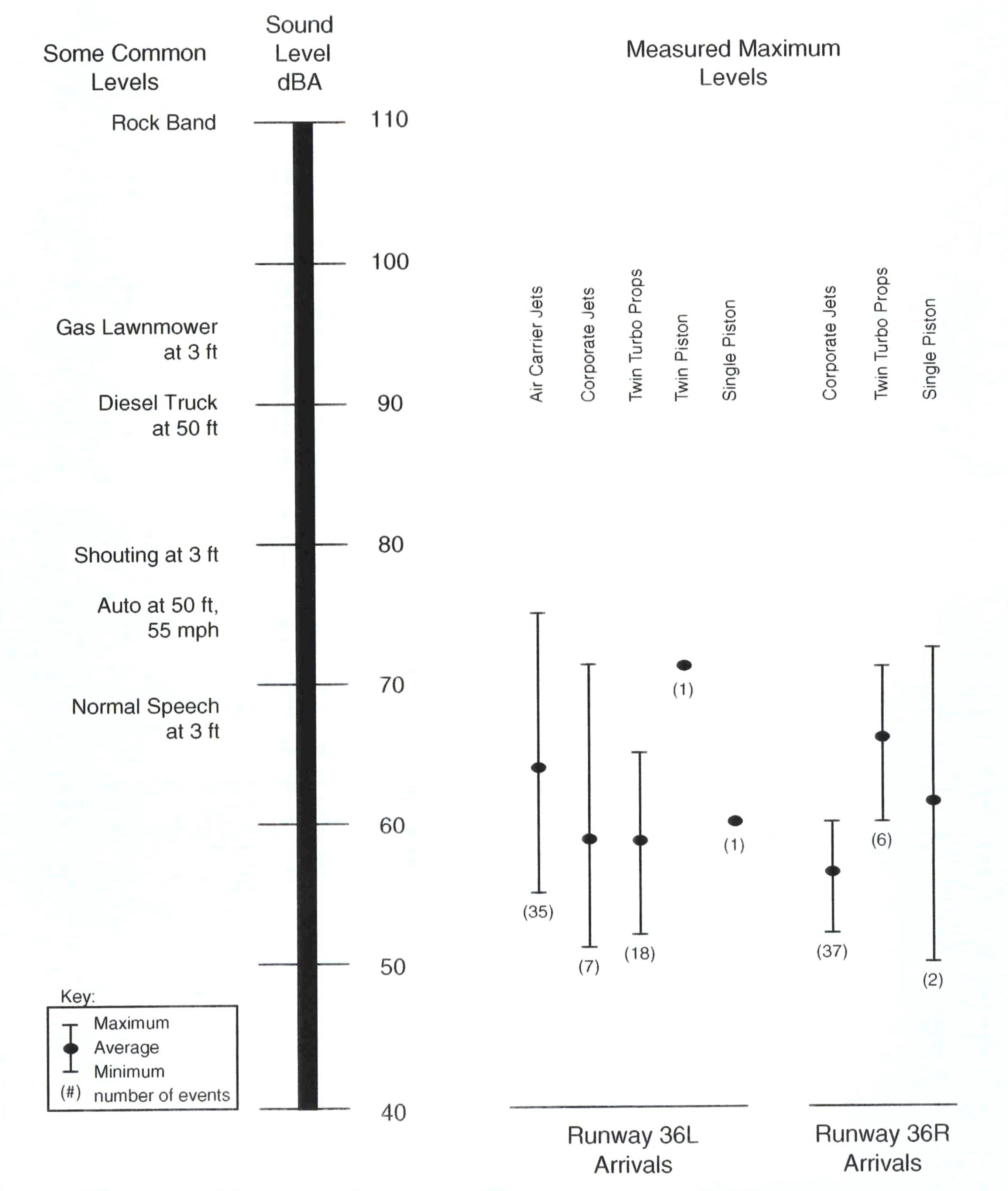
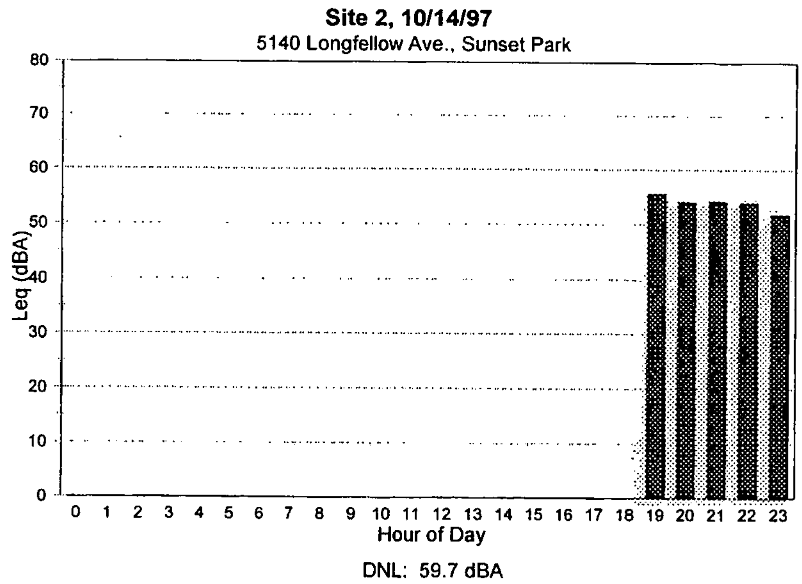
L_{max} Measured at Site 2, 5150 Longfellow Avenue, Sunset Park

Figure 3-7

Source: HMMH, October 1997 Measurements





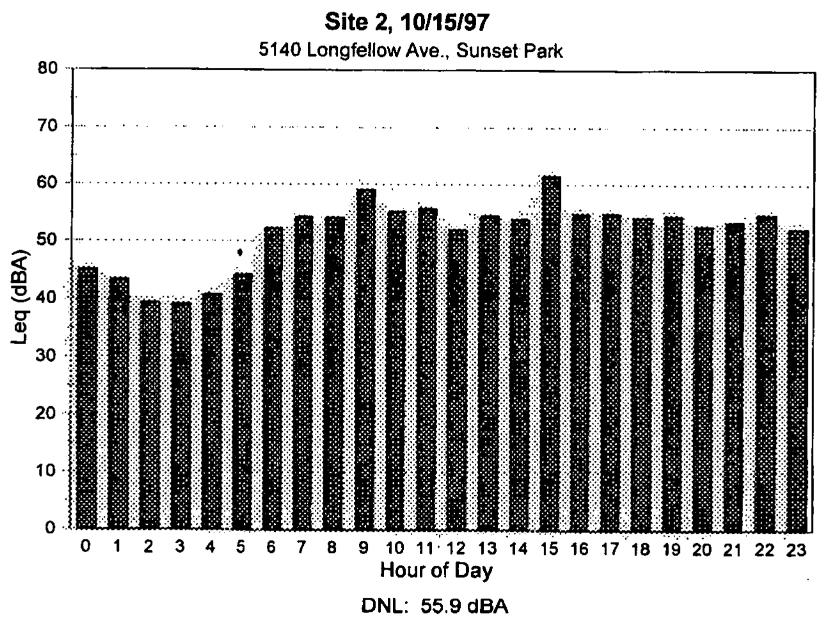


Figure 3-8
L_{eq} Measured at Site 2, 5140 Longfellow Ave., Sunset Park, Oct. 14 and 15, 1997
Source: HMMH, October 1997 Measurements

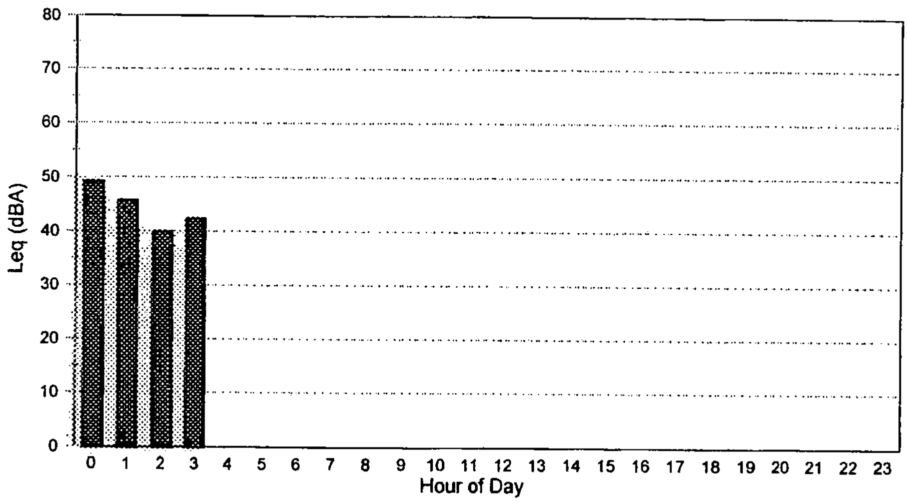
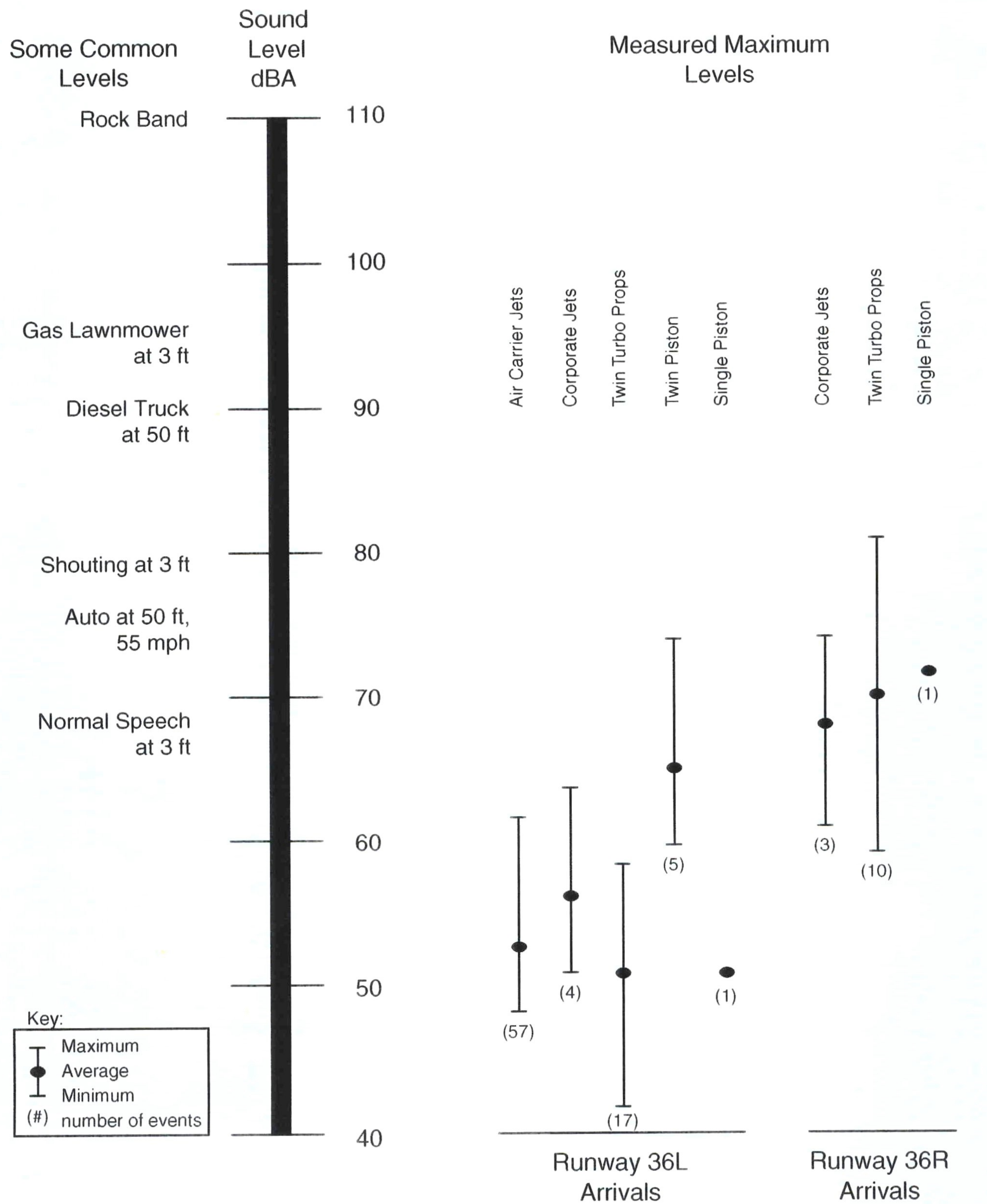


Figure 3-9
L_{eq} Measured at Site 2, 5140 Longfellow Avenue, Sunset Park, October 16, 1997
Source: HMMH, October 1997 Measurements

Lmax Measured at Site 3, 4923 St. Croix Drive, Culbreath Isle

Figure 3-10

Source: HMMH, October 1997 Measurements



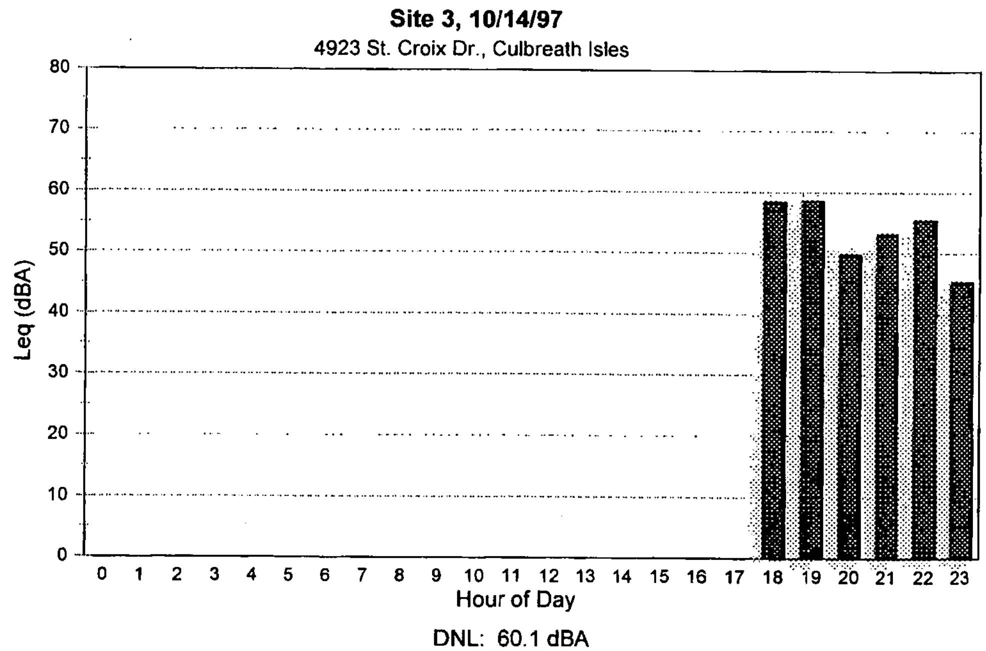


Figure 3-11

L_{eq} Measured at Site 3, 4923 St. Croix Dr., Culbreath Isle, October 14 and 15, 1997

Source: HMMH, October 1997 Measurements

As shown in **Figure 3-12**, air carrier jet departures were the loudest events on average, followed by corporate jets and twin turboprops. Lighter aircraft were not measured at the site, because the generally turn away from the runway centerline closer to the Airport. There was a wide range in jet noise levels, due to flight track dispersion, and differences in aircraft performance and emission levels. The noisiest aircraft were generally older Stage 2 airline jets that do not meet the more stringent Stage 3 noise levels. The Stage 3 airliners emit less noise and also generally climb faster than the Stage models. The measured maximum levels for Stage 3 airliners were generally seven to eight decibels quieter than comparably sized Stage 2 models at this site. Federal regulations require operators to phase out their Stage 2 aircraft or retrofit them to met Stage 3 limits by the year 2000. Therefore, it would not be unusual for most of the air carrier noise events above 80 dB shown in Figure 3-12 to be eliminated by that date.

As shown in **Figure 3-13**, there is a missing hour of L_{eq} data at 8 a.m. on October 17. There was rain during the night which appeared to cause a transient signal at the site that corrupted the data for that hour.

The DNL calculated from the remaining hours was approximately 62 dB.

This site is very close to measurement Site 4 from the original Part 150 study. The DNL measured at that site over a single day in 1983 was 64 dB. Both measurement locations are well outside the 65 dB contours for 1985 and 1990 in the original study.

3.5.5 Site 5: 4816 Sierra Madre Drive

Site 5 is located approximately 3,200 feet due west of the north end of Runway 18R-36L. Operations on both parallel runways were measured at the site. As shown in **Figure 3-14**, air carrier jet departures were generally the loudest and most frequently measured events. It was difficult to reliably distinguish between operations on the two runways, because the aircraft were hidden from view until some distance from the Airport.

The DNL calculated from measurements on two consecutive days was approximately 65 dB. The Airport was operating in the north flow throughout the measurement period.

Site 5 is approximately 2,500 feet northeast of 8 in the original Part 150. The DNL measured at that site over a single day in 1983 was 70 dB. That original measurement location was outside the 1985 and 1990 65 dB DNL contour. As shown in **Figures 3-15 and 3-16**, the current location falls within the 65-70 dB contour intervals from those two cases.

3.5.6 Site 6: 4610 Westford Circle, Village West

Site 6 is located approximately 3,500 feet east of the extended centerline for the east parallel, approximately 28,000 feet north of the Airport. Five hours of single event noise measurements were conducted at the site on October 16th. Aircraft operations measured at the site were almost exclusively air carrier jet departures from Runways 36L and 36R. The site would also be affected by approaches to Runways 18R and 18L in south-flow operations.

Table 3.1

Summary of Noise Monitoring Locations, Dates (1997), and Times

Site No.	Address	Approximate Start Date/Time	Approximate End Date/Time	Approx. Hours of Monitoring	Primary Noise-Producing Aircraft Activity During Measurements	Comments
1	5833 Mariner St., Beach Park	Tues., 10/14, 4 p.m.	Friday, 10/17, 10 a.m.	66	Runway 36L arrivals	Essentially the same location as site 12 in original Part 150. The resident indicated that the Runway 36L arrivals are the most annoying normal activity.
2	5140 Longfellow Ave., Sunset Park	Tues., 10/14, 5 p.m.	Thursday, 10/16, 10 a.m.	41	36L arrivals	The resident indicated that the Runway 36L arrivals are the most annoying normal activity.
3	4923 St. Croix Dr., Culbreath Isles	Tuesday, 10/14, 6 p.m.	Wednesday, 10/15, 6 p.m.	24	36L arrivals	
4	13902 Pepperell Dr., Carrollwood Village	Two sessions: 1. Wednesday, 10/15, 3:30 - 5 p.m. 2. Thursday., 10/16, noon - Friday, 10/17, 1 p.m.		26.5	36L/R departures	Within several hundred feet of site 4 in original Part 150.
5	4816 Sierra Madre Dr.	Two sessions: 1. Thursday, 10/16, 10 a.m. - 5 p.m. 2. Friday 10/17, 9 a.m. - Sat. 10/18, noon		34	36L/R departures	Approximately 2,500' northeast of site 8 in original Part 150.
6	4610 Westford Cir., Village West	Thursday, 10/16, noon	Thursday 10/16, 5 p.m.	5	36L/R departures	
7	Clubhouse, Plantation	Friday, 10/17, noon	Saturday, 10/18, 1 p.m.	25	36L/R departures	Development staff requested additional short-term measurement of single events on south end of development. Site 3 in original Part 150 was on east side of development.
7A	10557 Park Crest, Plantation	Friday, 10/17, 4:30 p.m.	Friday, 10/17, 6 p.m.	1.5	36L/R departures	
8	6719 Twelve Oaks Blvd., Twelve Oaks	Friday, 10/17, 4 p.m.	Sunday, 10/19, 4 p.m.	48	36L/R departures	Approximately 2,500' west of site 5 in original Part 150.
9	4613 D'Azzo Ave., Drew Park	Saturday, 10/18, 1 p.m.	Sunday, 10/19, 1 p.m.	24	36L/R departures	Approximately 500' north of site 10 in original Part 150.
10	6526 Johns Rd., Northwest Park	Saturday, 10/18, 8 p.m.	Monday, 10/20, 10 a.m.	38	36L/R departures	Approximately 2,000' northwest of site 6 in original Part 150.
11	5215 West Laurel St.	Sunday, 10/19, 4 p.m.	Tuesday, 10/21, 9 a.m.	41	36L arrivals	Approximately 2,500' northwest of site 16 in original Part 150.
12	North St. and Occident Ave.	Saturday, 10/18, 4 p.m.	Saturday, 10/18, 6 p.m.	2	36L/R departures	Approximately 1,500' south of site 7 in original Part 150.
13	Leeward Dr., Watermill Village	Sunday, 10/19, 4:30 p.m.	Sunday, 10/19, 6 p.m.	1.5	36L/R departures	
14	3947 Doral Dr., Dana Shores	Monday 10/20, 11 a.m.	Tuesday 10/21, midnight	13	36L/R arrivals and departures	Approximately 1,000' northeast of site 9 in original Part 150.
15	Cypress Point Park - west end of Cypress Ave.	Monday, 10/20, noon	Tuesday, 10/21, noon	24	36L/R arrivals	
16	3405 Aileen St.	Monday, 10/20, 2:30 p.m.	Monday, 10/20, 4:30 p.m.	2	Runway 9/27 operations and 36L/R departures	Approximately 500' south of site 11 in original Part 150.

Source: HMM&H, 1998.

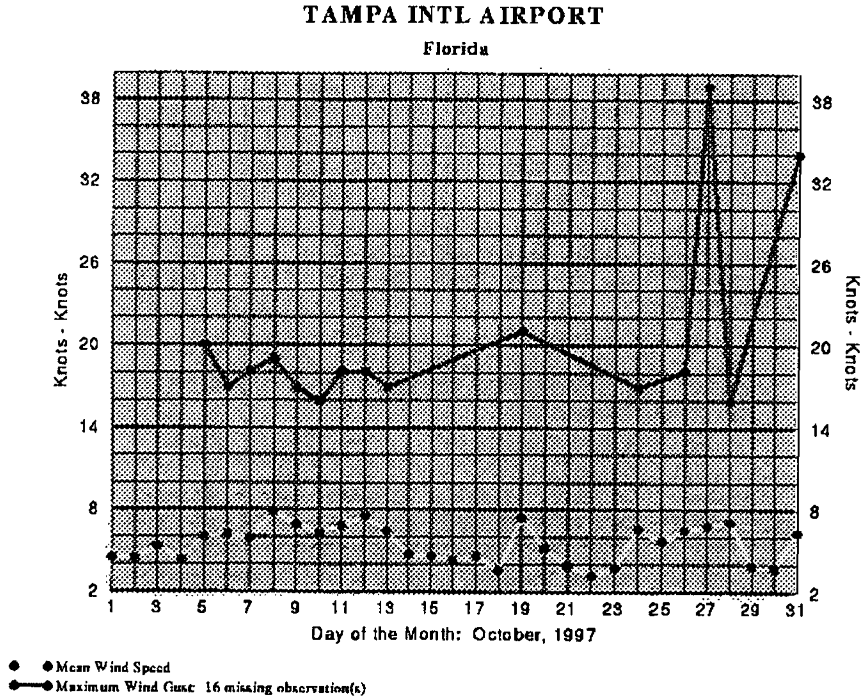


Figure 3-2
TPA Wind Conditions, October, 1997
Source: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Climatic Data Center, Data from Tampa International Airport Weather Station (Internet Access, February 6, 1998)

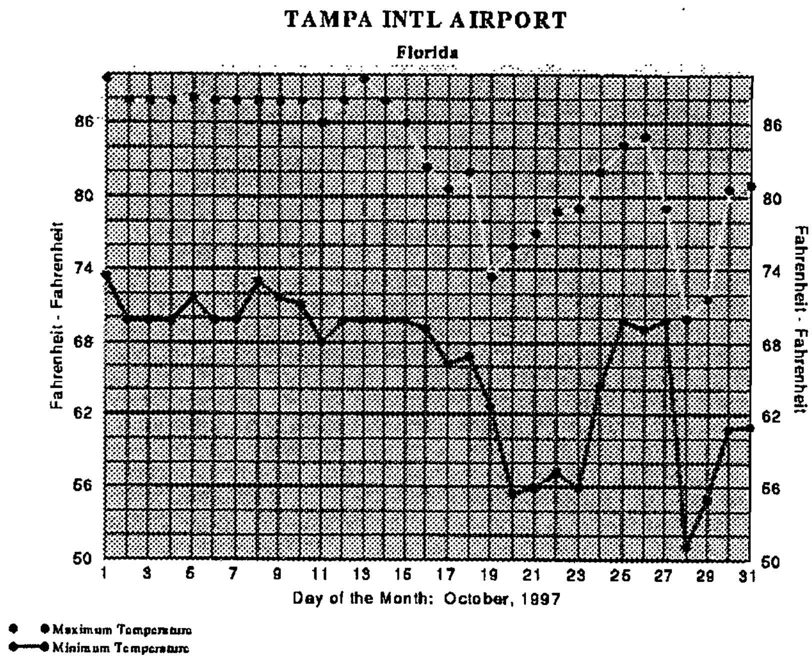


Figure 3-3
TPA Maximum and Minimum Daily Temperature, October, 1997
Source: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Climatic Data Center, Data from Tampa International Airport Weather Station (Internet Access, February 6, 1998)

meets American National Standards Institute (ANSI) S1.4-1983 standards for a Type I sound level meter. Measurements at Sites 4 (on October 15), 6, 7A, 12, and 16 were conducted using a Brüel & Kjaer Model 2221 Type 2 sound level meter. All measurements, instrumentation and calibrators meet or exceed accuracy requirements outlined in FAR Part 150 Appendix A, paragraph A150.5. Calibrations of the equipment were carried out 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 type of monitor used at each site was based on the measurement objective for that site. The LD 870s were used at sites where both single event and cumulative exposure measurements were desired. The B&K 2221 was used at sites where the objective was to obtain only representative single event information, through short-duration measurements.

The LD 870 units were programmed to record hourly L_{eq}, daily DNL, and SEL and L_{max} for individual noise events. The B&K 2221 allowed measurement of L_{max} values. Section 2.1 introduces these metrics. All measurements were A-weighted, as discussed in Section 2.1.2.

3.4 DAY-NIGHT AVERAGE SOUND LEVEL RESULTS

Table 3.2 summarizes the DNL measurement results for the sites at which both daytime and nighttime measurements were conducted.

3.5 SITE-BY-SITE RESULTS

This section provides site-by-site discussions for each monitoring location. The summaries present the A-weighted maximum single event level (L_{max}) and hourly equivalent sound level (L_{eq}) data in graphical form, and compare measured and modeled DNL.

Presentation of Maximum A-Weighted Levels (L_{max}) for Individual Aircraft Noise Events

A project team member observed and logged aircraft activity for a portion of the measurement period at each location, providing a basis for identifying a sample of single event noise levels, in terms of L_{max},. These measurements provide a basis for comparing the maximum levels produced by different aircraft types, and for comparing single event levels among sites.

For each measurement location, there is a figure that presents L_{max} data in a "thermometer" form. Representative sound levels from typical community sources are on the left of the thermometer. The ranges of L_{max} values for observed aircraft operations are on the right.

The figures group the aircraft data by type of operation (i.e., arrival, departure, and overflight) and by major aircraft type categories. The aircraft type categories include:

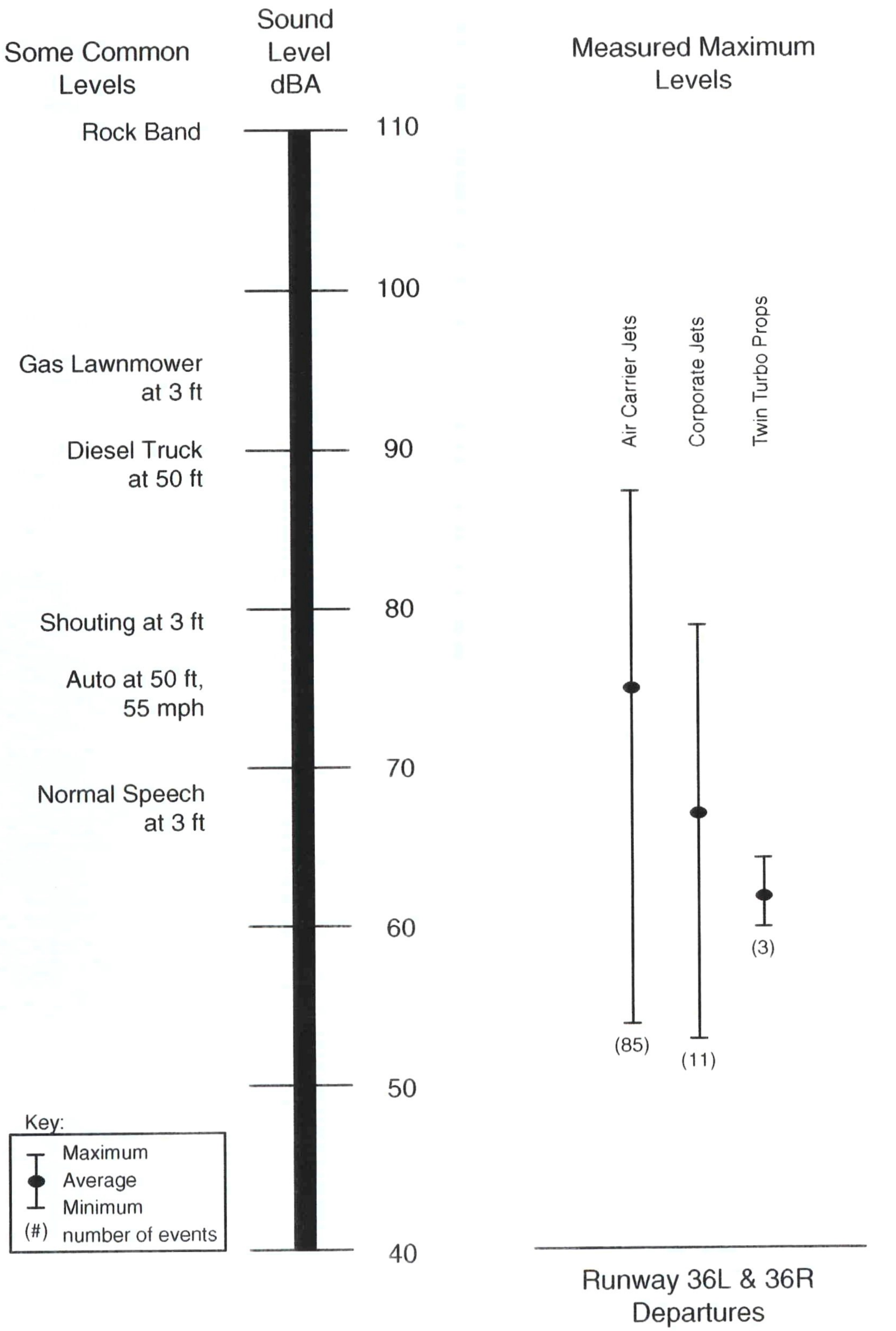
- "Air Carrier Jets" - Large turbojet aircraft operated by commercial airlines.
- "Corporate Jets" - Small turbojet aircraft operated by private owners.

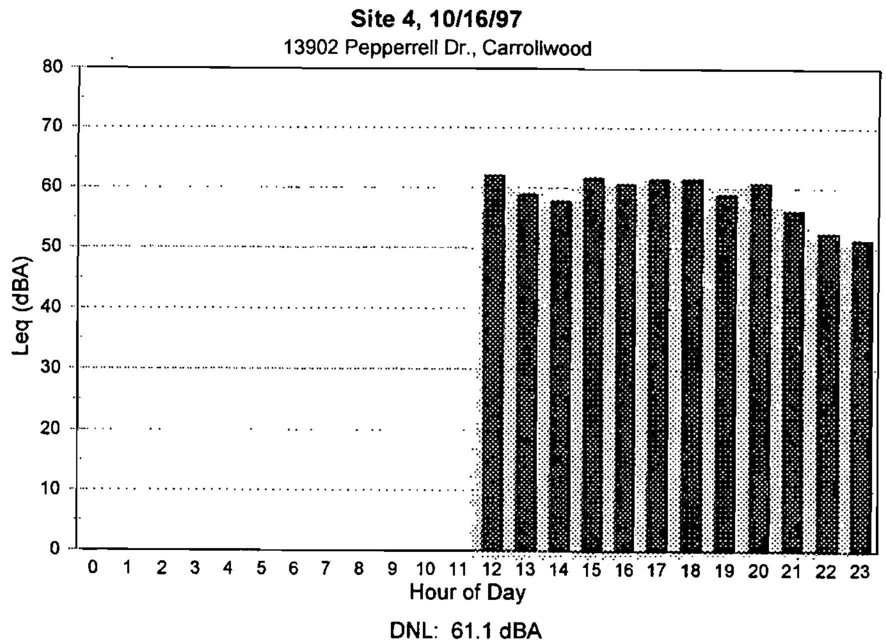
HILLSBOROUGH COUNTY AVIATION AUTHORITY

L_{max} Measured at Site 4, 13902 Pepperrell Drive, Carrollwood

Figure 3-12

Source: HMMH, October 1997 Measurements





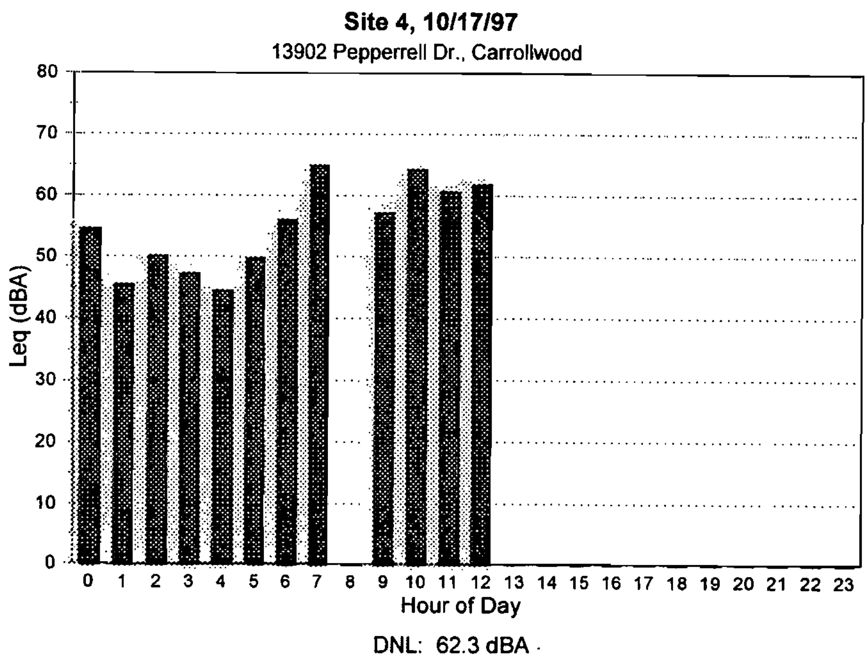
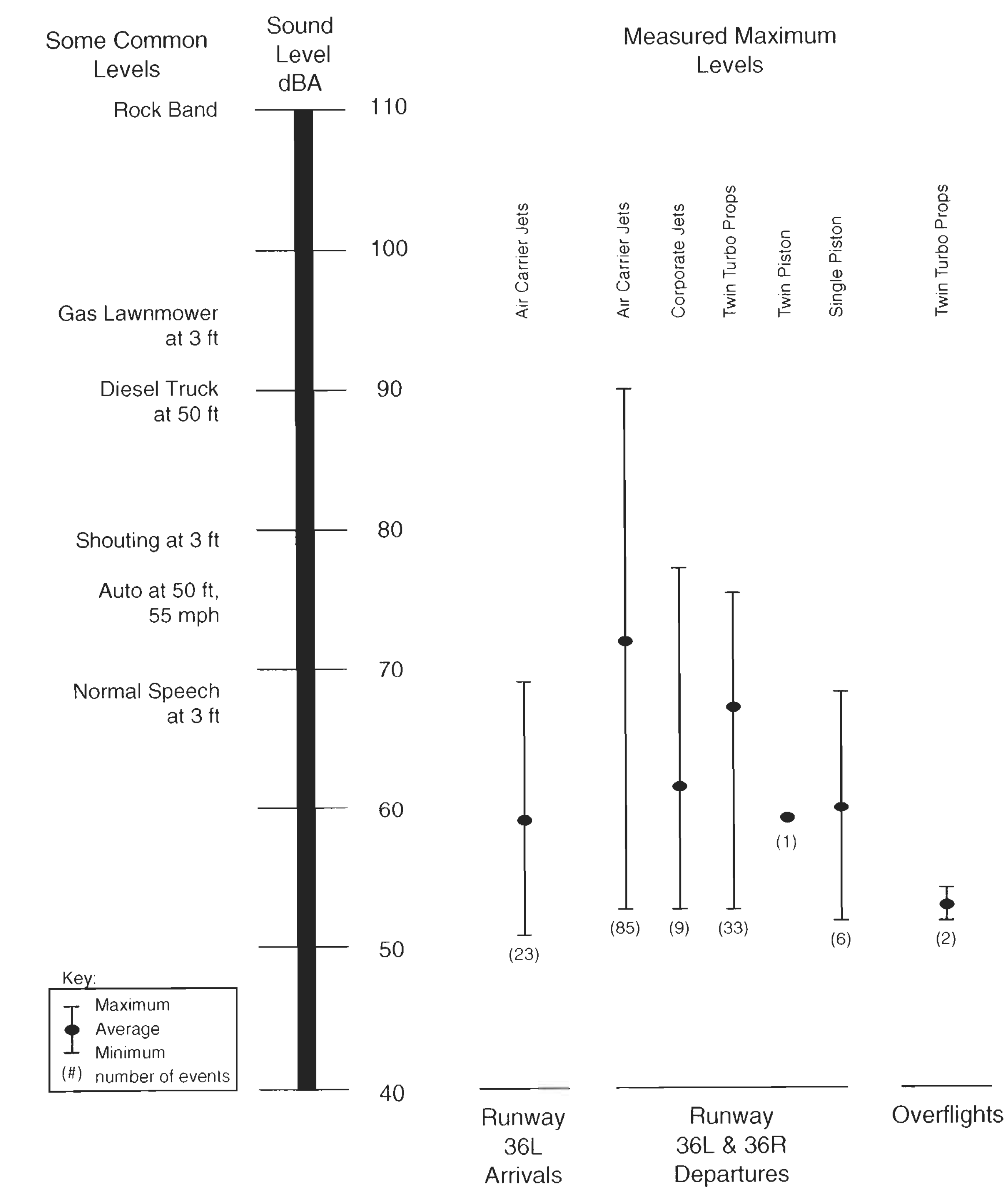


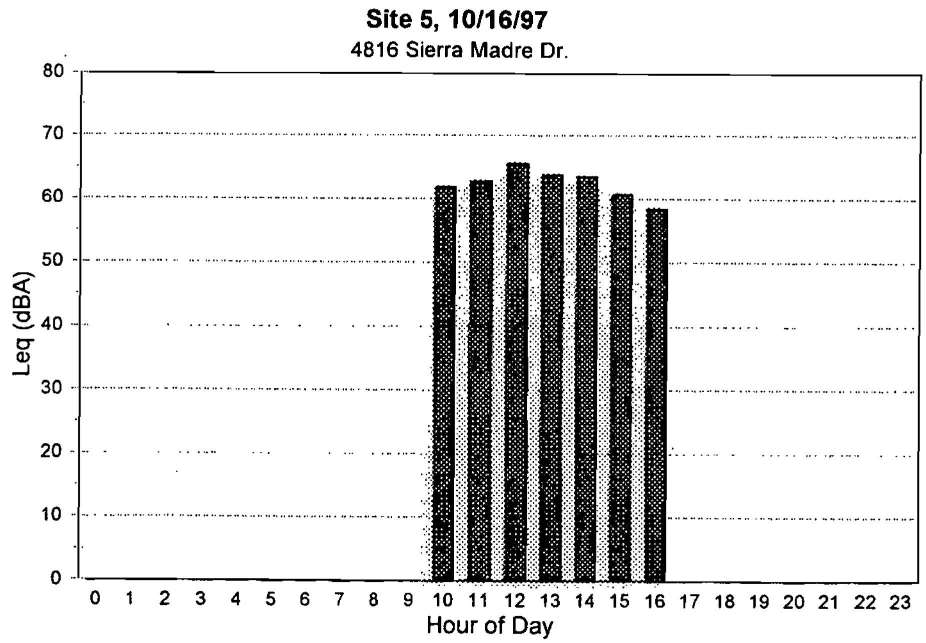
Figure 3-13
L_{eq} Measured at Site 4, 13902 Pepperrell Dr., Carrollwood, October 16 and 17, 1997
Source: HMMH, October 1997 Measurements

Lmax Measured at Site 5, 4816 Sierra Madre Drive

Figure 3-14

Source: HMMH, October 1997 Measurements





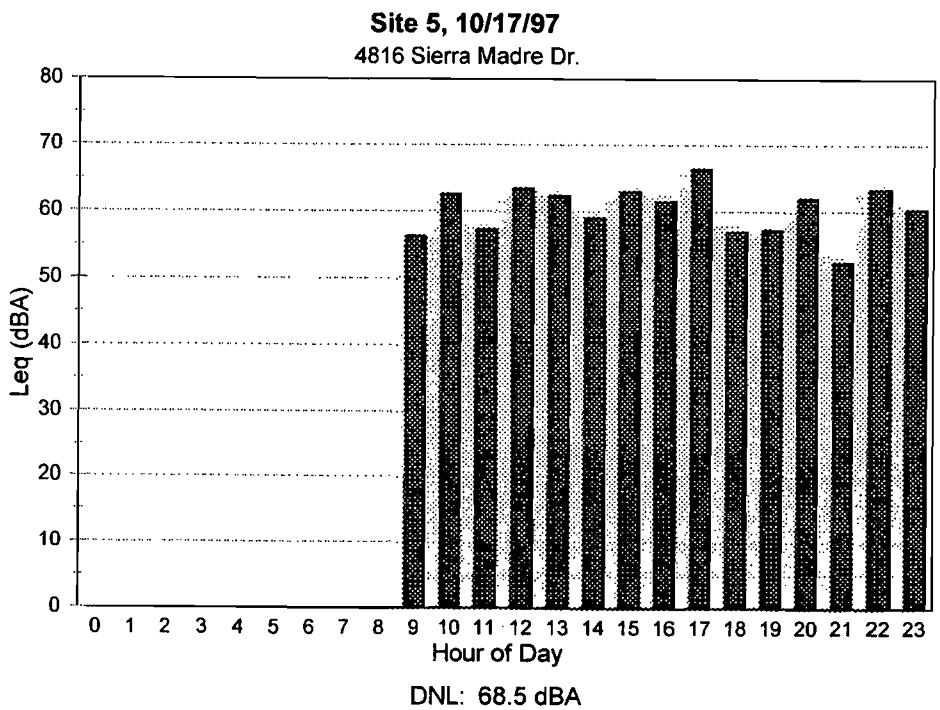


Figure 3-15
L_{eq} Measured at Site 5, 4816, Sierra Madre Drive, October 16 and 17, 1997
Source: HMMH, October 1997 Measurements

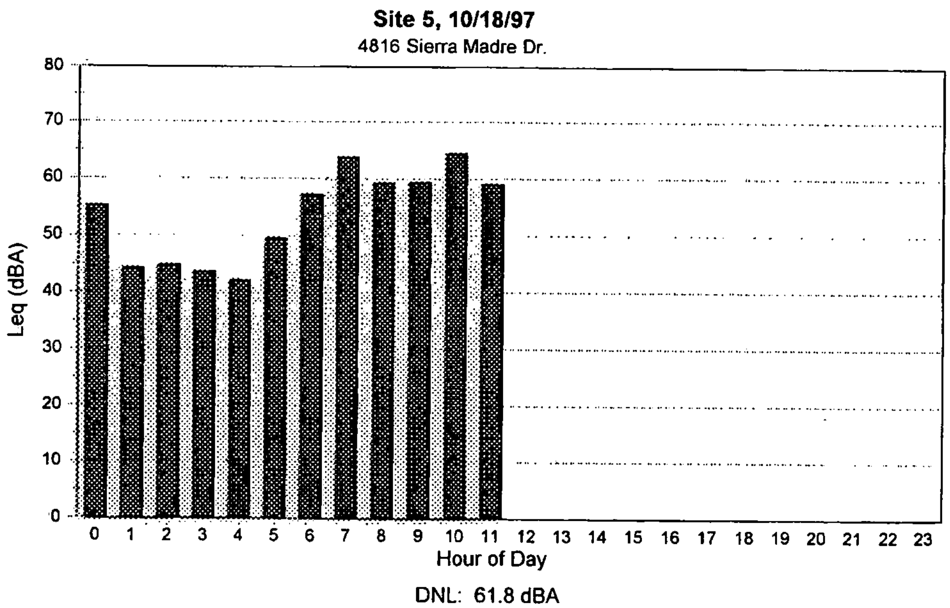


Figure 3-16

L_{eq} Measured at Site 5, 4816, Sierra Madre Drive, October 18, 1997

Source: HMMH, October 1997 Measurements

As at nearby Site 4, the loudest operations were in Stage 2 models (see **Figure 3-17**). While precise aircraft identification was difficult at this distance, Stage 2 models appeared to account for most of the aircraft in the noisiest 10 dB of the measured range. Once again these noisiest operations will be eliminated by the Federal Stage 2 phase out, scheduled for completion in 2000.

No L_{eq} or DNL measurements were conducted at this site.

3.5.7 Site 7: Clubhouse, Plantation

Site 7 is located approximately 23,000 feet north of the Airport, approximately 1,000 feet east of the extended centerline of the east parallel. Measurements at the site included portions of two days, covering a total of approximately 27 hours. The Airport was operating in the north flow throughout the measurement period. As shown in **Figure 3-18**, aircraft operations measured at the site were almost exclusively air carrier and corporate jet departures from Runways 36L and 36R. The site would also be affected by approaches to Runways 18R and 18L in south-flow operations. Propeller-driven aircraft generally turn from centerline prior to reaching this site.

As shown in **Figure 3-19**, the DNL values for the two partial days had a mathematical average of approximately 64.5 dB.

The measurement site is approximately 2,000 feet northwest of measurement Site 3 in the original Part 150 study. The DNL measured over a single day at that site in 1983 was 65 dB. The 1985 and 1990 DNL calculated for that site in the 1983 study were also approximately 65 dB.

3.5.8 Site 7A: 10557 Park Crest, Plantation

Site 7A is located approximately 2,500 feet southwest of Site 7, approximately directly under the Runway 18L/36R extended centerline, approximately 20,000 feet north of the Airport. This second location in the Plantation subdivision was visited for a short measurement duration, at the request of the development staff, because of its closer proximity to direct overflight.

Single event measurements were conducted at the site for approximately 1.5 hours. The Airport was operating in the north flow throughout the measurement period. Aircraft operations measured at the site were almost exclusively air carrier jet departures from Runways 36L and 36R. The site would also be affected by approaches to Runways 18R and 18L in south-flow operations.

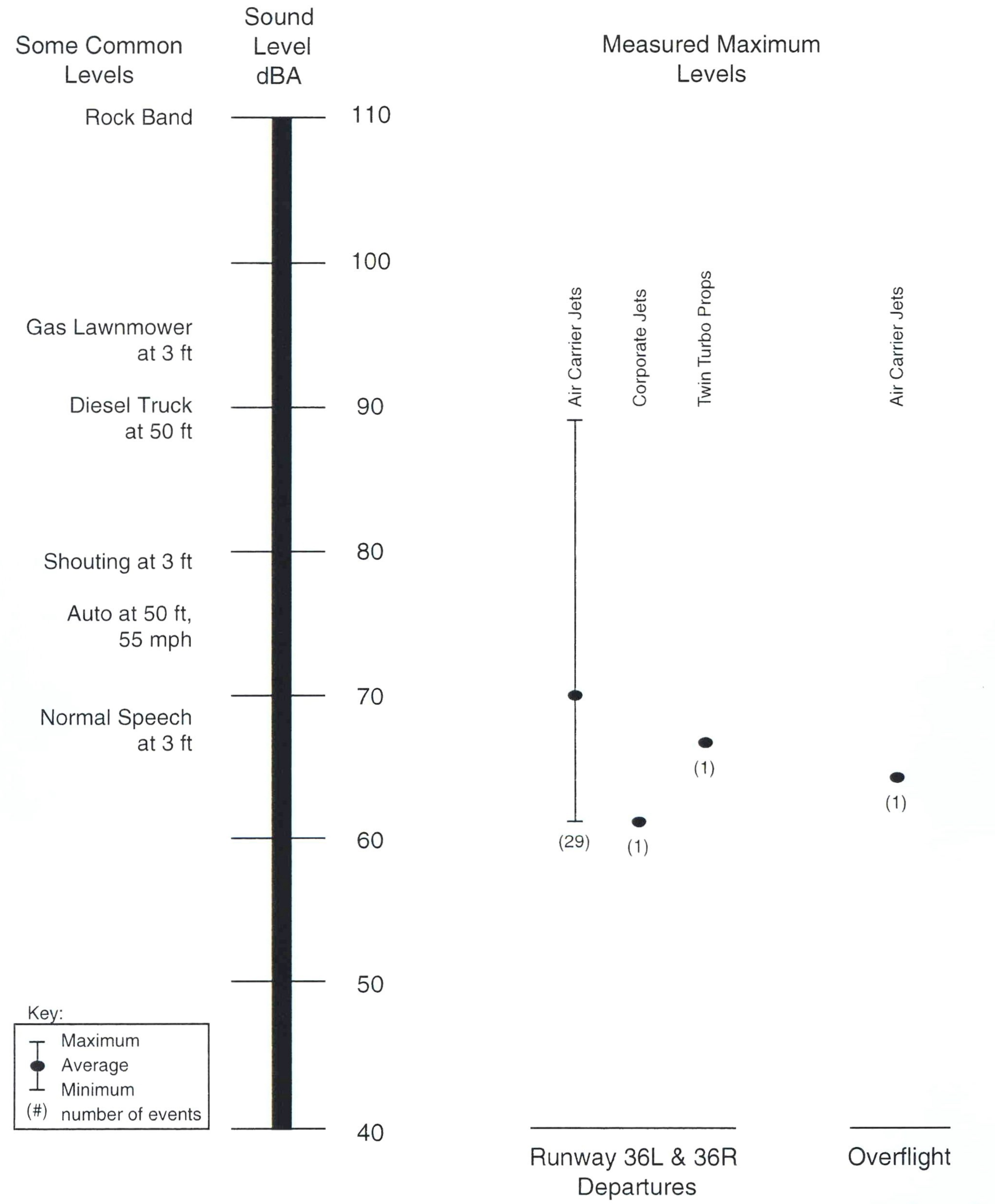
Review of the single event measurement results for this site (see **Figure 3-20**) reveals that the maximum levels for air carrier jet departures fell within the range measured for that aircraft type at the Clubhouse site (Figure 3-18). This comparison provides an example of the fact that, at such relatively large distances from the Airport, shifts in measurement location can be less important than variability flight tracks, the specific aircraft models, power settings, pilot technique, air-to-ground sound propagation, and other factors affecting the noise level we measure and hear.

No L_{eq} or DNL measurements were conducted at this site.

L_{max} Measured at Site 6, 4610 Westford Circle, Village West

Figure 3-17

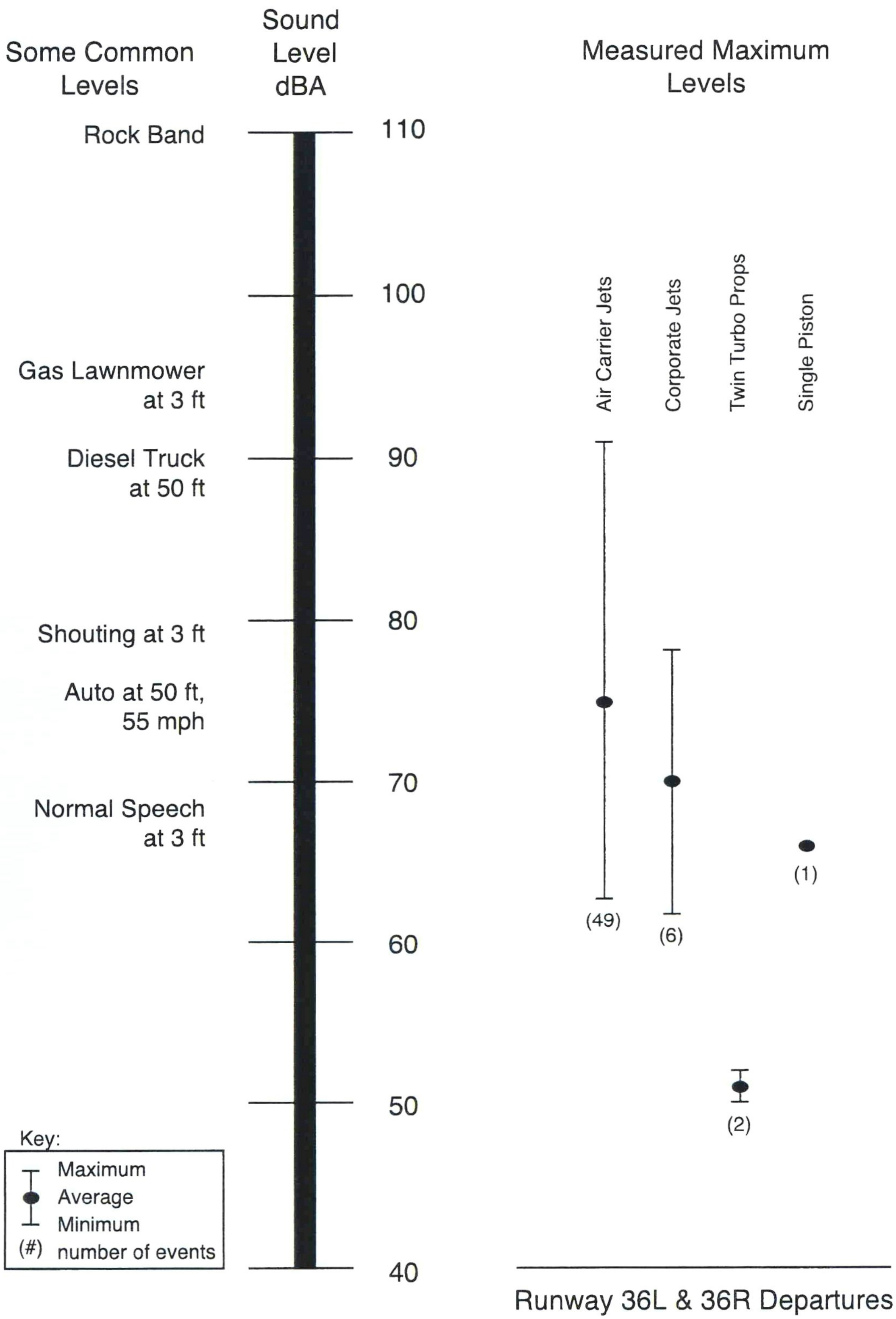
Source: HMMH, October 1997 Measurements

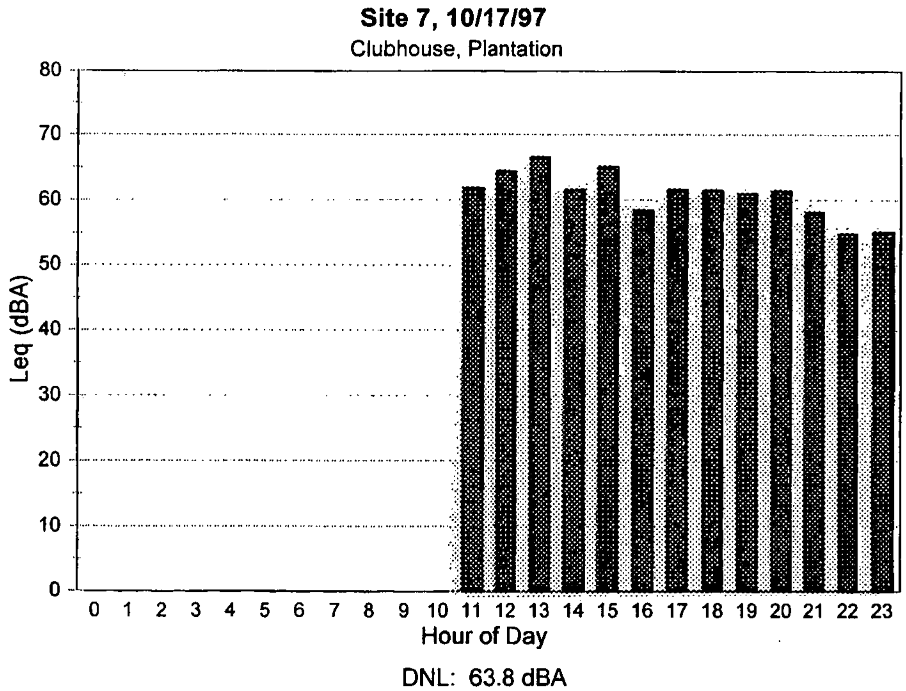


Lmax Measured at Site 7, Clubhouse, Plantation

Figure 3-18

Source: HMMH, October 1997 Measurements





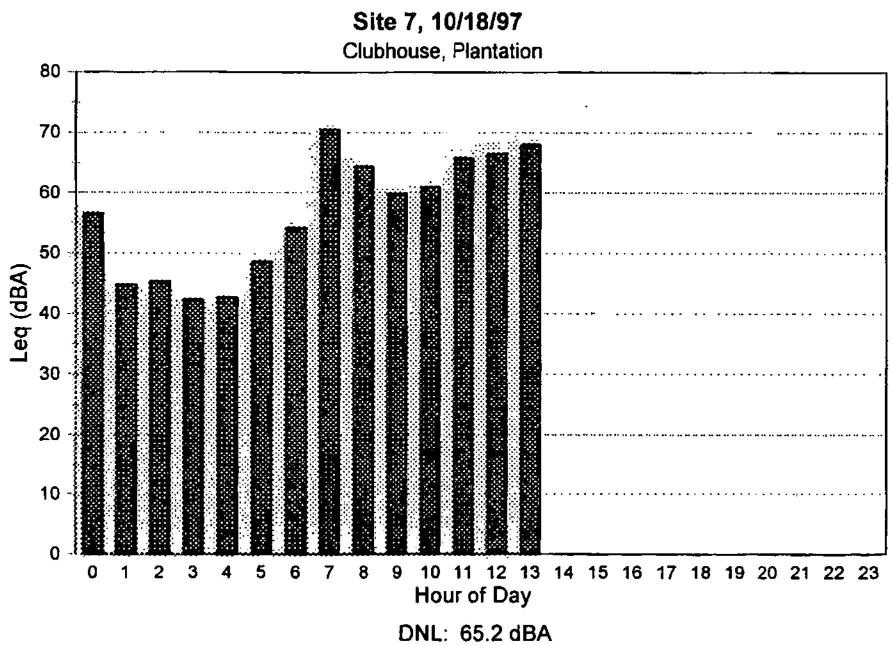
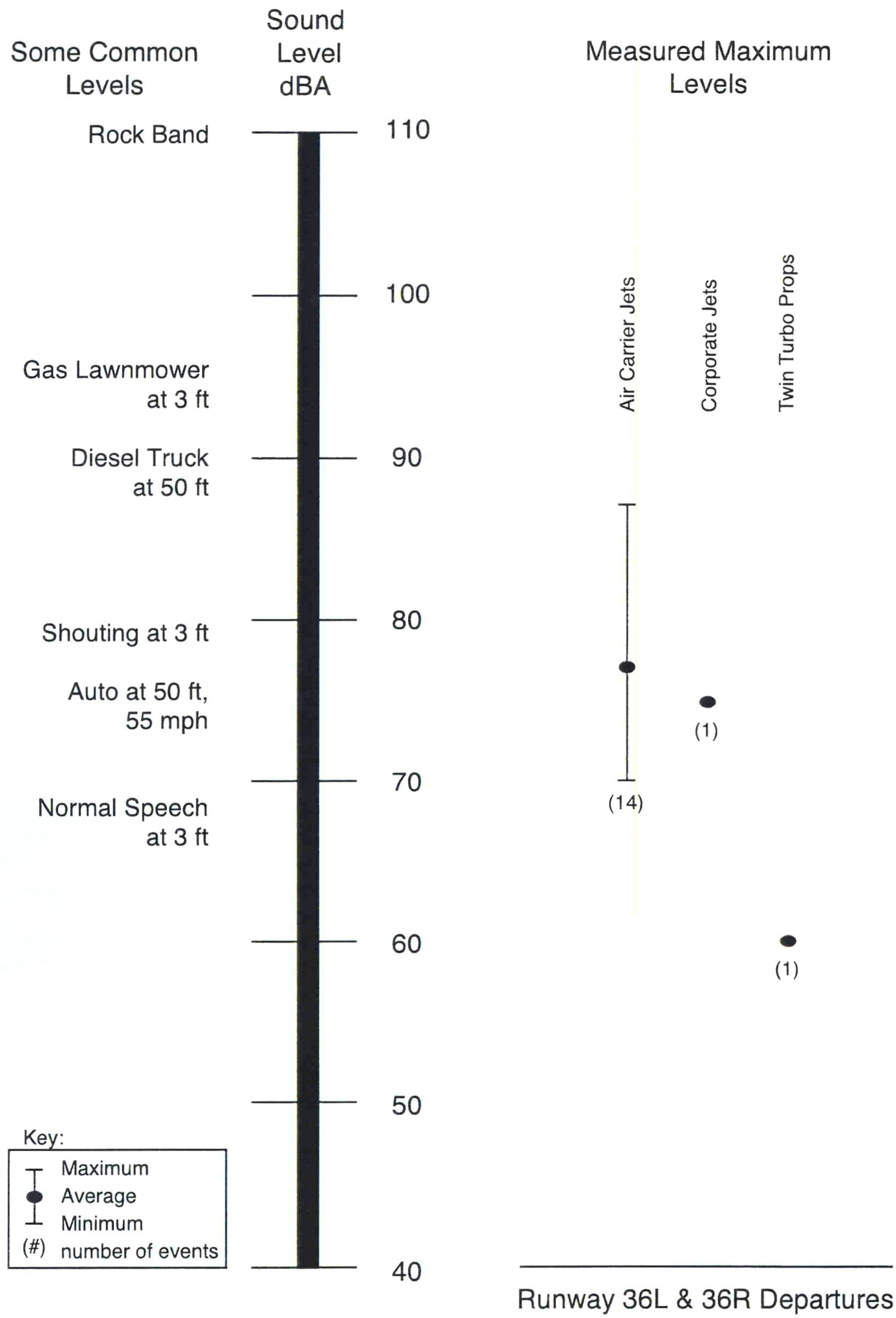


Figure 3-19
L_{eq} Measured at Site 7, Clubhouse, Plantation, October 17 and 18, 1997
Source: HMMH, October 1997 Measurements

Lmax Measured at Site 7A, 10557 Park Crest, Plantation

Figure 3-20

Source: HMMH, October 1997 Measurements



3.5.9 Site 8: 6719 Twelve Oaks Boulevard

Site 8 is located approximately 10,000 feet north of the Airport, approximately 3,000 feet west of the extended centerline of the west parallel. Measurements at the site included all or a portion of three days. The Airport was operating in the north flow throughout the measurement period.

Principal aircraft operations affecting noise levels at the site during the measurement period were Runway 36R and 36L departures. During south-flow operations, the site would also be affected by Runway 18R and 18L arrivals.

As shown in **Figure 3-21**, air carrier jets departures from Runways 36R and 36L were the most common and loudest events measured, as would be expected. There was approximately a 30 dB variation in measured maximum levels for air carrier jets, due to differences in flight path, runway used, and aircraft model.

As shown in **Figures 3-22 and 3-23**, the DNL values over the three days ranged from approximately 63 to 65 dB, with a mathematical average of approximately 64.

The measurement site is approximately 2,500 feet west of measurement Site 5 in the original Part 150 study. The DNL measured over a single day at that site in 1983 was 71 dB. That measurement location had a calculated noise exposure of approximately 72 dB for the 1985 and 1990 DNL cases in the original study.

3.5.10 Site 9: 4613 D'Azzo Avenue, Drew Park

Site 9 is located approximately 1,700 feet due east of the midpoint of the east parallel, in the Drew Park neighborhood. The major operations affecting the site are arrivals and departures on both of the parallel runways.

As shown in **Figure 3-24**, the loudest aircraft noise events are departures. Interestingly, single engine propeller aircraft produced almost exactly the same range of maximum levels as air carrier jets. The propeller aircraft turned to the east after takeoff in many cases, and flew nearly over the site, whereas the jets flew straight out along the runway centerline. The approximate 30 dB variation in air carrier jet departure noise levels is the result of difference in aircraft types and runway used.

As shown in **Figure 3-25**, measurements at the site included portions of two days, for a total of approximately 24 hours. The Airport was operating in the north flow throughout the measurement period. The average DNL over the two days was approximately 61 dB.

The measurement site is approximately 500 feet north of measurement Site 10 in the original Part 150 study. The DNL measured over a single day at that site in 1983 was 72 dB. The calculated 1985 DNL was approximately 67 dB. The calculated 1990 DNL was approximately 65 dB.

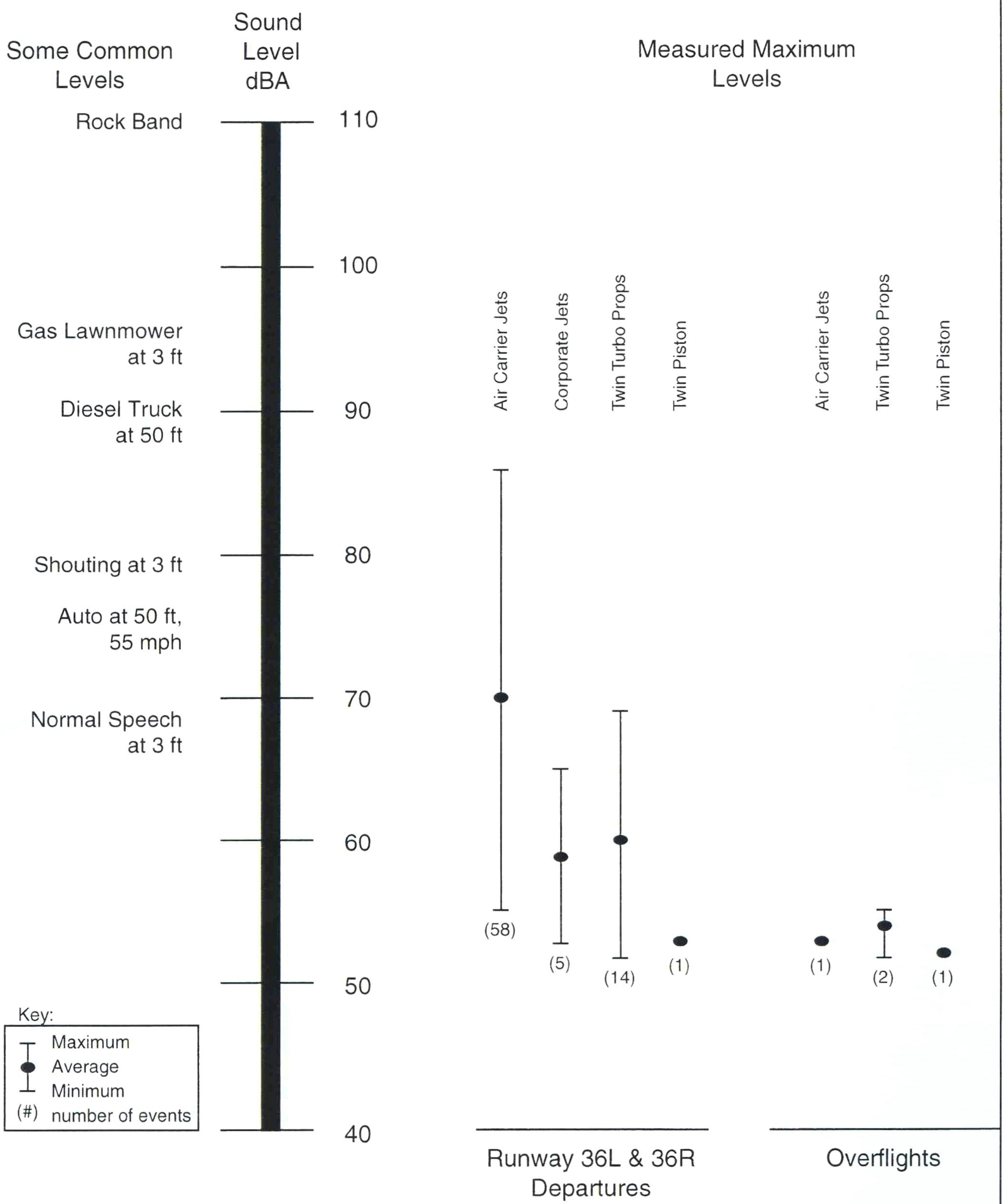
3.5.11 Site 10: 6526 Johns Road, Northwest Park

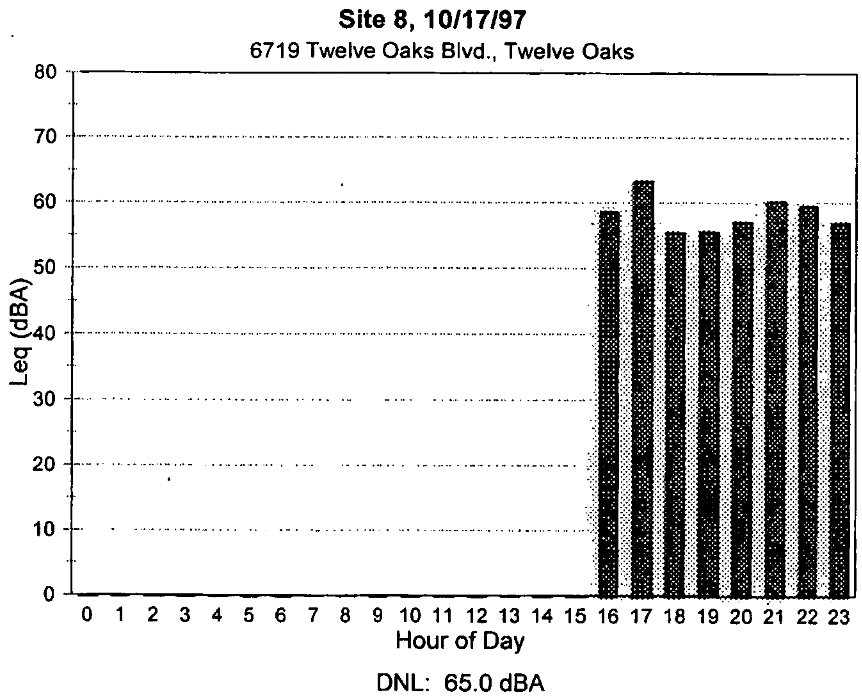
Site 10 is located approximately 4,900 feet north of the Airport, approximately 3,600 feet west of the extended centerline of the west parallel. Measurements at the site included all or a portion of three days. The Airport was operating in the north flow throughout the measurement period.

Lmax Measured at Site 8, 6719 Twelve Oaks Boulevard

Figure 3-21

Source: HMMH, October 1997 Measurements





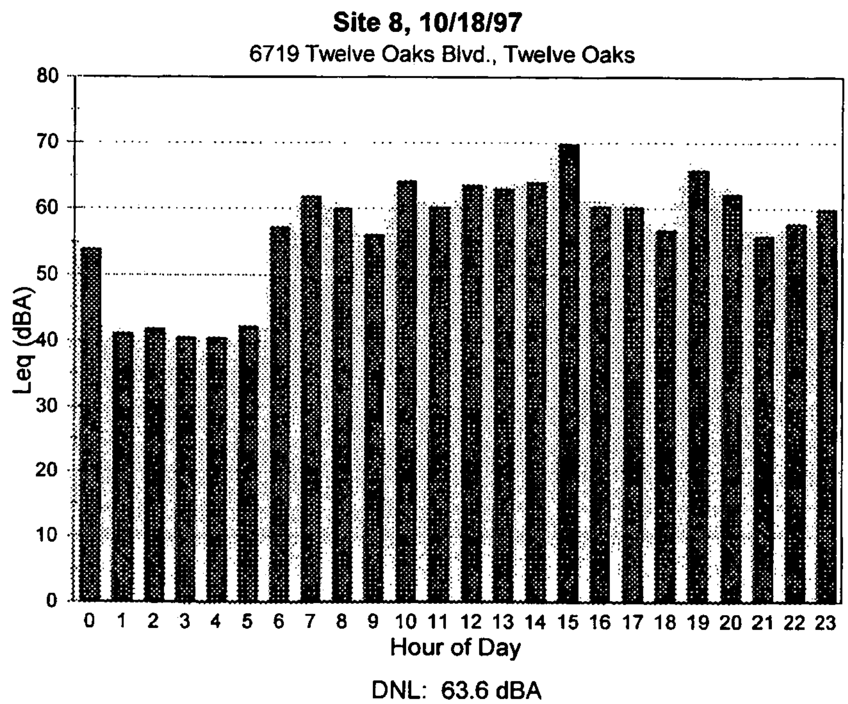


Figure 3-22
L_{eq} Measured at Site 8, 6719 Twelve Oaks Boulevard, October 17 and 18, 1997
Source: HMMH, October 1997 Measurements

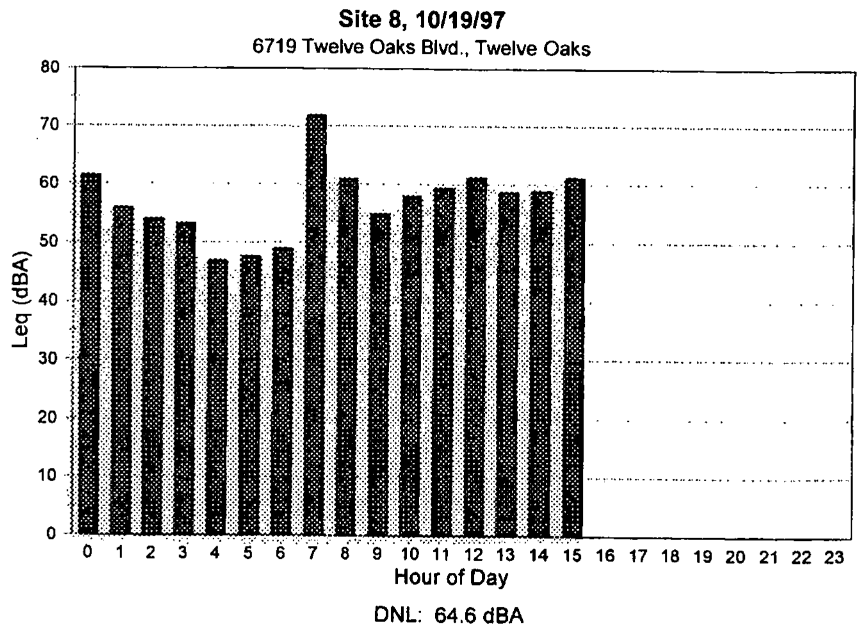


Figure 3-23

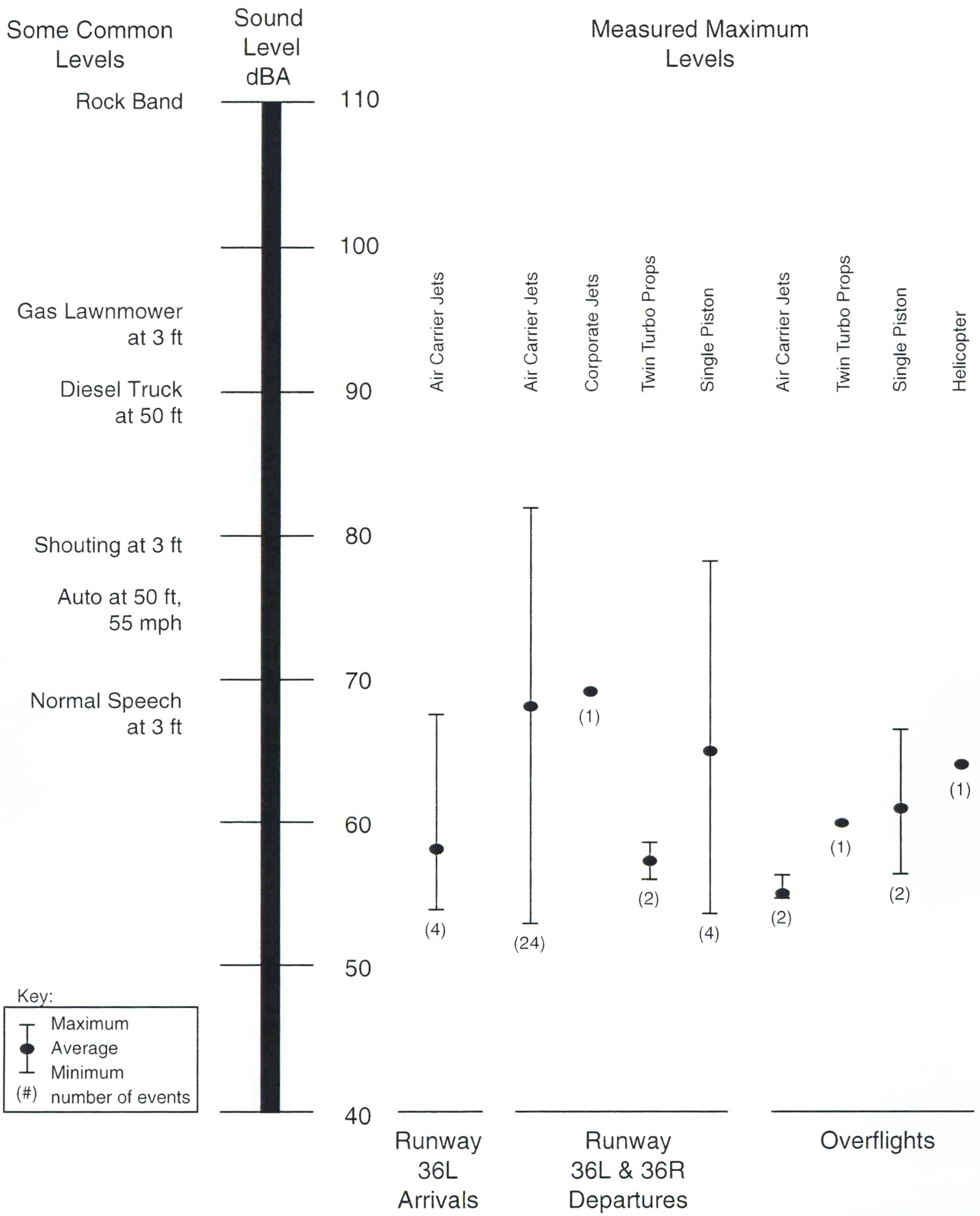
L_{eq} Measured at Site 8, 6719 Twelve Oaks Boulevard, October 19, 1997

Source: HMMH, October 1997 Measurements

Lmax Measured at Site 9, 4613 D'Azzo Avenue, Drew Park

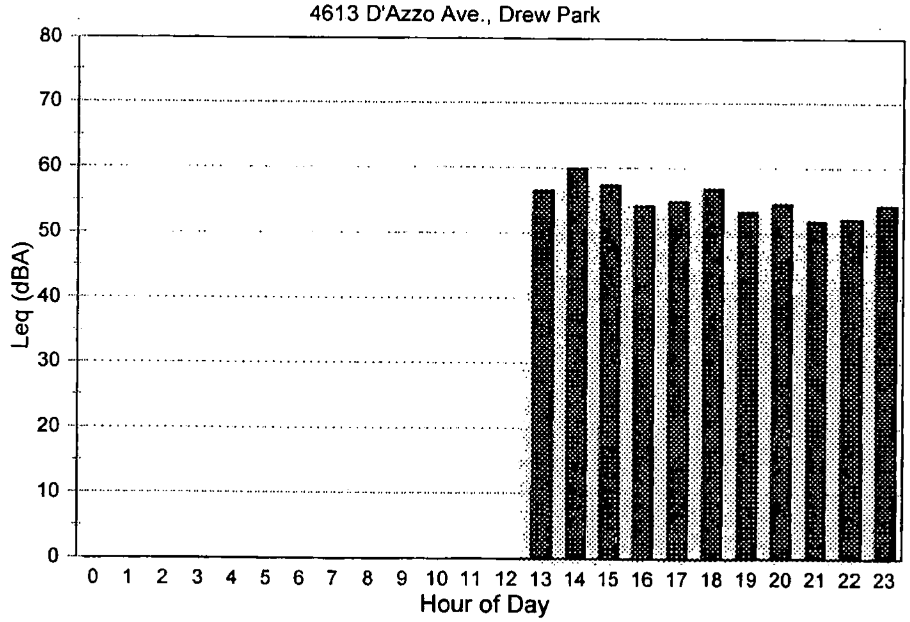
Figure 3-24

Source: HMMH, October 1997 Measurements



Site 9, 10/18/97

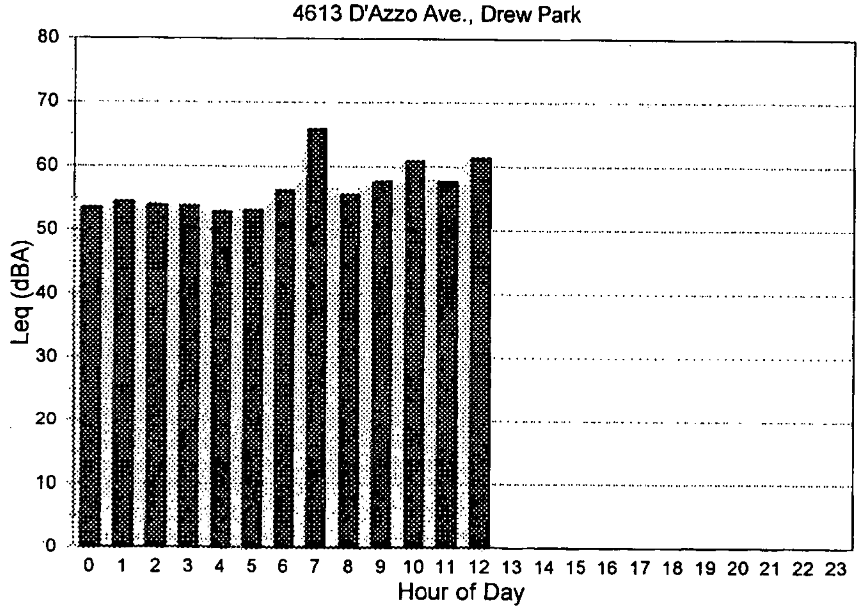
4613 D'Azzo Ave., Drew Park



DNL: 60.3 dBA

Site 9, 10/19/97

4613 D'Azzo Ave., Drew Park



DNL: 62.6 dBA

Figure 3-25
L_{eq} Measured at Site 9, 4613 D'Azzo Ave., Drew Park, October 18 and 19, 1997
Source: HMMH, October 1997 Measurements

Principal aircraft operations affecting noise levels at the site during the measurement period were Runway 36R and 36L departures. During south-flow operations, the site would also be affected by Runway 18R and 18L arrivals.

As shown in **Figure 3-26**, air carrier jets departures from Runways 36R and 36L were the most common and loudest events measured, as would be expected. There was over a 30 dB variation in measured maximum levels for air carrier jets, due to differences in flight path, runway used, and aircraft model. Twin turboprops also caused many noise events at the site, and the maximum levels produced by those aircraft fell within the range for air carrier jets. The turboprops produced these high noise levels because many turned west toward (or directly over) the site, whereas the jets continued straight out along the extended runway centerline.

As shown in **Figures 3-27 and 3-28**, the DNL values over the three days ranged from approximately 59 to 60 dB, with a mathematical average of approximately 59 dB.

The measurement site is approximately 2,000 feet northwest of measurement Site 6 in the original Part 150 study. The DNL measured over a single day at that site in 1983 was 71 dB. That measurement location had a calculated noise exposure of approximately 71 dB for both the 1985 and 1990 cases in the original study.

3.5.12 Site 11: 5215 West Laurel Street

Site 11 is located approximately 2,000 feet south of the Airport, approximately between the two runways. As shown in **Figure 3-29**, principal aircraft operations affecting noise levels at the site during the measurement period were Runway 36L and 36R arrivals, which passed to either side of the site. The second most common category of noise events was start-of-takeoff-roll noise from Runway 36R and 36L departures, proceeding north. The site would be affected by Runway 18R and 18L departures during south-flow operations.

Measurements at the site included all or a portion of three days. The Airport was operating in the north flow throughout the measurement period. As shown in **Figures 3-30 and 3-31**, the DNL values over the three days ranged from approximately 67 to 70 dB, with a mathematical average of approximately 69 dB.

The measurement site is approximately 2,500 feet northwest of Site 16 in the original Part 150 study. The DNL measured over a single day at that site in 1983 was 62 dB. The calculated DNL at that site was below 65 dB for both the 1985 and 1990 contour cases in the previous study. However, the current location was approximately on the 65 dB contour in the 1985 case, and just inside it for the 1990 case.

3.5.13 Site 12: North Street/Occident Avenue Intersection

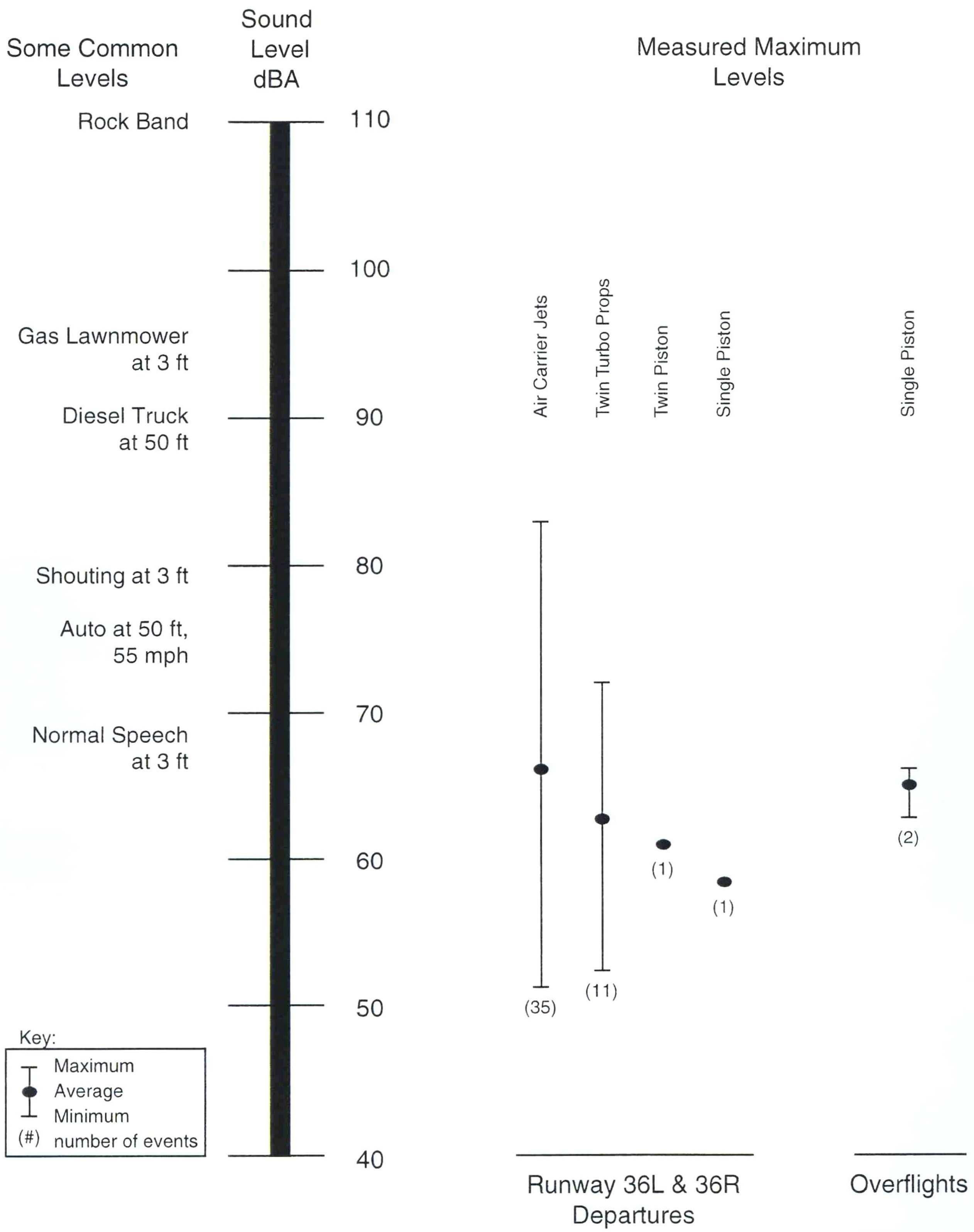
Site 12 is located approximately 7,000 feet north of the Airport, approximately 1,500 feet east of the extended centerline of the east parallel. Principal aircraft operations affecting noise levels at the site are arrivals and departures on both parallels.

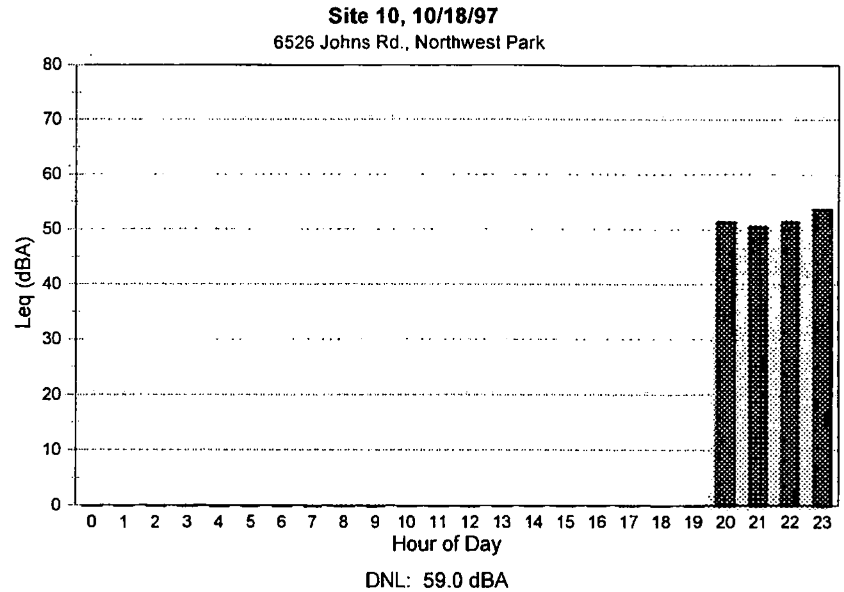
Measurements were conducted at this site using a portable noise monitor for a period of approximately 2 hours, to obtain a sample of single event levels, depicted in **Figure 3-32**. As would be expected, departures produced the highest noise levels, with the average levels higher on the east runway.

Lmax Measured at Site 10, 6526 Johns Road, Northwest Park

Figure 3-26

Source: HMMH, October 1997 Measurements





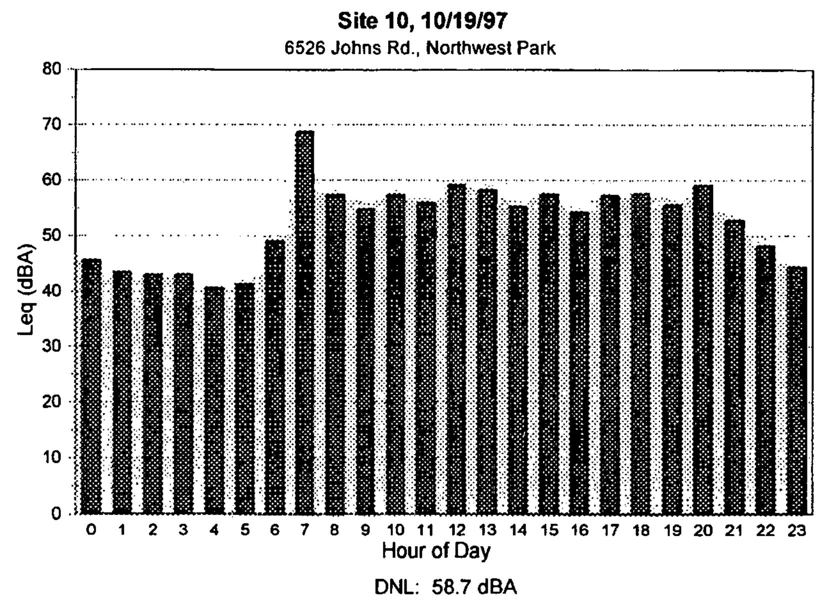


Figure 3-27

L_{eq} Measured at Site 10, 6526 Johns Road, Northwest Park, October 18 and 19, 1997

Source: HMMH, October 1997 Measurements

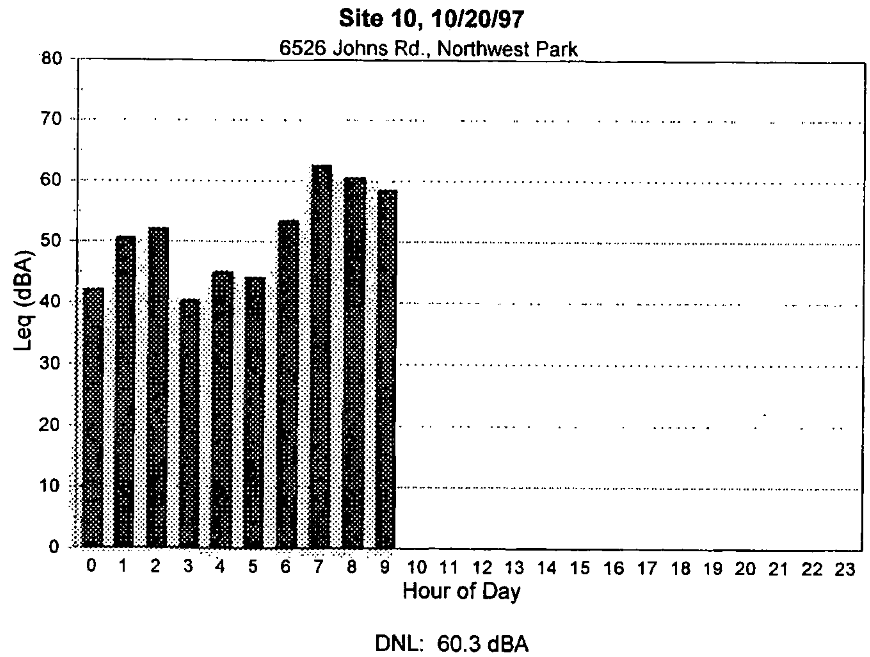
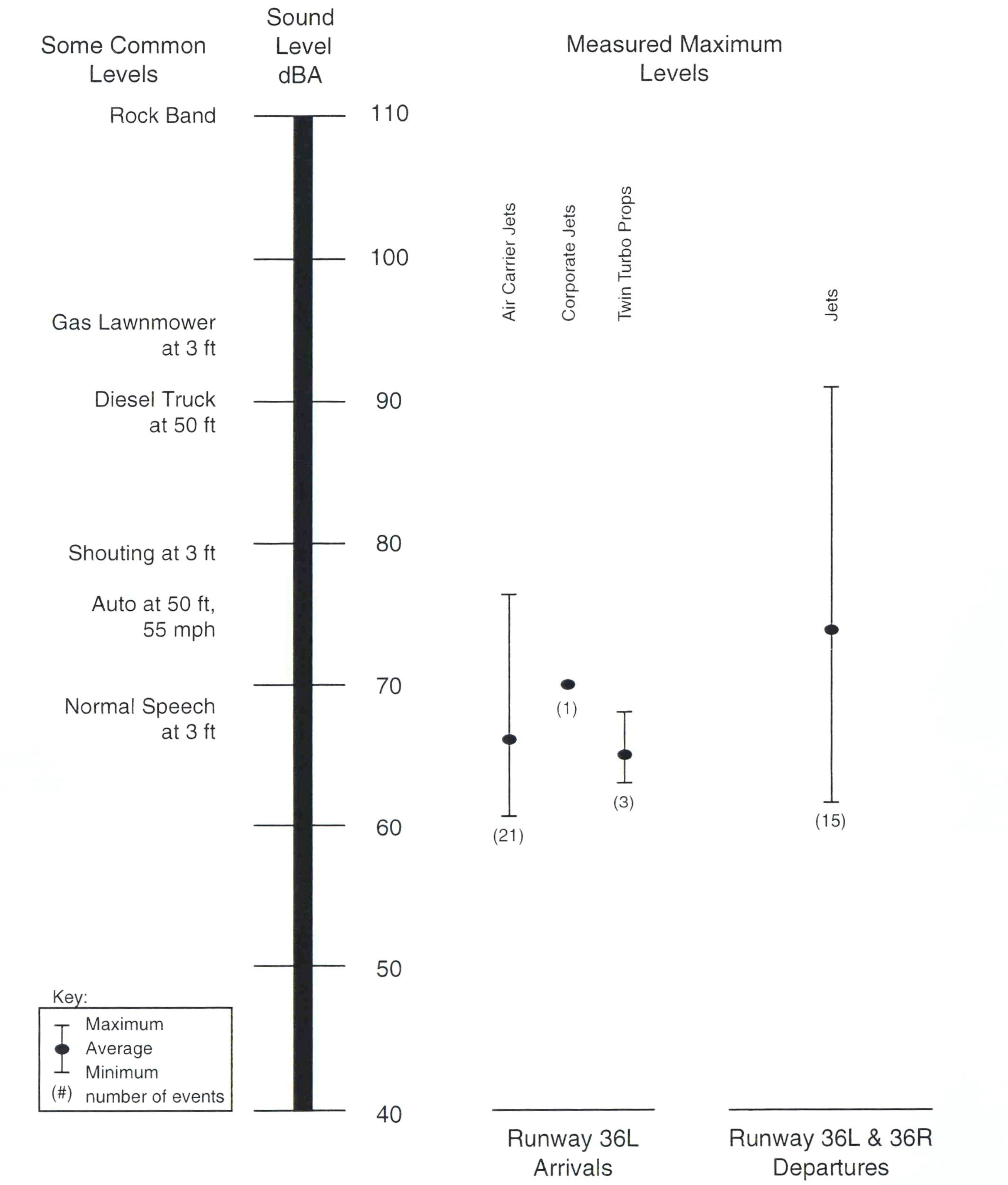


Figure 3-28
L_{eq} Measured at Site 10, 6526 Johns Road, Northwest Park, October 20, 1997
Source: HMMH, October 1997 Measurements

Lmax Measured at Site 11, 5215 West Laurel Street, Dana Shores

Figure 3-29

Source: HMMH, October 1997 Measurements



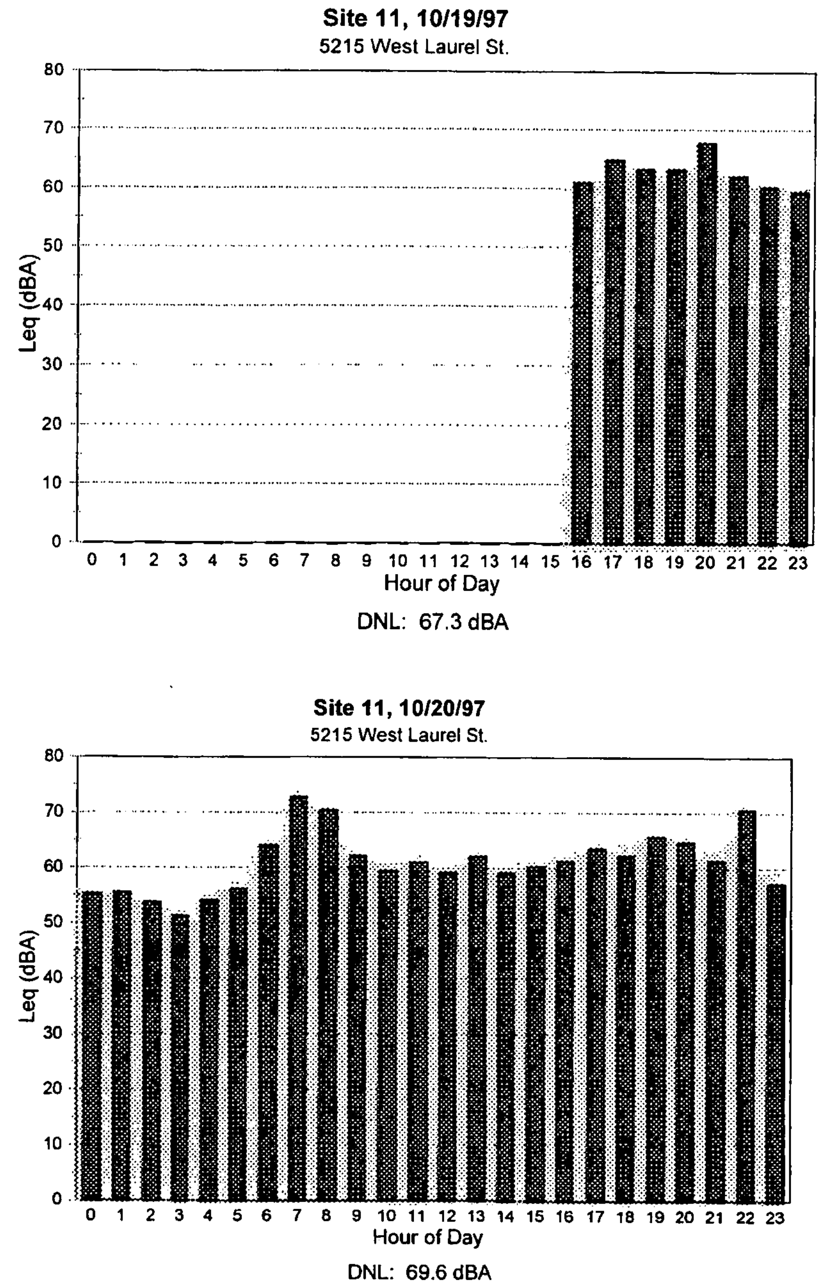


Figure 3-30
L_{eq} Measured at Site 11, 5215 West Laurel St., Dana Shores, Oct. 19 and 20, 1997
Source: HMMH, October 1997 Measurements

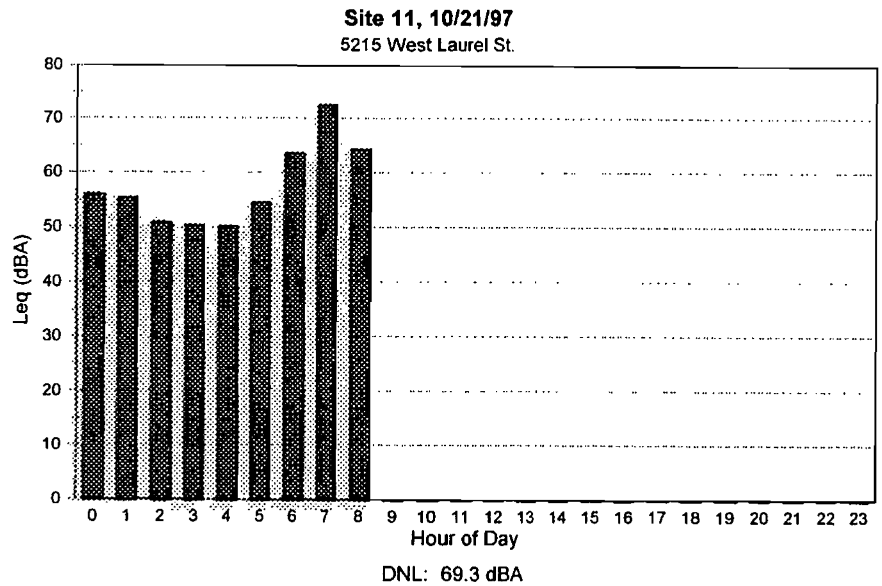
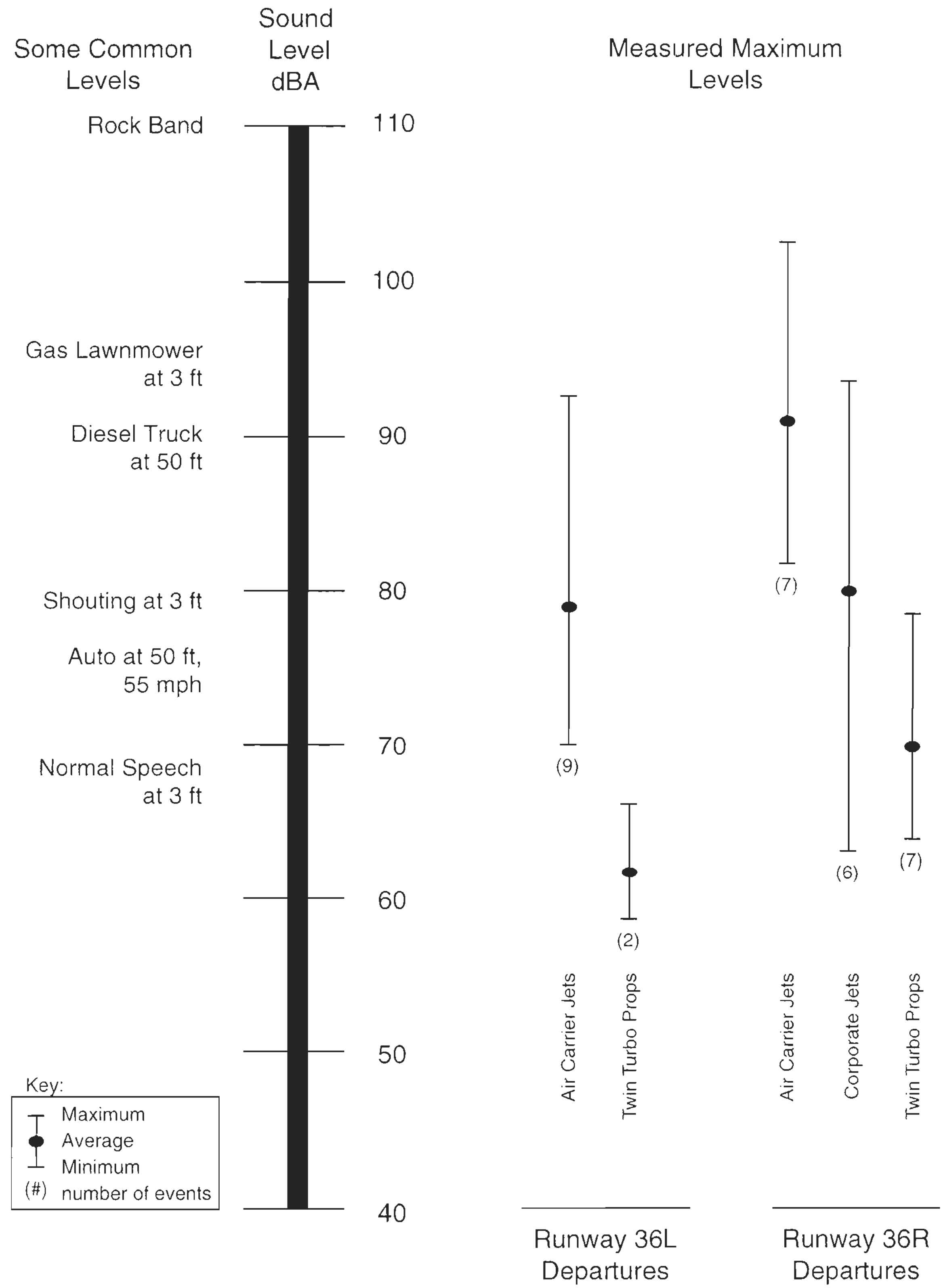


Figure 3-31
L_{eq} Measured at Site 11, 5215 West Laurel Street, October 21, 1997
Source: HMMH, October 1997 Measurements

Lmax Measured at Site 12, North St. / Occident Avenue Intersection Figure 3-32

Source: HMMH, October 1997 Measurements



No L_{eq} or DNL measurements were collected at this site.

3.5.14 Site 13: Leeward Drive, Watermill Village

Site 13 is located approximately 14,000 feet north of the Airport, approximately 3,000 feet west of the extended centerline of the west parallel. Measurements were conducted at this site using the B&K sound level meter for a period of approximately 1.5 hours, to obtain a sample of single event levels, depicted in **Figure 3-33**. The Airport operated in the north flow during the measurements. As would be expected, a majority of the measured operations were air carrier jet departures on Runways 36R and 36L. Because of the site location, it was not possible to differentiate between operations on the east and west runways.

No L_{eq} or DNL measurements were collected at this site.

3.5.15 Site 14: 3947 Doral Drive, Dana Shores

Site 14 is located approximately 2,800 feet due west of the west parallel, approximately one-third of the distance from the south end of the Airport. Measurements were conducted at the site for a portion of a day.

As shown in **Figure 3-34**, the site is affected by a diverse range of aircraft activity, because of its proximity to the airfield. Principal aircraft operations affecting noise levels at the site during the measurements were air carrier jet arrivals on Runway 36L and departures on Runways 36R and 36L. Runway 18R and 18L arrivals and departures would affect the site during south-flow operation.

As shown in **Figure 3-35**, the DNL values for the partial day allowed calculation of a DNL value of approximately 67 dB.

The measurement site is approximately 1,000 feet northeast of measurement Site 9 in the original Part 150 study. The DNL measured over a single day at that site in 1983 was 69 dB, and the calculated 1985 DNL was approximately 67 dB.

3.5.16 Site 15: Cypress Point Park

Site 15 is located approximately 4,000 feet due south of the west parallel, Runway 18R/36L.

As shown in **Figure 3-36**, the most common aircraft noise events measured at the site were Runway 36L arrivals, particularly by air carrier jets, which flew directly over the site. The two Runway 36L departure measurements are start-of-takeoff roll noise for jets departing to the north.

As shown in **Figure 3-37**, measurements at the site included portions of two days, with a total measurement duration of approximately 24 hours. The Airport was operating in the north flow throughout the measurement period. The average DNL calculated from the two days was approximately 69 dB.

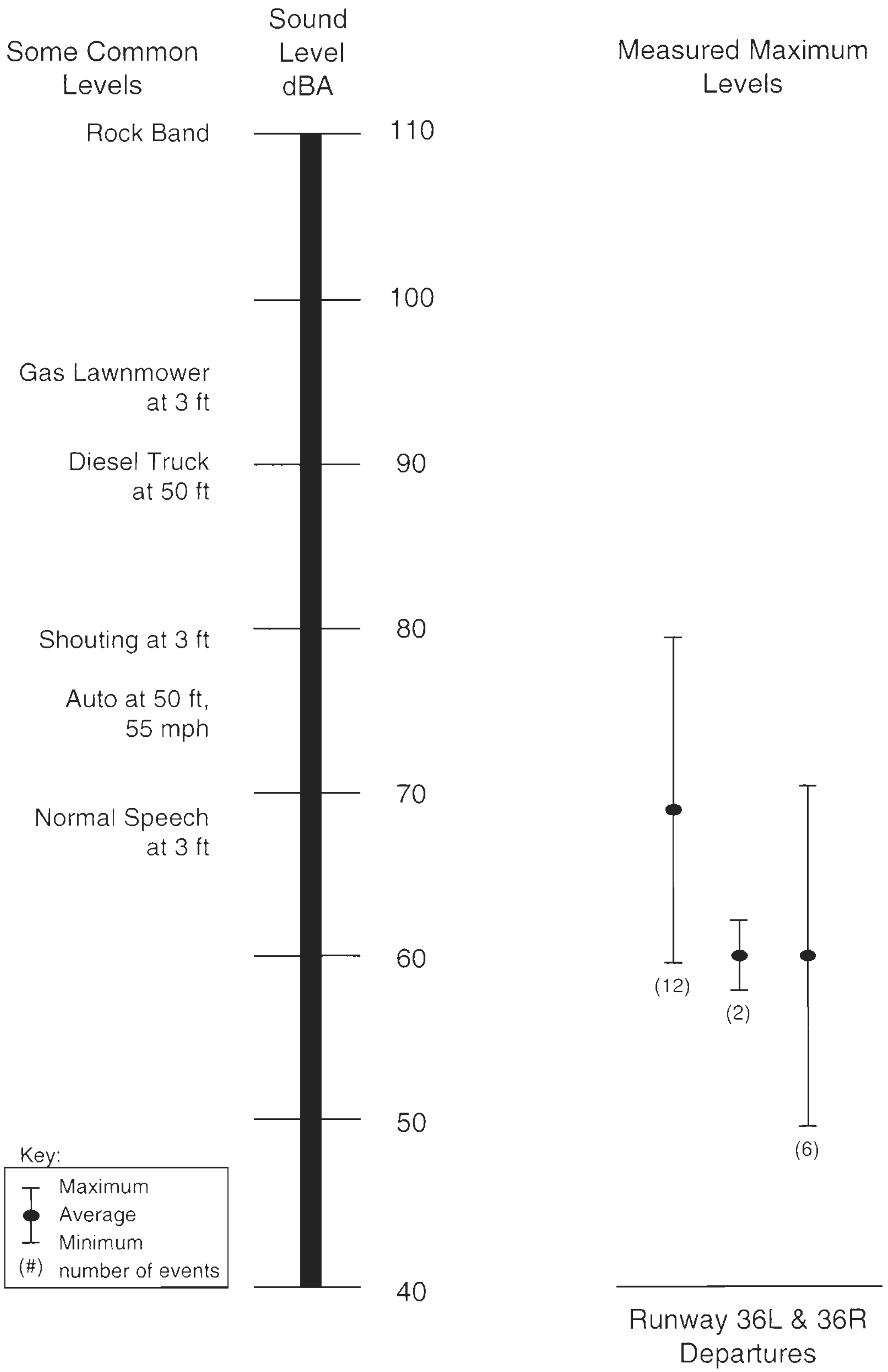
3.5.17 Site 16: 3405 Aileen Street

Site 16 is approximately 4,300 feet east of the east end of Runway 9/27, slightly south of the Runway 9/27 extended centerline. Measurements were conducted with a portable noise monitor at this site for a period of approximately 2 hours, to obtain a sample of single event data for light aircraft operations.

Lmax Measured at Site 13, Leeward Drive, Watermill Village

Figure 3-33

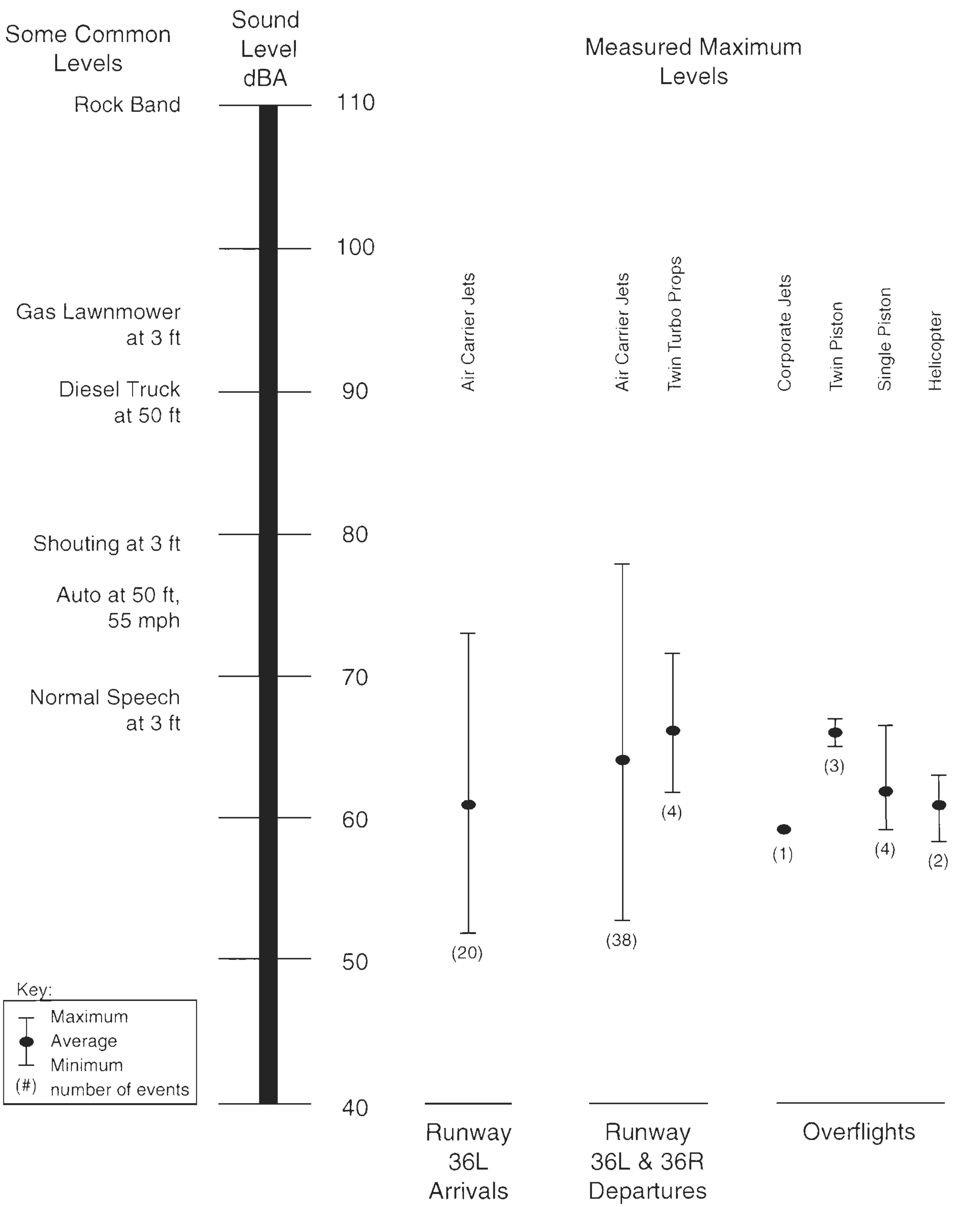
Source: HMMH, October 1997 Measurements



Lmax Measured at Site 14, 3947 Doral Drive, Dana Shores

Figure 3-34

Source: HMMH, October 1997 Measurements



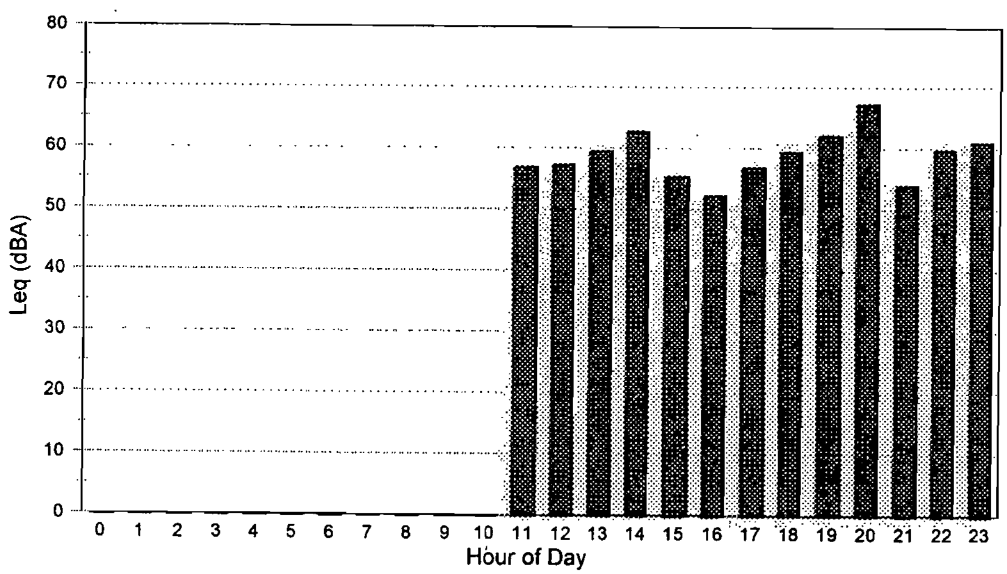


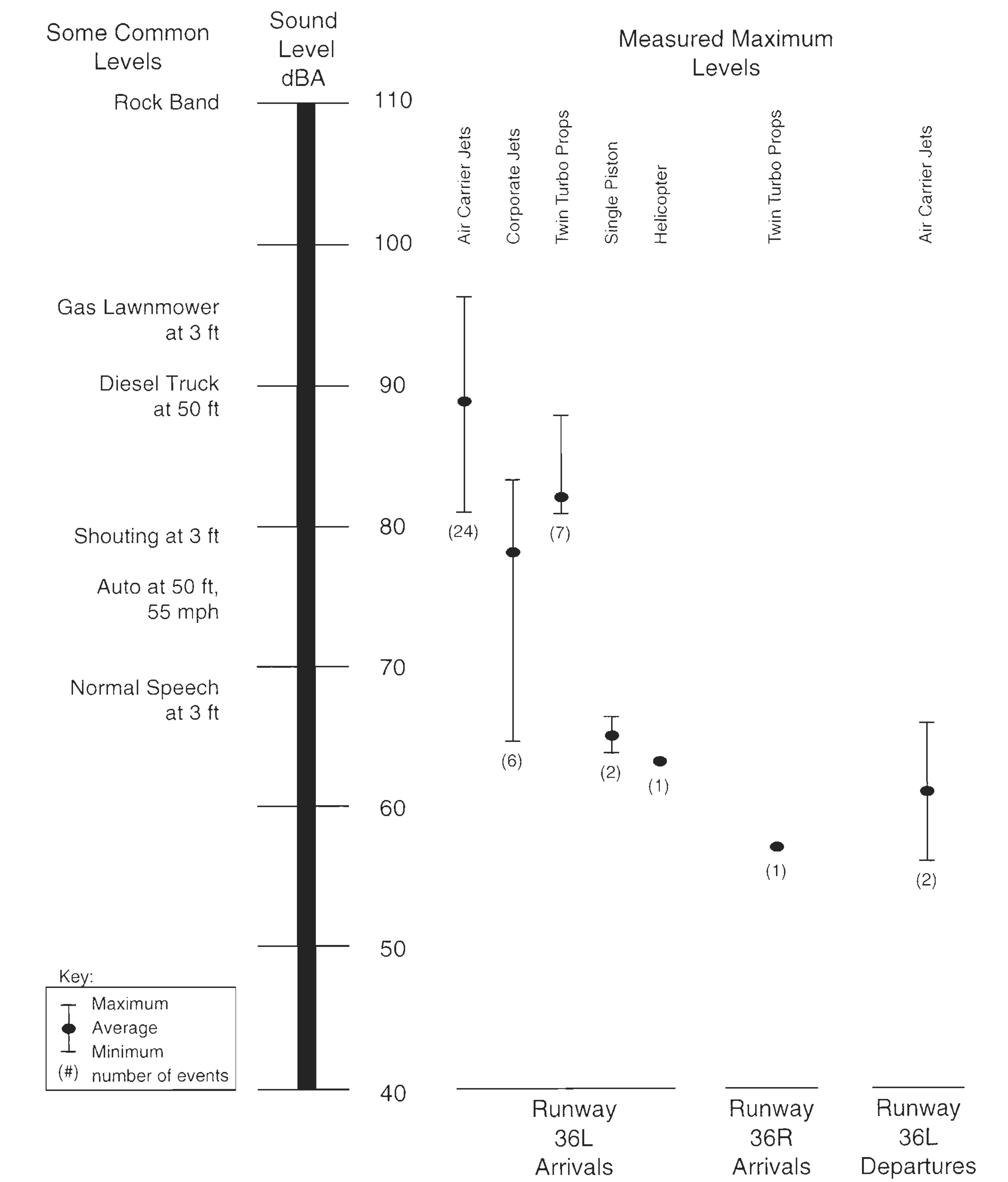
Figure 3-35
L_{eq} Measured at Site 14, 3947 Doral Drive, Dana Shores, October 20, 1997
Source: HMMH, October 1997 Measurements

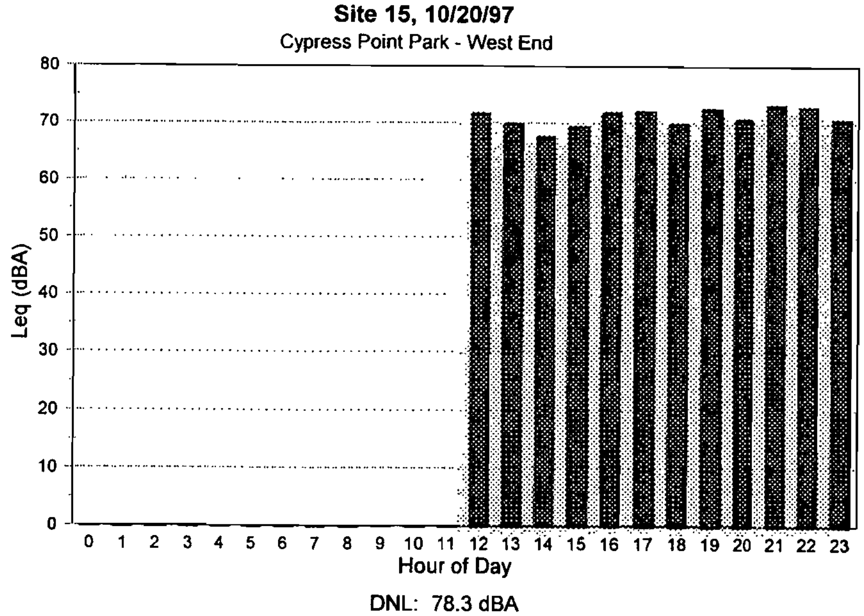
HILLSBOROUGH COUNTY AVIATION AUTHORITY

Lmax Measured at Site 15, Cypress Point Park

Figure 3-36

Source: HMMH, October 1997 Measurements





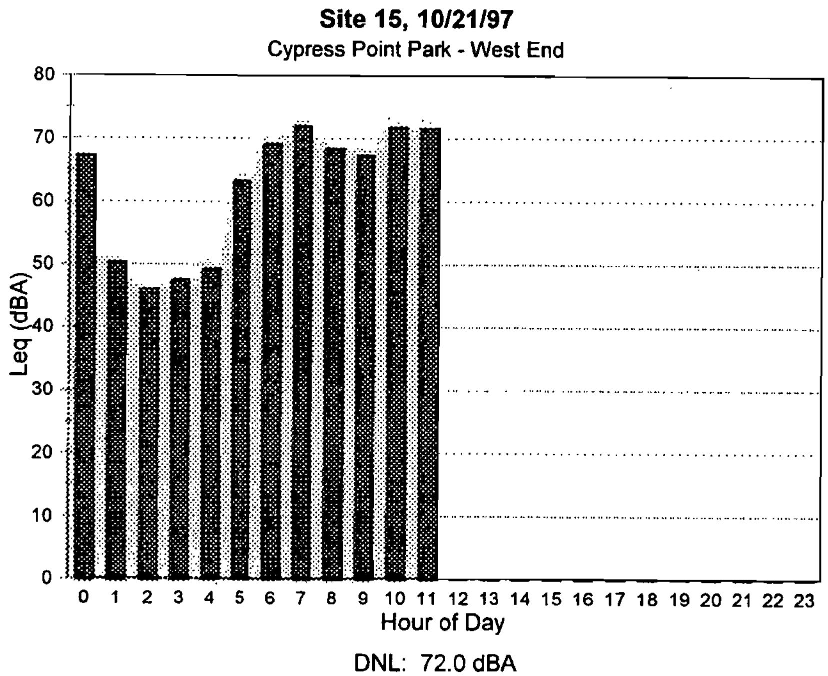


Figure 3-37
L_{eq} at Site 15, Cypress Point Park, October 20 and 21, 1997
Source: HMMH, October 1997 Measurements

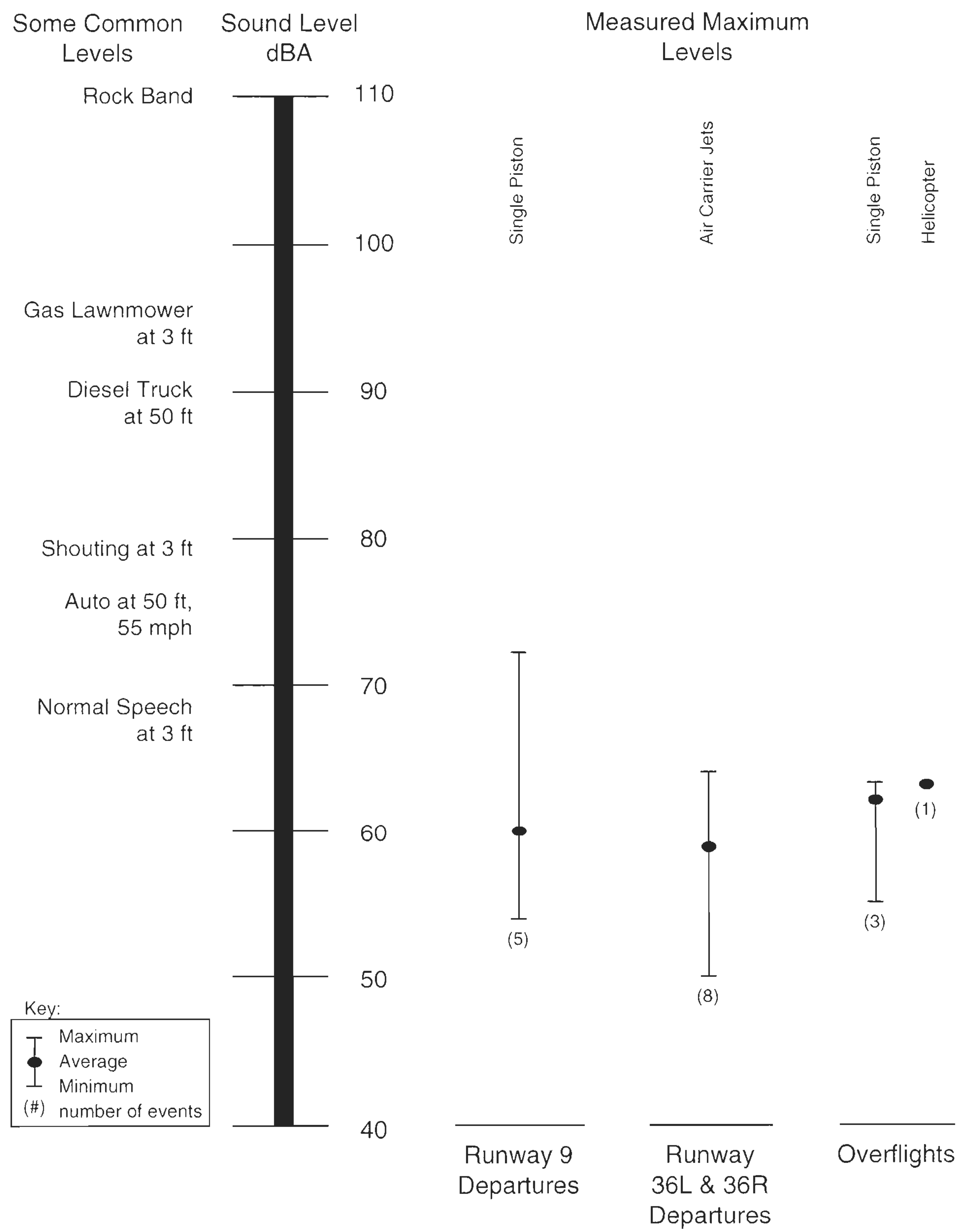
As shown in **Figure 3-38**, single engine propeller departures from Runway 9 and single engine overflights (most likely aircraft in the traffic pattern) produced the highest noise levels. Sideline noise from jet departures on Runways 36L and 36R produced noise events just as frequently, with nearly the same noise levels.

The site is approximately 500 feet south of Site 11 in the 1983 study. The DNL from a single day of measurement at the site in 1983 was approximately 59 dB.

L_{max} Measured at Site 16, 3405 Aileen Street

Figure 3-38

Source: HMMH, October 1997 Measurements



Chapter Four
Existing and Forecast Noise Exposure

This chapter presents a description of the existing and future aircraft-related noise exposure in the TPA environs in the form of Day-Night Average Sound Level (DNL) "noise contours." These contours all assume the Airport is operating under the provisions of the existing NCP described in Chapter One. Noise exposure cases include:

- 2000 existing conditions
- 2005 forecast conditions

DNL contours for this study were prepared using Version 5.1a of the FAA's Integrated Noise Model (INM), which was the most current version of the INM available at the time the Noise Exposure Map contours were prepared. The INM requires inputs in the following areas:

- airport layout;
- number and mix of aircraft operations;
- day-night split of operations (by aircraft type);
- noise and performance characteristics of aircraft types;
- runway utilization rates;
- prototypical flight track descriptions; and
- flight track utilization rates.

As discussed in Section 1.1.1, the existing conditions contours are based on a level of activity that is representative of 1998 activity levels. All other modeling assumptions, including airport layout, flight geometry and utilization, and runway use rates, are representative of conditions as of the date of submission.

As discussed in Section 1.1.1, HNTB estimated existing conditions and 5-year forecast activity based on current information during the data collection phase of the study, in 1998. Therefore, the 2000 and 2005 NEMs are based on the estimated fleet mixes for 1998 and 2003. However, consistent with FAA guidelines, the data for those years are representative of conditions for 2000 and 2005. That is, airport layout, runway use percentages, flight tracks, general aircraft mix, and operational data, and noncompatible land uses are equivalent; and total numbers of operations do not vary over 15% in the aggregate.

4.1 AIRPORT AND PHYSICAL PARAMETERS

Runway orientation has a significant influence on aircraft operations and the resulting pattern of noise exposure. Since climate and terrain can affect aircraft performance and air traffic control (ATC) procedures, these factors also play major roles in aircraft noise exposure. The location of the Airport within an urban area directly affects the types of land uses exposed to aircraft overflights and noise.

This section reviews the major factors affecting aircraft flight patterns and performance at TPA.

4.1.1 Airport Location and Layout

TPA is located approximately five miles west of downtown Tampa and covers an area of 3,100 acres (3,300 acres after acquiring additional land) in Hillsborough County. The predominant features of the Airport include two parallel north-south runways, an east-west crosswind runway, associated taxiways, the landside/ airside terminal complex, a cargo area, airline maintenance area, and a GA area. **Figure 4-1** depicts the location of the Airport in its regional setting. The existing Airport Layout Plan is presented in **Figure 4-2**. The runway-taxiway components of the airfield pavement as they exist in 2000 are summarized in this section.

Runways - The existing airfield configuration consists of three runways: two parallel north-south runways designated as Runways 18L-36R and 18R-36L, and an east-west crosswind runway designated as Runway 9-27.

- **Runway 18L-36R** is an air carrier runway. It is 8,300-feet long with an effective gradient of 0.11 percent.
- **Runway 18R-36L** is an air carrier runway. It is 11,002-feet long with an effective gradient of 0.10 percent.
- **Runway 9-27** is an air carrier runway. It is 6,998-feet long with an effective gradient of 0.17 percent.

Operational System - The Airport's runway system is operated with mixed operations depending on wind and weather conditions and demand. Because of noise abatement requirements on Runway 18L-36R, airport capacity is constrained.

4.1.2 Climate

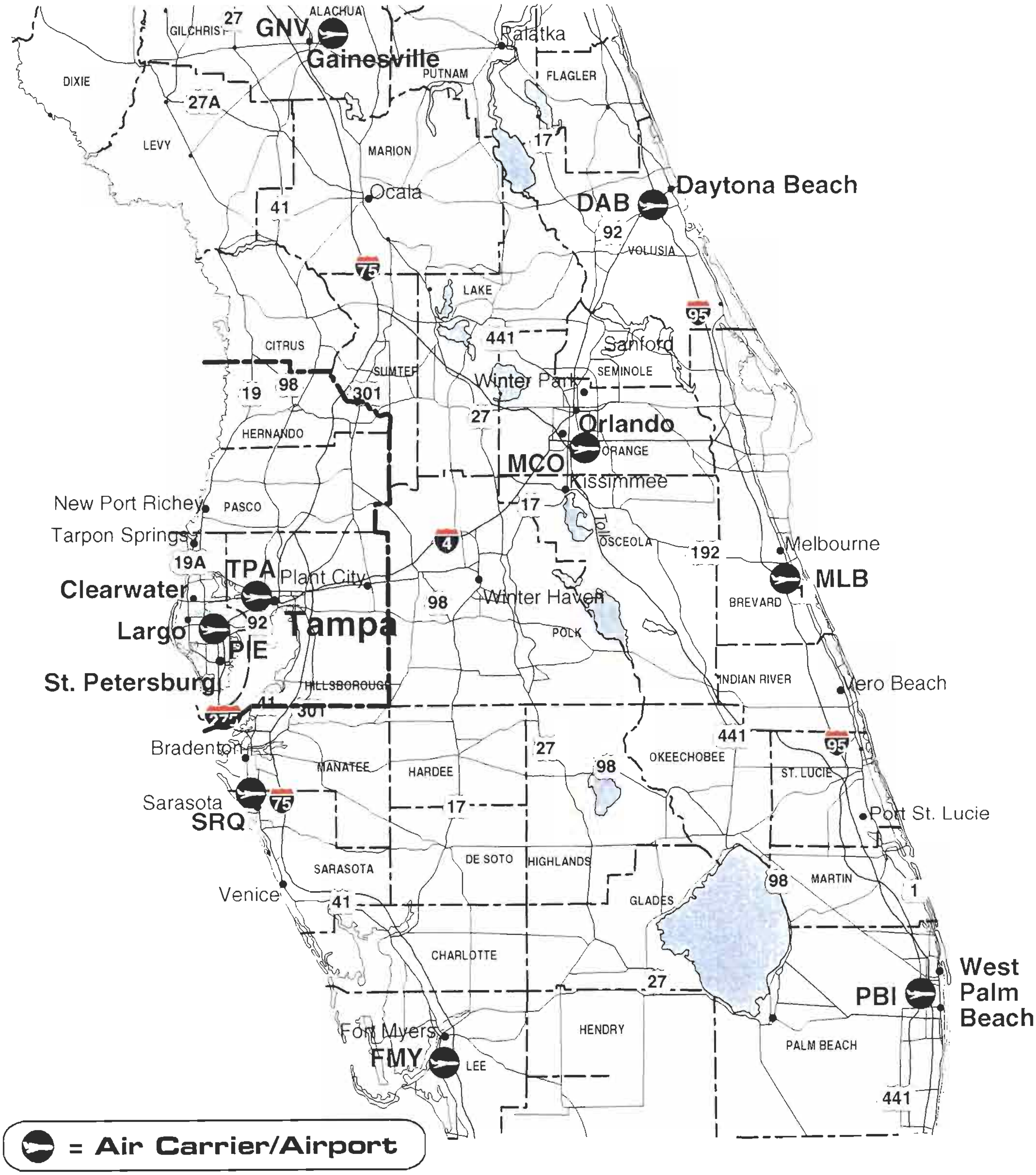
Weather plays a significant role in the operational capabilities and noise characteristics of aircraft. Temperature is an important factor in determining aircraft performance. In addition, prevailing winds have a major role in determining the pattern of runway use.

Temperature - Warmer air temperatures cause lower air densities and result in lower thrust output and lift. Consequently, aircraft take longer to become airborne and climb. At TPA, normal daily mean temperatures range from 61 degrees Fahrenheit (F) in December and January to 82 °F in July and August, with an annual average daily mean temperature of 72 °F. August is the hottest month with an average daily mean maximum temperature of 90 °F. January is the coldest month with a daily mean minimum temperature of 50 °F.

Wind Direction - Wind speed and direction determine runway selection and operational flow. Operating with a headwind is desirable for takeoffs and landings, as headwind can help to decrease takeoff and landing distance requirements. The average annual wind speed in the Tampa area is 6.3 knots. March is the windiest month with winds averaging about 7.5 knots. Because the average wind speed is below 10 knots, the tailwind component is not as frequent a consideration for runway operations at TPA. A tailwind component is that portion of the wind which acts directly on the tail of the aircraft. A strong tailwind component can

LOCATION MAP

Figure 4-1

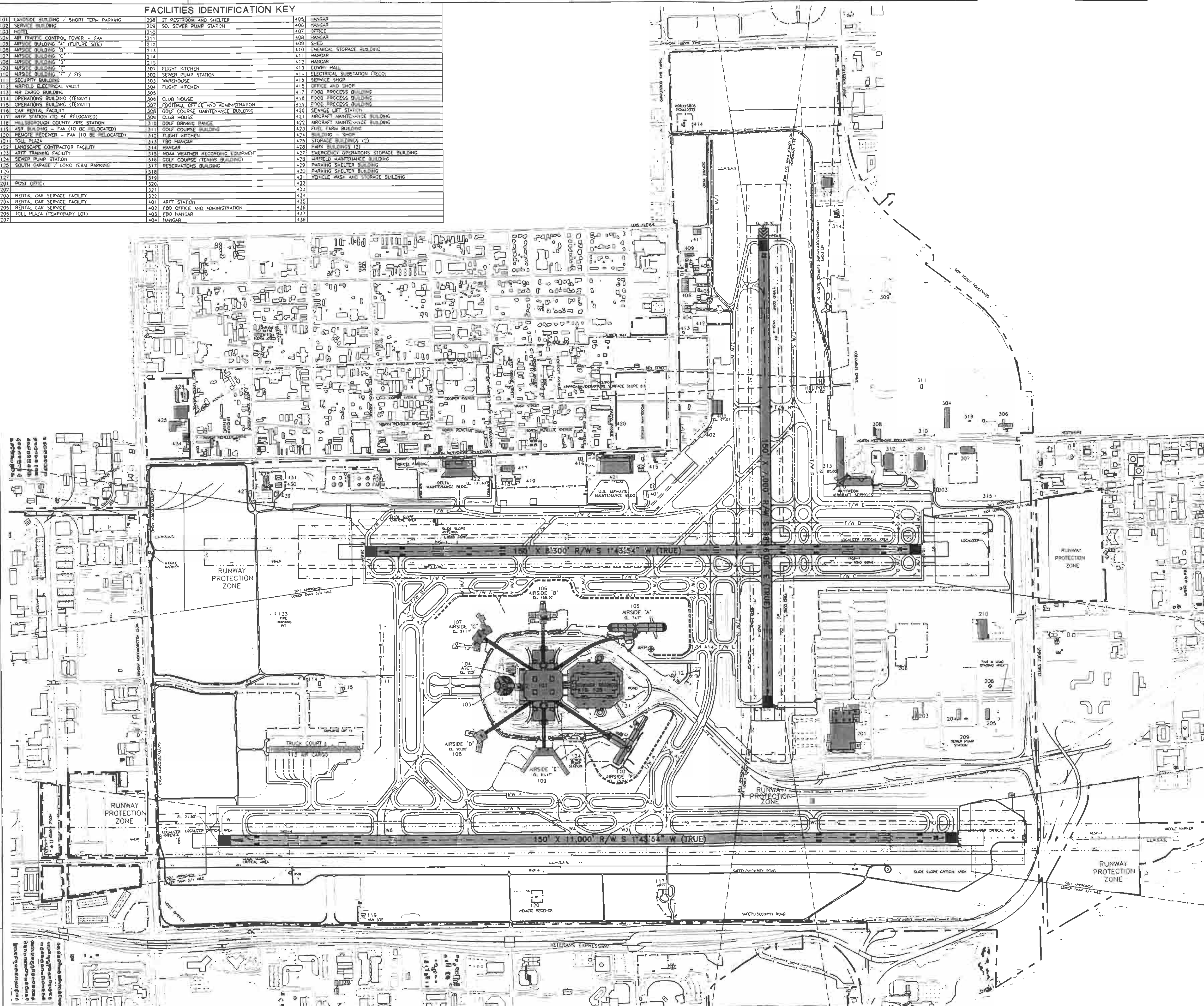


MASTER PLAN UPDATE STUDY

FAR PART 150 UPDATE STUDY

FACILITIES IDENTIFICATION KEY

101	LANDSIDE BUILDING / SHORT TERM PARKING	208	GT RESTROOM AND SHELTER	405	HANGAR
102	SERVICE BUILDING	209	SO. SEWER PUMP STATION	406	HANGAR
103	HOTEL	210		407	OFFICE
104	AIR TRAFFIC CONTROL TOWER – FAA	211		408	HANGAR
105	AIRSIDE BUILDING "A" (FUTURE SITE)	212		409	SHED
106	AIRSIDE BUILDING "B"	213		410	CHEMICAL STORAGE BUILDING
107	AIRSIDE BUILDING "C"	214		411	HANGAR
108	AIRSIDE BUILDING "D"	215		412	HANGAR
109	AIRSIDE BUILDING "E"	301	FLIGHT KITCHEN	413	COWRY HALL
110	AIRSIDE BUILDING "F" / FIS	302	SEWER PUMP STATION	414	ELECTRICAL SUBSTATION (TECO)
111	SECURITY BUILDING	303	WAREHOUSE	415	SERVICE SHOP
112	AIRFIELD ELECTRICAL VAULT	304	FLIGHT KITCHEN	416	OFFICE AND SHOP
113	AIR CARGO BUILDING	305		417	FOOD PROCESS BUILDING
114	OPERATIONS BUILDING (TENANT)	306	CLUB HOUSE	418	FOOD PROCESS BUILDING
115	OPERATIONS BUILDING (TENANT)	307	FOOTBALL OFFICE AND ADMINISTRATION	419	FOOD PROCESS BUILDING
116	CAR RENTAL FACILITY	308	GOLF COURSE MAINTENANCE BUILDING	420	SEWAGE LIFT STATION
117	ARFF STATION (TO BE RELOCATED)	309	CLUB HOUSE	421	AIRCRAFT MAINTENANCE BUILDING
118	HILLSBOROUGH COUNTY FIRE STATION	310	GOLF DRIVING RANGE	422	AIRCRAFT MAINTENANCE BUILDING
119	ASR BUILDING – FAA (TO BE RELOCATED)	311	GOLF COURSE BUILDING	423	FUEL FARM BUILDING
120	REMOTE RECEIVER – FAA (TO BE RELOCATED)	312	FLIGHT KITCHEN	424	BUILDING – SHOP
121	TOLL PLAZA	313	FBO HANGAR	425	STORAGE BUILDINGS (2)
122	LANDSCAPE CONTRACTOR FACILITY	314	HANGAR	426	PARK BUILDINGS (2)
123	ARFF TRAINING FACILITY	315	NOAA WEATHER RECORDING EQUIPMENT	427	EMERGENCY OPERATIONS STORAGE BUILDING
124	SEWER PUMP STATION	316	GOLF COURSE (TENNIS BUILDING)	428	AIRFIELD MAINTENANCE BUILDING
125	SOUTH GARAGE / LONG TERM PARKING	317	RESERVATIONS BUILDING	429	PARKING SHELTER BUILDING
126		318		430	PARKING SHELTER BUILDING
127		319		431	VEHICLE WASH AND STORAGE BUILDING
201	POST OFFICE	320		432	
202		321		433	
203	RENTAL CAR SERVICE FACILITY	322		434	
204	RENTAL CAR SERVICE FACILITY	401	ARFF STATION	435	
205	RENTAL CAR SERVICE	402	FBO OFFICE AND ADMINISTRATION	436	
206	TOLL PLAZA (TEMPORARY LOT)	403	FBO HANGAR	437	
207		404	HANGAR	438	



N

0' 1,500' 3,000'

Scale in Feet

LEGEND

	EXISTING
Object Free Area	OFA
Runway Safety Area	RSA
Object Free Zone	OFZ
Roads	
Pavement	
Runway Protection Zone	
MALSR	
On–Airport Property Buildings	619
Off–Airport Property Buildings	
Fence Line	x x
Tree and Treetop Elev.	x 619
Property Line	
Voluntary Acquisition Area	
RVR	●
Windcone	
Papi	
Airport Reference Point	
RW End Lights	
VASI	
REILS	
Localizer	
Glide Slope	G
ASOS	A
Helipad	H

REVISIONS | DATE | BY | AUTH

F.A.A. NO.
HCAA NO.
JOB NO.
DESIGN JDN
DRAWN ALD
CHECKED RVW
FILE NAME FIG. 2-3
SCALE 1" = 1,500'

HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA INTERNATIONAL AIRPORT
TAMPA – FLORIDA

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

PROJECT NAME
AIRPORT MASTER PLAN UPDATE

DRAWING TITLE
EXISTING AIRPORT LAYOUT

DRAWING NO.
FIGURE 4-2

DATE: 2/15/98

ROTATED BASE PT. 0.0 ANGLE 272

ARACAD\27246-TAMPA\FIGURES\FIG 2-3.DWG ALD 02/15/98 increase the airplane's forward speed and thereby increase the time required to reduce speed enough to exit the runway. Winds are most frequent from the north-northeast to east during the winter months and from the south-southwest to west in the summer months. The strongest winds, over 6 knots, typically originate from these sectors. Because the prevailing winds are from the north, the primary runways are typically aligned in a north-to-south configuration.

Humidity - Humidity alone is not considered a significant contributing factor in reducing aircraft performance or increasing noise levels. It does, however, affect aircraft engine performance by taking up space that is normally available for vaporized fuel. Typically, as humidity increases less air enters the engine, causing a small increase in density altitude. For reciprocating engines, moist air tends to retard even fuel burning in the cylinder, which causes engine power loss. In reciprocating engine aircraft, the loss in engine power translates into reduction in total takeoff and climb performance. Relative humidity typically affects smaller training type aircraft. Humidity also has a minor effect in reducing the density of air, thus decreasing aircraft lift. The annual average relative humidity in the Tampa area is 74 percent. At TPA, humidity influences aircraft performance.

Visibility - The percent of time visibility is impaired due to cloud coverage is a major factor in determining the use of instrument approach aids. The FAA classifies weather conditions according to two basic types: visual meteorological conditions (VMC) and instrument meteorological conditions (IMC). VMC conditions are weather conditions such that an aircraft can maintain safe separation by visual means. IMC conditions prevail when the visibility or ceiling falls below those minimums prescribed for VMC conditions. During periods of IMC conditions, all aircraft must operate under IFR flight plans, and operating patterns become the responsibility of ATC. Based on 1984-1993 meteorological data from the National Climatic Center, VMC conditions exist 95.1 percent of the time and IMC conditions 4.9 percent of the time in the Tampa area. Visual approaches can be conducted on any runway at TPA when the cloud ceiling is at least 2,600 feet and the visibility is at least 5 miles. Weather conditions permit visual approaches to TPA approximately 95 percent of the time.

Precipitation - Precipitation influences flight types by requiring IFR flights for flights that would normally be VFR. Additionally, precipitation also influences the ATC arrival separation time when an IFR flight plan is required. The normal annual precipitation in Tampa is approximately 44 inches. Precipitation is highest during the month of August. April is typically the driest month. The majority of traffic operations at TPA are IFR flights. The Tampa Bay area is known for its thunderstorm season, with on average 88 days of thundershowers per year. Precipitation may influence operations due to facility closure, if only for a few hours. Closure of runways due to weather conditions could potentially influence noise levels along approach and departure paths associated with the redirection of flights to open runways. The redirection of flights may increase noise levels along the flight tracks for the runway(s) in-use. The potential change in typical noise levels due to weather conditions would be temporary and would not present a significant impact to average annual noise levels for any specific points.

4.1.3 Terrain

The terrain surrounding an airport can also influence aircraft operations and thereby the areas of potential noise impact. Because the terrain surrounding TPA is relatively flat due to its proximity to the ocean, terrain does not impact operational use of the Airport.

4.2 AIRSPACE AND AIR TRAFFIC CONTROL

The structure of airspace around an airport significantly affects the pattern of aircraft overflights, the types of aircraft which may operate in specific areas, and the options available to air traffic controllers in directing aircraft. Accordingly, airspace structure also influences the range of potential noise abatement measures.

4.2.1 Types of Airspace

The FAA Act of 1958 established the FAA responsible for the control and use of navigable airspace within the United States. Airspace is currently classified as either controlled or uncontrolled. Controlled airspace is supported by ground-to-air communications, navigation aids, and air traffic services.

The types of controlled airspace in the Tampa area are:

- Class A airspace, which includes all airspace between 18,000 feet mean sea level (MSL) and 60,000 feet MSL;

- Tampa Class B airspace (formerly, the Terminal Control Area), which includes all airspace from the Airport's established elevation of 27 feet MSL up to 10,000 feet MSL (9,973 feet above ground level (AGL)) and consists of four layers which generally parallel the bay area, roads, and railroads;

- Sarasota/Bradenton International Airport (SRQ) Class C airspace (formerly referred to as the Airport Radar Service Area) which includes all airspace from that airport's established elevation of 28 feet MSL up to 4,000 feet MSL (3,972 feet AGL) and consists of two airspace layers;

- Class D airspace for airports with air traffic control towers (ATCTs), which normally extends from the surface to 2,500 feet above an airport's established elevation (but is charted in MSL) and includes control zones and airport traffic areas. The Class D airspace surrounding the airports in the Tampa area are individually configured; and

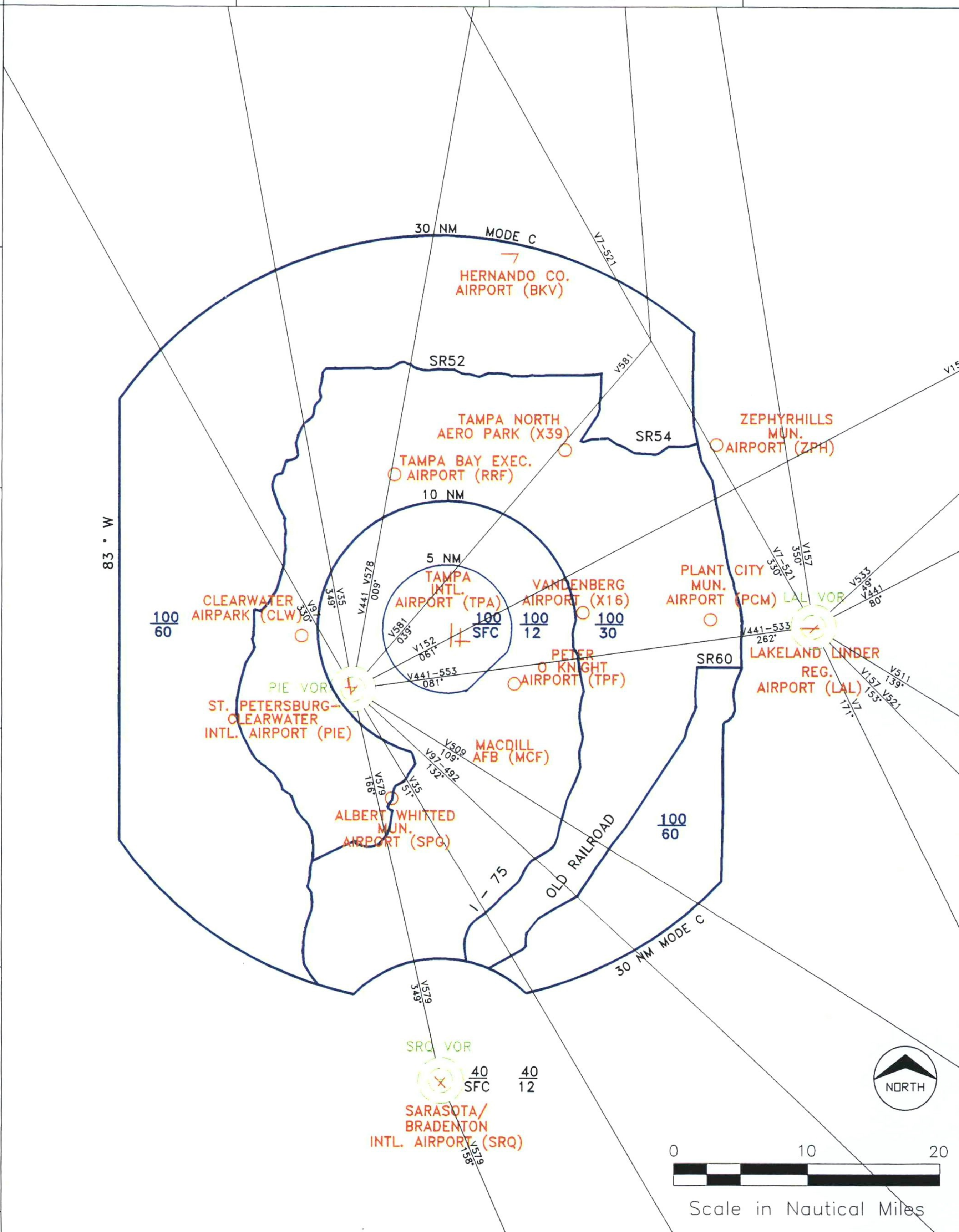
- Class E airspace, which includes all controlled airspace other than Classes A, B, C, or D. Class E airspace extends upward from either the surface of a designated altitude to overlying or adjacent controlled airspace. Class E airspace includes transition areas and control zones for airports without ATCTs.

Uncontrolled airspace is referred to as Class G airspace.

Only those areas which pertain to the study (Classes B, C, and D) are described further.

Class B Airspace

Figure 4-3 shows the Tampa Class B airspace. Class B airspace is established at



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PROJECT NAME
Master Plan Update \
FAR Part 150 Study

DRAWING TITLE
TAMPA CLASS B AIRSPACE

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FIGURE
4–3

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29 high-density airports in the United States as a means of regulating air traffic activity in these areas. It is established on the basis of a combination of enplaned passengers and volume of operations.

Class B airspace is designed to regulate the flow of uncontrolled traffic above, around, and below the arrival and departure airspace required for high-performance, passenger-carrying aircraft at major airports. Class B airspace is the most restrictive controlled airspace routinely encountered by pilots operating under visual flight rules (VFR) in an uncontrolled environment. The four layers of the airspace surrounding TPA are shown in Figure 4-3.

To fly through Class B airspace, an aircraft must have special radio and navigation equipment and must obtain an ATC clearance. To operate within the TPA Class B airspace, a pilot must have at least a private pilot's certificate or be a student pilot who has met the requirements of Federal Aviation Regulations (FAR) 61.95, which requires special ground and flight training for Class B airspace. Those aircraft within 30 miles of TPA and below 10,000 feet MSL must be equipped with a Mode C transponder, which automatically reports the aircraft's altitude to ATC radar. No fixed-wing aircraft are allowed to operate under these Special VFR conditions; however, helicopters can operate within TPA Class B surface area under these rules as long as they stay at or below 1,600 feet. Helicopters flying under VFR and intending to depart TPA's Class B airspace must have clearance from TPA Clearance Delivery personnel.

Class C Airspace

Class C airspace surrounds airports that have an operational ATCT, are serviced by a radar approach control, and have a certain number of instrument flight rules (IFR) operations or passenger enplanements. In the case of SRQ, Tampa Approach Control provides approach control services.

There are two layers of Class C Airspace centered around SRQ. The inner core area is approximately 10 nautical miles in diameter and extends from the airport's elevation to 1,200 feet AGL. The outer area has a diameter of approximately 18 nautical miles and extends from 1,200 feet AGL to 4,000 feet AGL. The Class C airspace is active between 6 a.m. and 12 midnight local time. When the SRQ tower is not in operation, the Class C airspace resorts to Class E airspace.

Class D Airspace

The airspace under the jurisdiction of a local ATCT is called Class D airspace. Class D airspace provides airspace within which a tower can control aircraft in the vicinity of an airport. Its configuration is typically designed to encompass the published airspace procedures associated with the airport. Aircraft operating within this area are required to maintain radio communication with the control tower.

There are three airports in the vicinity of TPA that have a control tower and, therefore, require users to observe Class D airspace operating rules. These are St. Petersburg-Clearwater International (PIE), Albert Whitted Municipal, and MacDill Air Force Base (AFB). The top elevations of Class D airspace for PIE and Albert Whitted Municipal are both 2,500 feet MSL. The top elevation of Class D airspace for MacDill AFB is 2,600 feet MSL.

The Class B airspace associated with TPA encompasses and intersects portions of the

Class D airspace for these three airports. The PIE tower controls the Class D airspace in the areas that intersect the Tampa Class B airspace up to 1,600 feet MSL. The Class D airspace for PIE is active between 6:30 a.m. and 10:30 p.m. local time.

The tower at Whitted Municipal also controls the Class D airspace in the areas which intersect TPA's Class B airspace up to 1,600 feet MSL; however, this is scheduled to be lowered to 1,500 feet MSL. The Class D airspace at Whitted Municipal is active between 7 a.m. and 9 p.m. When the towers are not operating PIE or Whitted, the associated Class D airspace becomes Class E airspace.

The MacDill tower is a 24-hour facility that controls Class D airspace in the areas that intersect TPA Class B airspace to an elevation of 1,200 feet MSL. The MacDill tower also gives over control of a portion of its Class D airspace to Tampa Approach Control.

4.2.2 Air Traffic Control

Air traffic control plays a critical part in noise compatibility planning. The development of new flight tracks to provide noise abatement benefits must be coordinated and approved by ATC to insure that the procedures considered are operationally viable. ATC must consider safety and efficiency when new flight tracks are being developed. Noise abatement procedures can and should provide benefits to the Airport's surrounding communities but not at the cost of public safety.

The TPA ATCT is the agency responsible for controlling aircraft operations within the TPA terminal area. The TPA ATCT controls the airspace in an area extending approximately 45 nautical miles north, 60 nautical miles south, 45 nautical miles east, and 35 nautical miles west of TPA, with varying altitudes of control throughout. The bulk of this area is centered over the Airport from the surface up to 12,000 feet MSL. There are slight differences in the top elevation in some areas of this controlled airspace (to the west over water, to the north, to the northeast, and to the south) where control is limited to 10,000 feet MSL.

There is one other portion of the area controlled by the TPA ATCT (an area approximately 10 nautical miles east of Lakeland Linder Regional Airport (LAL) that is surface to 3,000 feet MSL). TPA's Class B airspace is a smaller interior portion of this larger area of control with four different segmented elevations centered on the Airport. The boundaries of the Class B airspace follow geographic features, including water and roads.

The TPA ATCT provides two levels of air traffic control: tower control for TPA itself, and terminal radar approach control (TRACON) for the rest of the terminal area surrounding TPA.

The TPA ATCT exercises control over aircraft operations on the ground and in the airport traffic control area (Class D) at TPA. Both the TPA ATCT and TRACON (described below) are headed by an area manager who uses 11 teams of controllers, each headed by an area supervisor, to control operations 24 hours a day.

The Tampa TRACON is the second level of air traffic control provided by Tampa ATCT. The TRACON exercises radar traffic control in the terminal area from a facility located in the base building for the Airport's ATCT.

Tampa TRACON manages all traffic in the Class B airspace which is not under tower control, and handles IFR arrivals and departures for area airports and other IFR traffic within its designated airspace.

4.2.3 Neighboring Airports

Figure 4-4 shows the airports in the vicinity of TPA. There are currently 13 airports operating within 30 nautical miles of TPA. Although SRQ is more than 30 miles from TPA, it is included because of the extent of airspace interactions. The airports include:

- Albert Whitted Municipal
- Clearwater Airpark
- Hernando County
- Lakeland Linder Regional
- MacDill AFB
- Peter O. Knight
- Plant City Municipal
- Sarasota/Bradenton International
- St. Petersburg/Clearwater International
- Tampa North Aero Park
- Tampa Bay Executive
- Vandenberg
- Zephyrhills Municipal

Albert Whitted Municipal (SPG), SRQ, PIE, and MacDill AFB are the only airports within the TPA terminal area with ATCTs other than TPA.

4.2.4 Local Air Traffic Control Procedures

Local ATC procedures are established to separate traffic and assign ATC responsibilities, and to accommodate approved noise abatement procedures. These procedures are designed to maintain the capacity of the local system, simplify ATC coordination requirements, and reduce noise levels over non-compatible land uses. Different procedures apply to visual and instrument traffic.

Visual Flight Rules

Aircraft departing TPA under VFR come under positive control of the TPA ATCT when in Class B airspace. Aircraft must comply with local airspace restrictions and contact the appropriate controlling agency to enter special use airspace. Aircraft landing at TPA must contact appropriate TRACON personnel prior to entering the TPA Class B airspace. The arrival procedure will vary depending on the operational flow and volume of traffic.

IFR Procedures

Aircraft under IFR and coming from or going to the north are generally under control of the Jacksonville air route traffic control center (ARTCC) outside of Tampa TRACON airspace. ARTCCs control aircraft operating under IFR within controlled airspace in the en route phase of flight; an individual ARTCC is typically referred to as a "center." Aircraft staying low and going east may go directly into Orlando TRACON airspace. IFR aircraft coming from or going to the south are under control of the Miami ARTCC.

When ARTCC personnel prepare to transfer arriving turbojet or other high-performance IFR aircraft to Tampa TRACON control, they clear aircraft to TPA via a standard terminal arrival route (STAR). A STAR is a preplanned IFR ATC arrival procedure published for pilot use. STARs use a combination of published VOR radials and intersections and ATC-assigned vectors, altitudes, and speeds to route aircraft into the arrival flow sequence. STARs are generally utilized by heavier and faster turbojet aircraft. Other aircraft are brought to the Airport using Arrival Transition Areas (ATAs) which are defined in the agreements between the Tampa ATCT and the two Centers (Miami and Jacksonville). Aircraft are typically assigned to one of four established arrival posts based on the aircraft's city of origin. The four STAR routings are directed to the St. Petersburg VOR (the closest VOR to TPA).

TPA's STARs and ATAs are depicted in **Figure 4-5.** The four STARs, designated by five-letter codes, are briefly described below.

- BLOND TWO Arrival—for aircraft arriving from the west. This is an over-the-water STAR.
- BRDGE FIVE Arrival—for aircraft arriving from the southeast.
- DADES ONE Arrival—for aircraft arriving from the east and north using fixes off the MARVI checkpoint and from the Orlando VOR.
- DARBS ONE Arrival—for aircraft arriving from the northwest.

For departing IFR turbojet aircraft, the FAA issues standard instrument departures (SIDs). There is one official published SID available for TPA departures called the TAMPA THREE Departure. In addition to this single SID (usually utilized only by heavier and faster turbojet aircraft), all other aircraft are vectored toward Departure Transition Areas (DTAs).

There are eight DTAs associated with TPA which are defined in the agreements between TPA ATCT and Miami and Jacksonville Centers. For turbojet aircraft, there are two departure routes to the north into Jacksonville Center airspace. For turbojet aircraft departing to the south, there are three routes into Miami Center airspace. TPA's SIDs and DTAs are depicted in **Figure 4-6.**

Other Procedures

To increase capacity, conserve fuel, and improve controller workload, certain aircraft landing on intersecting runways at TPA are allowed to land simultaneously and hold short of the intersecting runway. These land and hold short operations (LAHSOs) are permitted for certain aircraft and are allowed only when dry conditions prevail.

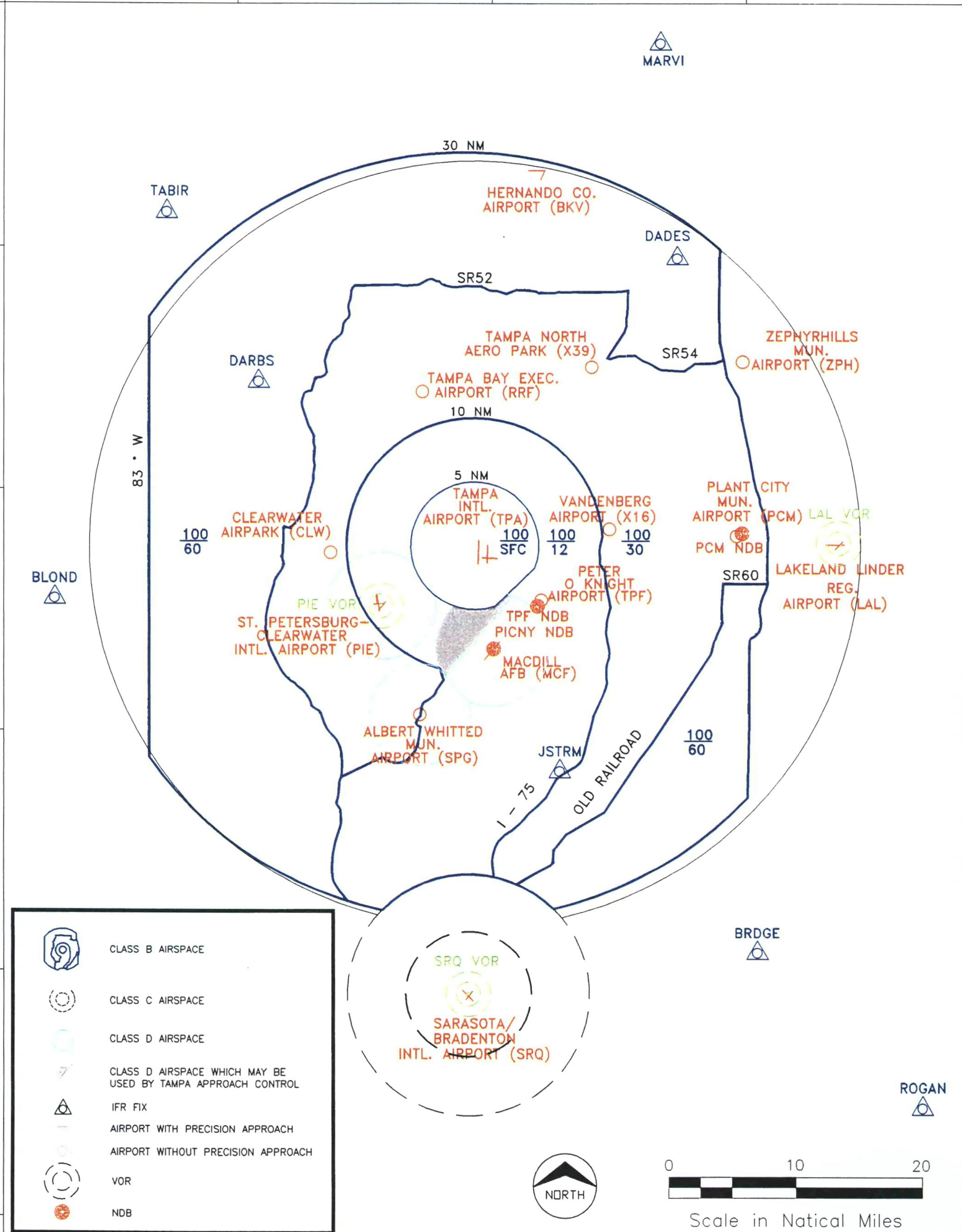
Runway 27 has a LAHSO effective length of 4,350 feet; LAHSO operations are authorized for aircraft within Design Groups I and II (e.g., most GA aircraft and most regional turboprops).

Runway 18L has a LAHSO effective length of 5,650 feet; LAHSO operations are authorized for Design Groups I, II, and III aircraft. Group III aircraft include most narrow-body air carrier aircraft, such as the DC-9, MD-80, B-737, and B-727.

Runways 9 and 36R have LAHSO lengths of 2,100 feet and 2,000 feet, respectively. Only smaller GA aircraft and small commuter aircraft (e.g., the Swearingen Metro) are authorized for LAHSO operations on these runways.

ATC personnel plan to allow LAHSO during wet conditions; however, HCAA would need to install in-pavement lighting.

A *Media Control Route* is available for operators of fixed- and rotary-wing aircraft



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HILLSBOROUGH COUNTY AVIATION AUTHORITY

TAMPA INTERNATIONAL AIRPORT

TAMPA - FLORIDA

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

PROJECT NAME: Master Plan Update \ FAR Part 150 Study

DRAWING TITLE: AIRSPACE STRUCTURE AND SURROUNDING AIRPORTS

DRAWING NO. FIGURE 4-4

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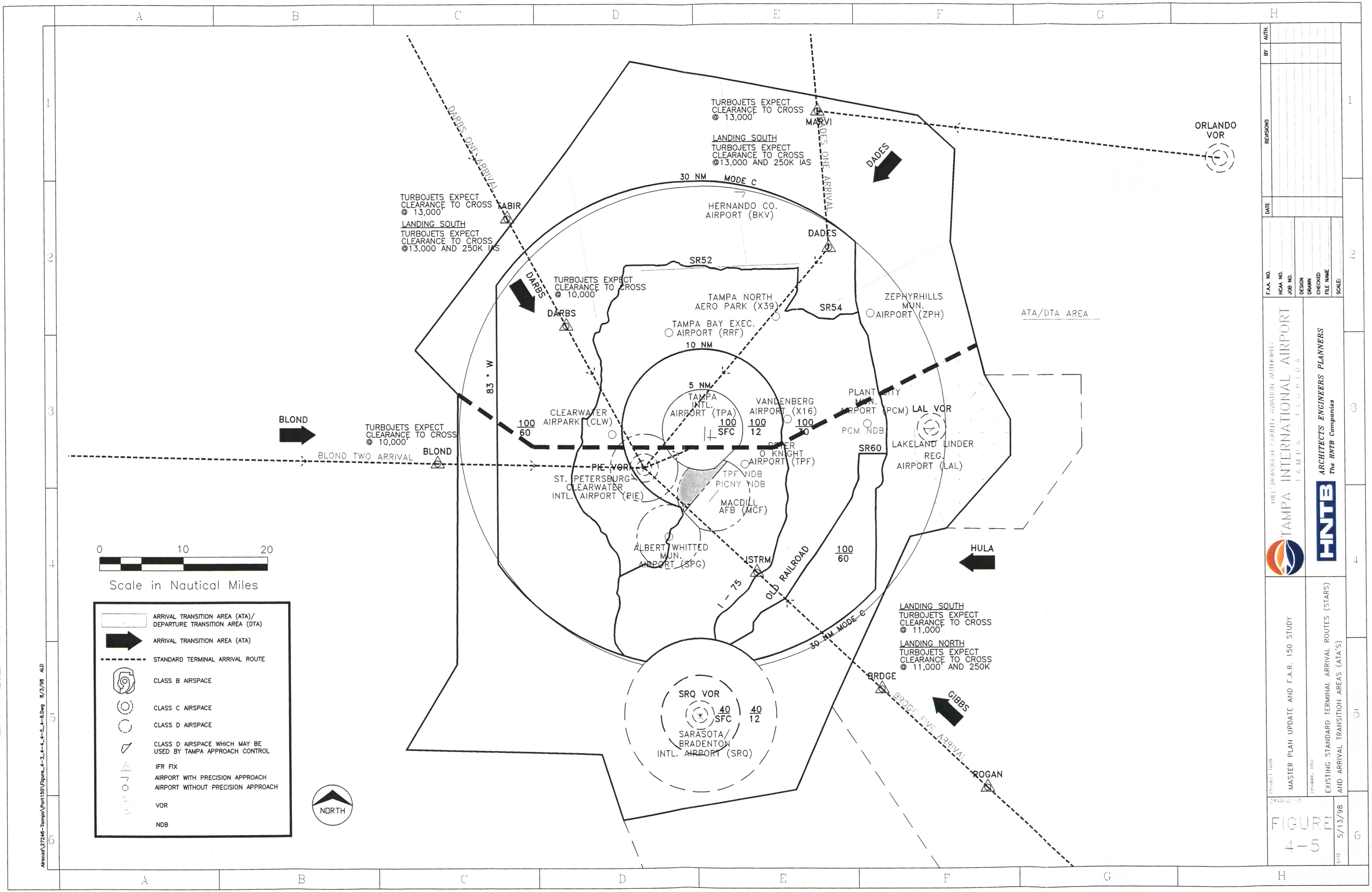
TURBOJETS EXPECT CLEARANCE TO CROSS @ 13,000'
MARVI
LANDING SOUTH
TURBOJETS EXPECT CLEARANCE TO CROSS @13,000 AND 250K IAS
DADES
ORLANDO VOR
DARBS ONE ARRIVAL
DADES ONE ARRIVAL
30 NM MODE C
HERNANDO CO. AIRPORT (BKV)
TURBOJETS EXPECT CLEARANCE TO CROSS @ 13,000'
TABIR
LANDING SOUTH
TURBOJETS EXPECT CLEARANCE TO CROSS @13,000 AND 250K IAS
SR52
DARBS
TURBOJETS EXPECT CLEARANCE TO CROSS @ 10,000'
TAMPA NORTH AERO PARK (X39)
SR54
ZEPHYRHILLS MUN. AIRPORT (ZPH)
ATA/DTA AREA
TAMPA BAY EXEC. AIRPORT (RRF)
10 NM
83° W
5 NM
TAMPA INTL. AIRPORT (TPA)
100 SFC
VANDENBERG AIRPORT (X16)
100 12
100 30
PLANT CITY MUN. AIRPORT (PCM)
LAL VOR
PCM NDB
LAKELAND LINDER REG. AIRPORT (LAL)
SR60
CLEARWATER AIRPARK (CLW)
100 60
BLOND
TURBOJETS EXPECT CLEARANCE TO CROSS @ 10,000'
BLOND TWO ARRIVAL
BLOND
PIE VOR
PETER O KNIGHT AIRPORT (TPF)
TPF NDB
PICNY NDB
ST. PETERSBURG-CLEARWATER INTL. AIRPORT (PIE)
MACDILL AFB (MCF)
ALBERT WHITTED MUN. AIRPORT (SPG)
STRM
OLD RAILROAD
I - 75
100 60
HULA
LANDING SOUTH
TURBOJETS EXPECT CLEARANCE TO CROSS @ 11,000'
LANDING NORTH
TURBOJETS EXPECT CLEARANCE TO CROSS @ 11,000' AND 250K
30 NM MODE C
BRDGE
BRDGE FIVE ARRIVAL
GIBBS
SRQ VOR
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SARASOTA/BRADENTON INTL. AIRPORT (SRQ)
ROGAN
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10
20
Scale in Nautical Miles
ARRIVAL TRANSITION AREA (ATA)/DEPARTURE TRANSITION AREA (DTA)
ARRIVAL TRANSITION AREA (ATA)
STANDARD TERMINAL ARRIVAL ROUTE
CLASS B AIRSPACE
CLASS C AIRSPACE
CLASS D AIRSPACE
CLASS D AIRSPACE WHICH MAY BE USED BY TAMPA APPROACH CONTROL
IFR FIX
AIRPORT WITH PRECISION APPROACH
AIRPORT WITHOUT PRECISION APPROACH
VOR
NDB
NORTH
A B C D E F G H
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MASTER PLAN UPDATE AND F.A.R. 150 STUDY
EXISTING STANDARD TERMINAL ARRIVAL ROUTES (STARS) AND ARRIVAL TRANSITION AREAS (ATA'S)
FIGURE 4-5
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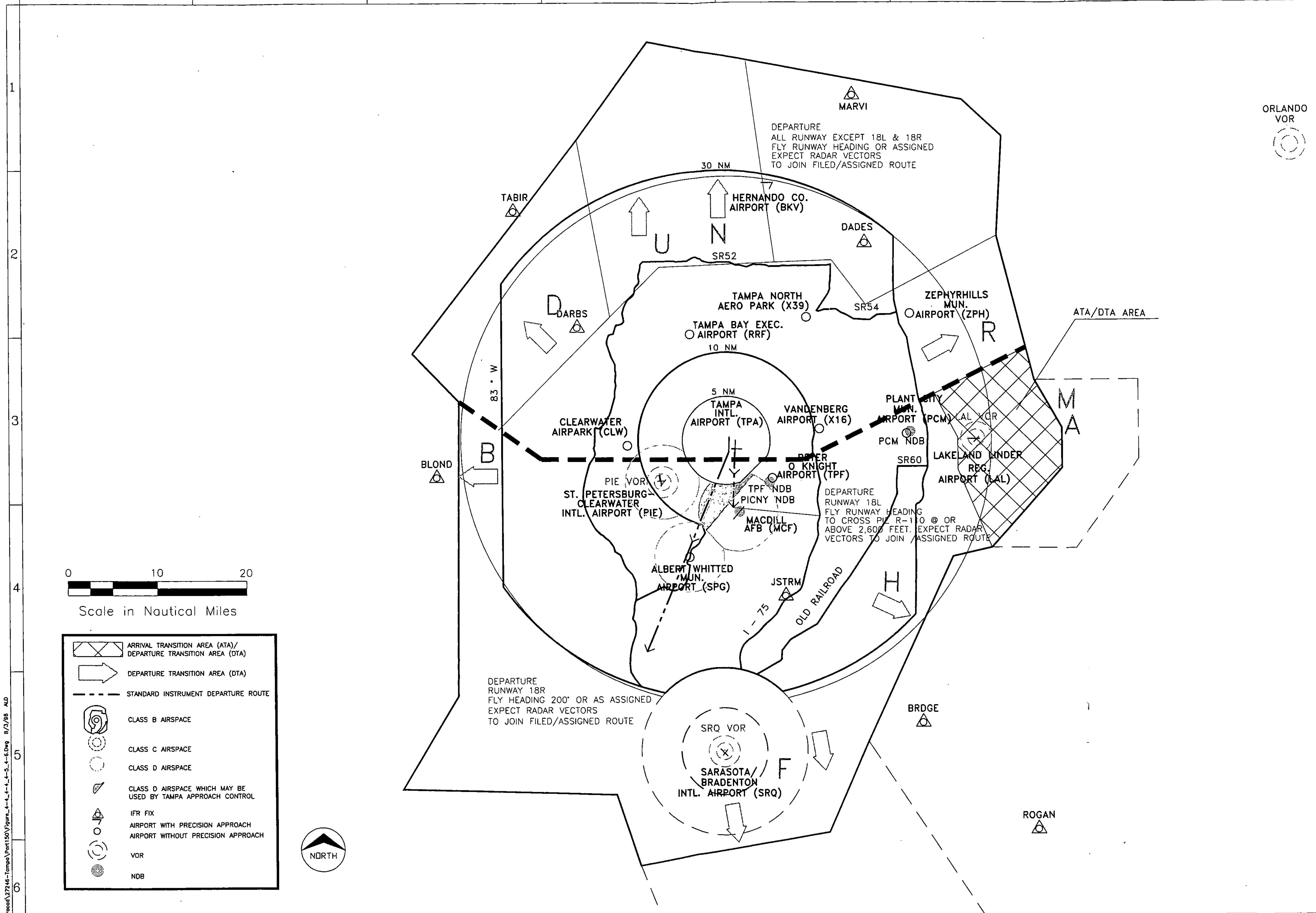

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TAMPA - FLORIDA

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PROJECT NAME
MASTER PLAN UPDATE AND F.A.R. 150 STUDY

DRAWING TITLE
EXISTING STANDARD INSTRUMENT DEPARTURE RTS. (SIDS) AND DEPARTURE TRANSITION AREAS (DTA'S)

DRAWING NO.
FIGURE 4-6

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operated by television and radio stations. To use this route, aircraft must fly along two elongated traffic patterns on either side of TPA's parallel runways. A crossover point between the two areas occurs approximately 1,000 feet MSL and approximately 9 nautical miles north of the Runway 18L threshold.

The *9-27 Bridge* is a portion of the TPA Class B airspace earmarked for aircraft to transit the area from either an eastbound or westbound direction. All aircraft other than turbojets are allowed to utilize this "bridge" which is parallel to the east-west crosswind runway (9-27). The altitude limits within which these aircraft can traverse the area are 2,100 feet and 4,000 feet MSL. While the bridge is in use, aircraft departing the parallel runways and making turns must stay below 1,600 feet MSL to provide adequate altitude separation.

4.3 NOISE MODELING METHODOLOGY

The number and type of aircraft are obviously important aspects of the aircraft noise environment. Forecasts of aircraft operations are necessary to estimate future noise levels and to predict the pattern of runway and flight track use.

4.3.1 Aviation Forecasts

As part of the 1999 TPA Master Plan, a complete aviation activity forecast was completed. The Master Plan review process required that the forecast be reviewed and approved by the FAA. These forecasts were utilized for evaluating airfield capacity and delay as well as for analysis of environmentally sensitive impacts such as noise and air quality. The information that follows is a summary of the forecast factors used in the 1999 Master Plan forecasts. For a detailed discussion of these forecasts see Chapter Four, Annual and Derivative Forecasts, in the 1999 Master Plan.

Socioeconomic Factors

Passenger travel is ultimately determined by the strength of the economy and the cost of the service. The ultimate determinants of passenger travel are the strength of the economy and the cost of the service. Thus, any evaluation of this type of activity should take these factors into account.

The Tampa-St. Petersburg-Clearwater metropolitan statistical area (MSA) includes Hernando, Hillsborough, Pasco, and Pinellas Counties. For development of aircraft operations forecasts, the area of potential affect was defined to include the Tampa MSA, combined with Citrus, Sumter, and Manatee Counties and the western half of Polk County.

The numerical growth of the U.S. population between 1969 and 1995 totaled 61.6 million, an increase of 30.6 percent. The State of Florida population over this 26-year period more than doubled in size. The Tampa MSA increased at three times the rate of the U.S., more than doubling in size over the same period. However, when compared to the growth patterns of the entire State of Florida, the Tampa MSA grew at a slightly slower pace with an average annual increase of 2.8 percent compared to 3.0 percent for the State. The Tampa extended area grew slightly faster than the Tampa MSA, reflecting the trend for outer suburbs and satellite cities to grow faster than the core metropolitan areas.

The Tampa MSA is projected to increase to over 2.9 million by the end of the forecast period, an average annual growth rate of 1.2 percent. The population in the expanded area is projected to increase to over 3.8 million, an average annual increase of 1.3 percent. These growth rates are slightly lower than those projected for Florida over the same period (1.4 percent) but still much higher than the growth rate projected for the U.S. (0.9 percent).

Changes in employment numbers and the rate of change for the subject 25-year period would normally parallel those of the population. However, over the past 25 years, the overall rate of growth was significantly greater for employment than for population. For example, the overall population increase for the Tampa MSA was 102 percent but the employment increase was 163 percent. This increase in the employment-to-population ratio corresponds, in part, to the previously cited trends, such as the changing composition in the labor force, the maturing of the "Baby Boomer" generation, and the gradual decline in average family size during the past 25 years. Most of the employment growth occurred in the 1970s and 1980s. The early 1990s saw a leveling off of employment which was directly attributable to the recession.

Both the Tampa and U.S. economies have experienced a significant transition over the past quarter of a century. The most rapidly growing sector has been the service sector, including personal services, business services, the amusement industry, legal services, and health services. There is no accurate information on the extent of this growth because the rapidly growing temporary employment sector, which is classified as a service industry, actually provides employment in all sectors. The most significant declines have been in the farm and manufacturing sectors, paralleling the experience in the U.S.

Both the BEA and UF forecasts project employment to continue to grow through the forecast period, but lower rates are projected in the later years as an increasing number of people enter retirement age.[10] The BEA projects employment in the Tampa MSA to increase by 1.8 percent annually through 2020, while the UF projects employment to grow by 1.6 percent annually through 2010. The Expert Panel noted that the Tampa Bay area has a lower labor cost compared to the U.S. average, making it attractive to business and industry. This supports the BEA and UF projections that Tampa area employment will continue to exceed national averages.

As with population, a combined UF/BEA forecast of employment was developed for this study. The projected average annual growth rates are 1.4 percent for the Tampa MSA and TPA catchment areas, 1.6 percent for Florida, and 0.9 percent for the United States. Future employment is projected to continue to grow faster than population, though the difference is not expected to be as great as in the past. After 2010, the rate of increase in employment begins to parallel that of population as an increasing number of people enter retirement age.

Historical data from 1969 to 1995 indicates that the growth in both population and employment within the Tampa portion of the State of Florida has remained fairly constant. Conversely, the historic income data for Tampa as a portion of the U.S. income shows a steady increase, ranging from 0.50 percent in 1969 to 0.81 percent in 1995. During that time, income in Tampa grew at a

4.9 percent annual rate, compared to 5.0 percent for Florida and 3.0 percent in the United States over the same period.

Per capita income is a more reliable means of depicting changes in relative welfare per individual over time since it adjusts for population change. The combined UF/BEA forecasts show an average annual increase of 1.2 percent for the Tampa MSA and catchment area, 1.1 percent for Florida, and 0.8 percent for the United States.

Airline Industry Factors

Socioeconomic factors are an important determinant of passenger demand; however, the future structure of the aviation industry also plays a major role in shaping the level of passenger, cargo, and GA activity. The 1999 Master Plan forecast was developed considering the effect of yield (gross revenue per passenger mile) and the changes in the aviation industry that affect yield. Average aircraft size and load factor, developments in the regional carrier industry, and air cargo and GA trends were also considered in development of the forecast. Other aviation factors considered while developing the forecast included the decline in business travel as a percentage of U.S. air travel due to the use of teleconferencing, the introduction of new markets (i.e., leisure), and the potential for TPA to become a "focus city" for a low cost carrier.

Existing and Forecast Fleet Mix

Tables 4.1 and 4.2 show the fleet mix utilized for producing the noise contours by means of the INM Version 5.1. The Master Plan forecast was interpolated to determine operations for the years analyzed within this study.

The INM database contains standard noise, arrival and departure profiles, and performance data for over 100 different fixed-wing aircraft types, most of which are civilian aircraft. The program automatically accesses the applicable noise and performance data for departure and approach operations by those aircraft. The data must be manually entered into the model for aircraft not included in the database, such as helicopters, new aircraft, or modified aircraft, or for non-standard operations such as training patterns.

The majority of helicopter operations at TPA are conducted by Bell 206-type helicopters. All helicopter operations were modeled as the Bell 206, using noise data from the 1982 FAA document, Helicopter Noise Exposure Curves for Use in Environmental Impact Assessment[11] and flight profile data from the FAA's Helicopter Noise Model (HNM) database. The FAA has previously approved this method for Part 150 noise contour development.

The 2000 and 2005 projected aircraft fleet mixes include DC-9 and 737 aircraft types with retrofitted or hushkitted engines to meet Stage 3 noise emission standards. Operations by these aircraft were modeled according to FAA guidelines, using noise data adapted from the retrofitted 727 aircraft data which are included in the INM database in conjunction with the standard DC-9 and 737 aircraft performance data.

All other modeled aircraft operations in this study used standard INM database noise and performance data. For aircraft types not specifically included in the database, substitutions were made according to the FAA's pre-approved substitution list.

Table 4.1

Modeled Average Daily Aircraft Operations - 2000

Aircraft Category	INM Aircraft Type	Daily Departures		Daily Arrivals	
		Day	Night	Day	Night
Air Carrier Jet	737600	.89	0.12	0.86	0.14
	737HK	10.42	0.65	10.61	0.46
	A319	1.34	0.08	1.30	0.12
	DC9HK	4.56	0.42	4.26	0.72
	727EM1	0.80	0.26	1.01	0.05
	727EM2	9.75	0.17	8.73	1.19
	727Q15	10.59	0.04	8.93	1.69
	727Q7	1.42	0.06	0.46	0.02
	737300	27.14	1.07	25.96	2.24
	737400	12.74	0.44	10.92	2.28
	737500	5.76	0.24	6.00	0.00
	737D17	12.11	0.70	12.47	0.34
	747400	0.06	0.00	0.06	0.00
	757PW	16.85	2.85	11.89	7.81
	767300	2.77	0.06	2.83	0.00
	767JT9	3.61	0.06	3.59	0.07
	A300	0.80	0.00	0.04	0.76
	A310	0.09	0.02	0.09	0.01
	A320	7.92	0.09	6.46	1.54
	DC1010	0.61	0.41	1.02	0.00
	DC870	0.12	0.39	0.50	0.00
	DC8QN	0.03	0.07	0.01	0.09
	DC950	1.11	0.14	1.23	0.02
	DC9Q9	2.33	0.21	2.30	0.23
	F10062	1.53	1.37	2.12	0.78
	L1011	3.70	0.73	3.68	0.75
	MD11PW	0.17	0.03	0.18	0.02
	MD81	19.85	1.90	20.07	1.68
	MD9025	0.47	0.03	0.43	0.08
	Subtotal	**158.50**	**12.59**	**148.00**	**23.10**
Corporate Jet	CIT3	6.14	0.61	6.28	0.47
	CL601	2.15	0.04	2.15	0.05
	CNA500	9.28	0.92	9.49	0.71
	GIIB	0.18	0.02	0.18	0.02
	LEAR25	4.10	0.41	4.19	0.32
	LEAR35	6.61	1.14	6.49	1.26
	Subtotal	**24.47**	**3.13**	**28.77**	**2.84**
Turboprop	CNA441	10.21	0.77	10.43	0.55
	DHC6	37.99	0.00	37.15	0.84
	DHC7	0.97	0.00	0.97	0.00
	DHC8	51.61	0.00	50.49	1.12
	SD330	5.37	0.47	5.84	0.00
	SF340	11.56	1.88	12.34	1.10
	Subtotal	**117.71**	**3.12**	**117.23**	**3.60**
Piston	BEC58P	6.25	1.73	5.49	2.49
	COMSEP	11.30	8.86	6.92	13.24
	Subtotal	**17.55**	**10.58**	**12.41**	**15.73**
Helicopter	B206L	2.42	0.02	2.43	0.01
TOTAL		**308.83**	**45.28**	**324.67**	**29.45**

Table 4.2

Modeled Average Daily Aircraft Operations - 2005

Aircraft Category	INM Aircraft Type	Daily Departures		Daily Arrivals	
		Day	Night	Day	Night
Air Carrier Jet	737600	3.03	0.42	3.01	0.49
	737HK	14.11	0.84	14.32	0.63
	A19	14.27	0.59	7.35	0.75
	DC9HK	3.85	0.35	3.66	0.54
	727EM1	1.19	0.51	1.45	0.26
	727EM2	9.87	0.31	8.82	1.36
	737300	36.66	1.40	35.04	3.02
	737400	21.29	1.16	19.38	3.08
	737500	7.28	0.32	7.60	0.00
	747400	0.12	0.00	0.12	0.00
	757PW	23.42	3.82	17.90	9.28
	767300	7.74	0.32	7.92	0.13
	767JT9	5.39	0.19	5.29	0.29
	A300	1.07	0.00	0.05	1.02
	A310	0.30	0.05	0.26	0.09
	A320	20.13	0.33	16.64	3.83
	BAE146	1.28	0.02	1.27	0.03
	DC1010	0.65	0.45	1.10	0.00
	DC870	0.05	0.15	0.20	0.00
	DC950	0.18	0.02	0.18	0.02
	F10062	2.39	1.40	2.95	0.86
	L1011	2.11	0.4	2.08	0.43
	MD11PW	0.85	0.22	0.89	0.18
	MD81	18.49	1.55	18.30	1.70
	MD9025	1.80	0.09	1.62	0.28
	Subtotal	**190.83**	**14.91**	**177.40**	**28.25**
Corporate Jet	EMB135	0.98	0.02	0.97	0.03
	EMB145	0.98	0.02	0.97	0.03
	CIT3	6.73	0.67	6.88	0.52
	CL601	4.45	0.08	4.42	0.11
	CNA500	10.10	1.00	10.32	0.78
	GIIB	0.18	0.02	0.18	0.02
	LEAR25	4.50	0.45	4.60	0.35
	LEAR35	7.20	1.20	7.10	1.30
	Subtotal	**35.13**	**3.46**	**35.45**	**3.13**
Turboprop	AYRES	2.13	2.37	0.96	3.54
	CNA441	10.42	0.78	10.64	0.56
	DHC6	34.20	0.00	33.45	0.75
	DHC7	1.30	0.00	1.30	0.00
	DHC8	66.28	0.00	64.84	1.44
	SD330	7.45	0.65	8.10	0.00
	SF340	13.10	2.05	13.88	1.27
	Subtotal	**134.88**	**5.85**	**133.17**	**7.56**
Piston	BEC58P	6.37	1.73	5.61	2.49
	COMSEP	10.51	8.19	6.50	12.20
	Subtotal	**16.88**	**9.92**	**12.11**	**14.69**
Helicopter	B206L	2.48	0.03	2.49	0.01
TOTAL		**360.62**	**53.64**	**380.11**	**34.16**

Aircraft Substitutions

The INM database generally does not include the exact models of every aircraft type that must be modeled at an airport. To address this situation, the FAA policy is that the contour preparer presents a request identifying the aircraft types to be modeled, and the agency provides appropriate guidance. For the contours in this study, HMMH requested and received FAA guidance as shown in **Table 4.3.**

Appendix C provides a copy of the FAA response.

4.3.2 Runway Utilization

Part 150 specifies that the base case and 5-year forecast case Noise Exposure Map (NEM) present DNL contours resulting from operations on the "average annual day"; i.e., total annual operations divided by 365. Operations must be allocated among the six runway ends at TPA in the same proportions as the overall yearly distribution. The runway use must take into account effects of wind, weather, runway instrumentation, traffic conditions, aircraft performance (runway length), and other operational requirements. Because of the 10 dB weighting added to nighttime activity, DNL requires separate runway use rates for day and night operations.

Wind speed and direction are critical considerations because safe aircraft operation places limits on permissible crosswind and tailwind components. The specific limits differ among aircraft types. In general, above approximately 10 knots, aircraft must take off and land into the wind. The TPA runway configuration lends itself to two principal flows: north (operation on Runways 36R and L) and south (18R and L). The crosswind component from the east or west is rarely high enough to require that larger aircraft use Runway 9 (east flow) or 27 (west flow). Lighter aircraft (particularly single and twin-engine propeller types) use this runway more frequently because of their lower crosswind limits, and also for capacity reasons to reduce demand on the north-south parallels.

Table 4.3

FAA Recommended Aircraft Substitution

HMMH Request for Substitution				FAA Recommended Substitution				
Aircraft Type	**Engine**	**Maximum Takeoff Weight**	**Thrust per Engine (1,000s of lbs.)**	**INM Aircraft Number**	**Aircraft Type**	**Engine**	**Maximum Takeoff Weight**	**Thrust per Engine (1,000s of lbs.)**
B737-600	CFM56-7B	143.5	22	36	737B2	CFM56-3B-2	139	20
B767-400	PW4000/CF M6-80	450	N/A	87	767300	PW4060	407	60
A-319	CFM56-5A4 IAE-V2522	150	23	97	A320	CFM56-5A-1	162	25
Ayres Loadmaster	Allison CTP-800	19	2,400 h.p.	68	SD330	PT6A-45AR	22.9	1,245 h.p.
EMB 145	AE3007A	7	43	61	CL601	CF34-3A	9.2	43
EMB 135	N/A	N/A	N/A	58	CL600	ALF502L	7.5	36

Source: HMMH analysis and coordination with FAA.

As Section 1.4.1 discusses, the FAA-approved elements of the NCP from the original Part 150 study included a measure calling for the Airport to "use southerly traffic flows whenever possible." The FAA ATCT at TPA implements the Airport's preferential runway program, through the Tampa Air Traffic Control Tower Letter to Airmen 98-05, that applies to all turbojet operations. **Appendix D** presents a copy of that Letter to Airmen.

The ATCT Letter establishes the following runway use priorities:

- Daytime (6 a.m. to midnight)

    1. South operation: arrive 18L/R, depart 18R
    2. South operation: arrive 18L/R, depart 18L
    3. North operation: depart 36L/R, arrive 36L
    4. North operation: depart 36L/R, arrive 36R
    5. East/west operation: arrive/depart 9 or 27

- Nighttime (midnight to 6 a.m.)

"When traffic, wind weather, and field conditions permit, and no delays to arrivals or departures will result, Tower will use Runway 18R for turbojet departures and Runway 36L for turbojet arrivals. If conditions do not permit, then runways will be assigned [in the daytime order of priority]."

The Letter includes additional terms related to "operational safety criteria" and the implementation of the procedures. The Letter also includes sections related to flight tracks, as discussed in Section 4.3.3. The NCP phase of this study will consider all elements of the Letter, including implementation criteria and procedures.

Development of Runway Use Rates for Modeling

Runway use rates were developed using a two-step process, as described below.

Step 1. Develop overall north/south/east/west split of air carrier runway utilization.

Air carrier jets are the most important contributors to the overall airport noise exposure. The preceding runway use priorities were applied to long-term historic "wind rose" data to develop the overall split of traffic flow for these aircraft. FAA ATCT staff provided further clarification of their application of those priorities:

- Parallel runways used in south flow (18L-R) during calm winds (up to 3 knots).

- Parallel runways (18L-R and 36L-R) used up to a 15-knot crosswind.

- Crosswind runway (9-27) used when crosswind on parallels exceeds 15 knots.

- Most common air carrier use of crosswind runway is for arrivals on 27.

- Other air carrier use of crosswind runway is too rare to consider.

Application of these runway assignment criteria to historic wind data indicated that Runway 9-27 would only be required on the order of one percent of the time. It also suggested an overall south-flow (Runway 18) use on the order of 67 percent to 68 percent of the time. These results were consistent with verbal estimates of runway use from Authority and FAA staff, and also with the 65 percent use of Runway 18 that the original Part 150 study estimated for the preferential runway.

Table 4.4 presents the results of this overall flow analysis:

Table 4.4

North-South Traffic Flow

Estimated TPA Air Carrier Runway Flows

Assuming Use of 18R-36L Up to 15-Knot Crosswind and Use of 18L When Winds Below Three Knots

Runway	Percentage Use	
End	Departures	Arrivals
18R	67	67
36L	33	33
9	Trace	Trace
27	Trace	Trace

Note: The term "trace" for air carrier use of Runway 9-27 is used in this table to recognize that large airline type jets do occasionally use the crosswind runway. However, that use is below one percent and would not have a significant effect on the contours; in fact, the number of affected operations would likely be below the noise model's threshold for inclusion in the calculations.

Source: HMMH, 1997.

Step 2. Distribute air carrier jet operations between parallels and develop detailed utilization rates for other aircraft groups.

The FAA provided a large sample of flight track (radar) data from the TPA Automated Radar Terminal Service (ARTS) system. The sample includes data from the following dates and times (a total of slightly over 18 days) and approximately 15,000 flight tracks:

- March 15, 1997, 2:07 p.m. - March 18, 1997, 2:37 p.m.
- October 8, 1997, 6:15 p.m. - October 23, 1997, 11:21 p.m.[12]

The ARTS data provide detail on the distribution of operations among the runways (such as the split of operations on the parallels) in north and south flow. **Tables 4.5 and 4.6** present the results of that analysis for major aircraft type categories (defined by common runway and flight track use characteristics) including:

- Air carrier jets, including military equivalents
- Twin turboprop aircraft
- Corporate jets, including military equivalents .
- Piston propeller aircraft

Combining the north and south detail from Tables 4.5 and 4.6 with the wind rose analysis from Table 4.4 provided the "annualized" runway use rates presented in **Table 4.7.**

4.3.3 Flight Track Geometry and Usage

The flight track geometry and use rates for each major category of aircraft operating at TPA were developed from the ARTS data samples. For each aircraft category, a set of prototypical arrival and departure flight paths on each runway end were prepared, and traffic counts were used to develop flight track utilization rates, including the split of use between the parallel runways.

Table 4.5

Modeled Runway Use
North Flow

Aircraft Category	Runway	Departures Day	Departures Night	Arrivals Day	Arrivals Night
Air Carrier Jet (includes Military DC9s)	09	0.0%	0.0%	0.0%	0.0%
	18L	0.0%	0.0%	0.0%	0.0%
	18R	0.0%	0.0%	0.0%	0.0%
	27	0.0%	1.0%	1.0%	1.0%
	36L	54.5%	54.5%	99.0%	99.0%
	36R	45.5%	45.5%	0.0%	0.0%
Corporate Jet (includes Military GIIBs)	09	0.0%	0.0%	0.0%	0.0%
	18L	0.0%	0.0%	87.2%	59.1%
	18R	0.0%	0.0%	11.8%	39.9%
	27	1.0%	0.0%	1.0%	1.0%
	36L	9.0%	0.0%	74.3%	58.8%
	36R	90.0%	100.0%	24.8%	40.2%
Turboprop	09	4.0%	1.0%	1.0%	1.0%
	18L	0.0%	0.0%	0.0%	0.0%
	18R	0.0%	0.0%	0.0%	0.0%
	27	1.0%	0.0%	3.0%	3.0%
	36L	68.3%	81.5%	61.9%	68.1%
	36R	26.7%	17.5%	34.1%	27.9%
Piston	09	54.0%	59.0%	3.0%	3.0%
	18L	0.0%	0.0%	0.0%	0.0%
	18R	0.0%	0.0%	0.0%	0.0%
	27	3.0%	14.0%	35.0%	35.0%
	36L	0.0%	0.0%	3.1%	6.2%
	36R	43.0%	27.0%	58.9%	55.8%

Source: HMMH analysis

Table 4.6

Modeled Runway Use
South Flow

Aircraft Category	Runway	Departures Day	Departures Night	Arrivals Day	Arrivals Night
Air Carrier Jet (includes Military DC9s)	09	0.0%	0.0%	0.0%	0.0%
	18L	1.5%	0.0%	38.4%	47.3%
	18R	98.5%	100.0%	60.6%	51.7%
	.27	0.0%	0.0%	1.0%	1.0%
	36L	0.0%	0.0%	0.0%	0.0%
	36R	0.0%	0.0%	0.0%	0.0%
Corporate Jet (includes Military GIIBs)	09	0.0%	0.0%	0.0%	0.0%
	18L	6.0%	0.0%	87.2%	59.1%
	18R	93.0%	100.0%	11.8%	39.9%
	27	1.0%	0.0%	1.0%	1.0%
	36L	0.0%	0.0%	0.0%	0.0%
	36R	0.0%	0.0%	0.0%	0.0%
Turboprop	09	4.0%	1.0%	1.0%	1.0%
	18L	32.0%	33.5%	34.0%	62.0%
	18R	64.8%	65.5%	62.0%	34.0%
	27	1.0%	0.0%	3.0%	3.0%
	36L	0.0%	0.0%	0.0%	0.0%
	36R	0.0%	0.0%	0.0%	0.0%
Piston	09	54.0%	59.0%	3.0%	3.0%
	18L	37.1%	27.0%	62.0%	62.0%
	18R	5.9%	0.0%	0.0%	0.0%
	27	3.0%	14.0%	35.0%	35.0%
	36L	0.0%	0.0%	0.0%	0.0%
	36R	0.0%	0.0%	0.0%	0.0%

Source: HMMH analysis.

Table 4.7

Modeled Runway Use
Annual Average Day

Aircraft Category	Runway	Departures Day	Departures Night	Arrivals Day	Arrivals Night
Air Carrier Jet (includes Military DC9s)	09	0.0%	0.0%	0.0%	0.0%
	18L	1.0%	0.0%	26.0%	32.0%
	18R	66.0%	67.0%	41.0%	35.0%
	27	0.0%	0.0%	1.0%	1.0%
	36L	18.0%	18.0%	32.0%	32.0%
	36R	15.0%	15.0%	0.0%	0.0%
Corporate Jet (includes Military GIIBs)	09	0.0%	0.0%	0.0%	0.0%
	18L	4.0%	0.0%	59.0%	40.0%
	18R	62.0%	67.0%	8.0%	27.0%
	27	1.0%	0.0%	1.0%	1.0%
	36L	3.0%	0.0%	24.0%	19.0%
	36R	30.0%	33.0%	8.0%	13.0%
Turboprop	09	4.0%	1.0%	1.0%	1.0%
	18L	20.0%	22.0%	23.0%	42.0%
	18R	43.0%	43.0%	42.0%	23.0%
	27	1.0%	0.0%	3.0%	3.0%
	36L	23.0%	28.0%	20.0%	22.0%
	36R	9.0%	6.0%	11.0%	9.0%
Piston	09	54.0%	59.0%	3.0%	3.0%
	18L	25.0%	18.0%	42.0%	42.0%
	18R	4.0%	0.0%	0.0%	0.0%
	27	3.0%	14.0%	35.0%	35.0%
	36L	0.0%	0.0%	1.0%	2.0%
	36R	14.0%	9.0%	19.0%	18.0%

Source: HMMH analysis.

Figures 4-7 through 4-14 present the modeling flight tracks overlaid on the actual radar tracks for departures and arrivals in the four major aircraft type categories. **Figure 4-15** presents the modeling tracks for helicopters. There were no identifiable helicopters in the ARTS data to use in developing these modeling tracks so they were based on standard FAA entry and exit portions of the "media routes" used by traffic patrols. **Tables 4.8 through 4.11** present the track utilization rates for air carrier jets, business jets, combined turboprop and piston propeller aircraft, and helicopters. The departure and arrival use data are combined on one table in each case.

4.3.4 Maintenance Runup Activity

Significant runup activity is performed by Delta Airlines and USAirways at their maintenance facilities on the east side of the Airport. **Figure 4-16** depicts the major runup locations that the carriers use.

The airlines' maintenance facility managers provided estimates of average daily runup activity, as summarized below.

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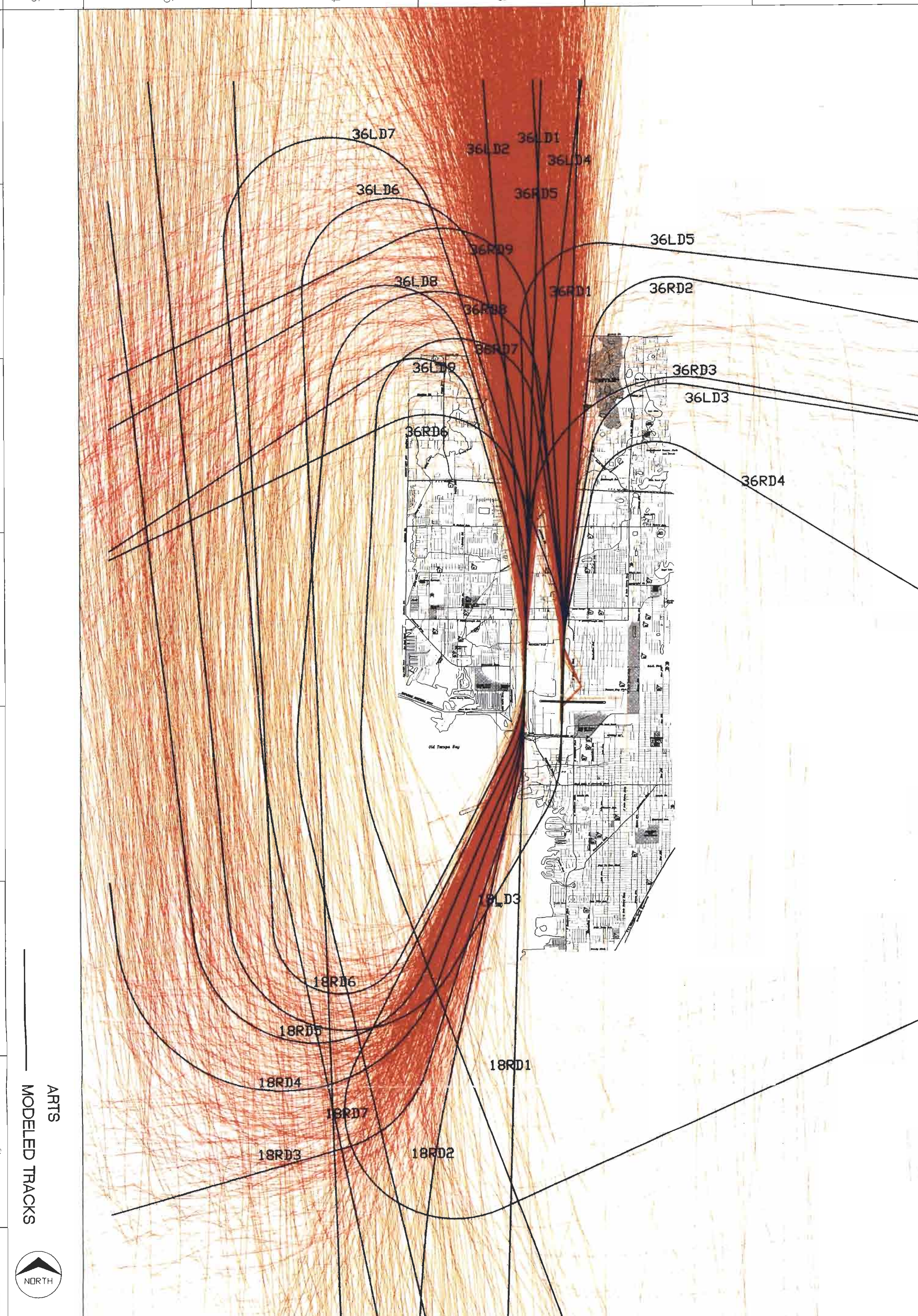

DRAWING NO. Figure 4-7

PROJECT NAME: MASTER PLAN UPDATE AND F.A.R. 150 STUDY

DRAWING TITLE: AIR CARRIER JET DEPARTURE TRACKS MODELED AND ARTS SAMPLE

HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA INTERNATIONAL AIRPORT
TAMPA - FLORIDA

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

DATE	REVISIONS	BY	AUTH.

DESIGN ______ SCALE ______
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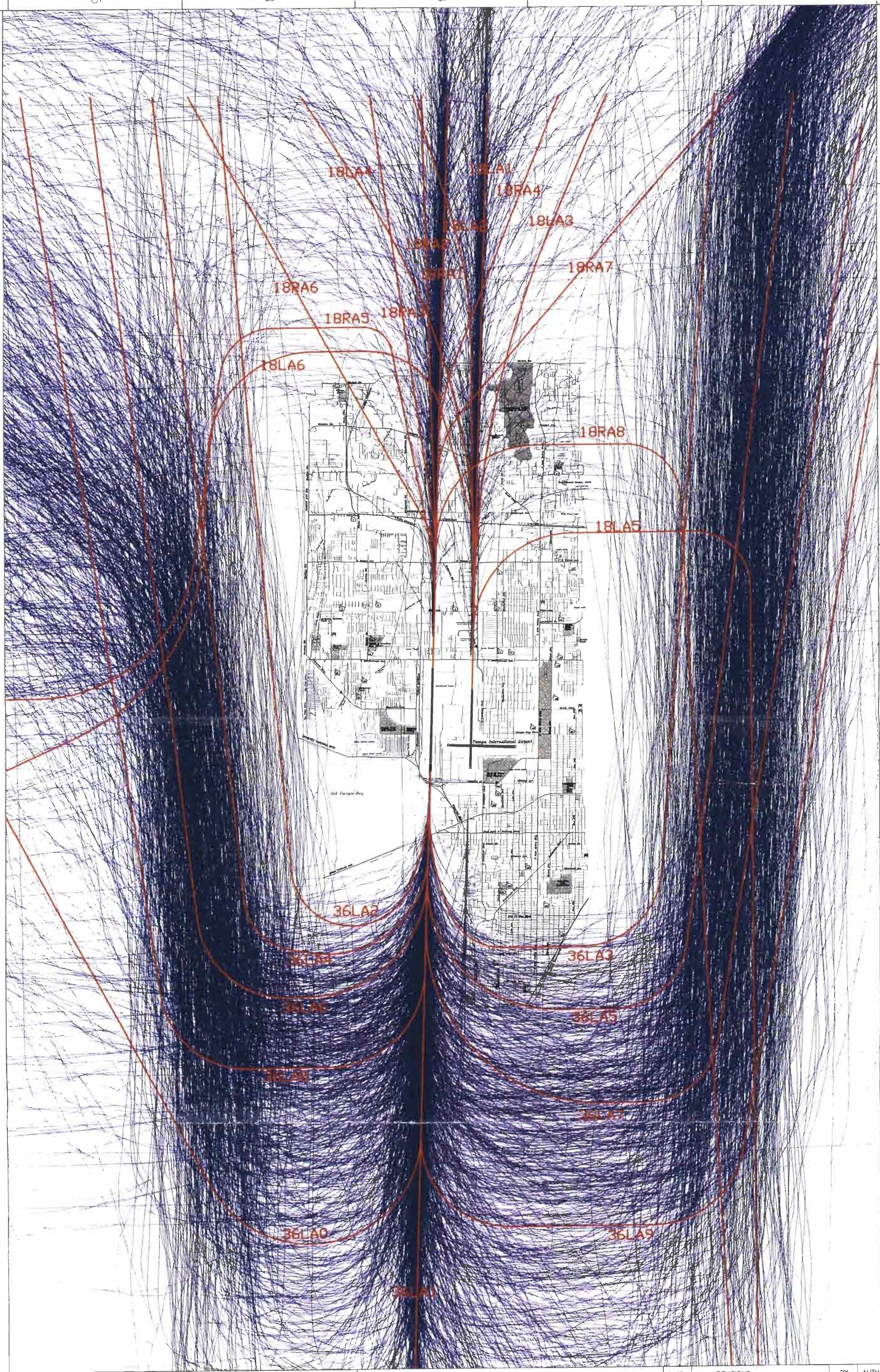

ARTS

MODELED TRACKS

NORTH

PROJECT NAME

MASTER PLAN UPDATE AND F.A.R. 150 STUDY

HILLSBOROUGH COUNTY AVIATION AUTHORITY

TAMPA INTERNATIONAL AIRPORT

TAMPA - FLORIDA

DRAWING TITLE

Air Carrier Jet Arrival Tracks
Modeled and ARTS Sample

HNTB ARCHITECTS ENGINEERS PLANNERS

The HNTB Companies

DRAWING NO.

Figure 4-8

DATE	REVISIONS	BY	AUTH.

DESIGN

DRAWN

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SCALE

JOB NO.

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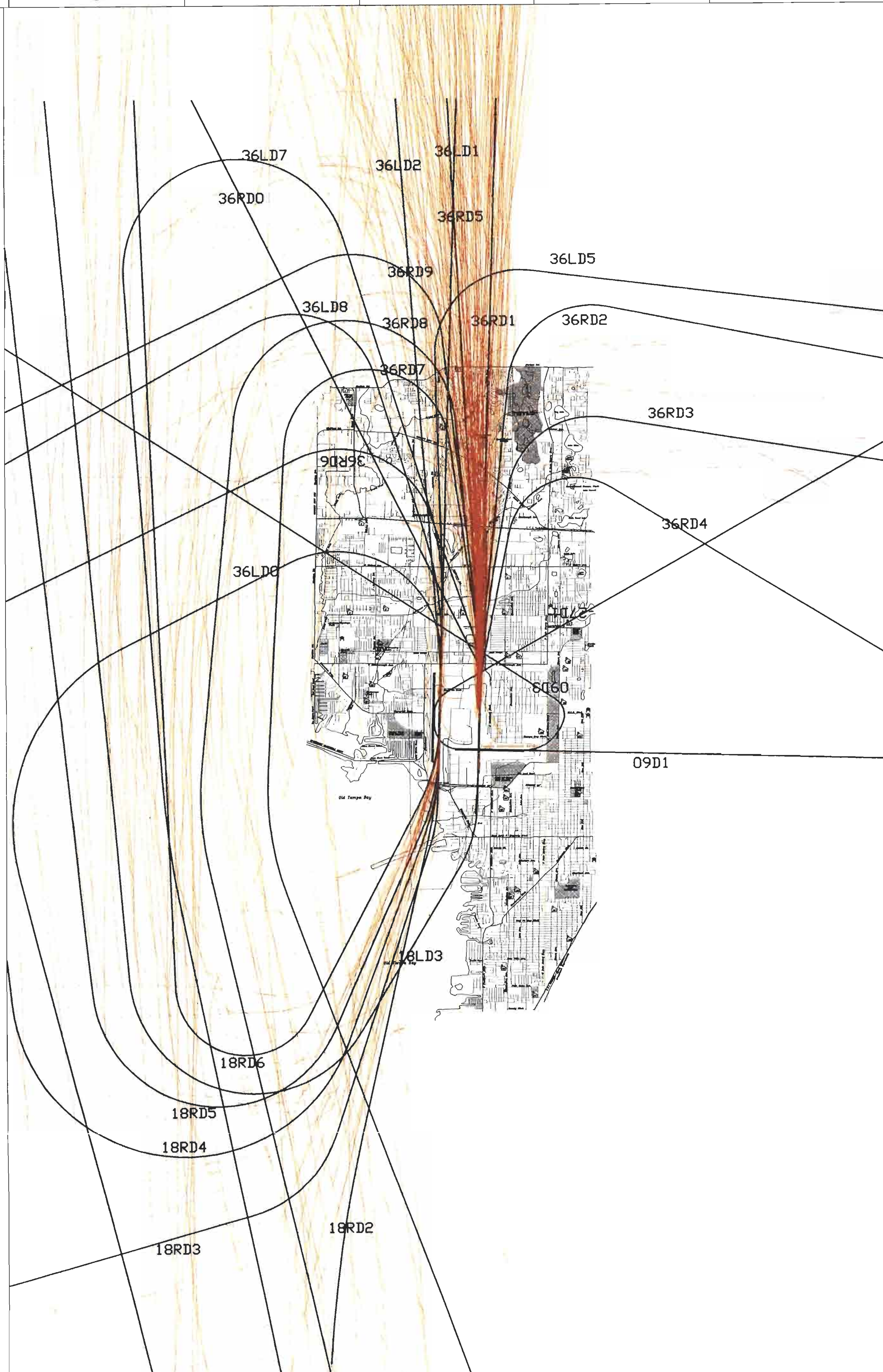

ARTS

MODELED TRACKS

NORTH

Figure 4-9

PROJECT NAME	
MASTER PLAN UPDATE AND F.A.R. 150 STUDY	HILLSBOROUGH COUNTY AVIATION AUTHORITY TAMPA INTERNATIONAL AIRPORT TAMPA - FLORIDA
DRAWING TITLE CORPORATE JET DEPARTURE TRACKS MODELED AND ARTS SAMPLE	HNTB ARCHITECTS ENGINEERS PLANNERS The HNTB Companies

DATE	REVISIONS	BY	AUTH.

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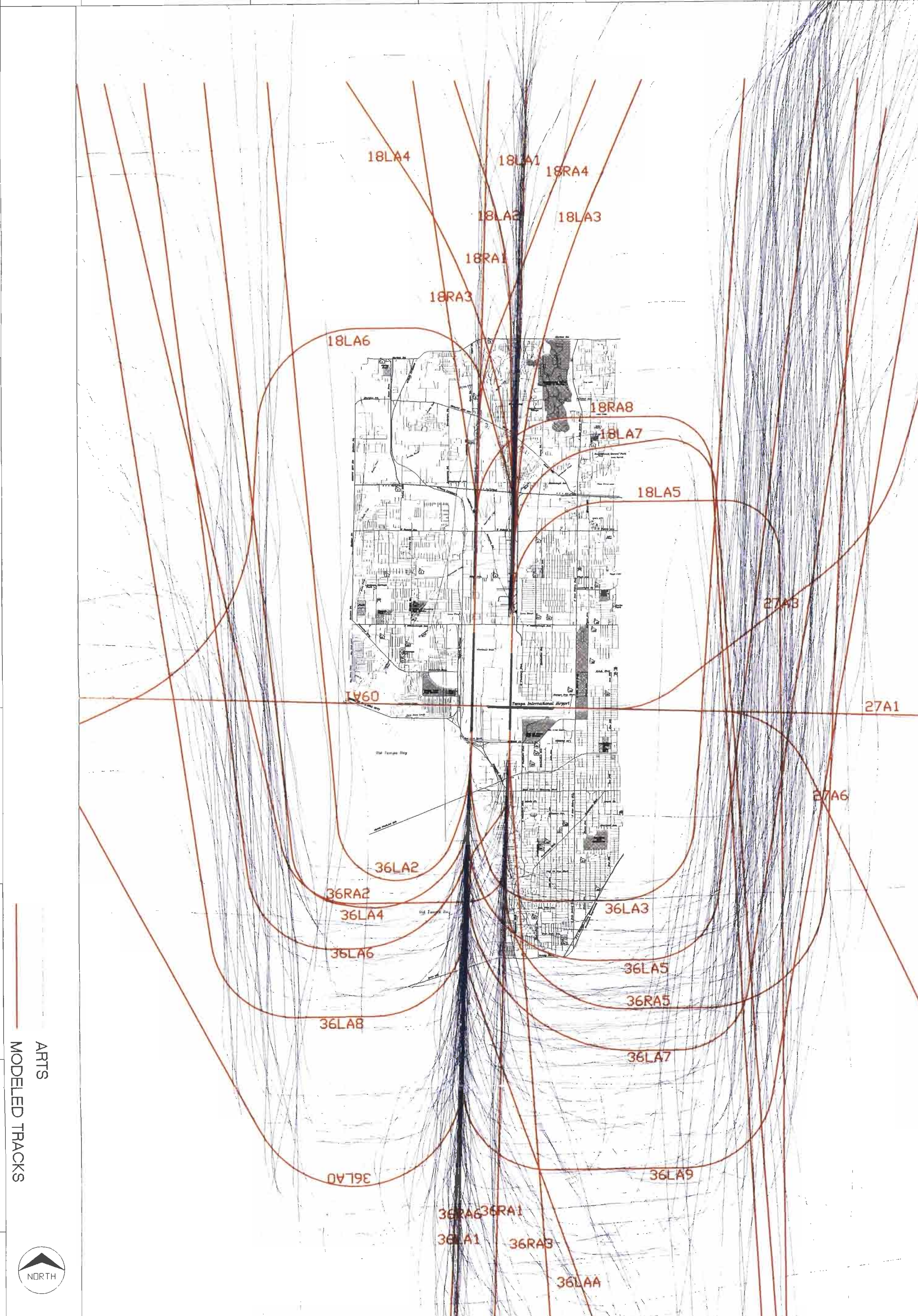

Figure 4-10

PROJECT NAME
MASTER PLAN UPDATE AND F.A.R. 150 STUDY

DRAWING TITLE
CORPORATE JET ARRIVAL TRACKS
MODELED AND ARTS SAMPLE

HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA INTERNATIONAL AIRPORT
TAMPA - FLORIDA

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

DATE	REVISIONS	BY	AUTH.

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SCALE
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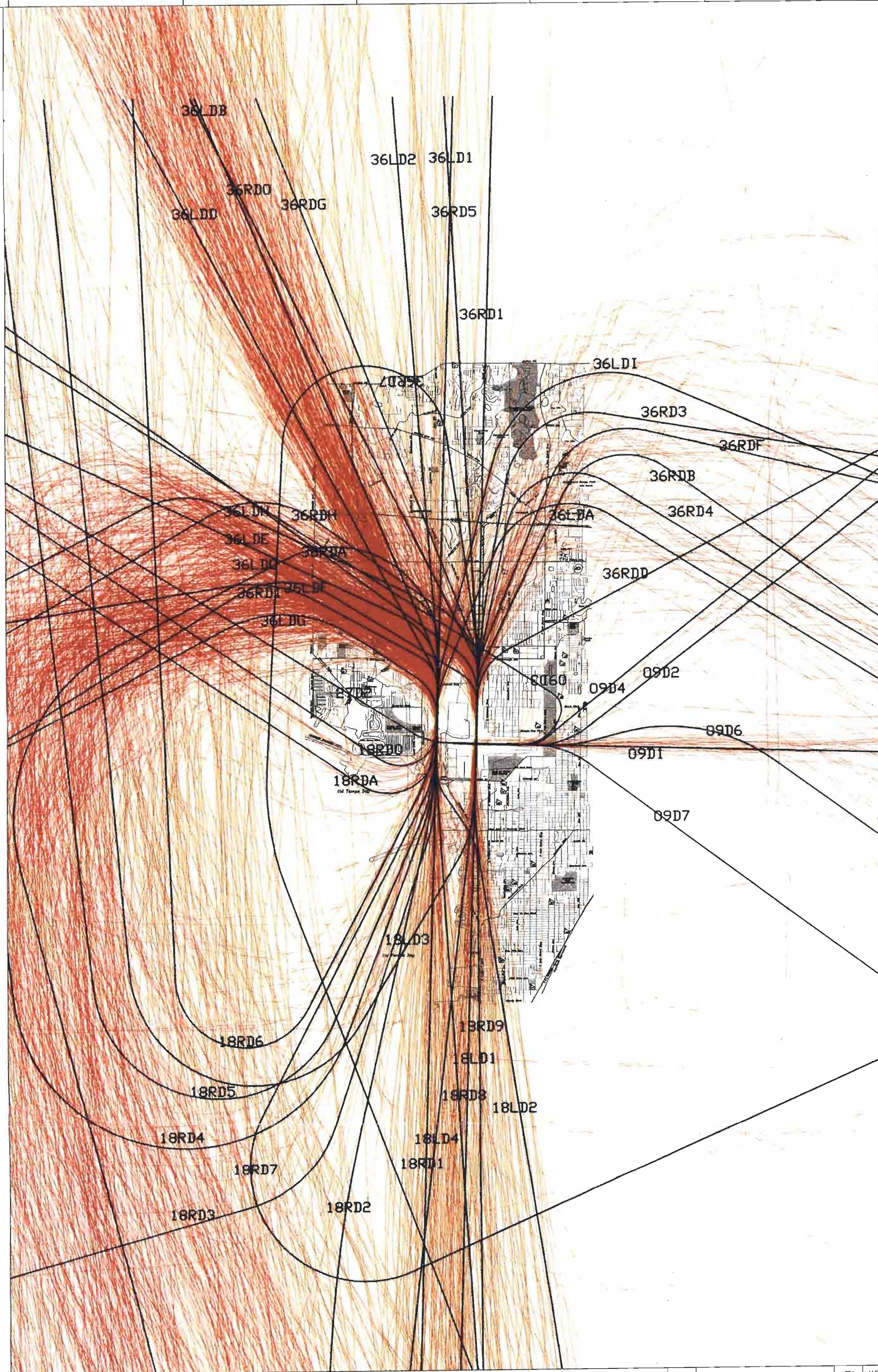

ARTS

MODELED TRACKS

Figure 4-11

PROJECT NAME: MASTER PLAN UPDATE AND F.A.R. 150 STUDY

DRAWING TITLE: TURBOPROP DEPARTURE TRACKS MODELED AND ARTS SAMPLE

HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA INTERNATIONAL AIRPORT
TAMPA - FLORIDA

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

DATE	REVISIONS	BY	AUTH.

DESIGN ____ SCALE ____
DRAWN ____ JOB NO. ____
CHECKED ____

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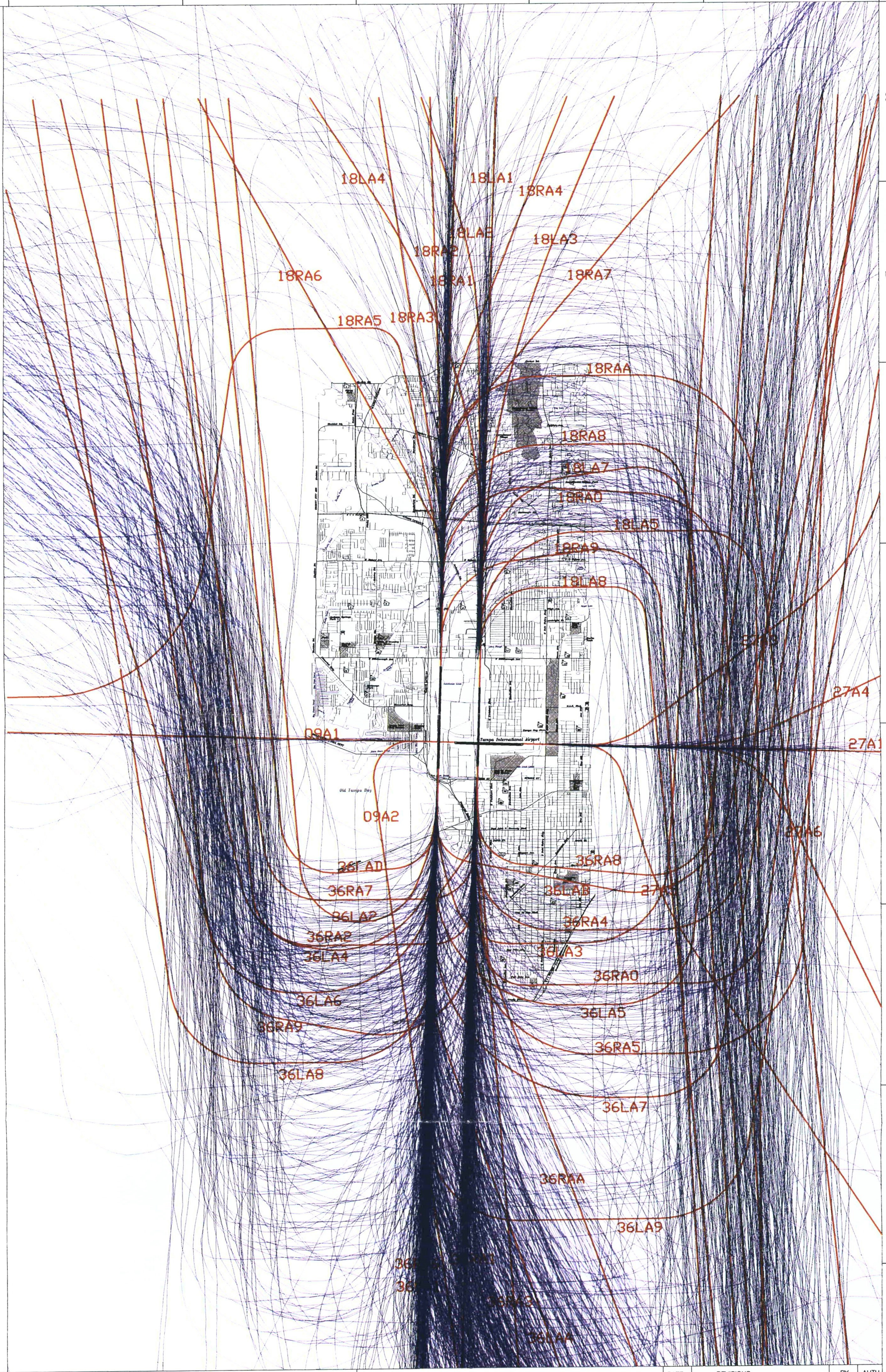

ARTS

MODELED TRACKS

NORTH

DRAWING NO.

Figure 4-12

PROJECT NAME

MASTER PLAN UPDATE AND F.A.R. 150 STUDY

DRAWING TITLE

TURBOPROP ARRIVAL TRACKS
MODELED AND ARTS SAMPLE

HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA INTERNATIONAL AIRPORT
TAMPA - FLORIDA

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

DATE	REVISIONS	BY	AUTH.

DESIGN
DRAWN
CHECKED
SCALE
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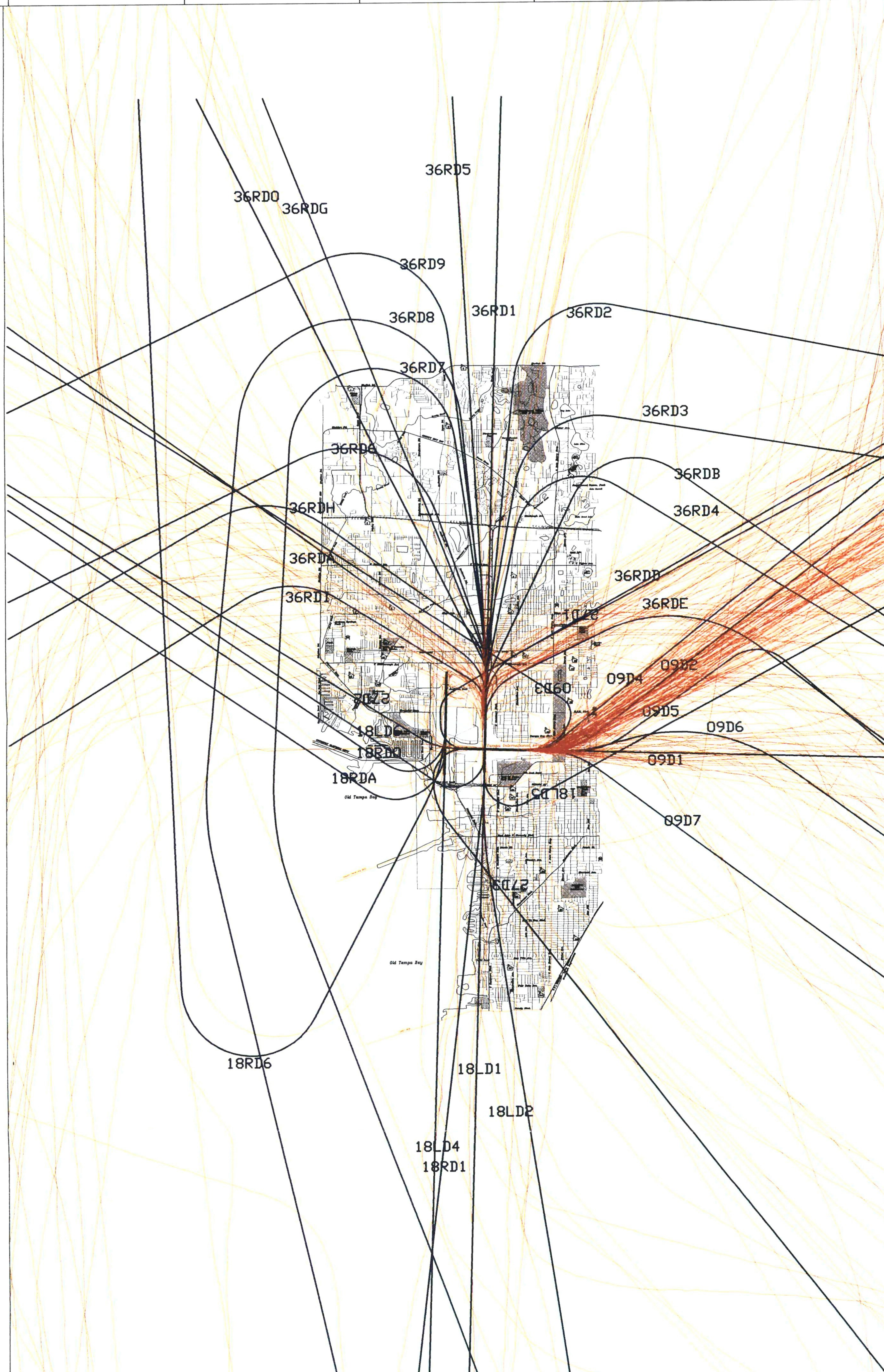

PROJECT NAME	MASTER PLAN UPDATE AND F.A.R. 150 STUDY
DRAWING TITLE	PISTON PROPELLER DEPARTURE TRACKS MODELED AND ARTS SAMPLE

DRAWING NO. Figure 4-13

HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA INTERNATIONAL AIRPORT
TAMPA - FLORIDA

HNTB ARCHITECTS ENGINEERS PLANNERS
The HNTB Companies

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ARTS

MODELED TRACKS

NORTH

Figure 4 – 14

DRAWING NO.

PROJECT NAME

MASTER PLAN UPDATE AND F.A.R. 150 STUDY

HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA INTERNATIONAL AIRPORT
TAMPA – FLORIDA

DATE	REVISIONS	BY	AUTH.

DRAWING TITLE

PISTON PROPELLER ARRIVAL TRACKS
MODELED AND ARTS SAMPLE

HNTB ARCHITECTS ENGINEERS PLANNERS
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DRAWING NO. Figure 4-15	PROJECT NAME MASTER PLAN UPDATE AND F.A.R. 150 STUDY	HILLSBOROUGH COUNTY AVIATION AUTHORITY TAMPA INTERNATIONAL AIRPORT TAMPA - FLORIDA	DATE	REVISIONS / BY / AUTH.
	DRAWING TITLE MODELED HELICOPTER TRACKS	HNTB ARCHITECTS ENGINEERS PLANNERS The HNTB Companies	DESIGN / DRAWN / CHECKED	SCALE / JOB NO.

Table 4.8

Modeled Air Carrier Jet Flight Track Use
(includes Military DC9s)

	Departures			Arrivals		
Runway	**Track Name**	**Day Use**	**Night Use**	**Track Name**	**Day Use**	**Night Use**
09	09D1	0.0%	0.0%	09A1	0.0%	0.0%
	09D2	0.0%	0.0%	09A2	0.0%	0.0%
	09D3	0.0%	0.0%	09A3	0.0%	0.0%
	09D4	0.0%	0.0%			
	09D5	0.0%	0.0%			
	09D6	0.0%	0.0%			
	09D7	0.0%	0.0%			
18L	18LD1	0.0%	0.0%	18LA1	35.0%	59.0%
	18LD2	0.0%	0.0%	18LA2	20.0%	20.0%
	18LD3	100.0%	100.0%	18LA3	10.0%	0.0%
	18LD4	0.0%	0.0%	18LA4	15.0%	15.0%
	18LD5	0.0%	0.0%	18LA5	10.0%	3.0%
	18LD6	0.0%	0.0%	18LA6	10.0%	3.0%
				18LA7	0.0%	0.0%
				18LA8	0.0%	0.0%
18R	18RD1	1.0%	5.0%	18RA1	30.0%	46.0%
	18RD2	10.0%	15.0%	18RA2	20,0%	20.0%
	18RD3	20.0%	0.0%	18RA3	10.0%	10.0%
	18RD4	30.0%	20.0%	18RA4	10.0%	10.0%
	18RD5	30.0%	40.0%	18RA5	10.0%	0.0%
	18RD6	6.0%	20.0%	18RA6	6.0%	10.0%
	18RD7	3.0%	0.0%	18RA7	10.0%	0.0%
	18RD8	0.0%	0.0%	18RA8	4.0%	4.0%
	18RD9	0.0%	0.0%	18RA9	0.0%	0.0%
	18RD0	0.0%	0.0%	18RA0	0.0%	0.0%
	18RDA	0.0%	0.0%	18RAA	0.0%	0.0%
27	27D1	0.0%	0.0%	27A1	100.0%	100.0%
	27D2	0.0%	0.0%	27A2	0.0%	0.0%
	27D3	0.0%	0.0%	27A3	0.0%	0.0%
				27A4	0.0%	0.0%
				27A5	0.0%	0.0%
				27A6	0.0%	0.0%
36L	36LD1	35.0%	35.0%	36LA1	22.0%	20.0%
	36LD2	32.0%	45.0%	36LA2	2.0%	4.0%
	36LD3	1.0%	5.0%	36LA3	4.0%	5.0%
	36LD4	10.0%	10.0%	36LA4	3.0%	16.0%
	36LD5	1.0%	1.0%	36LA5	4.0%	10.0%
	36LD6	7.0%	0.0%	36LA6	7.0%	17.0%
	36LD7	6.0%	0.0%	36LA7	10.0%	8.0%
	36LD8	4.0%	0.0%	36LA8	16.0%	10.0%
	36LD9	4.0%	4.0%	36LA9	20.0%	5.0%
	36LD0	0.0%	0.0%	36LA0	12.0%	5.0%
	36LDA	0.0%	0.0%	36LAA	0.0%	0.0%
	36LDB	0.0%	0.0%	36LAB	0.0%	0.0%
	36LDD	0.0%	0.0%	36LAD	0.0%	0.0%
	36LDE	0.0%	0.0%			
	36LDF	0.0%	0.0%			
	36LDG	0.0%	0.0%			
	36LDH	0.0%	0.0%			
	36LDI	0.0%	0.0%			

Table 4.8 (cont.)

Modeled Air Carrier Jet Flight Track Use
(includes Military DC9s)

Runway	Departures			Arrivals		
	Track Name	Day Use	Night Use	Track Name	Day Use	Night Use
36R	36RD1	30.0%	30.0%	36RA1	100.0%	100.0%
	36RD2	4.0%	4.0%	36RA2	0.0%	0.0%
	36RD3	2.0%	18.0%	36RA3	0.0%	0.0%
	36RD4	1.0%	2.0%	36RA4	0.0%	0.0%
	36RD5	40.0%	40.0%	36RA5	0.0%	0.0%
	36RD6	2.0%	2.0%	36RA6	0.0%	0.0%
	36RD7	7.0%	2.0%	36RA7	0.0%	0.0%
	36RD8	7.0%	2.0%	36RA8	0.0%	0.0%
	36RD9	7.0%	0.0%	36RA9	0.0%	0.0%
	36RD0	0.0%	0.0%	36RA0	0.0%	0.0%
	36RDA	0.0%	0.0%	36RAA	0.0%	0.0%
	36RDB	0.0%	0.0%			
	36RDD	0.0%	0.0%			
	36RDE	0.0%	0.0%			
	36RDF	0.0%	0.0%			
	36RDG	0.0%	0.0%			
	36RDH	0.0%	0.0%			
	36RDI	0.0%	0.0%			

Source: HMMH analysis.

Table 4.9

Modeled Corporate Jet Flight Tracks
(includes Military GIIBs)

Runway	Departures		Arrivals	
	Track Name	Day and Night Use	Track Name	Day and Night Use
09	09D1	30.0%	09A1	100.0%
	09D2	0.0%	09A2	0.0%
	09D3	70.0%	09A3	0.0%
	09D4	0.0%		
	09D5	0.0%		
	09D6	0.0%		
	09D7	0.0%		
18L	18LD1	0.0%	18LA1	44.0%
	18LD2	0.0%	18LA2	12.0%
	18LD3	100.0%	18LA3	12.0%
	18LD4	0.0%	18LA4	12.0%
	18LD5	0.0%	18LA5	12.0%
	18LD6	0.0%	18LA6	4.0%
			18LA7	4.0%
			18LA8	0.0%
18R	18RD1	0.0%	18RA1	60.0%
	18RD2	10.0%	18RA2	0.0%
	18RD3	20.0%	18RA3	10.0%
	18RD4	30.0%	18RA4	20.0%
	18RD5	30.0%	18RA5	0.0%
	18RD6	10.0%	18RA6	0.0%
	18RD7	0.0%	18RA7	0.0%
	18RD8	0.0%	18RA8	10.0%
	18RD9	0.0%	18RA9	0.0%
	18RD0	0.0%	18RA0	0.0%
	18RDA	0.0%	18RAA	0.0%
27	27D1	100.0%	27A1	40.0%
	27D2	0.0%	27A2	0.0%
	27D3	0.0%	27A3	30.0%
			27A4	0.0%
			27A5	0.0%
			27A6	30.0%
36L	36LD1	25.0%	36LA1	37.0%
	36LD2	45.0%	36LA2	1.0%
	36LD3	0.0%	36LA3	5.0%
	36LD4	0.0%	36LA4	1.0%
	36LD5	12.0%	36LA5	6.0%
	36LD6	0.0%	36LA6	5.0%
	36LD7	6.0%	36LA7	16.0%
	36LD8	6.0%	36LA8	6.0%
	36LD9	0.0%	36LA9	12.0%
	36LD0	6.0%	36LA0	6.0%
	36LDA	0.0%	36LAA	5.0%
	36LDB	0.0%	36LAB	0.0%
	36LDD	0.0%	36LAD	0.0%
	36LDE	0.0%		
	36LDF	0.0%		
	36LDG	0.0%		
	36LDH	0.0%		
	36LDI	0.0%		

Table 4.9 (cont.)

Modeled Corporate Jet Flight Tracks
(includes Military GIIBs)

Runway	Departures		Arrivals	
	Track Name	**Day and Night Use**	**Track Name**	**Day and Night Use**
36R	36RD1	36.0%	36RA1	40.0%
	36RD2	5.0%	36RA2	15.0%
	36RD3	4.0%	36RA3	10.0%
	36RD4	1.0%	36RA4	0.0%
	36RD5	36.0%	36RA5	20.0%
	36RD6	2.0%	36RA6	15.0%
	36RD7	5.0%	36RA7	0.0%
	36RD8	8.0%	36RA8	0.0%
	36RD9	2.0%	36RA9	0.0%
	36RD0	1.0%	36RA0	0.0%
	36RDA	0.0%	36RAA	0.0%
	36RDB	0.0%		
	36RDD	0.0%		
	36RDE	0.0%		
	36RDF	0.0%		
	36RDG	0.0%		
	36RDH	0.0%		
	36RDI	0.0%		

Source: HMMH analysis.

Table 4.10

Modeled Turboprop and Piston Flight Track Use

	Departures			Arrivals		
Runway	**Track Name**	**Day Use**	**Night Use**	**Track Name**	**Day Use**	**Night Use**
09	09D1	75.0%	10.0%	09A1	90.0%	0.0%
	09D2	6.0%	40.0%	09A2	10.0%	50.0%
	09D3	4.0%	1.0%	09A3	0.0%	50.0%
	09D4	10.0%	35.0%			
	09D5	0.0%	4.0%			
	09D6	5.0%	4.0%			
	09D7	0.0%	6.0%			
18L	18LD1	38.0%	10.0%	18LA1	25.0%	65.0%
	18LD2	38.0%	25.0%	18LA2	5.0%	0.0%
	18LD3	14.0%	0.0%	18LA3	5.0%	5.0%
	18LD4	10.0%	10.0%	18LA4	5.0%	0.0%
	18LD5	0.0%	45.0%	18LA5	25.0%	10.0%
	18LD6	0.0%	10.0%	18LA6	0.0%	0.0%
				18LA7	25.0%	10.0%
				18LA8	10.0%	10.0%
18R	18RD1	30.0%	25.0%	18RA1	30.0%	0.0%
	18RD2	2.0%	0.0%	18RA2	5.0%	0.0%
	18RD3	3.0%	0.0%	18RA3	7.0%	0.0%
	18RD4	3.0%	0.0%	18RA4	5.0%	0.0%
	18RD5	5.0%	0.0%	18RA5	3.0%	0.0%
	18RD6	5.0%	25.0%	18RA6	5.0%	0.0%
	18RD7	2.0%	0.0%	18RA7	5.0%	0.0%
	18RD8	20.0%	0.0%	18RA8	10.0%	0.0%
	18RD9	10.0%	0.0%	18RA9	10.0%	0.0%
	18RD0	10.0%	25.0%	18RA0	10.0%	0.0%
	18RDA	10.0%	25.0%	18RAA	10.0%	0.0%
27	27D1	0.0%	20.0%	27A1	35.0%	26.0%
	27D2	100.0%	50.0%	27A2	0.0%	8.0%
	27D3	0.0%	30.0%	27A3	4.0%	25.0%
				27A4	30.0%	8.0%
				27A5	4.0%	25.0%
				27A6	27.0%	8.0%
36L	36LD1	3.0%	0.0%	36LA1	45.0%	40.0%
	36LD2	2.0%	0.0%	36LA2	2.0%	0.0%
	36LD3	0.0%	0.0%	36LA3	2.0%	10.0%
	36LD4	0.0%	0.0%	36LA4	8.0%	10.0%
	36LD5	0.0%	0.0%	36LA5	3.0%	10.0%
	36LD6	0.0%	0.0%	36LA6	10.0%	0.0%
	36LD7	0.0%	0.0%	36LA7	2.0%	0.0%
	36LD8	0.0%	0.0%	36LA8	4.0%	0.0%
	36LD9	0.0%	0.0%	36LA9	2.0%	20.0%
	36LD0	0.0%	0.0%	36LA0	0.0%	0.0%
	36LDA	5.0%	0.0%	36LAA	15.0%	0.0%
	36LDB	15.0%	0.0%	36LAB	1.0%	10.0%
	36LDD	15.0%	0.0%	36LAD	6.0%	0.0%
	36LDE	15.0%	0.0%			
	36LDF	25.0%	0.0%			
	36LDG	10.0%	0.0%			
	36LDH	5.0%	0.0%			
	36LDI	5.0%	0.0%			

Table 4.10 (cont.)

Modeled Turboprop and Piston Flight Track Use

Runway	Departures			Arrivals		
	Track Name	Day Use	Night Use	Track Name	Day Use	Night Use
36R	36RD1	1.0%	3.0%	36RA1	55.0%	40.0%
	36RD2	0.0%	5.0%	36RA2	4.0%	2.0%
	36RD3	1.0%	0.0%	36RA3	15.0%	10.0%
	36RD4	3.0%	0.0%	36RA4	3.0%	10.0%
	36RD5	3.0%	2.0%	36RA5	1.0%	0.0%
	36RD6	0.0%	0.0%	36RA6	3.0%	0.0%
	36RD7	1.0%	0.0%	36RA7	2.0%	3.0%
	36RD8	0.0%	1.0%	36RA8	2.0%	10.0%
	36RD9	0.0%	0.0%	36RA9	4.0%	3.0%
	36RD0	11.0%	2.0%	36RA0	3.0%	1.0%
	36RDA	19.0%	18.0%	36RAA	8.0%	21.0%
	36RDB	14.0%	3.0%			
	36RDD	1.0%	30.0%			
	36RDE	0.0%	20.0%			
	36RDF	14.0%	0.0%			
	36RDG	11.0%	10.0%			
	36RDH	19.0%	5.0%			
	36RDI	2.0%	10.0%			

Source: HMMH analysis

Table 4.11

Modeled Helicopter Flight Track Use

Departures			Arrivals		
Track Name	Day Use	Night Use	Track Name	Day Use	Night Use
06HD	50.0%	3.0%	06HA	50.0%	50.0%
31HD	50.0%	5.0%	31HA	50.0%	50.0%

Source: HMMH analysis.

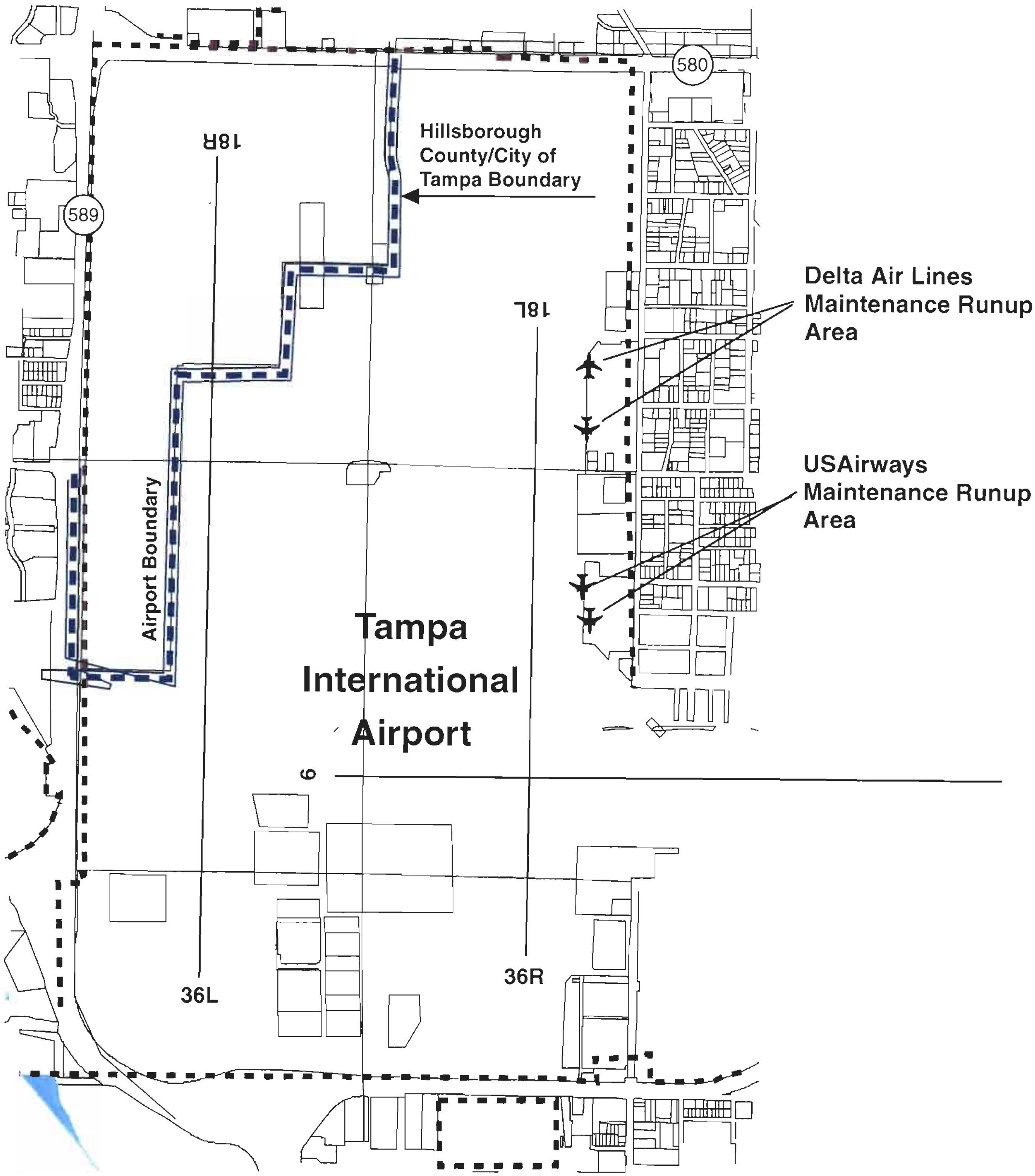
Delta Airlines Runup Activity

Delta operates the northern maintenance facility. They run up their aircraft on the ramp on the west side of the facility. Aircraft are parked with their tails approximately 70 feet from the north and south ends of the ramp with their tails facing blast fences along the perimeter of the apron, as shown in Figure 4-16. When the wind is from the north, the aircraft are parked on the south end of the ramp with their noses facing north. When the wind is from the south, the aircraft are parked on the north end of the ramp with their noses facing south. There is approximately a 50/50 split of runups at the two locations.

Half of the Delta runups are between 6 and 7 a.m., the other half are between 7 and 10 a.m. The runups are approximately 15 to 20 minutes long, with approximately 20 to 30 seconds at takeoff power, the balance at idle. The modeling assumed the upper end of these times to take into account taxiing to and from the ramp and parking position. The runups are for one engine at a time.

Run-up Locations

Figure 4-16



Delta conducts an average of 10 runup sessions each week, split among the three aircraft types indicated in **Table 4.12**.

USAirways Runup Activity

USAirways operates the southern maintenance facility. They run up their aircraft on the ramp on the west side of the facility at the two positions shown in Figure 4-16. Takeoff runs are conducted with the aircraft's tail approximately 70 feet from the blast fence along the north perimeter of the apron. Idle runs are conducted in front of the hangar.

USAirways conducts an average of 12 runup sessions each week (two per day on Monday through Friday, one per day on Saturday and Sunday). The runups are primarily Boeing 737-300, Boeing 737-400, and DC9 aircraft. MD80 and 757 runups occur on rare occasions as well, but are too few to model. 75 percent of the runups are between 4 and 7 a.m., the other 25 percent are between 7 and 9 a.m. The condition runups are approximately 10 to 15 minutes long. All of the DC9 and 90 percent of the 737 runups are at idle power only. The remaining 10 percent of the 737s include approximately 2 minutes at takeoff power, the balance at idle. A majority of the runups are for a single engine only since the facility is doing "heavy engine servicing." Once again, the modeling assumed the upper end of the overall duration to take into account taxiing from the ramp to the gate. (The aircraft are almost always towed to the runup area.)

Table 4.13 summarizes the USAirways runup activity modeled for the average annual day.

4.4 DAY-NIGHT AVERAGE SOUND LEVEL

4.4.1 2000 Base Case and 2005 Forecast Case DNL

Figures 4-17 and 4-18 present the 2000 and 2005 DNL contours, respectively, overlaid on a street map of the TPA environs. These contours assume annual average day operations, including the level and mix of activity, runway use, flight track use, and runup activity.

The contours for 2000 and 2005 were developed using annualized runway use. A sensitivity analysis was completed to determine the impact of operating the Airport in north- and south-flow conditions. Results of the sensitivity analysis are provided in **Appendix E**. The north-flow and south-flow contours provided in Appendix E consider the noise environment produced by operating the Airport only in north-flow and only in south-flow conditions.

4.4.2 Comparison of Measured and Calculated DNL

Table 4.14 compares the INM-calculated DNL to the values measured in the October 1997 field trip. Chapter Three presents a detailed discussion of the measurement program objectives, design, execution, and results. Also in Chapter Three are the issues involved with site selection and the relationship of the sites to measurement locations in the original 1983 Part 150 Study. Figure 3-1 in Chapter Three depicts the measurement locations.

Table 4.12

Modeled Delta Maintenance Runups for the Average Annual Day

Aircraft Type (Modeled Type)	Power Settings	Duration	Daily Run Activity: Number at North Position Day	Number at North Position Night	Number at South Position Day	Number at South Position Night	Total Per Day	Total Per Week
B727-232 JT8D15A	One engine at takeoff power, two at idle (1.4 EPR)	30 seconds	.18	.18	.18	.18	.72	5.04
(50% of runups)	Three engines at idle (1.4 EPR)	20 minutes	.18	.18	.18	.18	.72	5.04
B737-200 JT8D15A	One engine at takeoff power, two at idle (1.4 EPR)	30 seconds	.04	.04	.04	.04	.16	1.12
(10% of runups)	Three engines at idle (1.4 EPR)	20 minutes	.04	.04	.04	.04	.16	1.12
MD88 JT8D-219	One engine at takeoff power, one at idle (1.4 EPR)	30 seconds	.14	.14	.14	.14	.56	3.92
(40% of runups)	Two engines at idle (1.4 EPR)	20 minutes	.14	.14	.14	.14	.56	3.92

Source: HMMH analysis and observation.

Table 4.13

Modeled USAirways Maintenance Runups for the Average Annual Day

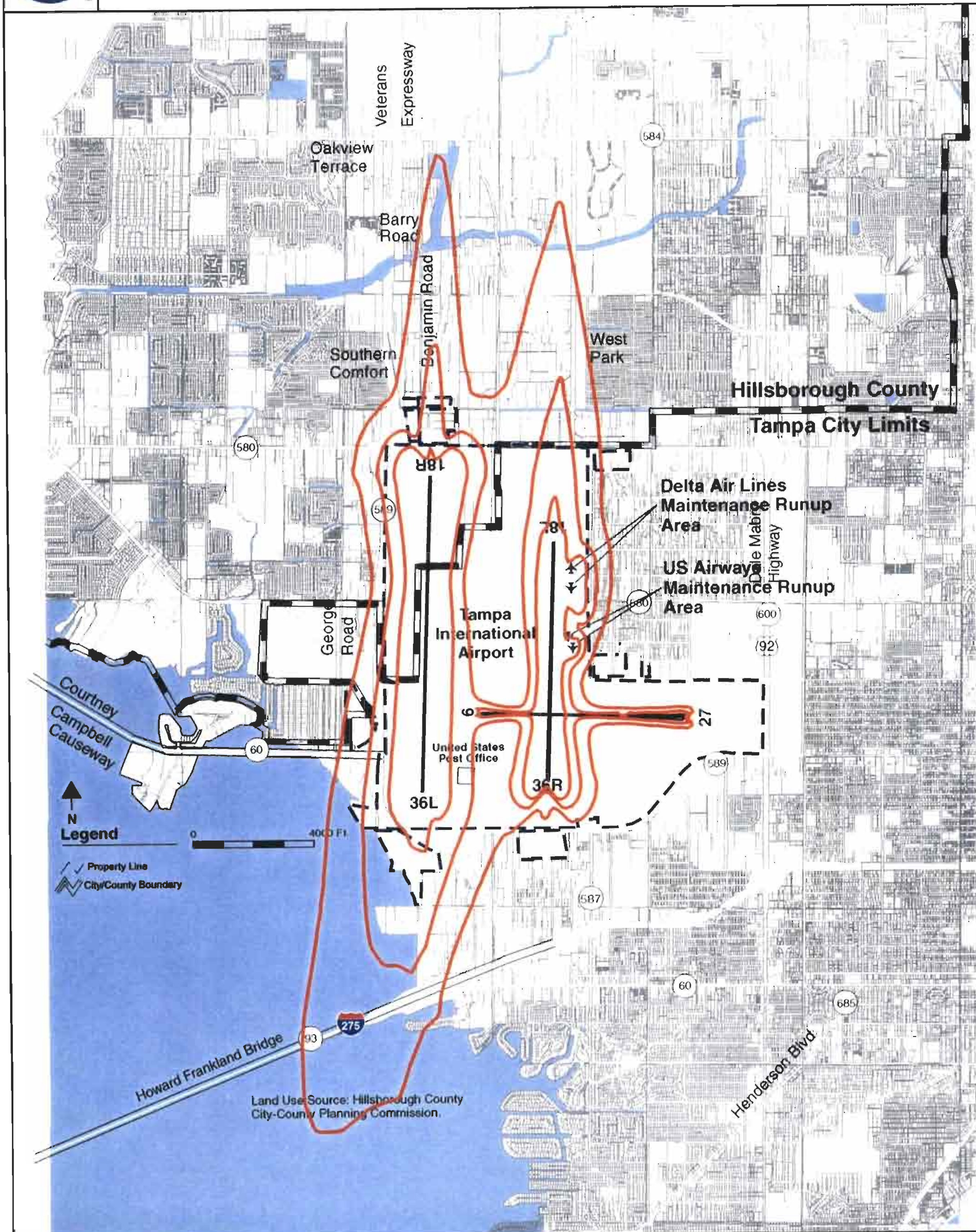
Aircraft Type	Power Settings	Duration	Daily Run Activity: Number at Blast Fence Day	Number at Blast Fence Night	No. in Front of Hangar Day	No. in Front of Hangar Night	Total Per Day	Total Per Week
B737-300	One engine at takeoff power	2 minutes	.02	.06	0	0	.08	.56
(45% of runups)	One engine at idle (10% power)	13 minutes	.02	.06	0	0	.08	.56
	One engine at idle (10% power)	15 minutes	0	0	.17	.52	.69	4.83
B737-400	One engine at takeoff power	2 minutes	.02	.06	0	0	.08	.56
(45% of runups)	One engine at idle (10% power)	13 minutes	.02	.06	0	0	.08	.56
	One engine at idle (10% power)	15 minutes	0	0	.17	.52	.69	4.83
DC9 (10% of runups)	One engine at idle (10% power)	15 minutes	0	0	.04	.13	.17	1.19

Source: HMMH analysis and observation.

HILLSBOROUGH COUNTY AVIATION AUTHORITY

2000 Day-Night Average Sound Level Contours

Figure 4-17



HILLSBOROUGH COUNTY AVIATION AUTHORITY

2005 Day-Night Average Sound Level Contours

Figure 4-18

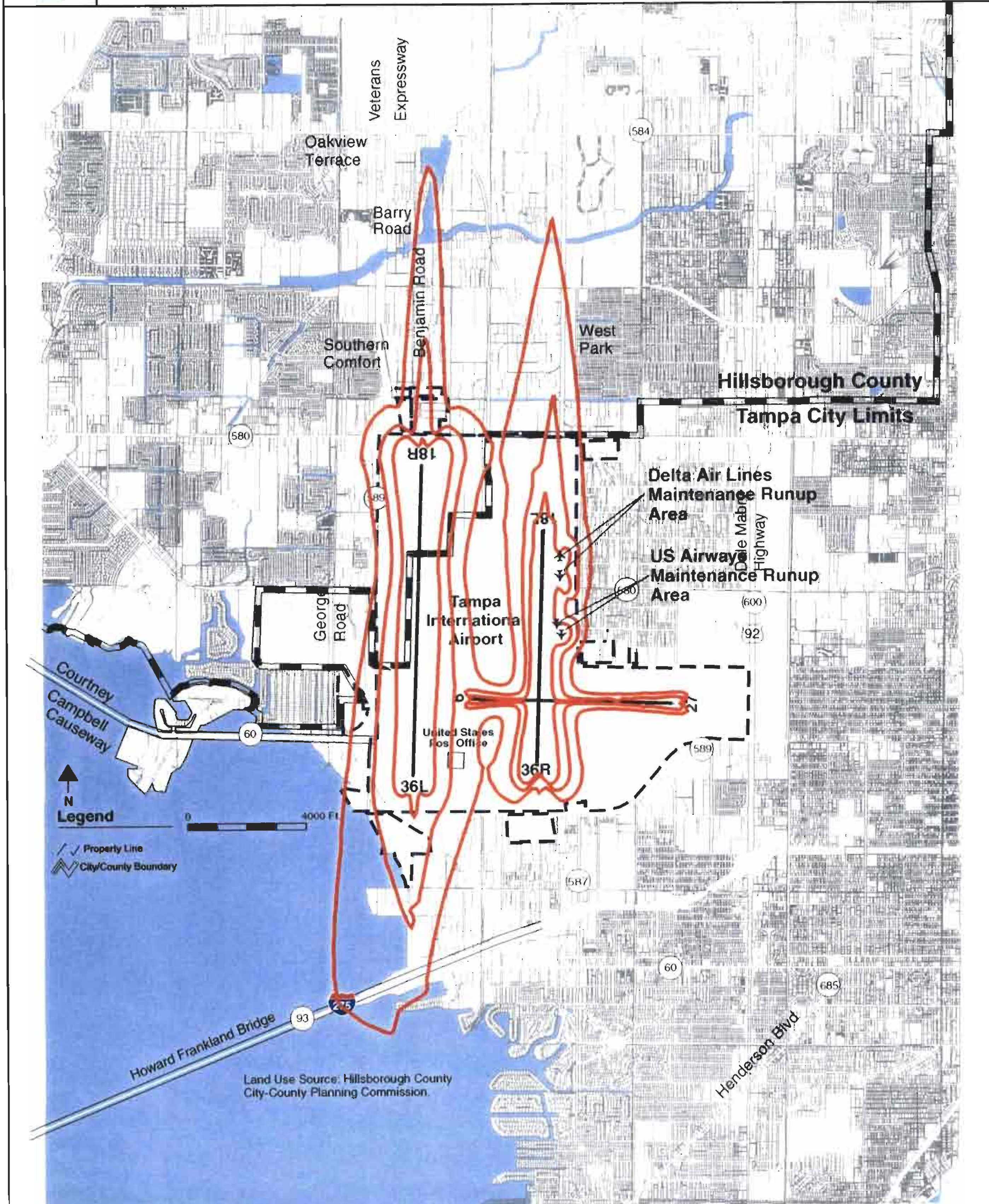


Table 4.14

Comparison of DNL Measurements (October 14-21, 1997) to INM-Calculated Values for 2000 North-Flow Contour Case

Site No.	Address	Average DNL Measured	INM-Calculated DNL
1	5833 Mariner St., Beach Park	75	68
2	5140 Longfellow Ave., Sunset Park	58	56
3	4923 St. Croix Dr., Culbreath Isles	59	54
4	13902 Pepperrell Dr., Carrollwood	62	57
5	4816 Sierra Madre Dr.	65	62
6	4610 Westford Cir., Village West	Short-term measurements only - no DNL	
7	Clubhouse, Plantation	65	59
7A	10557 Park Crest, Plantation	Short-term measurements only - no DNL	
8	6719 Twelve Oaks Boulevard	64	61
9	4613 D'Azzo Ave., Drew Park	62	66
10	6526 Johns Rd., Northwest Park	59	60
11	5215 West Laurel St.	68	63
12	North St./Occident Ave. Intersect.	Short-term measurements only - no DNL	
13	Leeward Dr., Watermill Village	Short-term measurements only - no DNL	
14	3947 Doral Dr., Dana Shores	67	58
15	Cypress Point Park	69	71
16	3405 Aileen St.	Short-term measurements only - no DNL	

Source: HMMH.

Table 4.14 lists only sites at which sufficient measurements were conducted to calculate DNL from the measurements. Chapter Three discusses sites at which short-term measurements of single-event noise levels were conducted. Table 3.1 in Chapter Three summarizes the dates, times, and durations of measurements. At sites with more than one day of measurements, the measured values presented are averages of the values from each day.

Overall, the measured and calculated values agree reasonably well, and the comparisons do not suggest any reasons to question the INM results.

It is normal for measured and INM-calculated values to disagree by even several decibels for several reasons. Part 150 requires that the base case contours represent activity on the "average annual day"; that is, activity for a hypothetical day in which overall airport operations, runway use, and flight track use are the same as the total annual activity divided by 365, and the temperature is equal to the average annual level. On any given day, it is very unlikely that actual activity and weather will match these hypothetical conditions. During the measurement period, the Airport operated only in north flow. The north-flow contour run provided in Appendix E eliminates at least the variable of overall traffic flow, providing a closer comparison to conditions during the measurements.

Even though the comparison presented here corrects for overall runway use, the exact level and mix of activity during the measurements differs from the activity assumed for the average annual day, as do the exact flight tracks and the exact distribution of operations among the runways (such as between the parallels). The INM also calculates only the aircraft-related DNL, whereas the measurements include the effects of non-aircraft sources, such as local traffic, children playing, dogs barking, and the like. While measurement locations were selected to minimize the effects of non-aircraft sources, they cannot be avoided entirely.

At most locations, the measured DNL was higher than the INM-based modeling results. This result is reasonable given that the modeled DNL considers only the aircraft noise contribution, whereas the measurements include the noise from all sources. Most of the measurement locations are outside of the 65 dB DNL contour interval. In developed suburban areas, such as around TPA, background noise has a major effect on total noise exposure, particularly where the aircraft noise exposure is below 65 dB DNL. Above 75 dB DNL, aircraft noise generally dominates. However, the specific microphone siting, local traffic levels, and unusual noise sources must be considered for each location.

The following paragraphs discuss the DNL comparison in general terms on a site-by-site basis.

Many of the measurement locations are near measurement sites from the 1983 Part 150 study. Where possible, the 1983 and 1997 measurements are compared, and the 1985 contours from that study are compared to the updated 2000 base case. In general, aircraft noise levels dropped from 1983 to 2000, and are expected to drop further by 2005 despite increasing aircraft activity. The reduced noise exposure is largely the result of the airline transition to a quieter fleet. However, it should be recognized that the original Part 150 used an older version of the INM (Version 3.8) which included different computational algorithms and different aircraft noise and performance data than Version 5.1a used in this study. A portion of the difference in computed DNL comes from the change in models.

Site 1: 5833 Mariner Street, Beach Park

The site faces north toward the Howard Franklin Bridge (Route 275), which is less than 500 feet away. During most of the day, starting as early as 5 or 6 a.m. until as late as midnight, there was a fairly steady "drone" from the surface traffic. However, the loudest individual events are aircraft-related.

Measurements at the site included all or a portion of four days. The DNL values over the four days ranged from approximately 73 to 77 dB, with a mathematical average of approximately 75.

The DNL for the 2000 average annual day and for the 100 percent north-flow case are both approximately 68 dB. The 2005 forecast DNL is approximately one decibel lower, reflecting anticipated noise reductions from transition to a quieter airline fleet that will overcome the forecast increase in activity.

It is reasonable to conclude that most of the difference between the measured and modeled values is due to the high level of noise exposure from the surface traffic on the bridge.

The measurement site is very close to measurement Site 12 in the original Part 150 study. The DNL measured over a single day at that site in 1983 was 72 dB. The previous Part 150 study included DNL contours for 1985 and 1990 contours. Site 1 was approximately under the 75 dB contour line in both cases.

Site 2: 5140 Longfellow Avenue, Sunset Park

Measurements at Site 2 included all or a portion of three days. The DNL values over the three days ranged from approximately 56 to 60 dB, with a mathematical average of approximately 58 dB. These measurements agree very well with the 2000 average day and 100 percent north-flow DNL calculations, which were both approximately 56 dB. The 2-decibel difference between measured and modeled values is likely to be the result of non-aircraft "background" noise. This very close level of agreement partly reflects the isolated and shielded measurement location. (The measured value on the one full day of monitoring, October 15, was 55.9 dB, essentially the same as the modeled 2000 values.)

The 2005 forecast DNL is approximately one decibel lower that the 2000 values, again reflecting anticipated noise reductions from the transition to a quieter airline fleet that will overcome the forecast increase in activity.

The measurement site is approximately 4,500 feet north and west of measurement Site 14 in the original Part 150 study. The DNL measured over a single day at that site in 1983 was 55 dB. Site 2 was well outside the 65 dB DNL in both the 1985 and 1990 contour cases from that study.

Site 3: 4923 St. Croix Drive, Culbreath Isle

Measurements at the site ran for 24 hours over two days. The measured DNL was approximately 59 dB.

The 2000 base case aircraft DNL for this site is approximately 54 dB. The 2000 DNL for 100 percent north-flow operations is also approximately 54 dB. The forecast 2005 DNL is approximately one decibel lower, again reflecting anticipated noise reductions from the transition to a quieter airline fleet that will overcome the forecast increase in activity.

The difference between measured and modeled DNL can be attributed to normal community noise sources. While the microphone was behind the residence, away from the road, noise from neighboring roads was readily audible, and there were a number of dogs in the neighborhood. Community noise sources generally contribute significantly to the overall DNL outside of the 65 dB DNL contour, and are particularly important outside of the 60 dB contour.

Site 3 was well outside of the 65 dB DNL contour in both the 1985 and 1990 contour cases prepared for the original Part 150 study.

Site 4: 13902 Pepperrell Drive, Carrollwood

The DNL calculated from the measurements was approximately 62 dB.

The aircraft DNL calculated for this site for the 2000 base case and the 2000 100 percent north-flow case were both approximately 57 dB. The 2005 forecast DNL is approximately 54 dB. The difference between the measured and modeled DNL can be attributed to community noise, particularly traffic. As noted previously, a significant difference due to community sources is not unusual for a measurement location outside of the 65 dB contour. The site was within

100 feet of a suburban street with through traffic.

This site is very close to measurement Site 4 from the original Part 150 study. The DNL measured at that site over a single day in 1983 was 64 dB. Both measurement locations are well outside of the 65 dB DNL contour in both the 1985 and 1990 contour cases in the original study.

Site 5: 4816 Sierra Madre Drive

The DNL calculated from measurements on two consecutive days was approximately 65 dB. The Airport was operating in the north flow throughout the measurement period. The 2000 base case and 100 percent north-flow aircraft DNL calculated for this site are both approximately 62 dB. The 2005 forecast DNL drops to approximately 58 dB. The 3-decibel difference between measured and modeled DNL for 2000 is typical for a measurement site in a built-up residential area.

Site 5 is approximately 2,500 feet northeast of Site 8 in the original Part 150. The DNL measured at that site over a single day in 1983 was 70 dB. That original measurement location was outside the 1985 and 1990 65 dB DNL contours. The current location falls within the 65 - 70 dB contour intervals from those two cases.

Site 6: 4610 Westford Circle, Village West

No L_{eq} or DNL measurements were conducted at this site.

Site 7: Clubhouse, Plantation

The DNL values for two partial days of measurements had a mathematical average of approximately 64.5 dB.

The 2000 base case and 100 percent north-flow case aircraft DNL calculated for this site are both approximately 59 dB. The forecast 2005 DNL is approximately 56 dB. The differences between measured and modeled values can be attributed to activity within the development, lawn maintenance that occurred during the measurements, and rain during part of the measurement visit. The difference between measured and modeled DNL is to be expected; the site was well outside the 65 dB DNL contour, in the area where community noise can have a significant effect on overall DNL.

The measurement site is approximately 2,000 feet northwest of measurement Site 3 in the original Part 150 study. The DNL measured over a single day at that site in 1983 was 65 dB. The 1985 and 1990 DNL calculated for that site in the 1983 study was also approximately 65 dB.

Site 8: 6719 Twelve Oaks Boulevard

The DNL values over three days of measurement ranged from approximately 63 to 65 dB, with a mathematical average of approximately 64.

The 2000 base case and 100 percent north-flow case aircraft DNL calculated for this site are both approximately 60 dB. The estimated 2005 DNL is approximately 54 dB. Again, the site was well outside the 65 dB DNL contour, in the area where community noise can have a significant effect on overall DNL.

The measurement site is approximately 2,500 feet west of measurement Site 5 in the original Part 150 study. The DNL measured over a single day at that site in 1983 was 71 dB. That measurement location had a calculated noise exposure of approximately

72 dB for the 1985 and 1990 DNL cases in the original study.

Site 9: 4613 D'Azzo Avenue, Drew Park

Measurements at the site included portions of two days, for a total of approximately 24 hours. The average DNL over the two days was approximately 61 dB. The 2000 base case and 100 percent north-flow aircraft DNL calculated for this site are both approximately 66 dB. The forecast 2005 DNL is approximately 62 dB. DNL at this site is sensitive to runup activity, use of the east parallel, and use of Runway 9-27. Conditions during the measurements appeared to be below the norm.

The measurement site is approximately 500 feet north of measurement Site 10 in the original Part 150 study. The DNL measured over a single day at that site in 1983 was 72 dB. The calculated 1985 DNL was approximately 67 dB. The calculated 1990 DNL was approximately 65 dB.

Site 10: 6526 Johns Road, Northwest Park

Measurements at the site included all or a portion of three days. The DNL values over the three days ranged from approximately 59 to 60 dB, with a mathematical average of approximately 59 dB. The 2000 base case and 100 percent north-flow case aircraft DNL calculated for this site are both approximately 59 dB. The estimated 2005 DNL is approximately 54 dB.

The measurement site is approximately 2,000 feet northwest of measurement Site 6 in the original Part 150 study. The DNL measured over a single day at that site in 1983 was 71 dB. That measurement location had a calculated noise exposure of approximately 71 dB for both the 1985 and 1990 cases in the original study.

Site 11: 5215 West Laurel Street

Measurements at the site included all or a portion of three days. The DNL values over the three days ranged from approximately 67 to 70 dB, with a mathematical average of approximately 69 dB. The 2000 base case, 100 percent north-flow case, and 2005 forecast case aircraft DNL calculated for this site are all approximately 62 dB. Once again, the site was in an area outside the 65 dB DNL contour where the community noise levels would be expected to significantly effect the overall DNL.

The measurement site is approximately 2,500 feet northwest of Site 16 in the original Part 150 study. The DNL measured over a single day at that site in 1983 was 62 dB. The calculated DNL at that site was below 65 dB for both the 1985 and 1990 contour cases in the previous study. However, the current location was approximately on the 65 dB contour in the 1985 case, and just inside it for the 1990 case.

Site 12: North Street/Occident Avenue Intersection

No L_{eq} or DNL measurements were conducted at this site.

Site 13: Leeward Drive, Watermill Village

No L_{eq} or DNL measurements were conducted at this site.

Site 14: 3947 Doral Drive, Dana Shores

The DNL values for the partial day of measurements allowed calculation of a DNL value of approximately 67 dB. The 2000 base case and 100 percent north-flow aircraft DNL calculated for this site are both approximately 57 dB. The forecast 2005 DNL is approximately 62 dB. Closer agreement would not be expected at a site this far from the 65 dB contour.

The measurement site is approximately 1,000 feet northeast of measurement Site 9 in the original Part 150 study. The DNL measured over a single day at that site in 1983 was 69 dB, and the calculated 1985 DNL was approximately 67 dB.

Site 15: Cypress Point Park

Measurements at the site included portions of two days, with a total measurement duration of approximately 24 hours. The average DNL calculated from the two days was approximately 69 dB. The calculated 2000 average day and 100 percent north-flow DNL for the site are both approximately 71 dB. The forecast 2005 DNL is approximately 70 dB. This is excellent agreement for a site at this orientation to the Airport.

The INM-calculated 2000 average day and 100 percent north-flow DNL for the site are both approximately 71 dB. The forecast 2005 DNL is approximately 70 dB.

Chapter Five Land Use

TPA and its surrounding communities have a successful history of planning for compatible land use in areas affected by aircraft noise. Previous planning efforts have developed noise abatement flight procedures, which minimize noise exposure in existing residential areas, and land use planning measures to reduce future noise sensitive development. After a brief description of existing and planned land use and a review of land use compatibility criteria, this chapter will examine the degree to which the measures recommended in earlier planning efforts have been implemented and the results of this implementation.

5.1 EXISTING AND PLANNED LAND USE

TPA straddles the city limits of the City of Tampa, the current airport boundary encompasses approximately 3,100 acres. After completion of the Drew Park acquisition, the airport land area will be approximately 3,300 acres in western Hillsborough County. **Figure 5-1** illustrates the existing land use surrounding the Airport. **Figure 5-2** presents the future zoning for the airport surrounds. The existing land use and future zoning was supplied by the Hillsborough County City County Planning Commission (HCCCPC).

The existing land use south of TPA is a mix of commercial and single-family residential development. The area between Kennedy Boulevard and the Airport has undergone intensive commercial development in recent decades along and west of West Shore Boulevard. This area includes a regional shopping mall and numerous commercial multi-story offices and hotels. Older established commercial development fronts Kennedy Boulevard, Dale Mabry Highway, and Gandy Boulevard.

The single-family residential land use south of the Airport ranges from modest- to high-cost homes, including prestigious homes along Tampa Bay due south of the Airport.

Immediately east of the Airport is Drew Park, an older area of mixed use comprised of small businesses, shops, garages, and older low-cost, single-family homes. It is an area that has gradually shifted from residential to a predominance of industrial and commercial uses.

Al Lopez Park is located east of the Airport adjacent to Dale Mabry Highway. This is a park and recreation facility of regional importance. Also in this vicinity, to the south, is the new Raymond James Stadium, home of the NFL Tampa Bay Buccaneers, and Legend Field, spring training facility of the New York Yankee baseball team. Also in this immediate vicinity, east of Dale Mabry Highway, is a regional shopping mall and office center. The dominant land use east of the Dale Mabry and Himes Avenue is residential.

Middle- and upper-income, single-family residential housing characterizes most of the area west of the Airport. Large, modern office complexes have been developed over the past two decades along the west side of Eisenhower Boulevard.

Directly north of the Airport is an area which extends northward to Waters Avenue and is comprised of industrial, wholesale-commercial, and warehousing development. Established single-family residential neighborhoods are located both to the east and to the west of this district. Residential development extends northward of Linebaugh Avenue.

Few mobile home parks are located within the study area. The largest of these are located between MacDill Air Force Base and on Hillsborough Avenue, west of Eisenhower Boulevard. Others are relatively small and scattered.

5.2 LAND USE COMPATIBILITY CRITERIA

The degree of annoyance which people experience from aircraft noise varies depending on their activities at any given time. People are usually less disturbed by aircraft noise when they are shopping, working, or driving than they are at home. Transient hotel and motel residents seldom express as much concern with aircraft noise as do permanent residents of an area. The concept of "land use compatibility" has arisen from this systematic variation in community reaction to noise.

5.2.1 Federal Guidelines

Studies by governmental agencies and private researchers, in particular those by the Department of Housing and Urban Development (HUD), the FAA, and other Federal agencies, have compatibility guidelines for different land uses with varying noise levels. In 1980, the Federal Interagency Committee on Urban Noise (FICUN) published a report, Guidelines for Considering Noise in Land Use Planning and Control, which contained detailed land use compatibility guidelines for varying day-night noise levels (DNL). The FAA adopted a revised and simplified version of these guidelines when it promulgated Federal Aviation Regulations (FAR) Part 150.[13] This study utilizes these guidelines.

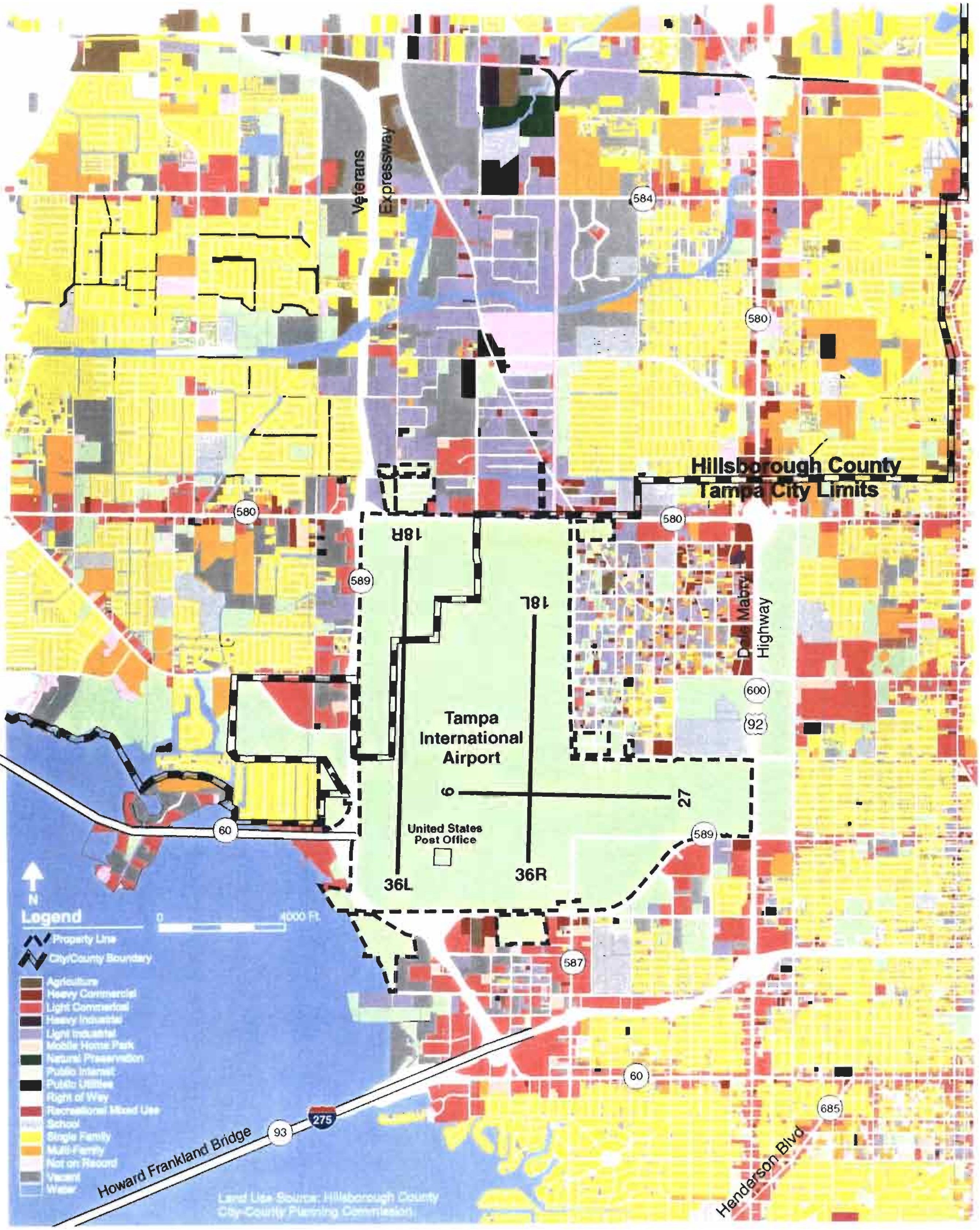
5.2.2 Recommended Guidelines

Part 150 states that determinations of noise compatibility and regulation of land use are local responsibilities. Federal guidelines are provided to assist local communities in making land use compatibility determinations. Land use compatibility criteria recommended for the TPA Part 150 update are based on the Federal guidelines described earlier. Notes on selected categories of land use with explanations of the rationale for the criteria follow.

Residences (other than hotels)

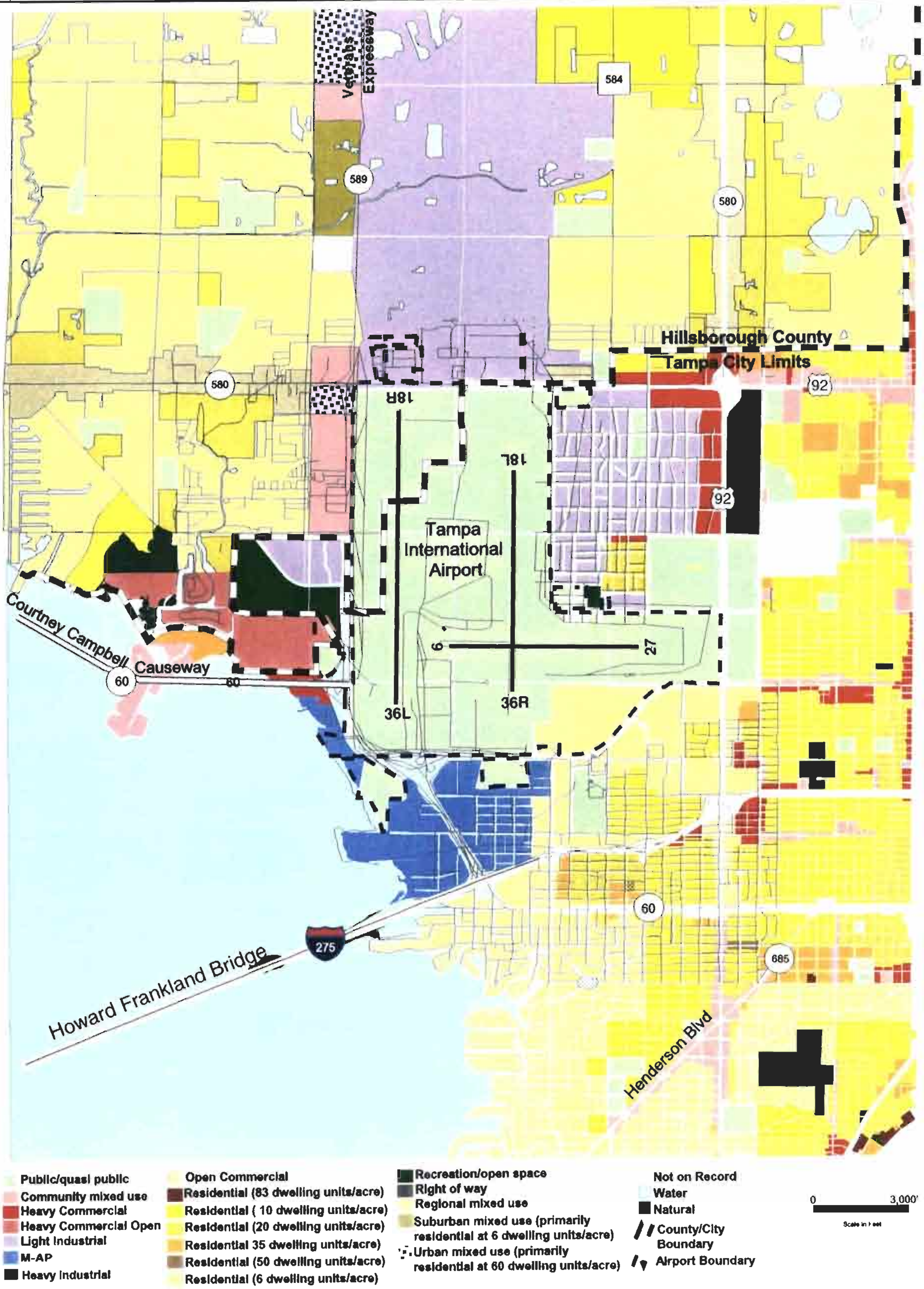
All residential development within the DNL 75^{+} contour should be considered non-compatible. New single-family residential development in DNL 65-70 and DNL 70-75 contour intervals should be permitted only where in-filling of existing residential neighborhoods is the only reasonable land use. In the 65-70 contour interval, insulation should be required to achieve interior noise level reduction (NLR) of at least 25 dBA, consistent with Part 150 Table 1 guidelines (see Table 2.1), resulting in an interior level

Existing Land Use Figure 5-1



Planned Land Uses

Figure 5-2



Land Use Source: Hillsborough County City-County Planning Commission.

of DNL 45, as recommended by the U.S. Environmental Protection Agency. Similarly, in the 70-75 contour interval, an NLR of at least 30 dBA is required by Part 150 guidelines. In addition to acoustical treatment of structures, potential new residents should be made aware of the noise environment.

Hotels, Motels, and Transient Lodgings

It is recommended that hotels be permitted in all noise contours provided that interior NLR measures sufficient to achieve acceptable noise levels are required. The construction standards of hotels and motels generally provide interior sound attenuation higher than single-family homes. In addition, the temporary nature of their use justifies minimal restrictions, provided an interior noise level of no more 45 dBA is attained; i.e., 25 dBA in the 65-70 DNL interval, and 30 dBA in the 70-75 DNL interval.

Schools

It was determined in the previous Part 150 Study for TPA that schools should be considered compatible in the DNL 65-70 noise contour interval, provided they have an NLR of at least 30 dBA, but that they be considered non-compatible in the higher noise areas. The special sensitivity of classroom teaching to periodic aircraft noise events justifies that the NLR level be more stringent than that applied to residences. The criteria should apply equally to public and private schools.

Hospitals

Hospitals are generally well-constructed and centrally air conditioned with windows kept closed, resulting in high levels of interior noise attenuation. Hospital facilities are considered non-compatible in contours above DNL 75. From recommendations in the previous TPA Part 150 Study, they can be considered compatible in the DNL 65-70 contour interval with a NLR of at least 30 dBA, and in the DNL 70-75 contour interval with a NLR of 35 dBA.

Nursing Homes

Nursing homes are essentially residences and should be addressed consistent with requirements for multi-family dwellings.

Child Care Centers

Since classroom instruction is not as important a function of a child care center as it is a function of a school, it is recommended that criteria for child care centers be less stringent than those for schools. As with the previous TPA Part 150 Study, it is recommended that these facilities be considered compatible in the DNL 65-70 contour interval with an NLR of at least 25 dBA and in the DNL 70-75 contour interval with an NLR of at least 30 dBA, and non-compatible above the DNL 75 contour.

Churches

Given the small amount of time per week that a church is used for quiet activities, and given that the proportion of time spent by an individual in a church is also small, the justification for adopting more stringent compatibility standards for churches is less strong than for schools. It is recommended that the criteria proposed in the FAA's table of criteria in FAR Part 150 be applied (i.e., an NLR of 25 dBA in the 65-70 DNL interval, NLR 30 in the 70-75 interval, and no churches over 75 DNL). For schools, child care centers, or other types of facilities that are part of a church complex, the criteria for these secondary types of facilities would be applied. In addition to structures specifically dedicated to church use, numerous small churches are often established in portions of commercial buildings. These "storefront churches" are frequently located in commercial areas which are otherwise compatible with aircraft noise levels. Due to their locational characteristics and sometimes transient nature, it is recommended that storefront churches be treated as other uses in commercial districts (i.e., non-compatible above 80 DNL, and NLRs of 25 and 30 in the 70-75 and 75-80 DNL intervals).

Commercial, Industrial, and Recreational Uses

Most uses in these categories are not as noise sensitive as the uses described previously. It is recommended that the FAA suggested criteria in FAR Part 150 be applied (i.e., non-compatible above 80 DNL, and NLRs of 25 and 30 in the 70-75 and 75-80 DNL intervals).

5.3 EXISTING LAND USE CONTROLS

Both the City of Tampa and Hillsborough County have adopted comprehensive plans for growth management in their respective jurisdictions. These plans have been developed in accordance with Chapter 163 of the Florida Statutes which require local government preparation and adoption of policies for land development regulation. The land use elements of these plans include future land use maps which reflect these policies for growth management.

The comprehensive plans for the City and the County were prepared in the mid-to-late 1980s and were adopted in 1989. These Florida Statutes require that the plans be evaluated and updated every five years. The County plan was updated in October 1994 and the City plan in May 1998. In addition, minor amendments are considered twice a year as provided by the State law.

Hillsborough County has adopted a Land Development Code, most recently amended in November 1996. This code regulates all land use in accordance with the adopted comprehensive plan. The code includes zoning regulations with specific sections related to districts likely to be affected by airports and airport operations.

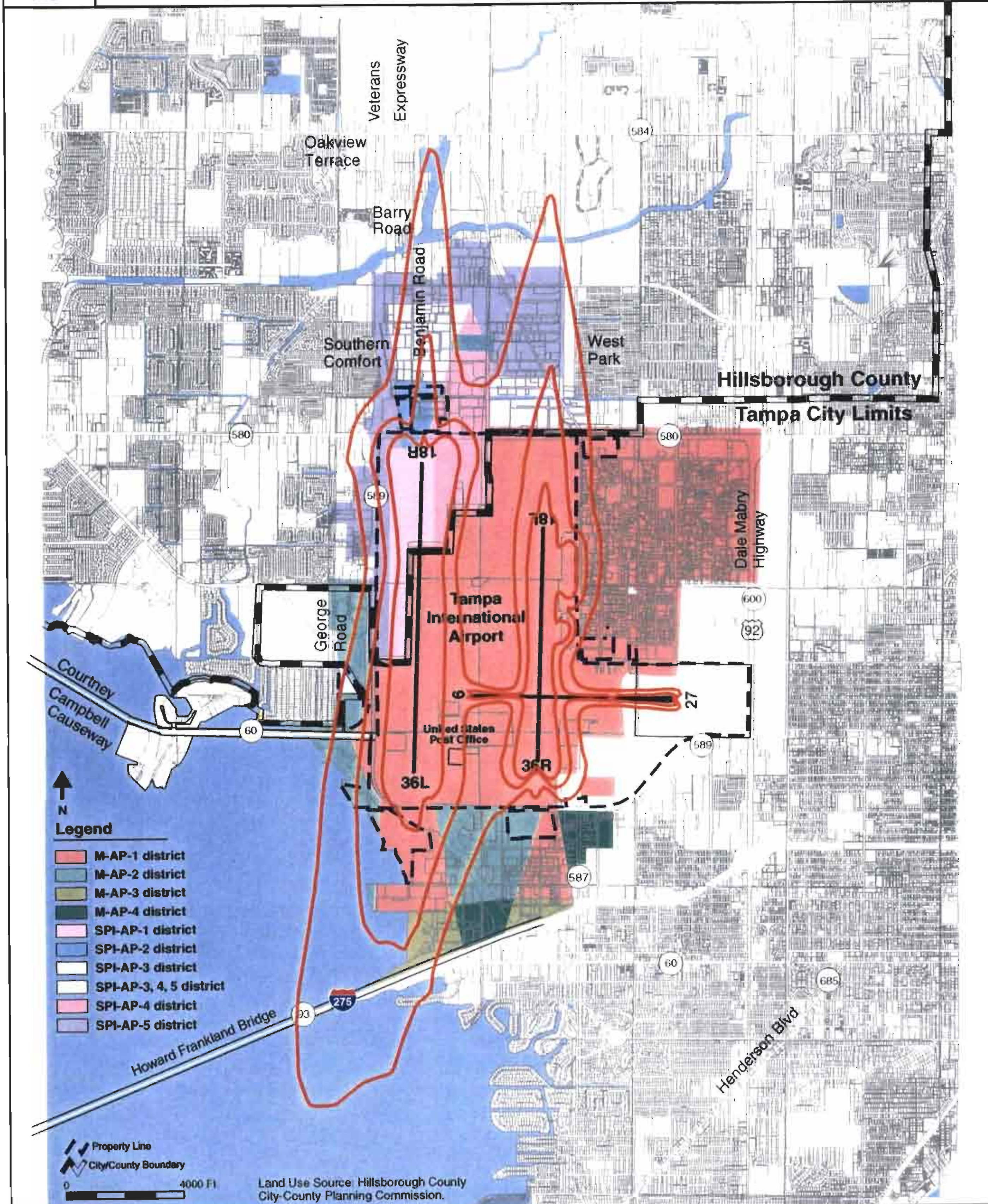
The County Land Development Code sets forth a special Airport District with six sub-areas for regulating development "...to promote the public health, safety, and general welfare by limiting the type, the arrangement, and intensity of uses in an effort to minimize adverse affects of aircraft operations such as potential aircraft crash hazards, aircraft noise and vibration emissions, and related effects on uses, structures, and occupants of areas likely to be affected by airports and aircraft operations".

The sub-areas within the Airport District are identified as Special Interest Zoning Districts SPI-AP-1, SPI-AP-2, SPI-AP-3, SPI-AP-4, SPI-AP-5, and SPI-AP-V. The permitted uses in these zones exclude noise sensitive residential, outdoor passive recreation activities, and regional cultural and entertainment uses. Other zoning districts located north of TPA include industrial (District M) and commercial zones (Districts C-N, C-G, and C-I), all of which exclude residential development as a permitted use. **Figure 5-3** presents these zones.

HILLSBOROUGH COUNTY AVIATION AUTHORITY

2000 Day-Night Average Sound Level Contours with Airport Special Zoning Districts

Figure 5-3



The City of Tampa Code of Ordinances provides for an airport compatibility district in accordance with the City's comprehensive plan. This district includes four sub-districts. Theses sub-districts regulate the types of uses, intensity of use, and heights of structures to minimize population and eliminate hazards to aircraft operations at TPA. These sub-districts are identified as M-AP-1, M-AP-2, M-AP-3, and M-AP-4. Permitted uses in these zones exclude residential development and places of public assembly. Figure 5-3 presents these zones.

The City's codes also include subdivision regulations and site development standards as further land development controls.

The Hillsborough County Aviation Authority (HCAA) is also involved in the review and approval process for developments proposed in the City and the County in the vicinity of the Airport which might pose a safety hazard.

5.4 EXISTING AND FORECAST LAND USE COMPATIBILITY

5.4.1 Current (2000) Non-Compatible Land Uses

Figure 5-4 shows the existing 2000 land use areas that are considered by FAA guidelines to be non-compatible with the noise levels generated by aircraft operating at TPA. The DNL contours for 2000 annual operations are evaluated for their impact on land use compatibility.

The 2000 DNL contours were developed for an average day that considers annualized runway use. A sensitivity analysis was completed to evaluate an average day when airport operations are primarily to and from the north, and an average day when operations are primarily to and from the south. The results of this analysis are found in **Appendix E**.

Table 5.1 summarizes the estimated population residing in these non-compatible areas for each of the three scenarios. The estimates were made by applying a factor of 2.46, the average household size for Hillsborough County, to the number of dwelling units located within the noise contours. The dwelling unit counts were determined by aerial photography supported by field investigation.

The following discussion examines the non-compatible land uses surrounding the Airport.

Areas North of TPA

The residential vicinity most potentially impacted by existing aircraft noise is located north of the Airport, as can be seen in both Figure 5-4 and Table 5.1.

West Park Estates is a subdivision of several hundred single-family homes. The 2000 DNL contours result in 0 dwelling units and 0 residents in the DNL 65-70 contour interval. No dwelling units are located within the 65 DNL contour in the south scenario

The Benjamin Road area in the vicinity of Barry Road has an estimated 27 dwelling units and 66 residents in the DNL 65-70 contour interval. No dwelling units are located within the 70 DNL contour. Field observation discloses that many of the dwellings are older mobile (manufactured) homes that appear to have been in place for many years.

Table 5.1

Existing Land Use Non-Compatible Properties for 2000 DNL Noise Contour Intervals

Location	Contour Interval [1]	Population [2]	Residential Dwelling Units
South of TPA (Mariner St.)	65-70 DNL	54	22
West of TPA (Dana Shores)	65-70 DNL	34	14
West of TPA (George Road Vicinity)	65-70 DNL	0	0
North of TPA (Southern Comfort)	65-70 DNL	15	6
North of TPA (Benjamin Road/Barry Lane Vicinity)	65-70 DNL	66	27
North of TPA (Subdivision NE of R/W 18L-36R)	65-70 DNL	22	9
East of TPA (Drew Park)	65-70 DNL	0	0
Total		191	78

[1] There are no residential dwelling units within the 70 and higher DNL contours.
[2] Population estimated based on dwelling unit counts. Hillsborough County household size of 2.46 persons/household as estimated by Hillsborough County City-County Planning Commission, April 1997.

Areas South of TPA

The only existing non-compatible residential land use south of the Airport is the neighborhood that extends along Mariner Street. The residences are very large and situated on the waterfront of Tampa Bay. This street is located approximately one and one-half miles south of the end of Runway 18R-36L. An estimated 22 dwelling units with a population of 54 are located within the 2000 DNL 65-70 contour interval. No dwelling units are within the 2000 DNL 70^+ contour.

Cypress Point Park, a City of Tampa park, is located south of Cypress Street due south of Runway 36l. This is a swimming beach facility located within the DNL 70. The park has been in place for many years and is not considered noise sensitive by the City of Tampa.

Areas East of TPA

The Drew Park area is an older area in transition from a once residential area. It is now primarily comprised of small industrial and commercial uses with an interspersing of older, small single-family homes. No dwelling units are located in the 2000 DNL 65^+ contour interval.

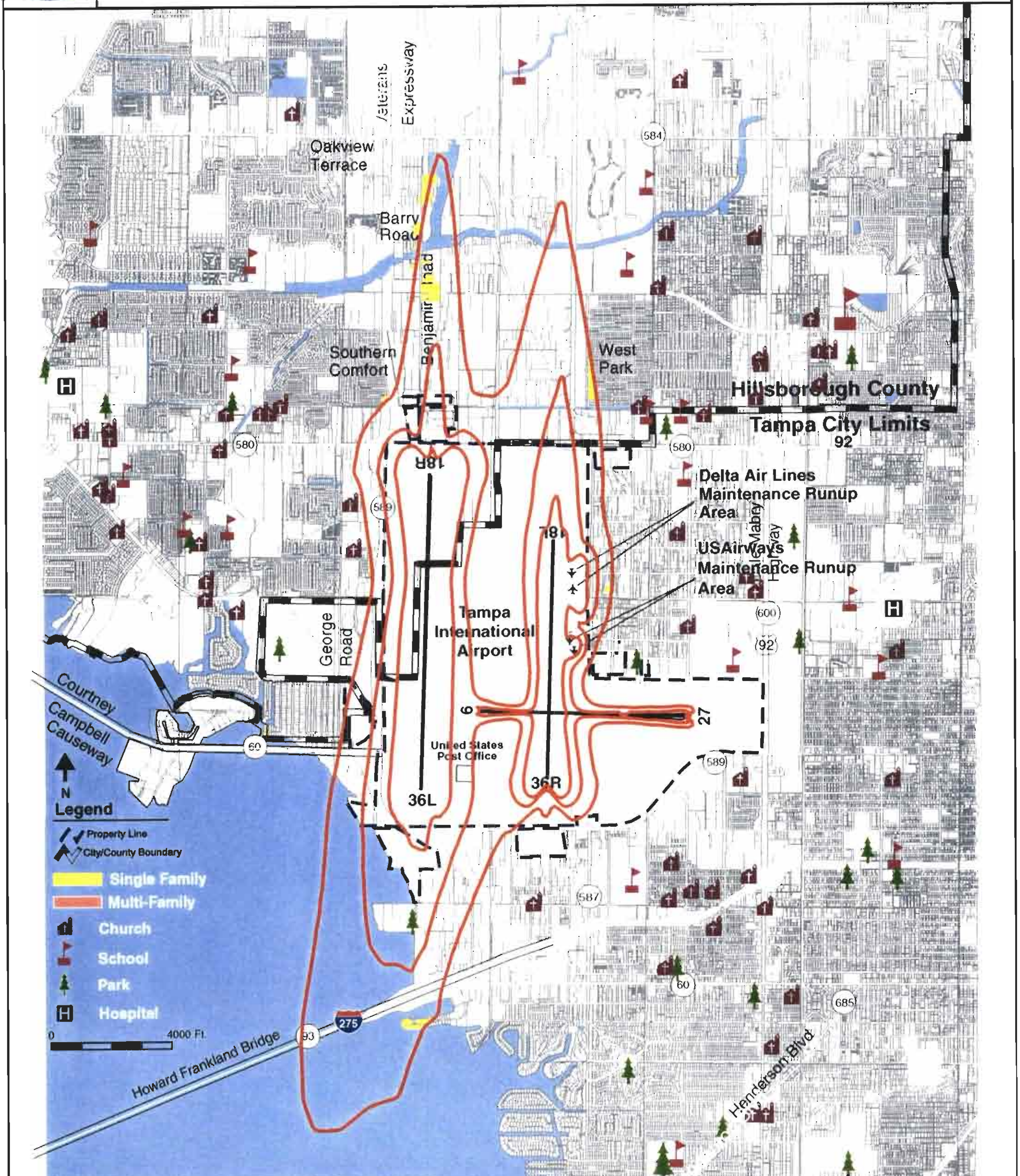
Areas West of TPA

Skyway Park is located on the west side of the Veterans Expressway in the DNL 65-70 contour interval. It serves as recreational playing fields and is not considered noise sensitive by the City of Tampa.

Another transitional area impacted by aircraft noise is east of George Road in the vicinity of Chelsea and Eleanor Streets. There are no dwelling units and no residents in the 2000 DNL 65-70 contour interval.

HILLSBOROUGH COUNTY AVIATION AUTHORITY

2000 Day-Night Average Sound Level Contours with Non-Compatible and Noise Sensitive Land Uses Figure 5-4



Land Use Source: Hillsborough County City-County Planning Commission and visual certification (HNTB: summer 1998) of non-compatible uses.

There are no dwelling units within the 2000 DNL 70^{+} contour.

Additionally, the Dana Shores area is impacted by aircraft noise. There are an estimated 34 residents living in 14 dwelling units in the 2000 DNL 65-70 contour interval. There are no dwelling units within the 2000 DNL 70+ contour.

Conclusions

Table 5.1 summarizes the estimated dwelling units and population within the 2000 DNL contours. There are approximately 191 persons within the 2000 DNL 65^{+} contour for TPA. There are no existing noise sensitive land uses other than residential located within the 2000 DNL 65dB contour.

5.4.2 Potential (2000) Non-Compatible Land Uses

The land use elements of the adopted comprehensive plans of the City of Tampa and of Hillsborough County are reflected in **Figure 5-5**. The 2000 noise contours superimposed on this composite map indicate potential areas of future land use non-compatibility.

These comprehensive plans, developed in the mid-1980s, had the benefit of considerable input from the HCAA and the findings of the FAR Part 150 Noise Study. This planning process addressed land use compatibility issues. The results of this cooperative effort are reflected in the land use plan elements of the comprehensive plans depicted in Figure 5-5, particularly in the areas north and south of TPA.

Figure 5-5 shows the extent to which the plan designates future non-residential land uses north and south of the Airport where the 2000 DNL 65^{+} contours are located.

The following discussion addresses the potential for future non-compatibility in the areas surrounding the Airport.

North of TPA

Southern Comfort, Oakview Terrace, and West Park Estates are totally built-out developments, therefore, no change is anticipated in the number of people impacted within the 2000 DNL contours.

The Benjamin Road area has vacant potentially developable land. However, the previously discussed land use controls have discouraged new residential development over the past decade and are expected to continue to discourage new residential development in areas within the DNL 65^{+} contour.

Given the existing development already within the DNL 65^{+} contour and the likelihood of little, if any, new residential development in these impacted areas, the existing number of residents is projected to be impacted in the future. Since there are a number of older mobile homes in the Benjamin Road vicinity that are in an area transitioning to commercial uses, the residential population within the DNL 65 contour could slightly decline during the next five years.

South of TPA

The Mariner Street neighborhood is totally developed. No new residential development in the next five years can be expected. Therefore, the same number of people within the DNL 65 contour is forecast for the future.

East of TPA

It is anticipated that there will be no residences within the DNL 65 contour in the future. This is due to the expansion of airport property coupled with the conversion of the land to commercial purposes in the vicinity of the DNL 65^+ contour.

West of TPA

It is likely that there will be fewer residents in the vicinity east of George Road. The transitioning of this area to commercial uses and restrictions on building new residential housing will continue to constrain development of future non-compatible land. Conservatively, it is estimated that the existing residential population will remain in this vicinity for the next 5 years.

Conclusions

The future land use within the 2000 DNL 65^+ contour will not significantly change over the next five years for the reasons stated above. **Table 5.2** conservatively reflects the projected population that will be residing within the DNL 65^+ contours. As discussed, because of certain areas undergoing transition from residential to commercial uses and the development controls in place to discourage new non-compatible uses, the resident population could actually slightly decline in these noise impacted areas.

Table 5.2

Planned Land Use Non-Compatible Properties for 2000 DNL Noise Contour Intervals

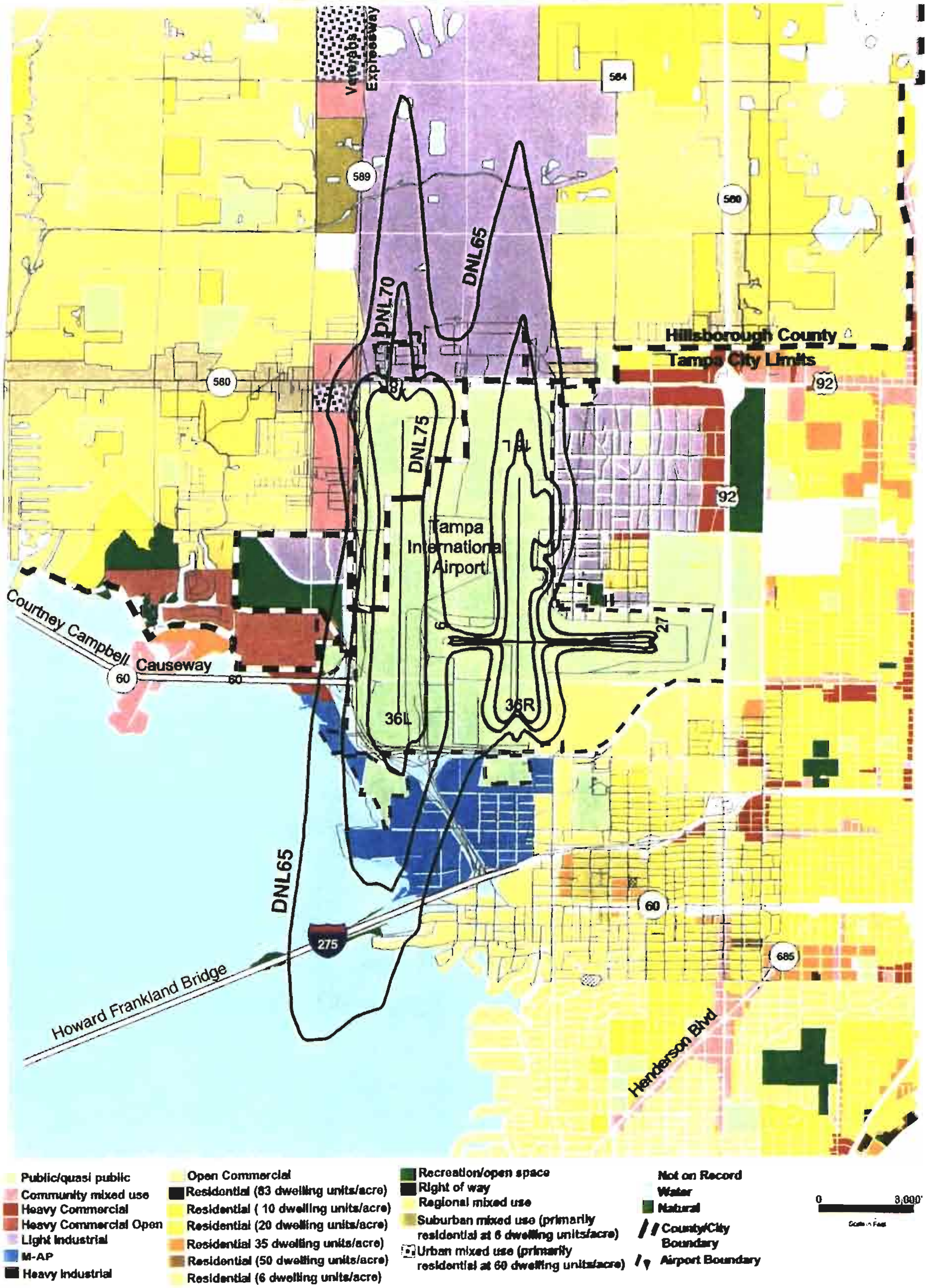
Contour Interval	Population	Residential Dwelling Unit
75+	0	0
70-75	0	0
65-70	191	78
Total	191	78

[1] Population estimated based on dwelling unit counts. Hillsborough County household size of 2.46 persons/household as estimated by Hillsborough County City-County Planning Commission, April 1997.

HILLSBOROUGH COUNTY AVIATION AUTHORITY

Planned Land Use with 2000 DNL Contours

Figure 5-5



Land Use Source: Hillsborough County City-County Planning Commission.

Chapter Six
Updated Noise Exposure Maps

This section presents the TPA Noise Exposure Maps for 2000 and 2005, submitted in accordance with the provisions of FAR Part 150 Airport Noise Compatibility Planning.

Figures 6-1 through 6-4 present Noise Exposure Maps for the following cases, based on assumptions noted, and as replacements for existing maps as noted. The certification page at the front of this document addresses Part 150 requirements regarding accuracy of the maps and the opportunities provided for public review and input.

Figure 6-1 represents existing conditions for the year of submission, assuming the existing Noise Compatibility Program, airport layout, operations, and other noise modeling assumptions described in Chapter Four.

Figure 6-2 represents forecast conditions for the fifth year following the year of submission, assuming the existing Noise Compatibility Program (unchanged from 2000), airport layout (unchanged from 2000), forecast operations, and other noise modeling assumptions described in Chapter Four.

Figure 6-3 represents the existing conditions with the implementation of the revised Noise Compatibility Program, as described in Chapter Seven, including the revised runway and flight track utilization rates presented in **Appendix F**.

Figure 6-4 represents the forecast conditions with the implementation of the revised Noise Compatibility Program, as described in Chapter Seven, including the revised runway and flight track utilization rates presented in Appendix F.

Figures 6-1 and 6-2 replace the previously approved 1985 and 1990 maps, pending FAA approval for revised Noise Compatibility Program. Following FAA review and approval of the revised program, Figures 6-3 and 6-4 will represent the official maps.

The 2000 Noise Exposure Map (Figure 6-1) shows 78 dwellings which represent approximately 191 people currently within the DNL 65 dB contour. Figure 6-2 shows that by the year 2005, with the existing NCP that shows 10 dwellings which represent approximately 24 people. This represents a 87% decrease in the number of dwellings and people within the DNL 65 dB contour as discussed in the tables and discussion in Chapter Five.

The 2000 Noise Exposure Map with the revised NCP (Figure 6-3) shows 70 dwellings and 172 people within the DNL 65 dB contour. Figure 6-4 shows by the year 2005, with the revised NCP that shows 10 dwellings which represent 25 people. This represents an 87% decrease in the number of dwellings and people within the DNL 65 dB contour as discussed in the tables and discussion in Chapter Five.

Table 6.1 summarizes the number of dwelling units and people within the DNL 65 dB contour.

Table 6.1

Non-Compatible Land Use within Updated 2000 and 2005 Noise Exposure Maps, with Existing and Revised Noise Compatibility Programs

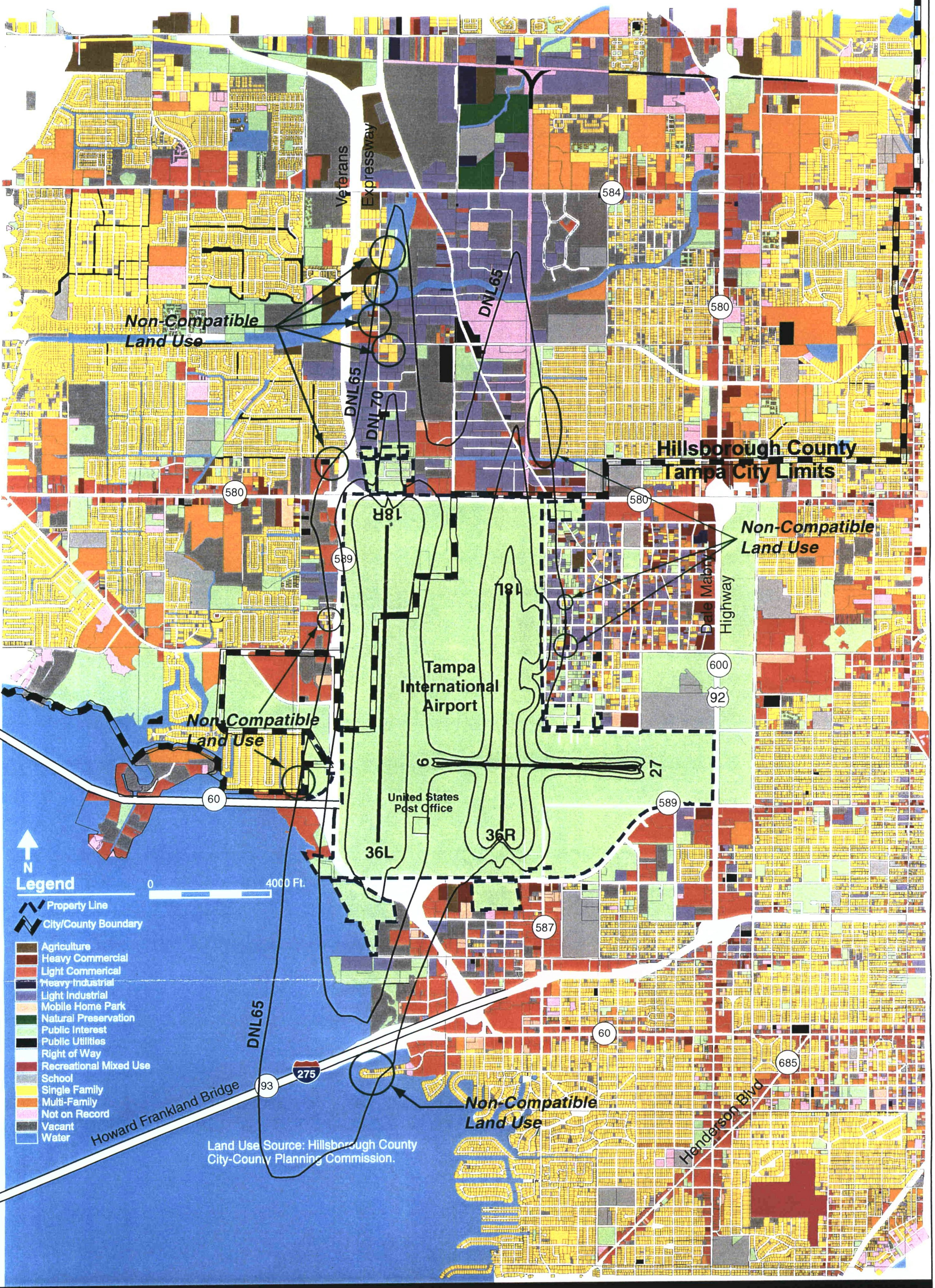
Case	Estimated Dwelling Units within DNL 65-70 dB Contour Interval	Estimated Residents within DNL 65-70 dB Contour Interval
2000 with Existing Noise Compatibility Program	78	191
2005 with Existing Noise Compatibility Program	10	24
2000 with Revised Noise Compatibility Program	70	172
2005 with Revised Noise Compatibility Program	10	25

Source: HMMH, Inc.

H I L L S B O R O U G H   C O U N T Y   A V I A T I O N   A U T H O R I T Y

2000 Existing Conditions Noise Exposure Map with Existing Noise Compatibility Program

Figure 6-1



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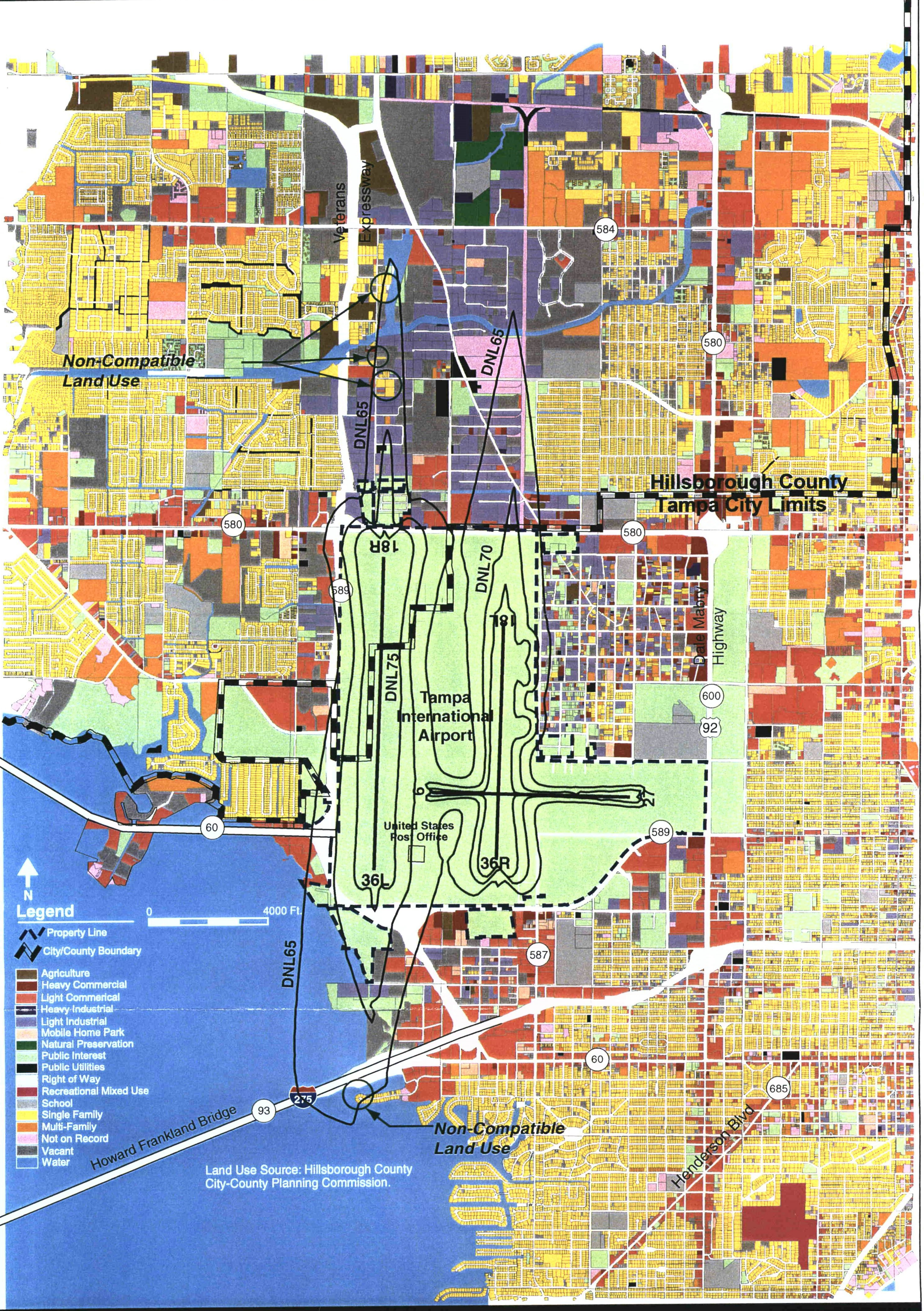
2005 Five-Year Forecast Conditions Noise Exposure Map with Existing Noise Compatibility Program

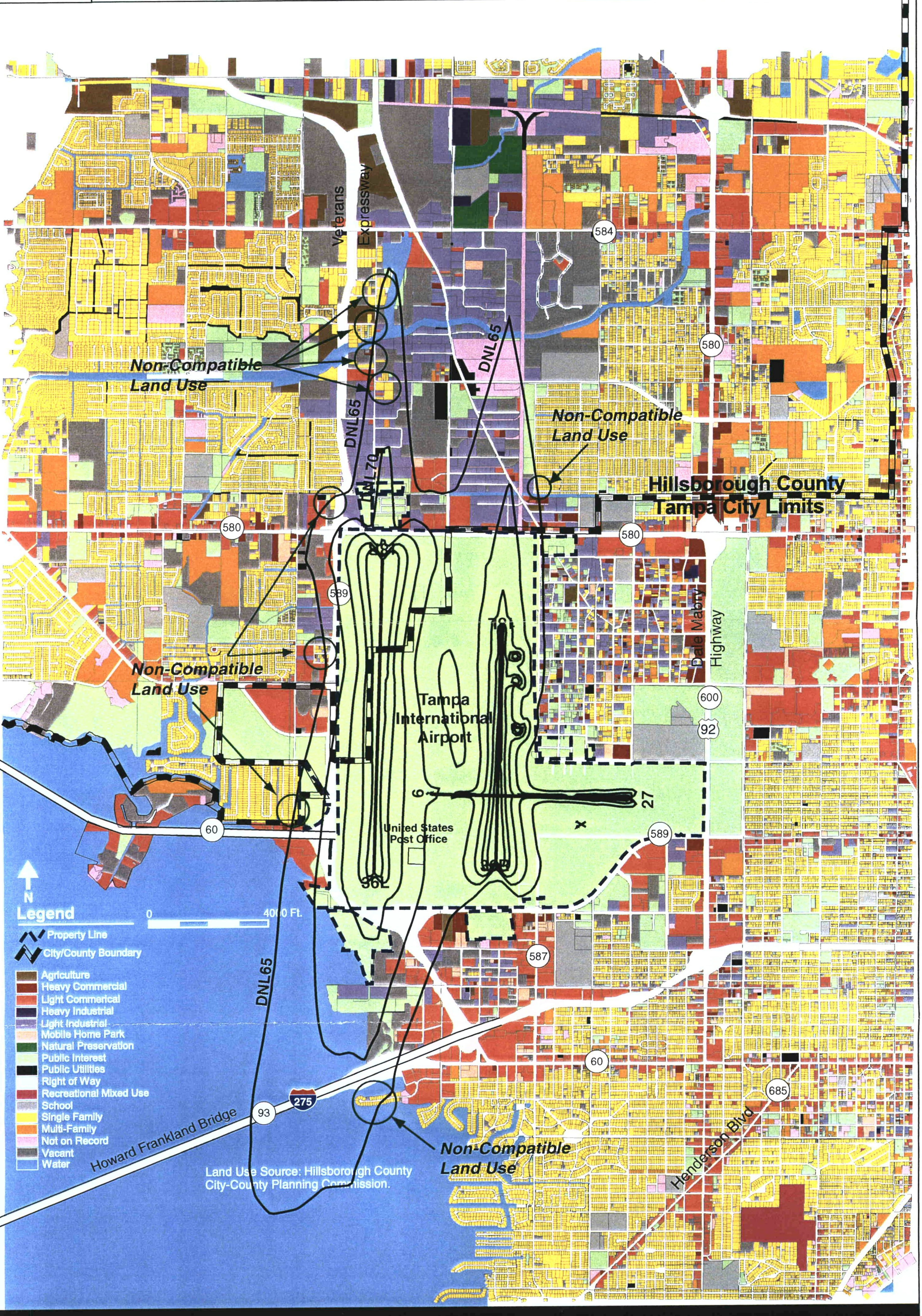
Figure 6-2



HILLSBOROUGH COUNTY AVIATION AUTHORITY

2000 Existing Conditions Noise Exposure Map with Revised Noise Compatibility Program

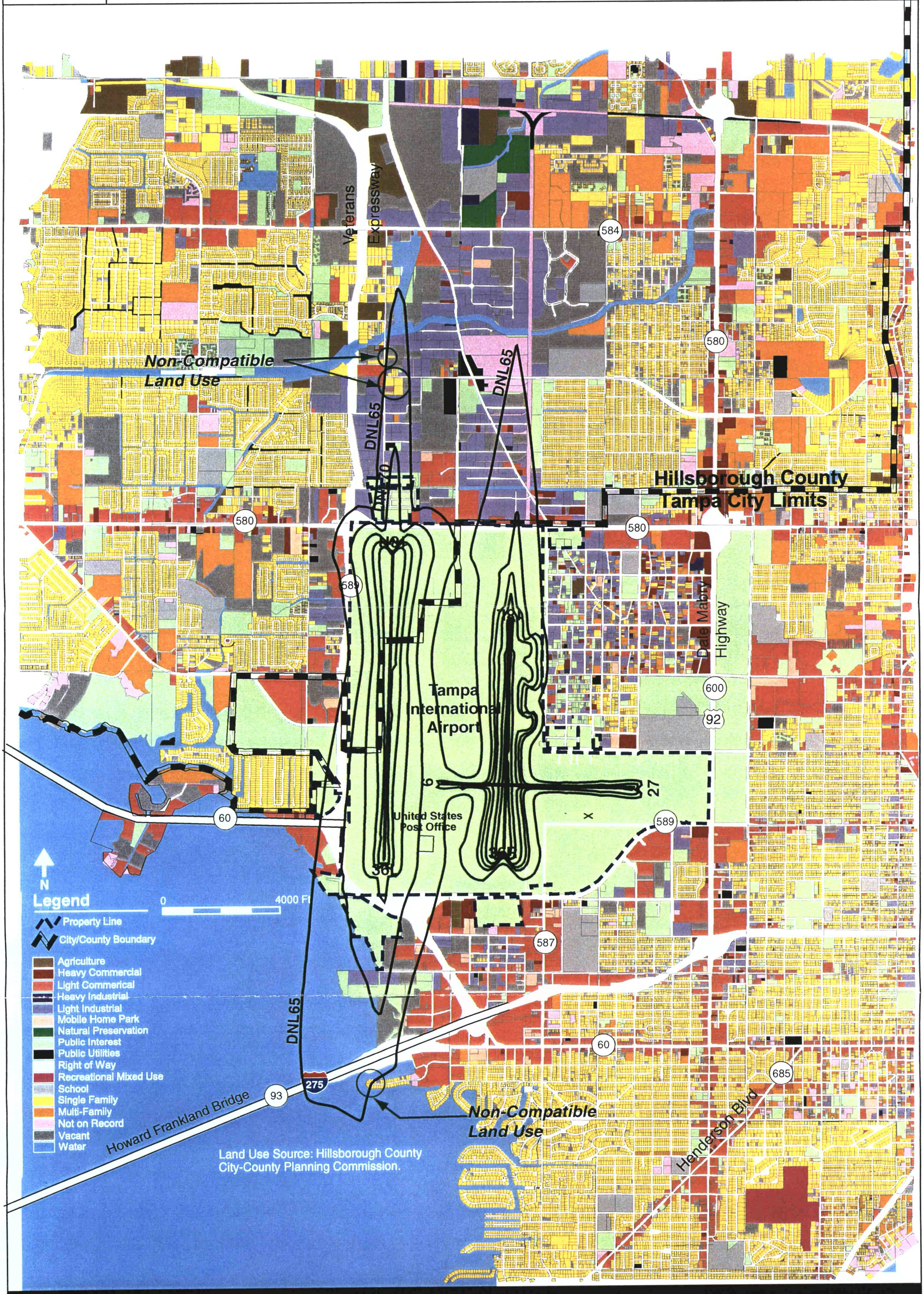
Figure 6-3



HILLSBOROUGH COUNTY AVIATION AUTHORITY

2005 Five-Year Forecast Conditions Noise Exposure Map with Revised Noise Compatibility Program

Figure 6-4



TAMPA INTERNATIONAL AIRPORT MASTER PLAN UPDATE AND F.A.R. PART 150 STUDY

Chapter Seven
Noise Abatement

The existing TPA Noise Compatibility Program (NCP) includes three categories of compatibility measures: (1) noise abatement (measures that affect the size and shape of the noise contours), (2) land use (measures that address land use incompatibilities that remained after the implementation of the noise abatement measures), and (3) continuing program measures (measures related to the implementation and review of the NCP).

This study considered noise abatement alternatives first. Then, land use compatibility actions were considered because noise abatement measures are generally preferable to land use measures as a means of reducing noise impacts since land use measures typically involve higher economic, social, and political costs. This chapter presents the noise abatement analyses that initiated the TPA NCP update. Chapter Eight presents the review and update of land use measures that followed the noise abatement analyses.

Chapter Nine summarizes the revised NCP, including the recommended continuing program measures that complement the recommended noise abatement and land use actions.

7.1 RECOMMENDED CHANGES TO EXISTING NCP

The recommended NCP is a refinement of the existing, highly effective NCP. It recommends continuation of one measure without change, changes to three of the measures, and four new measures. One measure is complete and will not require further action. Section 1.4.1 lists the noise abatement elements of the existing NCP.

The recommended revisions to the existing NCP follow (with the "existing" numbering from the original NCP documentation noted):

Completed measure (no FAA action required)

- Augment vegetation noise barrier along the western perimeter of the Airport to increase its noise attenuation qualities. (*Existing Measure #4*. The highway structures west of the Airport make this recommendation largely irrelevant. Landscaping does not significantly attenuate sound, unless there is heavy vegetation over relatively long distances. No further noise barriers west of the Airport would offer potential benefits).

Established measure to be continued (no FAA action required)

- Establish a helipad on the east side of the Airport to help separate helicopter traffic from fixed wing flows, and thereby reduce unnecessary overflight of areas adjacent to the Airport. (*Existing Measure #5*. HCAA established a helipad location approximately 700 feet south of Runway 9-27, approximately 2,100 feet west of its east end. There is no basis to consider a change in the helipad location).

Measures recommended to be modified from existing NCP

- The ATCT will make all reasonable efforts to implement the preferential runway program consistent with operating conditions and reasonable attention to delay. Adopt existing Tampa ATCT "Informal Runway Use Program" Letter to Airmen Daytime (6 a.m. to midnight) Preferential Runway Use Priority for Turbojets:

  A. South Operation: Arrive 18L-18R
     1. Depart 18R
     2. Depart 18L

  B. North Operation: Depart 36L-36R
     1. Arrive 36L
     2. Arrive 36R

  C. East/West Operation: Arrive/Depart 9-27

  (*Modification of existing Measure #1.*

- This measure amends existing Measure #1, which calls for maximizing south flow. It adds the detailed runway use priorities set form in the existing Letter to Airmen (Appendix D).

- Encourage operators of turbojet aircraft to use Air Transport Association (ATA)-recommended noise abatement arrival procedures and "distant" Noise Abatement Departure Procedure (NADP) profiles, as recommended in FAA Advisory Circular 91-53A for turbojets over 75,000 pounds, or by National Business Aviation Association (NBAA) or manufacturers for corporate jets.

  (*Modification of existing Measure #2.* This measure adds NADP profiles to complement existing arrival procedures.

- An engine maintenance runup enclosure will be constructed at the north end of the existing Delta Air Lines maintenance ramp, with the opening oriented to the south, with the requirement that operators share the facility and use it for all runups above idle power. Idle runups to continue at previously approved locations. Section 7.4.3 discusses and depicts the location of this proposed facility.

  (*Modification of existing Measure #3.* This measure adds a runup enclosure for runups above idle.)

New measures to be added to NCP

- Initial turbojet departure headings:
  - Runway 36L or 36R – 360°M (Magnetic) track
  - Runway 18R – 200°M track
  - Runway 18L – 210°M track
  - Runway 27 – 270°M track
  - Runway 9 – 90°M track

  Headings to be maintained until reaching 3,000 feet MSL unless instructed by the TPA ATCT "Informal Runway Use Program," which should be included in the NCP at this time.

- Nighttime bi-directional runway use:

  When wind, weather, and field calculations permit, and no delays to arrivals or departures will result, all aircraft are to use Runway 18R for departures and Runway 36L for arrivals from midnight to 6 a.m. If conditions do not permit, use daytime preferential runway use program. (This measure is also an existing element of the TPA ATCT: "Informal Runway Use Program," which should be included in the NCP at this time. While the "Informal Runway Use Program" currently applies only to turbojets, it is recommended to be extended to all aircraft.)

- When wind, weather, field, and traffic conditions permit, and no excessive delays will result, turbojet arrivals to Runway 36L will not conduct base legs north of MacDill Air Force Base. (This measure incorporates a procedure into the NCP that the Tampa ATCT is currently implementing on an informal basis.)

- When wind, weather, field, and traffic conditions permit, and no excessive delays will result, the Tampa ATCT will not assign propeller-driven aircraft departure turns greater than 360°M (magnetic) on Runway 36L and greater than 20°M on Runway 36R. (This is a new measure not addressed in the original NCP or any subsequent ATCT procedures.)

Table 7.1 summarizes the recommended noise abatement elements of the revised NCP as compared to the original NCP elements.

7.2 CATEGORIES OF MEASURES REQUIRED FOR CONSIDERATION UNDER FAR PART 150

Section B150.7(b) of FAR Part 150 requires airport proprietors to consider at least seven categories of compatibility measures for inclusion in the NCP. These measures and the sections of this document that address them follow:

1) To ensure the use of property for purposes which are compatible with airport operations, acquisition of land and interests therein including, but not limited to, air rights, easements, and development rights. Addressed in Chapter Eight - Land Use Compatibility.

2) The construction of barriers and acoustic shielding, including the soundproofing of public buildings. Addressed in Chapter Eight - Land Use Compatibility.

3) The implementation of a preferential runway system. Addressed in Section 7.4.1.

4) The use of flight track procedures, including modifications of flight tracks, to control aircraft operations to reduce exposure of individuals (or specific noise sensitive areas) to noise in the areas around an airport. Addressed in Section 7.4.4.

5) The implementation of any restriction on the use of an airport by any type or class of aircraft based on the noise characteristics of those aircraft. Such restrictions may include, but are not limited to, the following list. It is not necessary for all of these potential restrictions to be examined in each NCP, as long as a program gives consideration to at least one type of restriction. Addressed in Section 7.4.2.

   i) Denial of an airport to aircraft types or classes which do not meet Federal noise standards;

   ii) Capacity limitation based on the relative noisiness of different types of aircraft;

Table 7.1

Comparison of Original and New/Revised Noise Abatement Elements of NCP

Original NCP #	Original Measure	Revised or New Measure	FAA Action Required
1.	Daytime south flow preferential	Revise wording in NCP to reflect runway use priority in existing Letter to Airmen.	Approve revised wording to make consistent with existing Letter to Airmen.
2.	Recommend turbojet use of ATA arrival procedure.	Add request for turbojet use of distance NADP profiles.	Approve addition of distant NADP profile.
3.	Recommend construction of shared runup enclosure for runups above idle power. Continue idle runups at designated locations.	Add runup enclosure.	Approve addition of runup enclosure.
4.	Augment vegetative barrier on western perimeter or Airport.	Measure completed by effect of construction of highway berms.	None.
5.	Establish helipad on east side of Airport.	Helipad designated. Use will continue.	None.
N/A	Not applicable.	Initial turbojet departure headings, as set forth in Tampa ATCT Letter to Airmen.	Approve existing measure as part of NCP.
N/A	Not applicable.	Nighttime bi-directional runway use. Extend existing nighttime turbojet runway use, as defined in existing Tampa ATCT Letter to Airmen, to all aircraft.	Approve measure as part of NCP.
N/A	Not applicable.	Limit turbojet base legs on east downwind approaches to 36L north of MacDill AFB.	Approve measure as part of NCP.
N/A	Not applicable.	Limit propeller departure turns greater than 310° on 36L and greater than 60° on 36R.	Approve measure as part of NCP.

iii) Requirement that aircraft using an airport must use noise abatement takeoff or approach procedures previously approved as safe by the FAA;

iv) Landing fees based on FAA-certificated or -estimated noise emission levels or on time of arrival; and

v) Nighttime restrictions.

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

7) Other actions recommended for analysis by the FAA for a specific airport.

7.3 IMPLEMENTATION OF NOISE ABATEMENT ELEMENTS OF EXISTING NCP

The success of the abatement program depends on actions taken to implement and monitor the effectiveness of the measures. This study was initiated with a review of implementation of the existing noise abatement measures. The result of the review was that overall compliance with the existing noise abatement measures has been achieved with a high degree of compliance, as discussed below.

The original (1987) TPA Part 150 study recommended five noise abatement measures:[14]

1) Use southerly traffic flows whenever possible.

2) Encourage operators of turbojet aircraft to use ATA-recommended noise abatement arrival procedures.

3) Designate engine runup procedures.

4) Augment vegetation noise barrier along the western perimeter of the Airport.

5) Establish a helipad on the east side of the Airport.

The first measure (preferential south flow) is implemented through a "Letter to Airmen" on the TPA "Informal Runway Use Program" issued by the FAA's ATCT at TPA.[15] **Appendix D** provides the Letter to Airmen, the Letter also defines two additional noise abatement measures:

1) Priority of turbojet runway use from midnight to 6 a.m.

2) Initial turbojet departure headings.

These two additional noise abatement measures were not addressed in the FAA's ROA and, therefore, are not part of the approved NCP. However, they are part of the Airport's noise abatement program. This Part 150 Update reevaluates these measures for formal inclusion in the NCP.[16]

The following subsections review the implementation status of these seven noise abatement measures. It should be noted that overall compliance with the existing noise abatement program is very high.

South Flow Preferential Runway

This measure is implemented by the TPA ATCT's "Informal Runway Use Program" Letter to Airmen. Paragraph 1 of that Letter identifies the runway use priority for turbojet operations from 6 a.m. to midnight, in somewhat greater detail, as follows:[17]

- South Operations - Arrive 18L-18R
  (1) Depart 18R
  (2) Depart 18L

- North Operation - Depart 36L-36R
  (1) Arrive 36L
  (2) Arrive 36R

- East/West Operation - Arrive/Depart 9-27

As the preceding list indicates, this abatement measure is more than just south flow preferential; in operations in either flow, it sets the lowest priority to be operations on or off the south end of the east parallel. Therefore, it must be evaluated in two parts:

South Flow Preferential

Based on interviews conducted with ATCT staff and analysis of historic wind data, the runway use analysis conducted for the development of the NEM reveals that the south flow is used approximately 67 percent of the time overall. While this is a relatively high percentage of the time, it assumes that, on average, the ATCT assigns south flow up to approximately a 3-knot tail wind before switching to north flow. However, the FAA's criteria for assignment of the active runway actually allows the ATCT to permit up to a 5-knot tailwind (with clear and dry runways).[18]

Wind data indicates that this criterion would allow south flow at least 80 percent of the time. **Appendix E** provides noise contours for average annual daily operations in 2000, with the assumption that the Airport operates in either the north or south flow the entire day. As summarized in **Table 7.2**, the population within the 2000 south-flow noise contours is substantially less than either north flow or the actual annual runway use. Increasing south flow will reduce overall exposure.

Based on this analysis, it was initially recommended that the study considers the effect of increasing south flow to 80 percent of the time be prepared. Subsequent FAA input indicated that this assumed compliance was too high, and that a 73 percent use was a more reasonable assumption, which the NCP should include as a goal. Section 7.4.1 presents additional analysis.

The ATCT suggested that the NCP should call for them to make all reasonable efforts to implement the preferential runway program consistent with operating conditions and reasonable attention to delay. To assist in achieving this goal, the ATCT has already added improved wording to the existing Letter to Airmen, as discussed in Section 7.5.

Table 7.2

Population Within Contour Intervals for Differing Runway Use Assumptions

Contour Interval (DNL)	South Flow	North Flow	2000 Annualized
65 - 70 dB	148	1,954	191
70 - 75 dB	0	96	0
Over 75 dB	0	0	0
Total (over 65 dB)	148	2,050	191

Source: HNTB analysis.

Minimized Turbojet Departures on Runway 18L and Arrivals on 36R

The restriction of turbojet operations on and off the south end of the east parallel has been an element of the TPA noise abatement program since at least the early 1960's. The current Tower Letter to Airmen clearly identifies these operations as the lowest priority runway use for turbojets (see Appendix D), as have preceding versions of the Letter.

The NEM runway use analysis used a large sample of "radar" data obtained from the FAA's ARTS system for TPA. The sample included over 15,000 flight tracks from slightly over 18 days of operations in March and October 1997.[19] The data indicate that compliance was extremely high with this component of the preferential runway program, as summarized in **Table 7.3**.

As Table 7.3 indicates, corporate jet compliance with this component of the preferential runway was not as high as for air carrier jets. This is due largely to the following set of circumstances:

- Corporate jets generally originate or terminate at locations on the east side of the Airport, for which taxi times are often shorter to and from the east parallel. This causes pilots to request (and the ATCT to approve) the use of that runway, particularly during high demand periods when there are delays on the west parallel.
- Air carrier compliance with this component of the runway use program appears to be as high as expected given a reasonable balance between delay and noise considerations. It should be noted that some commentators have suggested *relaxing* this runway use restriction for quieter corporate jets.

This important measure should be continued with maximum possible compliance. Section 7.4.1 presents additional analysis.

Nighttime Bi-Directional Runway Use

Paragraph 2 of the "Informal Runway Use Program" Letter to Airmen defines this measure as follows:[20]

- *When traffic, wind, weather, and field conditions permit, and no delays to arrivals or departures will result, use Runway 18R for turbojet departures and Runway 36L for turbojet arrivals. If conditions do not permit, then runways will be assigned as defined in Paragraph 1.*

Table 7.3

Turbojet Operations on Runways 18L and 36R from 15-Day ARTS Data Sample from March and October 1997

Operator/Aircraft Type	Approximate Use of Runway End	
	18L Departures	36R Arrivals
Air Carrier Jets	1%	Less than 1%
Corporate Jets	Day: 4%, Night: Less than 1%	Day: 8% Night: 13%

Source: HMMH analysis.

The 1987 Part 150 Study investigated this measure, but it was not included in the approved NCP. The FAA subsequently added the measure to the Tower Letter to Airmen based on discussions with the HCAA staff. (See paragraph 2 of current Letter to Airmen presented in Appendix D.) The ARTS data analysis indicates partial compliance with this preferential runway program component, as **Table 7.4** indicates.

Operations complied with this measure to the extent that use of the least preferred runways was below 2 percent. There were no turbojet departures on Runway 18L and only two turbojet arrivals on Runway 36R, out of a total identified sample of 129 operations. However, there were 20 departures on 36R and 36L, and 49 arrivals on 18R and 18L. These 69 operations represent approximately 53 percent of the nighttime operations.

Public input groups requested the extension of this measure to all aircraft. The FAA accepted this recommendation, as long as operating conditions permit. Section 7.4.1 presents additional analysis.

Initial Departure Headings

Paragraph 4 of the Tower Letter to Airmen (Appendix D) sets forth the following initial departure tracks for turbojet operations.

- **Initial Departure Tracks.** Headings shall be assigned to insure aircraft remain on the designated tracks. Do not expect turns from initial headings until the aircraft has reached 3,000 feet unless operationally required.

a) Runway 36L or 36R track 360
b) Runway 18R track 200
c) Runway 18L track 210
d) Runway 27 track 270
e) Runway 9 track 090

The March and October 1997 ARTS data samples provide information that reveal a high degree of compliance with these desired initial departure tracks. Plots of flight tracks were used to analyze the actual flight track geometry. **Figure 7-1** presents a base map showing three imaginary airspace "gates" that were used for this analysis. The gates are vertical "windows" in space that start at ground level at the locations shown and extend up to 10,000 feet. The gates include:

- Westshore Gate: Extends southerly along the coast of the communities immediately south of the Airport, to identify departures that crossed over these communities below 2,600 feet, which was the minimum turn altitude in effect in 1997.

Table 7.4

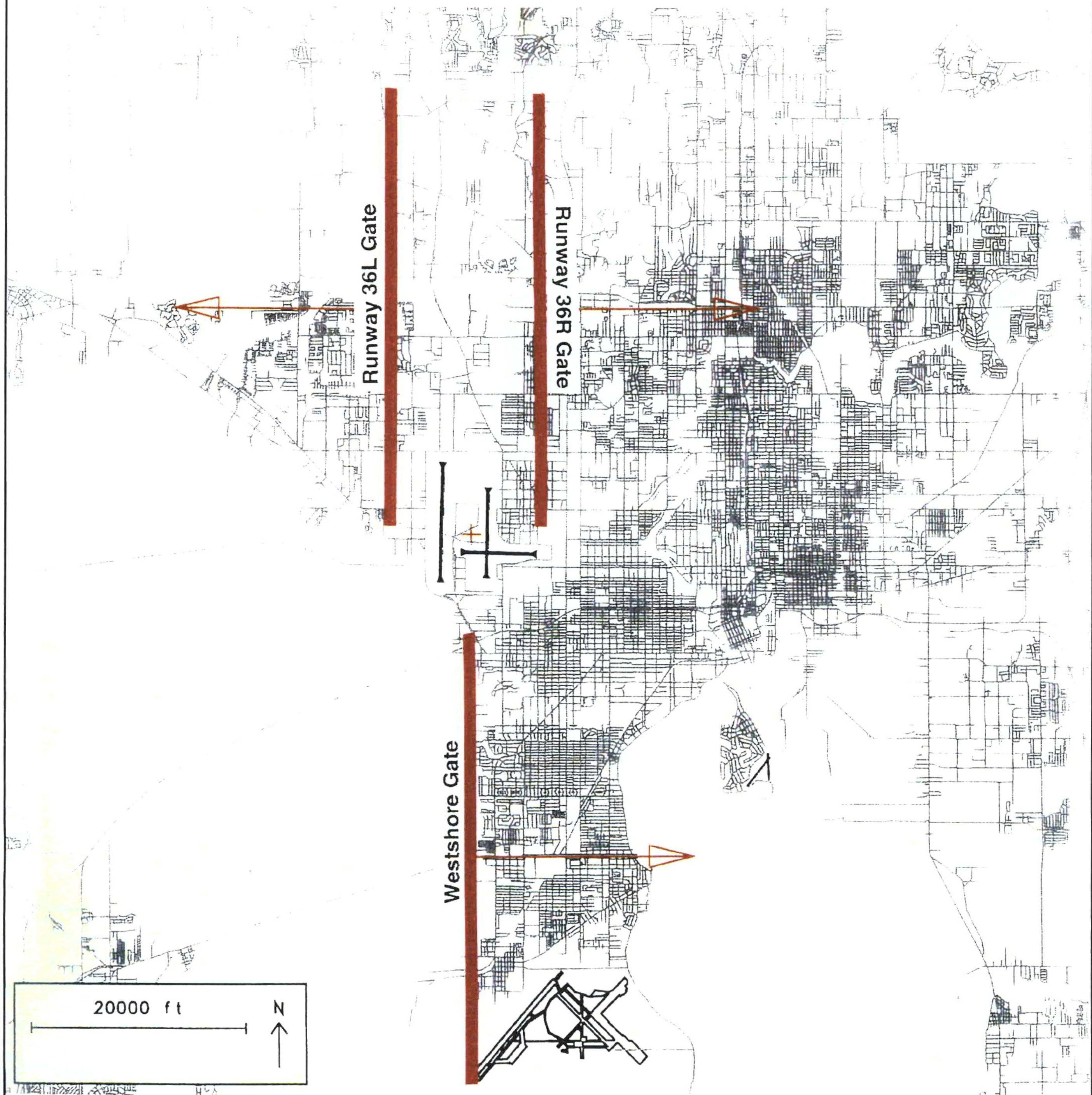
Turbojet Operations from Midnight to 6 a.m.
from 15-Day ARTS Data Sample from March and October 1997

	Number of Operations by Type of Operator, Type of Operation, and Runway End									
	18L		18R		36L		36R		Total	
	Air Carrier	Corp. Jet	Air Carrier	Corp. Jet	Air Carrier	Corp. Jet	Air Carrier	Corp. Jet	Air Carrier	Corp. Jet
Arr.	29	4	15	1	56	1	0	2	100	8
Dep.	0	0	1	0	7	0	2	11	10	11

Source: HMMH analysis.

Airspace "Gates" Used in Flight Track Analysis

Figure 7-1



- Runway 36R Gate: Extends north of the Airport to the east of the Runway 36R extended centerline, to identify departure turns to the east prior to reaching 2,600 feet.

- Runway 36L Gate: Extends north of the Airport to the west of the Runway 36R extended centerline, to identify departure turns to the west prior to reaching 2,600 feet.

The overhead view of air carrier jet flight tracks, by runway end, that show which tracks cross each of the gates is presented in **Figures 7-2 through 7-10**. The gates are also shown in vertical perspective (i.e., looking at the gates head on), depicting where the tracks "penetrate" the gates.

Analysis of Westshore Gate

Figure 7-2 presents the plot of the 465 flight tracks for air carrier jet departures off of Runway 18R from the March and October 1997 data samples. Figure 7-3 plots the nine operations that penetrated the Westshore Gate. Note that none of the tracks penetrated the gate below 2,600 feet, indicating perfect compliance with the departure procedure.

Figures 7-4 and 7-5 present the corresponding plots for the four Runway 18L air carrier jet departures in the March and October 1997 data samples. Three of the tracks penetrated the gate; however, note that two of those penetrations were at the extreme north end of the gate and flew through the gate from the east to the west. Only one track turned back to the east through the gate, and it penetrated the gate at nearly 6,000 feet, once again indicating perfect compliance with the departure procedure.

Figures 7-6 and 7-7 present the same plots for the 920 Runway 18L departures during 14 days in July 1997, when the west parallel was closed for rehabilitation. These plots clearly show the undesirable consequences of high turbojet use of Runway 18L for departure.

This analysis did not indicate a need to consider revisions to the existing procedures nor any alternative contour cases to run. However, the revised NCP should incorporate the initial departure heading procedure as they currently exist for turbojets in the Tampa ATCT Letter to Airmen.

Analysis of Runway 36R and 36L Gates

Figure 7-8 plots the 2,148 air carrier jet departures from Runways 36R and 36L, from the combined March, July, and October data samples.[21] Figures 7-9 and 7-10 plot the 44 operations that penetrated the Runway 36R and 36L gates below 2,600 feet (11 through the Runway 36R gate and 33 through the 36L gate). These operations represent approximately two percent of all departures and less than two operations on the average day. This rate of non-compliance with the departure procedures is very low, and is typical of the level of early turns that can be attributed to unusual weather or traffic considerations.

This analysis did not indicate a need to consider revisions to the existing procedures nor any alternative contour cases to run. However, the revised NCP should incorporate the initial departure heading procedures as they currently exist for turbojets in the current Tower Letter to Airmen (Appendix D).

Noise Abatement Procedures

The original Part 150 included an FAA-approved measure for the HCAA to: "Encourage operators of turbojet aircraft to use ATA [Air Transport Association] recommended noise abatement arrival procedures." This recommendation suggests a broader category of noise abatement that relates to procedures that pilots can use to reduce noise exposure through the manner in which they "fly" the aircraft. The original Part 150 only addressed *arrival* procedures. Since the completion of that study, the FAA has provided airports and operators of airline type jets with specific guidance on the selection and implementation of noise abatement *departure* procedures

Based on public input, one effect of increasing the glide slope is presented in Section 7.4.5. That analysis does not support increasing one glide slope angle, or otherwise changing one existing NCP element.

Noise Abatement Arrival Procedures

The intent of the noise abatement arrival procedures is to minimize thrust used on approach by delaying gear and flap deployment as long as possible, and to use the minimum flap setting possible. As discussed in the original study, these procedures affect aircraft approaches at least three miles from the landing threshold, when the aircraft are at altitudes above 1,000 feet above ground level (AGL). These distances are significantly outside of the 65 dB DNL contours for either 2000 or 2005. While the procedures would not affect the noise contours considered for land use compatibility purposes, there would be benefits outside the contours, and the procedures are worthy of continued implementation.

Implementation of this measure is purely voluntary and is based on wind, weather, visibility, traffic, aircraft weight and performance, and other considerations. Airlines develop guidelines for pilots to follow that take all of these factors into account, but pilots retain a high degree of discretion. These factors make it nearly impossible to model the effect of the recommended procedures with any degree of certainty.

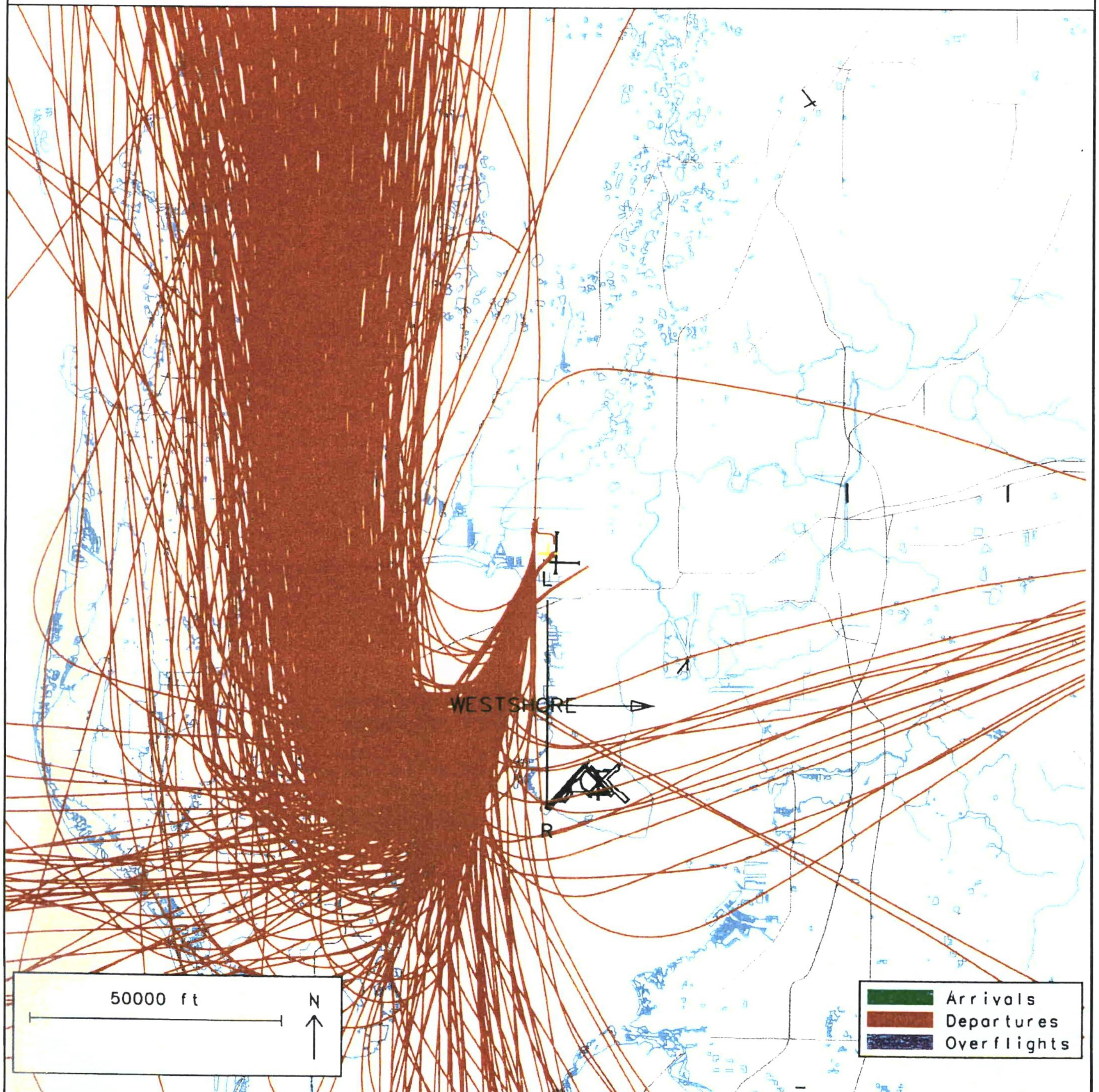
Figures 7-11 through 7-14 present plots of altitude profiles for Boeing 727-200 approaches to Runways 18R, 18L, 36R, and 36L, from the March, July, and October 1997 data. The dark lines on the plots show the 3-degree approach angle that is the standard setting for airport "glide slope" instrumentation that pilots can use for vertical guidance on approach (and that airline pilots must follow if it is turned on). The glide slope setting is three degrees on Runways 18R, 18L, and 36L (Runway 36R does not have glide slope instrumentation).[22] These plots reveal that the sample of approaches is almost universally at or above the 3-degree approach slope. In addition, they reveal that a large proportion of the aircraft approach at significantly steeper angles than three degrees. These steeper angles imply the use of reduced power over the settings that would be required to maintain a 3-degree slope, all other parameters being equal. It should be noted that, even without instrumentation, a 3-degree approach slope appears to be the effective "floor" for approaches to Runway 36R.

HILLSBOROUGH COUNTY AVIATION AUTHORITY

Air Carrier Jet departures, Runway 18R with Westshore Gate

Figure 7-2

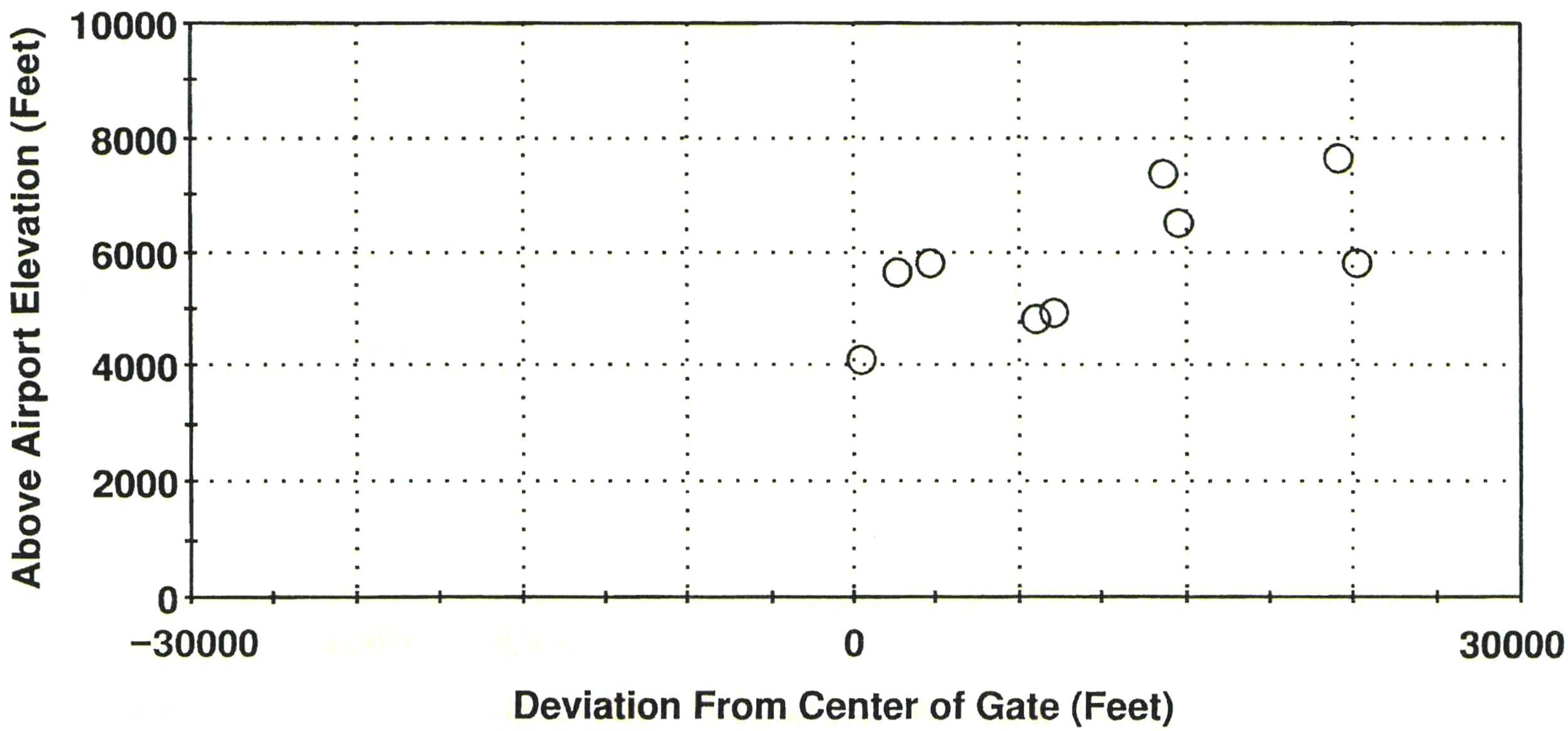
March and October 1997 Data Samples
(465 Operations)



Penetration Plot for Westshore Gate
Runway 18L Air Carrier Jet Departures

Figure 7-3

March and October 1997 Data Samples
No Tracks Penetrated Gate Below 2,600 Feet (Out of 465 Operations)



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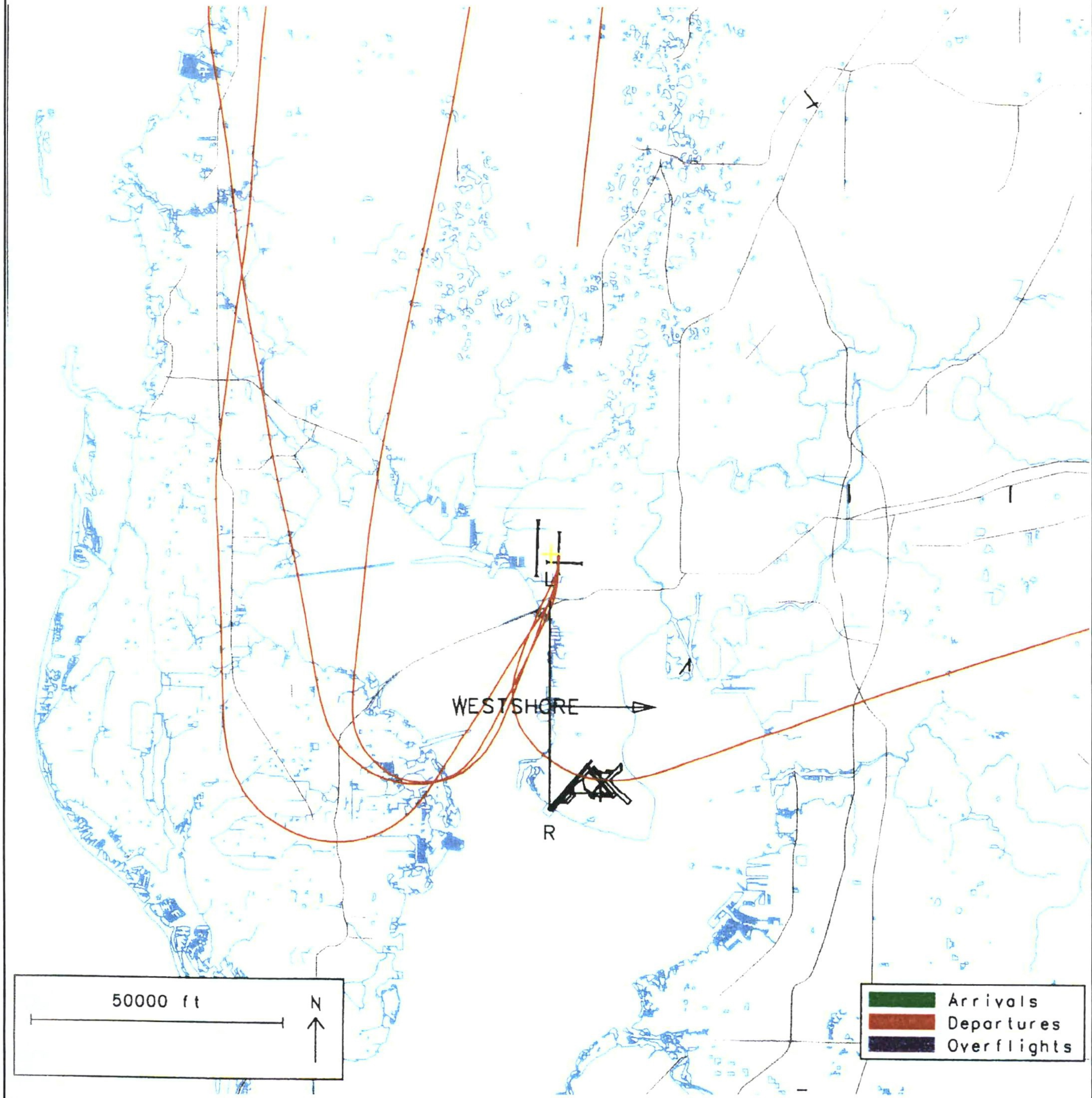
Air Carrier Jet Departures, Runway 18L with Westshore Gate

Figure 7-4

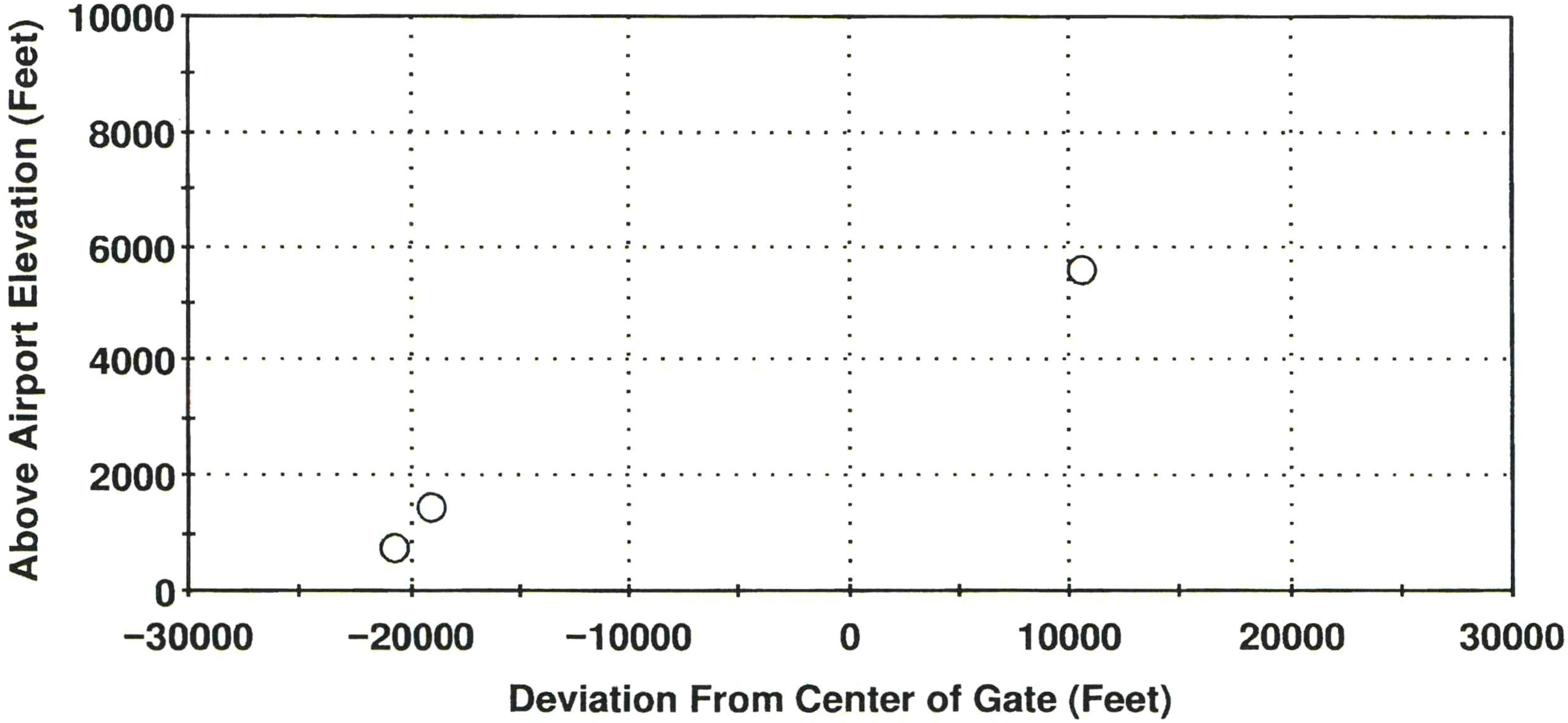
March and October 1997 Data Samples
(4 Operations)



Penetration Plot for Westshore Gate
Runway 18L Air Carrier Jet Departures

Figure 7-5

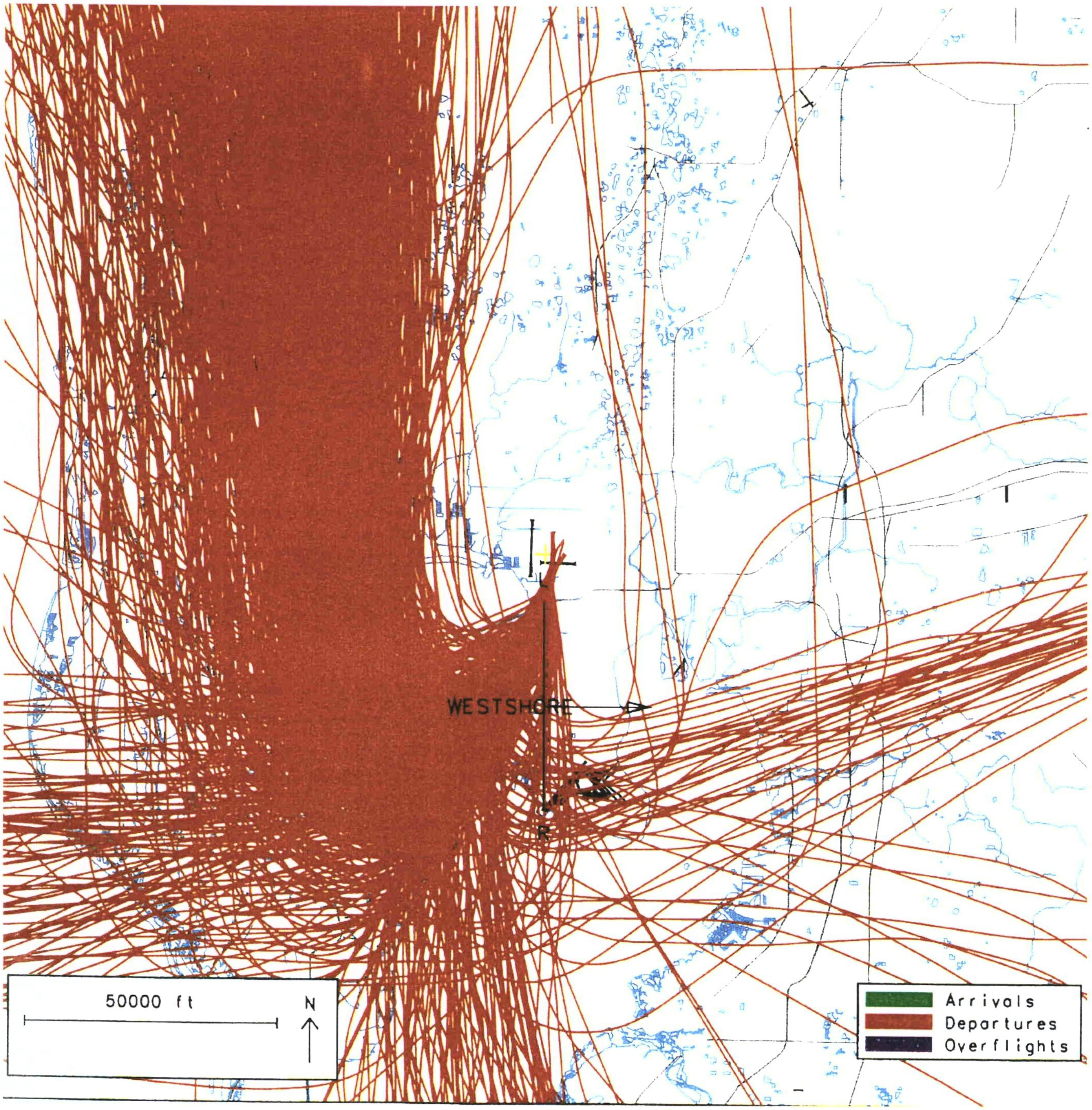
March and October 1997 Data Samples
2 Tracks Penetrated Gate Below 2,600 Feet (Out of Total)



Air Carrier Jet Departures, Runway 18L with Westshore Gate

Figure 7-6

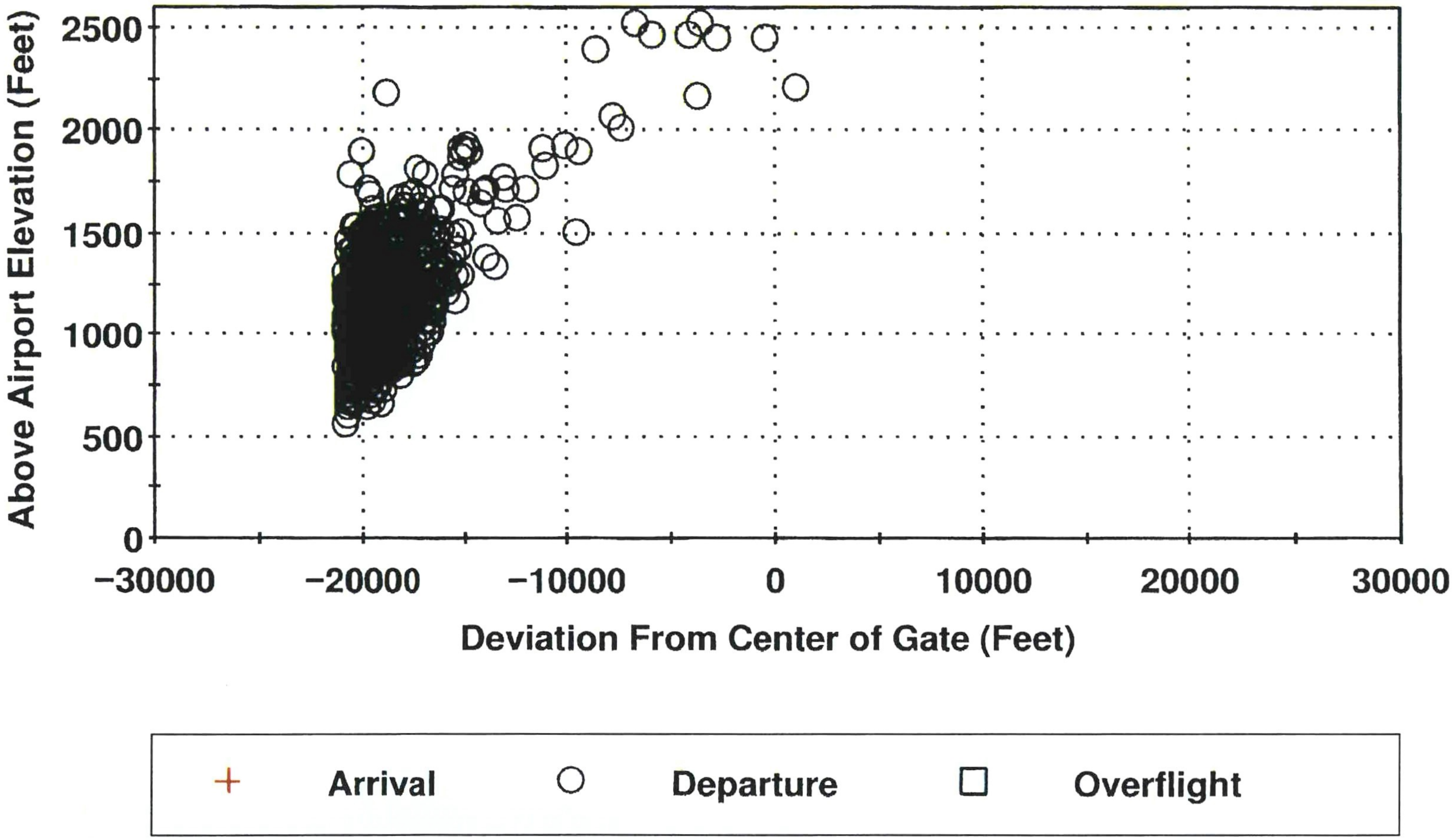
July 1997 Data Sample
(920 Operations)



Penetration Plot for Westshore Gate Runway 18L Air Carrier Jet Departures

Figure 7-7

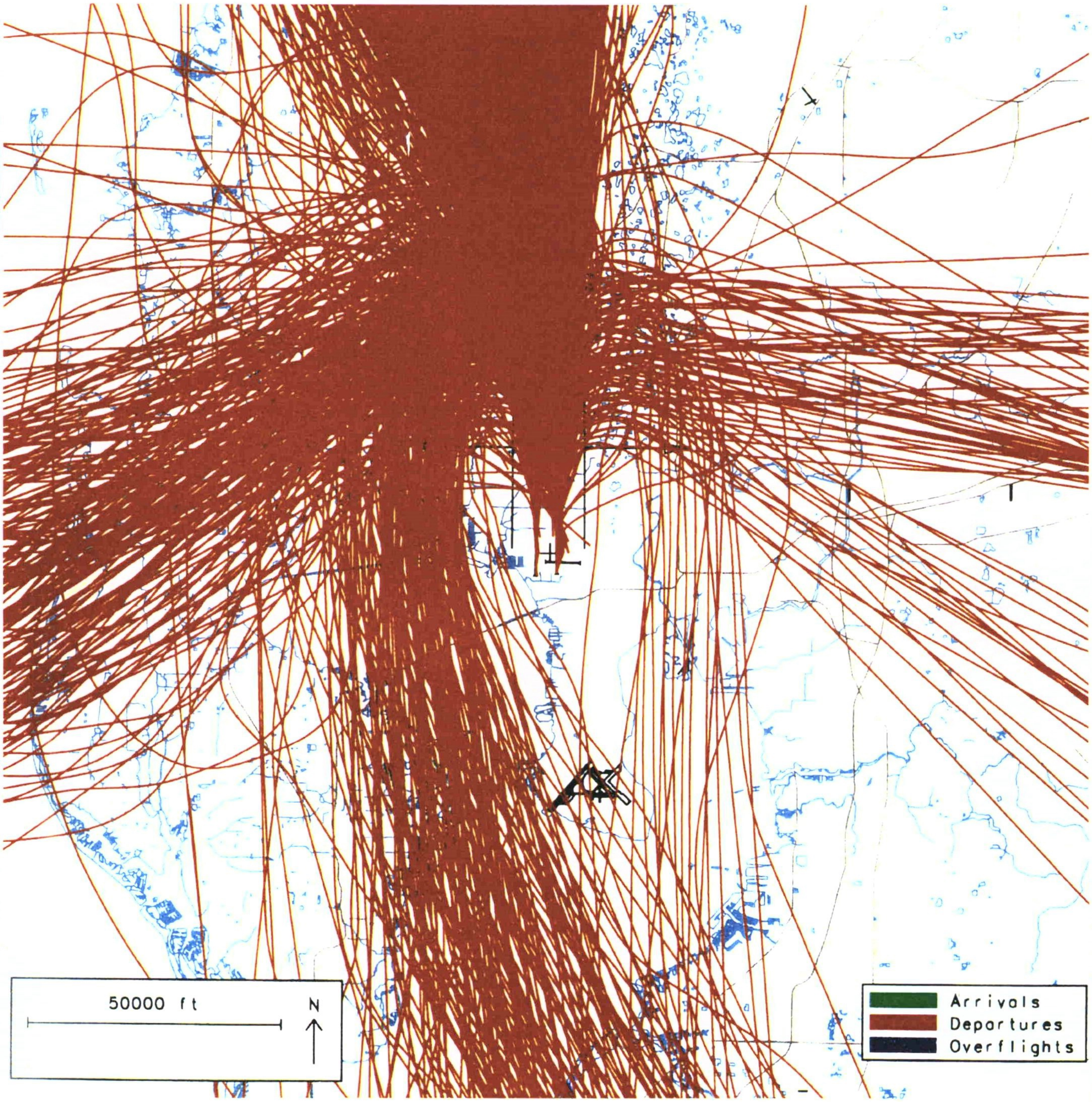
July 1997 Data Samples
681 Tracks Penetrated Gate (Out of 920 Tracks)



Air Carrier Jet Departures, Runways 36R and 36L, with 36R and 36L Gates

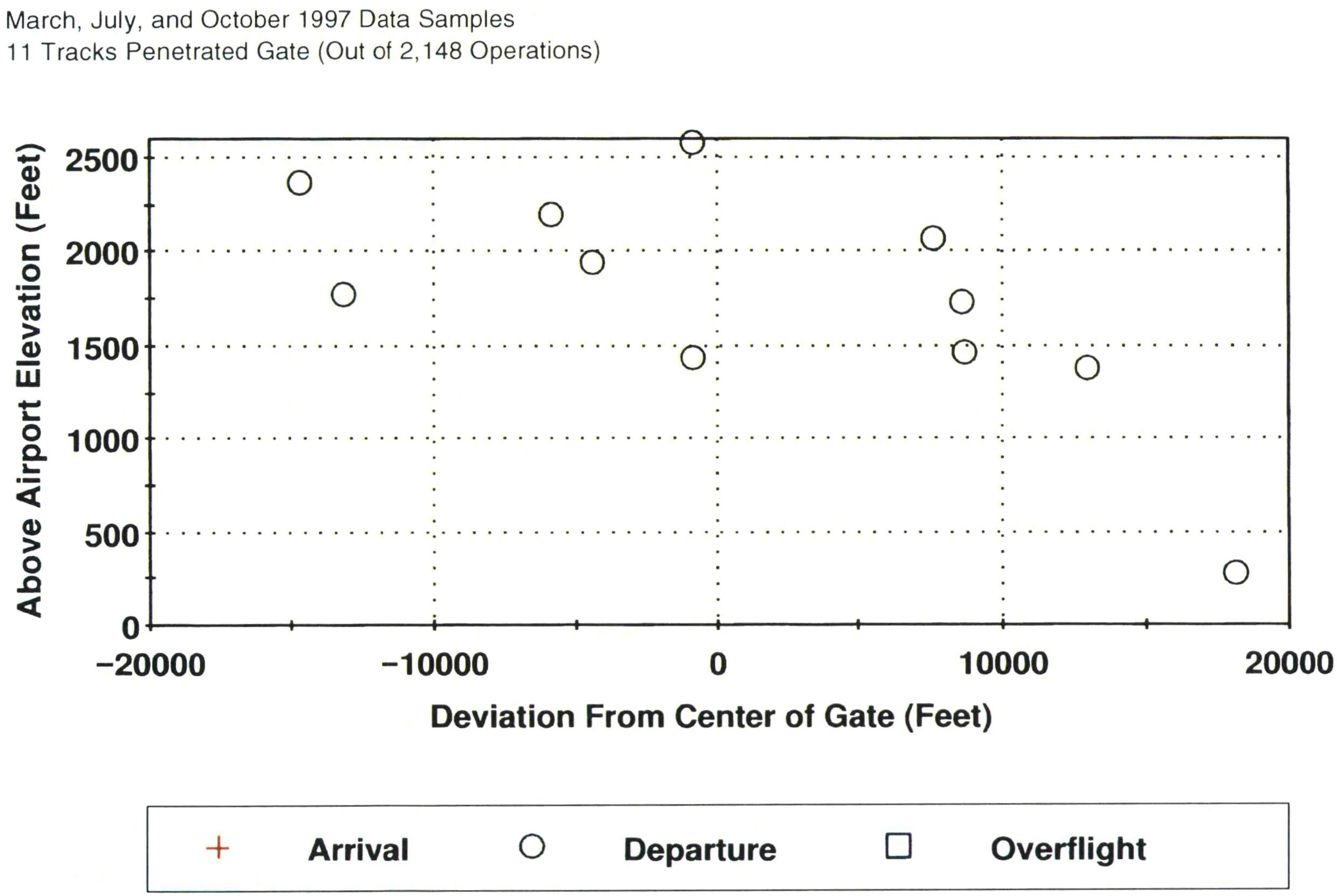
Figure 7-8

March, July and October 1997 Data Samples
(2,148 Operations)



Penetration Plot for Gate 36R
Runway 36R and 36L Air Carrier Jet Departures

Figure 7-9



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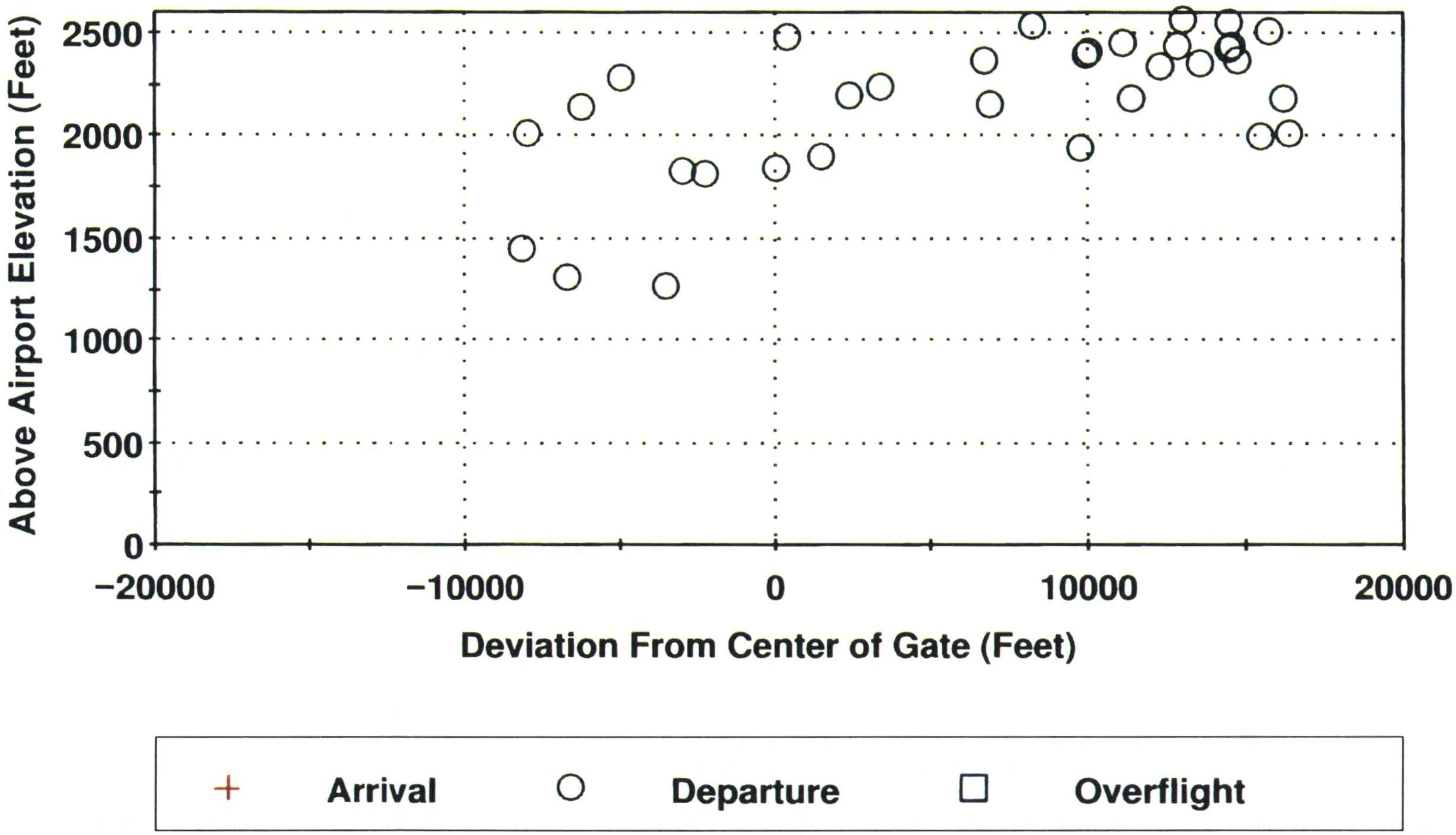
Penetration Plot for Gate 36L
Runway 36R and 36L Air Carrier Jet Departures

Figure 7-10

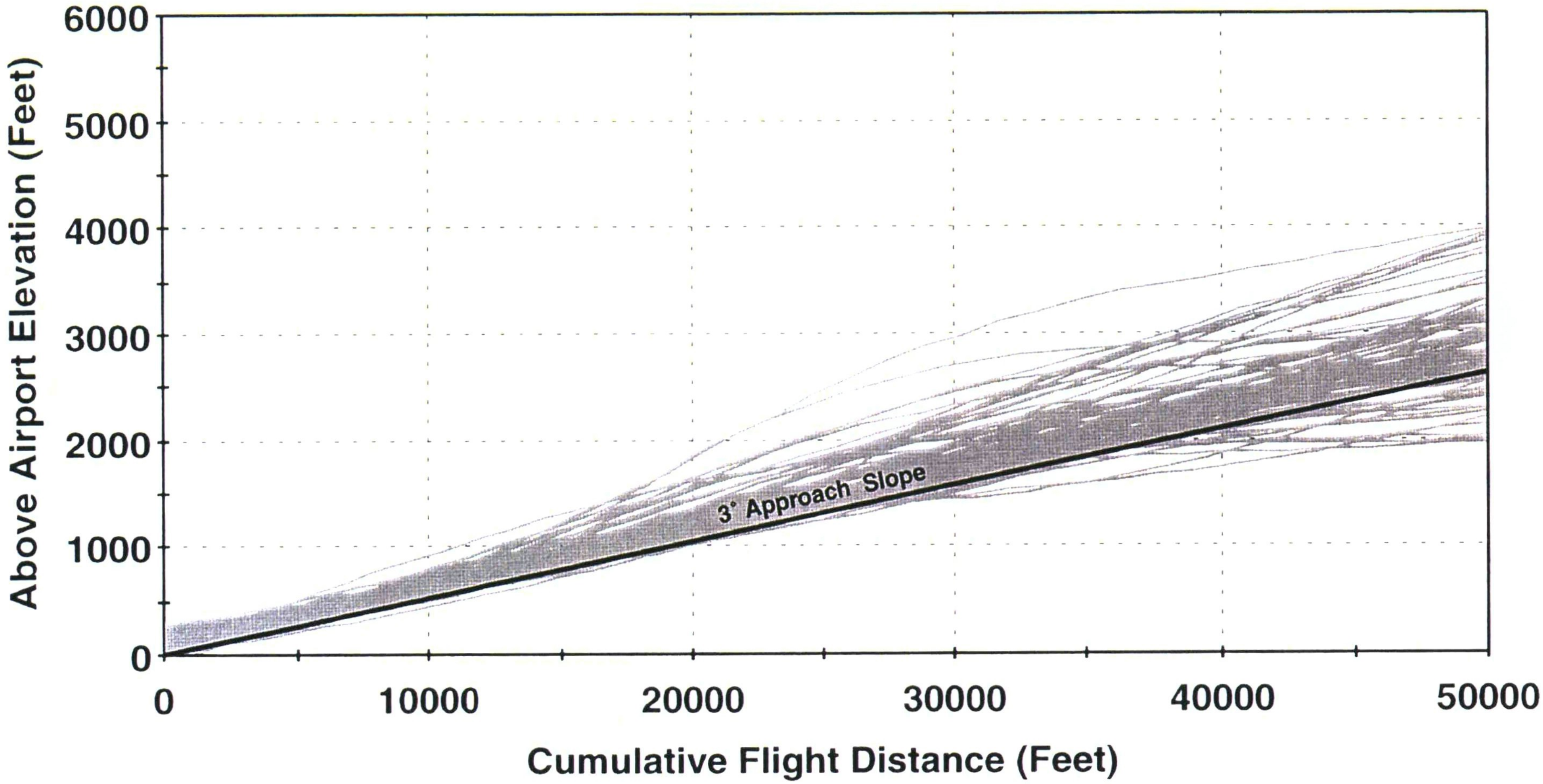
March, July, and October 1997 Data Samples
33 Tracks Penetrated Gate (Out of 2,148 Operations)



Approach Altitude Profiles
B727200s on Runway 18R

Figure 7-11

March, July, and October 1997 Data Samples
(76 Operations)



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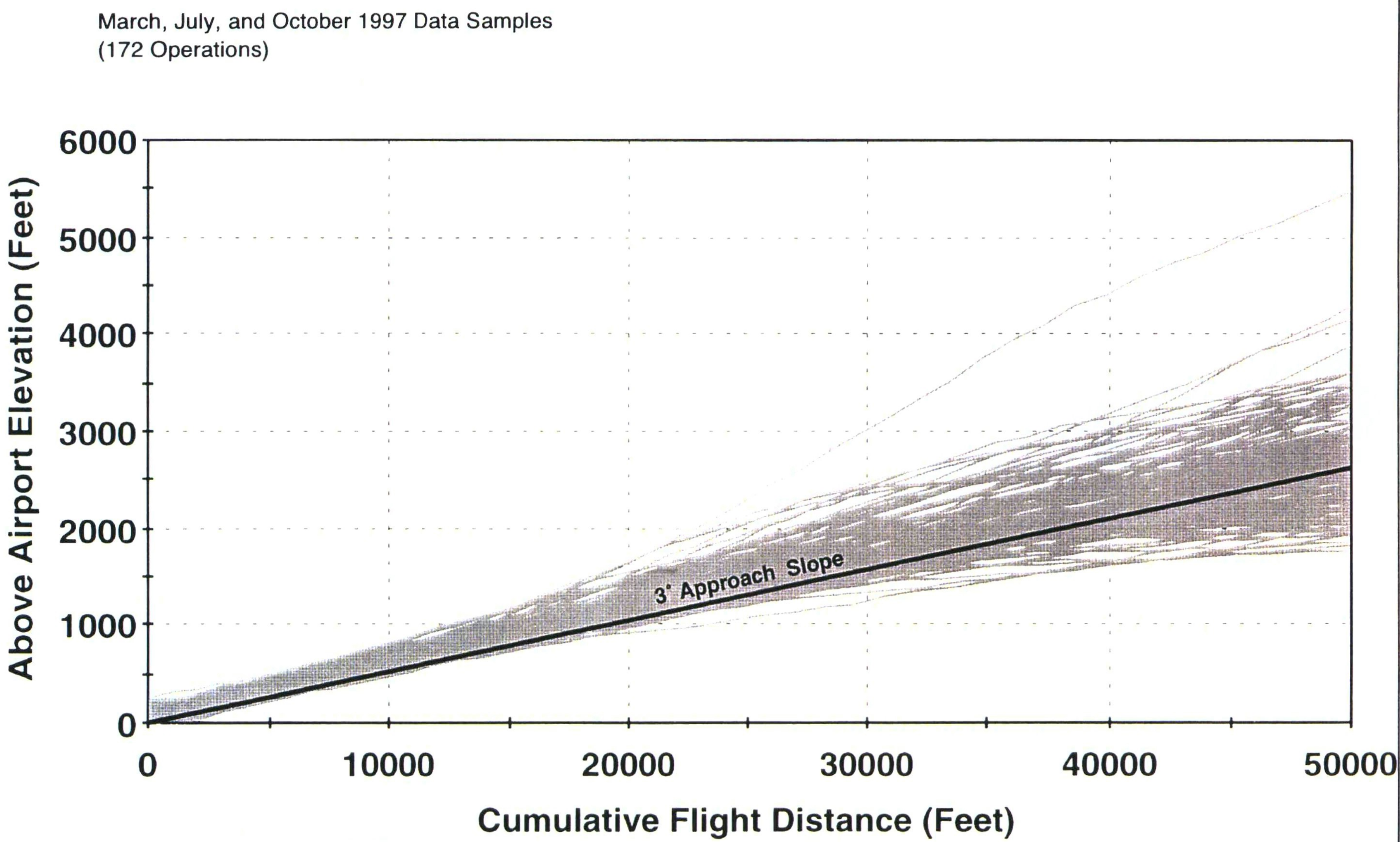
Approach Altitude Profiles B727200s on Runway 18L

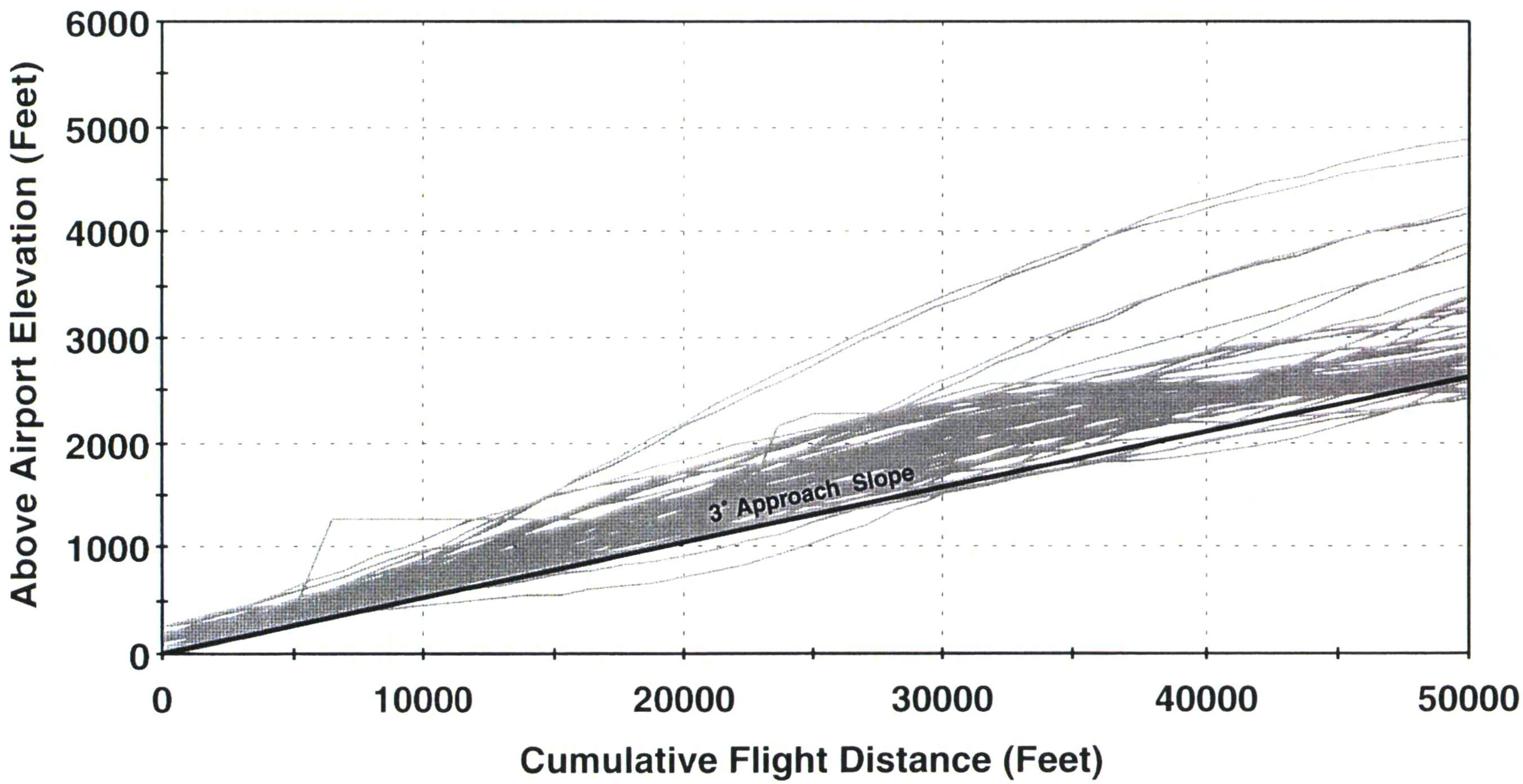
Figure 7-12



Approach Altitude Profiles
B727200s on Runway 36R

Figure 7-13

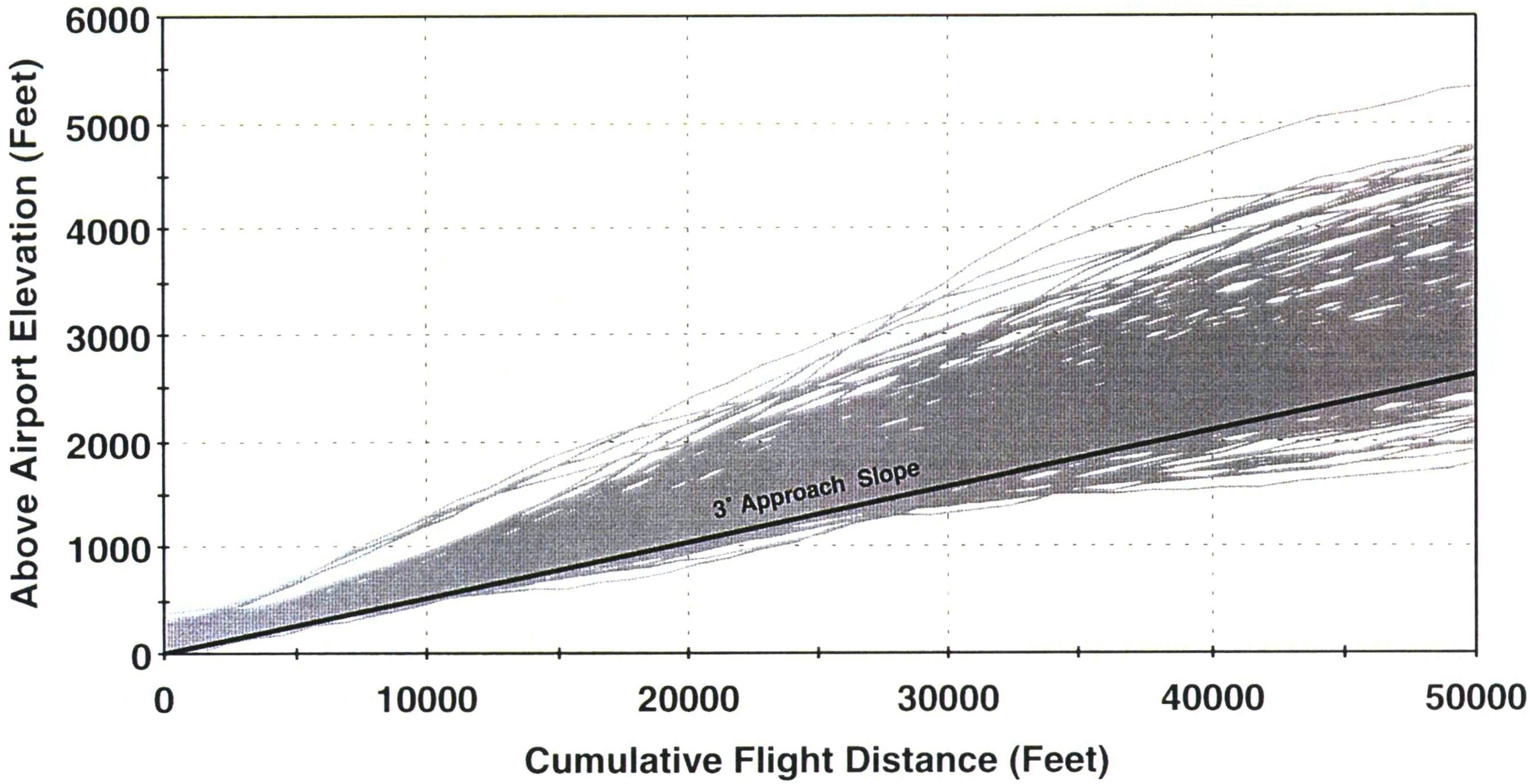
March, July, and October 1997 Data Samples
(61 Operations)



Approach Altitude Profiles B727200s on Runway 36L

Figure 7-14

March, July, and October 1997 Data Samples
(312 Operations)



Run-Up Procedures

The 1987 Part 150 included an approved measure for the HCAA to: "Designate engine runup areas." The study included a proposed runup policy and location. **Figure 7-15** represents that recommendation.

Currently, the only regular runup activity is conducted at the Delta and US Airways maintenance facilities on the east side of the Airport as shown in Figure 4-16. Section 4.3.4 describes the average daily runup activity that the airlines conduct at these two facilities, which are modeled in the 2000 and 2005 contours. The contours clearly show the effects of this activity, in the form of bulges on the east side of the Airport at the locations of these two facilities. It should be noted that the INM does not assume any sound attenuation from structures in calculating the effect of runups; the maintenance hangars and associated walls provide some attenuation. The con-tours should be considered conservatively large in that area.

Runups conducted at the two maintenance facilities are audible in the Drew Park community, including outside of the buyout area. At least one resident of the Drew Park area has requested that the HCAA consider using the buyout area to install a berm or other type of barrier to mitigate runup noise.

For the limited remaining runup activity, the HCAA Operations staff designate locations that do not conflict with airport operations on a case-by-case basis. In most instances the location shown in Figure 7-15 is used. Other locations are used too infrequently to depict.

The noise level produced in the community by run-up operations at the current Delta Airlines and USAirways facilities varies according to the type of aircraft conducting the operation, the power setting in use, and the meteorological conditions. However, maximum noise levels in excess of 75 decibels can occur up to a mile from the facility. The 2000 and 2005 noise contours without the run up enclosure (Figures 6-1 and 6-2) clearly show the effect of the existing runups, with the 65 dB DNL contour extending into the Drew Park community east of the airport in both years, and even the 70 dB DNL contour in the 2000 case.

Section 7.4.3 describes the analysis of a shared-use maintenance runup facility to address this issue. The proposed location is at the north runup location at the Delta Airlines maintenance facility shown in Figure 4-16.

Noise Barriers

The 1987 Part 150 included an FAA-approved measure for the HCAA to: "Augment the vegetation noise barrier along the western perimeter of the Airport." The highway structures west of the Airport make this recommendation largely irrelevant. Contrary to commonly-held views, landscaping does not significantly attenuate sound unless there is heavy vegetation over relatively long distances. On the order of 100 feet of heavily-wooded area is required to provide five decibels of attenuation; this is the same level of attenuation from a single structure that breaks the line of sight from the noise source to the receiver. The existing highway structure west of the Airport provides this type of attenuation. One hundred feet of dense vegetation in addition to the highway structure would add only one or two additional decibels of attenuation.

It should also be recognized that any type of vegetation or structure has essentially no benefit once an aircraft is in the air and there is a direct line-of-sight path from it to the residences west of the Airport.

No further noise barriers west of the Airport appear to offer potential benefit.

Helipad

The original Part 150 included a measure to: "Establish a helipad on the east side of the Airport." The HCAA established this helipad at a location approximately 2,100 feet west of the east end of Runway 9-27, approximately 800 feet south of the runway centerline. The helipad location is shown on the existing airport layout presented in Figure 4-2 of the Draft Part 150 NEM Update documentation, and with the modeled helicopter flight tracks in Figure 4-15.

Helicopter operations and the helipad location do not affect the noise contours to any noticeable extent; therefore, there is no basis on which to consider a change in the helipad location.

7.4 POTENTIAL NEW OR REVISED MEASURES

Five categories of noise abatement measures were considered:

- preferential runway use
- noise abatement cockpit procedures
- runup noise control
- noise abatement flight paths
- noise abatement arrival procedures

7.4.1 Preferential Runway Use

Five potential revisions to the existing preferential runway program at TPA are described below.

Alternative 1a. Increase south flow to 80 percent, possibly through "formal" preferential runway program status.

The runway use analysis for this study revealed that south flow is used approximately 67 percent of the time overall. While this is a relatively high percentage of the time, it suggests that the ATCT typically assigns south flow up to approximately a 3-knot tail wind before switching to north flow. However, the FAA's criteria for assignment of the active runway actually allows the ATCT to allow up to a 5-knot tailwind (with clear and dry runways).[23] Wind data indicates that this criterion would allow south flow at least 80 percent of the time. However, the Tampa ATCT review of this proposal indicated that operational requirements would only permit them to reduce the gap between current and ideal implementation by 50 percent, or to 73 percent use of the preferential south flow, so the final contours for 2000 and 2005 with the revised NCP (shown in Figures 6-1 and 6-2) assumed this percentage.

Figure 7-16 presents DNL contours for application of the 80 percent assumption to the 2000 operations, compared to the 2000 Base Case contours. As expected, the contours shrink to the north and expand to the south. It is estimated that this revision to the noise abatement program would result in a net *increase* in the residential population within the 65 dB DNL contour by approximately 100 persons.[24] The increased population appears to be largely in the Dana Shores neighborhood immediately west of TPA.

All Working Group members accepted this recommendation subject to the FAA ATCT suggestion that 73 percent compliance would be more reasonable to expect. There were no objectives to continued efforts to implement

Runup Procedures Recommended in Original Part 150

Figure 7-15

PROPOSED HANDOUT DESCRIBING RUNUP POLICY

AIRCRAFT RUNUPS

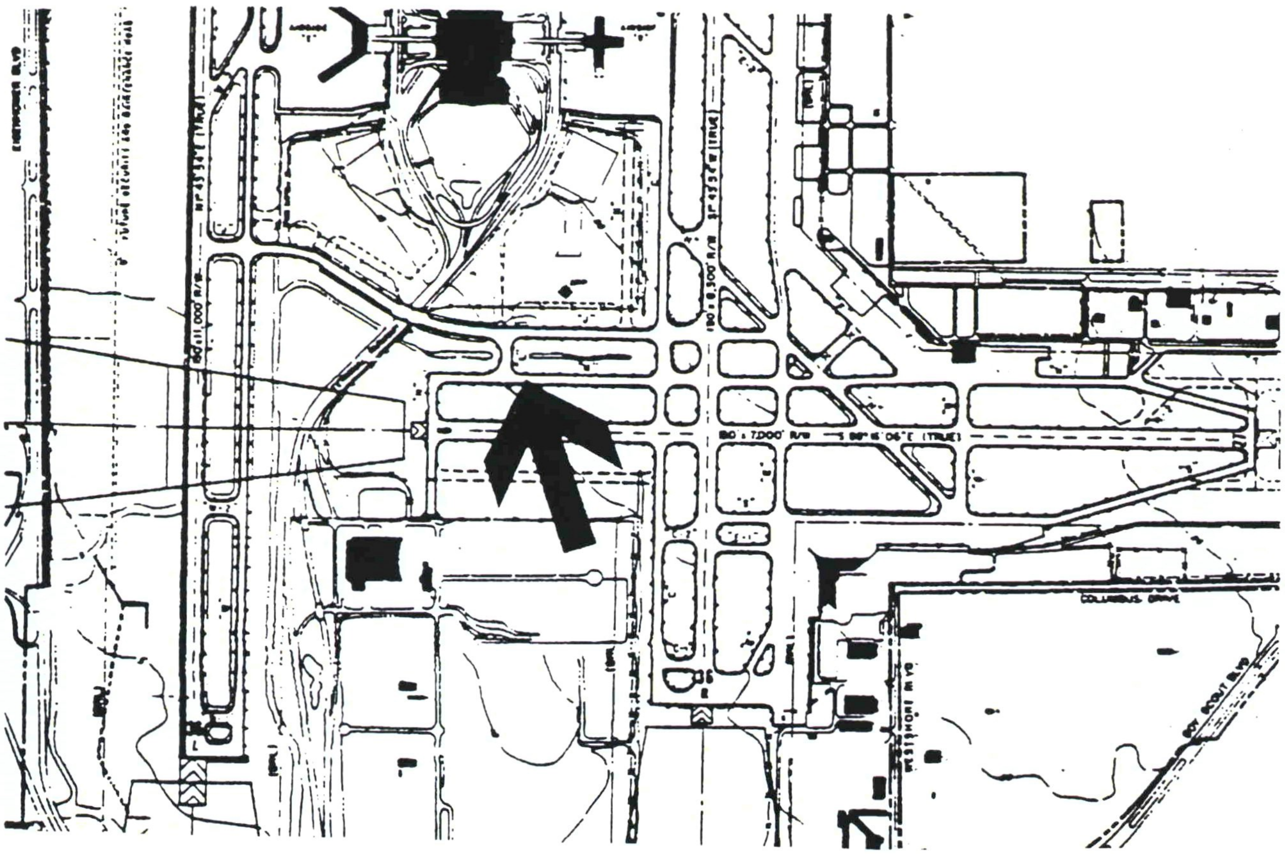
As part of its Noise Abatement Program, the Tampa International Airport has established the following policy for engine maintenance runups.

Time: Runups shall only be conducted between 6:00 a.m. and 11:00 p.m without prior approval. This limit has previously been in effect.

Location: Delta Air Lines will conduct runups at its maintenance area. All other extended turbojet runups (more than 30 seconds) shall be conducted at the location shown below, on Taxiway "N" just east of Taxiway "L."

Orientation: Aircraft orientation during runups at the Taxiway "N" site shall be limited to a heading of 345° to 165°, and a heading of 090° to 220° when Runway 9/27 is in use.

Your cooperation in carrying out the policy is appreciated. Let's help make Tampa International Airport a "Good Neighbor."



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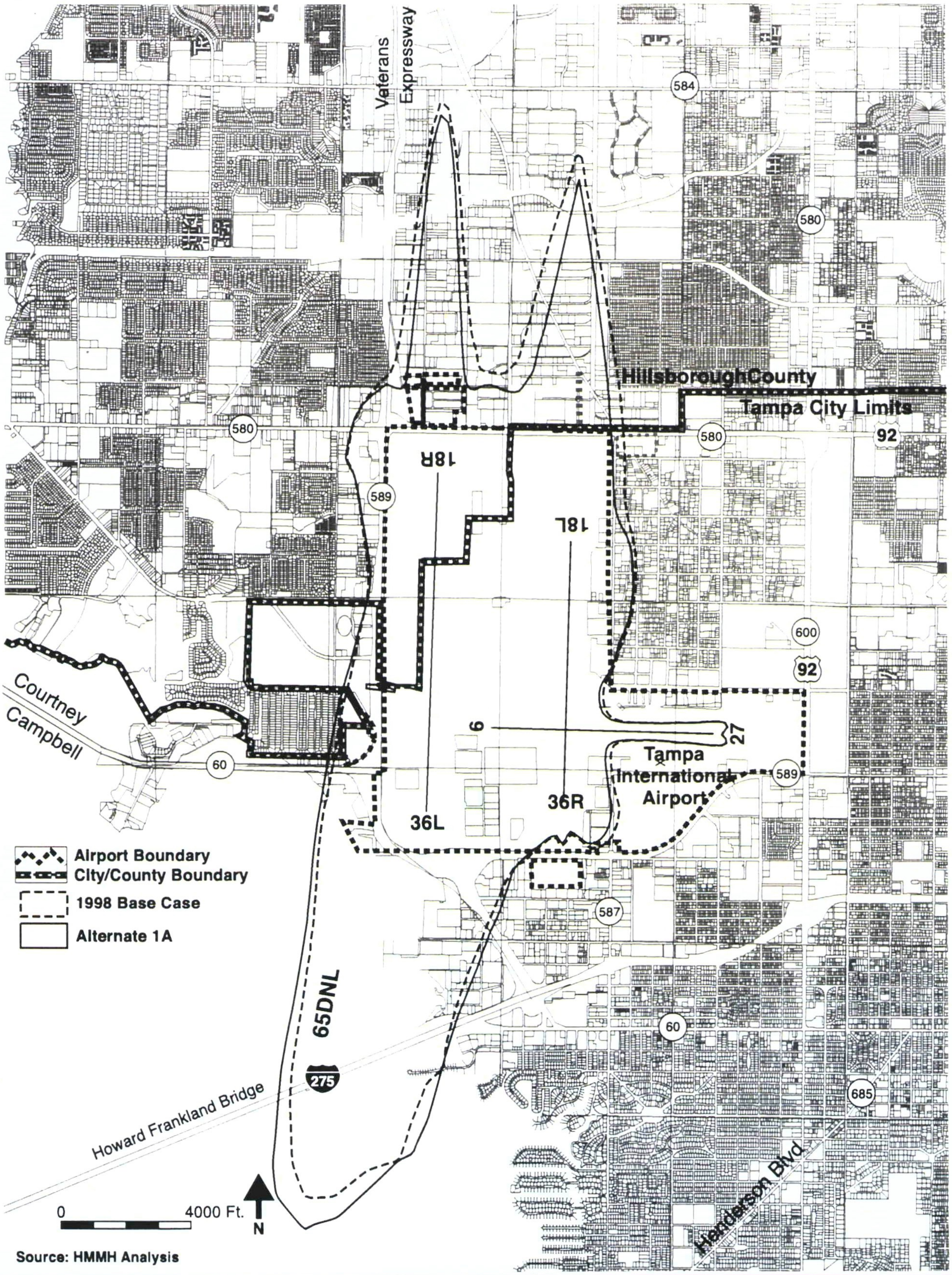
2000 Day-Night Average Sound Level (DNL) Contours for Noise Abatement Alt. 1A, Preferential Runway Use - 80% South Flow

Figure 7-16



Source: HMMH Analysis

this measure to the maximum extent feasible. Moreover, the ATCT proceeded to make revisions to the existing Letter to Airmen to help meet this objective. Specifically, they added the wording regarding the treatment of pilot requests for non-preferred runways, as presented in Section 7.5.

Alternative 1b. Increase corporate jet compliance with restricted use of turbojet operations on and off the south end of Runway 18L-36R.

The runway use analysis for this study used a large sample of "radar" data obtained from the FAA's ARTS system for TPA. The sample included over 15,000 flight tracks from slightly over 18 days of operations in March and October 1997.[25] The data indicate that overall compliance was extremely high with this component of the preferential runway program, as summarized in **Table 7.5.**

Working Group members agreed that air carrier compliance with this component of the runway use program appears to be as high as could be expected, given a reasonable balance between delay and noise considerations, but recommended analysis of increasing corporate jet compliance to the air carrier level. **Figure 7-17** presents DNL contours for application of this assumption to modeled 2000 operations compared to the 2000 Base Case contours. The two contour sets do not differ significantly over any populated area. A difference in the residential population within the 65 dB DNL contour is not expected.

Corporate aviation representatives to the Working Groups requested that this restriction be eased because it increases taxi time to and from corporate facilities on the east side of the Airport. This option is considered in Alternative 1e.

Alternative 1c. Increased compliance with nighttime preference for 18R departures and 36L arrivals.

The existing preferential runway program calls for turbojets to depart on Runway 18R and to arrive on Runway 36L between midnight and 6 a.m., when traffic, wind, weather, and field conditions permit, without delays to arrivals or departures.

As shown in **Table 7.6**, the ARTS data analysis indicates partial compliance with this preferential runway program component.

Table 7.5

Turbojet Operations on Runways 18L and 36R
from 15-Day ARTS Data Sample from March and October 1997

Operator/Aircraft Type	Approximate Overall (24-Hour) Use of Runway End[1]	
	18L Departures	36R Arrivals
Air Carrier Jets	1%	Less than 1%
Corporate Jets	4%	8%

[1]These runway use figures are for 24-hour runway use. Because of the numerical dominance of daytime activity, the 24-hour use rates are essentially the same as daytime runway use (under both the DNL definition of day, 7 a.m. - 10 p.m., and the TPA preferential runway program definition of day, 6 a.m. - midnight). Alternative 1b discusses the specific issue of nighttime preferential runway compliance.

Source: HMMH analysis.

Table 7.6

Turbojet Operations from Midnight to 6 a.m. from 15-Day ARTS Data Sample from March and October 1997

	Number of Operations by Type of Operator, Type of Operation, and Runway End									
	18L		18R		36L		36R		Total	
	Air Carrier	Corp. Jet	Air Carrier	Corp. Jet	Air Carrier	Corp. Jet	Air Carrier	Corp. Jet	Air Carrier	Corp. Jet
Arr.	29	4	15	1	56	1	0	2	100	8
Dep.	0	0	1	0	7	0	2	11	10	11

Source: HMMH analysis.

Operations complied with this measure to the extent that use of the least preferred runways was below 2 percent; out of a total sample of 129 operations, there were no turbojet departures on Runway 18L and only two turbojet arrivals on Runway 36R. However, there were 20 departures on 36R and 36L, and 49 arrivals on 18R and 18L. These 69 operations represent approximately 53 percent of the operations during the midnight to 6 a.m. preferential runway period.

Working Group members agreed that it would be reasonable to assume that tighter implementation could result in adherence to this measure to the extent permitted by wind conditions, which is approximately 81 percent for departures on Runway 18R, and 85 percent for arrivals on Runway 36L.

Figure 7-18 presents DNL contours for application of this assumption to the 2000 operations compared to the 2000 Base Case contours. As expected, the contours shrink to the north and expand to the south. It is estimated that this revision to the noise abatement program would result in a net *increase* in the residential population within the 65 dB DNL contour by approximately 100 persons. The increased population would be largely Mariner Street in the Beach Park community immediately south of TPA.

No Working Group members identified any significant capacity, delay, or other negative operational implications that this alternative might cause.

Alternative 1d. Extend nighttime preference for 18R departures and 36L arrivals to all aircraft.

Several members of the general public, as well as Working Group and Community Input Group members, suggested consideration of extending the nighttime (midnight to 6 a.m.) preferential runway program to all aircraft types.

Figure 7-19 presents DNL contours for application of this assumption to the 2000 operations compared to the 2000 Base Case contours. As expected, the contours shrink to the north and expand to the south. It is estimated that this revision to the noise abatement program would result in a net *increase* in the residential population within the 65 dB DNL contour by approximately 200 persons. The increased population would be largely on Mariner Street in the Beach Park community south of TPA, with a slight increase in the Dana Shores community immediately to the west.

No Working Group members identified any significant capacity, delay, or other negative

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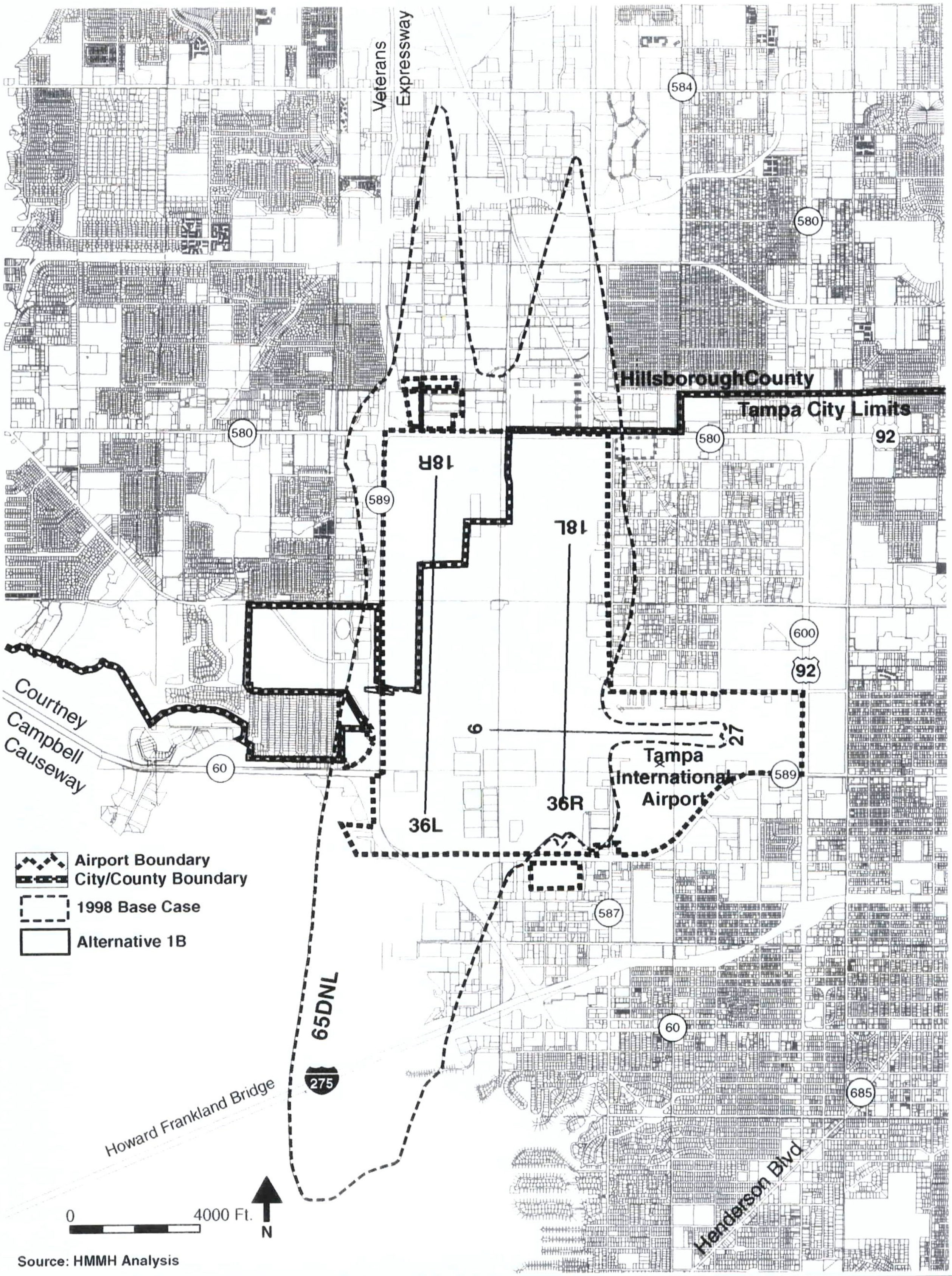
2000 Day-Night Average Sound Level (DNL) Contours for Noise Abatement Alt. 1B, Preferential Runway Use - Improved Corporate Jet Compliance

Figure 7-17



Source: HMMH Analysis

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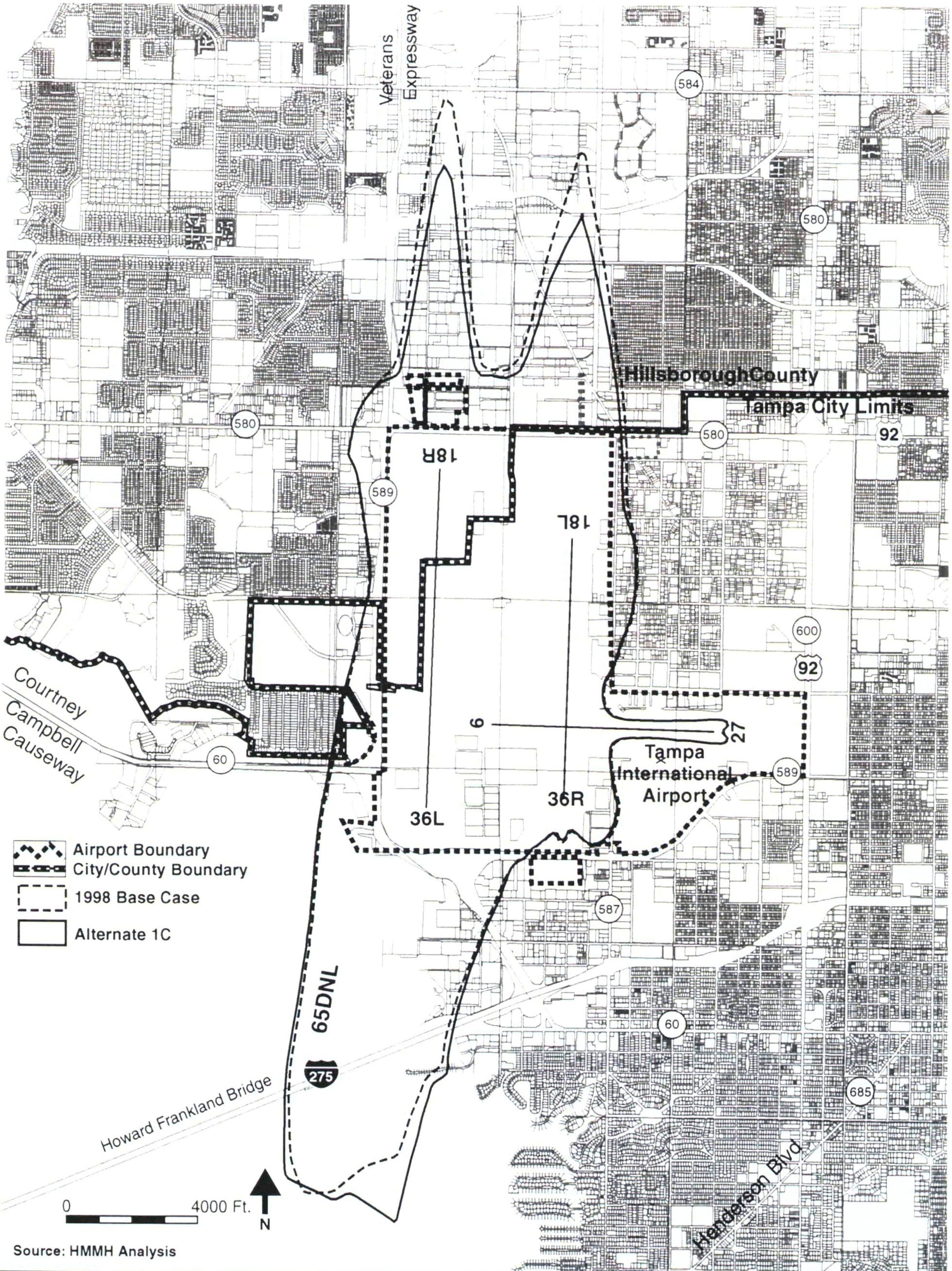
2000 Day-Night Average Sound Level (DNL) Contours for Noise Abatement Alt. 1C, Preferential Runway Use - Improved Nighttime Preferential

Figure 7-18



Source: HMMH Analysis

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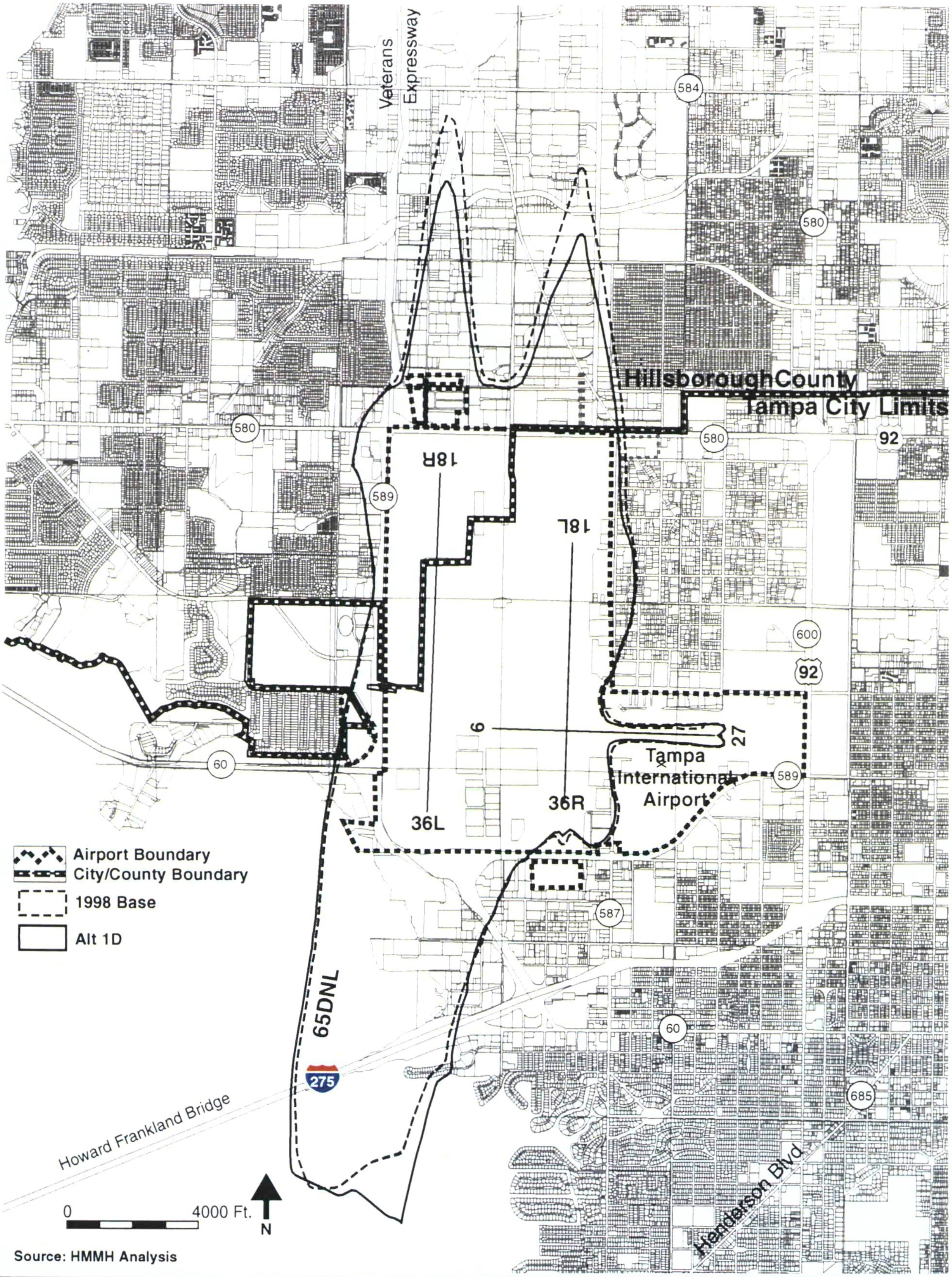
2000 Day-Night Average Sound Level (DNL) Contours for Noise Abatement Alt. 1D, Preferential Runway Use - Night Preferential for All Aircraft Type

Figure 7-19



Source: HMMH Analysis

operational implications that this alternative might cause.

Alternative 1e. Ease restrictions on turbojet 36R arrivals and 18L departures.

Corporate aviation representatives on the Working Groups requested that the HCAA consider easing the restriction on use of 18L-36R, because of the longer taxi time between the west parallel and corporate facilities on the east side of the Airport. Two principal factors oppose this action: (1) it would represent a major change in noise abatement policy that is extremely important to residents south of the Airport (and that many have considered in making home purchase decisions), and (2) analyses and forecasts of airport delay indicate that turbojet use of the east parallel would not be required within the 5-year forecast time frame of the Part 150 Update. The restriction could cause excessive delay within the 20-year time frame of the Master Plan Update. That study will include a DNL contour forecast for the year 2020. However, that year is beyond the time frame for consideration in this study.

In response to these concerns, corporate jet pilots suggested that they could turn sharply and early enough on departure from Runway 18L to sidestep to the west, so as to effectively follow the preferred departure path for Runway 18R, thereby avoiding residential areas south of the Airport. The pilots requested that flight track data be used to investigate this option, including information on where corporate jets reach 400 feet AGL (the earliest point at which they may initiate a turn), and comparisons of actual corporate and air carrier jet tracks on the two runways.

Appendix L provides a copy of a letter provided to three corporate jet pilots who commented on this matter. The appendix also includes copies of their letters.

Figure 7-20 presents a plot of corporate jet altitude profiles obtained from the 1997 ARTS data samples. That plot indicates that most corporate jets reach 400 feet somewhere between the southern end of Runway 18L and Interstate 275 (Frankland Bridge).

Figure 7-21 compares plots of corporate jet departure flight tracks for Runway 18L, and air carrier jet departure flight tracks for Runway 18R from the 1997 ARTS data samples.

Figure 7-22 compares plots of the points at which those tracks penetrate an artificial airspace "gate" or window in space over I-275. The plots assume the observer is looking south from the Airport toward the bay. The left (east) end of the gate is approximately at Westshore Boulevard. The right end of the gate is approximately 20,000 feet to the west over I-275.

The plots reveal that corporate jet tracks are centered on a point approximately 5,000 feet east of the air carrier jet tracks, approximately the same distance as the separation of the parallel runways, despite the fact that pilots are assigned a sharper turn on Runway 18L than 18R (210° versus 200).

This analysis did not support easing the restriction on use of 18L-36R. Moreover, easing the restriction would *increase* airport activity over communities south of the Airport, in a manner that is contrary to established noise abatement policy implications. In the absence of both delay and noise abatement benefits, no justification can be found for changing the existing restriction, at least within the 5-year Part 150 forecast period.

In response to corporate jet pilot requests, the HCAA proposes to undertake the following test, outside the Part 150 process:

Following FAA approval of the revised NCP, and after the HCAA has obtained flight tracking and portable noise monitoring equipment, the HCAA will request that the FAA initiate a test of eased use of Runway 18L for departures to allow pilots to demonstrate their ability to consistently make early turn in a manner that will have the same effect on the noise contours as the current departures on Runway 18R. The test will consider easing the restriction 24-hours a day, or for some portion(s) of the day. If the test indicates the procedures are feasible, the FAA will likely require an Environmental Assessment (EA). If the test and EA are successfully approved, and the measure implemented on a continuing basis, the FAA and HCAA will consider establishment of an appropriate Standard Instrument Departure (SID) which would be issued only to pilots who had demonstrated their ability to comply with the procedures, and who had entered into a Letter of Agreement with the HCAA and the FAA, recognizing that permission to use the SID was contingent on continued, demonstrated compliance based on HCAA flight track monitoring.

7.4.2 Noise Abatement Cockpit Procedures

Noise Abatement Departure Procedures

FAA Advisory Circular (AC) 91-53A ("Noise Abatement Departure Profiles") "describes acceptable criteria for safe NADP profiles for subsonic turbojet-powered airplanes with a maximum certificated gross takeoff weight over 75,000 pounds." The original version of this circular, AC 91-53, was adopted in 1978. That version—in effect at the time of the original Part 150—identified a *single* noise abatement departure profile for all situations. While the original study was silent on the matter of NADP profiles, information provided by the airlines for other airport studies indicated that most operators followed the AC 91-53 procedures at that time.

In 1990, in response to widespread concern over safety issues related to noise abatement departure procedures, the FAA instituted an Aviation Rulemaking Advisory Committee (ARAC) to assess NADP guidelines. The ARAC included representatives from airports, air carriers, Federal regulatory and research agencies, and communities. The committee developed two alternative procedures, which were tested by the FAA and the airlines at John Wayne Airport (Orange County, California) in 1992, and for which the FAA subsequently issued guide-lines in AC 91-53A, replacing AC 91-53.

Unlike its predecessor, AC 91-53A defines: (1) a close-in NADP to provide noise reduction for land uses in close proximity to the departure end of an airport runway, and (2) a distant NADP to provide noise reduction for more remote areas.

The AC defines the procedures generally, identifying a minimum set of operating parameters for carriers to use in developing their own aircraft-specific procedures. Because of the complexity of individual aircraft and airline operating procedures, the AC does not (and could not) provide precise cockpit instructions.

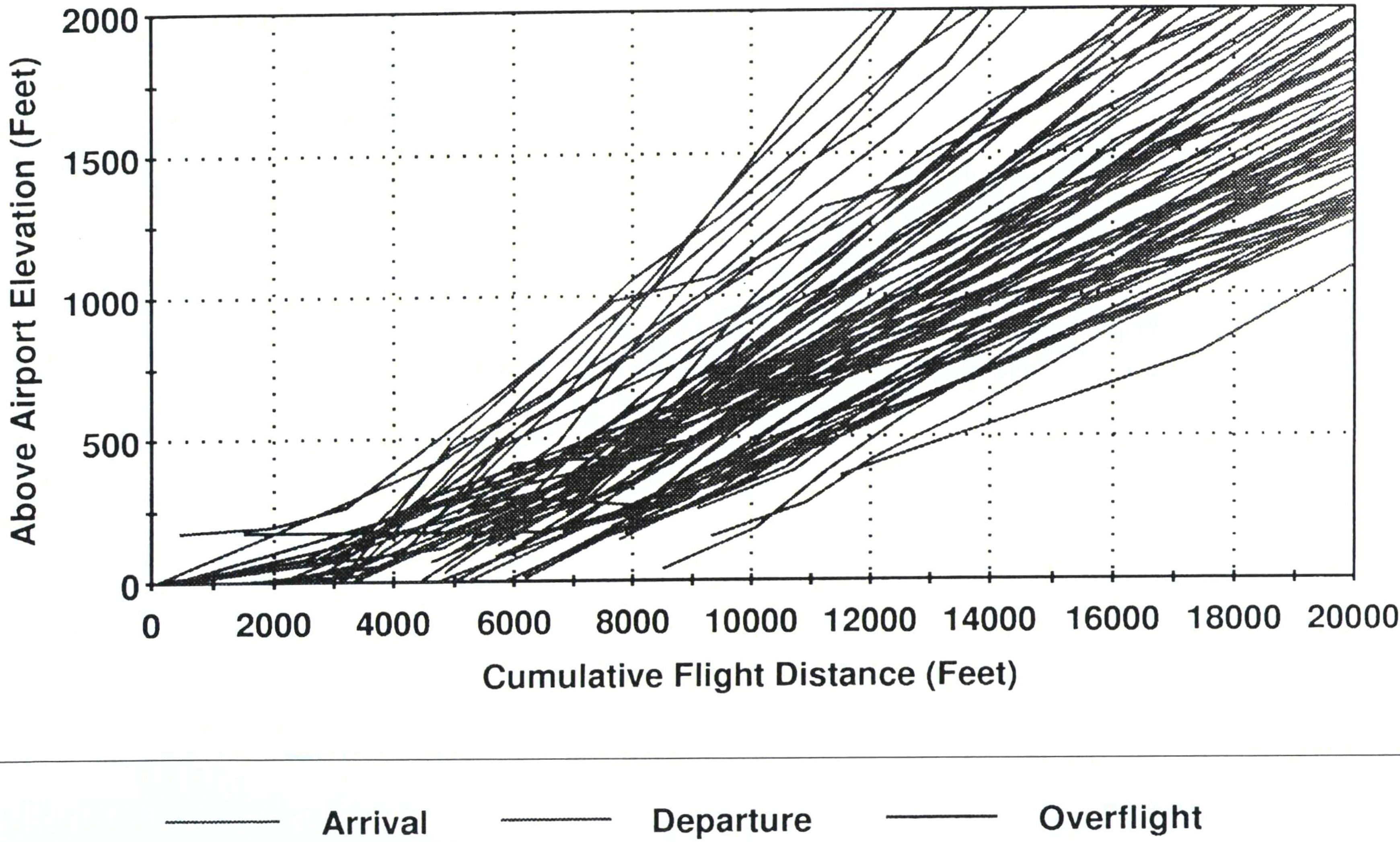
Major differences between AC 91-53A and AC 91-53 include the following:

- For either the close-in or distant NADP, thrust reductions can be initiated under AC 91-53A at 800 feet above airport

Departure Altitude Profiles
Corporate Jets on Runway 18L

Figure 7-20

March, July, and October 1997 Data Samples
(69 Operations)



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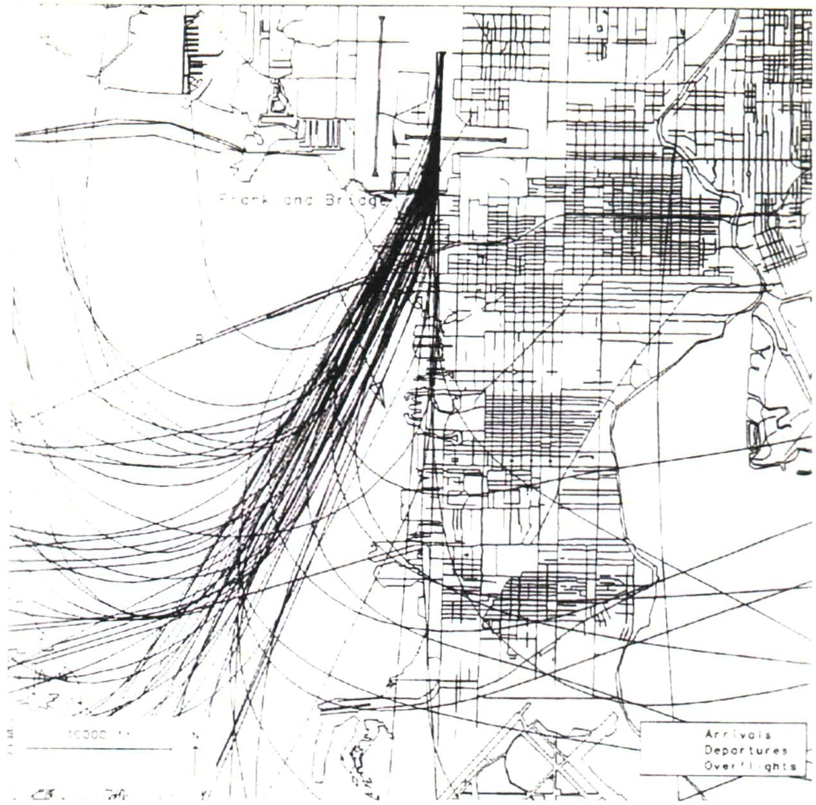
Departure Track Plots for Corporate Jet Departures on Runway 18L and Aircarrier Jet Departures onRunway 18R

Figure 7-21

Corporate Jet Departures
Runway 18L

March, July, and October 1997
Data Samples

(69) Operations

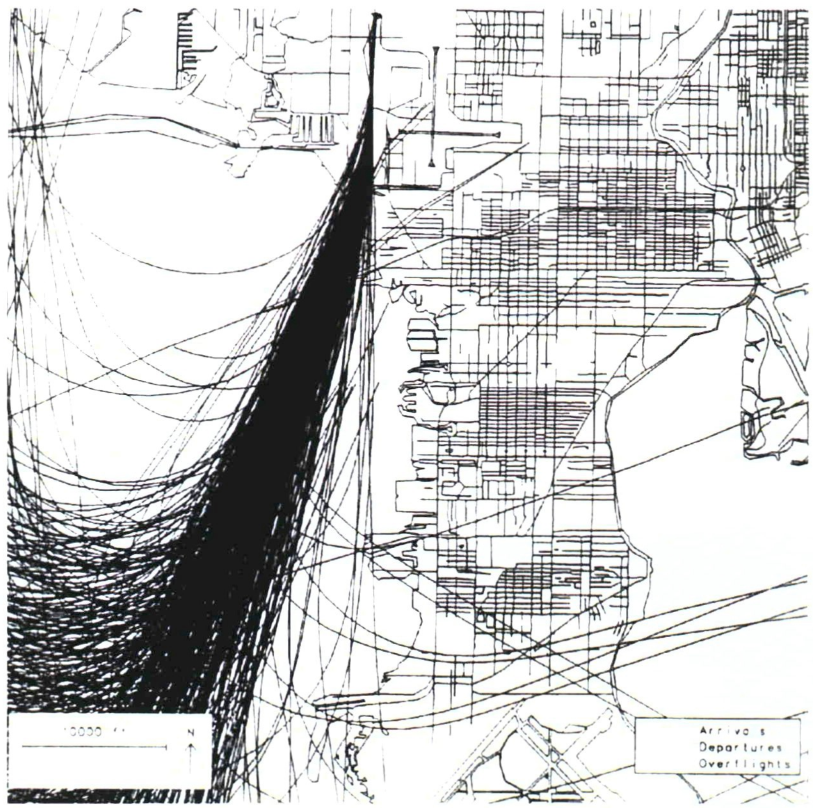


Air Carrier Jet Departures
Runway 18R

March and October 1997
Data Samples

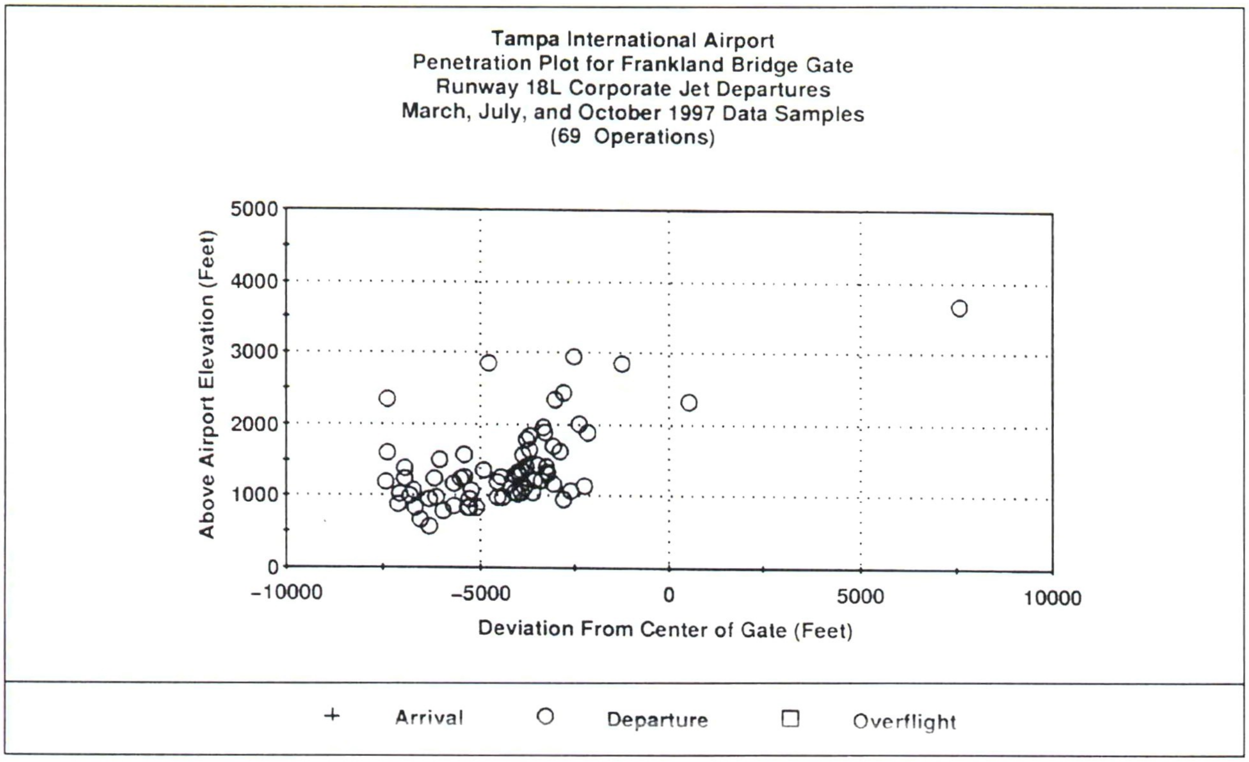
(Runway 18R was closed
for rehabilitation in July)

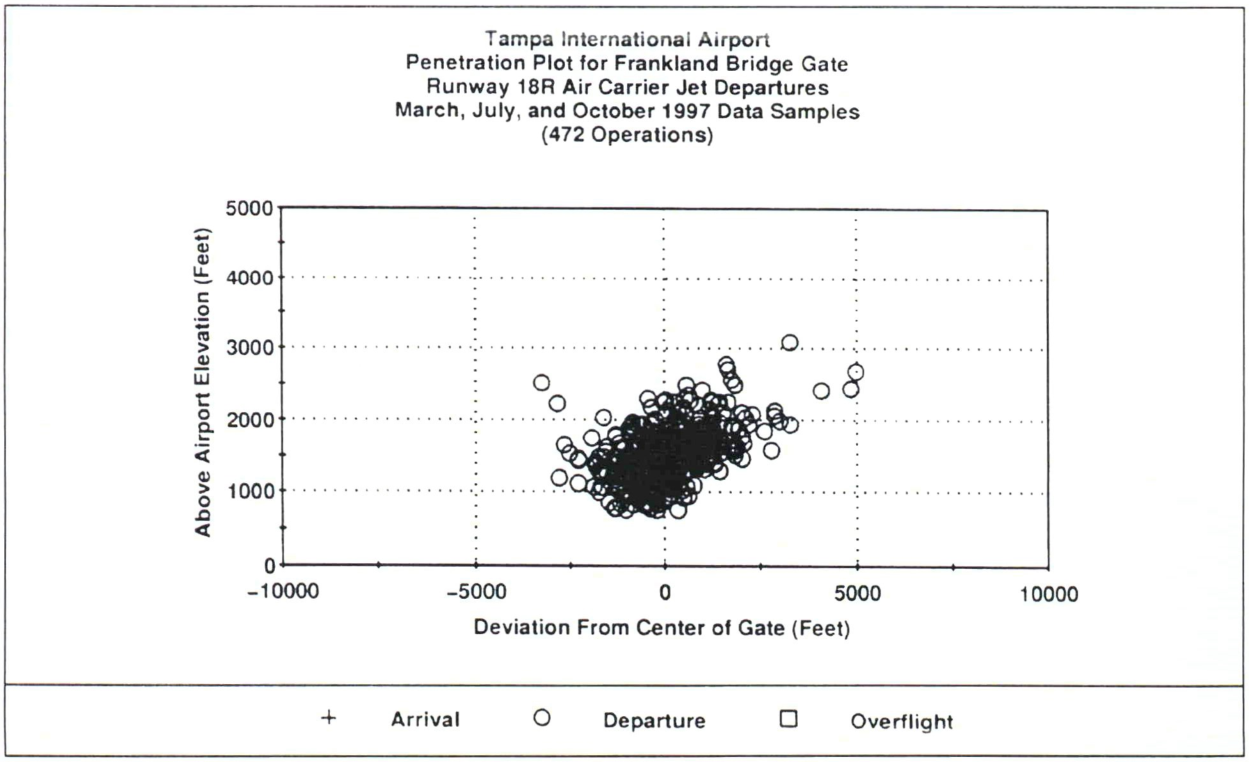
(472) Operations



Penetration Plots for the Franklin Bridge/ Airspace Gate for Corporate Jet departures on Runway 18L and Air Carrier Jet Departures on Runway 18R

Figure 7-22





elevation (AAE), 200 feet lower than the 1,000 feet AAE that AC 91-53 recommended, but 300 feet higher than the minimum cutback altitude in AC 91-53.

- AC 91-53A defines cutback thrust for all aircraft as "no less than the thrust necessary to maintain a takeoff path engine-inoperative climb gradient."[26] AC 91-53 identified the thrust for high-bypass-ratio aircraft reducing power at 1,000 feet AAE as "normal climb thrust."
- AC 91-53A's close-in NADP recommends that flaps be retracted after reaching 800 feet AAE and *after thrust reduction*, compared with flap retraction at 1,000 feet AAE, but before reducing thrust, in AC 91-53.
- Like AC 91-53, the distant NADP in AC 91-53A recommends *flap retraction before the thrust cutback*, but, like the close-in NADP, this cutback can be at a lower altitude and to a lower thrust level than AC 91-53A.

Table 7.7 summarizes these differences. As indicated, the major difference between the close-in and distant NADP is the timing of the flap/slat retraction relative to the thrust cutback.

AC 91-53A allows airport operators to work with aircraft operators to select the appropriate NADP for each runway end. This level of site-specific program customization was a major step over the previous AC.

Evaluation of NADP Alternatives at TPA

To consider the NADP alternatives and their potential effectiveness at TPA, **Figures 7-23 through 7-25** present and compare the 95 dB Sound Exposure Level (SEL) contours for straight-out departures on Runways 18R, 36R, and 36L, respectively, for the Boeing 737-200 with the JT8D-17 engine. Each figure presents contours for the following three departure procedures:

- Standard (non-NADP) departure procedure, as modeled in the INM.
- Close-in NADP.
- Distant NADP.

The contours were prepared using the FAA's INM Version 5.1a. The INM does not include modeling inputs for the NADPs. These NADP contours are based on data collected from airlines for a similar analysis at Palm Beach International Airport (PBI). The FAA requires that consultants and airports submit detailed documentation justifying the NADP modeling inputs used in developing official NEM contours. Following consideration of the alternatives is a discussion of how to obtain authorized inputs for critical aircraft types at TPA.

Table 7.7

Comparison of AC 91-53 NADP to AC 91-53A Close-In and Distant NADPs

	AC 91-53	AC 91-53A	
		Close-In	Distant
Minimum thrust cutback altitude	1,000' AAE (recommended)	800' AAE	
Cutback thrust	high-bypass-ratio engines: normal climb low-bypass-ratio engines: no less than minimum 1-engine out	no less than minimum one-engine out	
Flap/slat retraction	prior to cutback	after thrust cutback	prior to thrust cutback

Source: HMMH analysis.

The B737-200 was used as the example aircraft in these figures because it is the most common type of older, relatively noisy Stage 2 aircraft currently operating at TPA. It is likely that "hush-kitted" Stage 3 versions of this aircraft type will continue to operate at TPA after 2000. The NADP benefits of the Stage 3 version will essentially be the same as the Stage 2 version depicted here.

As shown in Figures 7-23 through 7-25, the close-in and distant NADP contours are narrower but longer than those for the standard procedure. The distant NADP contour is smaller than the close-in contour in all areas.

Based on this analysis, it is recommended that the revised NCP include the distant NADP.

7.4.3 Runup Noise Control

Noise from engine runups at the US Airways and Delta maintenance facilities is one of the most significant issues of public concern.

The noise level produced in the community by run-up operations at the current Delta Airlines and USAirways facilities varies according to the type of aircraft conducting the operation, the power setting in use, and the meteorological conditions. However, maximum noise levels in excess of 75 decibels can occur up to a mile from the facility. The 2000 and 2005 noise contours without the run up enclosure (Figures 6-1 and 6-2) clearly show the effect of the existing runups, with the 65 dB DNL contour extending into the Drew Park community east of the airport in both years, and even the 70 dB DNL contour in the 2000 case.

Data collected indicated that the Delta and US Airways conducted a combined total of approximately 21 runup sessions per week in 1997, of which approximately 14 were between 10 p.m. and 7 a.m. (DNL "nighttime").[27] Only half of the weekly runup sessions (approximately 11 per week on average) involved power settings above idle, and idle runups do not produce noise levels loud enough to require the use of an enclosure. It should be noted that US Airways has initiated maintenance on Airbus A319, A320, and A321 aircraft, and maintenance runup activity is expected to increase at the Airport.

The Working Groups and Community Input Group requested noise benefit and construction cost information for runup enclosures. This information was obtained from the two sources described below.

Chicago - O'Hare International Airport Runup Enclosure Study

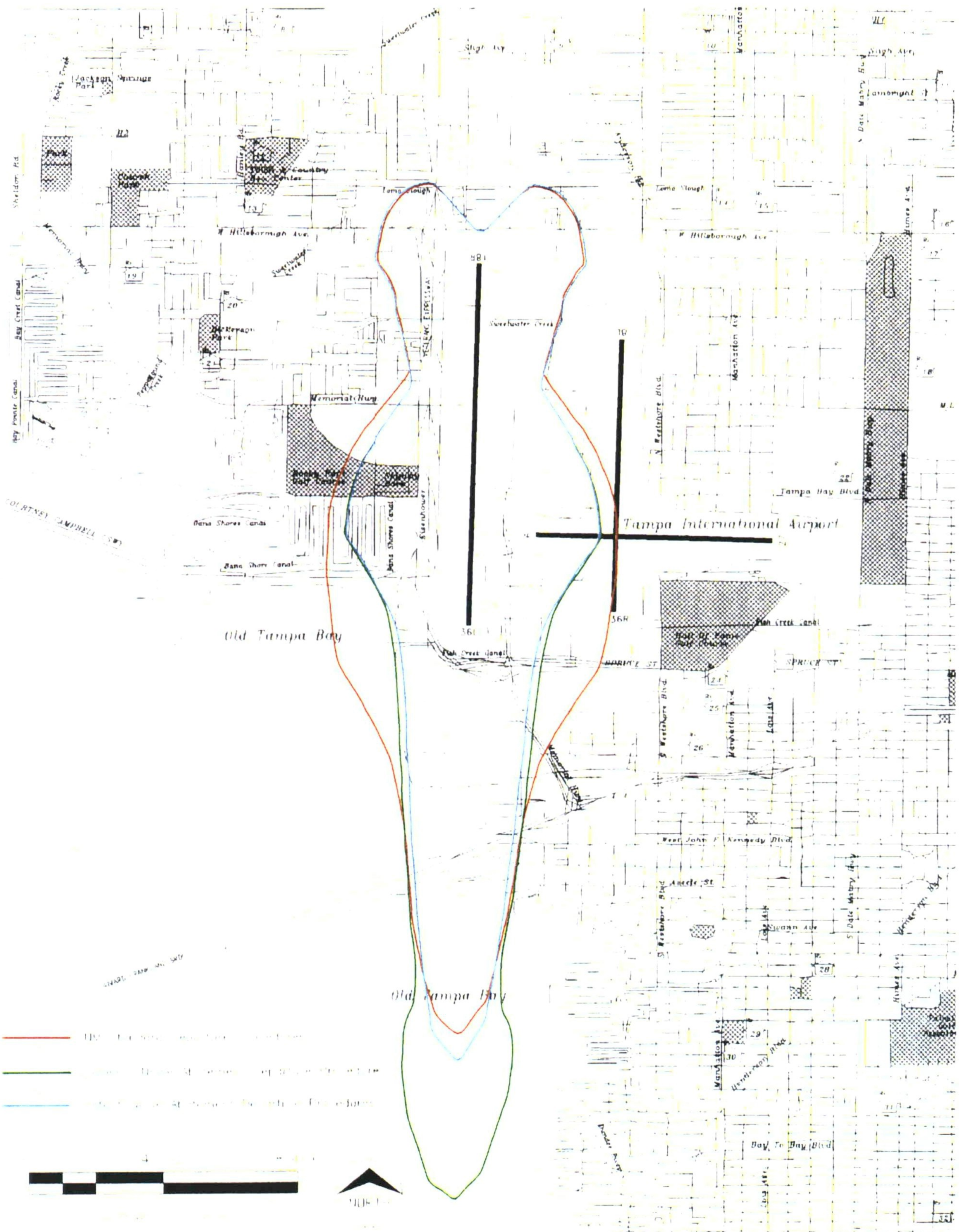
The Chicago Department of Aviation recently completed the installation of a runup enclosure designed for shared use by two major air carriers with maintenance facilities at O'Hare International Airport—United and American. That 3-sided facility is approximately 300 feet wide and 300 feet deep, and has no door. It is designed for "taxi-in, taxi-out" operation of aircraft up to a Boeing 757 (130-foot wingspan) and "push-in, pull-out" use by aircraft up to a Boeing 747 or 777 (198-foot wingspan). The facility is used three to four times per night (10 p.m. to 7 a.m.), i.e., 21 to 28 nighttime runup sessions per week.

The 11 runup sessions that Delta and US Airways conducted per week in 1997, on average, represent less than half of just the *nighttime* use at O'Hare. Even with the potential increase in runup activity associated with the US Airways' Airbus maintenance, a shared facility would accommodate current runup demand at TPA, and would provide

HILLSBOROUGH COUNTY AVIATION AUTHORITY

737-200 95 dB SEL Contours for INM Standard Departure Procedures, and for Close-in and DistantNoise Abatement Departure Procedures, on Runway 18R

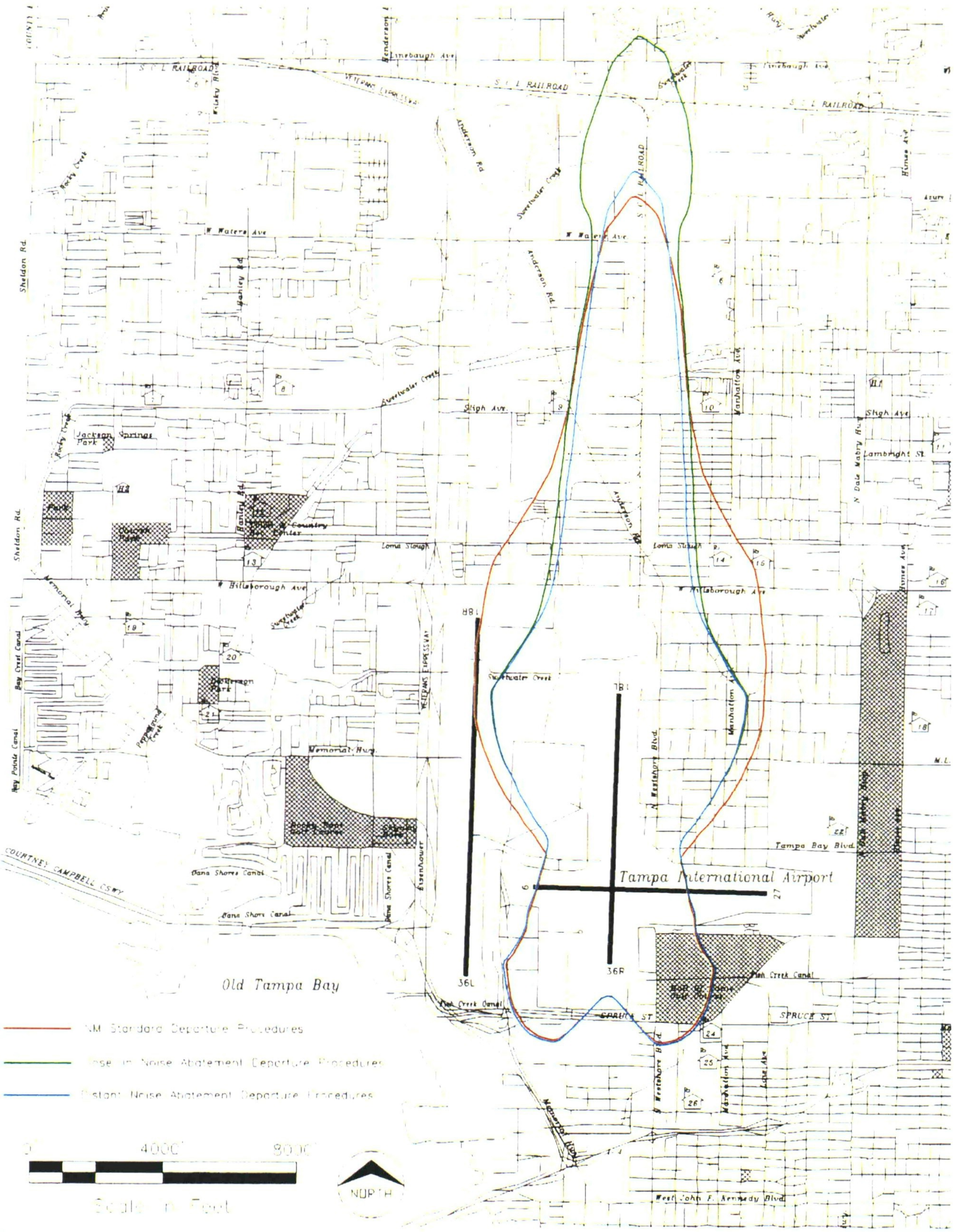
Figure 7-23



HILLSBOROUGH COUNTY AVIATION AUTHORITY

737-200 95 dB SEL Contours for INM Standard Departure Procedures, and for Close-in and DistantNoise Abatement Departure Procedures, on Runway 36R

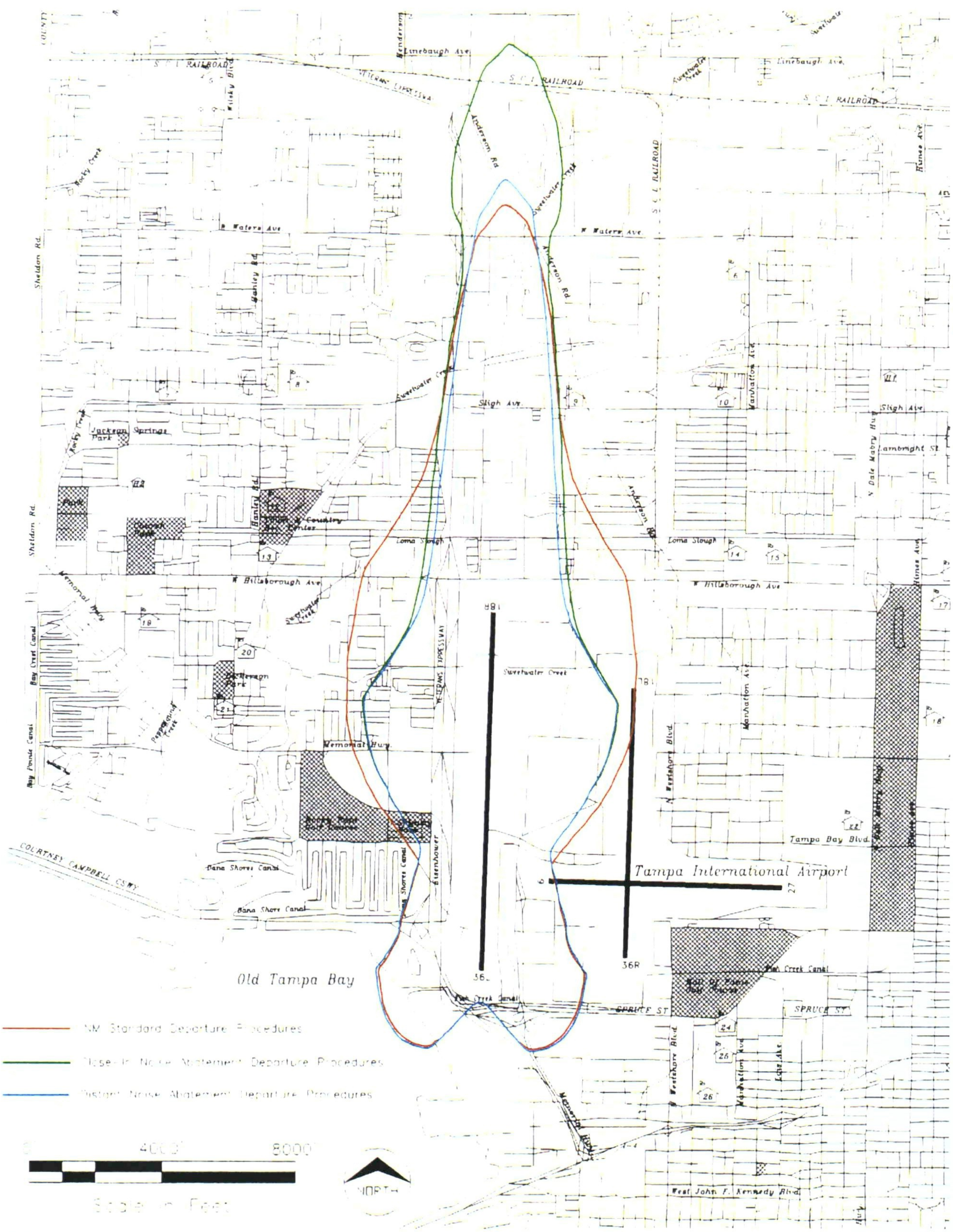
Figure 7-24



HILLSBOROUGH COUNTY AVIATION AUTHORITY

737-200 95 dB SEL Contours for INM Standard Departure Procedures, and for Close-in and DistantNoise Abatement Departure Procedures, on Runway 36L

Figure 7-25



significant capacity for growth in maintenance activity.

The O'Hare enclosure was constructed by Blast Deflectors Incorporated (BDI), at a cost of approximately $3 million, exclusive of ramp construction, since it was built on an existing ramp. The measurements conducted for BDI showed noise reduction of three to five decibels three miles from the facility under "adverse" wind conditions (wind blowing toward the community), and up to 10 to 11 dB in more neutral or beneficial wind conditions.

Portland International Airport Ground Runup Enclosure Study

A study of runup enclosure options was conducted for Portland (Oregon) International Airport. That study estimated potential costs for enclosures for several aircraft types, as summarized in **Table 7.8.**[28]

Computed noise analyses indicate that noise reductions of 10 to 15 dBA are possible in most wind conditions at community locations approximately 5,000 to 10,000 feet from the enclosure.

Conclusion

These runup data suggest that the HCAA could reasonably expect approximately a 10 dB reduction from an open 3-sided enclosure properly oriented on the airfield. The enclosure could be shared by all turbojet operators conducting maintenance runups at power settings above idle. The enclosure would cost $1 to $3 million, depending on configuration and whether or not it would be necessary to construct a runup pad. Based on the fact that prevailing winds are from the south, the structure would be oriented with the opening to the south, and the engine exhausts facing north. This orientation would maximize the conditions under which the facility could be used, and would maximize noise reduction in the critical directions to the sides and rear of the aircraft.

7.4.4 Noise Abatement Flight Paths

The first round noise analysis resulted in the identification of the following two flight path issues of significant public concern:

- Short finals conducted by aircraft on approach to Runways 36L and 36R when conducting east downwinds.

- Early turns conducted by propeller-driven aircraft departing on Runways 36L and 36R.

The Working Groups requested noise contour analyses of these issues.

Table 7.8

Runup Enclosure Cost Estimates for a Variety of Air Carrier Aircraft Types

Aircraft Type	Dimensions	Runup Enclosure Cost	Enclosure Door Cost	Runup Pad Cost[1]	Total Cost
F-28	100' by 100', 30' high	$700,000	$400,000	$1 million	$2.1 million
MD-11	205' by 205', 45' high	$3 million	$1 million	$2.4 - $3 m.	$6.4 - $7 m.
Boeing 737	N/A	$1 million	$600,000	$1.2 million	$2.8 million
Boeing 757	140' wide, 165' deep, 30' high	$1.2 million	$800,000	$1.4 - $1.6 m.	$3.4 - $3.6 m.

[1]The runup pad costs included engineering, excavation, paving, drainage, lighting signage, relocation of some existing facilities, a 15% contingency, and other costs.

Source: HMMH research.

Alternative 4a. Short finals conducted by aircraft on approach to Runways 36L and 36R, when conducting east downwinds.

The 1997 ARTS data sample reveals that substantial numbers of aircraft make east downwind approaches to 36L and 36R, with relatively short finals. **Table 7.9** summarizes the observed frequency of east downwinds where the "base leg" (the east-to-west turn from the downwind to the final approach course) was north of MacDill Air Force Base.

Figure 7-26 presents DNL contours for 2000 operations, with the assumption that early turns north of MacDill are eliminated, compared to the 2000 Base Case contours. This contour case does not differ significantly from the base case contours. No change in population within the 65 dB contour is estimated. However, single event analysis reveals that the length of the final approach legs for these arrivals has a significant effect on population exposure, as discussed below.

Figure 7-27 presents 70 dBA single event noise contours for five different flight paths.[29] Three of the paths involve turns north of MacDill, while the other two paths involve straight-in approaches from south of MacDill and are essentially identical within the figure. These tracks are based on radar observations of the most common groupings of east-downwind approaches.

Residential population within the 70 dBA contour for tracks that turn south of MacDill (tracks Arr36la1 and Arr36la9) is estimated to be approximately 500. The encompassed population for tracks that turn north of MacDill is approximately as follow:

- Arr36la3 (turns north of MacDill) - 14,400 residents
- Arr36la5 (turns north of MacDill) - 15,700 residents
- Arr36la7 (turns north of MacDill) - 13,100 residents

Elimination of early turns would clearly result in sharp reductions in single event exposure.

FAA ATCT staff on the Technical Working Group indicated that prohibition of turns north of MacDill could significantly increase delay during busy traffic periods. It is suggested that the measure could be implemented on an informal basis when traffic and other operating conditions permit.

Alternative 4b. Early turns by propeller-driven aircraft departing on Runways 36L and 36R.

Table 7.9

Frequency of East Downwinds Based on 15-Day ARTS Data Sample from March and October 1997

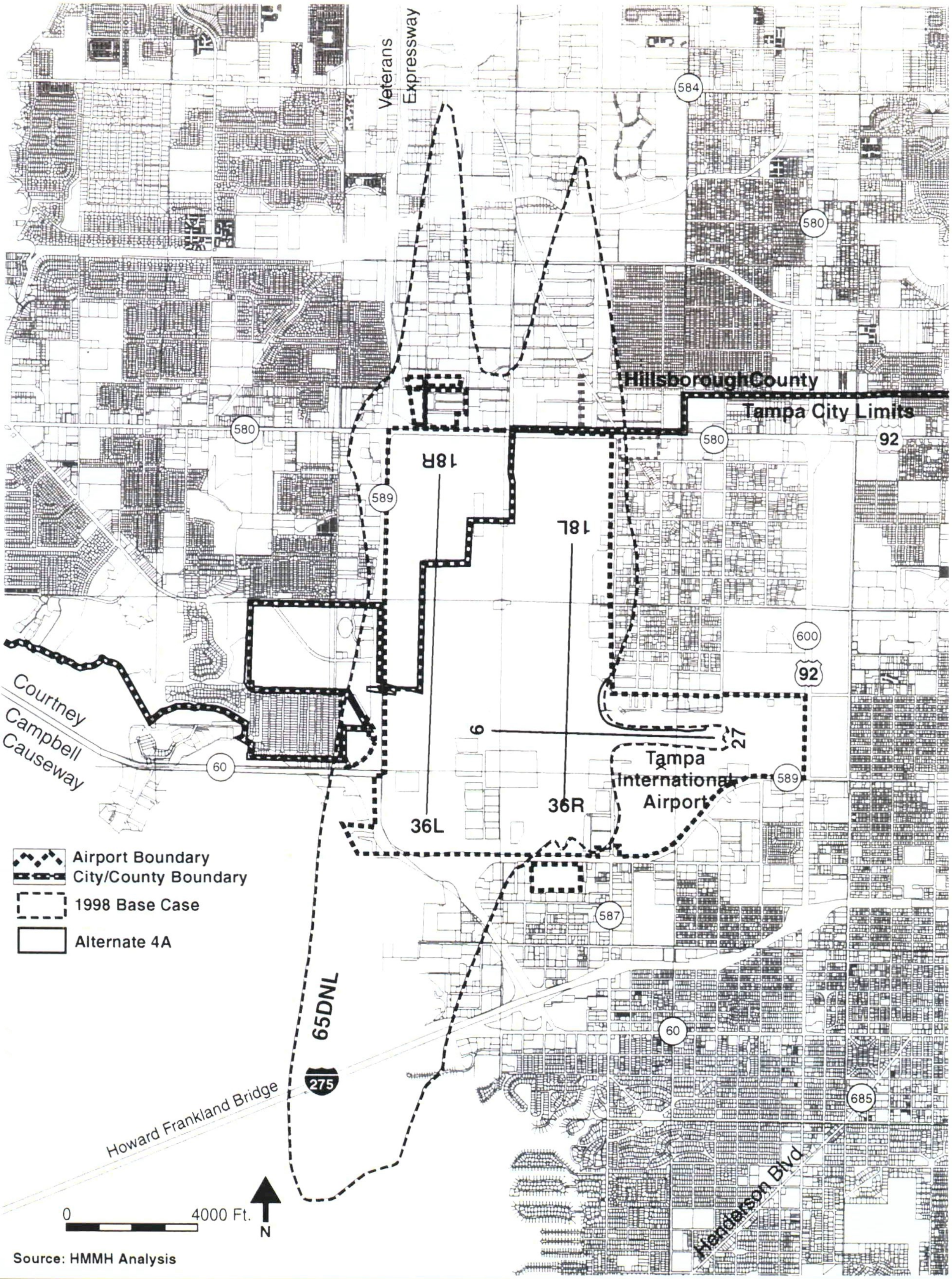
Aircraft Type Category	East Downwinds to 36L with Short Finals (Turns North of MacDill)		East Downwinds to 36R with Short Finals (Turns North of MacDill)	
	Day	Night (10 p.m. – 7 a.m.)	Day	Night (10 p.m. - 7 a.m.)
Air Carrier Jets	8%	15%	0%	0%
Corporate Jets	11%	11%	0%	0%
Propeller Aircraft	6%	30%	8%	21%

Source: HMMH analysis.

HILLSBOROUGH COUNTY AVIATION AUTHORITY

2000 Day-Night Average Sound Level (DNL) Contours for Noise Abatement Alt. 4A, Elimination of Turbojet East Base Legs North of MacDill AFB

Figure 7-26

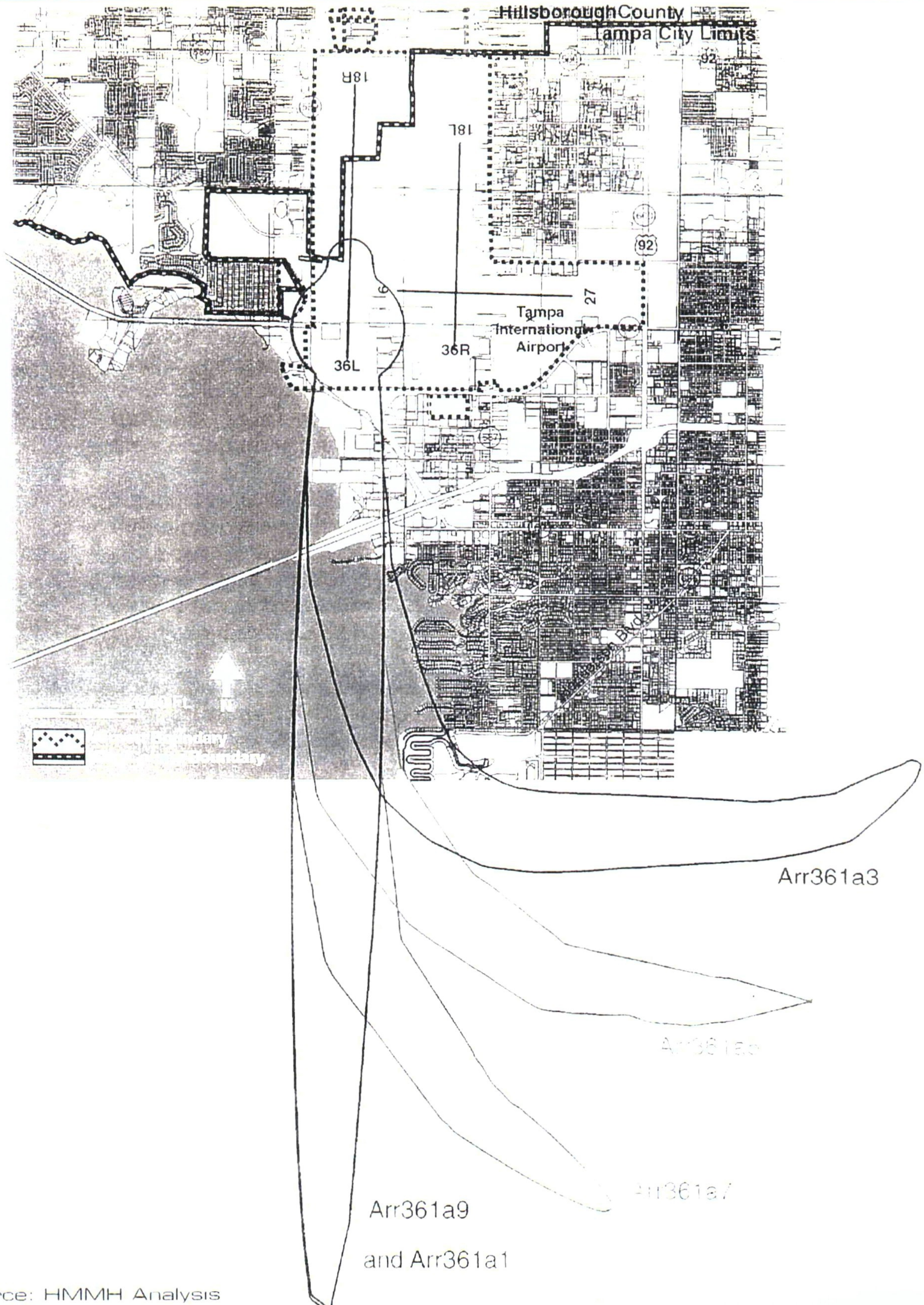


Source: HMMH Analysis

HILLSBOROUGH COUNTY AVIATION AUTHORITY

Representative Boeing 737-200 70dB Maximum A-Weighted Sound Level Single Event Contours for Straight-in and Left Downwind Approaches to Runway 36L

Figure 7-27



Source: HMMH Analysis

Residents in communities north of TPA have commented that early departure turns by turboprops are a major issue of concern.[30] The FAA assigns propeller-driven aircraft departing on Runways 36L and 36R to three basic flight paths:

Runway 36L
1) runway heading
2) 20 degree turn (340 degree heading)
3) 50 degree turn (310 degree heading)

Runway 36R
1) runway heading
2) 20 degree turn (20 degree heading)
3) 60 degree turn (60 degree heading)

The track assignments are based on destination and traffic considerations. For example, on Runway 36L, westerly and southerly departures are assigned the 20 degree and 50 degree turns, respectively, as a rule. Other propeller departures are assigned the straight-out track unless a faster jet aircraft is waiting to depart next. In that case, the FAA assigns the propeller aircraft a turn to provide a path that diverges from the straight-out path of the following turbojet. If there are multiple propeller aircraft with a turbojet following, the FAA uses both turn headings.

Figures 7-28 and 7-29 present 70 dBA single event noise contours for the most common INM turboprop class operating at TPA, for prototypical tracks off of Runways 36L and 36R[1] that represent the three basic heading assignments made by the FAA. Note that the modeling tracks are based on "center of gravity" paths from actual radar observations of aircraft following these instructions; the modeled tracks do not match the exact heading assignments. It is estimated that the residential populations within these contours are approximately as follows:

- Runway 36L straight-out - 200 residents
- Runway 36R straight-out - 200 residents
- Runway 36L 20 degree turn - 300 residents
- Runway 36R 20 degree turn – 400 residents
- Runway 36L 50 degree turn – 400 residents
- Runway 36R 60 degree turn – 500 residents

Increased angles of turn clearly increase exposure to single event noise levels. As a compromise between operational necessity and noise abatement, it is suggested that a contour case be evaluated where turns over 20 degrees would be prohibited. This alternative would allow the FAA to assign diverging paths, except in the cases where two turboprops are followed by a turbojet.

Figure 7-30 presents DNL contours for application of this assumption to the 2000 operations compared to the 2000 Base Case contours. The figure reveals minor differences in the two contours, including a slight expansion to the immediate northeast of the Airport that increases the encompassed population by approximately 100 residents.

The Working Groups also suggested assigning runways and headings based on destination in a more formal manner than currently occurs (i.e., for east and southbound departures to be assigned 36R). However, the single event contours indicate that impacts are relatively equal on both sides of the Airport, and that it is more appropriate to reduce the incidence of early turns.

Further ATCT input led to the understanding that an outright prohibition on turns greater than 20° might result in excessive delay in some conditions. At the ATCT's request, this measure was revised to allow for sharper turns when excessive delay might result, or for other safety-related reasons. Based on ATCT input, the revised Noise Exposure Map Contours (Figures 6-1 and 6-2) assume

50 percent reduction in turns greater than 20° (i.e., turns to 310° on 36L and to 60° on 36R.

7.4.5 Noise Abatement Arrival Procedures

The effect of increasing approach slopes over the 3-degree standard that is imple-mented by the glide slope instrumentation at TPA[31] was analyzed.

Table 7.10 presents the estimated reduction in maximum A-weighted sound level of 737-200 approaches that would result from increasing the approach slope from 3 to 4.5 degrees. These estimates were calculated using the INM for the noise monitoring locations from the NEM development phase of the study. The calculations are for straight-in approaches to Runways 18R, 18L, and 36L, as appropriate for each location.

As shown in Table 7.10, the results are mixed. A rule of thumb to consider in reviewing these results is that it is highly unlikely that a person will notice a change in A-weighted maximum levels of less than two to three decibels in a normal day-to-day listening environment. Only Sites 1 and 15, immediately off the end of Runway 36L, have estimated reductions over two decibels. The estimated noise level actually goes up at more sites than it goes down. This is because the increased altitude may actually reduce the attenuation provided by interaction with the ground, that occurs at low propagation path angles, when sites are to the side of the approach path.

It should be noted that the 4.5-degree approach slope used in this analysis is higher than many turbojet aircraft could safely use, including such common aircraft as the Boeing 757. A more reasonable angle would yield even less significant noise reduction.

Table 7.10

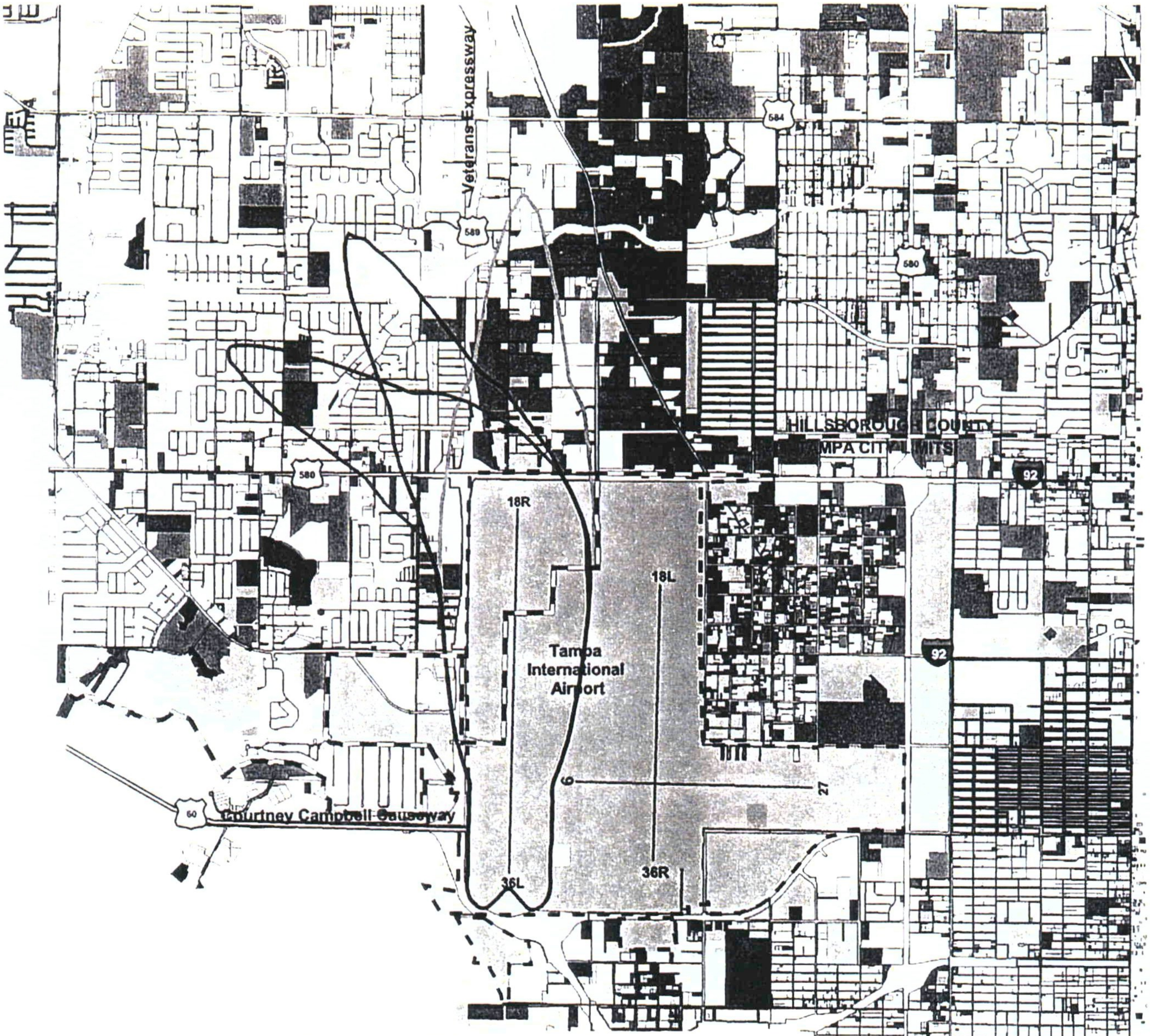
INM-Estimated Reduction in Maximum A-Weighted Sound Level of Straight-In B737-200 Approaches from Increasing Approach Slope from 3 to 4.5 Degrees

Site	Runway 18L	Runway 18R	Runway 36L
1. Mariner Street, Beach Park			-2.3
2. Longfellow Ave., Sunset Park			-0.8
3. St. Croix Drive, Culbreath Isles			1.3 (increase)
4. Pepperell Dr., Carrollwood	N. A. - Aircraft are not likely to be established on glide slope.		
5. Sierra Madre Drive	0.2 (increase)	0.1 (increase)	
6. Westford Cir., Village West	N. A. – Sites are too distant. Aircraft are not likely to be established on glide slope.		
7. Clubhouse, Plantation			
7A. Park Crest, Plantation			
8. Twelve Oaks Blvd.	1.5 (increase)	1.3 (increase)	
9. D'Azzo Ave., Drew Park	N.A. - Sideline site.		
10. Johns Road, Northwest Park	0.4 (increase)	1.3 (increase)	
11. West Laurel St.			0.8 (increase)
12. North St./Occident Ave.	0.3 (increase)	0.5 (increase)	
13. Leeward Dr., Watermill Village	0.9 (increase)	0.6 (increase)	
14. Doral Drive, Dana Shores	N.A. - Sideline site.		
15. Cypress Point Park			-2.3
16. Aileen St.	N.A. - Sideline site.		

Source: HMMH analysis.

Representative 70dB Maximum A-Weighted Single Event Contours for Shorts SD-330 Twin-Engine Turboprop Departures off of Runway 36L

Figure 7-28



Note: Modeled tracks based on observed flight paths rather than assigned headings.

Legend

- Agriculture
- Heavy Commercial
- Heavy Industrial
- Light Commercial
- Light Industrial
- Multi Family
- Mobile Home Park
- Natural Areas
- Public Institution
- Public Utilities
- ROS
- School
- Single Family
- Not on Record
- Vacant
- Water
- Representative 50 Degree Left Turn
- Representative 20 Degree Left Turn
- Representative Straight-Out Track
- County Property Line
- Airport Property Line

N

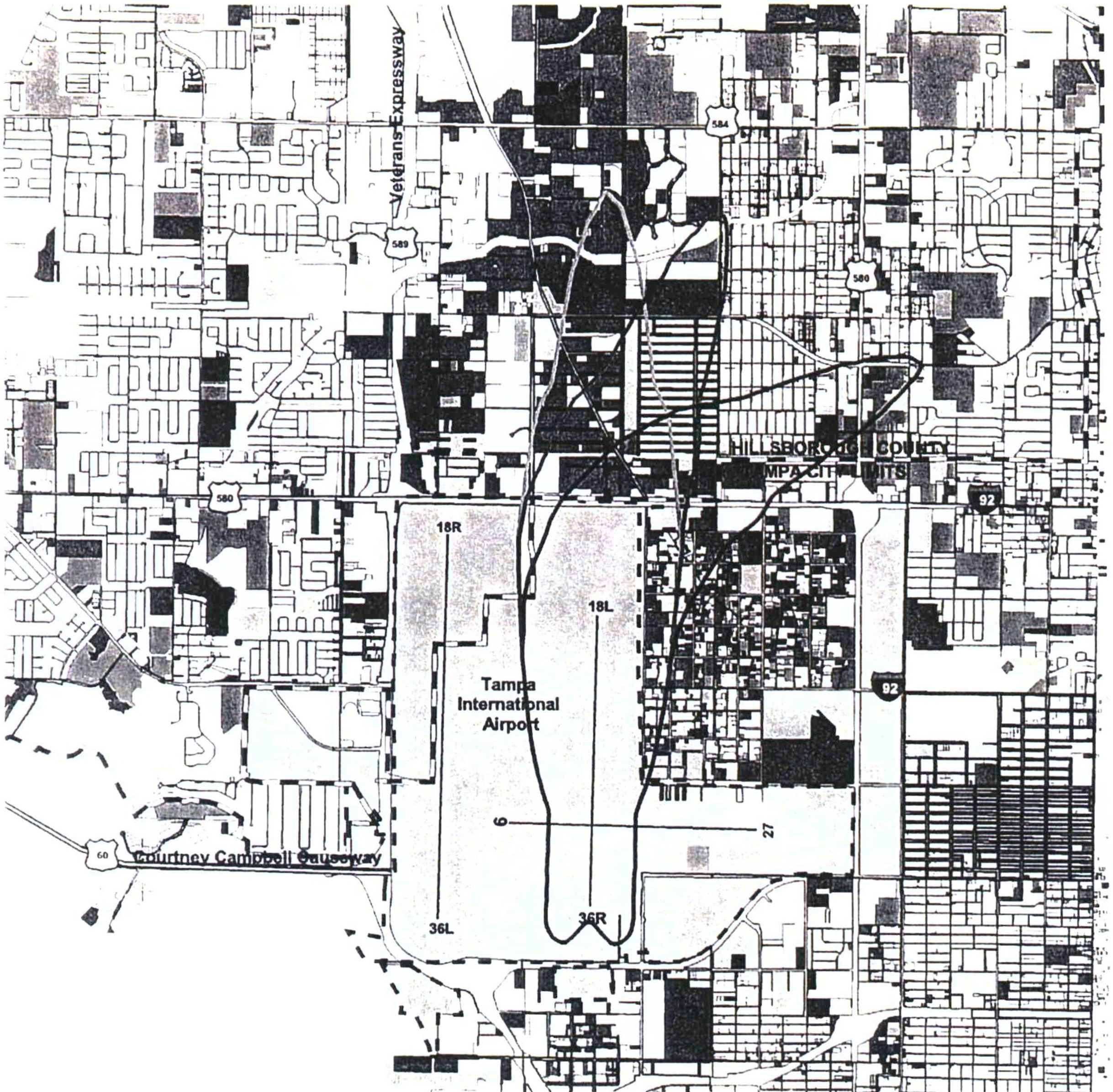
0 1

Scale in Miles

Source: Hillsborough County-City Planning Commission.

Representative 70dB Maximum A-Weighted Single Event Contours for Shorts SD-330 Twin-Engine Turboprop Departures off of Runway 36R

Figure 7-29



Note: Modeled tracks based on observed flight paths rather than assigned headings.

Legend

- Agriculture
- Heavy Commercial
- Heavy Industrial
- Light Commercial
- Light Industrial
- Multi Family
- Mobile Home Park
- Natural Areas
- Public Institution
- Public Utilities
- ROS
- School
- Single Family
- Not on Record
- Vacant
- Water
- Representative 60 Degree Right Turn
- Representative 20 Degree Right Turn
- Representative Straight-Out Track
- County Property Line
- Airport Property Line

N

0 1

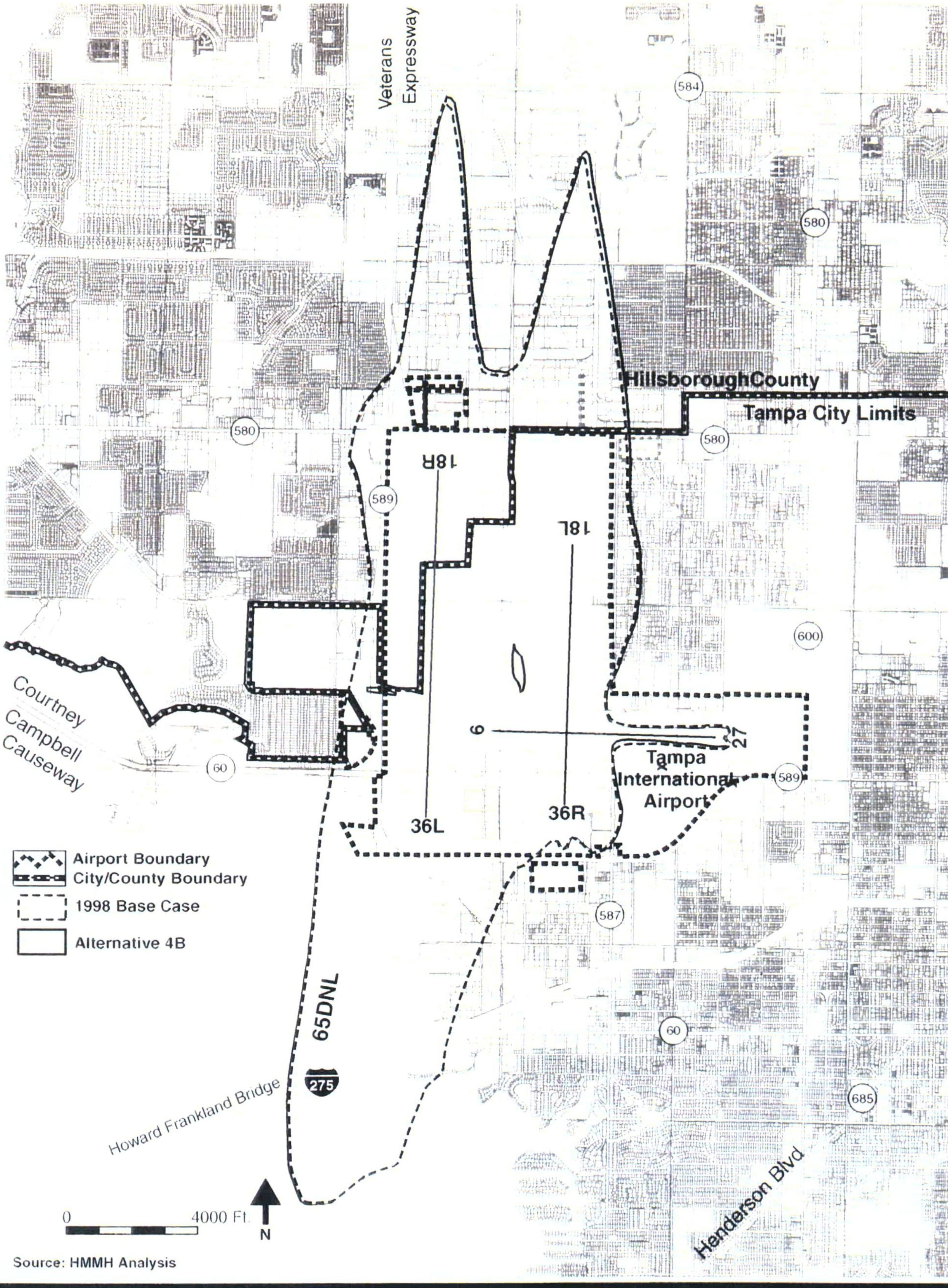
Scale in Miles

Source: Hillsborough County-City Planning Commission.

HILLSBOROUGH COUNTY AVIATION AUTHORITY

2000 Day-Night Average Sound Level (DNL) Contours for Noise Abatement Alt. 4B, Elimination of Propeller Departure Turns Sharper than 20 Degrees, Compared to Base Case

Figure 7-30



Source: HMMH Analysis

7.4.6 Modeling Assumptions for Preferred Alternative

The following revisions to the TPA noise abatement program were recommended:

Preferential Runway Use

- Assume 73 percent compliance with daytime south-flow preferential.
- Extend nighttime (midnight to 6 a.m.) preferential runway program to all aircraft types, and assume 81 percent compliance for departures on 18R and 85 percent for arrivals on 36L.

The FAA Air Traffic Control Tower at Tampa indicated that they believed it would be reasonable to expect this level of compliance through improved wording in the Tower Letter to Airmen. Appendix D presents a copy of the current Tower Letter to Airmen on the "Informal Runway Use Program" that the Tower issued during the study partly in response to this objective. The Tower added the second paragraph in the Letter with the specific purpose of achieving the desired level of preferential runway use.

The Tower provided the estimate of compliance that this improved program would yield, for use in developing the revised noise contours. In addition to this very positive action by the Tower, the operations monitoring system that the HCAA proposes to install as part of the revised NCP will provide the airport staff with a means to monitor actual runway use and provide appropriate feedback to the Tower and aircraft operators to maximize compliance.

Noise Abatement Cockpit Procedures

- Recommend air carrier turbojet use of AC 91-53A "distant" noise abatement departure profile.

Runup Noise Control

- Construction of single shared-use runup enclosure sized for Delta and US Airways fleets, in the vicinity of existing maintenance areas. Use of runup facility would only be required for runups above idle power, with voluntary use for idle power runups. Assume 10 dBA attenuation will be achieved.

Noise Abatement Flight Paths

- When traffic, wind, weather, and field conditions permit, and no delays will result, turbojet arrivals on Runway 36L will not conduct base legs north of MacDill Air Force Base. Assume 50 percent reduction in current level of base legs occurring north of MacDill Air Force Base.
- When traffic, wind, weather, and field conditions permit, and no delays will result, propeller-driven aircraft will not conduct turns greater than 20 degrees on departure from Runways 36L and 36R prior to reaching 3,000 feet. Assume 50 percent reduction in current use of sharper turns.

7.5 UPDATED LETTER TO AIRMEN

On July 1, 1998, the FAA Air Traffic Manager for the TPA ATCT issued "Tampa Air Traffic Control Tower Letter to Airmen No. 98-05" (see Appendix D). A copy of that letter is appended to this document. It includes several changes that are consistent with noise abatement analysis results to date, including the following:

- The preferential runway program instructions include the following statement:

  Pilots requesting to use a runway other than the active are expected to advise the control tower. These requests will be honored; however, the Tower will advise that the requested runway is a deviation from the Noise Abatement Runway Use Program and will advise of any expected delay. These deviations from the Informal Runway Use Program will be noted in the Facility Record of Operations (FAA 7230-4). *This revision requires that ATCT staff implement effectively the same process that a formal runway use program would require. HCAA should monitor runway use under this revised order to determine the extent to which ATCT staff adhere to these better-defined assignment practices. The updated Part 150 NCP should include a recommendation to officially adopt the preferential runway program on a formal basis, and to recognize the importance of ongoing implementation and monitoring.*

- A new paragraph relating to east base legs north of MacDill:

  Noise Sensitive Area. Between the hours of 11 p.m. and 6 a.m., when traffic conditions permit, turbojet arrivals to Runway 36L shall be vectored to avoid the Interbay Area (peninsula south of Runway 36R).

  This paragraph represents nighttime implementation of the recommended restriction on east base leg turns north of MacDill.

Chapter Eight
Land Use Compatibility

The HCAA, in cooperation with Hillsborough County and the City of Tampa, has worked to minimize non-compatible land uses in the areas surrounding TPA. They cooperatively prepared and implemented land use regulations, as discussed in Chapter Five, have proven to be highly effective in the prevention of non-compatible development. Since the initiation of the first Part 150 program in 1985, the population within the DNL 65 contour area has declined from 14,200 to 310 in 1999.

This chapter reviews the 1985 FAR Part 150, identifies future non-compatible land uses, and evaluates land use alternatives to further reduce non-compatibility.

8.1 REVIEW OF 1985 FAR PART 150

The 1985 FAR Part 150 Study accepted by the HCAA recommended five preventive land use measures and two remedial land use measures.

8.1.1 1985 FAR Part 150 Land Use Recommendations

Brief descriptions of the recommended preventive measures follow:

1. **Zoning for Compatible Use** - This measure recommended that the comprehensive plans and zoning maps be amended to show permitted compatible uses in airport noise zones and allow only low density uses in noise zones to prevent new development of residential dwelling units and other noise sensitive land uses from being constructed within the 65 DNL areas north and south of the Airport.

2. **Overlay Zoning** – The study recommended that the existing zoning regulations be amended to restrict new residential development and other non-compatible uses in airport noise zones, or to require noise reduction construction techniques for land uses permitted in noise zones.

3. **Purchase of Undeveloped Land** – This measure called for the purchase of land to (1) maintain as vacant land, (2) develop for compatible use, or (3) sell for development in compatible use.

4. **Public Information Program** – The study recommended the development of a package of aircraft noise zones and noise impacts information, including explanatory brochures and noise control maps. The purpose would be to raise public awareness about purchasing real estate in non-compatible zones and, thereby, discourage builders from developing in these zones.

5. **Soundproofing New Construction** – In areas within the 65 DNL where the land use would not be changed, the study recommended that the building codes be

amended to require noise reduction construction building approval for new development.

The 1985 FAR Part 150 Study also recommended the following remedial measures to alleviate non-compatibility with existing land uses:

1. **Purchase of Avigation Easements** – This recommendation called for the purchase of easements from property owners in airport noise zones permitting both overflights of aircaft and the associated noise.

2. **Acquisition of Developed Land** – The study recommended that developed property with non-compatible uses be purchased to (1) keep it vacant and unused, (2) redevelop it for compatible uses, or (3) resell it for compatible use.

8.1.2 Implementation of the FAR Part 150 Recommendations

As discussed in Section 5.3, both the City of Tampa and Hillsborough County adopted land use measures in coordination with the HCAA that effectively prohibited new, non-compatible land use in the areas surrounding TPA. These measures incorporated much of the preventive program recommended in the Part 150 Study in the 1980s.

The adoption of the Comprehensive Plans of the City and the County implemented recommendations for excluding non-compatible land uses in the areas north and south of the Airport where the areas within the 65 DNL were primarily located. As previously noted, the County adoption of its Land Development Code in 1989 established special airport zoning districts prohibiting non-compatible land uses. To develop land use compatibility, the City also adopted airport-related zoning to restrict land use types, heights of structures, and the intensity of development.

8.1.3 Results of Implementation

The noise impacts at TPA have been decreasing since the 1985 FAR Part 150 Study was completed and implemented. This has primarily been a result of the successful cooperative efforts by Hillsborough County, the City of Tampa, and the HCAA, and the increased utilization of Stage 3 aircraft. The land use regulations that the County and the City have developed have precluded the introduction of any new residential or other noise sensitive land uses into the 65 DNL areas surrounding the Airport since the completion of the 1985 FAR Part 150 Study.

8.2 FUTURE (2005) NON-COMPATIBLE LAND USES

The 2005 DNL contours are smaller in area than the 2000 contours. This is primarily the result of the future utilization of quieter aircraft. If land uses remain as they are today, there would be ten dwellings remaining within the 65 DNL for the forecasted 2005 DNL contour.

The potential for developing additional non-compatible land uses in the future was virtually eliminated by the comprehensive plan and zoning measures adopted by Hillsborough County and the City of Tampa in 1989 following the 1985 Part 150 Study.

Table 8.1 summarizes non-compatible land use properties relative to the 2000 and 2005 noise contours, without the recommended noise compatibility program. This analysis is based on the existing pattern of land use. Figure 6-1 presents the 2000 condition, **Figure 8-1** presents the 2005 noise contours without consideration of the noise abatement measures recommended in Chapter Seven.

8.3 RECOMMENDED LAND USE ALTERNATIVES

As discussed in Chapter Seven, the recommended land use element of the NCP is a refinement of the existing land use measures contained in the current NCP. The updated land use element of the NCP includes changes to five of the seven approved measures. Following are the three recommended measures to be continued without change and the three recommended measures to be modified from the existing NCP.

Measures recommended to be continued without change from the existing NCP:

- Zoning to promote compatible land use in airport noise zones and to allow only low density uses in noise zones.
- Overlay zoning to require noise reduction construction techniques for land uses permitted in noise zones.
- Public information program to provide information on aircraft noise zones and noise impacts.

Measures recommended to be modified from the existing NCP:

- Purchase of avigation easement from property owners in airport noise zones permitting overflight of aircraft and the associated noise. *Measure to be modified to be part of an acoustical treatment program for existing residencies.*
- Soundproofing of new construction to achieve the recommended Environmental Protection Agency (EPA) interior noise level standard of 45 dBA. *This measure should be modified for remedial efforts (existing residences).*

Measures not recommended for NCP.

- Purchase of undeveloped land to prevent non-compatible land uses from developing. *The potential for development of non-compatible land uses in the future is minimal due to comprehensive plan and zoning measure, this measure is no longer needed.*
- Purchase of developed lands. *Developed non-compatible land within the future contours is minimal and use of soundproofing as a remedial measure will mitigation these parcels, this measure is no longer needed.*

Table 8.1

Non-Compatible Land Use Properties by Noise Contour

Contour Interval	Residential Dwelling Units	Population
Current (2000)		
65-70	78	191
70-75	0	0
75-80	0	0
85+	0	0
Future (2005) without the proposed Noise Compatibility Program		
65-70	10	24
70-75	0	0
75-80	0	0
85+	0	0

Source: HNTB analysis.

8.4 POTENTIAL NEW OR REVISED LAND USE MEASURES

This section presents the rationale for recommended changes to the land use element of the existing NCP. These recommendations reflect the following developments since the adoption of the current program.

8.4.1 Aviation Easement Acquisition

This measure is part of the program for acoustical treatment of existing residences for the benefit of existing and future residents of these homes and to relieve HCAA from further mitigation responsibility associated with the impact of airport noise on these residences.

HCAA, in cooperation with the FAA, the City of Tampa, and Hillsborough County, is responsible for implementation.

8.4.2 Soundproofing/Climate Control Program

This measure would require the reduction of interior noise levels to 45 dBA for all residences within the 65 DNL contour. Twenty-two existing residences located on Mariner Street in the City of Tampa are within the 65 DNL. There is a total of 34 single family residences on Mariner Street in this residential neighborhood.

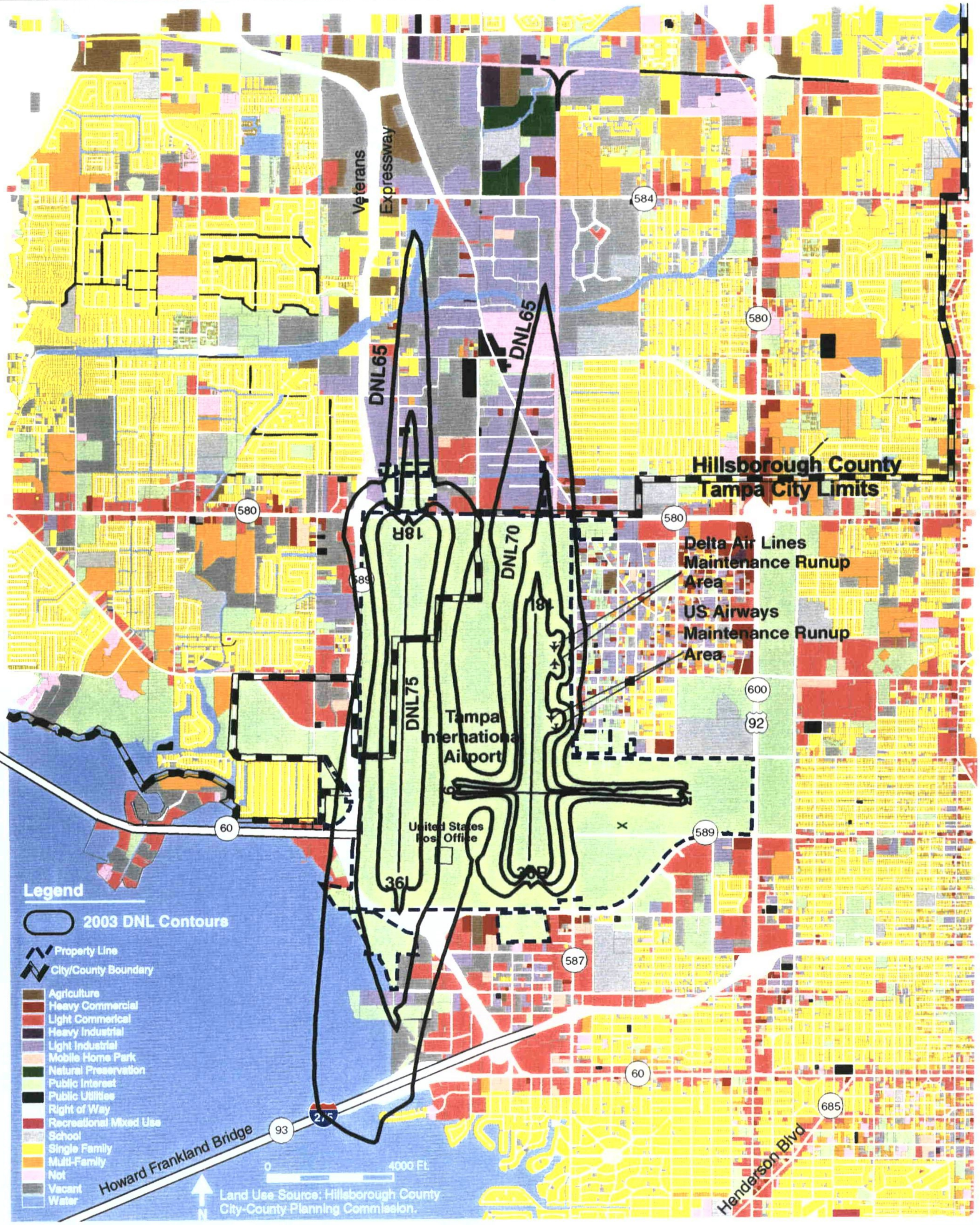
In addition, four homes are currently located north of Runway 18R-36L east of Benjamin Road in the vicinity of Bridal Veil Path within the DNL 65 dB contour. By the year 2005 it is estimated that because of the noise abatement measures recommended in this study this number will be reduced to 0 residences. Although this neighborhood is in a transition to non-residential uses these residences should be considered for inclusion in the soundproofing/climate control program.

It is recommended that all of the residences on Mariner Street in this neighborhood be included in the acoustical noise treatment program, starting with the homes within the

HILLSBOROUGH COUNTY AVIATION AUTHORITY

2005 Day-Night Average Sound Level Contours without the Proposed Noise Compatibility Program

Figure 8-1



65 DNL and adding homes eastward as funding is available. In addition, there are four single family homes located in the Benjamin Road vicinity within the 65 DNL that is to be included in the program.

8.4.3 Purchase of Undeveloped Land

This measure would require additional acquisition of undeveloped land to prevent non-compatible development. Review of aerial mapping and field verification of data for the Tampa area found there is no undeveloped land zoned for residential use remaining in the DNL 65 dB contour. Therefore, no additional land would need to be acquired as part of the Part 150 process.

This program, when coupled with the implementation of the noise abatement recommendations, would benefit an estimated 17 people now residing within the 65 DNL and up to an estimated 75 people in the immediate neighborhood by reducing the interior noise level of these residences to 45 dB. This program, when coupled with the other NCP recommendations, would achieve an interior noise level of 45 dB or less for all homes in the vicinity of TPA.

Figure 6-4 presents the 2005 condition with the recommended noise compatibility program. **Table 8.2** summarizes non-compatible land use properties within the 2005 noise contours, with the recommended noise compatibility program.

The HCAA, in cooperation with the City of Tampa and Hillsborough County, would be responsible for implementation, with financial funding assistance from the FAA, subject to FAA approval.

Table 8.2

Non-Compatible Land Use Properties by Noise Contour

Contour Interval	Residential Dwelling Units	Population
Future (2005) with the proposed Noise Compatibility Program		
65-70	10	25
70-75	0	0
75-80	0	0
85+	0	0

Source: HNTB analysis.

Chapter Nine
Recommended Noise Compatibility Program

As discussed in Section 1.2.1, the HCAA had overall responsibility for the conduct of the Part 150 update, including ultimate responsibility for the recommendation of measures for inclusion in the revised NCP. *All of the final NCP measures that this document proposes for implementation are the recommendations of the HCAA, and not those of the project consultants or any other third party. See checklist item V.A.2, Appendix A.2.*

Section 9.1 summarizes the noise abatement and land use measures that the Authority proposes for inclusion in the revised NCP. Section 9.2 summarizes program benefits. Section 9.3 summarizes NCP implementation documentation requirements set forth in the FAA's NCP checklist.

9.1 PROGRAM SUMMARY

The revised NCP for TPA includes nine measures: seven noise abatement measures and two land use measures.

Sections 9.1.1 and 9.1.2 define the noise abatement and land use measures. Chapters Seven and Eight present the analyses that led to the selection of those measures.

9.1.1 Noise Abatement Measures

The revised NCP includes the noise abatement measures below. They are defined in formal terms that adopt language from the existing ATCT/TRACON and Authority Letter of Agreement for the preferential runway and noise abatement flight path measures (measures 1 through 7). The descriptions indicate which measures are changed from the original NCP, and what FAA and HCAA actions are required to implement the change.[32]

1. **Maximize daytime (6 a.m. to midnight)** – The south flow preferential, based on existing improved language in the current ATCT Letter to Airmen. *(Existing measure, with improved implementation element.)*

2. **Adopt preferential order of runway use from existing ATCT Letter to Airmen** – *(Adopt existing measure in current Letter to Airmen as part of NCP.)*

3. **Extend night (midnight to 6 a.m.)** - Preference for 36L arrivals and 18R departures to all aircraft. *(Existing measure extended to all aircraft, not just turbojets.)*

4. **Initial turbojet departure headings** – *(Adopt existing measure in current ATCT Letter to Airmen as part of NCP.)*

5. **Noise abatement propeller aircraft flight paths for Runway 36L and 36R departures** – Minimize turns greater than 20°, as permitted by operating conditions. *(New measure.)*

6. **Limit base legs for Runway 36L arrivals** – Limiting base legs for

Runway 36L arrivals north of MacDill AFB as permitted by operating conditions. *(Adopt existing measure in current ATCT Letter to Airmen as part of NCP.)*

7. **Helipad on east side of the Airport** - *(Continue existing NCP measure.)*

8. **Recommend turbojets use distant noise abatement departure procedures** - *(New measure.)*

9. **Recommend turbojets use ATA noise abatement arrival procedures** - *(Continue existing NCP measure.)*

10. **Construct shared runup enclosure for turbojet maintenance runups above idle power** - Continue idle power runups in designated areas. *(Add enclosure to existing measure.)*

11. **Amend Tower Letter to Airmen to Reflect Revised NCP** – The TPA ATCT will revise the existing Letter to Airmen (presented in Appendix D) to reflect the NCP changes identified above. In addition, in order to ensure that the noise abatement elements of the NCP are implemented to the maximum feasible extent consistent with safe operation, the ATCT Manager has proposed revising the second paragraph of the Letter to state the following:

    Pilots requesting to use a runway other than the active or to deviate from noise abatement flight tracks for reasons of operations safety are expected to advise the control tower. The Tower will honor these safety-related requests. However, the Tower will advise that the requested runway or flight track is a deviation from the Informal Runway Use Program and will advise of any expected delay. The Tower will not direct pilots to deviate from preferential runway use or noise abatement flight track procedures unless the deviation is required to avoid unsafe operations or significant delay. All deviations from the Informal Runway Use Program, including preferential runway use and noise abatement tracks, will be noted in the Facility Record of Operations (FAA 7230-4).

9.1.2 Land Use Measures

The original NCP included seven land use measures, of which one was remedial and six were preventative measures. Although the specific measures recommended in the previous Part 150 were not implemented, the comprehensive plans for growth management adopted by both the City of Tampa and Hillsborough County have served to reduce non-compatible development. The revised NCP includes five of the seven original measures—three without revision and two with revisions to reflect current conditions and policies.

Preventive Measures

Continued application of these measures is recommended to maintain the current compatible development trends in the airport environs.

Existing Preventative Measure 1: Zoning for Compatible Use – This measure will prevent new development of residential dwellings and other noise sensitive land uses from being constructed with the DNL 65 dBA contour. *(No Change.)*

Existing Preventative Measure 2: Overlay Zoning – This measure will prevent new residential development and other non-compatible uses in airport noise zones. *(No Change.)*

Existing Preventative Measure 3: Public Information Program – This measure will raise public awareness in purchasing real estate in non-compatible zones. *(No Change.)*

Existing Preventative Measure 4: Soundproofing of New Construction - The original NCP recommended that the Airport provide soundproofing of new construction to achieve recommended EPA interior noise level standards of 45 dBA for buildings within the DNL 65 dB contour. The NCP should be revised such that this measure becomes a remedial measure. This measure is described within the remedial measure discussion.

Remedial Measures

The original remedial measures have been revised to incorporate existing conditions.

Existing Remedial Measure 1: Purchase of Avigation Easements - This measure is modified to be part of the acoustical treatment program of existing residences for the benefit of existing and future residents of these homes and to relieve HCAA from further financial responsibility associated with the impact of airport noise on these residences.

HCAA, in cooperation with the FAA, the City of Tampa, and Hillsborough County, is responsible for implementation.

Existing Remedial Measure 2: Soundproofing/Climate Control Program - This measure proposes to reduce the interior noise levels to 45 dBA for all residences within the DNL 65 dBA. This measure applies to existing residents; future development within the DNL 65 dBA contour will not be considered for this treatment if Federal funds are used.

The HCAA, in cooperation with the City if Tampa and Hillsborough County, would be responsible for implementation, with financial funding assistance from the FAA, subject to FAA approval.

9.2 OVERALL BENEFITS OF THE PROPOSED REVISED NOISE COMPATIBILITY PROGRAM

The noise abatement elements of the revised NCP will enhance the effectiveness of the existing NCP in reducing non-compatible land use in the TPA environs. The land use elements include preventative measures to deter future incompatibility.

With the implementation of the proposed noise abatement elements of the revised NCP, there will only be limited areas of non-compatible land use according to FAR Part 150 guidelines. These areas are shown in Figures 6-1 and 6-2 for the base and 5-year forecast case conditions. The general areas of non-compatible land use are as follow:

- Areas of residential use within planned industrial use areas surrounding the Airport.

- Areas of residential use within well-established residential communities that will not be rezoned.

Table 9.1 summarizes the residential population within the existing conditions and 5-year forecast contours for the current and proposed revised NCPs. The bottom line of the table summarizes the overall benefit of the revised noise abatement elements of the revised program. The net effect is that non-compatible land use at TPA will be reduced to six dwelling units by the year 2005.

Table 9.1

Comparison of the Estimated Residential Population[1] within the Existing Condition and 5-Year Forecast NEMs for the Existing and Proposed NCPs

	Population and Dwelling Units within 65 dB DNL Contours			
	Base Case NEM		5-Year Forecast NEM	
Case	Dwelling Units	Residents	Dwelling Units	Residents
Existing NCP	78	191	10	24
Revised NCP	70	172	10	25
Reduction (Effect of NCP Revision)	-8	-19	0	1

[1]Residents estimated to be 2.5 people per dwelling.

Source: HNTB analysis.

A major conclusion of this study is that comprehensive planning by the City of Tampa and Hillsborough County has served the Airport well by reducing the potential for development of non-compatible land uses. The reductions in the population level within the 65 dB DNL contour are the result of fine-tuning the existing flight track and preferential runway use measures to ensure their implementability and effectiveness under current and forecast operating conditions at the Airport.

9.3 CONTINUING PROGRAM ELEMENTS

This section outlines further suggestions for implementation of the NCP as it relates to the noise abatement measures recommended. The success of the abatement program depends on actions taken to implement and monitor the effectiveness of the measures. The following implementation and monitoring elements are recommended for inclusion in the revised NCP.

9.3.1 Operations, Noise and Complaint Monitoring

The revised NCP should include a provision for the HCAA to acquire the capabilities to monitor operations, noise, and complaints. This monitoring capability is eligible for Part 150 implementation funding.

9.4 NCP IMPLEMENTATION

Part 150 includes extensive requirements related to NCP implementation, including:

- Identification of the time period covered by the program.
- Identification of parties responsible for implementation of each program element.
- Indication that responsible parties have agreed to implement the measure.
- Schedule for implementation of the program.
- Essential government actions.
- Anticipated funding sources.

9.4.1 Time Period Covered by the Revised NCP

In the absence of unanticipated changes in forecast conditions, the revised NCP and related revised NEMs cover 5 years from the date of submission.

9.4.2 Implementation Responsibility

Part 150 requires that the NCP clearly identify the person(s) or entity(ies) responsible for implementing each recommended element.

According to the FAA's definition of implementation responsibility,[33] the Authority, as airport operator, must initiate the implementation of all noise abatement measures. Clearly, however, the FAA and pilots have key roles in the implementation of aircraft operational measures. Since the FAA is responsible for air traffic control, it must provide instructions to pilots related to preferential runway use and noise abatement flight tracks. Pilots must cooperate by following these instructions and by utilizing noise abatement cockpit procedures consistent with the safe operation of aircraft.

The Authority, counties, municipalities, and the FAA share responsibility for the implementation of land use measures. The Authority will seek assistance from county and municipal governments in the publicity and administration of land use measures. Local jurisdictions are responsible for the implementation and enforcement of land use controls. The FAA is involved in the implementation of land use measures through program approval and funding assistance.

The Authority has the lead responsibility for continuing program measures. The FAA will assist by providing funding and assisting in ongoing program review. County and municipal governments will assist in ongoing program review.

9.4.3 Indication of Agreement to Implement

As the lead agency in the implementation of all measures, the Authority clearly agrees to its responsibilities. Through the Authority staff, the consulting team members have discussed the proposed NCP elements with the FAA, aviation users, and local government representatives. They have indicated their support for the revised NCP.

9.4.4 Further Environmental Review

Federal or local regulations may require further environmental review prior to the implementation of some NCP measures. The Authority will not initiate the implementation of any measure until it, the FAA, or other responsible agency has satisfied any such requirements. It is not appropriate to initiate any such review until the FAA has completed the NCP approval process.

In particular, the FAA may approve some noise abatement measures "subject to environmental review." The FAA will determine environmental review requirements when an official FAA "action" is contemplated. In the case of the TPA NCP, the triggering FAA action would likely be the Authority's request to amend the existing ATCT Letter of Agreement.

9.4.5 Summary of Implementation Actions, Responsibilities, Costs, Funding Sources, and Schedules

Tables 9.2 through 9.4 summarize implementation details for each proposed element of the revised NCP in the noise abatement, land use, and continuing program categories, respectively.

Table 9.2

Summary of NCP Implementation Details for Proposed Noise Abatement Elements of Revised NCP

Proposed Measure	Implementation Actions and Responsible Parties	Anticipated Costs and Funding Sources	Anticipated Schedule
1. Maximize Daytime South Flow Preferential	Authority requests change in ATCT Letter of Agreement to reflect improved implementation element. FAA reviews, approves, and implements.	None	Process initiated immediately following NCP approval.
2. Preferential Order of Runway Use Adoption	Authority requests change in ATCT Letter of Agreement to reflect preferential runway use. FAA reviews, approves, and implements.	None	Process initiated immediately following NCP approval.
3. Extend Night Preference of Runway 36L Arrivals and 18R Departures to All Aircraft	Authority requests change in ATCT Letter of Agreement to reflect new night time preference to all aircraft. FAA reviews, approves, and implements.	None	Process initiated immediately following NCP approval.
4. Initial Turbojet Departure Headings	Authority requests change in ATCT Letter of Agreement to reflect existing measure. FAA reviews, approves, and implements.	None	Process initiated immediately following NCP approval.
5. Noise Abatement Propeller Aircraft Flight Paths for Runway 36L and 36R Departures	Authority requests change in ATCT Letter of Agreement to reflect minimization of turns greater than 20 degrees off Runways 36L and 36R. FAA reviews, approves, and implements.	None	Process initiated immediately following NCP approval.
6. Limit Base Legs for Runway 36L Arrivals North of MacDill AFB	Authority requests change in ATCT Letter of Agreement to reflect current measure. FAA reviews, approves, and implements.	None	Process initiated immediately following NCP approval.
7. Helipad on East Side of Airport	Continue existing measure. FAA implements.	None	Process initiated immediately following NCP approval.
8. Turbojet Use of Distant Noise Abatement Departure Procedures	Authority requests change in ATCT Letter of Agreement to reflect new turbojet procedures. FAA reviews, approves, and implements.	None	Process initiated immediately following NCP approval.
9. Turbojet Use of ATA Noise Abatement Arrival Procedures	Authority requests change in ATCT Letter of Agreement to reflect new turbojet procedures. FAA reviews, approves, and implements.	None	Process initiated immediately following NCP approval.
10. Shared Runup Enclosure for Turbojet Maintenance Runups Above Idle Power	Authority constructs runup enclosure and instructs all turbojet users to use runup enclosure for maintenance runups above idle. FAA reviews, approves, and implements.	$ 1 million - $ 3 million HCAA applies to FAA for funding support. (up to 80% eligible)	Process initiated immediately following NCP approval.
11. Amend Tower Letter to Airmen to Reflect Revised NCP	Authority requests changes in ATC Letter to Airmen to reflect the NCP revisions identified above, and to reflect the Tower's advisement regarding pilots' requests to deviate from the Informal Runway Use Program. FAA reviews, approves, and implements.	None	Process initiated immediately following NCP approval.

Table 9.3

Summary of NCP Implementation Details for Proposed Land Use Elements of Revised NCP

Proposed Measure	Implementation Actions and Responsible Parties	Anticipated Costs and Funding Sources	Anticipated Schedule
1. Zoning for Compatible Use	HCAA and Hillsborough County adopts measure and requests implementation by the County.	Administrative costs borne by local governments.	Upon County approval.
2. Overlay Zoning	HCAA adopts measure and requests implementation by Hillsborough County and Tampa City. County and City zoning regulations are revised. County and City Building departments determine noise reduction requirements for new construction.	Administrative costs borne by local governments.	Upon County approval.
3. Public Information Program	HCAA adopts measure, organizes and manages the program.	Administrative budget, local governments.	Continuing.
4. Purchase Avigation Easements	HCAA adopts measure. HCAA approves application for funding grant. HCAA staff negotiates with property owners for easement as a part of the soundproofing/climate control program.	Estimated cost: $4 million. Project would be eligible for up to 80% Federal funding under Airport Improvement Program (AIP).	Formal request to follow Authority adoption of the Part 150 Update.
5. Soundproofing/ Climate Control Program	HCAA adopts measure. Pilot program is developed to determine sound attenuation methods to be used to achieve required interior noise reductions.	Project would be eligible for up to 80% Federal funding under Airport Improvement Program (AIP).	Formal request to follow Authority adoption of the Part 150 Update.

Table 9.4

Summary of NCP Implementation Details for Proposed Continuing Program Elements of Revised NCP

Proposed Measure	Implementation Actions and Responsible Parties	Anticipated Costs and Funding Sources	Anticipated Schedule
1. Noise Abatement Office Staffing	Authority continues to implement.	Authority pays staff salary, benefits, and overhead.	Continuing.
2. Airport Noise and Operations Monitoring System	Authority continues to operate existing system until FAA approves revised NCP, then applies for FAA funding for system upgrade and expansion.	Estimated cost of $450,000 - $550,000, to cover costs for system specification, procurement, installation, testing, and staff training. HCAA applies to FAA for funding assistance (up to 80% eligible).	Continuing.
3. Periodic evaluation of noise exposure, and NEM and NCP Revision	Authority continues evaluation and review.	Authority for year-to-year evaluation, Authority and FAA fund NEM/NCP revision.	Continuing. NEM/NCP revision approximately at 5-year intervals.
4. Noise Abatement Committee	Authority continues to implement.	None.	Continuing.

Operations Monitoring

Compliance with the flight track and runway use elements of the noise abatement program could be increased if the HCAA had the capability to monitor, record, analyze, and report actual flight track geometry and runway utilization. This capability would provide the HCAA with information to use in communicating with the FAA, pilots, airlines, and other operators. It would provide a basis for determining actual compliance with measures, identifying conditions under which compliance is above or below expected levels, and suggesting actions which might improve compliance. The capability would also provide a basis for responding to citizen inquiries.

There are a number of different technical approaches available for accessing aircraft operational data. All of the systems utilize flight track and flight identification data collected by the FAA's Automated Radar Terminal Service (ARTS) system. Major operations include:

- "Passive radar" systems that monitor FAA radar tracking without any direct data transfer from the FAA.
- Systems that acquire data from the FAA on a post-processing basis, using a bulk data storage device that is compatible with the installation at the FAA TRACON facility at the Airport.
- A direct connection with the TRACON ARTS system.

Each of these systems provides information on flight track geometry, aircraft altitude, runway utilization, dates and times of operations, flight identification, flight origin and destination, navigational fixes, and other relevant information. The specific technical approach should be selected based on discussions with the FAA regarding the current and projected ARTS installation at the Airport.

Operations monitoring using a sample of ARTS data from the FAA was a major source of data used in this Part 150 Update.

Noise Monitoring

It is recommended that the monitoring system include two permanent noise monitors, one installed north of the Airport and one installed south of the Airport. It is also recommended that the system include two portable noise monitors with appropriate capabilities and accessories to allow independent, continuous monitoring for five days to a week, and software to support data processing, archiving, analysis, and reporting. The monitors could be used for the following purposes:

- To monitor trends in noise exposure at representative locations in the airport environs.
- To assess the effects of unusual airport operating conditions, such as temporary runway closures for maintenance, or the proposed test of corporate jet operations on and off the south end of Runway 18L-36R.
- To respond to citizen requests for noise measurements.
- To correlate with data collected from the operations monitoring system.

Complaint Database Software

The operations and noise monitoring software should also include capabilities to identify complainants' addresses, correlate complaints with operations and noise data, develop a database on complaints and correlated data, and prepare appropriate analyses, data summaries, and responses.

Estimated Cost of Monitoring Capabilities

The estimated cost of acquiring the operations and noise monitoring capabilities described in the preceding paragraphs is $450,000 to $550,000, including specification, acquisition, installation, and staff training, and assistance in acquisition of the capabilities (development for specifications, acceptance testing, etc.).

Continued Noise Abatement Advisory Committee

Given the comprehensive scope of the existing and recommended noise abatement measures, the anticipated testing of some procedures, and the recommended monitoring program, it would be beneficial for the HCAA to have a continuing committee to provide regular review and input. It would be most efficient to establish a single committee that is representative of the three groups formed for the Part 150 Update.

<u>Noise Office Staffing</u>

Monitoring and advisory committee functions would increase staff workload and potentially require additional staff support. It should be understood that such staffing is not eligible for FAA Part 150 funding support.

<u>Noise Compatibility Program Publicity</u>

Upon FAA approval of the revised noise abatement program, the HCAA should take steps to publicize the program. Methods for publicizing the program include:

- Revisions to on-airfield signs.
- Posters for pilot lounges or flight planning areas.
- Pilot handouts, such as flight manual inserts summarizing the preferred procedures.

These materials are eligible for FAA Part 150 funding.

9.5 NOISE COMPATIBILITY PROGRAM REVISION

The HCAA will consider the Noise Compatibility Program for revision, if it becomes necessary because of Noise Exposure Map revision.

Chapter Ten
Consultation with Public, Users, and Outside Agencies

The TPA Part 150 Study Update was conducted with extensive consultation with all members of the airport "public," including aviation interests, potentially affected residents of the Airport environs, and local, State, and Federal officials. The public involvement process exceeded Part 150 requirements.

The Airport Authority and its consultants used the following seven principal mechanisms in pursuing public input:

- The Agency Working Group (AWG), including written background material and formal briefings at committee meetings.
- The Technical Working Group (TWG), including written background material and formal briefings at committee meetings.
- The Community Input Group (CIG), including written background material and formal briefings at committee meetings.
- Public information workshops, including newspaper advertisements and direct mailings to potentially interested groups and individuals.
- Distribution of *Horizon 2020* Newsletter.
- Briefings of various public, quasi-public, and private boards.
- A public hearing.

10.1 WORKING GROUPS

The HCAA established three Advisory Groups to oversee the simultaneous Part 150 and Master Plan Update studies: an AWG, TWG, and CIG.

These Working Groups included representatives from a broad spectrum of entities with interest in the Part 150 process and its products. The AWG includes government agencies with aviation and land use responsibilities. The TWG includes private sector interests, particularly in the aviation industry. The CIG includes representatives of the affected communities in the Airport environs. **Appendix B** lists the invited working group memberships.

The Working Group members were responsible for representing their constituents throughout the study process by commenting on the adequacy and accuracy of collected data, simplifying assumptions, and performing technical analyses. The Working Groups also served as a forum in which the varied interest groups could discuss complex issues and share their perspectives on the use of the airport facilities and aircraft noise issues.

The Working Groups met six times during the course of the study process. All facets of the Master Plan/Part 150 process were discussed with these groups. The membership was encouraged to offer feedback and input on the progress to date either at these formal meetings or at a later date with the appropriate staff member. **Table 10.1** lists the dates of the Working Group meetings. **Appendix G** contains the meeting summaries for these Working Groups.

10.2 PUBLIC INFORMATION WORKSHOPS

The study team conducted two public workshops during the Master Plan/Part 150 update, as shown in **Table 10.2**.

The HCAA went to great lengths to invite potentially interested residents to the public workshops. Prior to each meeting, 1,000 invitation postcards were sent via direct mail, and a display-type ad was run in the metro section of two local newspapers. **Appendix H** contains copies of these invitations, sign-in sheets, and the meeting summaries.

Horizon 2020 Newsletter

A project newsletter was developed entitled "Horizon 2020 – Commitment to Excellence: Taking TPA Into the 21st Century." Five issues were developed and distributed, informing the general public as well as those already participating in the Master Plan/Part 150 Update about the study's progress and informing about upcoming meetings. **Appendix I** contains copies of all the newsletters developed.

Table 10.1

Schedule of Working Group Meetings

Group	Date	Time
AGENCY WORKING	#1 August 11, 1997	1 p.m.
	#2 March 3, 1998	1 p.m.
	#3 July 20, 1998	2 p.m.
	#4 September 9, 1998	
	#5 December 1, 1998	1 p.m.
	#6 August 31, 1999	
TECHNICAL WORKING	#1 August 11, 1997	1 p.m.
	#2 March 3, 1998	1 p.m.
	#3 July 20, 1998	2 p.m.
	#4 September 9, 1998	
	#5 December 1, 1998	1 p.m.
	#6 August 31, 1999	
COMMUNITY INPUT	#1 August 11, 1997	1 p.m.
	#2 March 3, 1998	1 p.m.
	#3 July 20, 1998	2 p.m.
	#4 September 9, 1998	
	#5 December 1, 1998	1 p.m.
	#6 August 31, 1999	

Table 10.2

Schedule of Public Workshops/Hearings

Event	Date	Time	Location
Public Workshop #1	October 22, 1998	6-8 p.m.	Higgins Hall at St. Lawrence Parish
Public Workshop #2	September 1, 1999	6-8 p.m.	Jefferson High School
Public Hearing (FAR Part 150)	December 16, 1999	6-8 p.m.	Higgins Hall at St. Lawrence Parish

10.3 EXPERT PANEL FORECAST SESSION

An "expert panel" session was held in order to have a group of local and industry "experts" review and discuss historic airport activity, the regional economy, and the industry trends; to agree on the assumptions and methodologies that will be used for the master plan forecast effort; and to ensure that the master plan forecasts are both credible and usable. The panel consisted of Authority staff, local business and aviation industry representatives, and Master Plan Team Members. **Appendix J** contains the list of expert panel participants.

10.4 PART 150 PUBLIC HEARING

A final public hearing on the Part 150 update was held on December 16, 1999. The meeting was held at Higgins Hall at St. Lawrence Parish (5225 Himes Avenue). **Appendix K** provides copies of materials used to provide notice of the meeting, including: (1) newspaper advertisements and (2) a postcard notice that was mailed to approximately 2000 individuals and organizations, public officials, working and input group members, and other interested parties. In addition, the fifth issue of the "Horizon 2020" project newsletter included an announcement of the meeting. A copy of that newsletter is included in Appendix I. With the other issues. The newsletter was mailed to 500 interested parties.

Approximately 49 individuals attended the meeting.

The meeting was conducted in a varied format, to meet all attendees' needs and interests. From approximately 6 t o7 p.m., the meeting was conducted in workshop format, with numerous staffed "stations" providing information on all aspects of the study. That portion of the meeting provided attendees with the opportunity to discuss issues of concern on a one-on-one basis with HCAA and consulting team staff. At 7 p.m., the meeting shifted to a formal presentation made by HCAA and consulting team staff. At the end of the presentation, the HCAA and consulting staff field questions from the audience. Appendix K presents a summary of the questions and responses.

Attendees at the meeting were also provided with forms to use in submitting written comments, either at the meeting or mailed in later. Appendix K includes copies. The comments and responses to technical issues can be summarized as follow:

1. Comments from Ms. Evelyn Bless, 5803 Myrtle Lane, Tampa

Ms. Bless observed that there were increased number of planes over her house from dawn to late at night, seven days a week. Planes frequently fly low enough to drown out conversation. There does not seem to have been abatement, to the contrary, noise has increased in the last couple of years.

Ms. Bless requested responses to two questions:

a) Why can't TIA disperse flight patterns to spread the traffic out more over North Tampa neighborhoods. Response: Ms. Bless lives to the north of the airport. Several of the recommended noise abatement measures will directly address her concerns, including improvements in the daytime preferential runway program implementation, the extension of the nighttime preferential runway program to all aircraft types, and the reduction in the frequency of turns greater than 20° by turbopropellor aircraft departing on runways 36L and 36R.

b) She requested noise monitoring. Response: Noise and operations monitoring are a study recommendation.

2. Comments from Ms. Teresa W. McDaniel, 5834 Mariner Street, Tampa

Ms. McDaniel notes that she lives immediately south of the airport, where noise from takeoff and landing is high. The most annoying flights are between 10 p.m. and 6 a.m., particularly larger cargo aircraft in the middle of the night. Ms. McDaniel requested that her whole street be considered for eligibility for sound insulation. Response: The recommended sound insulation program as presented in this document, proposes eligibility for her whole street.

3. Comments from Dr. Luis A. Gutierrez, 24 Sandpiper Road, Tampa

Dr. Gutierrez notes that noise levels are very high at his home, interrupting conversation and making windows rattle. He notes that his previous complaints have been ignored. He is concerned that future increases in airport activity and aircraft size will make his home unlivable and less valuable. Response: The recommended NCP includes provision for Noise Exposure Map and Noise Compatibility program revision, to take into account future changes.

4. Comments from Ms. Elia Gutierrez, 24 Sandpiper Road, Tampa

Ms. Gutierrez suggests the following:

a) Rather than increasing south flow, divide the traffic up in all directions. Response: The preferential runway analysis considered both north and south flow preferential. The analysis presented in Appendix F clearly shows that south flow affects significantly fewer residents (on the order of one-tenth as many within the contours).

b) Ms. Gutierrez recommends runway extensions, to allow aircraft to be as high as possible when passing over residential areas. Response: There is insufficient land area at TPA to permit extensions that would provide noticeable reduction.

c) She notes that her sliding glass door is cracked. She will not consider sound insulation at this time, because she does not know what effect the easement requirement would have. Response: Ms. Gutierrez is not in the area eligible for sound insulation.

5. Comments from George and Deborah Christen-Domedion, 5820 Mariner Street, Tampa

The Christen-Domedions cited problems including "hearing loss", "have to stop conversations", "difficulty in selling a home", "difficulty sleeping (planes keep coming later at night, earlier in the morning, and more frequently all day)", and "reluctant to entertain".

They offered two suggestions:

a) "Build a new runway to the west to keep planes over the water."

b) "Land more often from the north."

Response: The Part 150 Update recognizes that Mariner Street is one of the most highly noise impacted areas in the airport environs. The NCP recommends offering sound insulation to the entire street. With regard to the two proposals:

1) The Master Plan continues to include a new western runway, to be constructed when traffic requires.

2) South flow (land from the north) is the preferred flow during the daytime, for noise abatement reasons. However, the nighttime preferential runway use assigns highest priority to arrivals and departures over Mariner Street, as that practice essentially eliminates close-in overflight of all other areas. This runway use procedure is one of the major reasons for offering sound insulation in the neighborhood.

10.5 WRITTEN COMMENTS AND RESPONSES

Appendix L provides copies of written comments that have been received during the Part 150 study process (with the exception of comment sheets handed in during the public workshop, as summarized in Section 10.4). Appendix L also provides copies of the responses that the HCAA or consulting team staff provided to the copies of written correspondence related to the Part 150 Update received from the public and copies of the responses from HCAA and the consultant.

- Comments regarding restricted turbojet use of the east parallel, submitted by three corporate representatives (Mr. James Biggs, Dillards Department Stores; Mr. Richard Houghton, Havatampa; and Mr. Mark Wagner, Havatampa). A written response is included from Ted Baldwin of HMMH, on behalf of the HCAA and the consulting team. As he notes in his letter, the recommended Noise Compatibility Program includes provision for a potential future test of the pilots' proposal that they be allowed to depart on Runway 18L, if they are able to make sharp enough and early enough turns to follow the departure flight track for Runway 18R.

- A letter from Mr. Peter R. Cunzolo, Vice President, Director of Operations, ExecJet, and a response from Mr. Louis E. Miller, Executive Director of the HCAA. Mr. Cunzolo asks about the same issue as the preceding three pilots. The same response applies - the potential test of departures on Runway 18L will accommodate his interests.

- A letter from Ms. Janice O'Brien, 6017 West North Street, Tampa, and a response from Mr. Louis E. Miller, Executive Director, HCAA. Ms. O'Brien notes that there are aircraft turning over her house (to the northwest of the airport) at low altitudes. Mr. Miller notes that the noise abatement flight paths for turbojet aircraft (straight out until reaching at least 3,000 feet) and the recommended minimization of turns by turbopropellor departing on Runways 36L and 36R address her concerns. He also notes that the recommended monitoring system included in the Noise Compatibility Program will provide the HCAA with a means to monitor these flight path procedures, and work with the FAA and operators to improve compliance. In addition, the improved implementation of the day south flow preferential, and the extension of the night bidirectional runway use will benefit her.

- A letter from Ms. Melissa B. Rogers, 5810 Mariner Street, Tampa, and response from Mr. Louis E. Miller, Executive Director, HCAA. Ms. Rogers requests expansion of the sound insulation program to her entire street, and notes that she has already spent money to install new windows. The recommended sound insulation program as presented in this document, proposes eligibility for her whole street. Her home will be considered for additional treatment to the extent that the existing windows do not provide sufficient noise reduction.

NOTES

1 14 CFR Part 150

2 Noise Exposure Map Checklist, Part II, Section III("Noise Exposure Maps – General Requirements", paragraph B (Federal Aviation Administration, 1989, page 3). This portion of the NEM checklist narrative clarifies the FAA's interpretation of Part 150 § 150.21 requirements.

3 Ibid.

4 Mathematically, SEL is expressed by the following equation:

$$SEL = 10\log\int_{t_1}^{t_2} 10^{[SPL(t)/10]}\,dt$$

Where t_1 is the start of the event, t_2 is the end of the event, and L(t) is the time varying A-weighted sound level between t_1 and t_2.

5 Op. Cit., EPA Report No. 550/9-74-004, March 1974.

6 Wyle Labs, "Study of Soundproofing Public Buildings Near Airports", FAA Report No. DOT-FAA-AEQ-77-9, April 1977.

7 Op. Cit., EPA Report No. 550/9-74-004, March 1974.

8 Newman S.J., and Beattie, K.R., "Aviation Noise Effects", FAA Report No. FAA-EE-85-2, March 1985.

9 Schultz, T.J., "Synthesis of Social Surveys on Noise Annoyance", Journal of the Acoustical Society of America, Vol. 64, No. 2, August 1978.

10 Since the UF employment counts do not include farm workers or non-wage and salary workers, they are not strictly comparable with the BEA counts. Therefore, the BEA projections were adjusted downward, using the 1994 UF to BEA ratio to make the two sets of projections more comparable.

11 Newman, J. Steven; Rickley, Edward J.; and Bland, Tyrone J.; Helicopter Noise Exposure Curves for Use in Environmental Impact Assessment; (Report No. DOT-FAA-EE-82-16); U. S. Department of Transportation, Federal Aviation Administration, Office of Environment and Energy; Washington, DC; November 1982.

12 Additional ARTS data were obtained for July 1997 during a period when the west parallel was closed for repairs. The data from that period were not used in this analysis because of the unusual operating conditions.

13 Chapter Two, Table 2.1 of the Federal Aviation Regulation Part 150.

14HNTB Corporation, "Tampa International Airport Compatibility Study: FAR Part 150 Submittals.," pages III-1 through III-3.

15"Tampa Air Traffic Control Tower Letter to Airmen No. 98-05: Informal Runway Use Program," issued July 1, 1998, effective August 1, 1998, cancellation August 1, 2000, Department of Transportation, Federal Aviation Administration, Air Traffic Control Tower, Tampa International Airport, Tampa, Florida, 33607.

16There is no requirement that the NCP include all noise abatement measures; measures can be implemented outside of the NCP. Adding existing measures to the NCP subjects them to FAA review that could jeopardize continuing implementation. This is particularly true in the case of use restrictions, which are not a current issue at TPA. It is unlikely that adding the nighttime runway use priority or the noise abatement flight tracks to the NCP would jeopardize their continuing implementation by the FAA.

17 Paragraph 3 of the Letter sets forth "operational safety criteria" that the ATCT shall use in assigning runways, "whenever possible." See Attachment 2.

18 FAA Order 8400.9, "National Safety and Operational Criteria for Runway Use Programs."

19 ARTS data on over 10,000 additional operations were also obtained for approximately 14 days in July 1997, when the east parallel was closed for rehabilitation. Those data were not used for runway use analysis purposes because of the unusual airfield conditions.

20 Paragraph 4 of the Letter sets forth "operational safety criteria" that the ATCT shall use in assigning runways, "whenever possible." See Appendix D.

21 There is no reason to separate the July data in this case because closure of the west parallel increased departures on 36R, but did not put operations on runways where turbojet operations are restricted in any fashion.

22 The glide slope instrumentation also assumes a 50' crossing height at the landing threshold.

23 FAA Order 8400.9, "National Safety and Operational Criteria for Runway Use Programs."

NOTES

24 Census data were used to calculate these population statistics. This method is less precise than the parcel-by-parcel counting technique used in developing the updated NEM earlier in this study. However, this technique is appropriate for this level of analysis.

25 ARTS data on over 10,000 additional operations were also obtained for approximately 14 days in July 1997 when the west parallel was closed for rehabilitation. Those data were not used for runway use analysis purposes because of the unusual airfield conditions.

26This gradient is defined in FAR 25.111(c)3.

27 All of these nighttime runups were between midnight and 7 a.m.

28 The study also looked at fully enclosed (roofed) "hush houses." Those facilities had extremely high costs, ranging from approximately $10 to 18 million.

29 The base mapping available to HNTB does not extend throughout the full area affected by these contours.

30 FAA standard procedure is to assign runway heading in the south flow. Actual turns are rarely greater than 10 degree.

31 As shown in the first round analysis, the 3-degree slope represented the "floor" for actual turbojet operations at TPA.

32 Section 9.4.4 discusses environmental review steps that FAA must also consider.

33 As set forth in FAA Advisory Circular (AC) 150/5020-1, "Noise Control and Compatibility Planning for Airports", August 5, 1982.

APPENDIX A

Part 150 NEM and NCP Checklists

Table A.1

Part 150 Noise Exposure Map Checklist (page 1 of 5)
Source: Federal Aviation Administration, 1989

FAR PART 150 NOISE EXPOSURE MAP CHECKLIST–PART I			
Airport Name: Tampa International Airport	REVIEWER:		
	Yes/No/NA	Page/Other Reference	Notes/ Comments
I. IDENTIFICATION AND SUBMISSION OF MAP DOCUMENT			
A. Is this submittal appropriately identified as one of the following, submitted under Part 150:			
1. a NEM only	No		
2. a NEM and NCP	Yes	Sponsor Certification	
3. a revision to NEMs which 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	1-1	
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	Letter of Transmittal	
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	Chapter 10	
B. Identification:			
1. Are the consulted parties identified?	Yes	Chapter 10	
2. Do they include all those required by 150.21(b) and 150.105(a)?	Yes	Chapter 10	
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	Certification follows Title page, Chapter 10 provides consultation	
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	Chapter 10	Comments were not on FAR Part 150 documentation

Table A.1

Part 150 Noise Exposure Map Checklist (page 2 of 5)
Source: Federal Aviation Administration, 1989

FAR PART 150 NOISE EXPOSURE MAP CHECKLIST—PART I			
Airport Name: Tampa International Airport	REVIEWER:		
	Yes/No/NA	Page/Other Reference	Notes/ Comments
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	Chapter 6	
B. Map currency:			
1. Does the existing condition map year match the year on the airport operator's submittal letter?	Yes	Section 1.1.1	
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	Section 4.3	
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 condition and 5-year forecast conditions as of the date of submission?			
C. If the NEM and NCP are submitted together:			
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?	Yes	Chapter 6	With Program
2. If the 5-year map is based on program implementation:			
a. are the specific program measures which are reflected on the map identified?	Yes	Chapter 7	
b. does the documentation specifically describe how these measures affect land use compatibility's depicted on the map?	Yes	Chapter 8	
3. If the 5-year NEM does not incorporate program implementation, has the airport operator included an additional NEM for FAA determination after the program is approved which shows program implementation conditions and which is intended to replace the 5-year NEM as the new official 5-year map?	Yes	Chapter 6	

Table A.1

Part 150 Noise Exposure Map Checklist (page 3 of 5)
Source: Federal Aviation Administration, 1989

FAR PART 150 NOISE EXPOSURE MAP CHECKLIST–PART I			
Airport Name: Tampa International Airport	REVIEWER:		
	Yes/No/NA	Page/Other Reference	Notes/ Comments
IV. MAP SCALE, GRAPHICS, AND DATA REQUIREMENTS: [A150.101, A150.103, A150.105, 150.21(A)]			
A. Are the maps of sufficient scale to be clear and readable (they must be not be less than 1" to 8,000'), and is the scale indicated on the maps?	Yes	Figures 6-1 through 6-4	1" + 4,000'
B. Is the quality of the graphics such that required information is clear and readable?	Yes		
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	Figures 6-1 through 6-4	
a. airport boundaries	Yes	Figures 6-1 through 6-4	
b. runway configurations with runway and numbers	Yes	Figures 6-1 through 6-4	
2. Does the depiction of the off-airport data include:			
a. a land use base map depicting streets and other identifiable geographic features	Yes	Figures 6-1 through 6-4	
b. area within 65 L_{dn} (or beyond. at local discretion.)	Yes	Figures 6-1 through 6-4	Beyond DNL 60
c. clear delineation of geographic boundaries and the names of all jurisdictions with planning and land use control authority within the 65 L_{dn} (or beyond, at local discretion).	Yes	Figures 6-1 through 6-4	
D. 1. Continuous contours for at least L_{dn} 65, 70, and 75?	Yes	Figures 6-1 through 6-4	
2. Based on current airport and operational data for the existing condition year NEM, and forecast data for the 5-year NEM?	Yes	Section 4.3	
E. Flight tracks for the existing condition and 5-year forecast timeframes (these may be on supplemental graphics which must use the same land use base map as the existing condition and 5-year NEM), which are numbered to correspond to accompanying narrative?	Yes	Chapter 7	
F. Locations of any noise monitoring sties (these may be on supplemental graphics which must use the same land use base map as the official NEMs)	Yes	Figure 3-1	Monitored locations more clearly depicted on street map

Table A.1

Part 150 Noise Exposure Map Checklist (page 4 of 5)
Source: Federal Aviation Administration, 1989

FAR PART 150 NOISE EXPOSURE MAP CHECKLIST--PART I			
Airport Name: Tampa International Airport	REVIEWER:		
	Yes/No/NA	Page/Other Reference	Notes/ Comments
G. Noncompatible land use identification:			
1. Are noncompatible land uses within at least the 65 L_{dn} depicted on the maps?	Yes	Figures 6-1 through 6-4	
2. Are noise sensitive public buildings identified?	NA		
3. Are the noncompatible uses and noise sensitive public buildings readily identifiable and explained on the map legend?	NA		
4. Are compatible land uses, which would normally be considered noncompatible, explained in the accompanying narrative?	NA		
V. NARRATIVE SUPPORT OF MAP DATA: [150.21(A), A150.1, A150.101, A150.103]			
A. 1. Are the technical data, including data sources, on which the NEMs are based, adequately described in the narrative?	Yes	Chapters 2 and 4	
2. Are the underlying technical data and planning assumptions reasonable?	Yes	Chapters 2 and 4	
B. Calculation of Noise Contours:			
1. Is the methodology indicated?			
a. is it FAA approved?	Yes		INM
b. was the same model used for both maps?	Yes		INM 5.1a
c. has AEE approval been obtained for use of a model other than those which have previous blanket FAA approval?	NA		
2. Correct use of noise models:			
a. does the documentation indicate the airport operator has adjusted or calibrated FAA-approved noise models or substituted one aircraft type for another?	NA		
b. if so, does this have written approval from AEE?	NA		
3. If noise monitoring was used, does the narrative indicate that Part 150 guidelines were followed?	NA		Noise monitoring verified output

Table A.1

Part 150 Noise Exposure Map Checklist (page 5 of 5)
Source: Federal Aviation Administration, 1989

FAR PART 150 NOISE EXPOSURE MAP CHECKLIST–PART I			
Airport Name: Tampa International Airport	REVIEWER:		
	Yes/No/NA	Page/Other Reference	Notes/ Comments
4. For noise contours below 65 L_{dn}, does the supporting documentation include explanation of local reasons? (Narrative explanation is desirable but not required.)	Yes	Chapter 5	
C. Noncompatible Land Use Information:			
1. Does the narrative give estimates of the number of people residing in each of the contours (L_{dn} 65, 70 and 75, at a minimum) for both the existing condition and 5-year maps?	Yes	Tables 5.1 and 5.2	
2. Does the documentation indicate whether Table 1 of Part 150 was used by the airport operator?	Yes	Table 2.1	
a. If a local variation to Table 1 was used:			
(1) does the narrative clearly indicated which adjustments were made and the local reasons for doing so?	NA		
(2) does the narrative include the airport operator's complete substitution for Table 1?	NA		
3. Does the narrative include information on self-generated or ambient noise where compatible/ noncompatible land use identifications consider non-airport/aircraft sources?	NA		
4. Where normally noncompatible land uses are not depicted as such on the NEMs, does the narrative satisfactorily explain why, with reference to the specific geographic areas?	NA		
5. Does the narrative describe how forecasts will affect land use compatibility?	Yes	Chapter 8	
VI. MAP CERTIFICATIONS: [150.21(B), 150.21(E)]			
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?	Yes	Certification following Title page	
B. Has the operator certified in writing that each map and description of consultation and opportunity for public comment are true and complete?	Yes	Certification following Title Page	

Table A.2

Part 150 Noise Compatibility Program Checklist (page 1 of 5)
Source: Federal Aviation Administration, 1989

FAR PART 150 NOISE COMPATIBILITY PROGRAM CHECKLIST–PART I			
Airport Name: Tampa International Airport	REVIEWER:		
	Yes/No/NA	Page/Other Reference	Notes/ Comments
I. IDENTIFICATION and SUBMISSION of PROGRAM:			
A. Submission is properly identified:			
1. FAR 150 NCP?	No		
2. NEM and NCP together?	Yes		
3. Program Revision?	Yes		
B. Airport and Airport Operator's name identified?	Yes	1-1	
C. NCP transmitted by airport operator's cover letter?	Yes		
I. CONSULTATION: [150.23]			
A. Documentation includes narrative of public participation and consultation process?	Yes	Chapter 10	
B. Identification of consulted parties:			
1. all parties in 150.23(c) consulted?	Yes	Chapter 10	
2. public and planning agencies identified?	Yes	Appendix B	
3. agencies in 2., above, correspond to those indicated on the NEM?	Yes	NCP and NEM combined effort	
C. Satisfies 150.23(d) requirements:			
1. documentation shows active and direct participation of parties in B., above?	Yes	Chapter 10 and Appendix B	
2. active and direct participation of general public?	Yes	Chapter 10	
3. participation was prior to and during development of NCP and prior to submittal to FAA?	Yes	Chapter 10	Public Information meetings and TAC meetings
4. indicates adequate opportunity afforded to submit views, data, etc.?	Yes	Public Information meetings	
D. Evidence included of notice and opportunity for a public hearing on NCP?	Yes	Chapter 10	

Table A.2

Part 150 Noise Compatibility Program Checklist (page 2 of 5)
Source: Federal Aviation Administration, 1989

FAR PART 150 NOISE COMPATIBILITY PROGRAM CHECKLIST–PART I			
Airport Name: Tampa International Airport	REVIEWER:		
	Yes/No/NA	Page/Other Reference	Notes/ Comments
E. Documentation of comments:			
1. includes summary of public hearing comments, if hearing was held?	Yes	Chapter 10	
2. includes copy of all written material submitted to operator?	Yes	Chapter 10, Appendix L	
3. includes operator's response/disposition of written and verbal comments?	Yes	Chapter 10	
F. Informal agreement received from FAA on flight procedures?	Yes	Appendix D	"Letter To Airmen"
III. NOISE EXPOSURE MAPS: [150.23, B150.3; 150.35(f)] (This section of the checklist is not a substitute for the Noise Exposure Map checklist. It deals with maps in the context of the Noise Compatibility Program submission.)			
A. Inclusion of NEMs and supporting documentation:			
1. Map documentation either included or incorporated by reference?	Yes	Chapter 6	
2. Maps previously found in compliance by FAA?	NA		NEM submitted with NCP
3. Compliance determination still valid?	NA		
4. Does 180-day period have to wait for map compliance finding?	Yes		
B. Revised NEMs submitted with program: (Review using NEM checklist if map revisions included in NCP submittal)			
1. Revised NEMs included with program?	Yes	Chapter 6	
2. Has airport operator requested FAA to make a determination on the NEM(s) when NCP approval is made?	Yes		

Table A.2

Part 150 Noise Compatibility Program Checklist (page 3 of 5)
Source: Federal Aviation Administration, 1989

FAR PART 150 NOISE COMPATIBILITY PROGRAM CHECKLIST–PART I			
Airport Name: Tampa International Airport	REVIEWER:		
	Yes/No/NA	Page/Other Reference	Notes/ Comments
C. If program analysis uses noise modeling:			
1. INM, HNM or FAA-approved equivalent?	Yes	Section 4.3	INM
2. Monitoring in accordance with A150.5?	Yes	Section 4.4	ENOMS
D. Existing condition and 5-year maps clearly identified as the official NEMs?	Yes	Figures 6-1 through 6-4	
IV. CONSIDERATION of ALTERNATIVES: [B150.7, 150.23(e)]			
A. At a minimum, are the alternatives below considered?			
1. land acquisition and interests therein, including air rights, easements, and development rights?	Yes	Section 8.4	
2. barriers, acoustical shielding, public building soundproofing	NA		
3. preferential runway system	Yes	Chapter 7	
4. flight procedures	Yes	Chapter 7	
5. restrictions on type/class of aircraft (at least one restriction below must be checked): a. deny use based on Federal standards b. capacity limits based on noisiness c. noise abatement takeoff/approach procedures d. landing fees based on noise or time of day e. nighttime restrictions	 Yes No Yes No Yes	Chapters 7 and 8	
B. Responsible implementing authority identified for each considered alternative?	Yes	Chapter 9	
C. Analysis of alternative measures:			
1. measures clearly described?	Yes	Chapters 7 and 8	
2. measures adequately analyzed?	Yes	Chapters 7 and 8	
3. adequate reasoning for rejecting alternatives?	Yes	Chapters 7 and 8	
D. Other actions recommended by the FAA?	NA		

Table A.2

Part 150 Noise Compatibility Program Checklist (page 4 of 5)
Source: Federal Aviation Administration, 1989

FAR PART 150 NOISE COMPATIBILITY PROGRAM CHECKLIST–PART I			
Airport Name: Tampa International Airport	REVIEWER:		
	Yes/No/NA	Page/Other Reference	Notes/ Comments
V. ALTERNATIVES RECOMMENDED for IMPLEMENTATION: [150.23(e), B150.7(c); 150.35(b), B150.5]			
A. Document clearly indicates:			
1. alternatives recommended for implementation?	Yes	Chapter 9	
2. final recommendations are airport operator's, not those of consultant or third party?	Yes	Certification following Title page	
B. Do all program recommendations :			
1. relate directly or indirectly to reduction of noise and noncompatible land uses?	Yes		
2. contain description of contribution to overall effectiveness of program?	Yes	Section 9.2	
3. noise/land use benefits quantified to extent possible?	Yes	Chapter 9	
4. include actual/anticipated effect on reducing noise exposure within noncompatible areas shown on NEM?	Yes	Figures 6-2 and 6-4.	
5. effects based on relevant and reasonable expressed assumptions?	Yes	Section 4.3, Chapters 7 and 8	
6. have adequate supporting data to support its contribution to the noise/land use compatibility?	Yes	Chapters 3-9	
C. Analysis appears to support program standards set forth in 150.35(b) and B150.5?	Yes	Chapters 7-9	
D When use restrictions are recommended:			
1. Are alternatives with potentially significant noise/compatible land use benefits thoroughly analyzed so that appropriate comparisons and conclusions can be made?	Yes	Section 7.4	
2. use restrictions coordinated with APP-600 prior to making determination on start of 180-days?	Yes		TAC meetings

Table A.2

Part 150 Noise Compatibility Program Checklist (page 5 of 5)
Source: Federal Aviation Administration, 1989

FAR PART 150 NOISE COMPATIBILITY PROGRAM CHECKLIST--PART 1			
Airport Name: Tampa International Airport	REVIEWER:		
	Yes/No/NA	Page/Other Reference	Notes/ Comments
E Do the following also meet Part 150 analytical standards?:			
1. formal recommendations which continue existing practices?	Yes	Sections 9.1.1 and 9.1.2	
2. new recommendations or changes proposed at end of Part 150 process?		Sections 9.1.1, 9.1.2 and 9.1.3	
F Documentation indicates how recommendations may change previously adopted plans?	Yes	Sections 9.1.1, 9.1.2 and 9.1.3	
G. Documentation also:			
1. identifies agencies which are responsible for implementing each recommendation?	Yes	Section 9.1.3	
2. indicates whether those agencies have agreed to implement?			
3. indicates essential government actions necessary to implement recommendations?	Yes	Section 9.1.3	
H. Time frame:			
1. includes agreed-upon schedule to implement alternatives?	Yes	Tables 9.2, 9.3 and 9.4	
2. indicates period covered by the program?	Yes	Section 9.3.1	
I. Funding/Costs:			
1. includes costs to implement alternatives?	Yes	Tables 9.2, 9.3 and 9.4	
2. includes anticipated funding sources?	Yes	Tables 9.2, 9.3 and 9.4	
VI. PROGRAM REVISION: [150.23(e)(9)] Supporting documentation includes provision for revision?	Yes	Chapter 9	

APPENDIX B

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Tampa International Airport
Master Plan Update / Part 150 Study

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Tampa International Airport
Master Plan Update / Part 150 Study

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Tampa International Airport
Master Plan Update / Part 150 Study

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876-0674

Carver City/Lincoln Gardens
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Grove Park Civic Association
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Carrollwood Oaks Property Owners Assn.
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Burnbrook Homeowners Association
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APPENDIX C

INM Aircraft Substitution Information

FEDERAL AVIATION ADMINISTRATION
OFFICE OF ENVIRONMENT AND ENERGY
800 INDEPENDENCE AVENUE, SW
WASHINGTON, DC 20591

FACSIMILE TRANSMISSION

FACSIMILE NUMBER (202) 267-5594

From :	Steve Vahovich
Date :	Mar 16 1998, 09:26 AM
Voice Number :	

Name : Kate Larson
Voice Number :
Fax Number : 9,1,781-229-7939
Subject :
cc : Kate Larson
Fax Number : 9,1,781-229-7939

Note : I think this is the list you requested. If not please call me (202-267-3559). Thanks!

HMMH aircraft are listed on top line & recommended INM sub. below it:

Aircraft	Engine	MTOW(Klbs)	Thrust/Eng.(Klbs)
HMMH: B737-600	CFM56-7B	143.5	22
INM(#36): 7373B2 (narrow body)	2 eng. Turboprop CFM56-3B-2	139	20
HMMH: B767-400	PW4000/CF6-80	450	NA
INM(#87): 767300 (wide body)	2 eng. Turboprop PW4060	407	60
HMMH: A-319	CFM56-5A4/IAE V2522	150	23
INM(#97): A320 (wide body)	2 eng. Turbofan CFM56-5A-1	162	25
HMMH: Ayres Loadmaster	2 eng. turboprop Allison CTP-800	19	2,400 HP
INM(#68): SD330	2 eng Turboprop PT6A-45AR	22.9	1,254 HP
*HMMH: EMB 145	AE3007A	7	43
*INM(# 61) CL601	2 eng. Turbofan CF34-3A	9.2	43
HMMH: EMB 135	small ver. of 145		
INM(#58): CL600	2 eng. Turbofan ALF502L	7.5	36

* Currently in INM SUB list

APPENDIX D

Tampa Air Traffic Control Tower Letter to Airmen No. 98-05, "Informal Runway Use Program"

DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration
Air Traffic Control Tower
Tampa International Airport
Tampa, Florida 33607

ISSUED: July 1, 1998

EFFECTIVE: August 1, 1998

TAMPA AIR TRAFFIC CONTROL TOWER LETTER TO AIRMEN No. 98-05

SUBJECT: Informal Runway Use Program

CANCELLATION: August 1, 2000

This Letter to Airmen cancels Letter to Airmen 96-06 and restates the runway use program which has been in effect at Tampa International Airport for many years. The program was developed in the public interest, designed to enhance noise abatement efforts with regard to airport communities, and applies to all arriving and departing turbojet operations.

Pilots requesting to use a runway other than the active are expected to advise the control tower. These requests will be honored; however, the Tower will advise that the requested runway is a deviation from the Noise Abatement Runway Use Program and will advise of any expected delay. These deviations from the Informal Runway Use Program will be noted in the Facility Record of Operations (FAA 7230-4).

1. **RUNWAY USE IN ORDER OF PRIORITY FROM 6:00 a.m. to 12:00 Midnight**

   a. South Operation -- Arrive 18L/18R

      (1) Depart 18R (2) Depart 18L

   b. North Operation -- Depart 36L/36R

      (1) Arrive 36L (2) Arrive 36R

   c. East/West Operation -- Arrive/Depart 9/27

2. **RUNWAY USE PRIORITY FROM 12:00 Midnight to 6:00 a.m.**

When traffic, wind, weather, and field conditions permit, and no delays to arrivals or departures will result, Tower will use Runway 18R for turbojet departures and Runway 36L for turbojet arrivals. If conditions do not permit, then runways will be assigned as defined in Paragraph 1.

3. **NOISE-SENSITIVE AREA**. Between the hours of 11:00 p.m. and 6:00 a.m., when traffic conditions permit, turbojet arrivals to Runway 36L shall be vectored to avoid the Interbay Area (peninsula south of Runway 36R).

4. **OPERATIONAL SAFETY CRITERIA**. Whenever possible, Tower will assign runways based on the Runway Use Priorities stated above and will apply the following criteria:

a. There should be no significant wind shear or thunderstorms affecting the use of the assigned runway.

b. A runway of lower-use priority may be assigned as follows:

(1) For landing, when the reported visibility is less than one statute mile, or the runway visual range for the higher priority is less than 5,000 feet.

(2) When braking action is reported less than good, or if reports are received of hydro-planing or unusually slippery runway surfaces.

c. Maximum Crosswind Component (including Gust Values) -- Tailwind Component.

(1) Clear and dry runway, 20 KTS crosswind - 5 KTS tailwind.

(2) Runways not clear and dry, 15 KTS crosswind - No tailwind; except for the nominal range of wind reported as calm (less than 3 KTS).

5. **INITIAL DEPARTURE TRACKS.** (Headings will be assigned to insure aircraft remain on the designated tracks. Do not expect turns from initial headings until the aircraft has reached 3,000 feet, unless operationally required.)

a. Runways 36L or 36R -- track 360.

b. Runway 18R -- track 200.

c. Runway 18L -- track 210.

d. Runway 27 -- track 270.

e. Runway 9 -- track 090.

John W Stewart, Jr.
John W Stewart, Jr.
Air Traffic Manager
Tampa Tower

APPENDIX E

Operational Flow Sensitivity Analysis

A sensitivity analysis was performed to better understand noise levels associated with north and south-flow conditions experienced at TPA. These one-direction flow contours are presented for a number of reasons, including: (1) they provide a basis for understanding the potential day-to-day differences in noise levels resulting from variations in runway use, (2) they provide a basis for understanding the effects of preferential runway use as an introduction to the noise abatement planning phase of the study, and (3) the north-flow contours provide a basis for comparing modeled DNL to the values measured during the field measurements on October 14-21, 1997. Results of the noise monitoring measurement averaged DNL is compared to the north-flow conditions INM calculated DNL in Table 4.13 of Chapter Four.

Figures E-1 and E-2 present 2000 "North-Flow" and "South-Flow" DNL contours with existing non-compatible land uses. These contours assume 2000 annual day runway use, flight track use, and runup activity. However, they assume that the winds require 100 percent of the operations in the north or south flow with runway use as presented in Tables 4.4 and 4.5 of Chapter Four.

Existing land use compatibility was analyzed for the north-flow and south-flow conditions. The following discussion examines the non-compatible land uses surrounding the Airport.

Areas North of TPA

The residential vicinity most potentially impacted by existing aircraft noise is located north of the Airport, as can be seen in both Figure E-1 and Table 5.1.

West Park Estates is a subdivision of several hundred single family homes. Under the north-flow condition, the western portion of this community has an estimated 1,018 persons residing in 414 dwelling units within the DNL 65-70 contour interval, and another 96 residents in 39 dwelling units within the DNL 70-75 contour interval. No residents are located within the 65 DNL in the south-flow condition.

The Benjamin Road area in the vicinity of Barry Road has an estimated 50 dwelling units with 148 residents in the DNL 65-70 contour interval under the north-flow condition. This drops to 15 dwelling units and 37 residents for the south-flow condition. No residents are located within the DNL 70^+ contour. Field observation discloses that many of the dwellings are older, mobile (manufactured) homes that appear to have been in place for many years.

An estimated 292 dwelling units with 719 residents are located in the DNL 65-70 contour interval in the Southern Comfort subdivision with the north-flow condition. No residents are within the DNL 65^+ for the south-flow condition. No residents are within the DNL 70^+ contour for either condition. This development is comprised entirely of single family homes that have been in place for over two decades.

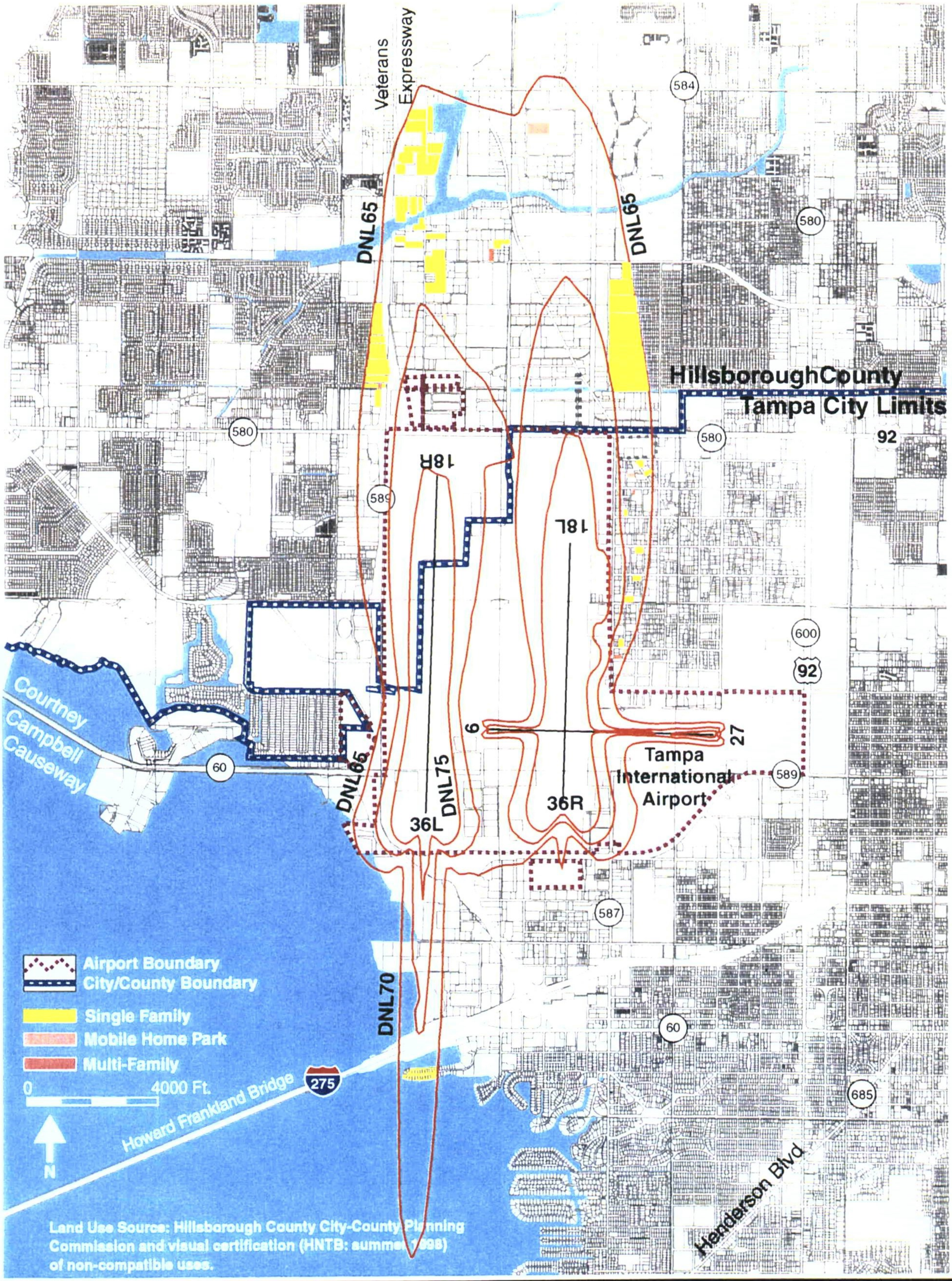
Areas South of TPA

The only existing non-compatible land use south of the Airport is a residential neighborhood that extends along Mariner Street. An estimated population of 64 in 26 dwelling units are located within the DNL 65-70 contour interval for both north-flow and south-flow conditions.

HILLSBOROUGH COUNTY AVIATION AUTHORITY

2000 North Flow Day-Night Average Sound Level Contours with Non-compatible Land Uses

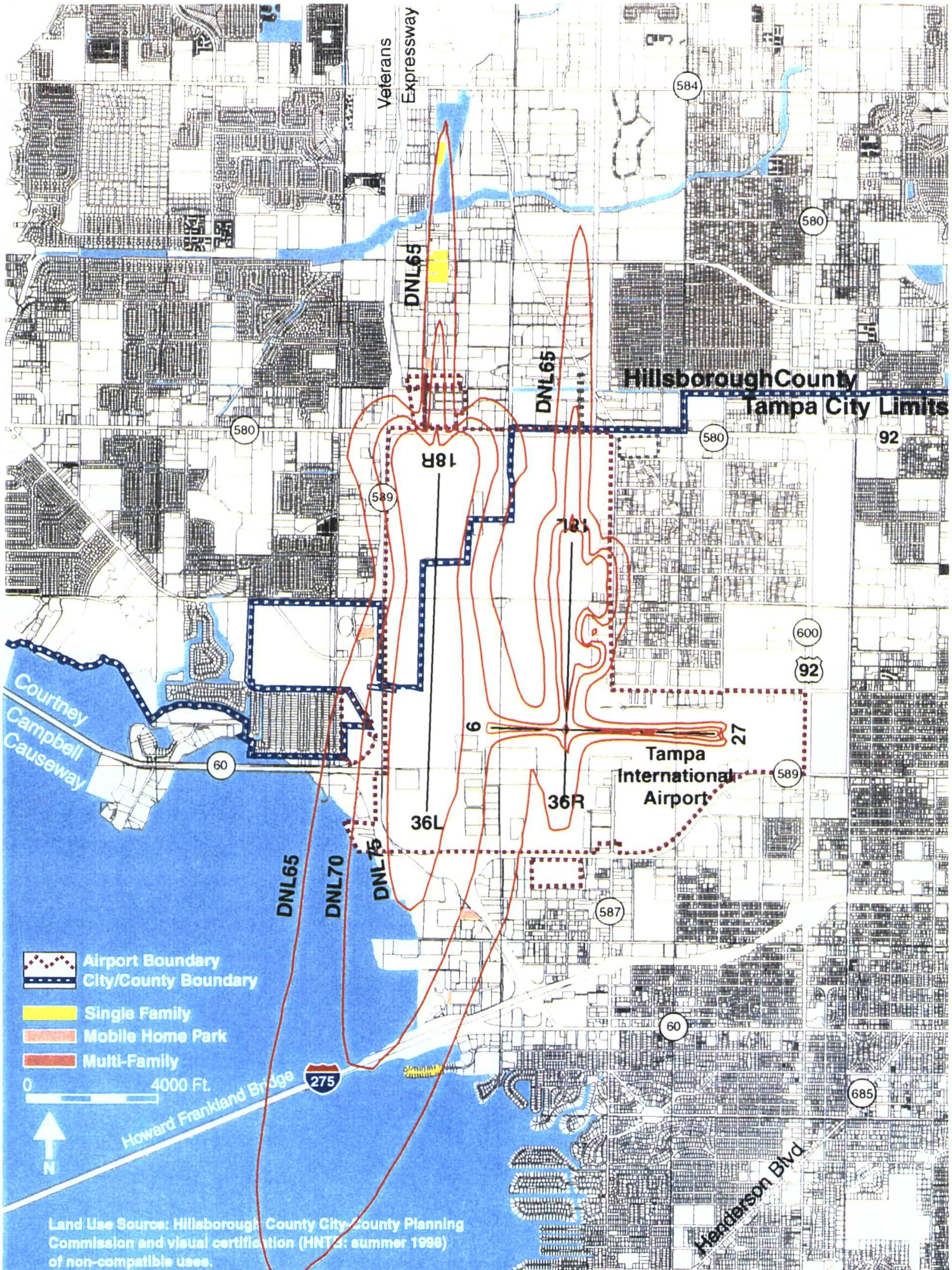
Figure E-1



HILLSBOROUGH COUNTY AVIATION AUTHORITY

2000 South Flow Day-Night Average Sound Level with Non-compatible Land Uses

Figure E-2



Areas East of TPA

The Drew Park area is an older area in transition from a one residential area. An estimated five residents in two dwelling units are located in the DNL 65-70 contour interval under the north-flow scenario. No residences are located in the DNL 70^+ contour for either condition.

Areas West of TPA

Another transitional area impacted by aircraft noise is east of George Road in the vicinity of Chelsea and Eleanor Streets. An estimated 47 residents live in 19 dwelling units are located in the DNL 65-70 contour interval under the south-flow condition; there are no residences within this contour interval for the north-flow condition. There are no residences within the DNL 70^+ contour for either condition.

Conclusions

The existing residential population in the vicinity of TPA is substantially less impacted by the south-flow condition and most impacted by the north-flow condition. **Table E.1** summarizes the total residential population impacted by the north- and south-flow conditions.

Table E.1

Non-Compatible Land Use Properties by Noise Contour Interval

Contour Interval	2000 North-Flow Condition		2000 South-Flow Condition	
	Dwellings	Population[1]	Dwellings	Population[1]
65-70	784	1,954	60	148
70-75	39	96	0	0
75^+	0	0	0	0
Total	823	2,050	60	148

[1] Population estimate based on dwelling unit counts. Hillsborough County household size of 2.46 persons/household as estimated by Hillsborough County City-County Planning Commission, April 1997.

APPENDIX F

Runway and Flight Track Use With Revised Noise Compatibility Program

Modeled Runway Use
Annual Average Day
With Revised Noise Compatibility Program

Aircraft Category	Runway	Departures		Arrivals	
		Day	Night	Day	Night
Air Carrier Jet (includes Military DC9s)	09	0	0	0	0
	18L	1	0	28	28
	18R	72	75	45	30
	27	0	0	1	1
	36L	15	14	26	41
	36R	12	11	0	0
Corporate Jet (includes Military GIIBs)	09	0	0	0	0
	18L	1	0	64	35
	18R	71	75	9	23
	27	1	0	1	1
	36L	2	0	26	41
	36R	25	25	0	0
Turboprop Aircraft	09	4	1	1	1
	18L	22	0	25	42
	18R	47	65	45	23
	27	1	0	3	3
	36L	19	28	17	31
	36R	7	6	9	0
Piston Aircraft	09	54	3	3	3
	18L	25	0	42	42
	18R	4	63	0	0
	27	3	3	35	3
	36L	0	0	1	52
	36R	14	31	19	0

Modeled Air Carrier Jet Flight Track Use
(includes Military DC9s)
With Revised Noise Compatibility Program

Runway	Departures			Arrivals		
	Track Name	Day Usage	Night Usage	Track Name	Day Usage	Night Usage
09	09D1	0.0%	0.0%	09A1	0.0%	0.0%
	09D2	0.0%	0.0%	09A2	0.0%	0.0%
	09D3	0.0%	0.0%	09A3	0.0%	0.0%
	09D4	0.0%	0.0%			
	09D5	0.0%	0.0%			
	09D6	0.0%	0.0%			
	09D7	0.0%	0.0%			
18L	8LD1	0.0%	0.0%	8LA1	35.0%	59.0%
	8LD2	0.0%	0.0%	8LA2	20.0%	20.0%
	8LD3	100.0%	100.0%	8LA3	10.0%	0.0%
	8LD4	0.0%	0.0%	8LA4	15.0%	15.0%
	8LD5	0.0%	0.0%	8LA5	10.0%	3.0%
	8LD6	0.0%	0.0%	8LA6	10.0%	3.0%
				8LA7	0.0%	0.0%
				8LA8	0.0%	0.0%
18R	8RD1	1.0%	5.0%	8RA1	30.0%	46.0%
	8RD2	10.0%	15.0%	8RA2	20,0%	20.0%
	8RD3	20.0%	0.0%	8RA3	10.0%	10.0%
	8RD4	30.0%	20.0%	8RA4	10.0%	10.0%
	8RD5	30.0%	40.0%	8RA5	10.0%	0.0%
	8RD6	6.0%	20.0%	8RA6	6.0%	10.0%
	8RD7	3.0%	0.0%	8RA7	10.0%	0.0%
	8RD8	0.0%	0.0%	8RA8	4.0%	4.0%
	8RD9	0.0%	0.0%	8RA9	0.0%	0.0%
	8RD0	0.0%	0.0%	8RA0	0.0%	0.0%
	8RDA	0.0%	0.0%	8RAA	0.0%	0.0%
27	27D1	0.0%	0.0%	A1	100.0%	100.0%
	27D2	0.0%	0.0%	A2	0.0%	0.0%
	27D3	0.0%	0.0%	A3	0.0%	0.0%
				A4	0.0%	0.0%
				A5	0.0%	0.0%
				A6	0.0%	0.0%
36L	6LD1	35.0%	35.0%	6LA1	22.0%	20.0%
	6LD2	32.0%	45.0%	6LA2	2.0%	4.0%
	6LD3	1.0%	5.0%	6LA3	0.0%	0.0%
	6LD4	10.0%	10.0%	6LA4	3.0%	16.0%
	6LD5	1.0%	1.0%	6LA5	0.0%	0.0%
	6LD6	7.0%	0.0%	6LA6	7.0%	17.0%
	6LD7	6.0%	0.0%	6LA7	18.0%	23.0%
	6LD8	4.0%	0.0%	6LA8	16.0%	10.0%
	6LD9	4.0%	4.0%	6LA9	20.0%	5.0%
	6LD0	0.0%	0.0%	6LA0	12.0%	5.0%
	6LDA	0.0%	0.0%	6LAA	0.0%	0.0%
	6LDB	0.0%	0.0%	6LAB	0.0%	0.0%
	6LDD	0.0%	0.0%	6LAD	0.0%	0.0%
	6LDE	0.0%	0.0%			
	6LDF	0.0%	0.0%			
	6LDG	0.0%	0.0%			
	6LDH	0.0%	0.0%			
	6LDI	0.0%	0.0%			

Modeled Air Carrier Jet Flight Track Use
(includes Military DC9s)
With Revised Noise Compatibility Program
(Continued)

Runway	Departures			Arrivals		
	Track Name	Day Usage	Night Usage	Track Name	Day Usage	Night Usage
36R	6RD1	30.0%	30.0%	6RA1	100.0%	100.0%
	6RD2	4.0%	4.0%	6RA2	0.0%	0.0%
	6RD3	2.0%	18.0%	6RA3	0.0%	0.0%
	6RD4	1.0%	2.0%	6RA4	0.0%	0.0%
	6RD5	40.0%	40.0%	6RA5	0.0%	0.0%
	6RD6	2.0%	2.0%	6RA6	0.0%	0.0%
	6RD7	7.0%	2.0%	6RA7	0.0%	0.0%
	6RD8	7.0%	2.0%	6RA8	0.0%	0.0%
	6RD9	7.0%	0.0%	6RA9	0.0%	0.0%
	6RD0	0.0%	0.0%	6RA0	0.0%	0.0%
	6RDA	0.0%	0.0%	6RAA	0.0%	0.0%
	6RDB	0.0%	0.0%			
	6RDD	0.0%	0.0%			
	6RDE	0.0%	0.0%			
	6RDF	0.0%	0.0%			
	6RDG	0.0%	0.0%			
	6RDH	0.0%	0.0%			
	6RDI	0.0%	0.0%			

Modeled Corporate Jet Flight Tracks
(includes Military GIIBs)
With Revised Noise Compatibility Program

Runway	Departures		Arrivals	
	Track Name	Day / Night Usage	Track Name	Day / Night Usage
09	09D1	30.0%	09A1	100.0%
	09D2	0.0%	09A2	0.0%
	09D3	70.0%	09A3	0.0%
	09D4	0.0%		
	09D5	0.0%		
	09D6	0.0%		
	09D7	0.0%		
18L	8LD1	0.0%	8LA1	44.0%
	8LD2	0.0%	8LA2	12.0%
	8LD3	100.0%	8LA3	12.0%
	8LD4	0.0%	8LA4	12.0%
	8LD5	0.0%	8LA5	12.0%
	8LD6	0.0%	8LA6	4.0%
			8LA7	4.0%
			8LA8	0.0%
18R	8RD1	0.0%	8RA1	60.0%
	8RD2	10.0%	8RA2	0.0%
	8RD3	20.0%	8RA3	10.0%
	8RD4	30.0%	8RA4	20.0%
	8RD5	30.0%	8RA5	0.0%
	8RD6	10.0%	8RA6	0.0%
	8RD7	0.0%	8RA7	0.0%
	8RD8	0.0%	8RA8	10.0%
	8RD9	0.0%	8RA9	0.0%
	8RD0	0.0%	8RA0	0.0%
	8RDA	0.0%	8RAA	0.0%
27	27D1	100.0%	A1	40.0%
	27D2	0.0%	A2	0.0%
	27D3	0.0%	A3	30.0%
			A4	0.0%
			A5	0.0%
			A6	30.0%
36L	6LD1	25.0%	6LA1	37.0%
	6LD2	45.0%	6LA2	1.0%
	6LD3	0.0%	6LA3	0.0%
	6LD4	0.0%	6LA4	1.0%
	6LD5	12.0%	6LA5	0.0%
	6LD6	0.0%	6LA6	5.0%
	6LD7	6.0%	6LA7	27.0%
	6LD8	6.0%	6LA8	6.0%
	6LD9	0.0%	6LA9	12.0%
	6LD0	6.0%	6LA0	6.0%
	6LDA	0.0%	6LAA	5.0%
	6LDB	0.0%	6LAB	0.0%
	6LDD	0.0%	6LAD	0.0%
	6LDE	0.0%		
	6LDF	0.0%		
	6LDG	0.0%		
	6LDH	0.0%		
	6LDI	0.0%		

Modeled Corporate Jet Flight Tracks
(includes Military GIIBs)
With Revised Noise Compatibility Program
(Continued)

Runway	Departures		Arrivals	
	Track Name	Day / Night Usage	Track Name	Day / Night Usage
36R	6RD1	36.0%	6RA1	40.0%
	6RD2	5.0%	6RA2	15.0%
	6RD3	4.0%	6RA3	10.0%
	6RD4	1.0%	6RA4	0.0%
	6RD5	36.0%	6RA5	20.0%
	6RD6	2.0%	6RA6	15.0%
	6RD7	5.0%	6RA7	0.0%
	6RD8	8.0%	6RA8	0.0%
	6RD9	2.0%	6RA9	0.0%
	6RD0	1.0%	6RA0	0.0%
	6RDA	0.0%	6RAA	0.0%
	6RDB	0.0%		
	6RDD	0.0%		
	6RDE	0.0%		
	6RDF	0.0%		
	6RDG	0.0%		
	6RDH	0.0%		
	6RDI	0.0%		

Modeled Turboprop and Piston Flight Track Use
With Revised Noise Compatibility Program

Runway	Departures			Arrivals		
	Track Name	Day Use	Night Use	Track Name	Day Use	Night Use
09	09D1	75.0%	10.0%	09A1	90.0%	0.0%
	09D2	6.0%	40.0%	09A2	10.0%	50.0%
	09D3	4.0%	1.0%	09A3	0.0%	50.0%
	09D4	10.0%	35.0%			
	09D5	0.0%	4.0%			
	09D6	5.0%	4.0%			
	09D7	0.0%	6.0%			
18L	8LD1	38.0%	10.0%	8LA1	25.0%	65.0%
	8LD2	38.0%	25.0%	8LA2	5.0%	0.0%
	8LD3	14.0%	0.0%	8LA3	5.0%	5.0%
	8LD4	10.0%	10.0%	8LA4	5.0%	0.0%
	8LD5	0.0%	45.0%	8LA5	25.0%	10.0%
	8LD6	0.0%	10.0%	8LA6	0.0%	0.0%
				8LA7	25.0%	10.0%
				8LA8	10.0%	10.0%
18R	8RD1	30.0%	30.0%	8RA1	30.0%	0.0%
	8RD2	2.0%	2.0%	8RA2	5.0%	0.0%
	8RD3	3.0%	3.0%	8RA3	7.0%	0.0%
	8RD4	3.0%	3.0%	8RA4	5.0%	0.0%
	8RD5	5.0%	5.0%	8RA5	3.0%	0.0%
	8RD6	15.0%	15.0%	8RA6	5.0%	0.0%
	8RD7	2.0%	2.0%	8RA7	5.0%	0.0%
	8RD8	20.0%	20.0%	8RA8	10.0%	0.0%
	8RD9	10.0%	10.0%	8RA9	10.0%	0.0%
	8RD0	5.0%	5.0%	8RA0	10.0%	0.0%
	8RDA	5.0%	5.0%	8RAA	10.0%	0.0%
27	27D1	0.0%	0.0%	A1	35.0%	26.0%
	27D2	100.0%	100.0%	A2	0.0%	8.0%
	27D3	0.0%	0.0%	A3	4.0%	25.0%
				A4	30.0%	8.0%
				A5	4.0%	25.0%
				A6	27.0%	8.0%
36L	6LD1	5.0%	5.0%	6LA1	45.0%	40.0%
	6LD2	4.0%	4.0%	6LA2	2.0%	0.0%
	6LD3	0.0%	0.0%	6LA3	2.0%	10.0%
	6LD4	0.0%	0.0%	6LA4	8.0%	10.0%
	6LD5	0.0%	0.0%	6LA5	3.0%	10.0%
	6LD6	0.0%	0.0%	6LA6	10.0%	0.0%
	6LD7	0.0%	0.0%	6LA7	2.0%	0.0%
	6LD8	0.0%	0.0%	6LA8	4.0%	0.0%
	6LD9	0.0%	0.0%	6LA9	2.0%	20.0%
	6LD0	0.0%	0.0%	6LA0	0.0%	0.0%
	6LDA	5.0%	5.0%	6LAA	15.0%	0.0%
	6LDB	27.0%	27.0%	6LAB	1.0%	10.0%
	6LDD	27.0%	27.0%	6LAD	6.0%	0.0%
	6LDE	7.0%	7.0%			
	6LDF	12.0%	12.0%			
	6LDG	5.0%	5.0%			
	6LDH	3.0%	3.0%			
	6LDI	5.0%	5.0%			

Modeled Turboprop and Piston Flight Track Use
With Revised Noise Compatibility Program
(Continued)

Runway	Departures			Arrivals		
	Track Name	Day Use	Night Use	Track Name	Day Use	Night Use
36R	6RD1	1.0%	1.0%	6RA1	55.0%	40.0%
	6RD2	0.0%	0.0%	6RA2	4.0%	2.0%
	6RD3	1.0%	1.0%	6RA3	15.0%	10.0%
	6RD4	3.0%	3.0%	6RA4	3.0%	10.0%
	6RD5	3.0%	3.0%	6RA5	1.0%	0.0%
	6RD6	0.0%	0.0%	6RA6	3.0%	0.0%
	6RD7	1.0%	1.0%	6RA7	2.0%	3.0%
	6RD8	0.0%	0.0%	6RA8	2.0%	10.0%
	6RD9	0.0%	0.0%	6RA9	4.0%	3.0%
	6RD0	31.0%	31.0%	6RA0	3.0%	1.0%
	6RDA	9.0%	9.0%	6RAA	8.0%	21.0%
	6RDB	15.0%	15.0%			
	6RDD	0.0%	0.0%			
	6RDE	0.0%	0.0%			
	6RDF	14.0%	14.0%			
	6RDG	11.0%	11.0%			
	6RDH	10.0%	10.0%			
	6RDI	1.0%	1.0%			

APPENDIX G

Working Group Meeting Summaries

Tampa International Airport

Master Plan Update/Part 150 Study
MEMORANDUM

Date: August 26, 1997

To: Agency Working Group

From: Jeff Mishler, HNTB, Project Manager

Re: **TIA Master Plan/Part 150 Study**
Meeting #1 - Summary

On August 11, 1997 the first meeting of the Agency Working Group was conducted at the Airport Marriott. Twenty-three (23) persons attended--13 invitees and 10 staff and consultant representatives. An attendance list is attached.

Louis Miller, Executive Director of the Hillsborough County Aviation Authority, made opening remarks and introduced Nadine Jones, HCAA's project director for update of these studies. Jeff Mishler, HNTB, introduced the project team, explained the purpose of the Master Plan/Part 150 Study and reviewed key issues. Ted Baldwin made a presentation on the Part 150 Study. Handouts included copies of the transparencies which summarize major points of the presentations and a draft of Chapter One, Goals and Objectives. Meeting participants were invited to review the draft Goals and Objectives and call Jeff with comments.

Bill Connors clarified that the update of the HCAA Height Zoning Ordinance would also be completed as part of the Master Plan/Part 150 Study update. He explained that state law enabled the HCAA to adopt height controls for structures based on runway configurations as shown on the Master Plan. The ordinance was last updated in 1986 and will be updated toward the end of this study.

Jeff indicated that agendas will be provided in advance of future meetings.

Questions/Comments:

Lucy Ayers, Hillsborough County MPO, offered the following questions and comments:

(1) What area will be included in the projections? She suggested that the metropolitan area incorporate the same four counties (Hillsborough, Pinellas, Pasco and Manatee) that the Regional Transportation Model includes. The Hillsborough County Planning Commission is in the process of projecting employment and population to 2020 (expected to be completed by early 1998). Population and employment to 2015 for the four counties has already been developed.

(2) Tampa/Hillsborough County/Lakeland are in the process of developing a Major Investment Study (MIS) Transit Operation Plan. The Master Plan update should be coordinated with this effort.

(3) I-275 will be completely reworked in the next ten years. There will be short term and long term improvements scheduled and a mid-range contingency plan. I-275 to the Howard Franklin will be widened to 8 lanes and access from the south side of the airport will be majorly affected. This study should take this potential problem into account.

Ram Kancharia, Port of Tampa, reported that the Port Authority has just finished a Master Plan update of their own. He asked if we also anticipate having to go through the Department of Community Affairs (DCA) in Tallahassee. Nadine explained that the HCAA would be completing a DRI after the update of the Master Plan; however, because the City of Tampa has been approved as a "Sustainable Community", HCAA will coordinate with the City, the state clearinghouse process and all applicable agencies.

Jim Cloar of the Downtown Partnership asked whether the new stadium was approved under the existing plan and height ordinance. The answer was yes.

Enclosures: Agency Working Group Membership
List of Attendees - Meeting #1
Project Schedule

ATTENDANCE - Agency Working Group Meeting #1
August 11, 1997
3:00 p.m.

1. Chuck Sackett
Hillsborough Community College
P.O. Box 31127
Tampa, FL 33631-3127
253-7158
253-7553 FAX

2. Henry Saavedra
Tampa Sports Authority
4201 N. Dale Mabry Hwy
Tampa, FL 33607
813-673-4300
813-673-4308 FAX

3. Bruce Haddock
City of Oldsmar
100 State Street
Oldsmar, FL 34677
855-4693

4. Grady Smith
Pinellas Co. MPO
14 South Ft. Harrison Ave.
Clearwater, FL 32761
813-464-4751

5. Bob Beaman
Hillsborough Comm. College
P.O. Box 30030
Tampa, FL 33630-3030

6. Lucie Ayer
Hillsborough County MPO
601 E. Kennedy Blvd., #1800
Tampa, FL 33602
813-272-5940
813-272-6258 FAX

7. Mary J. Hall
THCEA/Pat McCue
412 E. Madison Street S-800
Tampa, FL 33602
813-272-6740
813-273-3730 FAX

8. Terri L. Fox
Westshore Alliance
5100 W. Lemon
Tampa, FL
289-5488

9. Andrea Scarborough
City of Tampa
306 E. Jackson Street, 3N
Tampa, FL 33602
274-8405
274-8143

10. Ram Kancharia
Port of Tampa
P.O. Box 2192
Tampa, FL 33601
813-272-0554
813-272-0570 FAX

11. Gene Boles
Hillsborough Co. Planning &
Growth Management
272-5147

12. Jim Cloar
Tampa Downtown Partnership
P.O. Box 2387
Tampa, FL 33601
221-3686
229-1328 FAX

STAFF:

Louis Miller, HCAA
Bill Connor, HCAA
Nadine S. Jones, HCAA
Brenda Geoghagen, HCAA
Jeff Mishler, HNTB
Joe Navarette, HNTB
Richard T. Fricke, HNTB
George Huffman, HNTB
Ted Baldwin, HMM&H
Georgianne Ratliff, R&A

Tampa International Airport

SEP 1997
Received
HNTB
Alexandria

Master Plan Update/Part 150 Study
MEMORANDUM

Date: August 26, 1997

To: Technical Working Group

From: Jeff Mishler, HNTB, Project Manager

Re: **TIA Master Plan/Part 150 Study Meeting #1 - Summary**

On August 11, 1997 the first meeting of the Technical Working Group was conducted at the Airport Marriott. Twenty-five (25) persons attended--17 invitees and 8 staff and consultant representatives. An attendance list is attached.

Louis Miller, Executive Director of the Hillsborough County Aviation Authority made opening remarks and introduced Nadine Jones, HCAA project director for the update of these studies. Jeff Mishler, HNTB, introduced the project team, explained the purpose of the Master Plan/Part 150 Study and reviewed key issues. Ted Baldwin made a presentation on the Part 150 Study. Handouts included copies of the transparencies which summarize major points of the presentations and a draft of Chapter One, Goals and Objectives. Meeting participants were invited to review the draft Goals and Objectives and call Jeff with comments. Jeff indicated that agendas will be provided in advance of future meetings.

Questions/Comments:

1. The primary question concerned the methodology to be utilized in preparing activity forecasts. Jeff Mishler was asked if he would be distributing an airline questionnaire. The airline representatives expressed concern than they be given an opportunity to provide input and sufficient time to respond. Jeff reviewed the methodology including the intent to utilize a "panel of experts." He indicated to the group that the Expert Panel would most likely be meeting in late September or early October.

2. A committee member requested that copies of the "Project Schedule" be provided to the members.

It was decided that we would proceed with an airline questionnaire and use the expert panel regarding the forecast of activity.

Enclosures: Technical Working Group Membership
List of Attendees - Meeting #1
Project Schedule

ATTENDANCE - Technical Working Group Meeting #1
August 11, 1997
1:00 p.m.

1. Don Runyon
Marriott
T.I.A.
813-879-5151

2. Jim Sepa
Hertz Corporation
P.O. Box 31166
Tampa, FL 33631
813-874-3232
813-870-1354 FAX

3. Mary C. Leyden
U.S. Airways
2345 Crystal Drive
Arlington, VA 22227
703-872-5972
703-872-7986 FAX

4. Steve Senica
United
T.I.A.
396-3256

5. C. Ed. Howard Jr.
FAA-Orlando-APO
5950 Hazeltine Drive
Suite 400
Orlando, FL 32822
407-812-6331 ext.25
407-812-6978 FAX

6. Bill Harper
Dollar Rent A Car
T.I.A.
813-396-3640
813-289-0453 FAX

7. Laddie E. Irion
URS/Greiner-St. Pete Clearwater Airport
7650 West Courtney Campbell Causeway
Tampa, FL 33607
813-286-1711

8. Steve Callaway
Delta Air Lines
Dept. 878, Atlanta Int'l Airport
Atlanta, GA
404-715-2261
404-715-2548 FAX

9. John Roeller
FDOT
11201 N. McKinley Blvd.
Tampa, FL 33612
813-975-6409

10. Josephine Stevens
Avis Rent A Car
T.I.A.
813-396-3530 B.P.
813-879-9812 FAX

11. David Herrera
Southwest Airlines
P.O. Box 36611
Dallas, TX 75235-1611
214-792-5244
214-792-4086 FAX

12. Jay Dayhoff
United
2618 Cason
Houston, TX 77005
713-664-4134
FAX is the same #

13. Gary Lantner
VAL
3627 Coltwood Drive
Spring, TX 77388
281-350-2889
281-288-3945 FAX

14. Mike Fahlmark
USPS
2203 N. Lois Avenue, Suite 1010
Tampa, FL 33607-7110
813-354-6002
813-877-8656 FAX

15. Marvin Hudspeth
FAA Tampa ATCT
T.I.A.
Tampa, FL 33607
813-872-1528

16. Mark Wagner
Havatampa, Inc.
15920 Hampton Village Drive
Tampa, FL 33618
813-269-9225

17. Yeong S. Yee
TWA
Rm 201 Hangar #12
JFK Int'l Airport
718-244-2806
718-244-2810 FAX

STAFF:
Louis Miller, HCAA
Bill Connor, HCAA
Nadine S. Jones, HCAA
Brenda Geoghagen, HCAA
Jeff Mishler, HNTB
Joe Navarette, HNTB
Richard T. Fricke, HNTB
George Huffman, HNTB
Georgianne Ratliff, R&A

Tampa International Airport

Master Plan Update/Part 150 Study
MEMORANDUM

Date: August 14, 1998

To: Agency Working Group

From: Jeff Mishler, HNTB, Project Manager

Re: **TIA Master Plan/Part 150 Study**
Meeting #3 (July 20, 1998) - Summary

On July 20, 1998 the third meeting of the Agency Working Group was conducted in the HCAA Board Room at Tampa International Airport. Fourteen (14) persons attended–6 invitees and 8 staff and consultant representatives. An attendance list is attached.

Jeff Mishler, HNTB Corporation, made opening remarks and began the meeting with an explanation of where we are in the master plan update process. Jeff Mishler, explained that to date, the master plan focus has been on planning for the airport terminal. An extensive survey of TPA's terminal landside, airside and curb facilities was conducted. The survey's key observations were reviewed with the group. Major points of interest included:

- Departure Level– Ticket counters under lease are fully staffed; processing times are at or lower than industry standards, therefore the queues in the ticket lines seem to indicate the airlines are not leasing sufficient space.
- Arrival Level– Baggage display and claim area are insufficient, many conflicts occur with congestion between baggage claim area and rental car area;
- Transfer Level– currently under construction, some confusion with signage;
- Airside– Concourses C & D need expansion; and
- Parking– currently adequate (only approaches capacity at holidays).

Following an explanation of airfield capacity and requirements, four (4) preliminary terminal concepts were presented by Tony Dockery, terminal architect. Meeting participants were advised that the concepts presented are preliminary at this point. Handouts included copies of the transparencies which summarize major points of the presentations and terminal design concept drawings.

The next working group meeting will be held in September where a detailed evaluation of the terminal concepts will be presented, as well as the costs associated with each concept; this group will meet two (2) to three (3) more times before the end of the year.

Questions/Comments:

Jim Cloar, Tampa Downtown Partnership asked if conflicts would arise with the pedestrian access across lanes on the conceptual plan. Tony Dockery answered no, the plan actually misrepresents traffic flow, the arrows need to be changed.

Ned Baier, Hillsborough County Growth Management asked if the terminal concepts will show a light rail connection? Jeff Mishler answered yes, the team would like to integrate this connection into the terminal itself. Preliminary alternatives are still being evaluated and costed out.

Ram Kancharia, Port of Tampa, offered that the exit area from the parking garage need to be looked at, stating that the lanes are very confusing to drivers which results in a lot of weaving.

Andrea Scarborough, City of Tampa asked if expansion of the existing sky cap area had been considered, since this seems to be an area underutilized by passengers. Jeff answered that the potential for future expansion of the curb area for the sky cap is possible.

Enclosures: List of Attendees - Meeting #3

TIA
MASTER PLAN/PART 150 STUDY UPDATE

SIGN-IN SHEET

July 20, 1997
Agency Working Group
10:30 a.m.

(PLEASE PRINT)

Name: Andrea Scarborough
Representing: City of TAMPA
Address: 306 E. JACKSON St. 3E
Tampa 33602
Phone/FAX: 274-8405/8143

Name: LORI CHESTER
Representing: THCVA
Address: 400 N. Tampa St. Suite 1010
Tampa Fl. 33602
Phone/FAX: 223-1111 ext. 53

Name: BOB WHITEHEAD
Representing: HILLS. COUNTY MAD
Address: 201 E. KENNEDY 18th FL
Phone/FAX: 272-5940

Name: RAM KANCHARLA
Representing: PORT OF TAMPA
Address: P.O. BOX 2192
TAMPA FL 33601
Phone/FAX: 272-0554

Name: JIM CLOAR
Representing: TAMPA DOWNTOWN PARTNERSHIP
Address: P.O. BOX 2387
TAMPA FL 33601
Phone/FAX: 221-3686 (229-1328 FX)

Name: Ned Baier
Representing: Gene Boles-Hillsborough County
Address: 601 East Kennedy Blvd.
Tampa
Phone/FAX: 813-272-5849

Tampa International Airport

MEMORANDUM

Date: August 14, 1998

To: Technical Working Group

From: Jeff Mishler, HNTB, Project Manager

Re: **TIA Master Plan/Part 150 Study**
Meeting #3 (July 20, 1998) - Summary

On July 20, 1998 the third meeting of the Agency Working Group was conducted in the HCAA Board Room at Tampa International Airport. Eighteen (18) persons attended–10 invitees and 8 staff and consultant representatives. An attendance list is attached.

Jeff Mishler, HNTB Corporation, made opening remarks and began the meeting with an explanation of where we are in the master plan update process. Jeff Mishler, explained that to date, the master plan focus has been on planning for the airport terminal. An extensive survey of TPA's terminal landside, airside and curb facilities was conducted. The survey's key observations were reviewed with the group. Major points of interest included:

- Departure Level– Ticket counters under lease are fully staffed; processing times are at or lower than industry standards, therefore the queues in the ticket lines seem to indicate the airlines are not leasing sufficient space.
- Arrival Level– Baggage display and claim area are insufficient, many conflicts occur with congestion between baggage claim area and rental car area;
- Transfer Level– currently under construction, some confusion with signage;
- Airside– Concourses C & D need expansion; and
- Parking– currently adequate (only approaches capacity at holidays).

Following an explanation of airfield capacity and requirements, four (4) preliminary terminal concepts were presented by Tony Dockery, terminal architect. Louis Miller, executive director of HCAA, requested that meeting participants look carefully over the concepts and ideas presented and advise of any difficulties that might be encountered from an operational standpoint. He advised that the concepts presented are preliminary and have not been costed out at this point. Handouts included copies of the transparencies which summarize major points of the presentations and terminal design concept drawings.

The next working group meeting will be held in September where a detailed evaluation of the terminal concepts will be presented, as well as the cost associated with each concept; this group will meet two (2) to three (3) more times before the end of the year.

Questions/Comments:

Q: Why do the concept plans only show 757 gates?

A: We considered the projected fleet mix for peak hour aircraft parking and equalized to a 757 gate.

Q: It is important to consider baggage movement from the terminal to landside. Will you have a professional baggage consultant look at this aspect? This would be worthwhile.

A: Yes, the master plan team committed to get a baggage consultant to address the feasibility by conducting a preliminary evaluation of adding a high speed belt system from the landside terminal to airside.

Q: In the survey work presented today, did anyone talk with corporate users about runway use and airfield requirements?

A: Yes, during the inventory major coporate carriers were asked about runway use and requirments.

Comment: The concepts only provide for one (1) commercial area. There is too much commercial vehicle traffic for one area - this design would result in a massive traffic jam.

Enclosures: List of Attendees - Meeting #3

TIA
MASTER PLAN/PART 150 STUDY UPDATE

SIGN-IN SHEET

July 20, 1998
Technical Working Group
2:00 p.m.

(PLEASE PRINT)

Name: MARC STANIK
Representing: SOUTHWEST AIRLINES
Address: TAMPA INTL AIRPORT

Phone/FAX: 813.396.4350 / 396.4356

Name: Mike Thompson
Representing: URSGreiner / PIE
Address:

Phone/FAX: 813 286 1711

Name: JEFF ABBOTT
Representing: FAA TAMPA TOWER
Address: TAMPA INT'L AIRPORT
TAMPA FL 33607

Phone/FAX:

Name: GARY M. GUTKOWSKI
Representing: RAYTHEON AIRCRAFT SERVICES
Address: 2450 N. WESTSHORE BLVD.
TAMPA, FL. 33607

Phone/FAX: 813-878-4563
874-2590

Name: LADDIE IRION
Representing: URSGreiner / PIE.
Address:

Phone/FAX: 813 286-1711

Name:
Representing:
Address:

Phone/FAX:

TIA
MASTER PLAN/PART 150 STUDY UPDATE

SIGN-IN SHEET

July 20, 1998
Technical Working Group
2:00 p.m.

(PLEASE PRINT)

Name: RICHARD HOUGHTON
Representing: HAXATAMPA INC.
Address: 3901 RIGA BLVD.
TAMPA, FL. 33601
Phone/FAX: 621-3535

Name: Molly C. Leyden
Representing: US Airways
Address: 2345 Crystal Dr.
Arlington, VA 22227
Phone/FAX: F. 703-872-7986 P. 703-872-5972

Name: MIKE FAHLMARK
Representing: USPS
Address: 2203 N. LOIS AVE
SUITE 1010
TAMPA FL 33607-7110
P 813 354-6002
Phone/FAX: FAX 877-8656

Name: Dallas Belt
Representing: United Airlines
Address: 4403 Willow Shade Court
Orlando, FL 32835
Phone/FAX: (407) 532-0546

Name: ROBERT S. MIKKELSEN
Representing: FAA - Tampa ATCT
Address: Tampa International Arpt
Tampa, FL 33607
Phone/FAX: 348-1553/348-1560

Name:
Representing:
Address:
Phone/FAX:

Tampa International Airport

Master Plan Update/Part 150 Study
MEMORANDUM

Date: August 14, 1998

To: Community Input Group

From: Jeff Mishler, HNTB, Project Manager

Re: **TIA Master Plan/Part 150 Study**
Meeting #3 (July 20, 1998) - Summary

On July 20, 1998 the third meeting of the Community Input Group was conducted in the HCAA Board Room at Tampa International Airport. Seventeen (17) persons attended--9 invitees and 8 staff and consultant representatives. An attendance list is attached.

Jeff Mishler, HNTB Corporation, made opening remarks and began the meeting with an explanation of where we are in the master plan update process. Jeff Mishler, explained that to date, the master plan focus has been on planning for the airport terminal. An extensive survey of TPA's terminal landside, airside and curb facilities was conducted. The survey's key observations were reviewed with the group. Major points of interest included:

- Departure Level- Ticket counters under lease are fully staffed; processing times are at or lower than industry standards, therefore the queues in the ticket lines seem to indicate the airlines are not leasing sufficient space.
- Arrival Level- Baggage display and claim area are insufficient, many conflicts occur with congestion between baggage claim area and rental car area;
- Transfer Level- currently under construction, some confusion with signage;
- Airside- Concourses C & D need expansion; and
- Parking- currently adequate (only approaches capacity at holidays).

Following an explanation of airfield capacity and requirements, four (4) preliminary terminal concepts were presented. Meeting participants were advised that the concepts presented are preliminary at this point. Handouts included copies of the transparencies which summarize major points of the presentations and terminal design concept drawings.

The next working group meeting will be held in September where a detailed evaluation of the terminal concepts will be presented, as well as a the costs associated with each concept. In addition, City of Tampa representatives will talk about how the road system in Drew Park will be maintained after HCAA acquires property in this area. This group will meet two (2) to three (3) more times before the end of the year.

Questions/Comments:

Frank Gassler, Beach Park Isle, asked how Tampa International Airport plans to compete with Orlando in 2020. Louis Miller explained that a competition exists between "communities" for tourists, etc., not between airports. Therefore, he does not see TPA as competing with Orlando's airport.

Rick Eldridge, Twelve Oaks Special District, asked what will happen to Westshore in Drew Park? Bill Connors answered that Lois will become the main road. Martin Luther King will never become the main entrance to the airport.

Lydia Skaates, Drew Park Property League stated that Drew Park businesses are worried about having adequate roadways in and out of Drew Park. Louis Miller stated that he will ask the City of Tampa to have appropriate representatives on hand at the next meeting to discuss how they will maintain the road system.

Rick Eldridge, Twelve Oak Special District indicated that he feels the majority of the public misunderstands the plans for the new runway. The runway will have 1,200 feet of separation from Memorial, which he feels is adequate.

Enclosures: List of Attendees - Meeting #3

TIA
MASTER PLAN/PART 150 STUDY UPDATE

SIGN-IN SHEET

July 20, 1998
Community Input Group
6:30 p.m.

(PLEASE PRINT)

Name: Lydia Skaates
Representing: Drew Park Property
Address: 4301 N. Nash St.

Phone/FAX: 877-6669

Name: Richard Skaates
Helen Skaates
Representing:
Address: 909 E. 123rd Ave.
Tampa, Fl. 33612
Phone/FAX: 971-4751

Name: MIKE FREDERICK
Representing: 12 OAKS / TNC ALLIANCE
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TAMPA FL 33634
Phone/FAX: 813-889-9833

Name: CALVIN LOGAN
Representing: NORTHWEST PARK
Address: 6526 JOHNS RD
TAMPA, FL
Phone/FAX: 813 885-3750

Name: JOE BEARINGER
Representing: BAY POINTE
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TAMPA 33615
Phone/FAX: 886-9336

Name: Margaret R. Vizzi
Representing: Beach Park H.A.
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Phone/FAX: 286 0980

TIA
MASTER PLAN/PART 150 STUDY UPDATE

SIGN-IN SHEET

July 20, 1998
Community Input Group
6:30 p.m.

(PLEASE PRINT)

Name: RICK ELDRIDGE	**Name:**
Representing: TWELVE OAKS SPECIAL DISTRICT	**Representing:**
Address: 7803 GREENSHIRE DR.	**Address:**
TPA FL 33634	
Phone/FAX: 884-1550 / 881-1202	**Phone/FAX:**
Name: STEVE HUETTEL	**Name:**
Representing: TAMPA TRIBUNE	**Representing:**
Address: 202 S. PARKER ST	**Address:**
TAMPA, FL	
Phone/FAX: 813-259-7524	**Phone/FAX:**
Name: FRANK GASSLER	**Name:**
Representing: BEACH PARK ISLE	**Representing:**
Address: 4907 W. BAY WAY DR	**Address:**
TAMPA, FL 33629	
Phone/FAX: 281-1497	**Phone/FAX:**

Tampa International Airport

Master Plan Update/Part 150 Study
MEMORANDUM

Date: February 10, 1999

To: Agency Working Group

From: Jeff Mishler, HNTB, Project Manager

Re: **TIA Master Plan/Part 150 Study**
Meeting #4 - Summary

On September 9, 1998 the fourth meeting of the Agency Working Group was conducted in the HCAA Board Room at Tampa International Airport. Eighteen (18) persons attended—10 invitees and 8 staff and consultant representatives. An attendance list is attached.

Jeff Mishler, HNTB Corporation, made opening remarks and began the meeting by introducing Ted Baldwin. All meeting attendees received a copy of the noise abatement measures Technical Memorandum. Ted gave a quick review of the document.

George Huffman of HNTB presented the land use compatibility analysis. He reported that careful review of the existing land use maps and field investigation of areas surrounding TPA reveal that 14,000 residents currently live within the 65 dbl contour (representing 232 homes at an average of 2.46 persons per household). There are certain types of land uses that are noise sensitive – i.e.) churches, schools, passive recreation and hospitals. The closest of these types of uses to TPA are two churches, both located within the 70 or higher noise contour. No single family structures exist within the 70 dbl or higher noise contour. These findings demonstrate that TPA is implementing a successful program, since the last master plan update approximately 14,000 persons have been eliminated from the noise contour.

Ted Baldwin reviewed the recommendations from the 1997 TPA Part 150 study:

- Use southerly traffic flows whenever possible;
- Encourage turbo jet operations to use Air Transport Association (ATA) recommended noise abatement arrival procedures;
- Designate engine runup procedures;
- Augment vegetation noise barriers along the western perimeter of airport;
- Establish a helipad on the east side of airport.

Runway preference and airspace "gate" concepts were discussed. The group was referred to table 7 of the technical memorandum summarizing the recommended noise abatement alternatives for further consideration:

- preferential runway use;
- noise abatement cockpit procedures;

- runup noise control;
- noise abatement flight paths.

Evan Futterman of HNTB offered comment on the recommended alternatives by clarifying that although easing "restrictions" has been mentioned, the use of the word restriction is inaccurate. Pilot participation in the program is voluntary, not mandatory.

Attendees were asked to review the F.A.R. Part 150 Noise Abatement Measures Technical Memorandum document and asked to get back to Nadine Jones with any comments or concerns within three weeks. All members of the working group who were not present at this meeting will be mailed a copy of this document.

Questions/Comments:

Terri Fox, Westhore Alliance, asked if a daycare center had been identified within the noise contours around TPA? George Huffman answered that a daycare had not been identified; but he would look into the area in question and confirm.

Tony Mantenga, HCAA, asked if the tower informs the pilot about preferential runway procedures? Ted Baldwin explained that the tower resists this type of explanation to pilots due to regulations on the number of words that can be used in communications between aircraft and the tower, etc.

Enclosures: List of Attendees - Meeting #4

TIA
MASTER PLAN/PART 150 STUDY UPDATE

SIGN-IN SHEET

September 9, 1998
Agency Working Group
10:30 a.m.

(PLEASE PRINT)

Name: Jim Clark
Representing: THCVA
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Name: Elton Smith
Representing: City
Address:
Phone/FAX: 274 8048

Name: ROSE PETRUCHA
Representing: PLANNING COMMISSION
Address: 601 E. KENNEDY FL18
TAMPA, FL
Phone/FAX: ~~229~~ 272-5940

Name: Diane Vercelli
Representing: HCAA
Address:
Phone/FAX: 810 - 8789

Name: Diana Mendes
Representing: BRW, Inc
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Name: Terri L Fox
Representing: Westshore Alliance
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T 33609
Phone/FAX: 289-5488, 289-6727

TIA
MASTER PLAN/PART 150 STUDY UPDATE

SIGN-IN SHEET

September 9, 1998
Agency Working Group
10:30 a.m.

(PLEASE PRINT)

Name: Harvey Flechner
Representing: BRW, Inc
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(P) 813/224-0448
Phone/FAX: 813/224.0339
(FAX)

Name: Tony Mantegna
Representing: HCAA
Address:
Phone/FAX: 870-7863

Name: JAMES HOWES
Representing: PINELLAS COUNTY
Address: SUITE 221 TERMINAL
BLDG., ST. PETE-CLWTR INT'L
~~AIRPORT, CLWTR, FL~~ 33762
Phone/FAX: 531-1451

Name:
Representing:
Address:
Phone/FAX:

Name: Ned Baier
Representing: Hillsborough County
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20th Floor. Tampa
Phone/FAX: 813-272-5849
FAX-272-5248

Name:
Representing:
Address:
Phone/FAX:

Tampa International Airport

Master Plan Update/Part 150 Study
MEMORANDUM

Date: February 10, 1999

To: Technical Working Group

From: Jeff Mishler, HNTB, Project Manager

Re: **TIA Master Plan/Part 150 Study**
Meeting #4 - Summary

On September 9, 1998 the fourth meeting of the Technical Working Group was conducted in the HCAA Board Room at Tampa International Airport. Nineteen (19) persons attended—12 invitees and 7 staff and consultant representatives. An attendance list is attached.

Nadine Jones, HCAA, made opening remarks and began the meeting by introducing Jeff Mishler. All meeting attendees received a copy of the noise abatement measures Technical Memorandum. Jeff explained that at the last meeting was focused on the terminal. This meeting would be devoted to noise issues, both noise abatement and land uses surrounding the airport property.

Ted Baldwin of HMMH gave a quick review of the noise abatement measures Technical Memorandum for understanding. Attendees were asked to review the Noise Abatement Measures Technical Memorandum document and asked to get back to Nadine Jones with any comments or concerns within 3 weeks. All members of the working group who were not present at this meeting will be mailed a copy of this document.

George Huffman of HNTB presented the land use compatibility analysis. He reported that careful review of the existing land use maps and field investigation of areas surrounding TPA reveal that 232 homes are currently located within the 65 dbl contour. There are certain types of land uses that are noise sensitive – i.e.) churches, schools, passive recreation and hospitals. The closest of these types of uses to TPA are two churches, both located within the 70 or higher noise contour. No single family structures exist within the 70 dbl or higher noise contour. However, there are a few areas with single family homes within the 65-70 dbl noise contour. Since the 1983 Part 150 study, approximately 1,168 residences have been eliminated from the noise contour. These findings demonstrate that TPA is implementing a successful program.

Ted Baldwin reviewed the recommendations from the 1997 TPA Part 150 study:

- Use southerly traffic flows whenever possible;
- Encourage turbo jet operations to use Air Transport Association (ATA) recommended noise abatement arrival procedures;
- Designate engine runup procedures;
- Augment vegetation noise barriers along the western perimeter of airport;
- Establish a helipad on the east side of airport.

Runway preference and airspace "gate" concepts were discussed. The group was referred to table 7 of the technical memorandum summarizing the recommended noise abatement alternatives for further consideration:

- preferential runway use;
- noise abatement cockpit procedures;
- runup noise control;
- noise abatement flight paths.

Clarification was given that although easing "restrictions" has been mentioned, the use of the word restriction is inaccurate. Pilot participation in the program is voluntary, not mandatory. The FAA has approved an "informal" runway use program. Any changes to this program will have to approved by FAA.

Questions/Comments:

Richard Houghton, Raytheon, asked if equal weight was given to 18L and 18R in this analysis? Does the tower review these documents? Ted Baldwin answered that the tower sets the runway priorities. The tower reviews these analyses and has an opportunity to comment as part of their membership on this working group.

Mark Wagner, Havatampa, offers that it appears that if pilots keep on the west side of the gate, there will be no impact on residences. Ted Baldwin answered that residences would be impacted. The diagrams in the Technical Memorandum show air carriers only, not corporate users.

Richard Houghton asks that if there were no monitors on the southeast side of the airport, how can we know there are unacceptable noise events occurring? Ted Baldwin offers that the community is quick to inform us of problems.

Mark Wagner offers that it would be helpful to have graphics that overlay arrival flight paths with departures.

Jeff Abbott offers that if the changes Ted Baldwin is discussing are implemented, the delays would be extreme.

Richard Houghton asks why the 411 Turboprop is not on the list? Ted Baldwin indicates that there are limitations to the model of aircraft he can select. He has to choose representative models of planes on the list.

Michael Beachler, Outback, asks about the possibility of designating an exclusive runway? Ted Baldwin indicates that you cannot discriminate against certain types of users. Segregation of air traffic can only be due to the noise level of aircraft.

Mark Wagner asks if a corporate jet traffic graphic could be prepared? Ted Baldwin answers yes, in fact, please review the documentation in detail and let staff know if there are any more analyses you feel are needed.

Enclosures: List of Attendees - Meeting #4

TPA
MASTER PLAN/PART 150 STUDY UPDATE

SIGN-IN SHEET

September 9, 1998
Technical Working Group
2:00 p.m.

(PLEASE PRINT)

Name: RICHARD A. HOUGHTON
Representing: HAVATAMPA INC.
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Phone/FAX:

Name: MARK WAGNER
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Name: JEFF ABBOTT
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Phone/FAX: 813-348-1553 FAX (1550)

Name: MIKE FAHLMARK
Representing: USPS
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~~813~~ TAMPA FL 33607
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F 877-8656

Name: MOLLY C. LEYDEN
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TPA
MASTER PLAN/PART 150 STUDY UPDATE

SIGN-IN SHEET

September 9, 1998
Technical Working Group
2:00 p.m.

(PLEASE PRINT)

Name: John Roeller
Representing: FDOT D-7
Address: 11201 N. MCKINLEY Dr.
Tampa, FL.
Phone/FAX:

Name: LADDIE IRION
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CAMPBELL CAUSEWAY
Phone/FAX: 286-1711
286-6587.

Name: Jo STEVENS
Representing: Avis Rent a Car
Address: TAmpa APT

Phone/FAX: Phon 813 396 3530
FAX 813 879 9872

Name:
Representing:
Address:

Phone/FAX:

Name: Kenneth L. Johnson
Representing: HCAA-OPS
Address: Tampa Int'l Airport

Phone/FAX: 870-8752

Name:
Representing:
Address:

Phone/FAX:

TPA
MASTER PLAN/PART 150 STUDY UPDATE

SIGN-IN SHEET

September 9, 1998
Technical Working Group
2:00 p.m.

(PLEASE PRINT)

Name: Michael Beauchlin
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Name: Dallas Belt
Representing: United Airlines
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Phone/FAX: (407)532-0546/(407)532-2548

Name:
Representing:
Address:

Phone/FAX:

Name:
Representing:
Address:

Phone/FAX:

Name:
Representing:
Address:

Phone/FAX:

Name:
Representing:
Address:

Phone/FAX:

Tampa International Airport

Master Plan Update/Part 150 Study
MEMORANDUM

Date: February 10, 1999

To: Community Input Group

From: Jeff Mishler, HNTB, Project Manager

Re: **TIA Master Plan/Part 150 Study Meeting #4 - Summary**

On September 9, 1998 the fourth meeting of the Community Input Group was conducted in Higgins Hall at St. Lawrence Parish. Fifteen (15) persons attended—7 invitees and 8 staff and consultant representatives. An attendance list is attached.

Jeff Mishler, HNTB, made opening remarks and began the meeting by introducing Ted Baldwin. Jeff explained that at the last meeting the focus was on the terminal. This meeting would be devoted to noise issues, both noise abatement and land uses surrounding the airport property.

George Huffman of HNTB presented the land use compatibility analysis. He reported that careful review of the existing land use maps and field investigation of areas surrounding TPA reveal that 232 homes are currently located within the 65 dbl contour. There are certain types of land uses that are noise sensitive – i.e.) churches, schools, passive recreation and hospitals. The closest of these types of uses to TPA are two churches, both located within the 70 or higher noise contour. No single family structures exist within the 70 dbl or higher noise contour. However, there are a few areas with single family homes within the 65-70 dbl noise contour. Since the 1983 Part 150 study, approximately 1,168 residences have been eliminated from the noise contour. These findings demonstrate that TPA is implementing a successful program.

Ted Baldwin reviewed the noise abatement recommendations from the 1997 TPA Part 150 study:

- Use southerly traffic flows whenever possible;
- Encourage turbo jet operations to use Air Transport Association (ATA) recommended noise abatement arrival procedures;
- Designate engine runup procedures;
- Augment vegetation noise barriers along the western perimeter of airport;
- Establish a helipad on the east side of airport.

The following noise abatement alternatives are being recommended for further consideration:

- preferential runway use;
- noise abatement cockpit procedures;
- runup noise control;
- noise abatement flight paths.

Questions/Comments:

Q: What exactly is the vegetative barrier being referred to?
A: This barrier is located along the Veterans expressway and is composed of trees, shrubs, etc.

Q: Are you recommending removal of the barrier?
A: No, we are just recommending that it would be worth enhancing the vegetation that already exists.

Q: I am concerned that last evening I observed turboprops headed directly over my house (extremely low). I live in the Northwest Park Neighborhood.
A: We will check with the tower to find outwhat occurred.

Q: What angle do pilots take when arriving at TPA?
A: When reviewing data on 727s on 36L, most were well within 3 degrees upon arrival. Many were well above 3 degrees. It will be worthwhile to analyze the cost/benefit of a higher angle.

Q: Run-ups are still a problem, especially north and west of the airport.
A: Yes, we have been hearing complaints about runups from both the Town & Country and Drew Park neighborhoods. We are analyzing whether or not better orientation of aircraft will help reduce the noise associated withrunups. Atmospheric conditions have a big affect on this noise.

Q: Are aircraft getting smaller in size as a general rule? I am concerned that this trend will increase the number of flights taken to accommodate the same number of people.
A: Aircraft size is actually increasing. However, some markets do have regional carriers making the decision to go to smaller aircraft for certain flights.

Q: What if I buy a home near TPA, and later I am forced to leave due to zoning changes?
A: You will not have to move from your neighborhood as a result of TPA's growth. As has been demonstrated this evening, although TPA has a steady growth rate (3-4% per year), noise contours are shrinking around the airport.

Tampa International Airport

Master Plan Update/Part 150 Study
MEMORANDUM

Date: March 7, 1999

To: Agency Working Group

From: Jeff Mishler, HNTB, Project Manager

Re: **TIA Master Plan/Part 150 Study**
Meeting #5 (December 1, 1998) - Summary

On December 1, 1998 the fifth meeting of the Agency Working Group was conducted in the HCAA Board Room at Tampa International Airport. Twelve (12) persons attended–4 invitees and 8 staff and consultant representatives. An attendance list is attached.

Jeff Mishler, HNTB Corporation, welcomed the group and opened the meeting by introducing Ted Baldwin of HMMH. Ted presented the results of the second round of noise analysis alternatives. Six (6) noise abatement alternatives were detailed, each with differing effect on the population living within the noise contours. Alternatives to reduce "run-up" noise complaints (received from Dana Shores, Drew Park and areas north of TPA) were studied as well, with the benefit/costs of adding a run-up facility enclosure being discussed.

Recommendations for changes to TPA's noise abatement program include changes to:

- Preferential runway use (including a formal program to improve compliance and extending nighttime preferential to all aircraft types);
- Noise Abatement Cockpit procedures;
- Run-up noise control (including shared run-up enclosure on east side of airport);
- Noise Abatement Flight Paths (including prohibition of east base legs north of MacDill and departure turns greater than 20 degrees below 3,000 ft.).

Following an explanation these recommendations, Jeff Mishler reviewed airfield, air cargo and general aviation development concepts including a new west parallel, extension of 18L and 26R and lastly, use of the south end of the east parallel. He reported that it appears that the 2015-2020 is the time period in which TPA will need to address capacity issues.

The revised master plan layout includes improved taxiways, a new Spruce Street interchange (2005) and a shift of George Bean Parkway to the east. Remote surface parking and rental car expansion has also been identified but the phasing of these improvements has not yet been determined. Cargo operations are growing fast at TPA. Existing cargo operations, currently utilizing 25 acres, are expected to triple in 25 years. This growth would result in a need for a total of 90 acres in 2020. Identification of additional sites for cargo utilization is being examined.

Jeff reported that the master plan is moving along with refinement of the airport layout plan and development costs being the primary focus of the team's current efforts. Staff will continue to complete the Part 150 and Master Plan documentation and anticipate its completion by the end of March.

Enclosures: List of Attendees - Meeting #5

TIA
MASTER PLAN/PART 150 STUDY UPDATE

SIGN-IN SHEET

December 1, 1998
Agency Working Group
10:00 a.m.

(PLEASE PRINT)

Name: Tom Whalen
Representing: St. Petersburg City Administration
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St. Petersburg, FL 33701
Phone/FAX: (727) 893-7883

Name: Jim Cloar
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Address:
Phone/FAX:

Name: Teri Fox
Representing: Westshore Alliance
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Phone/FAX: 289-5488 - FAX 257-6727

Name: Taha Ataya
Representing: City of Tampa
Address: 306 E. Jackson
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Name:
Representing:
Address:
Phone/FAX:

Name:
Representing:
Address:
Phone/FAX:

Tampa International Airport

Master Plan Update/Part 150 Study
MEMORANDUM

Date: March 7, 1999

To: Technical Working Group

From: Jeff Mishler, HNTB, Project Manager

Re: **TIA Master Plan/Part 150 Study**
Meeting #5 (December 1, 1998) - Summary

On December 1, 1998 the fifth meeting of the Technical Working Group was conducted in the HCAA Board Room at Tampa International Airport. Eighteen (18) persons attended--13 invitees and 10 staff and consultant representatives. An attendance list is attached.

Jeff Mishler, HNTB Corporation, welcomed the group and opened the meeting by introducing Ted Baldwin of HMMH. Ted presented the results of the second round of noise analysis alternatives. Six (6) noise abatement alternatives were detailed, each with differing effect on the population living within the noise contours. Alternatives to reduce "run-up" noise complaints (received from Dana Shores, Drew Park and areas north of TPA) were studied as well, with the benefit/costs of adding a run-up facility enclosure being discussed.

Recommendations for changes to TPA's noise abatement program include changes to:

- Preferential runway use (including a formal program to improve compliance and extending nighttime preferential to all aircraft types);
- Noise Abatement Cockpit procedures;
- Run-up noise control (including shared run-up enclosure on east side of airport);
- Noise Abatement Flight Paths (including prohibition of east base legs north of MacDill and departure turns greater than 20 degrees below 3,000 ft.).

Following an explanation these recommendations, Jeff Mishler reviewed airfield, air cargo and general aviation development concepts including a new west parallel, extension of 18L and 26R and lastly, use of the south end of the east parallel. He reported that it appears that the 2015-2020 is the time period in which TPA will need to address capacity issues.

The revised master plan layout includes improved taxiways, a new Spruce Street interchange (2005) and a shift of George Bean Parkway to the east. Remote surface parking and rental car expansion has also been identified but the phasing of these improvements has not yet been determined. Cargo operations are growing fast at TPA. Existing cargo operations, currently utilizing 25 acres, are expected to triple in 25 years. This growth would result in a need for a total of 90 acres in 2020. Identification of additional sites for cargo utilization is being examined.

Jeff reported that the master plan is moving along with refinement of the airport layout plan and development costs being the primary focus of the team's current efforts. Staff will continue to complete the Part 150 and Master Plan documentation and anticipate its completion by the end of March.

Questions/Comments:

Q: As a result of these recommended programs, will we see an increase in larger traffic?
A: No, if we can get this program operating as we would like, traffic conflicts may actually decrease.

Q: What is the percentage of corporate aircraft that take off during the day? Would it be possible to add a sign that tells users to abide by the noise abatement procedures?
A: The percentage of corporate aircraft that take off during the day is very small. We do have these types of signs, but it is difficult to enforce things such as climb gradients.

Q: Are you proposing that the program currently in effect at TPA become formal? I am concerned about discrimination against certain types of aircraft.
A: Yes, we are proposing a formal program. It should be noted that he program in effect now does not treat all aircraft equally. This proposal may tie down some specific requirements, thereby decreasing some of the inequities.

Q: Is it possible we would be required to complete an Environmental Assessment?
A: It is possible, but at this point it would only be a formality.

Q: Who be responsible for approving the changes you are proposing?
A: The Hillsborough County Aviation Authority (HCAA) would have to approve the program. HCAA would then recommend approval to the Federal Aviation Administration (FAA). The FAA has 180 days to review the request.

Enclosures: List of Attendees - Meeting #5

TPA
MASTER PLAN/PART 150 STUDY UPDATE

SIGN-IN SHEET

December 1, 1998
Technical Working Group
1:00 p.m.

(PLEASE PRINT)

Name: RICHARD HOUGHTON
Representing: HAVATAMPA INC. + NBAA
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Phone/FAX: (813) 621-3595

Name: Michael Beachlin
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Name: Dallas Belt
Representing: United Airlines
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Phone/FAX: (407) 532-0596/ 2511

Name: Vic Slacta
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Phone/FAX: 941-727-8034/941-727-9134

Name: Gary Dempsey
Representing: Raytheon Aircraft Services
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Phone/FAX: 813-874-1542

Name: Jeff Abbott
Representing: TAMPA TOWER FAA
Address: Tampa Int'l Airport

Phone/FAX: 813-371-7702

TPA
MASTER PLAN/PART 150 STUDY UPDATE

SIGN-IN SHEET

December 1, 1998
Technical Working Group
1:00 p.m.

(PLEASE PRINT)

Name: Wayne Boggs
Representing: TAMPA TOWER
Address: FAA ATCT
TAMPA INTERNATIONAL A/P
Phone/FAX: 813 371 7705

Name: Steve Callaway
Representing: Delta Air Lines
Address:
Phone/FAX: 404-715-2261 / FAX 404-715-254

* Add to CIG list
Name: Joel Toro
Representing: Homeowner
Address: 5108 W Cleveland St
Tampa Fl 33609
Phone/FAX: 2860419

Name:
Representing:
Address:
Phone/FAX:

* Add to CIG list
Name: JEFFREY SHIDLER
Representing: HOMEOWNER
Address: 5105 W. CLEVELAND ST.
TAMPA FL 33609
Phone/FAX: 288-0212 288-0364

Name:
Representing:
Address:
Phone/FAX:

TPA
MASTER PLAN/PART 150 STUDY UPDATE

SIGN-IN SHEET

December 1, 1998
Technical Working Group
1:00 p.m.

(PLEASE PRINT)

Name: Dan Dill / Dave Maliszewski | Name:
Representing: MAC Aviation | Representing:
Address: 2450 N. Westshore Blvd Suite 205A | Address:
Tampa, FL 33607
Phone/FAX: (813) 354-8100 / 354-8003 | Phone/FAX:

Name: DAVE GALLAGHER | Name:
Representing: TRANSWORLD AVIATION | Representing:
Address: 4908 LAKE JULIANA RES. | Address:
Auburndale FL 33823
Phone/FAX: 941-984-4866 | Phone/FAX:

Name: Michael Thompson | Name:
Representing: ORSGreiner / SPCIA | Representing:
Address: 7650 Courtney Campbell Cswy | Address:
Tampa, FL
Phone/FAX: 813 286-1711 | Phone/FAX:

Tampa International Airport

Master Plan Update/Part 150 Study
MEMORANDUM

Date: March 7, 1999

To: Community Input Group

From: Jeff Mishler, HNTB, Project Manager

Re: **TIA Master Plan/Part 150 Study**
Meeting #5 (December 1, 1998) - Summary

On December 1, 1998 the fifth meeting of the Community Input Group was conducted in Higgins Hall at St. Lawrence Parish. Eighteen (18) persons attended–14 invitees and 8 staff and consultant representatives. An attendance list is attached.

Jeff Mishler, HNTB Corporation, welcomed the group and opened the meeting by introducing Ted Baldwin of HMMH. Ted presented the results of the second round of noise analysis alternatives. Six (6) noise abatement alternatives were detailed, each with differing effect on the population living within the noise contours. Alternatives to reduce "run-up" noise complaints (received from Dana Shores, Drew Park and areas north of TPA) were studied as well, with the benefit/costs of adding a run-up facility enclosure being discussed.

Recommendations for changes to TPA's noise abatement program include changes to:

- Preferential runway use (including a formal program to improve compliance and extending nighttime preferential to all aircraft types);
- Noise Abatement Cockpit procedures;
- Run-up noise control (including shared run-up enclosure on east side of airport);
- Noise Abatement Flight Paths (including prohibition of east base legs north of MacDill and departure turns greater than 20 degrees below 3,000 ft.).

Following an explanation these recommendations, Jeff Mishler reviewed airfield, air cargo and general aviation development concepts including a new west parallel, extension of 18L and 26R and lastly, use of the south end of the east parallel. He reported that it appears that the 2015-2020 is the time period in which TPA will need to address capacity issues.

The revised master plan layout includes improved taxiways, a new Spruce Street interchange (2005) and a shift of George Bean Parkway to the east. Remote surface parking and rental car expansion has also been identified but the phasing of these improvements has not yet been determined. Cargo operations are growing fast at TPA. Existing cargo operations, currently utilizing 25 acres, are expected to triple in 25 years. This growth would result in a need for a total of 90 acres in 2020. Identification of additional sites for cargo utilization is being examined.

Jeff reported that the master plan is moving along with refinement of the airport layout plan and development costs being the primary focus of the team's current efforts. Staff will continue to complete the Part 150 and Master Plan documentation and anticipate its completion by the end of March.

Questions/Comments:

Margaret Vizzi, Beach Park, reports that noise is still a problem for many homes, particularly the arrival flights. She is concerned that the "numbers" reported this evening are skewed and paint "too good" a picture. Louis Miller explained that compliance with noise abatement measures has greatly decreased. The study's recommendation for formalizing the noise abatement program will help this situation. Margaret asks that it be put in writing that the final choice is up to the pilot.

Ben Nelson offers that he thinks local pilots are creating the noise problem (not the airlines). Pilot technique is to blame for the majority of noise problems experienced.

Ken Hoyt asks what happens to TPA in 2050? Can we expect to be out of capacity at that point? Bill Connors explains that the projections presented tonight are based on using today's data. Technology can change dramatically in fifty years. Therefore, we cannot accurately predict needs for that far in the future.

A representative of Arturo's Moving, a company located in the Drew Park Acquisition Area asks if there is a time frame for the acquisition of properties in the Drew Park area. Bill Connors explains that at this point in time, acquisition is on a voluntary basis only. There is no set timeline for acquiring Drew Park properties. Discussion followed regarding how appraisals are determined for these properties and concerns regarding decreasing property values in the area. Property owners interested in getting more information about the acquisition area were invited to contact Chris Hardman, HCAA Properties and Contracts (870-8700).

Enclosures: List of Attendees - Meeting #5

TPA
MASTER PLAN/PART 150 STUDY UPDATE

SIGN-IN SHEET

December 1, 1998
Community Input Group
6:00 p.m.

(PLEASE PRINT)

Name: MARGARet R. Vizzi
Representing: BPHA
Address: 213 So. SHERRill St.
TAMPA, Fl 33609
Phone/FAX: 2860980

Name: BOB HENNESSY
Representing: N W PARK
Address: 6573 JOHNS DT
TAMPA
Phone/FAX: 884-8326

Name: Ray Royster
Representing:
Address: PO BOX 151195
Tampa Fl
Phone/FAX: 690 4272

Name: Jack Reno
Representing: [illegible]
Address: 4208 N. TRASK
Phone/FAX: 813 8737492 8737582

Name: Danny Carrero
Representing: Arthur's Moving Comp
Address: 4101 N Westshore Blvd
Tampa, Fl 33614
Phone/FAX: 876-6919

Name:
Representing:
Address:
Phone/FAX:

TPA
MASTER PLAN/PART 150 STUDY UPDATE

SIGN-IN SHEET

December 1, 1998
Community Input Group
6:00 p.m.

(PLEASE PRINT)

Name: Nick Colmenarez
Representing: City of Tampa
Address: 306 E. Jackson St.
Tampa, FL 33602
Phone/FAX: 274-8152

Name: Tom Jones
Representing: Plantation HOA
Address: 11380 Brookgreen Dr
Tampa, FL 33624
Phone/FAX: 969-3991

Name: Ed Crease
Representing: T-C Alliance
Address: 4812 Wynnwood Dr.
Tampa FL 33615
Phone/FAX: 884-1530

Name: Paul Steele
Representing: Carrollwood Village
Address: 13721 Halliford Drive
Tampa, Fl 33624
Phone/FAX: 962-2418

Name: Ben Nelson
Representing: Self
Address: 4923 St. Croix Dr
Tampa, FL 33629
Phone/FAX: 289-9092

Name: Ken Hoyt
Representing:
Address:

Phone/FAX:

TPA
MASTER PLAN/PART 150 STUDY UPDATE

SIGN-IN SHEET

December 1, 1998
Community Input Group
6:00 p.m.

(PLEASE PRINT)

Name: ARTIE CARRENO
Representing: ARTURO'S MOVING
Address: 4104 N. WESTSHORE BLVD

Phone/FAX:

Name: RC ELDRIDGE
Representing: TWELVE OAKS SPECIAL DISTRICT
Address:

Phone/FAX:

Name:
Representing:
Address:

Phone/FAX:

Name: DOUG COTTON
Representing:
Address: 4616 SAN MIGUEL
TAMPA, FLA
Phone/FAX: 251-590
251-3046-FAX

Name:
Representing:
Address:

Phone/FAX:

Name:
Representing:
Address:

Phone/FAX:

APPENDIX H

Public Information Workshops

Public Information Workshop # 1

TPA Master Plan/Part 150 Update
Public Workshop #1
October 22, 1998

DRAFT

The first workshop for the TPA Master Plan/Part 150 update was held on October 22, 1998 from 6:00 to 8:00 p.m. in Higgins Hall at St. Lawrence Parish. Guests were given a handout at the door containing information about the project, the purpose of the workshop, what happens next and a comment form. Approximately twenty-seven (27) persons from the public attended (see attached sign-in sheet). Eleven (11) staff members were present. The meeting was held in an open-house format with information stations set around the room for public review. Staff members were available at these stations to answer questions. Six different information stations were presented:

1. Overview;
2. Forecast;
3. Airfield Requirements/Terminal Requirements;
4. Terminal Concepts/Airfield Concepts;
5. Land Use; and,
6. Noise Abatement.

Louis Miller gave an overall project presentation at 7:00 p.m. Jeff Mishler introduced the project team and discussed the information stations available as well as the schedule for proceeding through the Master Planning process. Participants were invited to fill out the comment form located in the packet of information that was handed out at the front door. No comment forms were received that evening or subsequently in the mail. However, there was public discussion after the presentation conclusion. The following is a summary of the public comment/concerns:

Q: Are there any plans to add more cars to Airside C? It seems this area in particular is always in need of additional back-up.

A: Yes, we are looking at this possibility. The master plan will address these types of needs for all areas of the airport.

Q: Will the HCAA ever levy a tax on citizens to fund the Year 2020 improvements that will be necessary?

A: No, the HCAA does not anticipate that levying a tax will ever be necessary since the HCAA has other methods of financing development at the airport.

Q: Will the HCAA continue to have and encourage disadvantaged business enterprise (DBE) participation in the development program?

A: Yes, the HCAA is very committed to ensuring this type of participation.

Q: Is there any intention to expand the East/West runway? I am curious because the HCAA purchased $20 million in property on the east side of airport. Why?

A: There are plans to extend the east/west runway. It is necessary because the runway does not meet the standards for air carrier use. The extension is not needed for capacity at this time.

Q: Arturo's Moving Company is a business located in the acquisition area. Do you have plans to close the road we are utilizing?

A: We have not yet determined the timeframe for developing in Drew Park. This will be based on demand or a company being interested in a new facility in Drew Park. We have no idea when acquisition will be completed because land is being purchased on a voluntary basis.

Q: What about the use of parking facilities for the Stadium? I have seen newspaper articles about this. Who will pay for it?

A: Yes, we have had discussions about this possibility. The developers of the lot will incur the costs. It is anticipated that they will use the property only 10 times per year.

...dies and ending with ...ondo a la turque. She ...a couple of popular

...tle. It's really evocative of Ravel's sensibility."

Walsh, who won the Munich International Piano Competition, ... get past the sort of doldrums of early middle age, there is more of a market for a mature woman pianist than there was for someone who was 35."

... that he uses."

Walsh's recital is at 8 p.m. Saturday at Tarpon Springs Performing Arts Center. Tickets are $10 and $12. Call (813) 942-5605.

Holiday begins tonight ...wntown Clearwater

...h annual Clearwater ... kicks off at 6 p.m. ...chman Park in downtown ...ater with the **Bobby** ...Trio, followed by ...guitarist **Duke Robil**... p.m. and the **Count** ...estra at 9:15 p.m. Ad...ee, and fans are en...oring lawn chairs and ...olers are permitted, ...holic beverages may ...ht in.

Albert meets Fox

Marv Albert and Michael J. Fox will bump into each other at Madison Square Garden on an episode of *Spin City*. It should be an easy role for the sportscaster — he will play himself. The episode hasn't been shot and an air date hasn't been set. Albert's career as an NBA play-by-play man collapsed last year after he pleaded guilty to biting a lover. But he landed a job last month with cable's MSG network.

Cash hospitalized

Johnny Cash is back in the hospital for a check on his medication for a nervous-system disorder. The 66-year-old country star has Shy-Drager syndrome, a disease in the Parkinson's family. He was admitted Monday to Baptist Hospital. Cash was released from Baptist on Oct. 2 after a week and a half for treatment for pneumonia.

Johnny Cash

Riverjam features jazz

Smooth jazz group **Spyro Gyra** will headline a free concert tonight at Curtis Hixon Park in downtown Tampa as part of the Downtown Riverjam music series. The concert is 5-9 p.m.

Mall surprise

Attention shoppers, **Garth Brooks** in the rotunda! The country star surprised **Trisha Yearwood** at the Mall of America in Minneapolis on Monday by stepping out of a crowd as she signed autographs and breaking into song. The pair did two duets before 5,000 screaming fans. Yearwood has been opening for Brooks, and the two were in town for sold-out shows at the Target Center in nearby Minneapolis.

...Williams

...Solved

SAME / ALEX / NANA / ...ADIUM / ...ER / ...RAFTS / ...EWE / SNEE / ...HEWED / ...ALADY / ...LY / PFC / HALL / AREA / SKEW

10/15/98

...er Brown's

...Mahal site ...cluding ...cal section ...and valley ...or Robert ...dessert? ...cted

...les@aol.com

12 13

Tampa International Airport

PUBLIC WORKSHOP NOTICE

Master Plan / Part 150 Study

A COMMITMENT TO EXCELLENCE:

Taking TPA Into the 21st Century

Date: October 22, 1998

Time: 6:00 - 8:00 PM, Open House
(7:00 PM - Overview Presentation)

Place: Higgins Hall at St. Lawrence Parish
5225 North Himes Avenue - Tampa

This is your chance to express your ideas and concerns.
Please plan to stop by and learn about our progress and give us your input.
For more information call (813) 615-1319.

Public Information Workshop # 2

Tampa International Airport®

PUBLIC WORKSHOP NOTICE

Master Plan / Part 150 Study

A COMMITMENT TO EXCELLENCE:

Taking TPA Into the 21st Century

Date: September 1, 1999

Time: 6:00 - 8:00 PM, Open House
(7:00 PM - Overview Presentation)

Place: Jefferson High School Auditorium
4401 West Cypress Street - Tampa

This is your chance to express your ideas and concerns.
Please plan to stop by and learn about our progress and give us your input.
For more information call (813) 615-1319.

APPENDIX I

Newsletters

Horizon 2020

Volume I

Tampa International Airport

HORIZON 2020
COMMITMENT TO EXCELLENCE:
Taking TPA Into the 21st Century

Issue 1 NEWSLETTER October 1997

TPA Planning Program Update Underway

The current Tampa International Airport (TPA) Master Plan, approved in 1990, has guided airport development during the past decade, but major changes in the aviation industry necessitate a re-examination of the development plan. The new Master Plan is being prepared to provide a comprehensive development program for TPA into the 21st century. This will enable TPA to respond to business opportunities as they arise, maintain its economic leadership role in the region, and continue to serve as a positive factor in regional economic decisions. TPA is important to the economic well-being of the Tampa Bay Region in two ways. First, the Airport and its support services and industries provide employment, purchase local goods and services, and add to local and state revenue. Second, the Airport serves as a major component of the region's transportation network, facilitating the movement of people and goods into and out of the community and thereby stimulating the local economy.

IN THIS ISSUE

What is a Master Plan?

The Hillsborough County Aviation Authority (HCAA) has begun an 18-month process to update the Master Plan and Federal Aviation Regulation Part 150 Noise Compatibility Program for TPA. An airport master plan is a blueprint for development of all the facilities within an airport, from runways to buildings to ticket counters. The objectives of the TPA Master Plan are to project the number of passengers who will use the Airport and the number of aircraft operations, assess the facilities needed to accommodate this activity, and investigate alternatives to meet these needs. "The Master Plan process will result in a long range plan for meeting the region's growing demand for air travel," said Louis E. Miller, Executive Director, HCAA. "We look forward to the future growth of the air transportation system to meet the needs of Airport customers; while at the same time, we want to make sure our plans are compatible with those of the community we serve."

What is a Part 150 Study?

A noise compatibility study (F.A.R. Part 150 Study) will be conducted at the same time as the Master Plan Study to address the compatibility of the Airport with its neighbors, specifically in the area of airport noise. A noise compatibility study is a specialized study and plan intended to promote aircraft noise control and land use compatibility. According to Miller, "Through the Part 150 Program we will do everything possible to ensure that the Airport remains a good neighbor as it develops in the future."

Did You Know?

Passengers in 1996:
13 Million

Cargo Handled in 1996:
173.3 Million lbs.

Mail Handled in 1996:
98.8 Million lbs.

Long Term Parking: 8,000 Cars *

Short Term Parking: 3,650 Cars

* Effective November 1997

Who is Conducting the Study?

The Master Plan will be conducted by the Hillsborough County Aviation Authority with technical assistance from a team of expert firms specializing in airport planning, financial planning, and environmental analysis led by HNTB Corporation. Nadine Jones is the Authority's Project Manager for these studies. Harris Miller Miller and Hanson, Inc. will assist in the development of the Part 150 Update and study the noise impacts of various Airport development concepts. Camp Dresser & McKee, Inc. will analyze potential environmental impacts. The Airport's future people mover system requirements will be addressed by Lea+Elliott. Financial planning will be conducted by Aviation Resource Partners, Inc. Pierce Goodwin Alexander & Linville, Inc. will detail the phasing of the Master Plan. Public and agency involvement will be coordinated locally by Ratliff & Associates, Inc.

NEIGHBORHOODS REPRESENTED

Twenty-five neighborhood associations have been invited to send representatives to the Community Input Group. These include:

Bay Crest Civic Assoc.
Bay Pointe Condo Assoc.
Beach Park
Beach Park Isles
Burnbrook Homeowners Assoc.
Carrollwood Oaks Property Owners Assoc.
Carrollwood Village - Phase 2
Carver City/Lincoln Gardens
Culbreath Bayou
Culbreath Isles
Dana Shores Civic Association
Drew Park Property League
Grove Park Civic Assoc.
Lake Eqypt Civic Assoc.
North Bon Air
North West Park Homeowners Assoc.
Pelican Island Civic Assoc.
Plantation Homeowners, Inc.
Sunset Park
Sweetwater Homeowners Assoc.
Twelve Oaks Civic Assoc.
Twelve Oaks Special District
Twin Lakes
Village of Cypress Bend
Village South Civic Assoc.
Village West Homeowners Assoc.
Westshore Palms

Opportunities for Input

The participation of various public agencies and private interests will be coordinated through three different representative groups: a Technical Working Group; an Agency Working Group; and, a Community Input Group.

Community Input Group held kick-off meeting in September.

These three working groups include representatives from:

- ***Airlines and Tenants***
- ***Business Community***
- ***Federal Aviation Administration***
- ***Florida Department of Transportation***
- ***Local City and County Agencies***
- ***Neighborhood Representatives***
- ***Policymakers***

Kickoff meetings for the Technical and Agency Working Groups were held in early August. The Community Input Group met in September. The study team welcomes the input of local citizens. Not only airport officials and users, but all interested citizens may participate in the development of the master plan and the noise compatibility program. As an individual, as a member of a group, or through your elected officials, you are invited to contribute your thoughts. During the course of the 18 month study, 3 to 5 public meetings will be held, giving you, as a private citizen, the chance to express your ideas and concerns, to help ensure that the study is more responsive to the community. Advance notice of these meetings will appear in your local newspapers and you are encouraged to attend.

Study Goals

- Continue to meet and enhance the existing high level of service for passengers, the community and other users.
- Provide an airport that is safe and reliable.
- Minimize costs to all users of the Airport.
- Ensure convenient ground access to the Airport.
- Develop the Airport in a manner which is flexible and adaptable to changing conditions.
- Reduce, to the extent feasible, the impact of aircraft noise on neighboring residents and noise-sensitive land uses through noise abatement and noise mitigation.
- Promote the development of compatible land uses in undeveloped areas expected to remain impacted by high noise levels.
- Develop the Airport and Airport vicinity to minimize and reduce environmental effects.
- Develop an airport that supports local and regional economic goals and plans while providing the flexibility to accommodate new opportunities and growth.
- Develop an airport that is consistent with Federal, State, regional and local plans.
- Build and maintain public confidence.

Noise Monitoring Program

Although Part 150 studies are voluntary, airports realize the value of determining potential aircraft noise impacts. The noise analysis requirement under the Federal regulations governing how noise studies are to be conducted include noise exposure maps for a base year (1997) and five year (2002) forecast conditions. The regulations do not require any noise measurements. However, the Hillsborough County Aviation Authority and the project team believe that collecting noise measurement data serves at least three important purposes:

(1) They provide information on a diverse range of representative aircraft noise events, including takeoffs and landings, fixed-wing and helicopter operations, overflights and runups.

(2) They provide information on non-aircraft noise events and "background" (ambient) noise levels in the community, as a basis for comparison to airport-related noise.

(3) They provide a sample of noise exposure measurements for comparison to the noise model.

An important element of the data base for the FAR Part 150 noise study is a week of noise measurements taken in communities around the Airport. The measurements are scheduled for October 15 through 22.

The noise monitoring program will involve the use of three computerized portable noise monitors that can operate independently 24-hours per day. The monitors are approximately the size of a large "bread box", with a cable to a tripod-mounted microphone, approximately 5 feet in height. A project team member will be stationed at each monitor for extended periods to photograph aircraft overflights and log information on aircraft and non-aircraft noise-producing activity. The monitors will collect noise information whether or not a person is stationed at the site. The project team will also collect radar data for the measurement period to correlate aircraft operations with noise events.

The project team described the measurement program at the first Community Input Group meeting on September 8. Community representatives provided valuable input on noise monitoring site selection. The project team anticipates that measurements will be conducted at 12 to 15 locations for periods ranging from several hours to two or three days.

Citizens who are interested in observing the measurements and providing input on potential monitoring locations are asked to call Georgianne Ratliff at (813) 899-2011.

Upcoming ACTIVITIES

October	Noise Monitoring (15th - 22nd)
	Passenger Survey (16th - 23rd)
November	Forecasting

PLEASE CALL TO CONFIRM & RECEIVE AN UPDATE OF ALL SCHEDULED MEETINGS AND TOPICS **(813) 899-2011**

Ratliff & Associates, Inc.
Universal Square, Suite C
6610 East Fowler Avenue
Tampa, Florida 33617

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HORIZON 2020

COMMITMENT TO EXCELLENCE:

Taking TPA Into the 21st Century

☐ Yes, I want to receive the Master Plan / Part 150 Study Newsletter.

☐ Please check if your address has changed

Name: ____________________

Address: ____________________

City: __________ State: __________ Zip: __________

Area Code/Phone: ____________________

Suggestions or comments? ____________________

Prior issues of the Horizon 2020 are available upon request at no charge. Please clip and return to: Ratliff & Associates, Inc., Universal Square, Suite C, 6610 E. Fowler Avenue, Tampa, FL 33617

Where Can You Get More Information?

For specific information on the progress of the study, please contact Georgianne Ratliff at (813) 899-2011. If you prefer, send written requests to:

TPA Master Plan/Part 150 Study
c/o Ratliff & Associates, Inc.
6610 E. Fowler Ave., Suite C
Tampa, Florida 33617
Fax: (813) 899-2207
e-mail: randa@gte.net

or contact Nadine Jones (813) 870-8773 at the Hillsborough County Aviation Authority Offices located in the Landside Terminal, 3rd Level-Blue Side between 8:30 a.m. and 5:00 p.m. any weekday.

Horizon 2020

Volume II

Tampa International Airport

HORIZON 2020
COMMITMENT TO EXCELLENCE:
Taking TPA Into the 21st Century

Issue II | NEWSLETTER | January 1998

Passenger and Employee Survey Results

As part of the Master Plan Update Process, both a passenger survey and an Airport employee survey were conducted during the Fall. The purpose of these surveys was to obtain information on passenger and employee travel characteristics. The data will be used to help plan future Airport facilities and to help identify ways of increasing transit use by Airport passengers and employees.

IN THIS ISSUE

Passenger Survey

A random sample of 1,200 passengers was surveyed during a one week period to collect information on passenger travel characteristics. This sample is statistically significant and has a sampling error of plus or minus 3 percentage points. Key findings are described below:

- Approximately 36 percent of passengers began their ground trip to the Airport from within the City of Tampa; 11 percent from St. Petersburg; and 9 percent from Clearwater.
- Most passengers are visitors to the region traveling on vacation or personal matters. About six-in-ten passengers were visitors (as opposed to residents); and 37 percent of passengers were traveling on business.
- About half of all passengers drove (or were driven) in a private vehicle to the Airport; one-in-four took a rental car; about 5 percent took a taxi. Six percent arrived by hotel/motel courtesy car; and 7 percent arrived by airport limousine. Less than 0.1 percent of surveyed passengers reported using public transit.
- The great majority of comments offered by survey respondents were favorable. The high level of positive comments is unique to Tampa International Airport. Sample responses include: "Fantastic," "Best Airport in the country," and "I love the Airport."

Employee Survey

There are over 8,000 employees working at the Airport. As part of the Master Plan Update effort, an analysis will determine if employees could benefit from improved mass transit service, and if doing so, congestion along local highways could be reduced. The employee survey was the first step in this analysis.

The purpose of the survey was to establish employee travel patterns, including where they live, where on the Airport they work, their work schedule, and schedule flexibility. This information will help determine how many employees would choose transit over using their own car. (Nearly 94 percent of the Airport employees drive alone to work.)

A representative sample of over 2,000 employees responded to the survey. The results suggest that it may be difficult to encourage a significant number of employees to switch to transit. The reasons are listed below:

- Employees live in many areas of the Tampa-Bay region and work in different areas of the Airport. Forty-four percent live outside the City of Tampa; and 44 percent do not work at either the Landside or Airside Terminals, but at the cargo center, airline maintenance bases, general aviation terminal, or U.S. Post Office.
- Forty-five percent of Airport employees report to work on the weekend.

Continued on Page 5

Aviation Authority Invited to Address Beach Park Group

As part of the on-going public information program for the Airport Master Plan and Part 150 Study, Aviation Authority officials are available to speak to any interested community or neighborhood association. On October 14th, Louis E. Miller, Executive Director and Nadine S. Jones, Director of Planning and Environmental Services, conducted a presentation on the master plan and noise study process before eighty residents at the annual meeting of the Beach Park Homeowners Association. Representatives from Harris Miller Miller & Hanson, Inc., the Aviation Authority's acoustical consultants conducting the noise study, were also present. The following is a summary of the questions and answers.

Q: What is the timing and impact of the new third parallel runway?

A: This runway is to the west of existing runway 18 Right / 36 Left and parallels the Veterans Expressway and Eisenhower Blvd. The work that is being conducted under the current master plan will determine when this runway is needed based on forecast demand. Our Part 150 Study will identify potential noise impacts (if any) and recommend mitigation measures. On a preliminary basis we feel that operation of this new runway will help to reduce noise impacts over residential areas.

Q: Given that the new runway is being constructed so close to the existing runway (18 Right/36 Left), won't this result in the east runway (18 Left/36 Right) having to be used by jet aircraft again?

A: It will be used on a limited basis during construction of the new runway; however, we will work with all affected parties to determine how to limit the noise impacts to the extent that we can. For example, we were able to reduce the construction time during the recent runway construction work by offering the contractors financial incentives.

Q: It is my understanding that some of the airports in California use aircraft departure profiles to reduce noise in communities near airports?

A: Noise abatement departure profiles are a promising area for noise abatement. We have already requested that our consultants consider them in the noise study. In addition to the potential for noise abatement, the consultants must assess the airspace operational implications of the procedures, to ensure that they do not affect airport safety and to determine if there are impacts on airport capacity.

Q: Will aircraft that haven't installed engine hush kits to reduce noise levels by the United States Department of Transportation's December 31, 1999, deadline be allowed to operate at Tampa International?

A: No, unless the USDOT were to grant extensions and that is doubtful. We also expect that every aircraft operating at the Airport will meet the Federal noise standards by 2000, either by original design and construction, or through "hushkits".

Noise Levels Measured

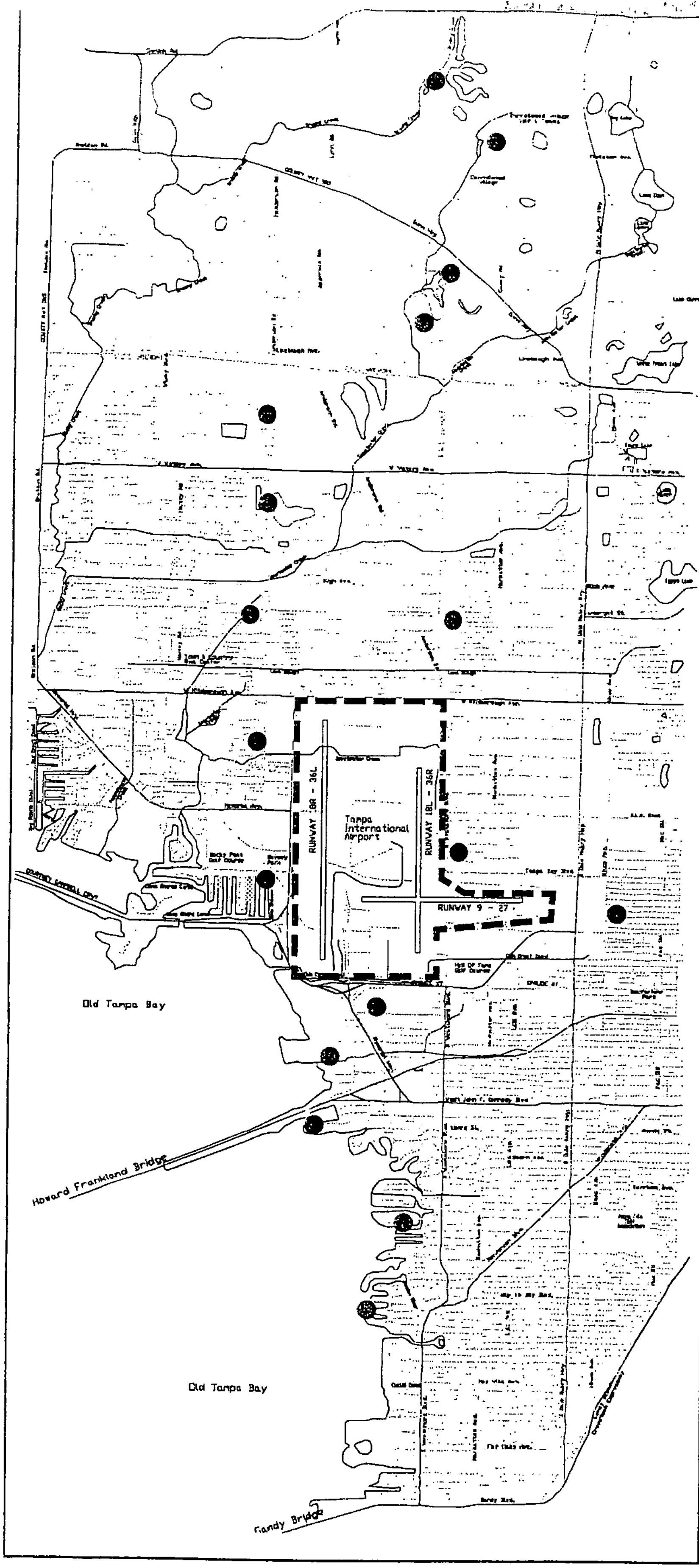
Consulting team staff conducted noise measurements around the Airport on October 14 - 21, 1997, as part of the database development for the Part 150 Noise Exposure Map and Noise Compatibility Program Update. The measurement program substantially exceeded Part 150 requirements established by the Federal Aviation Administration, and will provide valuable information for describing, analyzing, and improving noise issues.

Over 400 hours of measurements were conducted at 17 locations. The figure on page 3 depicts these locations.

Measurement locations were selected based on input received at the first Community Input Group meeting, on September 9, 1997. Sites were selected to provide representative information on a diverse range of aircraft activity in noise-sensitive areas on all sides of the airport. The sites were largely clustered under major flight corridors north and south of the airport, where aircraft overflights are the primary concern.

Additional locations were selected close to the airport, on the east and west, where communities are largely affected by noise from on-airport activity.

The measurements were conducted with four sets of instruments. Three of the instrument sets utilized portable noise monitors that permit extended unattended measurement of individual noise events and of cumulative noise exposure over hourly and daily time periods. The fourth instrument set utilized a hand-held sound level meter for measurement of individual noise events, and short term measurement of cumulative exposure.



Consulting team members spent the daylight hours conducting observations at the monitoring locations, to log the noise-producing aircraft and non-aircraft activity.

Single event measurements will provide us with a basis for understanding typical noise levels for different types of operations (such as landings, takeoffs, maintenance runups, and overflights), and for comparing the relative noisiness of different aircraft types. Cumulative exposure measurements will provide us with a basis for comparing actual measured data to noise modeling results, and for evaluating the overall compatibility of the noise levels with land uses.

We greatly appreciate the cooperation of residents in providing us with access to their yards for the measurement sessions.

Measurement results will be presented at Working Group and Community Input Group meetings in early 1998. The study documentation will present the measurement results in graphical form, with detailed technical discussion. Study team members will also present the results at public workshops held throughout the study process. Those workshops will provide an opportunity for one-on-one discussion of the measurement results of greatest interest to attendees.

Over 400 Hours of measurements were conducted at 17 Locations.

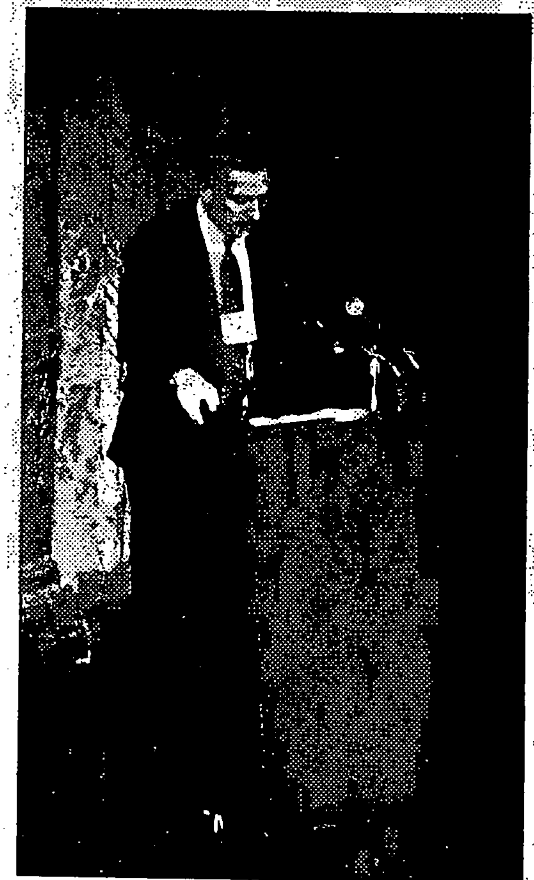
● – Noise Monitoring Location

▬ ▬ ▬ – Tampa International Airport

1997 Tampa Transportation Town Meeting

On October 24th the Tampa Downtown Partnership and HARTline held their annual town meeting to provide a forum for policy makers and transportation officials to discuss current and future regional transportation projects. The meeting was open to the public and held at the beautiful and historic Tampa Theater.

Louis E. Miller, Executive Director of the Hillsborough County Aviation Authority, was one of the transportation officials who spoke. His topic was "Don't Limit Tampa International Airport Through Inadequate Surface Transportation". During his presentation, he described how the current master planning activities at Tampa International Airport were addressing many of the issues and options other speakers had identified for the future inter-modal opportunities. He stated, "Intensive urbanization of communities ultimately leads to roadway congestion. Rightly or wrongly, airports are seen as significant contributors to this congestion. However, from my perspective, roadway congestion creates delay for airport users and leads to poor customer service. Rail service is one option to create inter-modal opportunities at airports...if there is significant demand, we want to have appropriate airport facilities planned to accommodate this demand." In concluding his remarks, he stated that planning a viable, regional, inter-modal transportation system required the four "C's", they are:



- Connections;
- Choices;
- Coordination; and
- Cooperation

Tampa Transportation Town Meeting
October 24, 1997
Tampa Theater
Tampa, FL

Louis E. Miller, Executive Director of Hillsborough County Aviation Authority

Did You Know?

- There are over 8,000 employees working at TIA.
- TIA is the 5th largest employer in Hillsborough County.
- TIA encompasses approximately 3,300 acres of land.
- TIA terminal, parking and airside buildings contain over 5,000,0000 sq. ft.

Student Executive for a Day

As part of the University of Tampa's twelfth annual STUDENT EXECUTIVE FOR A DAY program, the Hillsborough County Aviation Authority invited a student to attend a "Forecast Expert Panel" session conducted at the Tampa International Airport Marriott. The purpose of the STUDENT EXECUTIVE FOR A DAY program is to offer business students the opportunity to visit a company or agency for a day to gain knowledge about how it is managed. As part of the program, University of Tampa student Luiz Augusto de Oliviera Bisachi attended the Expert Panel session. Mr. Bisachi is originally from Sao Paulo, Brazil and is majoring in "international business". He is also a licensed pilot and would not be denied the opportunity for a tour of the airfield as part of his exposure to how the Aviation Authority manages the airport. In a letter to the Aviation Authority Mr. Bisachi states, "...there is still a long way before I can decide what to do with my professional career, however this event was a decisive, very important and unforgettable first step." We wish Mr. Bisachi much success in whichever career he decides to pursue.

Expert Panel - Forecast Session

On October 16, 1997 HCAA staff, local business and aviation industry representatives, and Master Plan Team members met at the Tampa Airport Marriott to conduct an Expert Panel Forecast Session. The purpose of the session was to have this group of local and industry "experts" review and discuss historic airport activity, the regional economy, and the industry trends; to agree on the assumptions and methodologies that will be used for the master plan forecast effort; and to ensure that the master plan forecasts are both credible and usable.

The Panel discussed demographic, employment, income and aviation industry trends as well technological, political, economic and social scenarios which could potentially impact local conditions and affect aviation activity forecasts. Twelve forecast scenarios were identified by the Panel as a way of testing the impact of variations in the assumptions used in the base case forecast.

Valuable information and insight was gained from the Expert Panel Session. The HCAA staff and the Master Plan Team extend their appreciation to Panel members for giving generously of their time and expertise.

Expert Panel meets in day-long session to discuss forecasting.

Panel Participants:

William Ashbaker, FDOT-Aviation Bureau
Alan Baker, Economist, City of Tampa
James Cloar, Tampa Downtown Partnership
John Dausman, Economist, Hillsborough County
Terri Fox, Westshore Alliance
James Hosler, Hillsborough County Planning Commission
C. Edward Howard, FAA
William Lax, Chamber of Commerce, Committee of 100
G. Hartley Mellish, Private Economist
Edward Mierzejewski, CUTR, USF
David Swierenga, Air Transport Assoc. of America

Passenger and Employee Survey Results

- Over 70 percent of employees have non-traditional working hours (i.e., they report to work before 6:00 AM or after 10:00 AM).
- More than seven-in-ten employees report that they have no flexibility in their scheduled work times.

Based on this data, transit routings and service frequency would have to be significantly expanded to encourage a sizable increase in employee use of this travel mode.

Upcoming ACTIVITIES

January
Forecasts, Passenger Surveys and Inventory Completed

• • •

March
Community Input Group
Technical Working Group
Agency Working Group
(March 3, 1998)

Facility Requirement Analysis

• • •

PLEASE CALL TO CONFIRM AND RECEIVE AN UPDATE OF ALL SCHEDULED MEETINGS AND TOPICS

(813) 899-2011

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Universal Square, Suite C
6610 East Fowler Avenue
Tampa, Florida 33617

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Tampa, Florida 33617
Fax: (813) 899-2207
e-mail: randa@gte.net

or contact Nadine Jones (813) 870-8773 at the Hillsborough County Aviation Authority Offices located in the Landside Terminal, 3rd Level-Blue Side between 8:30 a.m. and 5:00 p.m. any weekday.

Horizon 2020

Volume III

Tampa International Airport

HORIZON 2020
COMMITMENT TO EXCELLENCE:
Taking TPA Into the 21st Century

Issue III | NEWSLETTER | October 1998

UPCOMING PUBLIC WORKSHOP

The first public workshop for the Master Plan/Part 150 Study has been scheduled for October 22nd from 6:00 to 8:00 p.m. in Higgins Hall at St. Lawrence Parish (5225 N. Himes Ave.). This public workshop will be held in an informal "open house" format. Louis Miller, Executive Director of the Hillsborough County Aviation Authority will conduct an overview presentation at 7:00 p.m. Various presentation stations will be set up for participants to browse the Master Plan/ Part 150 information and learn about our progress to date. HCAA staff and project consultants will be readily available to answer your questions and respond to your comments/concerns. You will be able to turn in written comments at this hearing or mail them back in at a later date. For more information please contact Georgianne Ratliff, our Public Involvement Coordinator at (813) 615-1319.

TERMINAL COMPLEX STUDIED

Terminal Requirements

Past planning efforts at Tampa International Airport (TPA) have set the capacity of the existing terminal complex at approximately 20 million total passengers. When demand approaches 20 million passengers, the current master plan recommends development of a new, supplemental terminal complex to the north. Since total passenger levels are projected to reach approximately 25 million passengers by 2020, one overall objective of the Master Plan Update process is to evaluate the potential to accommodate 25 million passengers in the existing terminal complex.

IN THIS ISSUE

Landside Building - Arrival Level (Baggage Claim)

Demand has grown to the level where areas in which the rental car counters are near baggage claim devices are congested and general circulation is restricted during peak periods.

Landside Building - Departure Level (Ticketing)

Long ticket lines and congested circulation areas near ticket counter areas were observed during peak periods. However, processing times by the airlines were good, and the available ticket positions were fully staffed.

Airsides

Because they were designed to meet current standards, the newer airside buildings, Airsides A and F, were observed to function well during the peak periods. Congestion at the people mover stations, in the holdrooms, and at security were observed at the two older airside buildings, Airsides C and D, which are nearly 30 years old.

Departure and Arrival Level Curbs

Congestion was observed at both the upper and lower terminal roadways during peak periods.

Parking

Demand approaches the capacity of the two parking structures during peak periods. Peak periods for parking are typically around holidays such as Thanksgiving.

Continued on Page 2

Continued from Page 1

Terminal Expansion Concepts

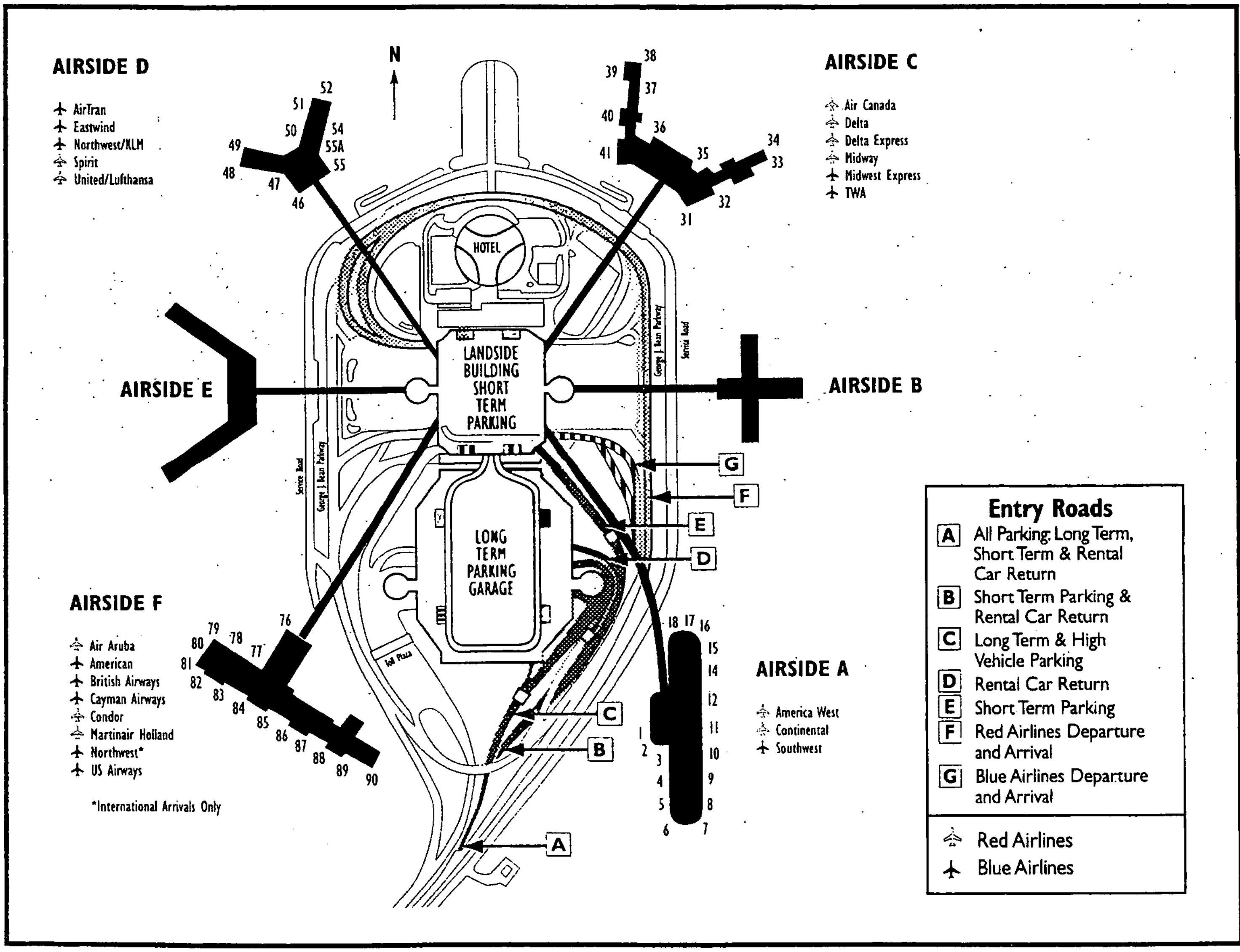
In an effort to maintain its historically high ratings, a series of planning objectives was established to guide the identification and evaluation of terminal area expansion alternatives:

- Maximum walking distances will not be greater than what exists today.
- Maximum passenger processing times will be between 20 and 30 minutes for arriving (baggage claim) passengers, and 30 and 45 minutes for departing (check-in) passengers.
- Short-term and long-term parking will be within walking distance of the terminal.
- Economy (remote) parking will be made available.
- Rental cars will be within walking distance of the terminal.
- The number of pedestrian roadway crossings will be minimized.
- A hotel will be within walking distance of the landside building.
- Light rail will have a seamless integration into the terminal area.

Landside Building - Arrival Level

The landside building has minimal east/west expansion capability. Therefore, a combination of building expansion and relocation of some functions is required to meet 2020 requirements. The following alternatives to address facility requirements are under consideration:

- Expand the ends of the building and add more baggage claim devices.
- Relocating the outbound baggage system currently in the center of the building to the airsides. This would require the development of a new baggage conveyor system between the landside and airsides.



- Move all or some of the airline baggage handling facilities in the center of the landside building and provide an open space between the Blue and Red sides for baggage claim area.
- Relocate the rental car counters outside the landside building but within walking distance.

Landside Building - Departure Level (Ticketing)

Unlike the arrival level, the departure level is not as constrained. Some combination of terminal building expansion and modification to the existing facilities should meet 2020 requirements. The following alternatives to address facility requirements are under consideration:

- Expand the building to the east and add more ticket counter positions.
- Reconfigure ticket counters to provide less linear feet per agent.
- To provide more circulation area, reduce the amount of airline ticket office area behind ticket counters, and move the ticket counters closer together.
- To provide more circulation area, close floor openings at escalators/stairs.

Airsides

The newer Airsides A and F are adequate throughout the planning period. The focus of the airsides alternatives analysis is on the redevelopment and/or expansion of the original four airsides.

- Alternatives for Airsides C and D include expansion of the existing layout or development of a new layout. The advantage of a new layout would be the ability to bring the shuttle cars into the second level, similar to Airsides A and F. Both Airside C and D currently have shuttle car systems on the third level.
- Airsides B and E will have to be demolished and rebuilt. The alternatives analysis for Airsides B and E focus on which one should get rebuilt by 2020. The advantage of Airside E is that it would place the majority of gates closer to the primary runway, resulting in reduced taxi distances.

Terminal Roadways

The terminal roadways have limited expansion capability. The alternatives to providing additional capacity are as follows:

- On the arrival level, capacity requirements could be met through the reduction of dwell times at the curb. Additional commercial lanes may have to be developed outboard of the existing roadways to replace commercial vehicle space lost to terminal expansion.
- The departure or upper level roadway will require both a reduction in dwell times and a segregation of commercial vehicles from private autos to meet 2020 facility requirements. There are three alternatives to segregate commercial vehicles on the departure level: (1) use the existing circulation roads at the end of the building, (2) develop new commercial vehicle lanes outboard of the existing roadway, or (3) use the existing rental car ready areas off either end of the building. The last alternative would require relocation of the rental car facilities.

Parking

The existing terminal area has little area in which to expand parking; the existing short-term structure could be expanded by approximately 2,000 spaces. The focus of the analysis is to identify a site for future economy parking. Alternative sites south of the terminal adjacent to the access roadway are under consideration.

Rental Car

There are three objectives for rental car facility expansion: (1) keep ready/return facilities within walking distance of the terminal, (2) relocate rental car counters from the terminal, and (3) reduce the number of rental car counter locations (there are currently five). The alternatives to meet these objectives are as follows:

- Consolidate all rental car facilities into the long-term parking structure. This would only work with building expansion concepts that provide an open space between the Red and Blue sides of the baggage claim level.
- Relocate the rental car ready spaces on the departure level to two new structures on the Red side of the terminal area. This would reduce the number of counter locations from five to three.

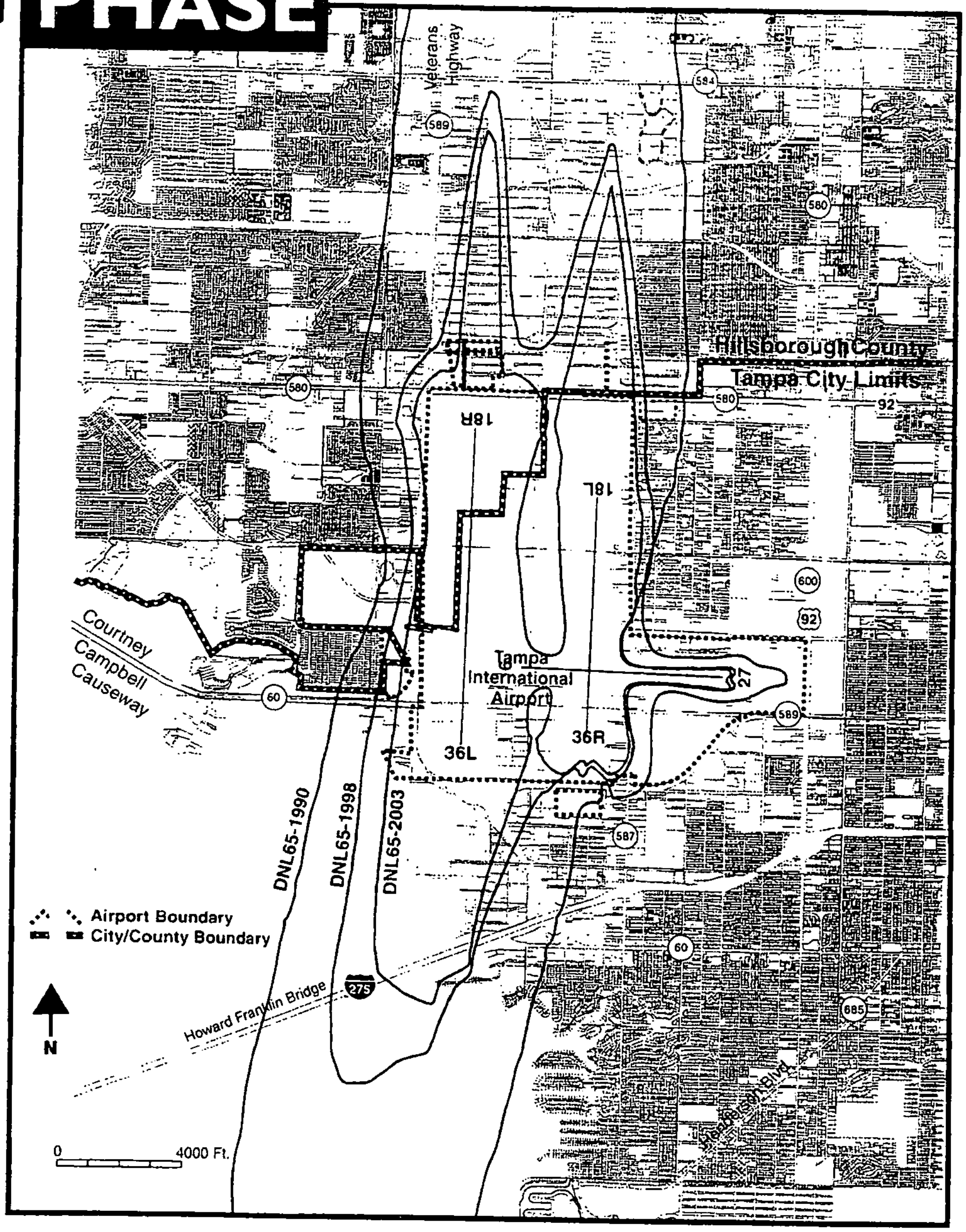
The evaluation of alternatives will consider their ability to meet planning objectives, passenger level of service, constructability, environmental factors, and costs. The final overall recommendation will likely include the best one or two alternatives from each of the individual facilities. The next newsletter will provide details of the final terminal area plan.

PART 150 NOISE STUDY ENTERS NOISE COMPATIBILITY PLANNING PHASE

The Noise Exposure Map phase of the study is essentially complete, and the Noise Compatibility Program phase is underway.

1998 and 2003 Forecast Case Noise Contours Prepared

The figure on this page presents the 65 decibel DNL contours for 1998 and 2003, compared to the 1990 forecast contour from the original (1985-87) Part 150 study. Federal Aviation Administration (FAA) guidelines in Part 150 consider all land uses to be compatible outside the 65 DNL contour. The contour comparison clearly shows the reductions in noise exposure that have occurred since the original study. The population within the contours has dropped dramatically, from approximately 14,000 residents within the 1990 contours, to approximately 200 - 300 in 1998. This drop is the result of two principal factors: (1) the effectiveness of the airport's Noise Compatibility Program, and (2) federal regulations that require airlines to retire older, noisier aircraft.



Authority Receives "High Marks" for Noise Abatement Program Implementation

The original Part 150 study recommended five noise abatement measures, all of which the FAA approved for implementation:

- Use southerly traffic flows whenever possible.

Continued on Page 5

- Encourage operators of turbojet aircraft to use Air Transport Association (ATA) recommended noise abatement arrival procedures.
- Designate engine runup procedures.
- Augment vegetation noise barrier along the western perimeter of the airport.
- Establish a helipad on the east side of the airport.

The Authority and FAA developed two other noise abatement measures outside of the Part 150 process:

- Priority of turbojet runway use from midnight to 6 a.m.
- Initial turbojet departure headings.

The noise consulting firm on the Part 150 study team, Harris Miller Miller & Hanson Inc. (HMMH), presented a detailed review of the implementation of these measures to meetings of the Technical Working Group, Agency Working Group, and Community Input Group on September 9th. That review revealed that the Authority and FAA, with cooperation from aircraft operators and pilots, are implementing the measures in a highly effective manner overall.

Based on its technical analysis and feedback, HMMH identified five areas for further assessment:

- Control of engine runup noise, particularly at night, possibly through the construction of noise-attenuating structures.
- Limitation of early turns by propeller aircraft on departure, particularly to the northwest of the airport.

the east that fly over populated areas between MacDill Air Force Base and Tampa International.

- Adding propeller aircraft to the nighttime preferential runway program (which maximizes operations over the Bay).
- Noise abatement flight paths on the eastern parallel runway and the east-west runway, that would lead aircraft over the water, in the same general area as operations on the west parallel.

These potential noise abatement measures are being evaluated.

Land Use Compatibility Controls

The previous Part 150 Study recommended that zoning restrictions be placed on areas potentially adversely impacted by noise from Tampa International Airport.

Thanks to the effectiveness of the Hillsborough County Aviation Authority's Noise Abatement Program and to the Land Use Compatibility Program implemented by the City of Tampa and Hillsborough County in cooperation with the Authority, virtually no new residential or noise sensitive land development has occurred since the adoption of city and county plans and airport related zoning districts.

The study team is investigating measures to further reduce existing and future non-compatible land uses.

TPA's AIRFIELD TO BE EVALUATED

It is estimated that the airfield is currently capable of handling between 410,000 and 440,000 operations per year at an acceptable delay level through the year 2020. Current operations are about 250,000 per year. As annual aircraft operations approach these levels, aircraft delays could increase rapidly with small increases in aircraft operations and delays potentially becoming unacceptable.

The present average delay at TPA is about 2.0 minutes per aircraft – lower than 4 to 6 minutes delay which is generally considered the acceptable range for measuring capacity. Above this range, delays tend to increase rapidly as the Airport nears its capacity to handle additional aircraft operations. Considering the forecast growth in aircraft operations, the Airport could reach its capacity between 2015 and 2020. As part of the Master Plan process, a series of alternative airfield improvements are under consideration to determine their potential to enhance airfield capacity.

Did You Know?

- Total passenger traffic continues to climb at TPA, rising to 1,115,927 passengers in August.
- Total air cargo for the last twelve months to date was up 6.29%.
- For the past twelve months (ending in August) - 13,610,026 passengers utilized TPA.
- Prior Community Input Group (CIG) Meetings have been held in September, 1997 (Study Objectives); March, 1998 (Airport Inventory and Survey); July, 1998 (Facility Requirements); and September, 1998 (Noise).

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e-mail: randa@gte.net

or contact Nadine Jones (813) 870-8773 at the Hillsborough County Aviation Authority Offices located in the Landside Terminal, 3rd Level-Blue Side between 8:30 a.m. and 5:00 p.m. any weekday.

Horizon 2020

Volume IV

Tampa International Airport

HORIZON 2020
COMMITMENT TO EXCELLENCE:
Taking TPA Into the 21st Century

Issue IV — NEWSLETTER — August 1999

Draft Master Plan Nears Completion

The final phase of the Draft Master Plan Study for Tampa Interna-tional Airport (TPA) is underway. This effort will consolidate all of the individual facility development recommendations into one integrated airport development program. The plan, when approved by the Federal Aviation Administration, will serve as a blueprint for future development at TPA, showing both the Airport as it exists today and the facilities recommended to accommodate projected demand through 2020.

One of the keys to a successful airport development plan is the ability to accommodate the projected airport facilities in a flexible manner. The plan lays the foundation to accommodate the expected requirements for the next 20 years, while allowing the flexibility to alter the development plan should a change in demand occur.

Did You Know?

Passengers in 1998:
13.8 Million

Cargo Handled in 1998:
197.8 Million lbs.

Mail Handled in 1998:
58.8 Million lbs.

Flights in May, 1999:
83% Departed on Time
77% Arrived on Time

Airport Development Program

The recommended development plan for each functional area of TPA is outlined below. The map on page 3 highlights some of these recommended projects.

Airfield

Objective: Additional airfield capacity was recommended when the benefits exceeded the costs of adding the additional capacity.

Recommendations:

1. Construct a new north-south runway, Runway 17-35, 700 feet from existing Runway 18R-36L.
2. Extend Taxiway N over George J. Bean Parkway to Taxiway A to improve circulation between east and west airfields.
3. Construct various other taxiways to improve aircraft circulation.
4. Preserve option to extend Runways 18L and 27 for long term capacity benefits.

Terminal

Objective: Identification of the best way to expand the existing terminal complex to accommodate 25 million passengers (the projected Year 2020 demand level) while maintaining the existing high level of customer service. Historically, the capacity of the existing terminal complex has been set at 20 million passengers, at which time a new terminal would be built on the north side of the airport.

Recommendations:

1. Expand the baggage claim level to the west and add additional claim devices.
2. Move the outbound baggage area to Airsides.
3. Relocate the rental car counters to new consilidated service facilities.
4. Expand the ticketing level to the west and add additional ticket counters.
5. Expand the shuttle car lobbies in Airsides C, D, and E to accommodate 2-car trains (currently one car).
6. Expand/renovate all airsides to accommodate an additional 15 jet gates, increase security areas, and holdrooms. This includes expansion/renovation of Airsides C and D, and demolition/redevelopment of Airside E.
7. Demolish Airside B and convert it to an overnight aircraft parking area.
8. Construct an additional terminal complex in the North Terminal Area.

Continued Next Page

Noise Compatibility Public Hearing

The noise compatibility study, also known as the F.A.R. Part 150 is nearing completion and will be presented to the community in an upcoming public hearing – to be scheduled in the next couple of months.

On Airport Roads

Objective: To provide sufficient capacity to maintain appropriate vehicle speeds and keep the number of driver decision points to a minimum.

Recommendations:

1. Expand and realign George J. Bean Parkway to be consistent with the development of the new interchange south of the Airport.
2. Add one lane to the terminal circulation roadway.
3. Maintain the segregation of commercial and private vehicles in the terminal area.
4. Convert upper rental car parking decks on east and west side of landside building to commercial vehicle parking.
5. Establish a new access corridor for the East Development Area (Drew Park Acquisition Area) that mitigates airport traffic impacts on local roads and the community.
6. Relocate Hillsborough Avenue to accommodate North Terminal development beyond 2020.

Passenger and Employee Parking

Objective: To provide a total supply that meets 2020 demand for parking (17,500 spaces). In response to passenger survey comments provide an enhanced spectrum of parking options and choices by instituting remote, economy lots oriented towards the more price sensitive segment of the market.

Recommendations:

1. Construct a new economy lot in the South Support Area (up to 8,200 spaces).
2. Construct a new employee parking lot in the South Support Area (up to 3,200 spaces).
3. Construct 1,200-space expansion to existing hourly parking garage in the landside building garage.

> **"The plan lays the foundation to accommodate the expected requirements for the next 20 years ..."**

Rental Car

Objective: The objective is to improve rental car operational efficiency through the consolidation of functions.

Recommendations:

1. Relocate/consolidate existing rental car counters into two new service facilities, one on the Red Side and one on the Blue Side.
2. Expand the ready/return area in the south parking structure (second level).
3. Construct two new ready/return garages on the Red Side, on either side of the Airport Service Building.
4. Expand the rental car storage areas in the South Support Area.
5. Construct additional rental car facilities for the North Terminal Area beyond 2020.

Light Rail

Objective: To provide for the integration of the regional light rail system into the Airport complex when the community requires it and there is an adequate ridership.

Recommendations:

1. Provide for a north/south right-of-way corridor through the Airport.
2. Develop a light rail station that is integrated into the Landside Terminal Building.

Cargo

Objective: To ensure adequate facilities can be built to facilitate the growth of air cargo in the Airport Service area. Air cargo is one of the fastest growing segments of demand at TPA.

Recommendations:

1. Develop all-cargo facilities in the East Support Area (Drew Park aquisition area).
2. Renovate/expand the existing air cargo facilities for airline belly cargo only.
3. Demolish the existing regional postal facility; develop a new air mail facility in the East Support Area.
4. A longer-term option is to relocate and expand the airline belly cargo facilities in the East Support Area.

General Aviation

Objective: To accommodate the projected growth in corporate general aviation activity.

Recommendations:

1. Preserve land east of the existing Raytheon facility for commercial general aviation (FBO) development (south of Runway 9/27).
2. Preserve land east of the existing private hangars for non-commercial aviation development (north of Runway 9/27).

Airlines Support

Objective: To ensure sufficient land is available for the airlines to develop those facilities needed to support their operations.

Recommendations:

1. Preserve approximately 60 acres of land east of Runway 18L-36R to either expand existing airline maintenance facilities or to construct new facilities.
2. Relocate the existing flight kitchen located in the South Support Area to the East Support Area to accommodate the development of a new employee parking lot.
3. Relocate the fuel farm to provide more direct airfield access for aviation-related facilities.

Airport Support

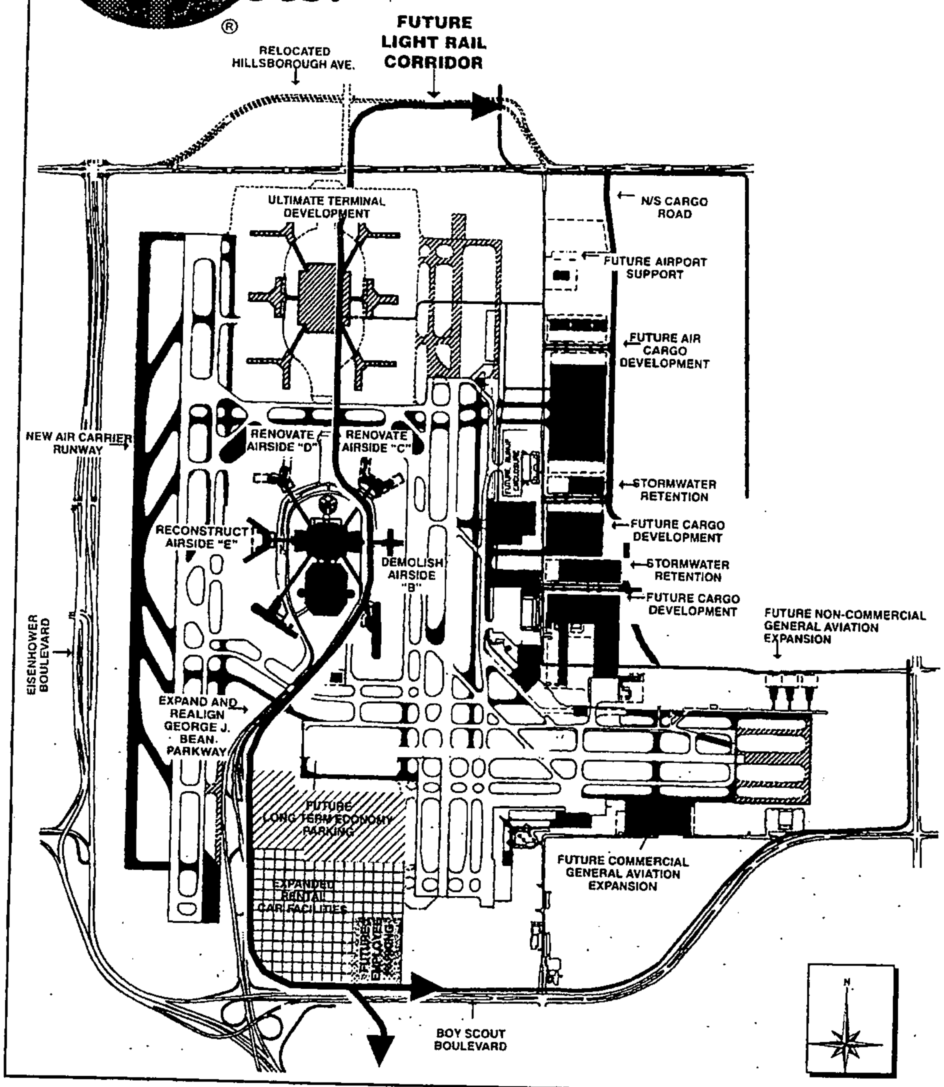
Objective: To ensure sufficient land is available for the airport authority to develop those facilities needed to support Airport operations and long-term growth.

Recommendations:

1. Construct a new consolidated Air Rescue and Fire Fighting (ARFF) facility at the south end of the terminal complex adjacent to the apron serving Airside A.
2. Expand the existing airport maintenance facilities as other Airport functions expand.
3. Complete the existing Drew Park Acquisition Program.
4. Initiate land acquisition north of Hillsborough Avenue to support long-term terminal expansion beyond 2020.

Continued Next Page

Highlights of Recommended Projects:



Environmental

Objective: To mitigate the environmental effects due to Airport development.

Recommendations:

1. Construct a noise enclosure facility for engine run-ups.
2. Soundproof up to 6 homes south and west of the Airport (based on 2003 noise contours).
3. Develop a long-term strategy to accommodate additional stormwater runoff due to Airport development.
4. Develop a long-term strategy to mitigate wetland impacts due to Airport development.

$ Development Costs

Capital costs for the TPA Master Plan total approximately $1.02 billion in 1999 dollars over the next 20 years. The Development Program will be funded through a combination of Federal and State funds, Passenger Facility Charges (PFCs), revenue bonds, and revenue from sources like airline landing fees, concessions and parking. As such, Airport users will bear the cost of development; no local tax dollars will be used to fund these improvements.

Opportunity for Input at Upcoming Public Workshop

The second public workshop for the Master Plan/Part 150 Study has been scheduled for Wednesday, September 1, 1999 from 6:00 to 8:00 p.m. in the Auditorium of Jefferson High School (4401 West Cypress Street). The public workshop will be held in an informal "open house" format. Louis E. Miller, Executive Director of the HCAA will give an overview presentation at 7:00 p.m. Various presentation stations will be set up for participants to browse the Master Plan/Part 150 Study information and learn about our progress to date. HCAA staff and project consultants will be readily available to answer your questions and respond to your comments/concerns. You will be given the opportunity to turn in written comments at the meeting or return them by mail. For more information, please contact Georgianne Ratliff, our Public Involvement Coordinator, at (813) 615-1319.

Working Group Meetings Scheduled

The sixth and final meetings of the Agency, Technical and Community Input Groups have been scheduled for Tuesday, August 31, 1999. The meeting schedule is as follows:

- **Agency Working Group**
  10:00 AM, HCAA Board Room at TPA
  (Earhart Elevators, Level 3, Blue Side)
- **Technical Working Group**
  1:00 PM, HCAA Board Room at TPA
  (Earhart Elevators, Level 3, Blue Side)
- **Community Input Group**
  6:00 PM, Jefferson High School Auditorium (4401 W. Cypress Street)

Please join us to discuss the final recommendations for the Master Plan and F.A.R. Part 150 Study recommendations. We request that you call to confirm your attendance:

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IN THIS ISSUE

- **Draft Master Plan Nears Completion**
- **Did You Know?**
- **Upcoming Workshop**
- **Working Group Meetings**

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Volume V

Tampa International Airport

HORIZON 2020
COMMITMENT TO EXCELLENCE:
Taking TPA Into the 21st Century

Issue V | NEWSLETTER | December 1999

Part 150 Noise Study Recommends Revised Noise Compatibility Program

The Part 150 Update Study has reached an important mile stone. With significant guidance from Community, Technical and Agency Input Groups, the HCAA staff and consultants have developed recommendations for a revised "Noise Compatibility Program". This program is a culmination of extensive work conducted over the past two years— meeting with members of the surrounding community, conducting over 400 hours of noise level measurements and evaluation of potential noise abatement measures. The recommendations that have been prepared build on the elements of the existing, highly successful program that the HCAA has continuously developed and refined over more than two decades at TPA.

Did You Know?

Passenger traffic broke the 1 million mark in September 1999.

(First time in TPA's history)

The recommended program includes 10 noise abatement measures that reduce noise and direct it away from residential areas. FAA guidelines consider all land uses compatible with aircraft noise outside of the 65 decibel "Day-Night Average Sound Level" (DNL) contour. Figure 1 shows the 65 decibel contour for two cases: (1) existing conditions, and (2) five-year forecast conditions with the recommended revised program. The population within the contours drops as shown in the following table:

Case	Estimated People with 65 DNL Contour	Estimated Properties within 65 DNL Contour
Existing Conditions	254	103
Five-Year Forecast with Recommended Program	15	6

As these figures show, the population within the estimated 65 DNL contour will drop dramatically over the five-year forecast with the noise abatement program. In fact, the airport benefits from a federal law that requires airlines to stop operating their noisiest aircraft, or to retrofit them to meet noise standards, by the end of 1999. That regulation is responsible for the overall shrinkage in the contours.

The proposed or recommended program includes two corrective land use measures designed to address remaining residential land in the forecast case contours, seven preventive land use measures to prevent new non-compatible uses, and program publicity and monitoring actions.

Noise Abatement Measures:

- Priority for daytime (6 am to midnight) south-flow departures over the bay;
- Daytime runway use priorities, to limit jet operations over residential areas in the communities immediately south of the airport;
- Nighttime (midnight to 6 am) preference for all arrivals from the north and departures to the north over the bay;
- Initial jet departure headings off all runways, to lead aircraft over least-populated areas;

Continued on Page 2

- Reduce early propeller aircraft departure turns northeast and northwest of the airport;
- Reduce close-in arrival turns over residential areas south of the airport;
- Continue use of existing helipad location on east side of airport designed to facilitate preferential routes;
- Request jet pilots use FAA-developed noise abatement departure profiles (cockpit procedures);
- Request jet pilots use industry-developed noise abatement arrival procedures (cockpit procedures); and
- Construct noise-reduction enclosure for high-power jet engine maintenance runups.

Corrective Land Use Measures - Within the Five-Year (2003) Forecast 65 DNL Contour

- Sound-insulation of existing residences; and
- Obtain avigation easements from property owners receiving sound insulation.

Preventive Land Use Measures - Within the Five-Year (2003) 65 DNL Contour

- Compatible zoning included in comprehensive plans and zoning maps;
- Overlay zoning to restrict non-compatible development; and
- Public information program for potential purchasers in non-compatible construction.

Publicity and Monitoring Actions

- Ongoing operations and flight track monitoring
- Portable noise monitoring
- Complaint database software
- Continuing Public Information/ Input Program
- Noise office staffing
- Noise Compatibility Program publicity: signs, posters, and pilot handouts

Implementation of these measures will result in Tampa International Airport achieving the objective of complete abatement, mitigation, and prevention of non-compatible land use. Details regarding these measures and the entire Part 150/Noise Compatibility study will be given at a final public hearing to be held on December 16th from 6:00 to 8:00 p.m. in Higgins Hall at St. Lawrence Parish (5225 N. Himes Avenue). HCAA and consultant staffs will be available at this hearing to answer your questions and respond to your comments/concerns. For more information please contact Georgianne Ratliff, our public involvement coordinator, at 813-615-1319.

HCAA APPROVES MASTER PLAN

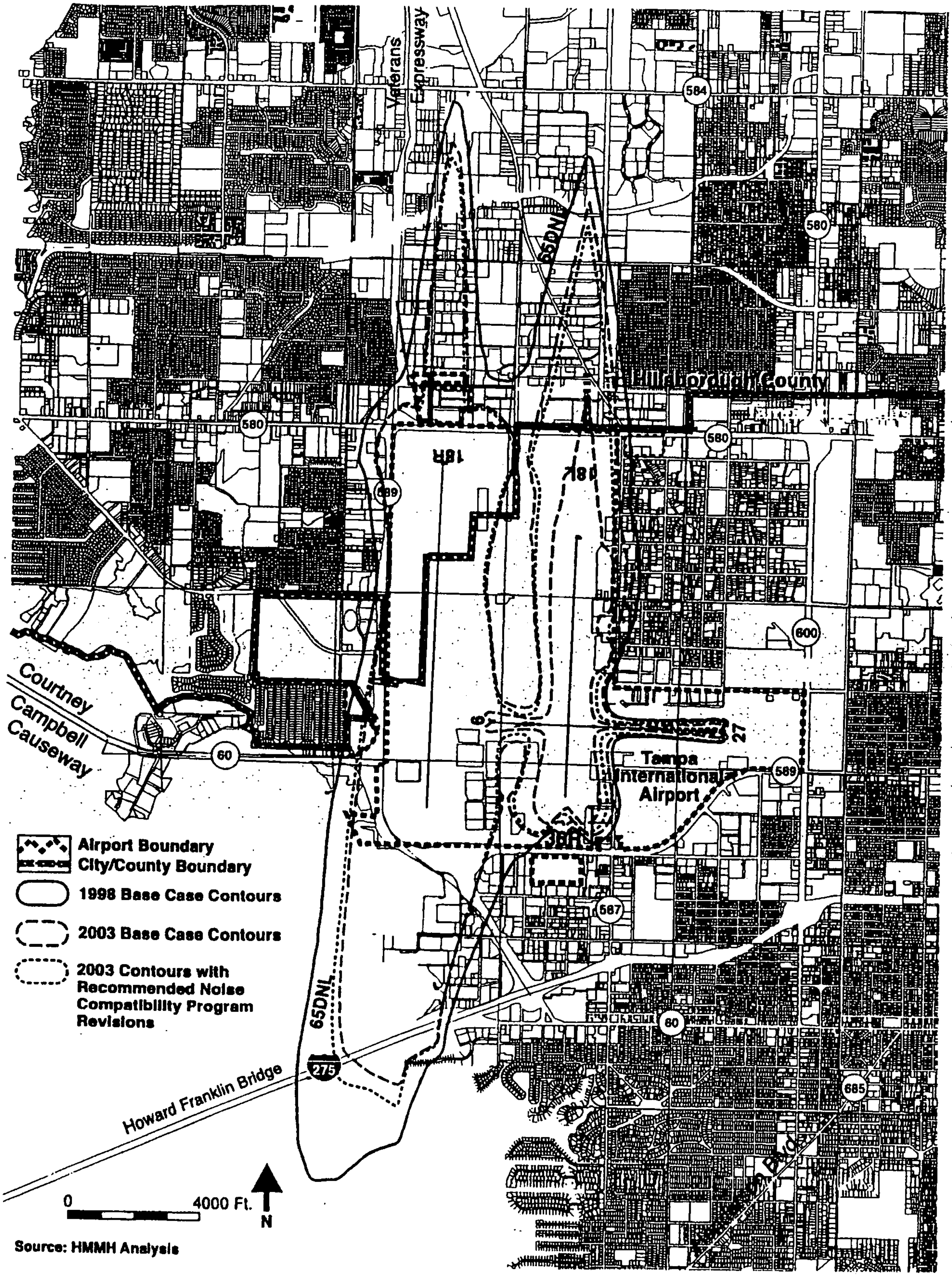
The Draft Master Plan was approved by the Board of the Hillsborough County Aviation Authority (HCAA) on October 7, 1999. The approved Master Plan consolidated all of the individual facility development recommendations developed over the past two years into one integrated airport development program. This plan must now be accepted by the Federal Aviation Administration (FAA). It will serve as the blueprint for future development at TPA and will show both the Airport as it exists today and the facilities recommended to accommodate projected demand through 2020. For more information about the Master Plan, please contact Nadine S. Jones, Director of Planning & Environmental Services for HCAA at 813-870-8773.

Thank You

Louis Miller, Executive Director of Hillsborough Co. Aviation Authority

As the Master Plan/F.A.R. Part 150 Update winds to a close, we would like to thank those members of the community who have taken part. Over the course of this extensive effort, many individuals have taken time out to give us their feedback, ideas, and often voice their concerns about the future "blueprint" for TPA. Three focus groups in particular —the Community Input Group (CIG), the Technical Working Group (TWG) and the Agency Working Group (AWG) have met many times over the last two years. The membership of these groups include business leaders; local government representatives; community leaders; airport neighbors and those pilots/employees who use the airport facilities on a daily basis. Input from such a diverse group of concerned people has made the TPA Master Plan/Part 150 Study Update a successful effort--one that lays the foundation to accommodate the expected needs for TPA for the next 20 years.

1998 and 2003 Day-Night Average Sound Level (DNL) Contours with Recommended Noise Compatibility Program



Source: HMMH Analysis

Ratliff & Associates, Inc.
c/o WilsonMiller, Inc.
Lakeview Office Building
8875 Hidden River Parkway, Suite 250
Tampa, Florida 33637

HORIZON 2020

COMMITMENT TO EXCELLENCE:

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☐ Yes, I wish to be added to the Master Plan mailing list.
☐ Please check if your address has changed.

Name: ____________________
Address: ____________________
City: __________ State: __________ Zip: __________
Area Code/Phone: ____________________
Suggestions or comments? ____________________

Prior issues of the Horizon 2020 are available upon request at no charge. Please clip and return to: Ratliff & Associates c/o WilsonMiller, 8875 Hidden River Parkway, Suite 250, Tampa, FL 33637.

Where Can You Get More Information?

For specific information on the progress of the study, please contact Georgianne Ratliff at (813) 615-1319. If you prefer, send written requests to:

TPA Master Plan/Part 150 Study
c/o Wilson Miller, Inc.
Lakeview Office Building
8875 Hidden River Parkway
Suite 250
Tampa, Florida 33637
Fax: (813) 615-0407
e-mail: tampa@wilsonmiller.com

or contact Nadine Jones (813) 870-8773 at the Hillsborough County Aviation Authority Offices located in the Landside Terminal, 3rd Level-Blue Side between 8:30 a.m. and 5:00 p.m. any weekday.

APPENDIX J

Expert Panel Participants

EXPERT FORECAST PANEL
TAMPA INTERNATIONAL AIRPORT PART 150 UPDATE

William Ashbaker	Aviation Bureau, Florida Department of Transportation
Alan Baker	Economist, City of Tampa Planning Department
Luiz Bisachi	University of Tampa
Ginny Brewer	Hillsborough County Aviation Authority
James Cloar	President, Tampa Downtown Partnership
Bill Connors	Hillsborough County Aviation Authority
John Dausman	Economic Development Dept., Hillsborough County
Terri Fox	Westshore Alliance
Evan Futterman	HNTB Corporation
Brenda Geoghagan	Hillsborough County Aviation Authority
James Hosler	Hillsborough County Planning Commission
C. Edward Howard	Orlando Airports District Office, FAA
Jim Johnson	Hillsborough County Aviation Administration
Nadine Jones	Hillsborough County Aviation Administration
Pat Kennon	HNTB Corporation
William Lax	Tampa Chamber of Commerce, Committee of 100
G. Hartley Mellish	Economist
Edward Mierzejewski	CUTR, University of South Florida
Louis Miller	Hillsborough County Aviation Authority
Jeff Mishler	HNTB Corporation
Joe Navarrete	HNTB Corporation
Paul Puckli	HNTB Corporation
Georgianne Ratliff	Ratliff & Associates
David Swierenga	Air Transport Association of America

APPENDIX K

Part 150 Public Hearing

TPA Part 150 Hearing - Summary

December 16, 1999

6:00 – 8:00 P.M.

The TPA Part 150 public hearing was held on December 16, 1999 from 6:00 to 8:00 p.m. in Higgins Hall at St. Lawrence Parish. Guests were given handouts at the door containing information about the Part 150 process and final recommendations, a copy of Newsletter #5 and a comment form. Approximately 46 persons from the public attended (see attached sign-in sheet). Ten (10) staff members were present. An open-house type format was utilized with information stations set around the room for public review. Staff members were available to answer questions.

Louis Miller, Executive Director of HCAA gave opening remarks at 7:00 p.m. and informed those present that although this hearing represents the close of the study, it does not mean it is the end of the process. The HCAA will continue to receive public comment on the Part 150 Study after this hearing. Participants were reminded to fill out the comment form provided to them at the door (see attached comment sheets received to date). The Part 150 document will be available for public inspection. Mr. Miller introduced Ted Baldwin of HMMH, Inc. who gave an overall project presentation. There was public discussion after the presentation concluded. The following is a summary of the public comment/concerns:

Q: Is there a specific timeframe that planes can land and takeoff from?
A: No, but it is recommended that when flying between midnight and 6 a.m., planes should land from the south and depart to the south.

Q: How will signing an avigation easement affect me? Is receiving sound insulation reimbursement predicated on signing this easement?
A: The FAA will not fund any sound insulation improvements without the signing of an easement. The easement allows aircraft to operate within projected noise levels that have been addressed through sound insulation. We do not provide reimbursement because we do the insulation work.

Q: If you sign an avigation easement, can pilots violate the informal runway use program?
A: No.

Q: Is 65 DNL based on the average over one year? Will noise contours shrink over time? Why?
A: The 65 DNL is based on the average over one year. Noise contours are shrinking because aircraft are getting quieter, many are making use of "hushkits" and runways are being used more properly.

Q: Why did the HCAA just purchase a large area in Drew Park? Is it for a new runway?
A: The HCAA is purchasing property in Drew Park (on a voluntary basis only) to build future cargo buildings and other additional facilities. The Drew Park property is not being acquired for a new runway. Although, if current trends continue, a new runway is a possibility for the year 2011 or 2012 on the west side of the airport.

Q: As a resident of Mariner Street, our homes are greatly affected by airport noise. Have you taken residences in this area (Mariner St.) into account in your studies? Are you going to include all of Mariner Street in the insulation program? People outside of the 65 DNL are still suffering.
A: The consultant team will take a close look at the Mariner Street area. It is clear that this area just outside of the 65 DNL is being subjected to similar noise levels and we will include them in the insulation program. All residences on Mariner Street will be added to the mailing list and receive future notices and updates.

Q: Shouldn't these meetings be held at a more centrally located facility i.e., the Westshore area?
A: The public meetings and workshops for the update of the Master Plan and Part 150 Study have been held in a variety of locations. The last meeting was held in the Westshore area at Jefferson High School's auditorium.

Q: When will you reach closure on this study?
A: The public comment period will be held open until approximately February 15, 2000. We anticipate that the HCAA Board will discuss the final report on March 2nd and then submit it to FAA for review. The FAA review typically lasts 3 - 6 months. We expect completion by the end of next summer.

Q: The noise from the airport is very loud at night. Will this get any better with the addition of a "runup" enclosure?
A: The noises you are describing are engine "runup" noises. This situation should improve, since there is no enclosure on the airport grounds now. We expect that within 3 - 4 years an enclosure will be built.

Q: How much control do you have over aircraft? Can you restrict the number of flights that take off in the evening?
A: None. The HCAA controls the airport and can only recommend flight patterns. The FAA controls aircraft and would not allow a restriction of that kind.

Q: Can you allocate money for the creation of a vegetative barrier for the south side of the airport?
A: There is a barrier located along the Veterans expressway, composed of trees, shrubs, etc. Vegetative barriers are not always the best solution for a noise problem because they require hundreds of feet of density to be effective. These barriers often only provide visual relief and actually do not decrease noise levels.

Q: I am concerned that the changes being recommended for the airport will increase traffic.
A: TPA does not generate traffic. The community generates additional business for the Airport facility. It is the Airport's responsibility to accommodate the growth of the community. These studies address any foreseen growth. But it is important to recognize that the Airport does not stimulate any growth. If this growth does not occur, TPA will not have a need to expand it's facilities.

Q: What if the FAA turns down the Part 150 Study?
A: The FAA has been repeatedly briefed on this study for over 2 years. We also have had preliminary feedback from them and at this point there has been no indication of a problem with the study.

Q: What about a new airport?
A: When looking at the availability of land and the development pattern of Hillsborough County, there is not land or airspace available for an international airport.

Q: Have you looked at dispersion of the flights at TPA over a wider area?
A: That is also called "fanning" It is more effective from a noise mitigation standpoint for us to continue flights over the water. Fanning would also require that flight tracks and airspace be changed and that would involve the FAA doing a major Environmental Impact Statement.

Q: How do we get notification on the status of the Part 150 study?
A: The sign-in sheets/comment forms handed out when you came in to this hearing are used for future notifications.

Q: Couldn't the Aviation Authority offer to pay the property taxes of residents in lieu of sound insulation?
A: We don't have the authority to do that and it wouldn't mitigate aircraft noise.

Q: I am very disturbed when there are operations to the south and you have to use the east runway because of rubber removal.
A: Rubber removal is a critical safety matter at airports. We have to do it. We are sorry for the disturbance and we will look at ways to stage the work to possibly reduce the time it takes.

Q: Are stage IV aircraft in development?
A: Yes. That is being looked at by the FAA, industry groups, airlines, and aircraft manufacturers.

Q: When will you build the west runway? Will it impact Dana Shores? When the west runway is constructed the airport should not monitor itself.
A: The new runway is projected for 2011-2012. There are a number of studies we must do before we can construct it. We are not going to monitor noise. We are going to acquire a flight monitoring system that will assist us in enforcing our preferential runway use program.

Q: I am bothered by jet fuel soot and kerosene odors on my property.
A: We conducted a study this past summer to investigate that concern and found nothing in that soot that would come from an aircraft. Our findings were sent to the property owners that had the problem. We would be happy to provide copies.

TPA PART 150 NOISE COMPATIBILITY STUDY
PUBLIC HEARING

SIGN-IN SHEET

December 16, 1999
6:00 - 8:00 p.m.

(PLEASE PRINT)

Name: Barbara Motte
Representing: EPC
Address: 1410 N. 21st St TPA, FL 33605
Phone/FAX: 272-5530

Name: JOE BEARINGER
Representing: YMA
Address: 8822 BAY PT DR TAMPA 33615
Phone/FAX: 813-886-9336

Name: Joyce Smith
Representing: Town & Country Alliance
Address: 7201 Daiquiri LN Tampa, Fl 33634
Phone/FAX: 885-4444

Name: OSCAR SARDUY
Representing: T&C PARK CIVIC ASSOC.
Address: 7003 LAWNVIEW CT. TAMPA FL 33615
Phone/FAX: 885-2328

Name: Teresa McDaniel
Representing: Self
Address: 5834 Mariner St. TPA FL 33609
Phone/FAX: 286-9041 / 289-8481

Name: Jana Jeseritz
Representing:
Address: 5839 Mariner Dr. Tampa, Fl. 33609
Phone/FAX: 286-2756

TPA PART 150 NOISE COMPATIBILITY STUDY
PUBLIC HEARING

SIGN-IN SHEET

December 16, 1999
6:00 - 8:00 p.m.

(PLEASE PRINT)

Name: John Wheat
Representing: HCAA
Address: 3531 Tabernacle Pl

Phone/FAX: 813 870 8761

Name: Cid & Josie Fernandez
Representing:
Address: 5826 - Mariner

Phone/FAX: (813) 286-0865

Name: Linda Heath & Reed Heath
Representing:
Address: 5814 Mariner St
Tampa FL 33609
Phone/FAX: 636 0398 - FAX

Name: MIKE FREDERICK
Representing: TWELVE OAKS SPECIAL DIST.
Address: 7502 ARMAND CIR

Phone/FAX: 889-9833

Name: DON COX
Representing:
Address: 5823 Mariner St
Tampa 33609
Phone/FAX: 813 286-0861

Name: DON Roberts
Representing: Roth Investment Realty
Address: 8507 Sunstate St.
Tpa, FL 33634
Phone/FAX: 885-5811 / 884 / 8927

TPA PART 150 NOISE COMPATIBILITY STUDY
PUBLIC HEARING

SIGN-IN SHEET

December 16, 1999
6:00 - 8:00 p.m.

(PLEASE PRINT)

Name: Edward Miles
Representing:
Address: 5003 Mirada Dr

Phone/FAX: 908 9025

Name: Nelson Roccaforte
Representing:
Address: 2520 W. North St.
Tampa, Fla. 33614
Phone/FAX: 813 877-2120

Name: Ken Hoyt
Representing: CAAN
Address: 4610 Westford Circle
Tampa FL 33624
Phone/FAX: 813 9603178

Name:
Representing:
Address:

Phone/FAX:

Name: Caroline Yowell
Russell Yowell
Representing: Self
Address: 5835 Mariner
Tampa FL 33609
Phone/FAX: 286-1421

Name:
Representing:
Address:

Phone/FAX:

TPA PART 150 NOISE COMPATIBILITY STUDY
PUBLIC HEARING

SIGN-IN SHEET

December 16, 1999
6:00 - 8:00 p.m.

(PLEASE PRINT)

Name: GEORGE + DEBORAH DOMEDION
Representing:
Address: 5820 MARINER ST
TAMPA, FL 33609
Phone/FAX: 813-877-1018

Name: Cheryl Burr
~~Representing:~~ + Robert Burr
Address: 3947 Doral Dr
Tampa, Fl 33634
Phone/FAX:

Name: Jack Parrino MD
Representing: Self
Address: 5830 Mariner Dr
Tampa, Fl.
Phone/FAX: (813) 281-0511
(813) 876-0635

Name: Michael Beach Li
Representing: Out Back Steakhse
Address: 2450 N Westshore Blvd
Tampa FL 33607
Phone/FAX: 813-870-0098
813 874-9803

Name: JERRY CARLSON
Representing: N/A
Address: 3909 VENETIAN DR
TAMPA FL 33634
Phone/FAX: 813-888-9709

Name: Neal Wilson
Representing: N/A.
Address: 5827 Mariner St.
Tampa, Fla. 33609
Phone/FAX: (813) 286-9018

TPA PART 150 NOISE COMPATIBILITY STUDY
PUBLIC HEARING

SIGN-IN SHEET

December 16, 1999
6:00 - 8:00 p.m.

(PLEASE PRINT)

Name: GUTIERREZ, Luis & Elia
Representing: OURSELVES
Address: 24 SANDPIPER Rd.
TAMPA, FL 33609
Phone/FAX: 813-286 2967

Name: Mark & Dee Oksa
Representing: ourselves
Address: 5811 Mariner St.
Tampa, FL 33609
Phone/FAX: 813-282-9875

Name: DOUG MEEHAN
Representing: WTSP-TV
Address:

Phone/FAX:

Name: R T Adams
Representing:
Address: 8009 Fountain
Tampa 33615
Phone/FAX:

Name: Gloria - Don Pierson
Representing: Mariner ST
Address: 5833 MARINER St
TAMPA 33609
Phone/FAX:

Name: Jonathan J Kaplan
Representing: DANA SHORES CIVIC ASS.
Address: 3729 VERSAILLES DR
TAMPA, FL 33634
Phone/FAX: (813) 882-8833

TPA PART 150 NOISE COMPATIBILITY STUDY
PUBLIC HEARING

SIGN-IN SHEET

December 16, 1999
6:00 - 8:00 p.m.

(PLEASE PRINT)

Name: BERT RACHER
Representing: ME
Address: 5816 MARINOR ST

Phone/FAX: 813-281-9597

Name: Bea Siniciope
Representing: Dana Shores
Address: 3946 DORAL DR
TAMPA 33634
Phone/FAX: 813 885 3312

Name: Louis Miller
Representing: HCAA
Address:

Phone/FAX:

Name:
Representing:
Address:

Phone/FAX:

Name:
Representing:
Address:

Phone/FAX:

Name:
Representing:
Address:

Phone/FAX:

TPA PART 150 NOISE COMPATIBILITY STUDY
PUBLIC HEARING

SIGN-IN SHEET

December 16, 1999
6:00 - 8:00 p.m.

(PLEASE PRINT)

Name: R.C. Hilton
Representing: Owner
Address: 5839 Mariner Dr.
Phone/FAX: 813/286-2756

Name: RON SCHON
Representing: ~~BEACH~~ PARK ISLE
Address: PO BOX 23572
TAMPA 33623
Phone/FAX: 287-0379

Name: Alastair Lawrie
Representing: Hills. Co. Planning Comm
Address: 601 Kennedy blvd.
Tampa
Phone/FAX: 813 ~~[illegible]~~ 272-5940 / 272-6250

Name: Diane Verrilli
Representing: HCAA
Address:
Phone/FAX: 810-8789

Name: MARIE IVANEK
Representing: —
Address: 4616 N. Lincoln
Phone/FAX: 813-875-9993

Name: Brenda Geoghagan
Representing: HCAA
Address:
Phone/FAX:

TPA PART 150 NOISE COMPATIBILITY STUDY
PUBLIC HEARING

SIGN-IN SHEET

December 16, 1999
6:00 - 8:00 p.m.

(PLEASE PRINT)

Name: Georgianne Ratliff
Representing: Wilson Miller
Address: 8875 Hidden River Pkwy
Ste 250 Tpa FL 33637
Phone/FAX: 615-1319

Name: Evelyn Bless
Representing:
Address: 5803 Myrtle Ln.
Tampa FL 33625
Phone/FAX: 813 264-0446

Name: MARYSE PARRINO
Representing: SELF
Address: 5830 MARINER
Phone/FAX: (813) 281-0511

Name: Robert Jones
Representing: Self
Address: 5806 Mariner
Tampa FL 33609
Phone/FAX:

Name: Mike & Millie Ged
Representing: SELF
Address: 5832 MARINER
813 - 288 - 1877
Phone/FAX:

Name: Carol Llareza
Representing: Self
Address: 5806 Mariner
Tampa FL 33609
Phone/FAX: (813) 878-2446

COMMENT FORM
HILLSBOROUGH COUNTY AVIATION AUTHORITY
PUBLIC HEARING
December 16, 1999

TPA PART 150 NOISE COMPATIBILITY STUDY

Please address the following items and provide any other comments and/or suggestions that you feel are appropriate:

1. Please identify any impacts to your property or neighborhood associated with the Airport or its activities.

I AM UNABLE TO MANTAIN A CONVERSATION INSIDE MY HOUSE. WE HAVE TO STOP WHEN A PLANE TAKES OFF OVER MY HOUSE. SAME FOR LISTENING TO MUSIC, TV, ETC. WINDOWS RATTLE & PICTURE WINDOWS (6 X 10) VIBRATE, EVENTUALLY WILL BREAK.

2. Any additional comments or suggestions? (Attach additional pages if necessary)

ON THE PAST ALL MY COMPLAINS HAVE BEEN IGNORED. EPA WILL NOT HANDLE "MOVING NOISE SOURCES". I HAVE NO REASON TO TRUST THAT IN THE FUTURE IT WILL GET BETTER BUT ON THE CONTRARY AS TRAFFIC (AIR) INCREASES AND PLANES GET BIGGER MY HOUSE WILL BECOME UNLIVABLE AND THE VALUE WILL DECREASE

Name: LUIS A. GUTIERREZ, MD Address: 24 SANDPIPER RD

Telephone Number: 813-286-2467 TAMPA, FL 33609

If you have any questions, please contact Georgianne Ratliff at (813)615-1319.

TPA PART 150 NOISE COMPATIBILITY STUDY
PUBLIC HEARING

SIGN-IN SHEET

December 16, 1999
6:00 - 8:00 p.m.

(PLEASE PRINT)

Name: Barbara A. Barton
Representing: HCAA
Address: Tampa INT'L Airport
P.O. Box 22287 Tpa 33622
Phone/FAX: 870-8100 x 8514
870-7844

Name: Monika Martin
Representing: HCAA
Address: TPA, P.O. Box 22287
Tampa, FL 33622
Phone/FAX: 870 8700 X 8512
870 7844

Name: Nadine S. Jones
Representing: HCAA
Address: Tpa INT'L Airport
P.O. Box 22287
Tampa 33622
Phone/FAX: 870-8773 / 870-~~88~~44

Name: Tony Mantegna
Representing: HCAA
Address: Tpa INT'L Airport
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Phone/FAX:

Name: Bill Connors
Representing: HCAA Tpa INT'L Airp
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Address: Tampa, FL 33622
Phone/FAX: 870-

Name: Lara Carnow
Representing: WilsonMiller
Address: 8875 Hidden Rvr Pkwy
Ste 250 Tpa 33637
Phone/FAX: 615-1319

COMMENT FORM
HILLSBOROUGH COUNTY AVIATION AUTHORITY
PUBLIC HEARING
December 16, 1999

TPA PART 150 NOISE COMPATIBILITY STUDY

Please address the following items and provide any other comments and/or suggestions that you feel are appropriate:

1. **Please identify any impacts to your property or neighborhood associated with the Airport or its activities.**

- Greatly increased numbers of airplanes overhead. From before dawn to late at night, seven days a week, our neighborhood is subject to constant airplane noise. Planes frequently fly low enough so the noise drowns out conversation. We have seen NO abatement in airplane noise - on the contrary, it has increased greatly in the last couple years.

2. **Any additional comments or suggestions? (Attach additional pages if necessary)**

1) Why can't TIA disperse flight patterns to spread the traffic out more over North Tampa neighborhoods?
2) I would like to see noise monitoring installed much further north - for example, my neighborhood
3) Ted Baldwin did a great job explaining the program. Of the airport personnel I talked with, Bill Connors was by far the least effective.

Name: Evelyn Bless **Address:** 5803 Myrtle Lane

Telephone Number: 813 2640446 H 813 273 3517 W

If you have any questions, please contact Georgianne Ratliff at (813)615-1319.

COMMENT FORM
HILLSBOROUGH COUNTY AVIATION AUTHORITY
PUBLIC HEARING
December 16, 1999

TPA PART 150 NOISE COMPATIBILITY STUDY

Please address the following items and provide any other comments and/or suggestions that you feel are appropriate:

1. Please identify any impacts to your property or neighborhood associated with the Airport or its activities.

We are located at the southern end of the Airport. The noise level is high due to the landing & taking off of planes. The most ~~annoying~~ annoying is the flights scheduled between 10pm. & 6AM. When the T.V. is off and all is quiet the airplane noise is very loud.

2. Any additional comments or suggestions? (Attach additional pages if necessary)

Please Consider the whole of our street because the pilots are not always perfectly in line with recommended paths. As we are all human the flight path does vary.

The larger aircraft that are used by UPS or Fedx or the Post Office in the middle of the night is by far the most annoying. Please consider us in your recommendation.

Name: TERESA W. McDANIEL

Address: 5834 MARINER ST. TPA, FL. 33609

Telephone Number: (813) 288-9041

If you have any questions, please contact Georgianne Ratliff at (813)615-1319.

COMMENT FORM
HILLSBOROUGH COUNTY AVIATION AUTHORITY
PUBLIC HEARING
December 16, 1999

TPA PART 150 NOISE COMPATIBILITY STUDY

Please address the following items and provide any other comments and/or suggestions that you feel are appropriate:

1. Please identify any impacts to your property or neighborhood associated with the Airport or its activities.

Rather than increase the south flow of airplane traffic consider dividing the traffic evenly in all directions, after all, the noise is just as bad for 1 person as it would be for another person in a different direction. I am talking quality noise control for 1 individual not quanity for more. each person is affected individually.

2. Any additional comments or suggestions? (Attach additional pages if necessary)

I would suggest runway be extended as much as possible over the airport so planes will reach higher altitude sooner before reaching nieghborhoods.

My sliding glass door is cracked from vibration of plane traffic this summer. I would appreciate replacement of door. As of this time I will not consider insulation because I don't know what effect the easement requirement will have.

Name: Elia Gutierrez Address: 24 Sandpiper Rd. Tampa, FL 33609

Telephone Number: (813) 286 2967

If you have any questions, please contact Georgianne Ratliff at (813)615-1319.

COMMENT FORM
HILLSBOROUGH COUNTY AVIATION AUTHORITY
PUBLIC HEARING
December 16, 1999

TPA PART 150 NOISE COMPATIBILITY STUDY

Please address the following items and provide any other comments and/or suggestions that you feel are appropriate:

1. Please identify any impacts to your property or neighborhood associated with the Airport or its activities.

I AM UNABLE TO MANTAIN A CONVERSATION INSIDE MY HOUSE. WE HAVE TO STOP WHEN A PLANE TAKES OFF OVER MY HOUSE, SAME FOR LISTENING TO MUSIC, TV, ETC. WINDOWS RATTLE & PICTURE WINDOWS (6X10) VIBRATE, EVENTUALLY WILL BREAK.

2. Any additional comments or suggestions? (Attach additional pages if necessary)

ON THE PAST ALL MY COMPLAINS HAVE BEEN IGNORED. EPA WILL NOT HANDLE "MOVING NOISE SOURCES". I HAVE NO REASON TO TRUST THAT IN THE FUTURE IT WILL GET BETTER BUT ON THE CONTRARY AS TRAFFIC (AIR) INCREASES AND PLANES GET BIGGER MY HOUSE WILL BECOME UNLIVABLE AND THE VALUE WILL DECREASE

Name: LUIS A. GUTIERREZ, MD Address: 24 SANDPIPER RD
Telephone Number: 813-286-2467 TAMPA, FL 33609

If you have any questions, please contact Georgianne Ratliff at (813)615-1319.

COMMENT FORM
HILLSBOROUGH COUNTY AVIATION AUTHORITY
PUBLIC HEARING
December 16, 1999

TPA PART 150 NOISE COMPATIBILITY STUDY

Please address the following items and provide any other comments and/or suggestions that you feel are appropriate:

1. Please identify any impacts to your property or neighborhood associated with the Airport or its activities.

We are located at the southern end of the Airport. The noise level is high due to the landing & taking off of planes. The most ~~annoying~~ annoying is the flights scheduled between 10 PM & 6 AM. When the T.V. is off and all is quiet the airplane noise is very loud.

2. Any additional comments or suggestions? (Attach additional pages if necessary)

Please consider the whole of our street because the pilots are not always perfectly in line with recommended paths. As we are all human the flight path does vary.

The larger aircraft that are used by UPS or Fedx or the Post Office in the middle of the night is by far the most annoying. Please consider us in your recommendation.

Name: Teresa W. McDaniel

Address: 5834 Mariner St. TPA, FL. 33609

Telephone Number: (813) 288-9041

If you have any questions, please contact Georgianne Ratliff at (813)615-1319.

GR

COMMENT FORM
HILLSBOROUGH COUNTY AVIATION AUTHORITY
PUBLIC HEARING
December 16, 1999

TPA PART 150 NOISE COMPATIBILITY STUDY

Please address the following items and provide any other comments and/or suggestions that you feel are appropriate:

1. Please identify any impacts to your property or neighborhood associated with the Airport or its activities.

- HEARING LOSS
- HAVE TO STOP CONVERSATIONS
- DIFFICULTY IN SELLING A HOME
- DIFFICULTY SLEEPING (PLANES KEEP COMING LATER AT NIGHT, EARIER IN THE MORNING, AND MORE FREQUENTLY ALL DAY.
- RELUCTANT TO ENTERTAIN.

2. Any additional comments or suggestions? (Attach additional pages if necessary)

- BUILD A RUNWAY TO THE WEST TO KEEP PLANES OVER THE WATER.
- LAND MORE OFTEN FROM THE NORTH.

Name: GEORGE + DEBORAH CHRISTEN-DOMEDION Address: 5820 MARINER ST.

Telephone Number: 877-1018

If you have any questions, please contact Georgianne Ratliff at (813)615-1319.

COMMENT FORM
HILLSBOROUGH COUNTY AVIATION AUTHORITY
PUBLIC HEARING
December 16, 1999

TPA PART 150 NOISE COMPATIBILITY STUDY

Please address the following items and provide any other comments and/or suggestions that you feel are appropriate:

1. Please identify any impacts to your property or neighborhood associated with the Airport or its activities.

- Greatly increased numbers of airplanes overhead. From before dawn to late at night, seven days a week, our neighborhood is subject to constant airplane noise. Planes frequently fly low enough so the noise drowns out conversation. We have seen NO abatement in airplane noise - on the contrary, it has increased greatly in the last couple years.

2. Any additional comments or suggestions? (Attach additional pages if necessary)

1) Why can't TIA disperse flight patterns to spread the traffic out more over North Tampa neighborhoods?

2) I would like to see noise monitoring installed much further north - for example, my neighborhood.

3) Ted Baldwin did a great job explaining the program. Of the airport personnel I talked with, Bill Connors was by far the least effective.

Name: Evelyn Bless Address: 5803 Myrtle Lane

Telephone Number: 813 264 0446 H 813 273 3517 W

If you have any questions, please contact Georgianne Ratliff at (813)615-1319.

Part 150 Public Hearing Advertisements

fro[redacted]ur Oa[redacted]er att[redacted]g a town meeting at which commissioners talk to residents. Jones said he has never once heard the name "Four Oaks" mentioned at one of those meetings.

Judy Siling, a community crime watch captain in the nearby Stonehedge subdivision, said CAAN would like for people from Four Oaks to help plan the new Carrollwood community center, which will use $3-million in tax money. But the group go there and develop contacts bec[redacted]f saf[redacted]cern[redacted]n Timberlan Park, a county facility in Four Oaks, is largely unused for the same reasons, Siling said.

"People are apprehensive about getting involved with that area, but it's not fair because I know there are probably a lot of good people in there," Siling said.

Many judge Four Oaks on its appearance, but for those residents who do maintain their homes and want to improve the neighborhood's

Oaks homeowner Murphy Woolard, [redacted]he c[redacted]will s[redacted]$85,0[redacted]community investment tax money to build 3,200 feet of new sidewalks along Four Oaks Road, said Steve Valdez, the county's community relations director. Construction is to start in February and last about six months.

Stormwater drain improvements are also planned at Four Oaks and Adams Street, Valdez said. That $7,000 project is expected in November 2002.

domingos a misa o a caminar por Coconut Grove.

Como mantiene el contacto con su país, siempre está al tanto de todo lo que ocurre a nivel musical en cada región.

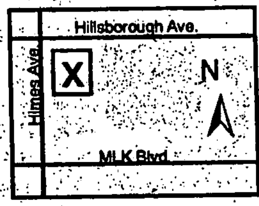
Gracias a Gaira, la compañía donde nace su música, se mide por la importancia que puede tener a nivel internacional", dice tajante. "Nadie aprecia el talento local de cada país."

¿Por eso no quieres volver a actuar? No me gustaría ... puesta que me llegó de República Dominicana. Si ésta se concretara, me los llevaría a todos hasta allá. Pero antes, estaré en el concierto de Amor, una experiencia que siempre vale la pena repetir.

Final Public Hearing Notice

Hillsborough County Aviation Authority

The HCAA will hold the final Public Hearing on the Part 150 Noise Compatibility Study for Tampa International Airport.



Thursday, December 16, 1999
6:00 P.M. to 8:00 P.M.
Higgins Hall at St. Lawrence Parish
5225 North Himes Avenue - Tampa

This pubic workshop will be held in an informal "open house" format with an overview by Louis E. Miller, Executive Director, and presentation to be given by the consultant team at 7:00 p.m. A question and answer session will follow. Various presentation stations with information about the study will provide a chance to learn about the study recommendations, as well as offer input. For more information, please contact our Public Involvement Coordinator Georgianne Ratliffe at (813) 615-1319.

... Hillsborough Area Regional Transit Authority, located 4305 East 21st Avenue, Tampa, Florida. Arrangements pickup of these documents may be made by ca HART's Purchasing Department at (813) 623-5835 1188, Monday through Friday, between the hours of AM and 5:00 PM.

A pre-proposal meeting will be held December 17, 1 at 10:00am, at HART's offices located at 4305 East Avenue, Tampa, FL 33605.

All inquiries pertaining to proposal specifications, or questions in reference to the proposal documents sh be directed to:

John J. Clark
Procurement Manager
(813) 623-5835 Ext 1189

12/10/9

[redacted]y faces [redacted]Christmas [redacted]ar crash

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Community With a Heart by Cleve Butler, a social worker assistant with Marion County Public Schools.

"This is something that has a long-term implication," Butler said. "He's got some treatment, but he has not really done some things that he needs to do, and there is a very strong possibility that this has hampered his being able to walk because he is not getting the treatment he needs.

"We need some help from somebody who has some clout and enough pull to be able to get through this red tape. This family is not asking for something they do not need."

THE GALES are not eligible for Medicaid or food stamps because of their previous income.

On top of the problems with his insurance company, his exhausted life savings and the uncertainty about whether he will ever work again, Reginald's home must be made wheelchair-accessible.

"I need a ramp built to the front and back door, and I would like to be able to get into the bathroom so I can take a shower. The doorway needs to be widened so I can get my wheelchair through it."

At the moment, Yvette tries to take care of Reginald herself.

"It is very difficult for me to help him because I still have this broken arm and a damaged back from the accident," Yvette said.

THE FAMILY'S SITUATION has them extremely worried about what lies ahead. Their retirement savings and money for their children's education is gone. Bills will soon begin piling up, and there is no way they can pay them. Their American dream is over.

Reginald is undergoing physical therapy at home. His insurance

THE TAMPA TRIBUNE
Published Daily
Tampa, Hillsborough County, Florida

State of Florida }
County of Hillsborough } ss.

Before the undersigned authority personally appeared J. Rosenthal, who on oath says that she is Classified Billing Manager of The Tampa Tribune, a daily newspaper published at Tampa in Hillsborough County, Florida; that the attached copy of advertisement being a

LEGAL NOTICE

in the matter of

NOTICE OF PUBLIC HEARING

was published in said newspaper in the issues of

DECEMBER 15, 1999

NOTICE OF PUBLIC HEARING
The Hillsborough County Aviation Authority announces final Public Hearing on Part 150 Noise Compatibility Study for Tampa International Airport to which all persons are invited.
DATE: Thursday, December 16, 1999
TIME: 6:00 PM - 8:00 PM Open House (7:00 Overview presentation)
LOCATION: Higgins Hall at St. Lawrence Parish, 5225 North Himes Avenue, Tampa, FL 33614
PURPOSE: To present results of the study and receive public comment.
Copies of the Part 150 Noise Compatibility Study document can be reviewed by contacting Brenda Gress at 813-870-8721.
6174 12/15/99

Affiant further says that the said The Tampa Tribune is a newspaper published at Tampa in said Hillsborough County, Florida, and that the said newspaper has heretofore been continuously published in said Hillsborough County, Florida, each day and has been entered as second class mail matter at the post office in Tampa, in said Hillsborough County, Florida for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that she has neither paid nor promised any person, this advertisement for publication in the said newspaper.

J. Rosenthal

Sworn to and subscribed before me, this 17 day

of DECEMBER, A.D. 1999

Personally Known____or Product Identification______
Type of Identification Produced____________________

CHARLOTTE A. OFFNER
Notary Public, State of Florida
My comm. expires April 21, 2000
No. CC548844

NOTARY PUBLIC

(SEAL)

Charlotte A. Offner

Part 150 Public Hearing
Post Card Notice

Tampa International Airport

FINAL PUBLIC HEARING NOTICE

Part 150 Noise Compatibility Study

A COMMITMENT TO EXCELLENCE:

Taking TPA Into the 21st Century

Date: December 16, 1999

Time: 6:00 - 8:00 PM, Open House
(7:00 PM - Overview Presentation)

Place: Higgins Hall at St. Lawrence Parish
5225 North Himes Avenue - Tampa

This is your chance to express your ideas and concerns.
Please plan to stop by and learn about our progress and give us your input.
For more information call (813) 615-1319.

APPENDIX L

Written Correspondence

James Biggs
8518 Ruth Pl
Tampa FL 33604

February 04, 1999

Mr. Ted Baldwin
Harris, Miller, Miller, & Hanson, Inc.

Dear Mr. Baldwin,

I would like to provide input on the Part 150 noise study at Tampa International Airport(TPA).
The current informal noise abatement procedures are not justified in regards to the distinction of types of aircraft. There is a definite difference between the noise levels produced by certain turbo-prop aircraft (i.e., Cessna Conquest, MU2, King Air B100) and light jet turbo-fan aircraft(i.e., Cessna Citation series and Beech jets). The Turbo-prop category is allowed access to more runways than the light jets, even though the jets are quieter. This discrimination provides for undue costs and delays.
Some possible suggestions to help alleviate the formalization of the current standards would be:

Time restrictions for use of certain runways.

Modifications of departure headings.

Re-categorize aircraft based on actual decibel data.

Should you need more detailed information, please contact me at the above address or by phone at: 813-932-2883.

Sincerely,

James Biggs
Pilot, Dillards Department Stores

HAVATAMPA, INC.

Mr. Ted Baldwin
Harris, Miller, Miller, Hanson, Inc.

February 4, 1999
Via facsimile: (781) 229-7939

Dear Mr. Baldwin:

This letter is in response to the difficulties I have with the process I observed at the last two Technical Working Group meetings at Tampa International Airport, and the Memorandum dated, 18 December, 1998, on the 150 Noise Abatement Analysis.

It appears to me that the objections and proposed solutions that I, and others, raised verbally at the Technical Working Group meetings have not seriously been addressed. I hope this letter does what I have failed to do thus far: convince you that the HCAA agenda, which is to formalize the current informal Noise Abatement Proposal, is flawed and needs to be reworked.

I submit the following articles for your consideration:

First, I have yet to receive a copy of this Memorandum from you. I am working from the copy supplied to Mark Wagner.

Second, it is my understanding that Tampa International Airport has an obligation to produce a Cost/Benefit Analysis for any proposed restrictions, as outlined in FAA Part 161 and I have not seen one, if it has been done.

Third, the proposed restriction may not unjustly discriminate between classes of aircraft. Any restriction must establish 'permissible levels of noise and apply them equally'. As yet, though I, and others, have requested noise profiles or "Footprints" for the Garret-Powered Turboprop Aircraft (Turbo-Commander, Mitsubishi, Merlin and Cessna 441), we have received no response. These aircraft are much noisier than our Stage III compliant Citation and permitting their access to runways to which we are denied access is, I believe, discriminatory, and if noisier non-jets that are given access denied quieter jets, it may also be considered an "Exclusive right" and, therefore prohibited by Part 161.

Fourth, any proposed noise restriction must be, at a minimum, based on a <u>demonstrated</u> noise problem, and the restriction must respond in a rational manner to that <u>specific</u> noise problem, (rather that a shotgun response to political pressure). In the three meetings we have attended, I have seen only two members of the affected communities, and only one spoke specifically about noise, and that was to say "It's not the jets on landing that cause so much noise for me; it's the propjets doing what sounds like they're going into reverse, and it rattles my windows as they go over". He surely doesn't understand turboprop aircraft because, of course, they don't 'go into reverse' in flight, but, rather advance the condition levers on final which is what he described. He certainly does, however, understand what noise he hears and can distinguish between a jet and a turboprop, and knows which one causes that noise that he experiences.

Fifth, in your Memorandum it is stated that during July 1997 when the west parallel runway was closed and "turbojets using 18L were requested to make early, sharp turns of the type corporate pilots have recommended, be made part of eased restrictions on 18L use".

I have been an operator on the Tampa Airport since July of 1995, and my corporate flight logs indicate that during the month of July I made seven departures from KTPA, and not once was I asked to make any kind of "early, sharp turn". While my logs do not indicate which runway was used, it is reasonable to assume that one or more departures would have been on 18L. Further, none of the other corporate operators with whom I spoke recall any request of that type ever at KTPA. Therefore, I submit that no sincere effort to explore my proposal was made. I have demonstrated on numerous occasions that our Citation is quite capable of making an early turn to a 210° heading well within the airport boundary and north of Westshore Boulevard. Also, there is no operational or statutory requirement which prohibits a turn below 400 feet.

In addition to this, I have demonstrated on numerous occasions, the most recent of which was on 2 February, 1999, the ability to depart runway 27 and make a left turn and follow the same 200° departure path as aircraft departing 18R.

Sixth, I see on Page 11, Par 1 of the Memorandum, reference to delays at the airport and that forecast delays are not such that use of the east parallel runway within the five-year time frame is necessitated.

Any time that we are requested to taxi to use the west parallel runway, we incur a delay of six to fifteen minutes.

Any time runway 36L is in use for turbojets and there is more than one aircraft in the queue, we experience a delay since all aircraft must get line to land, and it is obvious to even a casual observer that two runways in use reduce delays.

I believe that we corporate Stage III compliant operators can be good neighbors and still get fair and nondiscriminatory treatment by Air Traffic Control, and be permitted the use of all runways at KTPA.

I hope that we all are working to that end.

Sincerely,

R. A. Houghton

Richard A. Houghton

Mark Wagner
15920 Hampton Village Dr.
Tampa, Fl 32618
(813) 269-9225

February 3, 1999

Ted Baldwin
Harris, Miller, Miller, & Hanson, Inc.
15 New England Executive Park
Burlington, MA 01803

Re: Request for Comments – Noise Abatement Analysis

Ted,

As a corporate pilot and citizen of the Tampa community, I accepted the appointment to the Technical Working Group with a sincere desire to assist in developing a noise abatement program, which limits the impact on the local community but allows for efficient use of our aircraft.

After reviewing the memorandum dated December 18, 1998, of which I have recently received, I respectfully submit the following.

In the first paragraph of the section labeled *Alternative 1e* (page 11), you state that the first principle factor in not allowing for "easing" of current restrictions is due to a reluctance to changing the policy of which "is extremely important to residents south of the airport". From several comments made at the public meeting, I think our community wants to limit noise. If there is a public misconception that all turbofan aircraft are louder then turboprop, then we need to educate the population and make our decisions on facts not misconceptions.

Under the current Voluntary Noise Abatement Program, turboprop aircraft such as the Mitsubishi MU2 are allowed to use runways of which our Citation SII can not. From several comments that were made during the Technical Working Group meetings, I was under the impression this was to be addressed. I would therefore request that a study be undertaken as to the noise impact, in a quantifiable measure, allowing quieter jet aircraft, typically used in corporate aviation today, to use the runways otherwise unavailable and barring noisier turboprop aircraft. It would be reasonable to assume the aggregate noise would be reduced if quieter aircraft replace noisier aircraft. I strongly suggest the basis for aircraft inclusion/exclusion in the noise abatement policy be based on noise footprints for the individual aircraft not on general aircraft type (i.e. Turboprop, Turbofan, Turbojet). I would suggest this study utilize the FAA noise profile by aircraft type for noise signatures. If it is the goal of the Part 150 study to develop a plan to reduce the noise impact on our community, then this must surely be done.

In the sixth paragraph of the section labeled *Alternative 1e* (page 11), you state that pilots "were requested to make early, sharp turns" while using runway 18L. I can attest that we have never been asked to make turns other than the normal departure clearance to turn to a specific heading. Because we know what area the HCAA considers noise sensitive and how the HCAA would prefer aircraft to depart the airport boundaries, we have <u>offered</u> to turn in such a way as to have our aircraft depart the Tampa Airport boundary as if it was on the departure track of the preferential runway for noise abatement. A perfect example was our departure today (Feb 3) at 7:32am. A south flow was in effect, we requested runway 27, and said we could make the turn to follow as if we had departed 18R. The ground controller accepted our request and we taxied for take off. After we were cleared for takeoff from the tower controller, we were then given a clearance of "maintain runway heading". We explained to the controller that we were given the

200 heading and did not want to fly over sensitive areas. The clearance was changed as requested. Had we not questioned the clearance we would be one of the examples you have used to demonstrate the corporate aviation's non-compliance. Considering departures from 18L, I believe pilots whom are unaware of the geographic location of the "noise sensitive area" would most likely make the turn in accordance with standard operating procedures for their operation and would quite possibly impact the noise sensitive area. I believe this explains Figure 6's demonstration.

I therefore request a study be made as to the effect of publishing a noise abatement procedure, which geographically depicts the noise sensitive areas and a visual path to avoid such areas thereby allowing for greater utilization of the current airport runway structure. I would suggest one option, if using a south flow, would be to allow departures from 27 and make the turn as to track 18R departure profiles. A second option would be to allow use of 18L with a turn again to track 18R departure profiles. This would alleviate the prolonged taxi time to 18R and provide the desired effect of limiting noise over sensitive areas and increase airport utilization.

I believe we can achieve the desired result of limiting the noise impact on our community by designing a better system then formalizing the current policy, which is discriminatory in nature. I would gladly offer to coordinate our flight schedule with your noise survey reading as to demonstrate how we can operate as described above.

I look forward to receipt of your reply.

Sincerely,

Mark Wagner

HARRIS MILLER MILLER & HANSON INC.
15 New England Executive Park
Burlington, MA 01803
Tel. (781) 229-0707
Fax (781) 229-7939

March 3, 1999

Mr. James Biggs
8518 Ruth Place
Tampa, FL 33604

Mr. Richard A. Houghton
Havatampa, Inc.
3901 Riga Boulevard
P.O. Box 1261
Tampa, FL 33601

Mr. Mark Wagner
15920 Hampton Village Drive
Tampa, FL 32618

Dear Sirs:

I am writing a joint response to the individual letters that you sent me regarding the Part 150 Study at Tampa International Airport. I have attached copies of your letters.

Your comments can be grouped into the following areas:

- Formalizing the restriction on turbojet use of Runway 36R for arrivals and 18L for departures would "unjustly discriminate between classes of aircraft" and would require a Part 161 study.

Based on discussions with the FAA Air Traffic Control Tower (ATCT) staff, the Hillsborough County Aviation Authority (HCAA) staff have agreed that the Noise Compatibility Program may retain its "informal" designation, so a potential Part 161 analysis is not an issue.

- Corporate jets that are quieter than propeller driven (turboprop) aircraft should be allowed to use 18L/36R in an unrestricted fashion.

Some corporate jets are quieter than some turboprop aircraft. Table 1, on the following page, provides single event noise data for the six corporate jet and six turboprop aircraft types that are available in the Integrated Noise Model (INM) database for modeling operations at TPA. While there are more corporate jet and turboprop aircraft types operating at the airport, the INM does not have data for every specific model; the FAA has developed noise modeling data for aircraft that represent reasonable groupings.

The table lists the range of maximum A-weighted decibel level (Lmax) values published for each aircraft type at the FAR Part 36 takeoff and approach measurement locations.[1] The data are from FAA Advisory Circular 36-3G, "Estimated Airplane Noise Levels in A-Weighted Decibels" (4/2/96). The FAA maintains this Advisory Circular to give airports an A-weighted noise rating scale. Part 150 requires airports to use A-weighted noise levels. For most aircraft types, there are ranges of noise levels, due to variations in aircraft configuration, powerplants, weight, etc. The table also lists the percent of all corporate jet and turboprop operations that the aircraft types made up in the 1998 operations at TPA; e.g., the aircraft types represented in the INM by the Citation II accounted for approximately 32% of the 1998 corporate jet operations.

Table 1. Maximum A-Weighted Noise Levels for INM Corporate Jets and Turboprops

Aircraft Category	Aircraft Type	Maximum A-Weighted Sound Level at Part 36 Measurement Locations, from FAA AC 36-3C		Approximate Percent of Operations in Category
		Takeoff	Approach	
Corporate Jets	Citation II	63 - 67	79 - 80	32%
	Lear 35	65 - 72	82 - 83	25%
	Citation III	69	81 - 85	21%
	Lear 25	80 - 83	88 - 94	14%
	Canadair 600/601	66 - 67	80 - 82	7%
	Gulfstream IIB	80 - 84	84 - 91	1%
				100%
Turboprops	Dehavilland 8	65 - 67	81	43%
	Dehavilland 6	67	78	31%
	Saab-Fairchild 340	63 - 65	76 - 82	11%
	Cessna Conquest	63	75 - 77	9%
	Shorts 330/360	68 - 71	80 - 82	5%
	Dehavilland 7	69	84	1%
				100%

The noise levels presented in Table 1 reveal that, *as a group*, turboprops are quieter than corporate jets. All turboprops have departure noise levels of 71 dBA or less, compared to 85% of all

[1] The departure measurement location is under the flight path 6,500 meters from start of takeoff roll. The approach measurement location is under the flight path, 2,000 meters from the landing threshold.

corporate jets. All turboprops have approach noise levels of 84 dBA or less, compared to 86% of all corporate jets (assuming the quietest level in each range for the corporate jets).

Mr. Wagner's letter compared the Mitsubishi MU2 turboprop to the Citation SII. Mr. Houghton stated that the Turbo-Commander, Misubishi (MU2), Merlin, and Cessna 441 (Conquest) were much noisier than a Stage 3 Citation, such as the SII. Mr. Biggs compared the Citation and Beechcraft corporate jets to these aircraft and the Beechcraft King Air B100. Table 2 summarizes the noise levels for these specific aircraft. In most cases, the turboprop aircraft are quieter than the corporate jets.

Table 2. Requested Aircraft Comparisons

Aircraft Type	Maximum A-Weighted Sound Level, from FAA AC 36-3C	
	Part 36 Takeoff Estimate	Part 36 Approach Estimate
Citation SII Corporate Jet	65	80
Beechcraft Corporate Jet	72	83
Beech King Air B100 Turboprop	62	77
Cessna Conquest (441) Turboprop	63	75 - 77
Mitsubishi MU2 Turboprop	64 - 66	76
Fairchild Merlin Turboprop	69 - 71	76 - 79
Gulfstream Commander Turboprop	61 - 66	76 - 78

An advantage of the existing practice of basing the runway priority on the overall aircraft type classification is ease of implementation for the tower. A preferential runway program that required the tower to consider specific aircraft types would be extremely complex to implement. The tower staff would have to refer to a table of specific aircraft types to determine which aircraft fell under the program, on a flight-by-flight basis, which would introduce additional workload.

Instead of changing the existing runway priority, the HCAA staff support your offer to demonstrate that corporate jets can depart from 18L and 27 in a manner that simulates 18R departures, as discussed below.

- Corporate jets could depart on 18L and 27 and make turns to simulate a departure on 18R.

Two of your letters suggested that corporate jets could depart on 18L and make an "S" turn, and on 27 make a 90° left turn, in a fashion that would allow them to follow the 18R 200° departure track, with no change in community noise exposure. Mr. Wagner suggests a study, or test, of these procedures. *The HCAA staff will request that the FAA conduct the test. Radar data from the test* *period would provide a basis for evaluating aircraft performance.* If the test proves that the procedures are operationally feasible, it is likely that the FAA will require an Environmental Assessment (EA). The EA would include a noise analysis based on the actual aircraft performance, to determine the effect on noise exposure. Mr. Biggs suggests that runway use could be based on time of day. The test could consider this option. The test would take place after FAA approval of the Part 150 Update and after the HCAA has obtained monitoring equipment.

An important non-noise issue for the test to consider is the effect on FAA workload associated with the need to ensure that the Runway 18L or 27 departures safely merged with the Runway 18R flow. At a minimum, merging with the 18R traffic would mean that this procedure would have no benefit related to increasing overall airport capacity or reducing overall delay.

hmmh

Please note that the test would not imply any easing of the existing informal restriction on Runway 36R arrivals.

• • • • •

In closing, I would like to let you know that we have asked Ms. Georgianne Ratliff of Wilson•Miller, the study's public involvement coordinator, to ensure that all three of you are notified of Technical Working Group (TWG) meetings, so that you can continue to monitor the study's progress and provide input. Mr. Wagner is already a member of the TWG, as the corporate aviation representative. You may be aware that the study also has an Agency Working Group and a Public Input Group. You are also welcome to attend meetings of those groups.

We greatly appreciate your thoughtful input and look forward to working with you on the items discussed above, or other issues of interest to you. Please do not hesitate to contact me if you have any further questions.

Sincerely,

HARRIS MILLER MILLER & HANSON INC.

Ted Baldwin

Ted Baldwin
Vice President

c: L. Miller, HCAA
W. Connors, HCAA
N. Jones, HCAA
J. Mishler, HNTB
G. Ratliff, WHI

ExecuJet
THE ULTIMATE IN CHARTER SERVICE
P.O. Box 17266 • Clearwater, FL 33762
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December 1, 1998

Hillsborough County Aviation Authority
Tampa International Airport
Tampa, FL 33607

To Whom It May Concern:

It has been brought to my attention that a meeting is taking place regarding noise abatement an runway usage issues. Due to previous commitments I am unable to participate however, I an hopeful you will allow this letter be considered in lieu of my attendance.

In aviation there has been an ever-present conflict between airports and associated housin communities. Noise abatement concerns are an issue that most pilots will feel deserves attention I personally feel that a compromise is truly in order with respect to procedures at Tamp International Airport and there are several considerations that need to be addressed.

Many years ago I was based at TIA and flew Learjets for both air-ambulance and charter. A you are well aware, those older aircraft were unable to conform to stage three noise criteri however; we were still permitted to use 18L for a departure as long as we could initiate an earl right turn to a heading of 210 degrees. Authorizations were also obtained for a 36R departur and arrivals with no consequence. In my opinion, I believe that companies such as mine that ar operating newer generation equipment powered by engines that not only meet but exceed stag three noise criteria, should be permitted to use the most accessible runway available. I am eve willing to offer that my contemporaries and I would accept a compromise to only request the us of the runway in question during normal business hours. This would greatly enable us to full capitalize on both time and fuel savings if we are able to utilize 18L/36R for departures an arrivals. Furthermore, due to equipment type and applications of procedures in my opinion th residents of neighboring communities will not be affected.

Thank you for your attention to this matter, your considerations are greatly appreciated.

Sincerely,

Peter R. Cunzolo, Vice President,
Director of Operations

Tampa International Airport

December 28, 1998

Mr. Peter R. Cunzolo, Vice President
Director of Operations
ExecuJet
P.O. Box 17266
Clearwater, FL. 33762

Dear Mr. Cunzolo:

As a part of the update of the Master Plan and Part 150 Noise Control and Land Use Compatibility Study for Tampa International Airport, we have been striving though our Public Involvement Program to solicit input from as many segments of the community as possible. Using this approach has assisted us in identifying significant issues. The challenge remains to resolve these issues in a balanced manner for all Airport users.

A part of this study process addresses the issue of relaxing noise abatement restrictions on Runway 18L/36R, taking into consideration the fact that some corporate aircraft have achieved Stage III noise levels. The current noise abatement restrictions have been in effect since the sixties, and under the balanced approach mentioned previously, the only impetus the Aviation Authority would have to relax these restrictions would be the need for additional airfield capacity. Our preliminary airfield capacity studies have not identified a need for a new runway for at least ten to fifteen years. Therefore, it would be extremely difficult for the Aviation Authority to justify creating an environmental problem in the adjacent residential communities by operating Runway 18L/36R in a less restrictive manner. As you are based at Tampa, you are well aware of the residential areas adjacent to the Airport. Most of these communities were developed well before the Airport existed in its present location. Consequently, over the years we have fostered a very effective preferential runway use program that provides the Airport with adequate airfield capacity and the ability to operate without major noise impacts on surrounding communities. It is important that we maintain this balance in the future.

Thank you for taking the time to write about your concerns. Your suggestions are reasonable from your perspective as a corporate pilot and we will examine them in the "balanced" manner I have just discussed. I will forward your letter to our consultants updating the noise study for evaluation.

Sincerely,

Louis E. Miller

cc: [redacted]

Louis E. Miller Executive Director

Hillsborough County Aviation Authority P.O. Box 22287, Tampa, Florida 33622 phone 813-870-8700 fax 813-875-6670 web site www.TampaAirport.com
Peter O. Knight Airport Plant City Airport Vandenberg Airport

6017 W. North Street
Tampa, FL 33634-4445

November 16, 1999

I have been calling the airport authority about the noise that the planes cause going over my home.

Repeatedly I have been told that they can muffle the sound as they leave and land.

The noise is all the time, however, the most urge problem is at night, when we are asleep and the planes shake the windows and the house, waking us from a sound sleep.

I noticed by the article in the paper on Saturday, November 13th, that you plan to give the people with homes of $150,000 and up help with making their homes quieter.

I am a recent widow, who has now developed health problems making me give up my job of 21 years. I have had to apply for Social Security and of course that is limited money coming into the household.

It seems to me that if you are going to help those people who can afford a home of that value that you should also offer help to someone that has purchased a home, within their means but not that expensive.

When the reporter from the St. Pete Times called me about my calls to the airport, I explained that the noise at night was unbearable but that we can tolerate the noise during the daytime.

To listen to TV is impossible with the planes taking off. They do not stay on their flight pattern. They veer to the west as soon as they lift off and this brings them right over the house.

I noticed that you are having a meeting, however, with the pain I am in, I can not attend the meeting. I also have vision difficulties making it impossible for me to drive at night. I feel that this is a problem that could be solved between us, not bringing everyone into it.

I was very surprised when the reporter from the St. Pete Times called me one afternoon and I told him that the night time was the only thing that I could not take.

I have recently had new plywood and shingles placed on my home but that still has not helped with the noise. I have more insulation in the attic than is required according to the builder who lives next door to me and who installed the last amount of insulation.

Being on a fixed income, I can not afford the new windows that the article states you plan to help those other people with, and would really appreciate any help you can give me in obtaining and getting those windows installed and to add more insulation to the attic and get better doors on the house.

Please take this letter as a request for your help to solve the noise.

Planes leaving at 10pm and after are really a nuisance. At 11:23pm the other night both of us were brought out of a sound sleep by a plane that was too low, too loud and right over the house.

I live just north west of the airport. I have lived here 21 years and the noise has been getting louder and louder but with the windows and house vibrating, it is getting out of hand.

Please let me know if you can add me to your list of people to get help.

They can tell you at the airport that I have asked for help many times and gotten a lot of different reasons for the noise. One reason was a so called medical emergency coming in and the planes had to go out over my house to get out of the way. Why couldn't they have been kept on the waiting strip until the emergency was over. The wind is blowing toward the east so we have to go out over your house. There is a storm 50 miles out bothering the planes.

I do not want anyone put into jeopardy, however, I do want to be able to sleep and enjoy my home.

Please help me.

Sincerely,

Janice G O'Brien

Janice G. O'Brien

Tampa International Airport

December 1, 1999

Ms. Janice G. O'Brien
6017 W. North Street
Tampa, Florida 33634-44445

Dear Mrs. O'Brien:

Thank you for your letter dated 11/16/99, bringing to my attention the aircraft noise impacts you are currently experiencing in the Southern Comfort community. As you are probably aware, the Aviation Authority is in the process of updating its 1986 Part 150 Noise Compatibility Study for Tampa International Airport.

My staff has researched the recent information available in the 1998 updated Noise Study regarding noise levels in your community. This information is shown on a map of the Airport and surrounding communities with an overlay of the noise level contours. These contours represent day night noise levels averaged for one year. Our updated map was produced using a computer simulation developed by the Federal Aviation Administration (FAA) and called an integrated noise model (INM). Also, attached is the 1998 noise contour map for your reference.

I would like to bring to your attention that the 1990 noise contours in the former Part 150 Study covered a larger land area than the 1998 contours. This means that noise levels generated by aircraft operating at Tampa International have decreased -- and will continue to decrease. This is largely due to the following: 1) aircraft engines are quieter and 2) aircraft operations have grown at a slower rate than as forecast in the 1988 Master Plan.

When examining the 1998 noise contour map, your property does not fall within the 65 day night level (dnl) contour. At this noise level (65 dnl), the FAA asks airports to look at ways of reducing the noise impacts on adjacent residential properties, schools, hospitals, churches and other type land uses that could be considered incompatible with aircraft operations. The FAA also requires airports to complete a five year forecast to determine the possible impact growth in aircraft operations may have on adjacent incompatible land uses. The Aviation Authority has done this. By 2003, the projected noise contour map shows that your property (and community) will not be within the 65 dnl noise contour. Given this fact, your property is not eligible for sound insulation. I've attached a copy of the 2003 contour map for your reference.

Although our computer model did not show noise levels in your area that required mitigation on the Aviation Authority's part, we have nonetheless recommended some action to address noise impacts in your community. As part of our updated Part 150 Study, the Aviation Authority is requesting that the Air Traffic Control Tower at Tampa International Airport direct the noisier, propeller driven, small aircraft that tend to fly at lower attitudes and initiate turns over your community, when operating to the north, to take-off straight out, at a heading of 360 degrees, provided safety and weather conditions permit. This will reduce the number of aircraft turning over your community. The large jet aircraft currently use this heading when taking off to the north for a distance of at least 3 nautical miles before initiating any turns to the east or west.

For those instances described in your letter where aircraft are disturbing you in the evenings, the Aviation Authority will be acquiring a Flight Monitoring System, after the FAA approves our updated Part 150 Study. This equipment will assist us in identifying these aircraft and determining why they made early turns over Southern Comfort. Until such time that we have installed our equipment, please continue to notify the Authority's Operations or Planning and Environmental Services staff by calling 870-8700 so that we can follow-up with the Air Traffic Control Tower and the airline flying the aircraft.

Because your health will not permit you to attend our Part 150 Study Public Hearing on December 16th, I've asked my staff to make sure that you receive all the meeting materials and a newsletter. If you have any further questions, please feel free to contact Nadine Jones, Director of Planning & Environmental Services, at 870-8773. Or, you may contact me at 870-8701. I appreciate your bringing this matter to my attention.

Sincerely,

Louis E. Miller

Enclosures

Cc: Bill Connors, Sr. Director, Planning and Development
Grant Young, Director of Operations
Nadine Jones, Director of Planning and Environmental Services

5810 Mariner St.
Tampa, FL 33609
12/15/99

Nadine Jones
Planning and Environmental Services
Tampa International Airport Authority

Dear Ms. Jones,

I appreciate your taking the time to discuss the airport sound mitigation project. I have not yet received the contour map that you sent by email. I would appreciate your sending it again to "rogers@chuma.cas.usf.edu". I assume the data includes the predicted error of this analysis.

Based on your information and the Nov. 13 St. Petersburg Times article, I find the whole project highly irregular. It is inappropriate for just six houses to be chosen to receive a very large sum of money. The fact that the majority of this money is earmarked for "consultant" fees suggests that this project is more about appearances than substance. According to the Times article, 336 homes sit within the "contour" considered too noisy by FAA standards. If this is indeed the case, these homes should be soundproofed; to bring the interior within accepted limits. Clearly, all these homes should have at least partial assistance.

You stated that "65 DNL" is considered too noisy. The Times article states that this requires people to "raise their voices to be heard a few feet away" and that this is similar to the sound generated by a vacuum cleaner at 10 feet. This situation certainly occurs at our house when planes take-off or land over the southern approach. Indeed, we could not shout loud enough to be heard. Consequently, we spent $15,000 to install double-glazed windows last year.

As a frequent payer of the exorbitant airport use fees, I am outraged that this money will be spent so selectively and on these consultant studies. Anyone can walk down Mariner Street and hear the terrible noise produced by users of the airport. Computer models are notoriously unreliable. The suggestion that the consultants will be rehired in five years to see if their models are correct is ridiculous. The consultants should experiment at their own expense. Spend the money to help soundproof homes that are clearly unacceptably noisy. The Airport Authority should limit the number of hours that the airport is open and require all airlines to abandon the old jet engines that are the worst noise producers. If the airport cannot handle all the air traffic in a limited day, build another runway. This would improve the quality of life in many more than six homes.

Yours truly,

Melissa B. Rogers

cc: Mayor Greco, Laura Carnow, Commissioner Hart

Tampa International Airport

December 28, 1999

RECEIVED

JAN - 3 2000

HARRIS MILLER
MILLER HANSON INC.

Melissa B. Rogers
5810 Mariner St.
Tampa, Florida 33609

Dear Mrs. Rogers

I am writing to clear up some misunderstanding about why the Aviation Authority is looking at the option of sound insulation for at least six properties on Mariner Street. These properties are situated within the 65 dnl noise contour (year 2003) for Tampa International Airport. I also hope to outline a mutually acceptable option to address your particular situation discussed in your December 15, 1999, letter to Nadine Jones.

As a resident of Tampa and a frequent user of our Airport, you have every, correct expectation that the operators of this Airport will be prudent and fair when developing programs related to the expansion of Tampa International. Be assured that we have attempted to thoroughly evaluate noise impacts on all of our neighbors in the vicinity of the Airport. The FAR Part 150 Noise Compatibility Study was developed using the guidelines recommended by the Federal Aviation Administration for conducting noise impact analysis. The updated Noise Exposure Map (1998 and 2003 noise contours) were produced using a computer simulation, called the integrated noise model (INM). This model was developed by the Federal Aviation Administration in the late 1970s and has undergone at least six upgrades to further refine its performance.

As you are aware, we developed the 2003 Noise Exposure Map during the update of the Part 150 Study for Tampa International Airport. This is a voluntary study. As is the case with many airports, we have opted to conduct this study because it is prudent for airport management to determine the potential noise impacts our projected growth may have on all affected parties. Once approved by the FAA, this study makes us eligible for funding to implement noise abatement projects, if and when, funds are available. At noise level 65 dnl, the FAA asks airports to look at ways of mitigating noise impacts on adjacent residential properties, schools, hospitals, churches and other incompatible land uses. The FAA also recommends that airports update their Part 150 Studies as frequently as every five years to determine if there are any changes in the noise levels and affected areas.

Louis E. Miller *Executive Director*

Hillsborough County Aviation Authority P.O. Box 22287, Tampa, Florida 33622 phone 813-870-8700 fax 813-875-6670 web site www.TampaAirport.com
Peter O. Knight Airport Plant City Airport Vandenberg Airport

During the scheduled Public Hearing on December 16, 1999, we were informed by several residents on Mariner Street, whose homes were located outside of the 65 dnl, that they felt that they were exposed to levels of noise that were equally as intrusive as their neighbors whose properties fell within the 65 dnl contour. Because noise nuisance is subjective and because of the very close proximity of the properties outside of the contour, I have asked the consultants conducting the Part 150 Study to examine the feasibility of expanding sound insulation to all single family residences on Mariner St. that are outside of the 65 dnl. It is my understanding that your property falls in this category. Your letter to Mrs. Jones also indicates that you have recently installed new windows. My consultants have informed me that although you installed windows, the type windows and the manner of installation may not meet the FAA's standards for sound insulation programs. Therefore, at the appropriate time, we should measure the interior noise levels at your home to determine if your property meets the FAA noise attenuation standards. If the noise level does not meet the FAA's standards, they would make recommendations on what type of sound insulation treatment would be needed. We would apply this standard procedure to all eligible residential properties.

In closing, I want to make it clear that I cannot offer any of the options discussed in this letter until the FAA completes its evaluation, public review process and formally approves the updated Part 150 Study, including the Authority's recommendations relating to the sound insulation programs described above.

I hope that this information has adequately explained why we are proposing sound insulation as one option in our Noise Compatibility Program, as well as what our next steps will be in addressing your specific concerns.

If you have further questions or require additional information, please feel free to contact me at 870-8701 or Nadine Jones at 870-8773. Thank you for taking the time to write and inform us of the nature of the problems you have experienced.

Sincerely,

Louis E. Miller

cc: Mayor Dick Greco
Commissioner Chris Hart
Nadine Jones, HCAA
✓Ted Baldwin, HMMH
Bill Connors, HCAA
John Wheat, HCAA