NASHVILLE INTERNATIONAL AIRPORT

NOISE EXPOSURE MAP UPDATE

FINAL

December 2004

Prepared for:

Metropolitan Nashville Airport Authority
One Terminal Drive, Suite 501
Nashville, Tennessee 37214

Prepared by:

Landrum & Brown, Incorporated
11279 Cornell Park Drive
Cincinnati, Ohio 45242

METROPOLITAN NASHVILLE AIRPORT AUTHORITY
ONE TERMINAL DRIVE • SUITE 501 • NASHVILLE, TENNESSEE 37214-4114 • (615) 275-1600

November 22, 2004

LaVerne Reid
FAA, Memphis Airports District Office
2862 Business Park Drive, Building G
Memphis, Tennessee 38118-1555

Subject: Submission of Noise Exposure Maps for Nashville International Airport

Dear Ms. Reid:

Enclosed please find five (5) copies of the above referenced document submitted under 14 CFR FAR Part 150 for appropriate FAA determination. The Metropolitan Nashville Airport Authority requests approval of the Existing (2004) Noise Exposure Map for existing conditions and the Future (2009) Noise Exposure Map for future conditions.

The Future (2009) NEM is based on reasonable forecasts and planning assumptions developed for the airport. We herein verify that the documentation is representative of existing and future forecast conditions as of the date of submission. The NEMs are revisions to the NEMs that have been previously determined by the FAA to be in compliance with Part 150.

If you have any questions regarding the NEMs, please feel free to contact me. We look forward to an expeditious Federal review of the NEMs.

Sincerely,

Raul L. Regalado
President & CEO

NOISE EXPOSURE MAP -- CHECKLIST -- PART I

AIRPORT NAME: Nashville International Airport REVIEWER_____

	Yes/No/NA	Page No.\Other Reference
I. IDENTIFICATION AND SUBMISSION OF MAP DOCUMENT:		
A. Is this submittal appropriately identified as one of the following, submitted under FAR Part 150:		
1. a NEM only	N/A	
2. a NEM and NCP	N/A	
3. a revision to NEMs which have previously been determined by FAA to be in compliance with Part 150?	Yes	Cover Letter
B. Is the airport name and the qualified airport operator identified?	Yes	Cover Letter, Statement of Certification
C. Is there a dated cover letter from the airport operator which indicates the documents are submitted under Part 150 for appropriate FAA determinations?	Yes	Cover Letter
II. CONSULTATION: [150.21(b), A150.105(a)]		
A. Is there a narrative description of the consultation accomplished, including opportunities for public review and comment during map development?	Yes	Appendix A
B. Identification:		
1. Are the consulted parties identified?	Yes	Appendix A
2. Do they include all those required by 150.21(b) and A150.105(a)?	Yes	Appendix A
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	Statement of Certification
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	Appendix A

AIRPORT NAME: Nashville International Airport REVIEWER_____

	Yes/No/NA	Page No.\Other Reference
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	Exhibit 4 & 5
B. Map currency:		
1. Does the existing condition map year match the year on the airport operator's submittal letter?	Yes	Cover Letter
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	Statement of Certification
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?	N/A	
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?	N/A	
2. If the 5-year map is based on program implementation:	N/A	
a. are the specific program measures which are reflected on the map identified:	N/A	
b. does the documentation specifically describe how these measures affect land use compatibilities depicted on the map?	N/A	
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 plan?	N/A	
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 not be less than 1" to 8,000'), and is the scale indicated on the maps?	Yes	Exhibits 4 & 5

AIRPORT NAME: Nashville International Airport REVIEWER_____

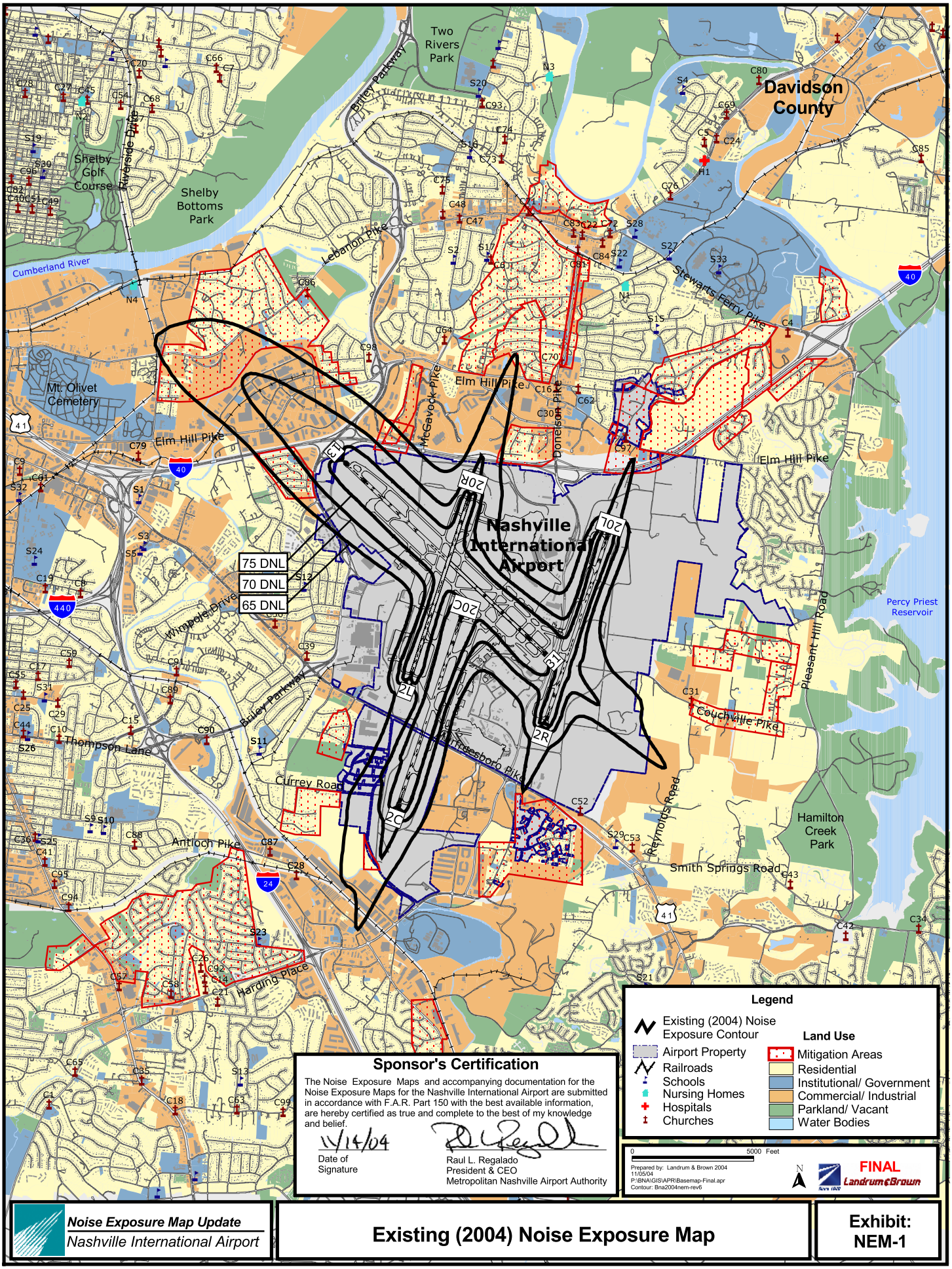
	Yes/No/NA	Page No.\Other Reference
B. Is the quality of the graphics such that required information is clear and readable?	Yes	Exhibits 4 & 5
C. Depiction of the airport and its environs.		
1. Is the following graphically depicted to scale on both the existing condition and 5-year maps:		
a. airport boundaries	Yes	Exhibits 4 & 5
b. runway configurations with runway end numbers	Yes	Exhibits 4 & 5
2. Does the depiction of the off-airport data include:		
a. a land use base map depicting streets and other identifiable geographic features	Yes	Exhibits 4 & 5
b. the area within the 65 Ldn (or beyond, at local discretion)	Yes	Exhibits 4 & 5
c. clear delineation of geographic boundaries and the names of all jurisdictions with planning and land use control authority within the 65 Ldn (or beyond, at local discretion)	Yes	Exhibits 4 & 5
D. 1. Continuous contours for at least the Ldn 65, 70, and 75?	Yes	Exhibits 4 & 5
2. Based on current airport and operational data for the existing condition year NEM, and forecast data for the 5-year NEM?	Yes	Exhibits 4 & 5
E. Flight tracks for the existing condition and 5-year forecast time frames (these may be on supplemental graphics which must use the same land use base map as the existing condition and 5-year NEM), which are numbered to correspond to accompanying narrative?	Yes	Exhibits 2 & 3
F. Locations of any noise monitoring sites (these may be on supplemental graphics which must use the same land use base map as the official NEMs)	N/A	
G. Noncompatible land use identification:		
1. Are noncompatible land uses within at least the 65 Ldn depicted on the maps?	Yes	Exhibits 4, 5, & C-1

AIRPORT NAME: Nashville International Airport REVIEWER_____

	Yes/No/NA	Page No.\Other Reference
2. Are noise sensitive public buildings identified?	Yes	Exhibits 4, 5, & C-1
3. Are the noncompatible uses and noise sensitive public buildings readily identifiable and explained on the map legend?	Yes	Exhibits 4, 5, & C-1
4. Are compatible land uses, which would normally be considered noncompatible, explained in the accompanying narrative?	Yes	Section 6
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	Sections 4 & 5
2. Are the underlying technical data and planning assumptions reasonable?	Yes	Statement of Certification
B. Calculation of Noise Contours:		
1. Is the methodology indicated?	Yes	Section 3
a. is it FAA approved?	Yes	Section 3
b. was the same model used for both maps?	Yes	Section 3
c. has AEE approval been obtained for use of a model other than those which have previous blanket FAA approval?	N/A	
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?	N/A	
b. if so, does this have written approval from AEE?	N/A	
3. If noise monitoring was used, does the narrative indicate that Part 150 guidelines were followed?	N/A	
4. For noise contours below 65 Ldn, does the supporting documentation include explanation of local reasons? (Narrative explanation is highly desirable but not required by the Rule.)	N/A	

AIRPORT NAME: Nashville International Airport REVIEWER_____

	Yes/No/NA	Page No.\Other Reference
C. Noncompatible Land Use Identification:		
1. Does the narrative give estimates of the number of people residing in each of the contours (Ldn 65, 70 and 75, at a minimum) for both the existing condition and 5-year maps?	Yes	Sections 4 & 5
2. Does the documentation indicate whether Table 1 of Part 150 was used by the airport operator?	Yes	Section 3
a. If a local variation to Table 1 was used:	N/A	
(1) does the narrative clearly indicate which adjustments were made and the local reasons for doing so?		
(2) does the narrative include the airport operator's complete substitution for Table 1?	N/A	
3. Does the narrative include information on self-generated or ambient noise where compatible/noncompatible land use identifications consider non-airport/aircraft sources?	N/A	
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?	N/A	
5. Does the narrative describe how forecasts will affect land use compatibility?	Yes	Section 5
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	Statement of Certification
B. Has the operator certified in writing that each map and description of consultation and opportunity for public comment are true and complete?	Yes	Statement of Certification



Sponsor's Certification

The Noise Exposure Maps and accompanying documentation for the Noise Exposure Maps for the Nashville International Airport are submitted in accordance with F.A.R. Part 150 with the best available information, are hereby certified as true and complete to the best of my knowledge and belief.

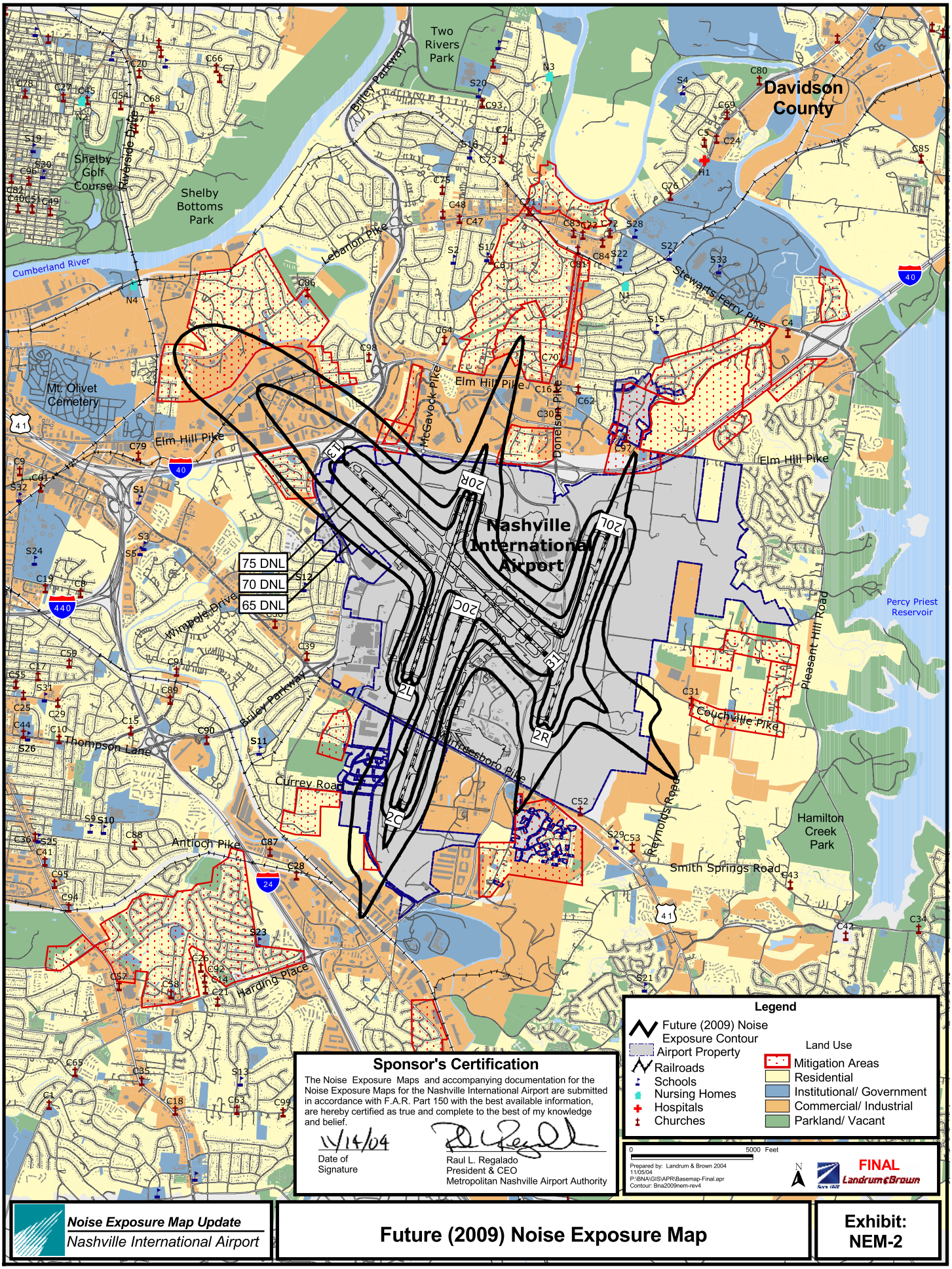
11/14/04
Date of Signature

Raul L. Regalado
President & CEO
Metropolitan Nashville Airport Authority

Noise Exposure Map Update
Nashville International Airport

Existing (2004) Noise Exposure Map

Exhibit: NEM-1



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11/14/04
Date of Signature

Raul L. Regalado
President & CEO
Metropolitan Nashville Airport Authority

Noise Exposure Map Update
Nashville International Airport

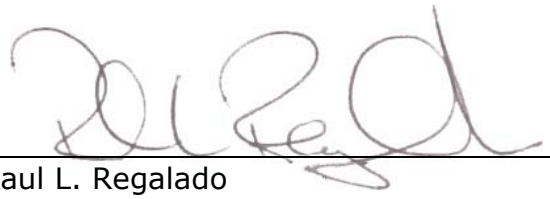
Future (2009) Noise Exposure Map

Exhibit: NEM-2

STATEMENT OF CERTIFICATION AND PUBLIC NOTIFICATION

The Existing (2004) and Future (2009) Noise Exposure Maps (NEMs) and accompanying documentation for Nashville International Airport, are submitted in accordance with Part 150 of the Federal Aviation Regulations (14 CFR 150). To the best of my knowledge and belief, the Existing (2004) and Future (2009) Noise Exposure Maps were prepared with the best available information and on the basis of reasonable assumptions and are hereby certified as true, complete, and representative of existing and future aircraft noise levels.

I also hereby certify that interested persons have been afforded adequate opportunity to submit their views, data, and comments concerning the correctness and adequacy of the draft Noise Exposure Maps and descriptions of forecast aircraft operations. A copy of all written comments received during development of the Noise Exposure Maps is included in this document.



Date 11/14/04

Raul L. Regalado
President and CEO
Metropolitan Nashville Airport Authority

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NASHVILLE INTERNATIONAL AIRPORT

NOISE EXPOSURE MAP UPDATE

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1.0 INTRODUCTION

1.1 FAR Part 150

Federal Aviation Regulation (FAR) Part 150 has two components: Noise Exposure Maps (NEMs) and a Noise Compatibility Program (NCP). The NEMs provide to all interested parties information on the existing and five-year future expected boundaries of significant levels of annual average noise exposure surrounding an airport. The NCP sets forth measures intended to mitigate the impacts of significant noise exposure on residential areas near the airport and to restrict the introduction of new incompatible land uses into locations exposed to significant noise levels. This document updates the NEMs for Existing (2004) and Future (2009) conditions at Nashville International Airport (BNA).

1.2 Background

The Metropolitan Nashville Airport Authority (MNAA) has a long history of noise compatibility planning at BNA. This document reflects the fourth iteration in noise compatibility planning for BNA. The first three iterations are listed below:

- BNA Noise Control Study, 1985-1986
- BNA FAR Part 150 Study, 1989
- BNA FAR Part 150 Noise Exposure Map Update Study, 1996

One of the recommendations of the previously approved plans is the periodic update of the NEMs and NCP to maintain currency with local conditions. In 1997, the NEMs for BNA were determined to be in compliance by the FAA as part of the *FAR Part 150 NEM Study Update, 1996*. Since development of the last NEMs, the aviation industry has gone through a number of changes. These include the overall aviation industry decline after the events of September 11, 2001, and the move by airlines towards higher use of regional jets versus narrow-body jet aircraft. Because of these factors and the need to periodically update the NEMs, the MNAA has undertaken this update of the official NEMs for BNA.

1.3 Public Involvement

The NEM update process began in December 2003 with the distribution of letters to Metropolitan Council members of the Metropolitan Government of Nashville and Davidson County. The letters notified the council members of the airport's intention to update the official NEMs for BNA. Appendix A, *Public Coordination*, includes a copy of the study notification letters.

1.4 Draft NEM Update Document

The Draft NEM Update document was made available to the public on September 27, 2004 and was available at local libraries, at the MNAA Administrative offices on the fourth floor at the airport, on the MNAA's website (www.flynashville.com/about/noise.cfm), and at the Tennessee Department of Transportation Aeronautics Division. Appendix B, *Document Locations*, provides a list of the locations for public viewing of the Draft NEM Update document. Written comments on the Draft NEM Update document were accepted between September 27, 2004 and October 29, 2004 and are included and responded to in Appendix F, *Response to Comments*.

2.0 NOISE EXPOSURE MAPS (NEMS)

Once certified by the FAA, the NEMs in this document will become the official noise contours for the airport. The NEMs are prepared for Existing (2004) conditions and for Future (2009) conditions. The NEMs were prepared according to the FAR Part 150 guidelines with regard to methodology, noise metrics, identification of incompatible land uses, and public outreach. Under FAR Part 150 guidelines it is required that the FAA's Integrated Noise Model (INM) be utilized in the preparation of the NEMs.

3.0 METHODOLOGY

The noise exposure patterns at BNA are presented in terms of the annual Day-Night Sound Level (DNL) for Existing (2004) and Future (2009) conditions. The annual DNL measure is the annual average of the total noise energy that occurs at a location. With DNL, nighttime (10:00 p.m. to 6:59 a.m.) noise events are weighted (or penalized) by 10 decibels (dB) to reflect the greater perceived impact of noise at night. The DNL is used in Part 150 studies and in other noise study-related documents to demonstrate compliance with the National Environmental Policy Act (NEPA). The NEMs display contour lines that connect points of equal DNL exposure at 65, 70, and 75 dB.

The noise levels computed during this study used the latest version of the INM at the time the study was initiated (version 6.1). The INM was developed under the auspices of the FAA for use in Part 150 and other environmental studies. The distribution of the noise pattern calculated by the INM is a result of the number of aircraft operations that occurred during the evaluation period, the types of aircraft flown, the time of day operations occur, the frequency of use of each runway, and the routes of flight to and from the runways. Substantial variations in any one of these factors may, when extended over a long period of time, cause marked changes to the annual noise pattern. Detailed information on each of these elements is presented in this document.

The distribution and number of residences, population, and noise-sensitive public uses located within each significant contour range (65-70 DNL, 70-75 DNL, 75+ DNL) were determined through the application of Geographic Information System (GIS) technology, coupled with a field validation survey taken during November 2003. Appendix C, *Land Use Assessment Methodology*, includes a detailed description of the mapping used in this report. The identification of noise-sensitive land uses is based upon Table D-1, *Part 150 Land Use Compatibility Guidelines*. This table is located in Appendix D, *FAA Policies, Guidance, and Regulations*, of this document. The underlying base map on which each noise exposure pattern is displayed is current as of April 2004. All noise impacts associated with Existing (2004) and Future (2009) conditions were automatically calculated by a combination of the contour set with the GIS base map.

4.0 EXISTING (2004) CONDITIONS

The noise contours displayed on the Existing (2004) NEM represent the noise pattern for the baseline conditions for 2004. The data on which the Existing (2004) NEM is based was derived from aircraft operations occurring between January 2003 and December 2003.

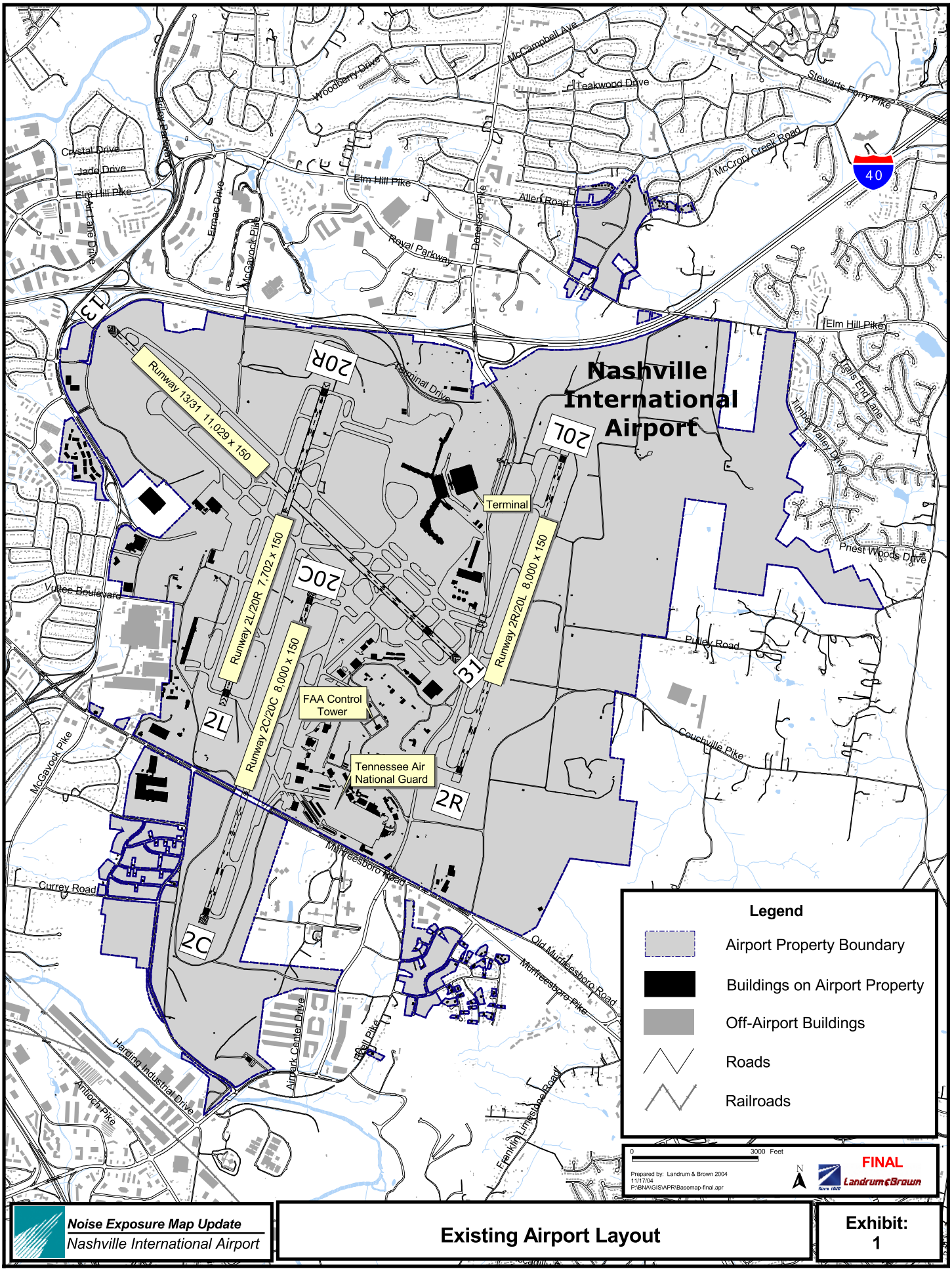
4.1 Runway Layout

The airport currently operates four runways - three parallel runways (2L/20R, 2C/20C, and 2R/20L) that are oriented in a north-northeast to south-southwest direction and a crosswind runway (13/31) that is oriented northwest to southeast. Runway 2L/20R is located on the west side of the airfield and is 7,702 feet in length. Runway 2C/20C is also located on the west side of the airfield, south of Runway 13/31, and has a length of 8,000 feet. Runway 2R/20L is located on the east side of the airfield and is 8,000 feet in length. The crosswind runway, Runway 13/31, is 11,029 feet in length and operates with a 801-foot displaced threshold on Runway 13 and a 741-foot displaced threshold on Runway 31. **Exhibit 1** shows the current airfield layout for BNA.

4.2 Operating Levels

The INM uses an average annual day of operation data, classified by the time of day, to calculate DNL contours. The number of operations, the types of aircraft, the distribution between daytime (7:00 a.m. to 9:59 p.m.) and nighttime (10:00 p.m. to 6:59 a.m.), and origin and destination city information for the Existing (2004) conditions were gathered from:

- Official Airline Guide (OAG) data
- Operating Records from the Airport Traffic Control Tower (ATCT)
- Landing Fee Reports from the airport
- Sample of 2003 Airport Radar Terminal System (ARTS) radar data



Noise Exposure Map Update
Nashville International Airport

Existing Airport Layout

Exhibit: 1

There were 229,220 landings and takeoffs at BNA during the Existing (2004) conditions period (January 2003 through December 2003). When divided by 365 days, the average-annual day includes 628 landings and takeoffs. **Table 1** summarizes the Existing (2004) operations by the four primary user groups. Air carrier jets, which include large jet cargo operations, make up the largest percentage of the fleet that operates at BNA, at nearly 45 percent. Propeller aircraft account for 25 percent of the total operations and include commuter turboprops, Tennessee Air National Guard military operations, and general aviation propeller aircraft. Regional jets currently represent 19 percent of total operations and the remaining 11 percent consists of general aviation/business jets.

Table 1
AIRCRAFT OPERATIONS BY USER GROUP - EXISTING (2004) CONDITIONS
Nashville International Airport

USER GROUP	2004 EXISTING	% OF TOTAL
Air Carrier Jets	102,200	44.6%
Regional Jets	43,800	19.1%
General Aviation/Business Jets	26,280	11.5%
Propeller Aircraft	56,940	24.8%
Total	229,220	100%

Sources: Aircraft Landing Fee Reports, OAG schedule data, FAA ATCT records, Landrum & Brown, 2004.

4.3 Fleet Mix

Fleet mix refers to the specific types of aircraft that operate at the airport. Air carrier jet operations were made up of Boeing 727 series, Boeing 737 series, Boeing 747-400, Boeing 757-200, DC9-30/50, MD-82/88, and Fokker 100 aircraft. Regional jet operations included Canadair, Embraer, and British Aerospace regional jets. The remaining operations were distributed among business jets and single/twin-engine turboprops.

Aircraft retrofitted with hushkits to meet the current aircraft noise standards (Stage 3) make up 15 percent of the current air carrier jet fleet operating at BNA. This is an important factor in calculating the overall noise levels, because while these aircraft meet the Stage 3 noise standards, they often remain the loudest aircraft in the fleet. These aircraft include the Boeing 727-100/200, Boeing 737-200, and DC9-30/50. As the airline industry continues the trend of replacing larger jets and hushkitted aircraft with smaller, quieter regional jet aircraft, the overall fleet mix operating at BNA will continue to become quieter in the future.

The INM applies a 10-dB penalty to all nighttime (10:00 p.m. to 6:59 a.m.) operations. For Existing (2004) conditions, approximately 13 percent of the total operations occurred during nighttime hours. **Table 2** shows the average annual day fleet mix and operating levels by time of day for the Existing (2004) conditions.

4.4 Runway End Utilization

Runway end utilization refers to the percent of time that a particular runway end is used for departures or arrivals. It is a principal element in the definition of the noise exposure pattern. Proportional use of a runway is based largely on conditions of wind direction and velocity. Arrival and departure runway end utilization was determined for the Existing (2004) conditions by reviewing previous runway use analysis, discussions with MNAA staff, and an analysis of ARTS radar data from 2003.

As part of the 1989 NCP, the MNAA recommended modifying the runway use so that daytime aircraft operations would be split 50/50, using both north and south flow approximately 50 percent of the time when favorable weather conditions permitted. The intent of the NCP measures was to focus a majority of aircraft operations over compatible land uses surrounding the airport. During 2004, a high proportion of the daytime air carrier jet aircraft departures were distributed between Runway 31 (39 percent) and Runway 20C (25 percent). The large number of daytime departures on Runway 31 increases the proportion of north flow versus south flow operations. In late 2003 the MNAA and the ATCT began working to decrease the use of Runway 31 for daytime operations, and according to a review of 2004 ARTS data, the percentage of aircraft using the runway is returning to historic percentages.

For the baseline period during daytime hours, a large percentage of air carrier jet aircraft arrived from the northeast on Runway 20L (28 percent) and from the southwest on Runway 2C (23 percent). All other arrivals were split between Runways 2L, 2R, and 20R, with approximately four percent using Runway 13/31. Propeller, general aviation, and the Tennessee Air National Guard aircraft are frequent users of Runway 2C/20C due to its proximity to general aviation facilities.

Table 2
OPERATIONS BY AIRCRAFT - EXISTING (2004) CONDITIONS
Nashville International Airport

Aircraft Type	INM Type	Arrivals		Departures		Total	
		Day	Night	Day	Night	Day	Night
Air Carrier Jets							
Boeing 727-100 (hushkitted)	727EM1	0	1	0	1	0	2
Boeing 727-200 (hushkitted)	727EM2	0	4	0	4	0	8
Boeing 737-300	737300	52	1	51	4	103	5
Boeing 737-500	737500	6	0	5	1	11	1
Boeing 737-700	737700	35	1	34	0	69	1
Boeing 737-200 (hushkitted)	737N17	3	0	3	0	6	0
Boeing 747-400	747400	0	1	0	1	0	2
Boeing 757-200	757PW	3	0	2	1	5	1
DC9-30 (hushkitted)	DC93LW	7	1	7	1	14	2
DC9-50 (hushkitted)	DC95HW	4	1	3	2	7	3
Fokker F100-65	F10065	7	0	7	0	14	0
MD-82 Series	MD82	7	2	6	3	13	5
MD-88	MD83	4	0	4	0	8	0
Subtotal		*128*	*12*	*122*	*18*	*250*	*30*
Regional Jets							
British Aerospace 146	BAE146	2	0	2	0	4	0
Embraer 135	CL600	7	0	7	0	14	0
Canadair Regional Jet	CL601	25	2	25	2	50	4
Embraer 145	EMB145	22	2	19	5	41	7
Subtotal		*56*	*4*	*53*	*7*	*109*	*11*
General Aviation/Business Jets							
Business Jet	CIT3	1	0	1	0	2	0
Business Jet	CNA500	5	1	5	1	10	2
Falcon 20	FAL20	2	0	2	0	4	0
Business Jet	GIV	3	0	3	0	6	0
Business Jet	IA1125	1	0	1	0	2	0
Business Jet	MU3001	7	0	7	0	14	0
Business Jet	LEAR25	3	0	2	1	5	1
Business Jet	LEAR35	12	1	13	0	25	1
Subtotal		*34*	*2*	*34*	*2*	*68*	*4*

Table 2 *(Continued)*
OPERATIONS BY AIRCRAFT - EXISTING (2004) CONDITIONS
Nashville International Airport

Aircraft Type	INM Type	Arrivals		Departures		Total	
		Day	Night	Day	Night	Day	Night
Propeller Aircraft							
Single Engine Turboprop	BEC58P	18	8	22	4	40	12
C-130 Hercules (Military)	C130	4	0	4	0	8	0
Conquest II	CNA441	10	0	9	1	19	1
Twin Engine Turboprop	DHC6	10	2	9	3	19	5
Single Engine Prop	GASEPF	7	3	6	4	13	7
Single Engine Prop	GASEPV	7	1	8	0	15	1
Twin Engine Turboprop	HS748A	1	1	1	1	2	2
Twin Engine Turboprop	SF340	5	1	5	1	10	2
Subtotal		*62*	*16*	*64*	*14*	*126*	*30*
Grand Total						***553***	***75***

Source: Landrum & Brown, 2004.

The current NCP and ATCT Tower Order identify Runway 13/31 as the preferred runway for nighttime turbojet aircraft arrivals and departures. More specifically, there is an emphasis placed on directing departures to the east on Runway 13 and arrivals from the southeast on Runway 31, in a head-to-head operation. However, for the Existing (2004) conditions, over 69 percent of nighttime turbojet departures utilized Runway 31 for departures due to mixed operations (both arrivals and departures at the same time) and the fact that Runway 31 is in close proximity to the terminal complex, resulting in a shorter taxi time for departing aircraft.

Table 3 presents the Existing (2004) conditions runway utilization percentages.

4.5 Flight Tracks

Flight tracks are lines that represent the ground path of an aircraft as it arrives or departs from the airport. The INM uses these flight tracks to model the flight paths of aircraft. The flight tracks for this study were developed using flight tracks from previous studies as well as analysis of radar data collected from the MNAA. The radar data was divided into different aircraft type categories and by operation type, time of day, and runway. Representative INM flight tracks were developed and are shown on **Exhibit 2** and **Exhibit 3**. Utilization of the flight tracks by track name and time of day for arrivals are shown in **Table 4** and for departures in **Table 5**.

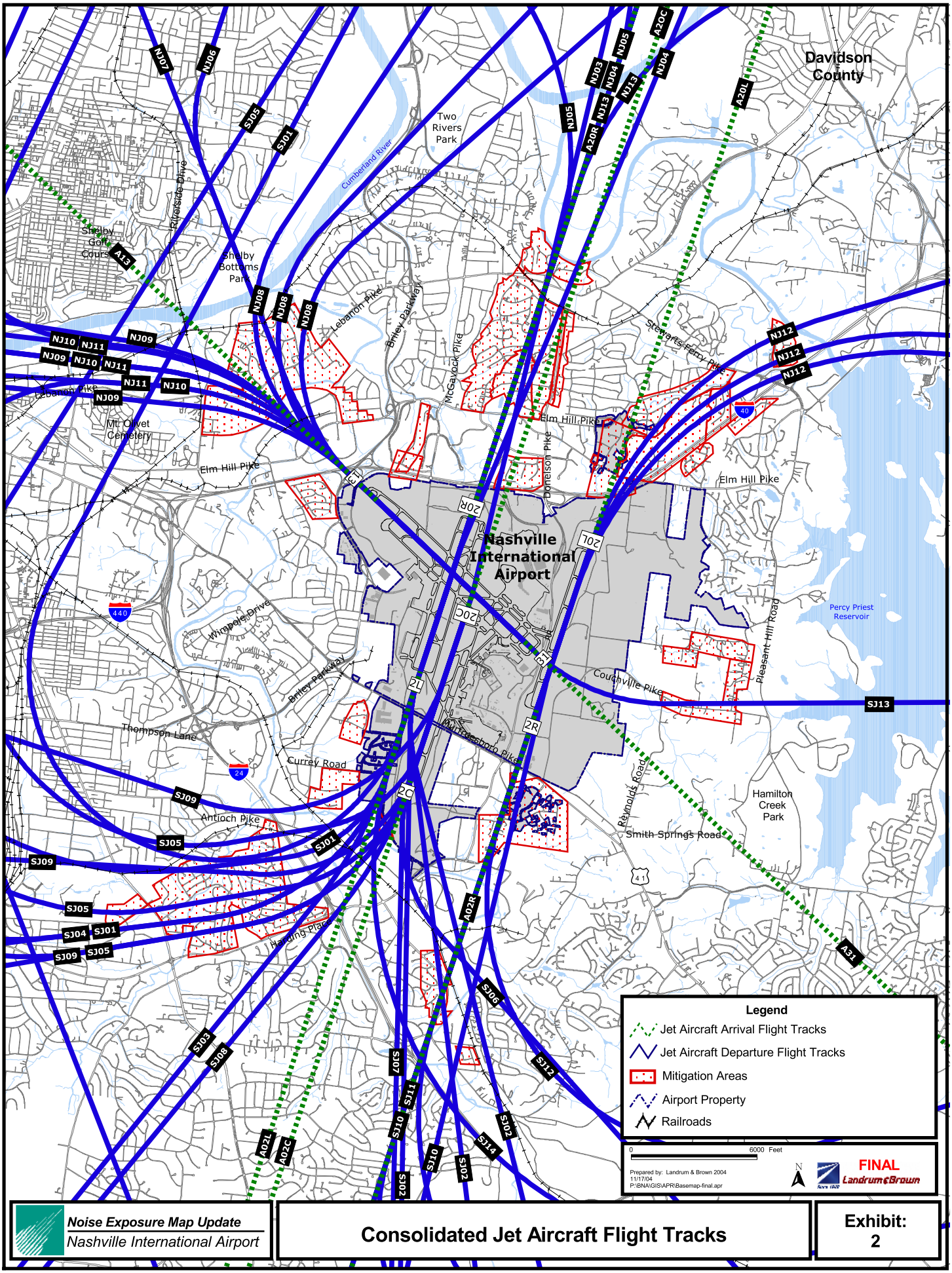
Table 3
RUNWAY UTILIZATION PERCENTAGES – EXISTING (2004) CONDITIONS
Nashville International Airport

TIME OF OPERATION	TYPE OF OPERATION	RUNWAYS								
		2C	2L	2R	13	20C	20L	20R	31	TOTAL
Air Carrier Jets										
Day	Arrival	23.0%	10.6%	17.8%	1.7%	0.1%	27.7%	17.1%	2.1%	100%
	Departure	0.2%	7.5%	12.4%	0.6%	25.2%	10.6%	3.9%	39.4%	100%
Night	Arrival	4.2%	3.6%	1.0%	1.8%	0.0%	3.8%	20.8%	64.8%	100%
	Departure	0.1%	4.9%	0.5%	16.3%	4.7%	1.6%	2.1%	69.8%	100%
Regional Jets										
Day	Arrival	13.8%	34.1%	3.0%	0.4%	0.1%	7.9%	38.7%	2.0%	100%
	Departure	0.2%	30.7%	5.0%	0.3%	15.2%	3.8%	27.4%	17.4%	100%
Night	Arrival	1.0%	7.2%	0.6%	0.9%	0.0%	2.7%	25.6%	62.0%	100%
	Departure	0.0%	2.3%	0.3%	17.4%	1.6%	0.8%	8.4%	69.2%	100%
General Aviation/Business Jets										
Day	Arrival	42.5%	0.6%	7.1%	0.6%	26.8%	14.2%	6.1%	2.1%	100%
	Departure	29.7%	1.9%	6.4%	0.1%	41.8%	3.4%	0.3%	16.4%	100%
Night	Arrival	13.0%	0.6%	1.3%	2.1%	7.7%	2.2%	14.9%	58.2%	100%
	Departure	3.3%	0.7%	0.1%	14.9%	10.5%	1.6%	0.1%	68.8%	100%
Propeller Aircraft										
Day	Arrival	33.4%	2.2%	13.0%	1.5%	25.3%	14.1%	5.4%	5.1%	100%
	Departure	25.2%	2.9%	7.2%	0.8%	40.7%	3.9%	2.1%	17.2%	100%
Night	Arrival	36.2%	0.7%	0.8%	8.0%	20.9%	6.0%	3.3%	24.1%	100%
	Departure	20.8%	1.4%	0.4%	1.4%	43.4%	0.6%	1.0%	31.0%	100%

Day = 7:00 a.m. to 9:59 p.m.

Night = 10:00 p.m. to 6:59 a.m.

Source: 2003 ARTS Data, Landrum & Brown, 2004.


Davidson County
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Cumberland River
Riverside Drive
Shelby Golf Cours
Shelby Bottoms Park
Lebanon Pike
Briley Parkway
McGavock Pike
Stewarts Ferry Pike
Elm Hill Pike
Donelson Pike
Mt. Olivet Cemetery
Nashville International Airport
Percy Priest Reservoir
Pleasant Hill Road
Couchville Pike
Murfreesboro Pike
Wimpole Drive
Thompson Lane
Currey Road
Antioch Pike
Reynolds Road
Smith Springs Road
Hamilton Creek Park
Hearing Place
NJ07
NJ06
SJ05
SJ01
NJ08
NJ05
NJ03
NJ04
NJ13
NJ04
A20C
A20L
A20R
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Jet Aircraft Arrival Flight Tracks
Jet Aircraft Departure Flight Tracks
Mitigation Areas
Airport Property
Railroads
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Noise Exposure Map Update
Nashville International Airport
Consolidated Jet Aircraft Flight Tracks
Exhibit:
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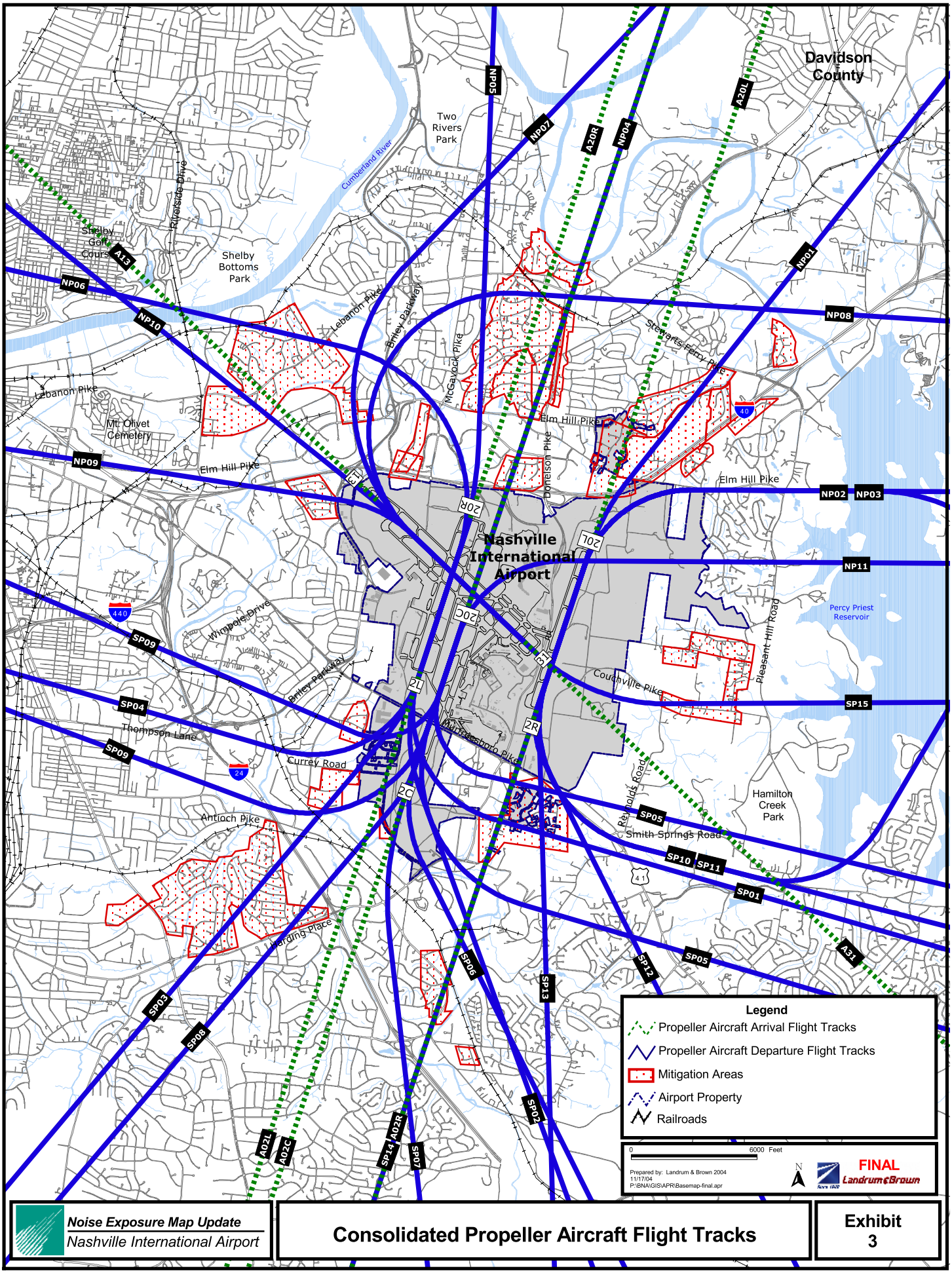
Davidson County
Two Rivers Park
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Currey Road
Antioch Pike
Reynolds Road
Hamilton Creek Park
Smith Springs Road
Harding Place
NP05
NP07
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A20L
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SP02
SP14
SP07
A02L
A02C
A02R
20R
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Legend
Propeller Aircraft Arrival Flight Tracks
Propeller Aircraft Departure Flight Tracks
Mitigation Areas
Airport Property
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6000 Feet
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Noise Exposure Map Update
Nashville International Airport
Consolidated Propeller Aircraft Flight Tracks
Exhibit 3

Table 4
FLIGHT TRACK UTILIZATION BY AIRCRAFT GROUP – ARRIVALS
EXISTING (2004) CONDITIONS
Nashville International Airport

TRACK NAME	RUNWAY	AIR CARRIER JETS		REGIONAL JETS		GENERAL AVIATION/BUSINESS JETS		PROPELLER AIRCRAFT	
		DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
A02C	02C	22.9%	4.2%	13.8%	1.0%	42.5%	13.0%	33.4%	36.2%
A02L	02L	10.6%	3.6%	34.1%	7.2%	0.6%	0.6%	2.2%	0.7%
A02R	02R	17.8%	1.0%	3.0%	0.6%	7.1%	1.3%	13.0%	0.8%
A13	13	1.7%	1.8%	0.4%	0.9%	0.6%	2.1%	1.5%	8.0%
A20C	20C	0.1%	-	0.1%	-	26.8%	7.7%	25.3%	20.9%
A20L	20L	27.7%	3.8%	7.9%	2.7%	14.2%	2.2%	14.1%	6.0%
A20R	20R	17.1%	20.8%	38.7%	25.6%	6.1%	14.9%	5.4%	3.3%
A31	31	2.1%	64.8%	2.0%	62.0%	2.1%	58.2%	5.1%	24.1%
Total		**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Landrum & Brown, 2004

Note: Percentages rounded to the nearest tenth of a percentage. Totals may not add up to 100 percent.

Table 5
FLIGHT TRACK UTILIZATION BY AIRCRAFT GROUP – DEPARTURES
EXISTING (2004) CONDITIONS
Nashville International Airport

TRACK NAME	RUNWAY	AIR CARRIER JETS		REGIONAL JETS		GENERAL AVIATION/BUSINESS JETS		PROPELLER AIRCRAFT	
		DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
NJ03	02C	0.2%	0.1%	0.2%	0.0%	29.7%	3.3%	-	-
NP04	02C	-	-	-	-	-	-	13.6%	13.4%
NP11	02C	-	-	-	-	-	-	11.6%	7.4%
NJ04	02L	2.0%	1.9%	12.7%	-	0.3%	-	-	-
NJ05	02L	2.4%	1.6%	8.7%	0.7%	0.9%	-	-	-
NJ13	02L	3.1%	1.4%	9.3%	1.6%	0.7%	0.7%	-	-
NP05	02L	-	-	-	-	-	-	0.9%	0.9%
NP06	02L	-	-	-	-	-	-	2.0%	0.5%
NJ12	02R	12.4%	0.5%	5.0%	0.3%	6.4%	0.1%	-	-
NP01	02R	-	-	-	-	-	-	2.7%	0.1%
NP02	02R	-	-	-	-	-	-	2.6%	0.2%
NP03	02R	-	-	-	-	-	-	1.9%	0.1%
SJ13	13	0.6%	16.3%	0.3%	17.4%	0.1%	14.9%	-	-
SP15	13	-	-	-	-	-	-	0.8%	1.4%
SJ05	20C	11.2%	2.4%	10.0%	-	4.8%	3.5%	-	-
SJ06	20C	1.9%	0.1%	0.3%	1.1%	9.6%	-	-	-
SJ07	20C	1.0%	0.7%	0.7%	-	11.9%	3.5%	-	-
SJ08	20C	2.8%	0.3%	0.7%	0.1%	4.8%	-	-	-
SJ09	20C	8.4%	1.3%	3.4%	0.3%	10.7%	3.6%	-	-
SP05	20C	-	-	-	-	-	-	10.8%	21.7%
SP06	20C	-	-	-	-	-	-	7.0%	3.1%
SP07	20C	-	-	-	-	-	-	4.5%	-
SP08	20C	-	-	-	-	-	-	3.2%	3.1%
SP09	20C	-	-	-	-	-	-	15.3%	15.5%
SJ10	20L	6.9%	1.1%	2.7%	0.5%	2.5%	1.6%	-	-

Table 5 *(Continued)*
FLIGHT TRACK UTILIZATION BY AIRCRAFT GROUP – DEPARTURES
EXISTING (2004) CONDITIONS
Nashville International Airport

TRACK NAME	RUNWAY	AIR CARRIER JETS		REGIONAL JETS		GENERAL AVIATION/BUSINESS JETS		PROPELLER AIRCRAFT	
		DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
SJ11	20L	2.0%	0.3%	0.8%	0.3%	0.3%	-	-	-
SJ12	20L	1.7%	0.2%	0.3%	0.1%	0.6%	-	-	-
SP10	20L	-	-	-	-	-	-	0.7%	0.2%
SP11	20L	-	-	-	-	-	-	0.7%	0.1%
SP12	20L	-	-	-	-	-	-	0.4%	-
SP13	20L	-	-	-	-	-	-	0.4%	-
SP14	20L	-	-	-	-	-	-	1.8%	0.3%
SJ01	20R	0.8%	0.8%	10.9%	-	0.1%	-	-	-
SJ02	20R	0.9%	0.4%	2.8%	0.6%	0.1%	0.1%	-	-
SJ03	20R	0.5%	0.2%	2.3%	1.8%	0.1%	-	-	-
SJ04	20R	0.7%	0.4%	4.4%	0.6%	0.1%	-	-	-
SJ14	20R	1.0%	0.4%	7.0%	5.4%	-	-	-	-
SP01	20R	-	-	-	-	-	-	0.6%	0.5%
SP02	20R	-	-	-	-	-	-	0.6%	0.1%
SP03	20R	-	-	-	-	-	-	0.4%	0.3%
SP04	20R	-	-	-	-	-	-	0.6%	0.1%
NJ06	31	0.6%	0.4%	0.1%	-	0.3%	-	-	-
NJ07	31	0.6%	0.4%	0.1%	-	0.3%	-	-	-
NJ08	31	8.7%	1.2%	1.7%	4.0%	1.9%	-	-	-
NJ09	31	10.4%	19.4%	4.7%	19.8%	4.9%	-	-	-
NJ10	31	12.6%	19.4%	3.8%	27.7%	6.8%	68.8%	-	-
NJ11	31	6.5%	29.1%	6.9%	17.8%	2.2%	-	-	-
NP07	31	-	-	-	-	-	-	0.4%	1.1%

Table 5 *(Continued)*
FLIGHT TRACK UTILIZATION BY AIRCRAFT GROUP – DEPARTURES
EXISTING (2004) CONDITIONS
Nashville International Airport

TRACK NAME	RUNWAY	AIR CARRIER JETS		REGIONAL JETS		GENERAL AVIATION/BUSINESS JETS		PROPELLER AIRCRAFT	
		DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
NP08	31	-	-	-	-	-	-	7.7%	16.6%
NP09	31	-	-	-	-	-	-	4.6%	8.9%
NP10	31	-	-	-	-	-	-	4.6%	4.4%
Total		**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Note: Percentages rounded to the nearest tenth of a percentage. Totals may not add up to 100 percent.

Source: Landrum & Brown, 2004

4.6 Engine Run-Ups

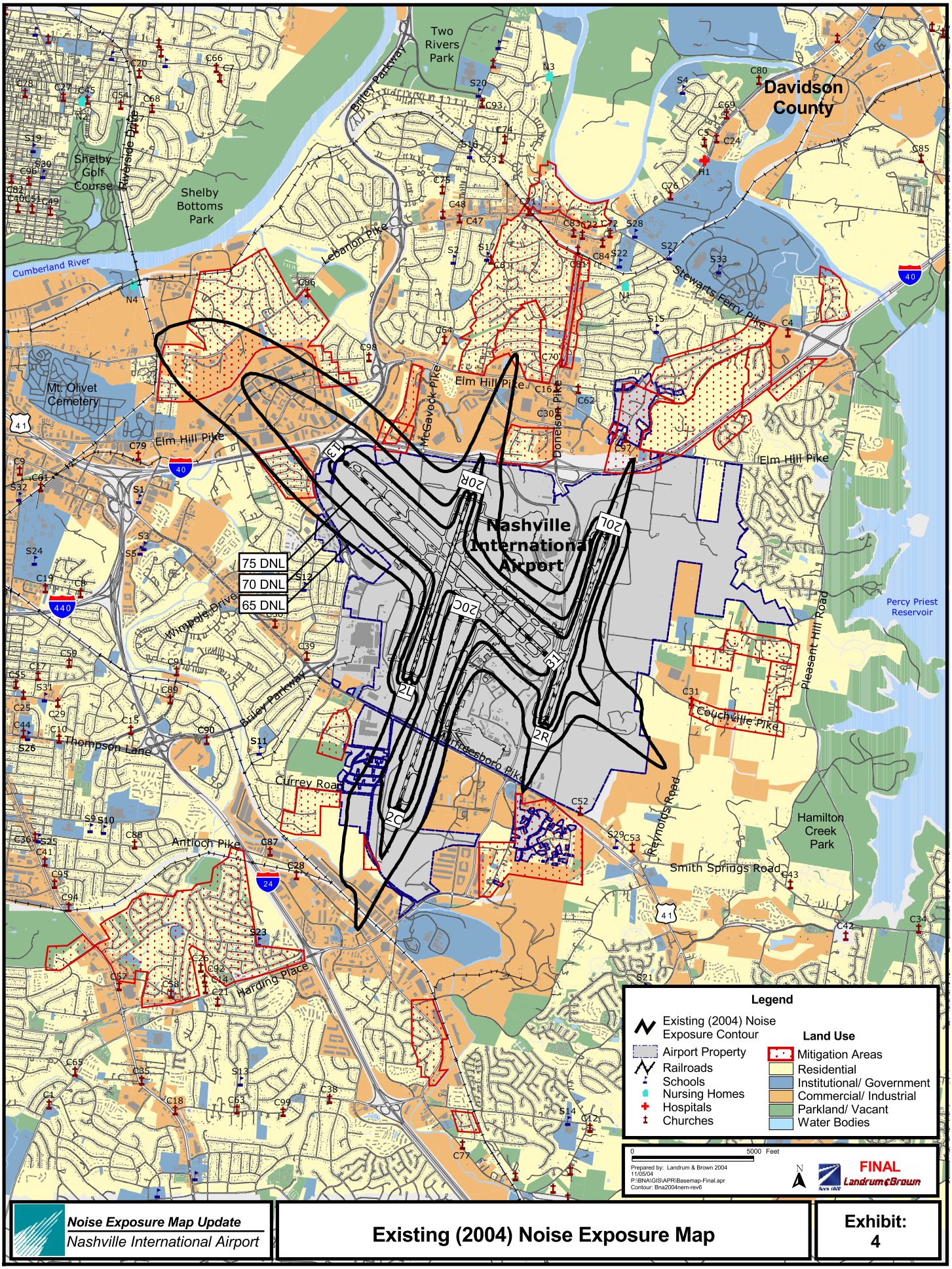
Engine maintenance run-ups are not currently and have not historically been a major concern for the community surrounding BNA and were not modeled for the Existing (2004) conditions.

4.7 Existing (2004) NEM

The Existing (2004) NEM, once accepted by the FAA, will be the official noise map of the airport for existing conditions. The 65 DNL contour represents the outer boundary of the area considered, under FAA Part 150 guidelines, to be exposed to significant levels of noise (see Appendix D, *FAA Policies, Guidance, and Regulations*). Less sensitive land uses, such as commercial or industrial property or vacant lands, are considered to be compatible with higher levels of aircraft noise exposure. The Existing (2004) NEM is presented on **Exhibit 4** and encompasses 5.4 square miles within the 65 DNL contour. **Table 6** summarizes the area of the noise exposure resulting from Existing (2004) conditions for each contour band (65-70 DNL, 70-75 DNL, 75+ DNL).

The noise contour pattern extends from the airport along each runway end, following the flight tracks used by all aircraft. The relative distance of the contours from the airport is a result of the frequency of operations occurring on each runway, the type of operation occurring (arrival or departure), the time of day the operations occur, and the type of aircraft assigned to it. The noise contour extends farthest from the airport to the northwest of Runway 31 due primarily to the high proportion of nighttime turbojet departures and the 10-dB penalty applied to nighttime operations when calculating DNL contours. The area within the 65 DNL contour is a combination of commercial/industrial land uses, which are compatible with this level of aircraft noise, or residential land uses that have received sound insulation or sales assistance.

The contour extends to the north of Runway 2L/20R due mainly to daytime and nighttime departures on both Runway 2L and Runway 2C, as well as arrivals by air carrier jets and regional jets. To the south, the contour extends beyond airport property and into a commercial/industrial area. Similarly, the land uses within the 65 DNL contour are compatible land uses, including residences that have taken part in a mitigation program. The noise exposure south of the airport is driven by daytime departures from Runway 20C and jet arrivals to Runway 2C. The noise contour is larger to the west of the runway as a result of the noise abatement turn to the west off of Runway 20C. The noise exposure on the east side of the airport falls largely on airport property, with the exception of a spike to the southeast of Runway 13/31, which is mainly the result of the nighttime turbojet arrivals to Runway 31.



Noise Exposure Map Update
Nashville International Airport

Existing (2004) Noise Exposure Map

Exhibit: 4

Table 6
NOISE EXPOSURE IMPACT - AREA (SQUARE MILES) – EXISTING (2004) NOISE EXPOSURE MAP
Nashville International Airport

NOISE CONTOUR	65-70 DNL	70-75 DNL	75+ DNL	65 + DNL
2004 Existing NEM	2.8	1.3	1.3	5.4

Source: Landrum & Brown, 2004.

Table 7 lists the impacts of the 65 DNL noise contour on residences within the 65 DNL noise contour. There are no noise-sensitive facilities located within the 65 DNL noise contour for the Existing (2004) conditions noise exposure contour.

Approximately 289 residences and 878 people are located within the 65+ DNL contours of the Existing (2004) NEM. A majority of these residences (277 residences) are located within the 1993 NCP areas and are considered mitigated. The remaining 12 residences are located to the south and west of Runway 2C and are considered mitigated through a buyout program completed as part of the relocation and construction of Runway 2C/20C. Table 6 summarizes the number of homes and estimated population that fall within each of the various levels of noise for the Existing (2004) NEM.

Table 7
NOISE EXPOSURE IMPACT– EXISTING (2004) NOISE EXPOSURE MAP
Nashville International Airport

RESIDENTIAL	65-70 DNL	70-75 DNL	75+ DNL	65 + DNL
Unmitigated	0	0	0	0
Previously Mitigated*	283	6	0	289
Total	**283**	**6**	**0**	**289**
POPULATION	**65-70 DNL**	**70-75 DNL**	**75+ DNL**	**65 + DNL**
Unmitigated	0	*0*	0	0
Previously Mitigated*	858	20	0	878
Total	**858**	**20**	**0**	**878**

*Note: Homes designated as Previously Mitigated are located within the noise contour and have been included in one of the airport's previous land use mitigation programs.

Source: Landrum & Brown, 2004

5.0 FUTURE (2009) CONDITIONS

The noise contours depicted on the Future (2009) NEM represent the noise pattern as developed for Future (2009) conditions. The Future (2009) NEM is based on information gathered from the FAA and the MNAA on future airport operations and operating characteristics that would occur at the airport five years in the future from the Existing (2004) conditions.

5.1 Runway Layout

There are no anticipated changes in the existing runway layout that would be in place by 2009.

5.2 Operating Levels

The number of operations for the Future (2009) condition was derived from an assessment of the *Nashville International Airport Master Plan Update* forecast and the FAA Terminal Area Forecast (TAF). The terrorist events of September 11, 2001 have led to increased security and reduced activity at BNA and other airports nationwide. The long-term forecasts used in this NEM update are based on the best available data and valid assumptions regarding the activity at the airport that was developed after September 11, 2001. Long-term forecasts assume that temporary downturns or upswings may occur during the forecast period. In the past, aviation activity has undergone significant, although temporary, reductions in response to economic downturns or security events such as the Persian Gulf War, but recovered in the longer term.

The total operations for the Future (2009) period are 251,850, a 10 percent annual increase from the Existing (2004) period. When divided by 365 days, the average annual day includes 690 landings and takeoffs, an increase of 62 daily operations. Across the industry, airlines have been shifting operations away from large narrow-body jets and towards regional jets. The effect of this trend on the overall fleet at BNA can be seen and it is expected that the trend will continue. Therefore, for the Future (2009) Condition, air carrier jet operations are held relatively flat and regional jet operations are increased. **Table 8** summarizes the Future (2009) operations by the four primary user groups.

5.3 Fleet Mix

The primary difference between the Future (2009) fleet and the current fleet will be the proportion of regional jets, as discussed above, and the reduction of older, noisier aircraft in favor of newer models. Specifically, it is expected that there will be a reduction in Boeing 727 and DC9-30/50 aircraft, both of which are hushkitted to meet Stage 3 noise requirements. Consequently, there will be an increase in the

Table 8
AIRCRAFT OPERATIONS BY USER GROUP - FUTURE (2009) CONDITIONS
Nashville International Airport

USER GROUP	2009 FUTURE	% OF TOTAL
Air Carrier Jets	107,310	42.6%
Regional Jets	49,640	19.7%
General Aviation/Business Jets	29,930	11.9%
Propeller Aircraft	64,970	25.8%
Total	**251,850**	**100%**

Source: Landrum & Brown, 2004.

use of Airbus 319/320 and Boeing 717-200 aircraft. Overall, hushkitted aircraft are expected to make up less than six percent of the air carrier jet operations at BNA by 2009.

The distribution of aircraft operating during nighttime hours (10:00 p.m. to 6:59 a.m.) is expected to remain nearly the same as the Existing (2004) conditions. **Table 9** shows the average annual day fleet mix and operating levels.

5.4 Runway End Utilization

The Future (2009) Condition assumes that runway utilization would remain approximately the same as the Existing (2004) conditions with two notable exceptions. As discussed in Section 4.4, the MNAA has been working with the ATCT to return to historical patterns with regard to the use of Runway 31 for daytime departures by turbojet aircraft. The efforts to date have proven effective as evidenced by the analysis of the first quarter 2004 ARTS data. Therefore it is assumed that the use of Runway 31 during daytime hours will return to more historic patterns. Specifically, what has been observed in early 2004 includes a decrease in the amount of use of Runway 31 for jet departures and an increase in the use of Runways 2L/20R and 2R/20L during the daytime and Runway 13 at night. **Table 10** presents the Future (2009) conditions runway utilization percentages.

5.5 Flight Tracks

Flight track locations are assumed to remain the same for the Future (2009) conditions. However, due to anticipated changes in fleet mix and the proportion of regional jets in the fleet, the flight track utilization has been modified. **Table 11** and **Table 12** show the flight track utilization by aircraft category for the Future (2009) conditions for arrivals and departures.

Table 9
OPERATIONS BY AIRCRAFT - FUTURE (2009) CONDITIONS
Nashville International Airport

AIRCRAFT TYPE	INM TYPE	ARRIVALS		DEPARTURES		TOTAL	
		DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
Air Carrier Jets							
Boeing 717-200	717200	9	0	8	1	17	1
Boeing 727-200 (hushkitted)	727EM2	0	4	0	4	0	8
Boeing 737-300	737300	28	0	28	0	56	0
Boeing 737-400	737400	6	0	6	0	12	0
Boeing 737-500	737500	5	1	3	3	8	4
Boeing 737-700	737700	37	0	36	1	73	1
Boeing 737-800	737800	12	1	12	1	24	2
Boeing 737-200 (hushkitted)	737N17	2	0	2	0	4	0
Boeing 747-400	747400	0	1	0	1	0	2
Boeing 757-200	757PW	13	1	12	2	25	3
Boeing 767-300	767300	3	0	3	0	6	0
Airbus A319	A319	3	0	3	0	6	0
Airbus A320	A320	3	1	3	1	6	2
DC9-30 (hushkitted)	DC93LW	1	0	1	0	2	0
DC9-50 (hushkitted)	DC95HW	0	1	0	1	0	2
Fokker F100-65	F10065	1	0	1	0	2	0
MD-82 Series	MD82	8	2	7	3	15	5
MD-88	MD83	4	0	4	0	8	0
Subtotal		*135*	*12*	*129*	*18*	*264*	*30*
Regional Jets							
British Aerospace 146	BAE146	1	0	1	0	2	0
Embraer 135	CL600	8	0	8	0	16	0
Canadair Regional Jet	CL601	36	2	34	4	70	6
Embraer 145	EMB145	19	2	15	6	34	8
Subtotal		*64*	*4*	*58*	*10*	*122*	*14*
General Aviation/Business Jets							
Business Jet	CIT3	1	0	1	0	2	0
Business Jet	CNA500	6	1	7	0	13	1
Falcon 20	FAL20	2	0	2	0	4	0
Business Jet	GIV	3	0	3	0	6	0
Business Jet	IA1125	2	0	2	0	4	0
Business Jet	MU3001	8	0	8	0	16	0
Business Jet	LEAR25	3	0	2	1	5	1
Business Jet	LEAR35	14	1	15	0	29	1
Subtotal		*39*	*2*	*40*	*1*	*79*	*3*

Table 9 *(Continued)*
OPERATIONS BY AIRCRAFT - FUTURE (2009) CONDITIONS
Nashville International Airport

AIRCRAFT TYPE	INM TYPE	ARRIVALS		DEPARTURES		TOTAL	
		DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
Propeller Aircraft							
Single Engine Turboprop	BEC58P	23	6	25	4	48	10
C-130 Hercules (Military)	C130	6	0	6	0	12	0
Conquest II	CNA441	14	0	12	2	26	2
Twin Engine Turboprop	DHC6	10	1	10	1	20	2
Single Engine Prop	GASEPF	9	5	8	6	17	11
Single Engine Prop	GASEPV	8	1	9	0	17	1
Twin Engine Turboprop	HS748A	2	1	2	1	4	2
Twin Engine Turboprop	SF340	1	0	1	0	2	0
Twin Engine Turboprop	SD330	2	0	2	0	4	0
Subtotal		*75*	*14*	*75*	*14*	*150*	*28*
Total		**313**	**32**	**302**	**43**	**615**	**75**

Source: Landrum & Brown, 2004.

Table 10
RUNWAY UTILIZATION PERCENTAGES – FUTURE (2009) CONDITIONS
Nashville International Airport

TIME OF OPERATION	TYPE OF OPERATION	RUNWAYS								
		2C	2L	2R	13	20C	20L	20R	31	TOTAL
Air Carrier Jets										
Day	Arrival	17.7%	10.4%	15.9%	1.4%	0.0%	29.6%	20.0%	5.0%	100%
	Departure	0.1%	16.4%	16.0%	0.9%	23.0%	19.0%	6.0%	18.6%	100%
Night	Arrival	1.6%	1.5%	1.8%	3.6%	0.2%	1.0%	24.8%	65.5%	100%
	Departure	0.0%	4.9%	0.5%	20.0%	3.3%	1.7%	2.3%	67.3%	100%
Regional Jets										
Day	Arrival	11.2%	31.6%	2.6%	0.4%	1.8%	6.2%	41.2%	5.0%	100%
	Departure	0.0%	27.9%	14.5%	0.7%	9.0%	14.1%	25.1%	8.7%	100%
Night	Arrival	1.0%	4.3%	1.0%	1.8%	0.0%	1.0%	29.2%	61.7%	100%
	Departure	0.0%	0.0%	0.0%	25.5%	1.6%	1.7%	4.5%	66.7%	100%
General Aviation/Business Jets										
Day	Arrival	38.1%	0.0%	5.8%	0.6%	28.3%	15.9%	5.4%	5.9%	100%
	Departure	21.1%	4.9%	15.2%	0.6%	31.5%	15.6%	0.1%	11.0%	100%
Night	Arrival	18.9%	0.0%	1.4%	2.8%	6.3%	0.7%	18.9%	51.0%	100%
	Departure	1.1%	0.0%	0.0%	22.5%	11.2%	4.1%	0.0%	61.1%	100%
Propeller Aircraft										
Day	Arrival	31.7%	2.9%	9.5%	1.0%	25.3%	17.0%	7.2%	5.4%	100%
	Departure	20.9%	3.0%	10.3%	0.5%	40.5%	6.4%	3.0%	15.4%	100%
Night	Arrival	36.0%	0.8%	0.5%	8.9%	21.9%	6.7%	4.0%	21.2%	100%
	Departure	17.7%	1.2%	0.0%	1.5%	46.1%	1.0%	1.4%	31.1%	100%

Source: 2004 ARTS Data, Landrum & Brown, 2004

Table 11
FLIGHT TRACK UTILIZATION BY AIRCRAFT GROUP – ARRIVALS
FUTURE (2009) CONDITIONS
Nashville International Airport

TRACK NAME	RUNWAY	AIR CARRIER JETS		REGIONAL JETS		GENERAL AVIATION/BUSINESS JETS		PROPELLER AIRCRAFT	
		DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
A02C	02C	17.7%	1.6%	11.2%	1.0%	38.1%	18.9%	31.7%	36.0%
A02L	02L	10.4%	1.5%	31.6%	4.3%	-	-	2.9%	0.8%
A02R	02R	15.9%	1.8%	2.6%	1.0%	5.8%	1.4%	9.5%	0.5%
A13	13	1.4%	3.6%	0.4%	1.8%	0.6%	2.8%	1.0%	8.9%
A20C	20C	-	0.2%	1.8%	-	28.3%	6.3%	25.3%	21.9%
A20L	20L	29.6%	1.0%	6.2%	1.0%	15.9%	0.7%	17.0%	6.7%
A20R	20R	20.0%	24.8%	41.2%	29.2%	5.4%	18.9%	7.2%	4.0%
A31	31	5.0%	65.5%	5.0%	61.7%	5.9%	51.0%	5.4%	21.2%
Total		**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Note: Percentages rounded to the nearest tenth of a percentage. Totals may not add up to 100 percent.

Source: Landrum & Brown, 2004

Table 12
FLIGHT TRACK UTILIZATION BY AIRCRAFT GROUP – DEPARTURES
FUTURE (2009) CONDITIONS
Nashville International Airport

TRACK NAME	RUNWAY	AIR CARRIER JETS		REGIONAL JETS		GENERAL AVIATION/BUSINESS JETS		PROPELLER AIRCRAFT	
		DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
NJ03	02C	0.1%	-	-	-	21.1%	1.1%	-	-
NP04	02C	-	-	-	-	-	-	11.6%	11.4%
NP11	02C	-	-	-	-	-	-	9.3%	6.3%
NJ04	02L	4.5%	1.8%	11.5%	-	1.0%	-	-	-
NJ05	02L	5.3%	1.8%	8.2%	-	2.2%	-	-	-
NJ13	02L	6.7%	1.3%	8.2%	-	1.7%	-	-	-
NP05	02L	-	-	-	-	-	-	0.9%	0.8%
NP06	02L	-	-	-	-	-	-	2.1%	0.4%
NJ12	02R	16.0%	0.5%	14.5%	-	15.2%	-	-	-
NP01	02R	-	-	-	-	-	-	3.8%	-
NP02	02R	-	-	-	-	-	-	3.4%	-
NP03	02R	-	-	-	-	-	-	3.0%	-
SJ13	13	0.9%	20.0%	0.7%	25.5%	0.6%	22.5%	-	-
SP15	13	-	-	-	-	-	-	0.5%	1.5%
SJ05	20C	10.2%	1.6%	4.4%	-	3.9%	3.7%	-	-
SJ06	20C	0.8%	0.1%	0.2%	1.1%	6.7%	-	-	-
SJ07	20C	2.8%	0.4%	0.8%	-	9.5%	3.7%	-	-
SJ08	20C	1.7%	0.3%	0.2%	0.1%	3.9%	-	-	-
SJ09	20C	7.5%	0.9%	3.5%	0.4%	7.5%	3.8%	-	-
SP05	20C	-	-	-	-	-	-	10.3%	19.8%
SP06	20C	-	-	-	-	-	-	7.0%	3.3%
SP07	20C	-	-	-	-	-	-	4.9%	-
SP08	20C	-	-	-	-	-	-	3.2%	3.3%
SP09	20C	-	-	-	-	-	-	15.1%	19.8%
SJ10	20L	12.4%	1.2%	10.3%	1.0%	11.7%	4.1%	-	-

Table 12 *(Continued)*
FLIGHT TRACK UTILIZATION BY AIRCRAFT GROUP – DEPARTURES
FUTURE (2009) CONDITIONS
Nashville International Airport

TRACK NAME	RUNWAY	AIR CARRIER JETS		REGIONAL JETS		GENERAL AVIATION/BUSINESS JETS		PROPELLER AIRCRAFT	
		DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
SJ11	20L	3.7%	0.3%	2.7%	0.6%	1.4%	-	-	-
SJ12	20L	2.9%	0.2%	1.1%	0.1%	2.5%	-	-	-
SP10	20L	-	-	-	-	-	-	1.2%	0.2%
SP11	20L	-	-	-	-	-	-	0.9%	0.2%
SP12	20L	-	-	-	-	-	-	0.6%	0.1%
SP13	20L	-	-	-	-	-	-	0.8%	-
SP14	20L	-	-	-	-	-	-	2.9%	0.5%
SJ01	20R	1.1%	0.8%	10.4%	-	-	-	-	-
SJ02	20R	1.3%	0.4%	2.8%	0.2%	-	-	-	-
SJ03	20R	0.8%	0.4%	1.9%	0.9%	-	-	-	-
SJ04	20R	1.1%	0.4%	4.1%	0.4%	-	-	-	-
SJ14	20R	1.6%	0.3%	5.8%	2.9%	-	-	-	-
SP01	20R	-	-	-	-	-	-	0.8%	0.6%
SP02	20R	-	-	-	-	-	-	0.9%	0.1%
SP03	20R	-	-	-	-	-	-	0.6%	0.4%
SP04	20R	-	-	-	-	-	-	0.7%	0.3%
NJ06	31	0.5%	0.4%	0.4%	-	0.3%	-	-	-
NJ07	31	0.5%	0.4%	0.4%	-	0.3%	-	-	-
NJ08	31	5.8%	3.2%	2.1%	4.0%	1.1%	-	-	-
NJ09	31	4.8%	17.7%	2.4%	20.0%	3.2%	-	-	-
NJ10	31	4.5%	23.0%	1.0%	24.7%	4.5%	61.1%	-	-
NJ11	31	2.5%	22.7%	2.3%	18.0%	1.6%	-	-	-
NP07	31	-	-	-	-	-	-	0.3%	1.1%

Table 12 *(Continued)*
FLIGHT TRACK UTILIZATION BY AIRCRAFT GROUP – DEPARTURES
FUTURE (2009) CONDITIONS
Nashville International Airport

TRACK NAME	RUNWAY	AIR CARRIER JETS		REGIONAL JETS		GENERAL AVIATION/BUSINESS JETS		PROPELLER AIRCRAFT	
		DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
NP08	31	-	-	-	-	-	-	6.9%	14.4%
NP09	31	-	-	-	-	-	-	4.5%	8.9%
NP10	31	-	-	-	-	-	-	3.7%	6.7%
Total		**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Note: Percentages rounded to the nearest tenth of a percentage. Totals may not add up to 100 percent.

Source: Landrum & Brown, 2004

5.6 Future (2009) NEM

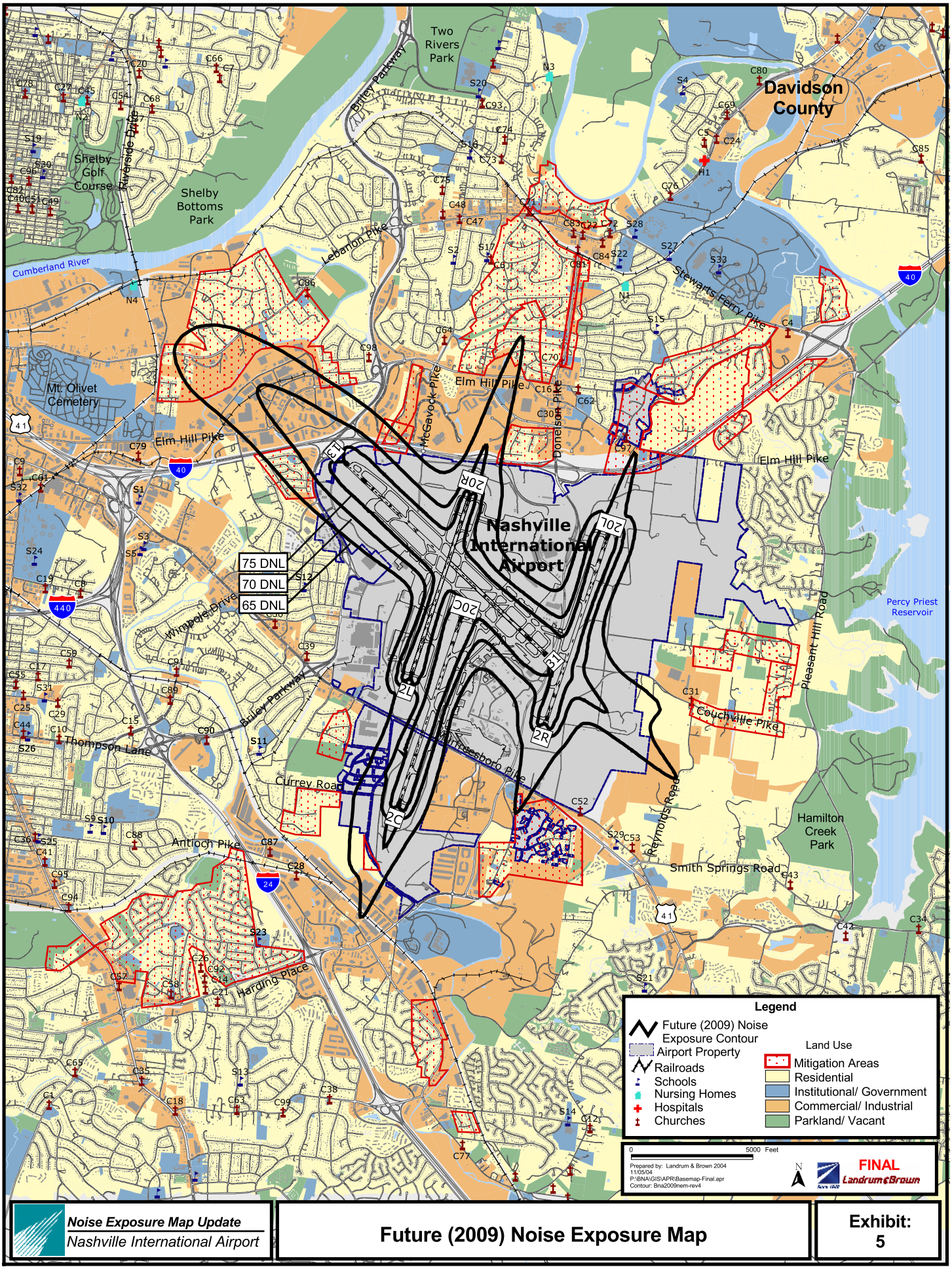
The Future (2009) noise contour is presented on **Exhibit 5**. The noise contours for the Future (2009) condition retain the same general shape as the Existing (2004) noise contour. Although there is an increase in the number of average annual day aircraft operations, changes in the fleet mix, including the reduction of hushkitted Stage 3 aircraft and the increase in the number of regional jet operations, moderate the growth in the noise contour. The most notable difference in the shape of the contour is growth to the east of the Runway 31 end, representative of increased jet aircraft departures on Runway 13. To the south of the airport, increases in the number of daytime operations on Runway 2R/20L results in growth to the contour and a reduction in the size of the contour on Runway 2C and 2L. To the north, increased operations on Runway 2R/20L and on Runway 2L/20R increase the size of the contour. The size of the contour to the northwest has been reduced, as more departures utilize Runway 13 instead of Runway 31.

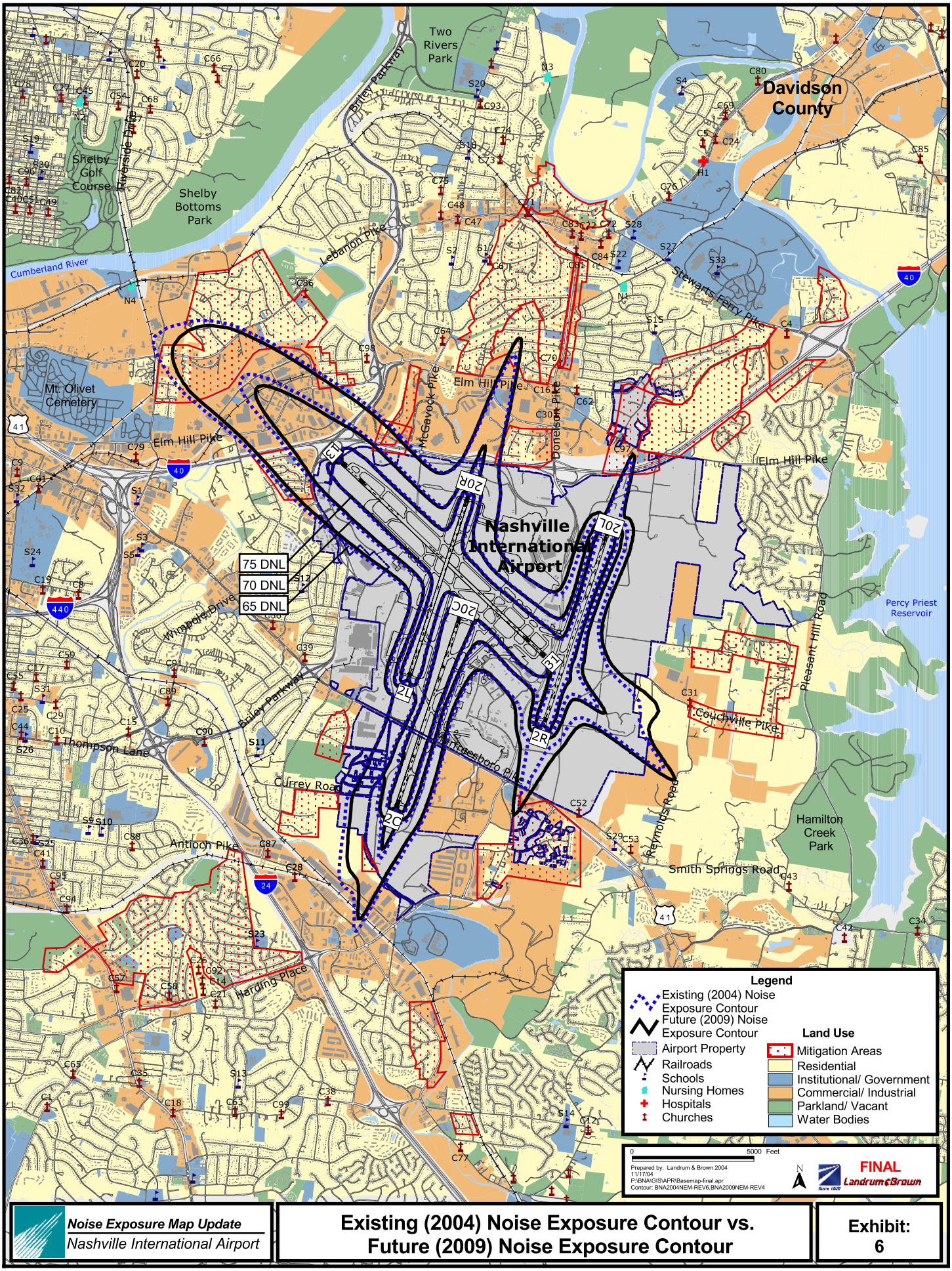
The Future (2009) NEM includes 5.4 square miles within the 65 DNL contours, which is approximately the same size as the Existing (2004) NEM. **Table 13** summarizes the area encompassed within the Future (2009) NEM and the Existing (2004) NEM. There are approximately 243 residences and 754 people that fall within the 65 DNL of the Future (2009) NEM, all of which are considered compatible through participation in the airport's sound insulation and acquisition programs. There are no noise-sensitive facilities located within the 65 DNL noise contour for the Future (2009) conditions. **Table 14** summarizes the residential unit and population impacts for the Future (2009) NEM. **Exhibit 6** provides a comparison of the Existing (2004) conditions contour and the Future (2009) conditions contour.

Table 13
NOISE EXPOSURE IMPACT - AREA (SQUARE MILES) - FUTURE (2009) NEM
Nashville International Airport

NOISE CONTOUR	65-70 DNL	70-75 DNL	75+ DNL	65 + DNL
Existing (2004) NEM	2.8	1.3	1.3	5.4
Future (2009) NEM	2.9	1.2	1.3	5.4
Difference	*+0.1*	*-0.1*	*0.0*	*0.0*

Source: Landrum & Brown, 2004.


Nashville International Airport
Davidson County
Two Rivers Park
Shelby Golf Course
Shelby Bottoms Park
Mt. Olivet Cemetery
Percy Priest Reservoir
Hamilton Creek Park
Cumberland River
Briley Parkway
Lebanon Pike
Stewarts Ferry Pike
Elm Hill Pike
McGavock Pike
Donelson Pike
Pleasant Hill Road
Couchville Pike
Murfreesboro Pike
Reynolds Road
Smith Springs Road
Currey Road
Antioch Pike
Harding Place
Thompson Lane
Wimpole Drive
Riverside Drive
75 DNL
70 DNL
65 DNL
Legend
Future (2009) Noise Exposure Contour
Airport Property
Railroads
Schools
Nursing Homes
Hospitals
Churches
Land Use
Mitigation Areas
Residential
Institutional/ Government
Commercial/ Industrial
Parkland/ Vacant
0
5000 Feet
Prepared by: Landrum & Brown 2004
11/05/04
P:\BNA\GIS\APR\Basemap-Final.apr
Contour: Bna2009nem-rev4
FINAL
Landrum&Brown
Noise Exposure Map Update
Nashville International Airport
Future (2009) Noise Exposure Map
Exhibit: 5



Noise Exposure Map Update
Nashville International Airport

Existing (2004) Noise Exposure Contour vs. Future (2009) Noise Exposure Contour

Exhibit: 6

Table 14
NOISE EXPOSURE IMPACTS - FUTURE (2009) NOISE EXPOSURE MAP
Nashville International Airport

RESIDENTIAL	65-70 DNL	70-75 DNL	75+ DNL	65 + DNL
Unmitigated	0	0	0	0
Previously Mitigated*	243	0	0	243
Total	243	0	0	243
POPULATION	65-70 DNL	70-75 DNL	75+ DNL	65 + DNL
Unmitigated	0	0	0	0
Previously Mitigated*	754	0	0	754
Total	754	0	0	754

*Note: Homes designated as Previously Mitigated are located within the noise contour and have been included in one of the airport's previous land use mitigation programs.

Source: Landrum & Brown, 2004.

6.0 REVIEW OF CURRENT NOISE COMPATIBILITY PROGRAM MEASURES

The previous sections provided the methodology and input data that was used in the preparation of the official NEMs. This section reviews the measures approved by the FAA in its Record of Approval (ROA) of the MNAA's 1989 Noise Compatibility Program (NCP). These measures are identified as noise abatement, land use control, and management measures.

6.1 Current Noise Abatement Measures

The MNAA NCP includes four operational strategies designed to reduce noise impacts to the communities near BNA.[1]

Operational Strategy 1: Modification of the daytime runway use to balance airfield operations resulting in a 50/50 north/south runway split. Adoption of this measure will direct more departures to the east, south, or southwest resulting in a reduced population impact.

- *Implemented.*

[1] FAA Record of Approval issued September 1989.

Operational Strategy 2: Use of Runway 13/31 for over 96% of operations between 10:00 p.m. and 7:00 a.m. with an emphasis on departing to the east and arriving from the southeast whenever conditions allow (i.e., low traffic periods, wind and weather conditions, etc.).

- *Implemented.*

Operational Strategy 3: Change the following nighttime (10:00 p.m. to 7:00 a.m.) flight corridors: Runway 13 departures turn to a heading of 090 degrees until reaching 3,600 feet above sea level; Runway 31 departures turn to a heading of 280 degrees until reaching 3,600 feet above sea level. Turn to be initiated at 2 DME; Runway 20R departures turn to a heading of 180 degrees until reaching an altitude of 3,600 feet MSL.

- *Implemented.*

Operational Strategy 4: Change the following daytime flight corridors: Runway 31 departures follow runway heading then turn to 50 degrees or 280 degrees at 2 DME; Runway 20R eastbound departures turn to the southeast (140 or 180 degrees); Runway 20L westbound departures turn to the southwest (220 degrees).

- *Implemented.*

The current Noise Abatement Measures defined flight corridors for arriving and departing aircraft at BNA, including noise abatement measures for Runway 20L. Based on field observations and flight track analysis of Automated Radar Terminal System (ARTS) radar data, the operational strategies are meeting the MNAA goal of minimizing noise impacts.

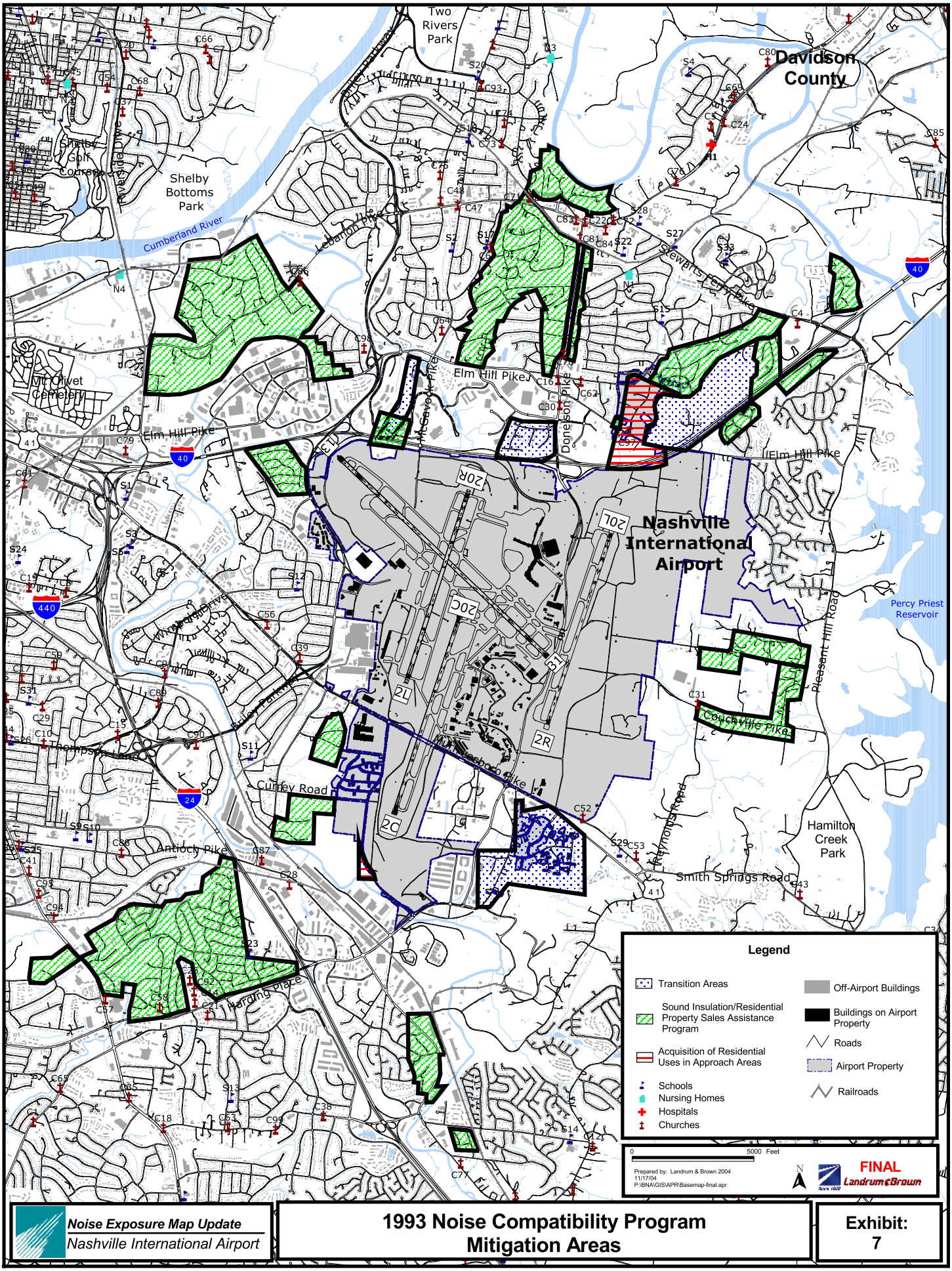
Because these measures are still effective in directing aircraft over the most compatible land use corridors, it is not recommended to modify, remove, or supplement the existing, currently approved Noise Abatement Measures.

6.2 Current Land Use Control Measures

The MNAA NCP contains four approved Remedial land use control measures to promote compatibility in previously developed areas around the airport, and one Preventive measure to discourage incompatible land uses for the undeveloped areas. **Exhibit 7** depicts the Remedial Land Use program boundaries.

Remedial Action 1: Acquisition of Residential Areas in the Extended Approach Areas.

Two residential areas, as shown on Exhibit 7, were acquired on a voluntary basis. One area is north of Runway 2R/20L. A second area is located south of Runway 2L and east of Airport Estates and some surrounding properties (which were being



Noise Exposure Map Update
Nashville International Airport

1993 Noise Compatibility Program Mitigation Areas

Exhibit: 7

acquired at the time of the ROA of the 1989 NCP). This community was within the 1993 70 DNL and would have been left fragmented due to the Airport Estates acquisition. The requirements of the Federal Uniform Relocation Assistance and Real Property Acquisition Policy Act were followed.

- *Implemented.*

Remedial Action 2: Sound insulation of single family, owner-occupied houses affected by the 65 to 75 DNL noise contours.

Intensive insulation was installed in the 70 to 75 DNL noise contour and less intensive insulation in the 65 to 70 DNL noise contour. MNAA provided the initial funding for the sound insulation program.

- *Implemented.*

Remedial Action 3: Residential Property Sales Assistance program (RPSAP).

The MNAA guaranteed property owners living in viable residential areas of the 65 DNL fair market value if they wished to sell their homes. Sales would be voluntary and the homeowners would not receive relocation assistance. To participate, homeowners were required to provide the MNAA with easements at the time of sale. If a homeowner had previously participated in the sound insulation option, they were asked to wait one year after completion of sound insulation before becoming eligible for the RPSAP option.

- *Implemented.*

Remedial Action 4: Transition Areas. To preclude future residential development and to transition existing incompatible land uses to nonresidential uses the MNAA worked with the Metropolitan Planning Commission to identify and effect zoning policy changes for several areas.

- *Not implemented. As required by the NCP Record of Approval, these areas were reviewed one year after the ROA to assess whether or not the transition from residential to commercial was occurring. Based upon the review, the commercial development was not occurring and the residents of the Transition Areas elected to participate in acquisition, sales assistance, or sound insulation (depending upon their location.) The Transition Areas were not rezoned to nonresidential; however, the Subarea plan administered by the Metropolitan Planning Commission was changed to indicate that the highest and best use of these areas was airport-compatible development such as commercial or office space. The **original text** of the NCP for Remedial Action 4 is shown below:*

- Spence Lane – The General Plan Land Use Policy Plan map was amended from "Residential Conservation: High Density" to "Manufacturing and Storage: Developing" for those areas which are currently vacant. The existing residential subdivision and apartments are to remain in "Residential Conservation: High Density" policy. Some homes on Spence Lane are eligible for the RPSAP and sound insulation programs.
- North Side of I-40 East, North of Airport – The General Plan Land Use Policy Plan amended from "Warehousing and Wholesaling: Developing" to "Commercial Office Concentration" policy and "Commercial Arterial Developing" policy.
- North Side of I-40 East, North of Elm Hill Pike, including the Waterfalls Park Subdivision – The General Plan Land Use Policy map was amended from "Residential Conservation: Low-Medium Density" to "Major Recreational Open Space" policy in the extended approach zone areas west and north of McCrory Creek Road, and "Commercial Office Concentration" policy east and south of McCrory Creek Road. Waterfalls Park Subdivision will be eligible for the RPSAP and sound insulation programs.
- Couchville Pike – The General Plan Land Use Policy Plan map was amended from "Residential Growth: Low-Medium Density" policy to "Warehousing and Wholesaling: Developing" and "Commercial Office Concentration" policies. The homes in this area will be eligible for the RPSAP and sound insulation programs.
- Franklin-Limestone Road – The General Plan Land Use Policy map was amended from "Residential Growth: Low-Medium Density" policy to "Warehousing and Wholesaling: Developing" policy.
- The subdivision located northwest of the intersection of I-40 and Donelson Pike, including Lockwood and Shacklett Drives - The land use policy in this area already indicates commercial use. The MPC staff is considering ways of transitioning the redevelopment of this area.
- Town Park and the homes south of it along Ezell Pike - MPC has reclassified the land use policy in Town Park to nonresidential use. This change will be extended to the area south of Town Park along Ezell Pike. The MPC is considering ways of transitioning land use in this area.
- Airport Estates and the area south of it along McGavock Pike - The MNAA is currently purchasing homes in Airport Estates. Purchased homes are being removed and the area will remain as open green space. A similar acquisition program is being proposed on portions of McGavock Pike. The land use policy in the McGavock Pike area (including Helen Drive) will be changed to nonresidential**.**

Preventive Action 1: Undeveloped areas. The MNAA will discourage residential development in the undeveloped areas within the 65 DNL, and will recommend that Nashville's building code be revised to identify an aircraft noise impact area with more stringent requirements for noise reduction.

- *Implemented. Most of the areas within the 1993 Noise Exposure Contour have been built out. However, there have been occasions when the MNAA has opposed zoning changes which would increase the residential density in areas currently or previously within a 65 DNL noise contour. The MNAA handles these situations on a case-by-case basis. The Metropolitan Government of Nashville and Davidson County's building codes were not updated to identify an area of aircraft noise impact with more stringent requirements for noise reduction.*

Of the five land use control measures approved as part of the 1989 ROA of the NCP, four have been implemented. Homeowners within the area identified by Remedial Action 4 were offered participation in other elements of the program, and are therefore considered mitigated. There are a few homes in the areas eligible for acquisition under Remedial Action 1 that have not chosen to enter the program. It is recommended that these homes be considered for purchase by the MNAA on a case-by-case basis if and when they request acquisition. The MNAA will continue to monitor development and zoning changes in an effort to discourage incompatible land uses within the airport environs. Based upon the analysis prepared for this NEM update, all of the homes within the Existing (2004) or Future (2009) 65+ DNL noise exposure contours have been offered land use mitigation. Therefore, it is not recommended to modify, remove, terminate, or supplement the existing, currently approved land use control measures.

6.3 Current Management Measures

The MNAA NCP contains three Management Techniques designed to assist in the implementation and management of the Noise Abatement and Land Use Control measures.

Management Technique 2: Documentation for the preferred runway use program should be updated as needed to reflect aircraft noise abatement turning procedures and runway utilization goals.

- *Implemented. The informal runway use program is currently implemented through a Tower Order dated October 31, 1996.*

Management Technique 3: An Automated Radar Terminal Service (ARTS) Data Acquisition System, such as the one installed on a temporary basis, should be retained in service.

- *Implemented. A Flight Track Monitoring System was installed on a permanent basis in 1989.*

Management Technique 5: The Airport Noise Advisory Committee (ANAC) or some comparable group should be used to review the MNAA's land use program implementation efforts.

- *Implemented. The Airport Noise Advisory Committee continued to meet until such time as the land use program measures had been implemented and was then disbanded.*

Of the five management techniques included in the NCP, the three listed above were accepted and implemented. The following two management techniques were disapproved by the FAA in the ROA:

Management Technique 1: Fan markers should be installed on Runways 31 and 20L to guide aircraft turns in conjunction with preferred flight corridors.

- *Disapproved. The FAA Air Traffic Control has determined that varying sensitivities/settings of aircraft receivers tend to impact precision and make the use of these markers ineffective.*

Management Technique 4: A standard Instrument Departure Procedure (SID) or other published procedures should be developed for Runway 2R to align aircraft turns over the highway.

- *Disapproved. However, the local Nashville International Airport Air Traffic Control Tower has since implemented a SID that does include the recommended noise abatement procedure for Runway 2R.*

It is not recommended to modify, remove, terminate, or supplement the existing and FAA-approved management measures.

Appendix A

APPENDIX A
PUBLIC COORDINATION

This appendix includes copies of coordination letters sent to local Metropolitan Council members of the Metropolitan Government of Nashville and Davidson County and other public outreach regarding the Noise Exposure Map Update project. A presentation was made to the Metropolitan Nashville Airport Authority Board of Directors, Planning and Engineering Committee on July 14, 2004. The presentation and meeting minutes are included in this appendix. An additional presentation was made to the MNAA Planning and Engineering Committee on September 8, 2004. Public notice of the availability of the Draft document are included. Comments received regarding the Noise Exposure Map Update Study and responses to these comments are located in Appendix F.

Metropolitan Council Coordination

METROPOLITAN NASHVILLE AIRPORT AUTHORITY
ONE TERMINAL DRIVE • SUITE 501 • NASHVILLE, TENNESSEE 37214-4114 • (615) 275-1600

December 19, 2003

The Honorable Diane Neighbors
Member of the Metropolitan Council
1311 Ordway Place
Nashville, Tennessee 37206-2731

Dear Councilwoman Neighbors:

Since 1989, the Metropolitan Nashville Airport Authority has pursued an active noise mitigation program in the areas most impacted by noise from aircraft operations at Nashville International Airport. Beginning with the 1989 Federal Aviation Regulation Part 150 Noise Compatibility Study, which led to the development of residential sales assistance and sound insulation programs completed in 1996, and continuing with the 1996 Noise Exposure Map Update Study, the MNAA has attempted to identify and address the most significant impacts of aircraft noise.

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Council members representing districts touched by the boundaries of the 2001 noise contour have also been notified. If you would like more information or have questions, please contact Lee Cothron, MNAA Noise Abatement Specialist, at 275-1446.

Sincerely,

Raul L. Regalado

Raul L. Regalado
President & CEO

cc: James H. Cheek, III, Chairman of the Board

METROPOLITAN NASHVILLE AIRPORT AUTHORITY
ONE TERMINAL DRIVE • SUITE 501 • NASHVILLE, TENNESSEE 37214-4114 • (615) 275-1600

December 19, 2003

The Honorable Carolyn Baldwin Tucker
Member of the Metropolitan Council
1521 Naples Avenue
Nashville, Tennessee 37207-1015

Dear Councilwoman Tucker:

Since 1989, the Metropolitan Nashville Airport Authority has pursued an active noise mitigation program in the areas most impacted by noise from aircraft operations at Nashville International Airport. Beginning with the 1989 Federal Aviation Regulation Part 150 Noise Compatibility Study, which led to the development of residential sales assistance and sound insulation programs completed in 1996, and continuing with the 1996 Noise Exposure Map Update Study, the MNAA has attempted to identify and address the most significant impacts of aircraft noise.

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President & CEO

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METROPOLITAN NASHVILLE AIRPORT AUTHORITY
ONE TERMINAL DRIVE • SUITE 501 • NASHVILLE, TENNESSEE 37214-4114 • (615) 275-1600

December 19, 2003

The Honorable Buck Dozier
Member of the Metropolitan Council
624 Ronnie Road
Madison, Tennessee 37115-2568

Dear Councilman Dozier:

Since 1989, the Metropolitan Nashville Airport Authority has pursued an active noise mitigation program in the areas most impacted by noise from aircraft operations at Nashville International Airport. Beginning with the 1989 Federal Aviation Regulation Part 150 Noise Compatibility Study, which led to the development of residential sales assistance and sound insulation programs completed in 1996, and continuing with the 1996 Noise Exposure Map Update Study, the MNAA has attempted to identify and address the most significant impacts of aircraft noise.

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President & CEO

cc: James H. Cheek, III, Chairman of the Board

METROPOLITAN NASHVILLE AIRPORT AUTHORITY
ONE TERMINAL DRIVE • SUITE 501 • NASHVILLE, TENNESSEE 37214-4114 • (615) 275-1600

December 19, 2003

Ms. Michelle Steele, Director
Mayor's Office of Neighborhoods
225 Polk Avenue, Suite 204
Nashville, Tennessee 37203-3500

Dear Ms. Steele:

Since 1989, the Metropolitan Nashville Airport Authority has pursued an active noise mitigation program in the areas most impacted by noise from aircraft operations at Nashville International Airport. Beginning with the 1989 Federal Aviation Regulation Part 150 Noise Compatibility Study, which led to the development of residential sales assistance and sound insulation programs completed in 1996, and continuing with the 1996 Noise Exposure Map Update Study, the MNAA has attempted to identify and address the most significant impacts of aircraft noise.

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Raul L. Regalado

Raul L. Regalado
President & CEO

cc: James H. Cheek, III, Chairman of the Board
Mayor Bill Purcell

METROPOLITAN NASHVILLE AIRPORT AUTHORITY
ONE TERMINAL DRIVE • SUITE 501 • NASHVILLE, TENNESSEE 37214-4114 • (615) 275-1600

December 19, 2003

Mr. Tom Jurkovich, Director
Mayor's Office of Economic & Community Development
222 3rd Avenue North, Suite 475
Nashville, Tennessee 37201-1604

Dear Mr. Jurkovich:

Since 1989, the Metropolitan Nashville Airport Authority has pursued an active noise mitigation program in the areas most impacted by noise from aircraft operations at Nashville International Airport. Beginning with the 1989 Federal Aviation Regulation Part 150 Noise Compatibility Study, which led to the development of residential sales assistance and sound insulation programs completed in 1996, and continuing with the 1996 Noise Exposure Map Update Study, the MNAA has attempted to identify and address the most significant impacts of aircraft noise.

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President & CEO

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Mayor Bill Purcell

METROPOLITAN NASHVILLE AIRPORT AUTHORITY
ONE TERMINAL DRIVE • SUITE 501 • NASHVILLE, TENNESSEE 37214-4114 • (615) 275-1600

December 19, 2003

The Honorable Vivian Wilhoite
Member of the Metropolitan Council
1029 Flinklock Court
Nashville, Tennessee 37217-3608

Dear Councilwoman Wilhoite:

Since 1989, the Metropolitan Nashville Airport Authority has pursued an active noise mitigation program in the areas most impacted by noise from aircraft operations at Nashville International Airport. Beginning with the 1989 Federal Aviation Regulation Part 150 Noise Compatibility Study, which led to the development of residential sales assistance and sound insulation programs completed in 1996, and continuing with the 1996 Noise Exposure Map Update Study, the MNAA has attempted to identify and address the most significant impacts of aircraft noise.

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Raul L. Regalado

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METROPOLITAN NASHVILLE AIRPORT AUTHORITY
ONE TERMINAL DRIVE • SUITE 501 • NASHVILLE, TENNESSEE 37214-4114 • (615) 275-1600

December 19, 2003

The Honorable Howard Gentry, Jr.
Vice Mayor of Metropolitan Nashville & Davidson County
3502 Geneva Circle
Nashville, Tennessee 37209-2525

Dear Vice Mayor Gentry:

Since 1989, the Metropolitan Nashville Airport Authority has pursued an active noise mitigation program in the areas most impacted by noise from aircraft operations at Nashville International Airport. Beginning with the 1989 Federal Aviation Regulation Part 150 Noise Compatibility Study, which led to the development of residential sales assistance and sound insulation programs completed in 1996, and continuing with the 1996 Noise Exposure Map Update Study, the MNAA has attempted to identify and address the most significant impacts of aircraft noise.

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President & CEO

cc: James H. Cheek, III, Chairman of the Board
Mayor Bill Purcell

METROPOLITAN NASHVILLE AIRPORT AUTHORITY
ONE TERMINAL DRIVE • SUITE 501 • NASHVILLE, TENNESSEE 37214-4114 • (615) 275-1600

December 19, 2003

The Honorable Jason Alexander
Member of the Metropolitan Council
4408 Dowdy Drive
Antioch, Tennessee 37013-2725

Dear Councilman Alexander:

Since 1989, the Metropolitan Nashville Airport Authority has pursued an active noise mitigation program in the areas most impacted by noise from aircraft operations at Nashville International Airport. Beginning with the 1989 Federal Aviation Regulation Part 150 Noise Compatibility Study, which led to the development of residential sales assistance and sound insulation programs completed in 1996, and continuing with the 1996 Noise Exposure Map Update Study, the MNAA has attempted to identify and address the most significant impacts of aircraft noise.

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Raul L. Regalado

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President & CEO

cc: James H. Cheek, III, Chairman of the Board

METROPOLITAN NASHVILLE AIRPORT AUTHORITY
ONE TERMINAL DRIVE • SUITE 501 • NASHVILLE, TENNESSEE 37214-4114 • (615) 275-1600

December 19, 2003

The Honorable Greg Adkins
Member of the Metropolitan Council
497 Elysian Fields Road Apt. G4
Nashville, Tennessee 37211-4238

Dear Councilman Adkins:

Since 1989, the Metropolitan Nashville Airport Authority has pursued an active noise mitigation program in the areas most impacted by noise from aircraft operations at Nashville International Airport. Beginning with the 1989 Federal Aviation Regulation Part 150 Noise Compatibility Study, which led to the development of residential sales assistance and sound insulation programs completed in 1996, and continuing with the 1996 Noise Exposure Map Update Study, the MNAA has attempted to identify and address the most significant impacts of aircraft noise.

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ONE TERMINAL DRIVE • SUITE 501 • NASHVILLE, TENNESSEE 37214-4114 • (615) 275-1600

December 19, 2003

The Honorable J.B. Loring
Member of the Metropolitan Council
3231 Knobview Drive
Nashville, Tennessee 37214-2138

Dear Councilman Loring:

Since 1989, the Metropolitan Nashville Airport Authority has pursued an active noise mitigation program in the areas most impacted by noise from aircraft operations at Nashville International Airport. Beginning with the 1989 Federal Aviation Regulation Part 150 Noise Compatibility Study, which led to the development of residential sales assistance and sound insulation programs completed in 1996, and continuing with the 1996 Noise Exposure Map Update Study, the MNAA has attempted to identify and address the most significant impacts of aircraft noise.

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President & CEO

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METROPOLITAN NASHVILLE AIRPORT AUTHORITY
ONE TERMINAL DRIVE • SUITE 501 • NASHVILLE, TENNESSEE 37214-4114 • (615) 275-1600

December 19, 2003

The Honorable Harold White
Member of the Metropolitan Council
2942 Leatherwood Drive
Nashville, Tennessee 37214-3206

Dear Councilman White:

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December 19, 2003

The Honorable Carl Burch
Member of the Metropolitan Council
4024 Windwood Lane
Nashville, Tennessee 37214

Dear Councilman Burch:

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December 19, 2003

The Honorable Adam Dread
Member of the Metropolitan Council
P.O. Box 158891
Nashville, Tennessee 37215-8891

Dear Councilman Dread:

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ONE TERMINAL DRIVE • SUITE 501 • NASHVILLE, TENNESSEE 37214-4114 • (615) 275-1600

December 19, 2003

The Honorable David Briley
Member of the Metropolitan Council
1902 Boscobel Street
Nashville, Tennessee 37206-2018

Dear Councilman Briley:

Since 1989, the Metropolitan Nashville Airport Authority has pursued an active noise mitigation program in the areas most impacted by noise from aircraft operations at Nashville International Airport. Beginning with the 1989 Federal Aviation Regulation Part 150 Noise Compatibility Study, which led to the development of residential sales assistance and sound insulation programs completed in 1996, and continuing with the 1996 Noise Exposure Map Update Study, the MNAA has attempted to identify and address the most significant impacts of aircraft noise.

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Raul L. Regalado
President & CEO

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Planning and Engineering Committee Presentation
July 14, 2004

Metropolitan Nashville Airport Authority
Planning and Engineering Committee

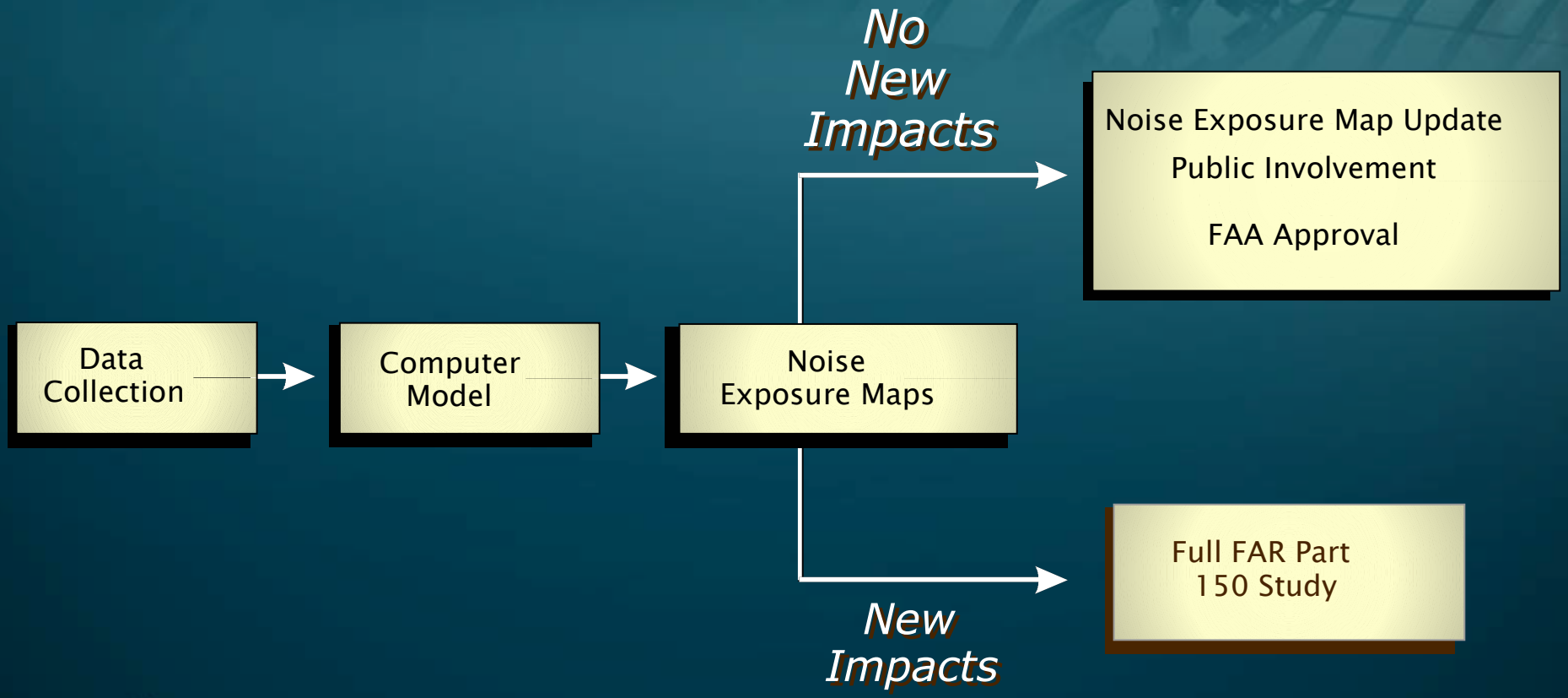
July 14, 2004

Noise Exposure Map Update

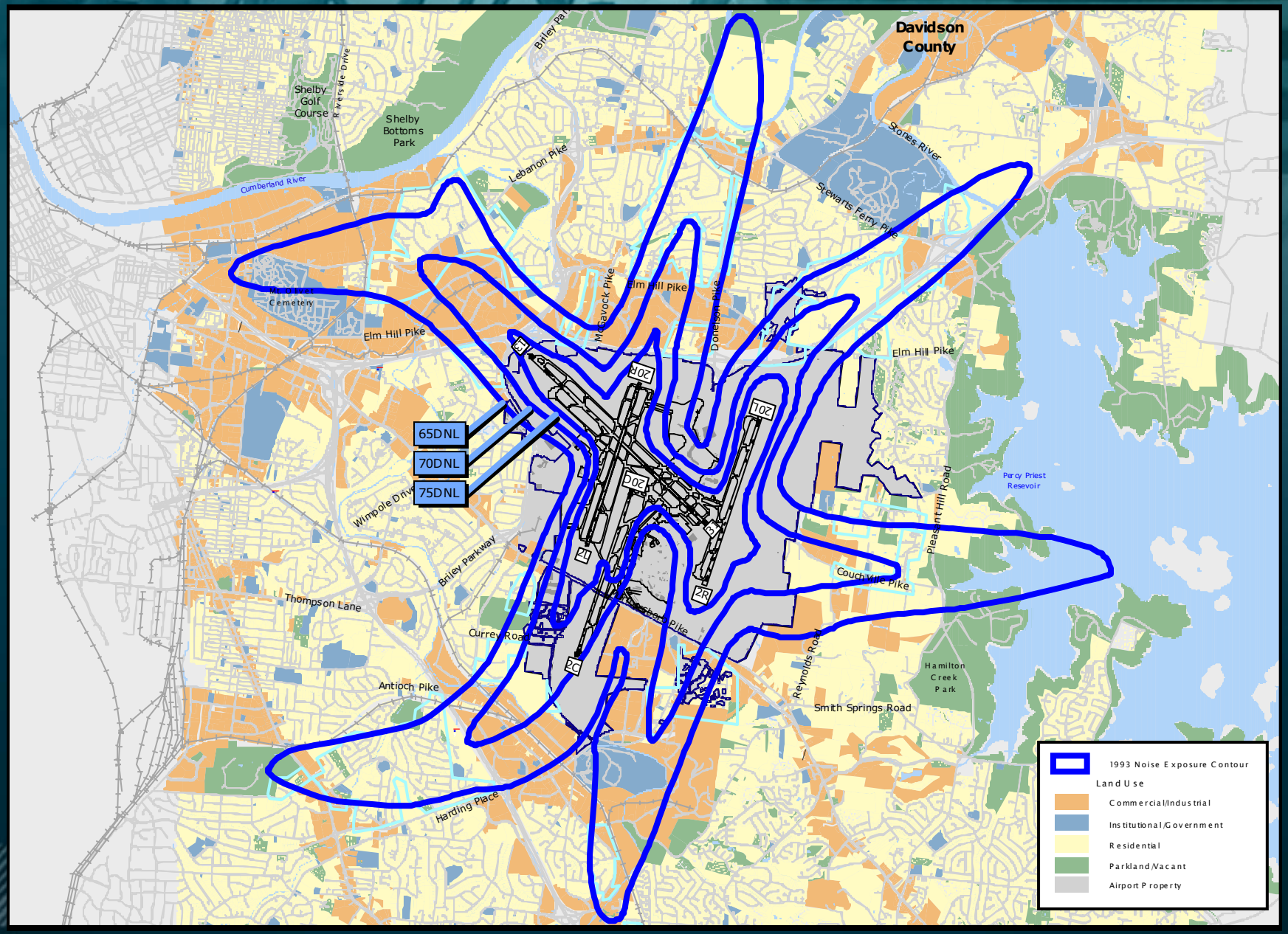
Landrum & Brown, Inc.

July 14, 2004

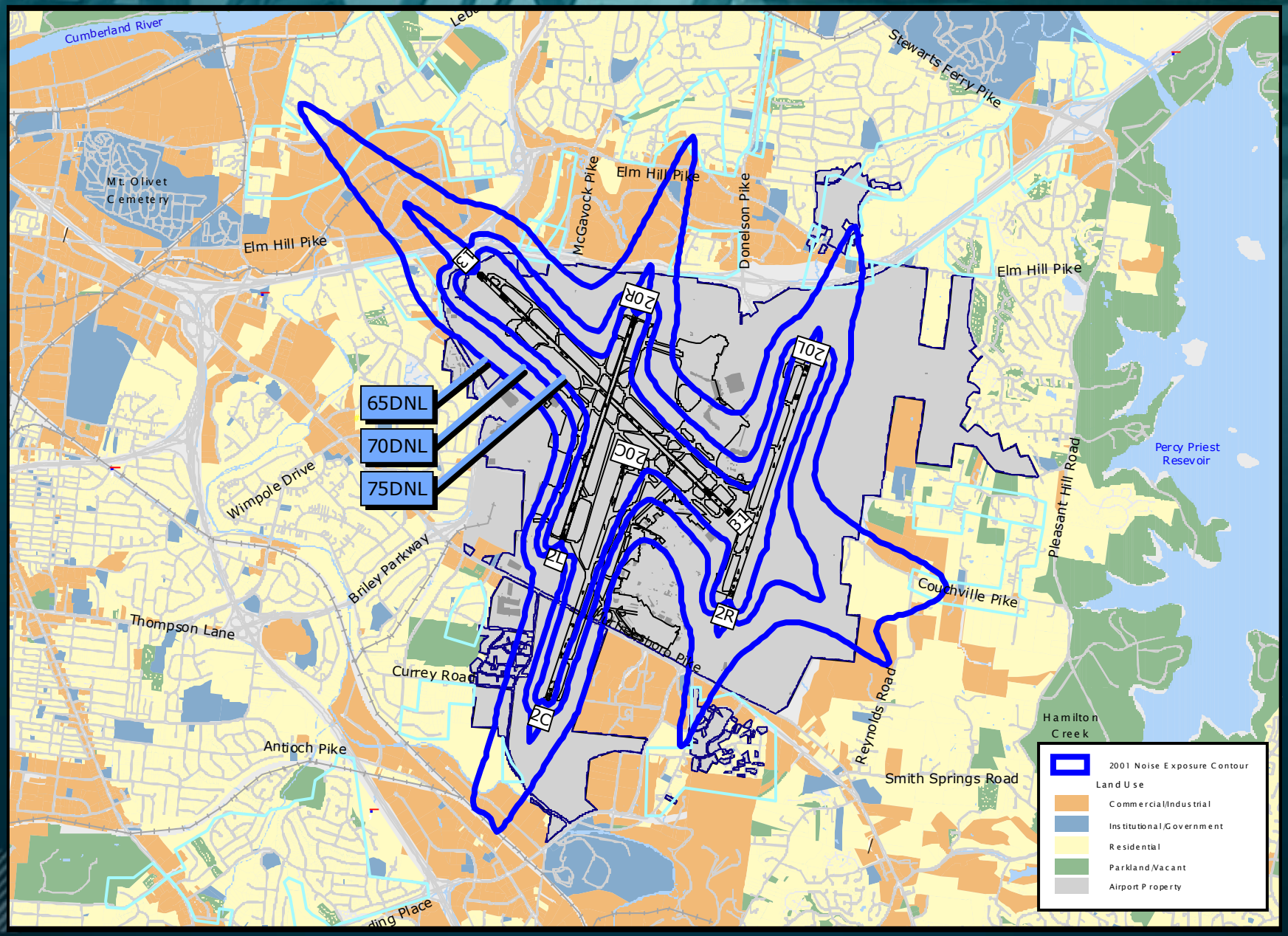
Noise Exposure Map Update Process



1993 Noise Exposure Map



2001 Noise Exposure Map



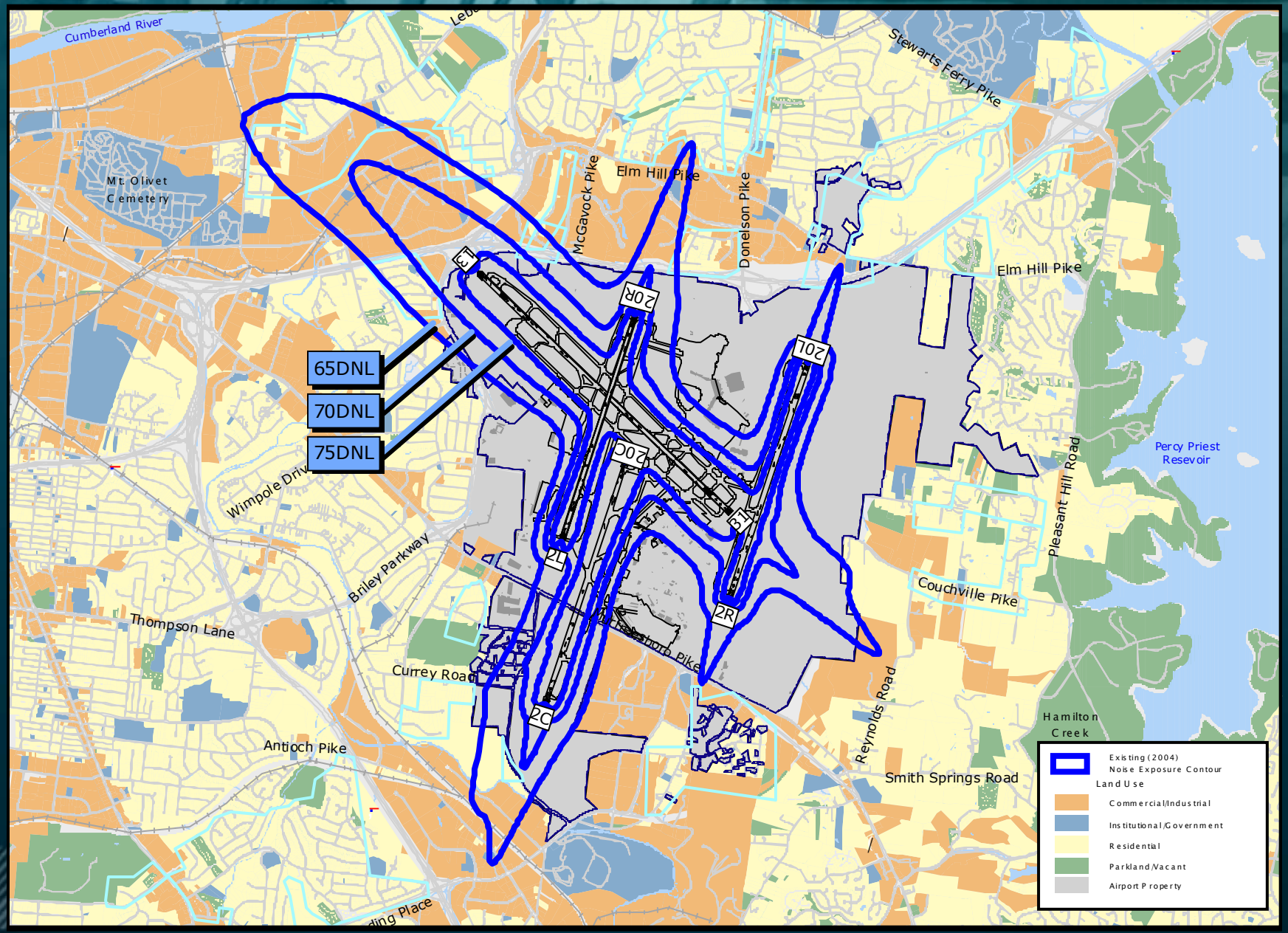
2004 and 2009 Operating Levels

User Group	2004 Existing	2009 Future	% Change
Air Carrier Jets	102,200	107,310	5.00%
Regional Jets	43,800	49,348	12.67%
General Aviation/ Business Jets	26,280	30,222	15.00%
Propeller Aircraft	56,940	64,970	14.10%
Total	**229,220**	**251,850**	**9.87%**

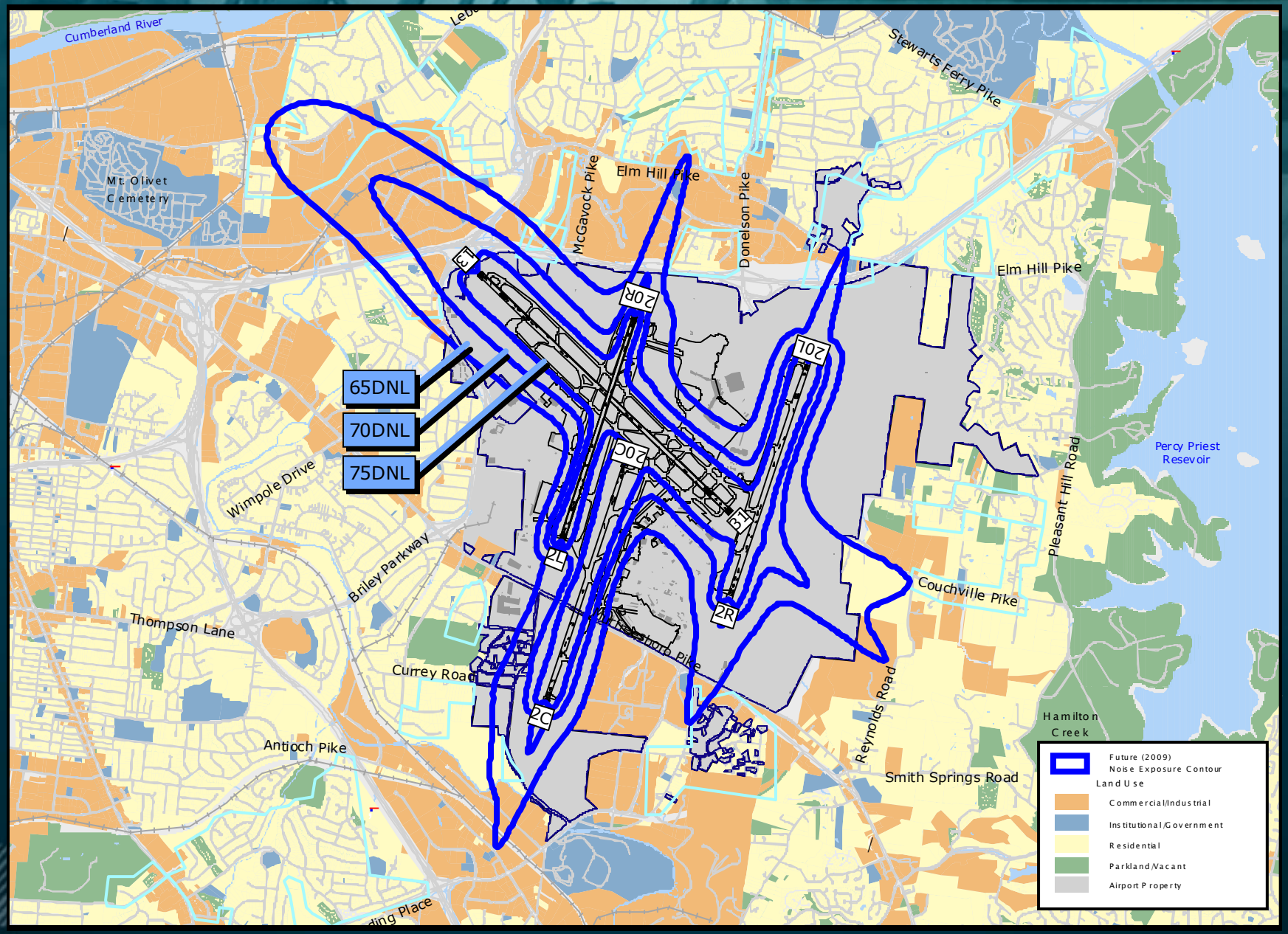
2004 Operating levels based on actual 2003 data

2009 Operating levels determined with FAA Terminal Area Forecast, 2002 Nashville International Airport Forecasts, consultation with MNAA staff

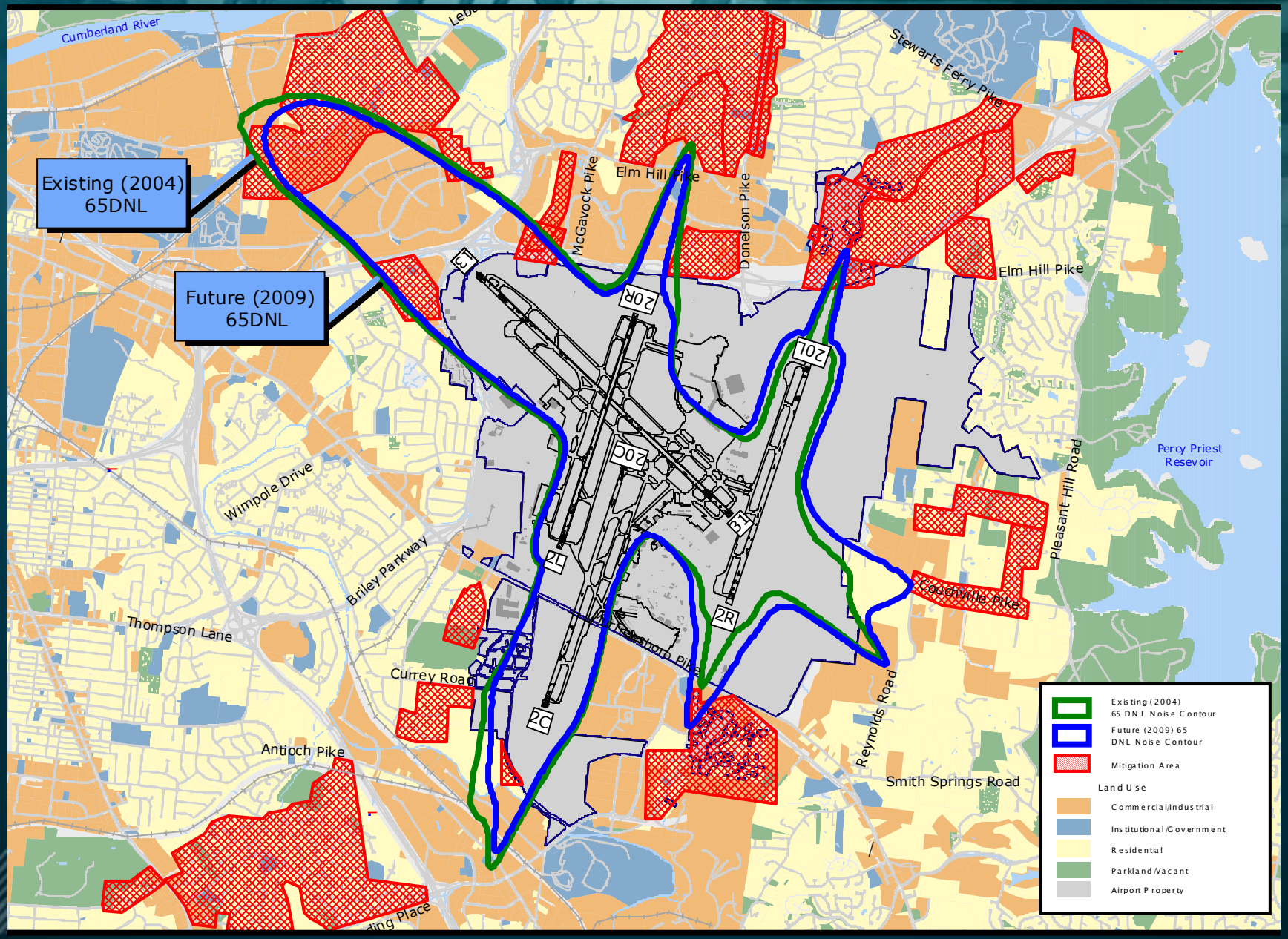
Existing (2004) Noise Exposure Contour



Future (2009) Noise Exposure Contour



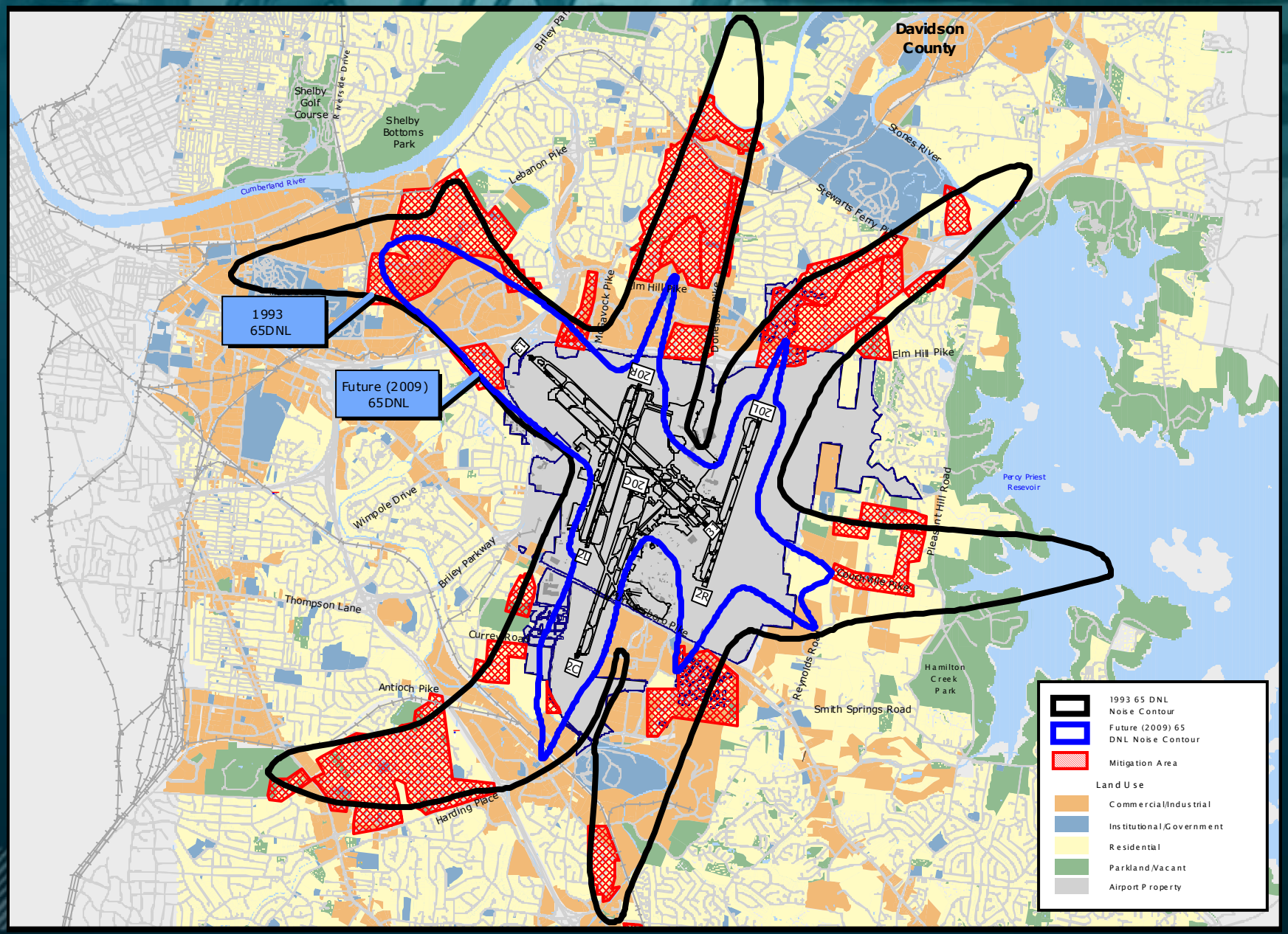
2004 vs. 2009 Noise Exposure Contours



Status of Land Use Control Measures

- Recommended Land Use Control Measures from the 1993 Noise Compatibility Study have been implemented
- Acquisition of residences which declined participation in the original program has been approved for purchase on a case-by-case basis
- No new impacts to residences or noise-sensitive facilities within the Future (2009) Noise Exposure Contour

1993 vs. 2009 Noise Exposure Contours



Next Steps

- Draft Document available in local libraries/ 30-day Public Comment and Review
- Submit Final document to the FAA
- FAA accepts NEMs
- Presentation to the Board

Planning and Engineering Committee Meeting Minutes
July 14, 2004

METROPOLITAN NASHVILLE AIRPORT AUTHORITY

Minutes of the July 2004 Planning/Engineering Committee Meeting

Date: July 14, 2004 **Place:** Nashville International Airport
Nashville, Tennessee

Time: 10:00 a.m.

Committee Members Present: Bert Mathews, Chair; Juli Mosley

Committee Members Absent: Gilbert Merritt

Others Present: James H. Cheek, III, Ann Butterworth, Raul Regalado, Iftikhar Ahmad, Monty Burgess, Nancy Vincent, Doug Wolfe and Paul Krivacka

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I. Call to Order

Chairman of the Planning/Engineering ("P/E") Committee, Commissioner Bert Mathews, called the meeting to order at 10:20 a.m., pursuant to Public Notice dated July 8, 2004.

II. Approval of Minutes

Commissioner Mosley moved to approve the minutes of the June 9, 2004 P/E Committee meeting, which was seconded by Commissioner Mathews. The motion carried by a vote of 2 to 0.

III. New Business

A. Concourse Overhead Directional Signage

Mr. Iftikhar Ahmad, Vice President of Planning, Design and Construction, briefed the Committee as to this item. Staff recommended that the P/E Committee approve and recommend to the Board that it: 1) accept the bid by Nashville Sign Company to replace the overhead directional signage located in the concourses at the Nashville International Airport ("BNA"); and, 2) authorize the Chairman and President & CEO to execute the proposed purchase order.

This capital improvement project involves the removal of the existing lettering and installation of new vinyl lettering on the existing concourse overhead directional signage in the terminal building

at BNA. The proposed concourse signage style was installed, tested, and approved by the signage review committee, which was comprised of members of the Authority's Executive Staff and other Staff members. The proposed signs will include English, Spanish, and Japanese languages as well as a color-coding scheme for each concourse. The chosen words for the dual languages are "Ticketing," "Ground Transportation," "Baggage," and "No Entry."

On May 12, 2004, the Authority solicited bids for the Concourse Overhead Directional Signage project at BNA. On June 10, 2004, bids were received from Alpha Signs of Tennessee, Jarvis Sign Company and Nashville Sign Company.

Staff evaluated the bids based upon price. Nashville Sign Company ("Nashville Sign") was the low bidder; its bid was approximately 41 percent lower than the Engineer's Probable Cost Estimate, 46 percent lower than the second lowest bid, and 61 percent lower than the highest bid.

The S,M&WBE goal established for this project is 13 percent, and participation will be 100 percent with Nashville Sign as the contractor. The duration of the project is 120 days, the anticipated contract start date is July 26, 2004, the completion date is slated for November 26, 2004, and the contract cost is $29,500. The Authority is the funding source for this project.

President Regalado informed the Committee that an outside consultant was retained to survey the signage program, and it made recommendations with respect to incorporating the additional languages and color codes. Those recommendations were discussed with the terminal tenants and airlines for their input, and, after some modifications and test signage, a final plan was approved.

Commissioner Mosley moved to approve and recommend to the Board that it approve the execution of the construction contract with Nashville Sign for concourse overhead directional signage in the terminal at BNA, which was seconded by Chairman Mathews. The motion carried by a vote of 2 to 0.

Commissioner Mosley inquired about the accuracy of the translations. Mr. Ahmad responded that the consultant utilized linguist experts who supplied the appropriate translations. Commissioner Mosley also inquired as to the selection of the languages chosen for translation. President

Regalado indicated that Staff made their language recommendations based on the businesses and the population that comprise middle Tennessee.

B. Stainless Steel Column Protection

Mr. Ahmad briefed the Committee as to this item. Staff recommended that the P/E Committee approve and recommend to the Board that it: 1) accept the bid by RCC Concrete Services, LLC to install stainless steel column protection located in the concourses at BNA; and, 2) authorize the Chairman and President & CEO to execute the proposed purchase order.

This capital improvement project involves the installation of a four-inch wide strip of stainless steel around the base of the columns. The stainless steel will prevent damage to the columns in the concourse areas. A successful test of the stainless steel column protection was conducted in April 2004.

On February 11, 2004, the Authority solicited bids for the Stainless Steel Column Protection project at BNA from RCC Concrete Services, LLC, Cutting Edge Laser Machining, Inc., and Tennessee Coatings. On May 20, 2004, bids were received.

Staff evaluated the bids based upon price. The bid by RCC Concrete Services, LLC was approximately 12.5 percent lower than the other bids. Staff recommends that the contract for this project be awarded to RCC Concrete.

The S,M&WBE goal established for this project is one percent, and with RCC Concrete Services, LLC, as contractor, participation will be 100 percent. The duration of the project is 90 days, the anticipated start date is July 2004, the completion date is slated for October 2004, and the contract cost is $36,380. The Authority will provide funding for this project.

Commissioner Mosley moved to approve and recommend to the Board that it approve the execution of the contract with RCC Concrete Services, LLC, to provide and install stainless steel column protection in the passenger terminal at BNA and authorize the Chairman and President &

CEO to execute the proposed contract, which was seconded by Chairman Mathews. The motion carried by a vote of 2 to 0.

IV. Information Only

A. Noise Exposure

Mr. Ahmad introduced Mr. Rob Adams and Mr. Royce Bassarab, Associates of Landrum & Brown, Inc., an aviation-consulting firm, who are currently in the process of updating the official Noise Exposure Maps ("NEM") for BNA and the community. Mr. Adams addressed the Committee stating that the purpose for their report was to determine whether there would be any new noise impacts and whether noise levels will remain at the current level, directly affecting homes that are in the significant noise level range that have not been treated with some sort of sound insulation. The report conclusion is that noise levels have declined over the last several years as a result of older noisier aircraft being retired and the switch to regional aircraft, and that no new impacts to residences or noise sensitive facilities are anticipated within the future noise exposure contour.

Mr. Bassarab indicated the next step in the process would be to prepare a draft document, which will include all technical documentation required by the Federal Aviation Administration ("FAA"), and make such available to all communities affected by placing it in local libraries for a 30-day public comment and review period. Once the public comments are received and integrated, the final document will be submitted to the FAA. The FAA will have two to three months to accept the updated NEM's. Once the NEM's meet federal requirements, a presentation will be submitted to the Board for approval.

The Committee then discussed consideration of broader notification to the community other than the 30-day public comment and review period. The Committee discussed additional notification avenues, including public meeting forums for affected homeowners, distribution to affected neighborhoods via the Authority Board's neighborhood representatives, and informing Metro Council members that represent the specific affected neighborhood.

B. John C. Tune Master Plan Update

Mr. Mark Gelband, Manager of Planning, presented the John C. Tune ("JWN") Master Plan Update. He indicated that the purpose of the Master Plan Update was to:

1. Establish a flexible development plan that will accommodate reasonably expected changes in the aviation market over the next 20 years;
2. Ensure that planned expansion is consistent with the safe, secure, efficient and financially sound operation and development of JWN;
3. Ensure that JWN is developed in an environmentally sensitive and responsible manner;
4. Ensure that JWN continues to serve as a catalyst for the economic development of the Nashville region; and
5. Develop the foundation for funding agreements and environmental approvals for key projects.

Analysis examines historical data, current developments, and recent aviation trends to create updated forecasts for based aircraft and fleet mix, total annual operations, instrument approach operations and peak hour airport operations.

The highlights of the Development Plan for JWN include:

1. The correction of non-standard runway safety areas;
2. New JWN entrance from the south – "Cockrill Bend Entrance;"
3. Short term facility improvements for north and south aprons;
4. Development of corporate hanger area on east side of JWN; and
5. Future growth to meet increased operational demand promoting flexibility for future growth, increasing JWN's ability to serve corporate aircraft.

Paramount in the Development Plan is the correction of the non-standard Runway Safety Areas ("RSA"), a 500-foot wide imaginary surface surrounding the runway and extending 1,000 feet down each runway. Currently for Runway 1, the RSA is 800 feet, which needs to be increased by 200 feet. Runway 19 currently measures 600 feet in length, which needs to be increased by 400 feet.

Two development items, which will take place immediately, include a new taxiway on the north ramp providing circulation to the terminal area as well as additional tie-down spaces. Construction of four t-hangar structures and two concrete pads for tie-downs should begin in the near future.

V. Adjournment

There being no further business to be brought before the Committee, Commissioner Mathews adjourned the meeting at 11:05 a.m.

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Board Secretary

Planning and Engineering Committee Presentation
September 8, 2004

Planning/Engineering Committee Meeting

Planning, Design and Construction Department
Metropolitan Nashville Airport Authority

September 2004

Planning Update

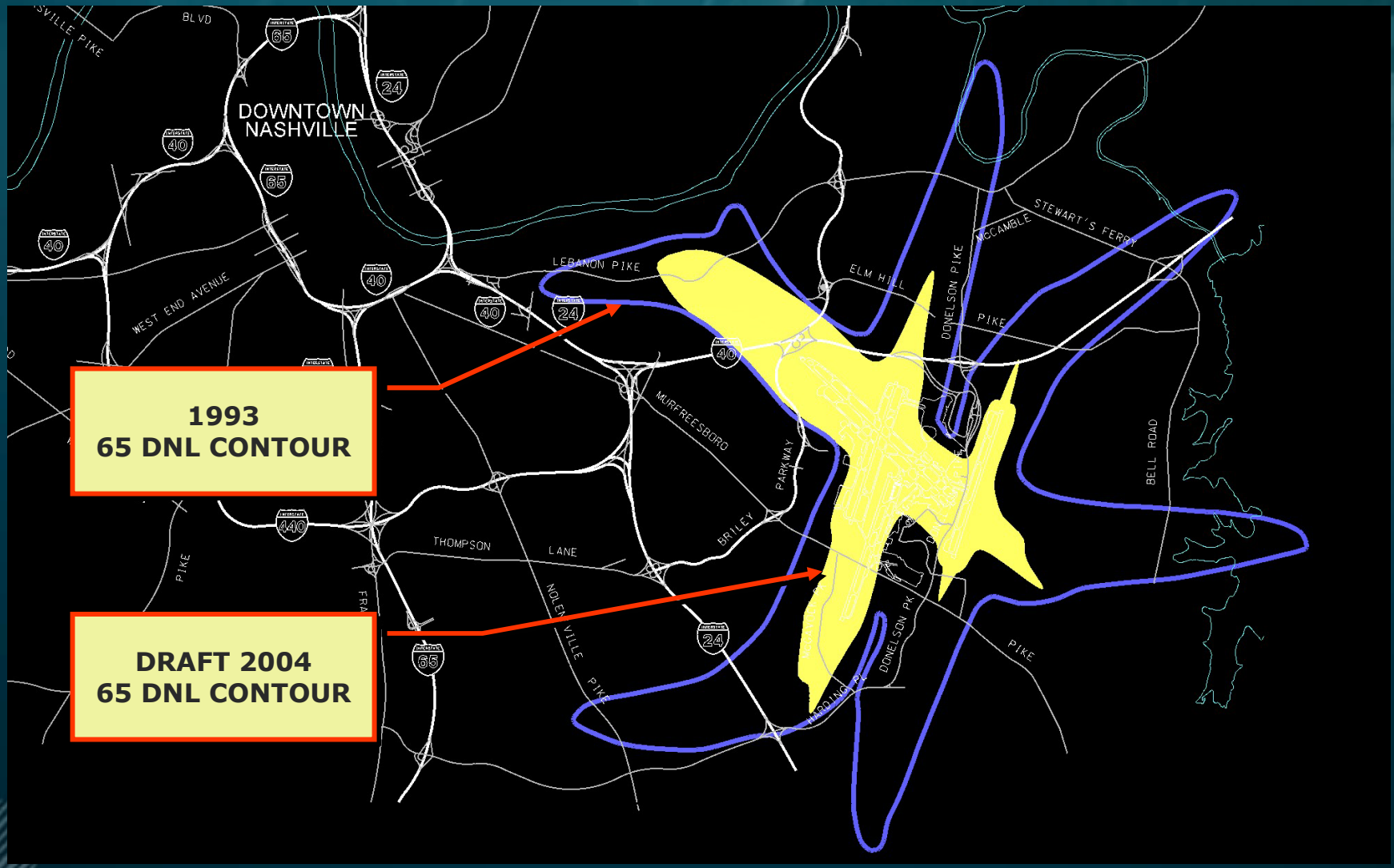
Planning, Design and Construction Department

September 2004

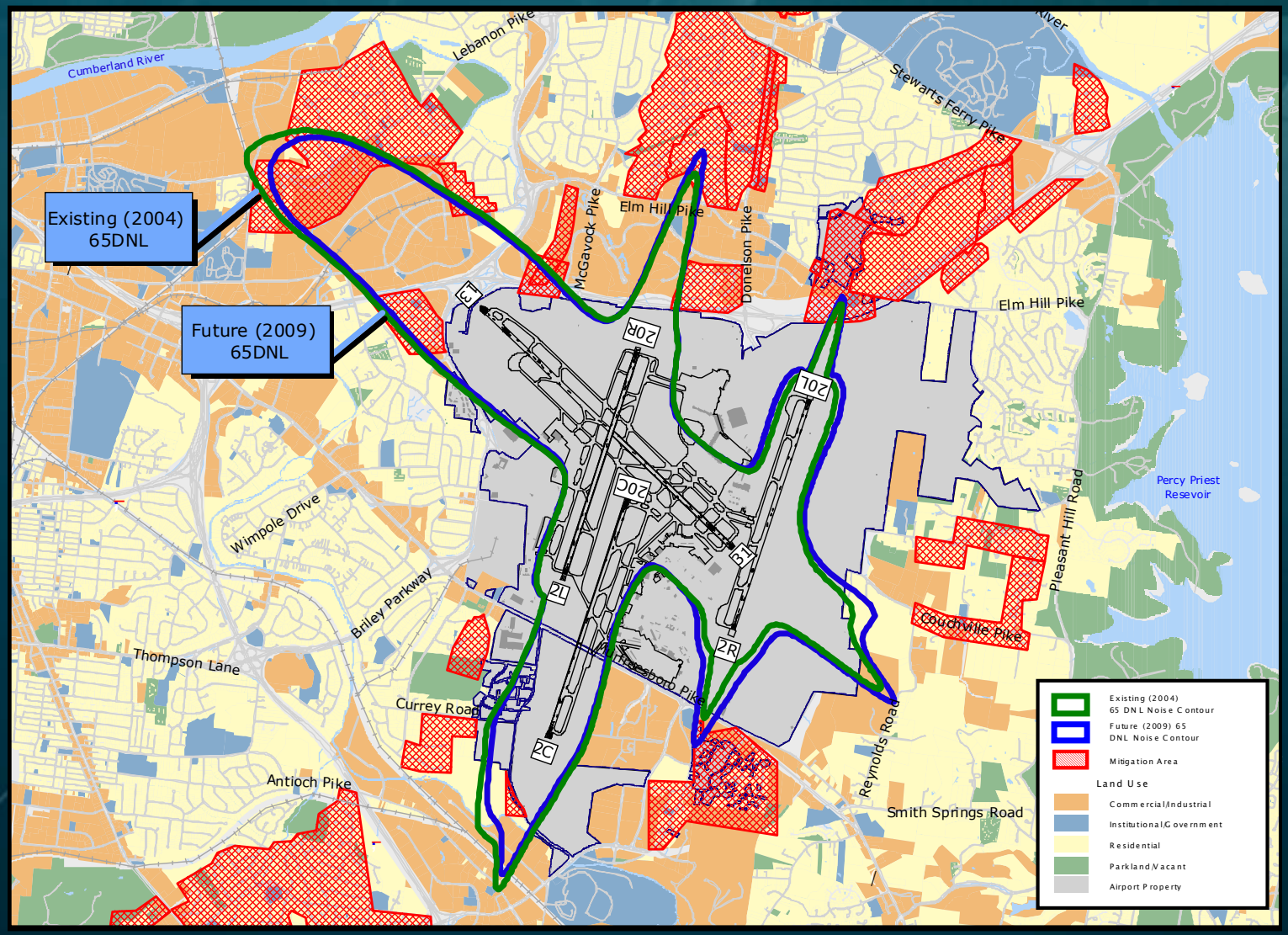
Noise Exposure Map Update

- Depicts aircraft noise exposure in the airport environs.
- Day-night average sound level (DNL) metric employed.
- Noise contours have decreased substantially since 1993.
- The Planning/Engineering Committee received a project briefing on July 14.

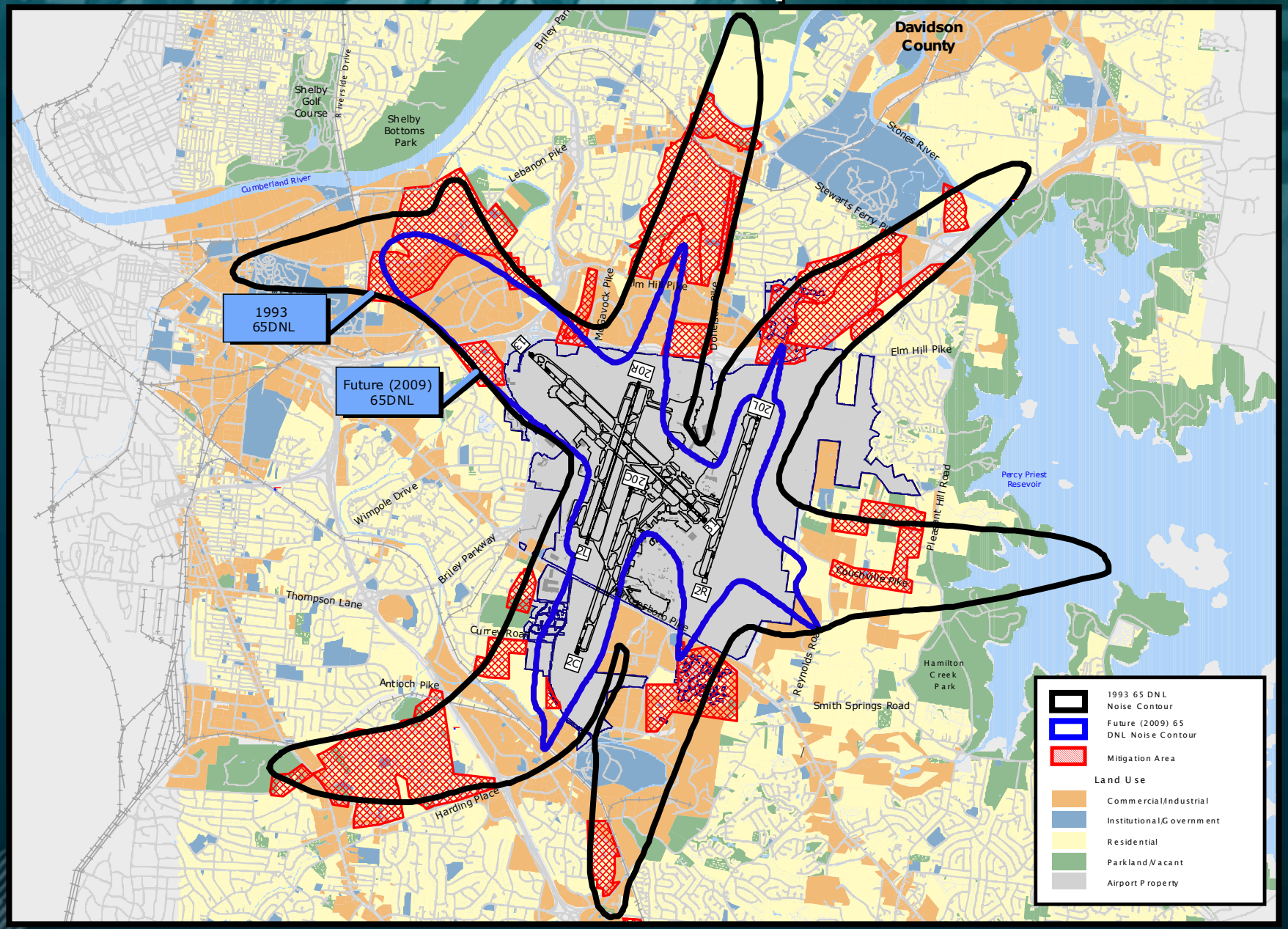
Noise Exposure Map Update (1993 & Draft 2004)



Noise Exposure Map Update (draft 2004 and 2009)



1993 vs. 2009 Noise Exposure Contours



Noise Exposure Map Update

Status:

- Draft Noise Exposure Maps (NEMs) and supporting documentation have been received from the consultant and have been reviewed by MNAA staff.
- A 30-day public comment period will begin in mid-September following completion of preparations to widely distribute the Draft document.
- Public comments will be responded to and incorporated into the final document.
- The NEMs and supporting documentation will be forwarded to the FAA for review and approval.

Notice of Draft Document Availability

PROOF OF PUBLICATION OF PUBLIC NOTICE ADVERTISING

THE TENNESSEAN
1100 Broadway
Nashville, TN 37203
615-259-8861

Advertiser: Metro Nashville Airport

Re: Noise Exposure Map Notice

Customer/Acct. No. 339113 **Cost of Ad: $** 968.27

Ad No: 68615 **Order/Billing No.** 233962
(This number will appear on your invoice)

STATE OF TENNESSEE COUNTY OF DAVIDSON

I, Peggy Byrd, Credit Manager for THE TENNESSEAN daily Newspaper in the aforesaid state and county, hereby certify that the attached advertisement appeared in THE TENNESSEAN on:

Sunday, September 26, 2004

Peggy Byrd
Peggy Byrd

Subscribed and sworn to before me, this 5th day of

October, 2004.

Carol H. Terry
Notary Public

CAROL H. TERRY
NOTARY PUBLIC AT LARGE
DAVIDSON COUNTY, TENN.

My Commission Expires SEPT. 30, 2006

This is not a bill. Please do not pay from this affidavit. Please save this notice for help in reconciling your statement. Thank you.

PUBLIC NOTICE

The Metropolitan Nashville Airport Authority (MNAA) has published the Draft of its Noise Exposure Map Update report.

Copies of the Draft report are available for public review at the following locations:

MNAA website:
http://www.flynashville.com/about/noise.cfm

MNAA Admin. Offices - 4th Floor, Nashville International Airport
One Terminal Drive, Suite 501
Nashville, TN 37214
Telephone:
(615) 275-1600

Nashville Main Public Library
615 Church Street
Nashville, TN 37219

Donelson Branch Library
2315 Lebanon Pike
Nashville, TN 37214

Edmondson Pike Branch Library
5501 Edmondson Pike
Nashville, TN 37211

Hermitage Branch Library
3700 James Kay Lane
Hermitage, TN 37076

Southeast Branch Library
2325 Hickory Highlands Drive
Antioch, TN 37013

Thompson Lane Branch Library
380 Thompson Lane
Nashville, TN 37211

Tennessee Dept. of Transportation
Aeronautics Division
607 Hangar Lane
Nashville, TN 37217

Tennessee State University
Brown-Daniel Libra
3500 John A. Merrit. Blvd.
Nashville, TN 37209

Tennessee State University
Avon Williams Campus Library
330 10th Avenue North
Nashville, TN 37203

Belmont University
Lila D. Bunch Library
1900 Belmont Blvd.
Nashville, TN 37212

Lipscomb University
Beaman Library
3901 Granny White Pike
Nashville, TN 37204

Trevecca Nazarene University
Waggoner Library
333 Murfreesboro Road
Nashville, TN 37210

Written comments regarding the Draft Noise Exposure Map Update may be sent in writing to:

Rob Adams, Senior Associate
Landrum & Brown
11279 Cornell Park Dr.
Cincinnati, OH 45242

E-mail: radams@landrum-brown.com

Comments must be received by Friday, October 29, 2004.

The Draft Noise Exposure Map Update will be available for public review for a period of 30 days following publication of this notice. For more information regarding this study, please contact Lee Cothron, MNAA Planning Specialist, at (615) 275-1446.

Appendix B

APPENDIX B
DOCUMENT LOCATIONS

Copies of the Draft NEM Update were made available to the public at the following locations beginning Monday, September 27, 2004. These locations were:

Metropolitan Nashville Airport Authority website:
An Adobe PDF version of the document is available for review and download at:
http://www.flynashville.com/about/noise.cfm

Metropolitan Nashville Airport Authority
Administrative Offices - 4th Floor
Nashville International Airport
One Terminal Drive, Suite 501
Nashville, Tennessee 37214
Telephone: (615) 275-1600

Nashville Public Library - Main Library
615 Church Street
Nashville, Tennessee 37219

Donelson Branch Library
2315 Lebanon Pike
Nashville, Tennessee 37214

Edmondson Pike Branch Library
5501 Edmondson Pike
Nashville, Tennessee 37211

Hermitage Branch Library
3700 James Kay Lane
Hermitage, Tennessee 37076

Southeast Branch Library
2325 Hickory Highlands Dr.
Antioch, Tennessee 37013

Thompson Lane Branch Library
380 Thompson Lane
Nashville, Tennessee 37211

Tennessee Department of Transportation
Aeronautics Division
607 Hangar Ln.
Nashville, TN 37217

Tennessee State University
Brown-Daniel Library
3500 John A. Merritt Blvd.
Nashville, TN 37209

Tennessee State University
Avon Williams Campus Library
330 10th Ave. North
Nashville, TN 37203

Belmont University
Lila D. Bunch Library
1900 Belmont Blvd.
Nashville, TN 37212-3757

Lipscomb University
Beaman Library
3901 Granny White Pike
Nashville, TN 37204-3951

Trevecca Nazarene University
Waggoner Library
333 Murfreesboro Rd.
Nashville, TN 37210

Comments were collected through Friday, October 29, 2004.

In addition to the locations listed for public review, the Draft document was distributed to the following parties for review and comment.

Donelson-Hermitage Chamber of Commerce

Vanderbilt University Library

Perry Heights Neighborhood Association

Donelson-Hermitage Neighborhood Association

118th Airlift Wing, Civil Engineering Squadron

Metropolitan Nashville Airport Authority Board Members

James H. Cheek, III
Jack O. Bovender, Jr.
Ann V. Butterworth
Rosalyn Carpenter
Bert Mathews
Deborah A. McDermott
Gilbert S. Merritt
Juli H. Mosley
Irby C. Simpkins, Jr.

Metro Planning Commission/ Codes / MDHA

Mr. Rick Bernhardt
Executive Director
Metropolitan Planning Commission

Mr. Lon F. "Sonny" West
Metropolitan Zoning Administrator
Department of Codes Administration

Mr. Phil Ryan
Executive Director
Metropolitan Development & Housing Agency (MDHA)

Metro Nashville/Davidson County Elected Officials / Mayor's Office

The Honorable Vivian Wilhoite
Member of the Metropolitan Council
(District 29)

The Honorable Jason Alexander
Member of the Metropolitan Council
(District 28)

The Honorable Greg Adkins
Member of the Metropolitan Council
(District 26)

The Honorable J.B. Loring
Member of the Metropolitan Council
(District 15)

The Honorable Harold White
Member of the Metropolitan Council
(District 14)

The Honorable Carl Burch
Member of the Metropolitan Council
(District 13)

The Honorable Adam Dread
At-Large Member of the Metropolitan Council

The Honorable David Briley
At-Large Member of the Metropolitan Council

The Honorable Carolyn Baldwin Tucker
At-Large Member of the Metropolitan Council

The Honorable Diane Neighbors
At-Large Member of the Metropolitan Council

The Honorable Buck Dozier
At-Large Member of the Metropolitan Council

Ms. Michelle Cummings, Director
Mayor's Office of Neighborhoods

Mr. Tom Jurkovich, Director
Mayor's Office of Economic & Community Development

The Honorable Howard Gentry, Jr.
Vice Mayor of Metropolitan Nashville & Davidson County

Members of the Tennessee House of Representatives

Rep. Janis Sontany (District 53)
Rep. Sherry Jones (District 59)
Rep. Beth Halteman Harwell (District 56)
Rep. Rob Briley (District 52)
Rep. Ben West, Jr. (District 60)

Members of the Tennessee Senate

Sen. Thelma Harper (District 19)
Sen. Joe Haynes (District 20)
Sen. Douglas Henry (District 21)
Sen. Jim Bryson (District 23)

Major Cargo Carriers Corporate Headquarters

Kitty Hawk Cargo, Inc.
China Airlines, LTD
Airborne Express
BAX Global
Menlo Worldwide

Nashville International Airport Fixed Base Operators

Mercury Air Center
Signature Flight Support

Nashville International Airport Airline Station Managers

Northwest Airlines
American Airlines
American Connection
US Airways
Skywest/United Express/Air Canada
Delta Air Lines
Frontier Airlines
Continental Airlines
Southwest Airlines
Independence Air

Appendix C

APPENDIX C
LAND USE ASSESSMENT METHODOLOGY

Identifying and evaluating land uses within the airport environs is an important step in the Noise Exposure Map update process. This evaluation is necessary to identify residential and other noise-sensitive land uses in the airport environs. The land use assessment includes examining land use classifications and verifying existing land uses. A GIS land use database was developed to facilitate the identification of land uses that are incompatible with airport operations.

C.1 AIRPORT ENVIRONS

The airport environs refers to the regional area that may experience the broader effects from the noise of aircraft overflight as well as social or socioeconomic impacts. All land uses below the noise level measured as 65 DNL are generally considered compatible with airport operations. Consequently, the boundary of the airport environs was formed by assessing both the location of flight tracks and the general area where noise levels would drop below 65 DNL. Areas outside the airport environs were not excluded from this process and were assessed; however, detailed land use assessments were focused on the area within the airport environs.

C.1.1 Land Use Classifications

Existing land use data was collected from previous noise studies prepared for the airport, as well as from the Metropolitan Planning Department. For this study, land use classifications were organized into generalized categories:

- Residential (Single- and Multi-Family)
- Institutional/Government
- Commercial/Industrial
- Noise-Sensitive Facilities (Schools, Churches, Nursing Homes, Hospitals)
- Parkland/Vacant

C.1.2 Land Use Mapping

Data Compilation: Efforts were made to acquire the most up-to-date GIS data from the Metropolitan Planning Department for this study. Where relevant, the data received was used to reflect current conditions. Base map information, including roads, county boundaries, and land use were compiled using ArcView GIS, version 8.1. ArcView is an analytical software tool which allows manipulation and

analysis of data from a variety of different sources. The base map information was supplemented by an AutoCAD drawing of BNA and flight tracks and noise contours generated by the INM, version 6.1.

Roads were obtained from the Metropolitan Planning Department and supplemented by Census TIGER (Topologically Integrated Geographic Coding and Referencing System) files.

The 2000 U.S. Census data, at the block level, was combined with the GIS land use file to calculate the population and housing incompatibilities within the noise contours. For each census block, the ratio of population to housing was determined and that ratio was applied to each dwelling unit. The housing and population incompatibilities for each of the noise contours were determined by merging the noise contour data files with the GIS land use file. The number of residential structures and population within each DNL noise contour level were then determined by an automated count.

Noise-Sensitive Public Facilities: Noise-sensitive public facilities include schools, churches, hospitals, and nursing homes. Noise sensitive public facilities were derived from previous studies. **Table C-1** lists these noise-sensitive public and community facilities that are also identified on **Exhibit C-1**.

C.2 FAA LAND USE PLANNING INITIATIVES

In 1999, the FAA announced a package of land-use planning initiatives designed to reduce problems with aviation noise around airports. Those initiatives are based on responses from local communities, aviation interests, and environmental groups. Of particular concern is the loss of noise reductions through the phase out of Stage 2 aircraft by permitting new noise-sensitive uses in areas where the noise contours are shrinking as a result of the phase out.

The purpose of the initiatives is to enable communities and airports to work together to manage the land use areas to be economically productive and protective of the airports' futures. The five initiatives include communication improvements for conveying FAA noise policies and noise compatibility information to communities near airports and state aviation organizations.

The FAA also issued a notice of final policy on Part 150 approval of noise mitigation measures and the effect on the use of Federal grants for noise mitigation projects. The final policy provides new limitations on the use Airport Improvement Program (AIP) funds for remedial noise mitigation projects.

Both the land use initiatives and the noise mitigation funding policy are discussed in Appendix D, *FAA Policies, Guidance, and Regulations*.

Table C-1
NOISE-SENSITIVE COMMUNITY FACILITIES
Nashville International Airport

MAP CODE	NAME
	Schools
S1	Allen Elementary
S2	Crieve Hall Kindergarten
S3	Foster Avenue School
S4	Glenn Middle
S5	Glenview Elementary
S6	Haywood Elementary
S7	Hermitage Elementary
S8	Hickman Elementary
S9	Hickman-Stanford Elementary
S10	Antioch High
S11	Apollo Middle
S12	Bailey Special Education
S13	Brinkley Elementary
S14	Caldwell Preschool
S15	Cameron Middle School
S16	Cloverbottom School for the Mentally Retarded
S17	Cole Elementary
S18	Cotton Elementary
S19	Crieve Hall Elementary
S20	Dalewood Elementary
S21	Davidson Technical College
S22	Dodson Elementary
S23	Donelson Christian Academy
S24	Draughons Junior College
S25	Dupont Middle School
S26	East Middle
S27	East Nashville Christian School (pr
S28	East Nashville Christian School (pr
S29	Ezell Harding Christian
S30	Franklin Road Academy
S31	Glencliff Elementary
S32	Glencliff High
S33	Glengarry Elementary

Table C-1 *(Continued)*
NOISE-SENSITIVE COMMUNITY FACILITIES
Nashville International Airport

MAP CODE	NAME
	Churches
C 1	Calvary Freewill Baptist
C 2	Heart Baptist
C 3	Hermitage Church of God
C 4	Hickory Bend United Methodist
C 5	Holy Comforter Anglican
C 6	Holy Rosary Catholic
C 7	Campbell Road Church of Christ
C 8	Holy Trinity Missionary
C 9	Iglesia Baptista Libre
C 10	Jehovah's Witness Woodbine
C 11	Jehovah's Witness Antioch
C 12	Jesus Only Tabernacle
C 13	Lake Providence Baptist
C 14	Cane Tabernacle
C 15	Lakewood Baptist Church
C 16	Liberty Baptist
C 17	Lord's Chapel
C 18	Lyle Lane Baptist
C 19	Memorial Lutheran
C 20	Mill Creek Baptist
C 21	Mt Hopewell Baptist Church
C 22	Central Pike Church of Christ
C 23	Nashville Christian
C 24	New Victory Primitive Baptist
C 25	Nolensville Road Baptist
C 26	Chapel Avenue Church of Christ
C 27	Paragon Mills Church of God
C 28	Patterson Memorial United
C 29	Perry Heights Church of Christ
C 30	Pleasant Hill Church of Christ
C 31	Priest Lake Christian
C 32	Priest Lake Community Baptist
C 33	Priest Lake Presbyterian
C 34	Radnor Baptist
C 35	Radnor Church of Christ
C 36	Riverside Drive
C 37	Christ Lutheran
C 38	Saturn Drive Baptist Church
C 39	Shelby Avenue Church of Christ

Table C-1 *(Continued)*
NOISE-SENSITIVE COMMUNITY FACILITIES
Nashville International Airport

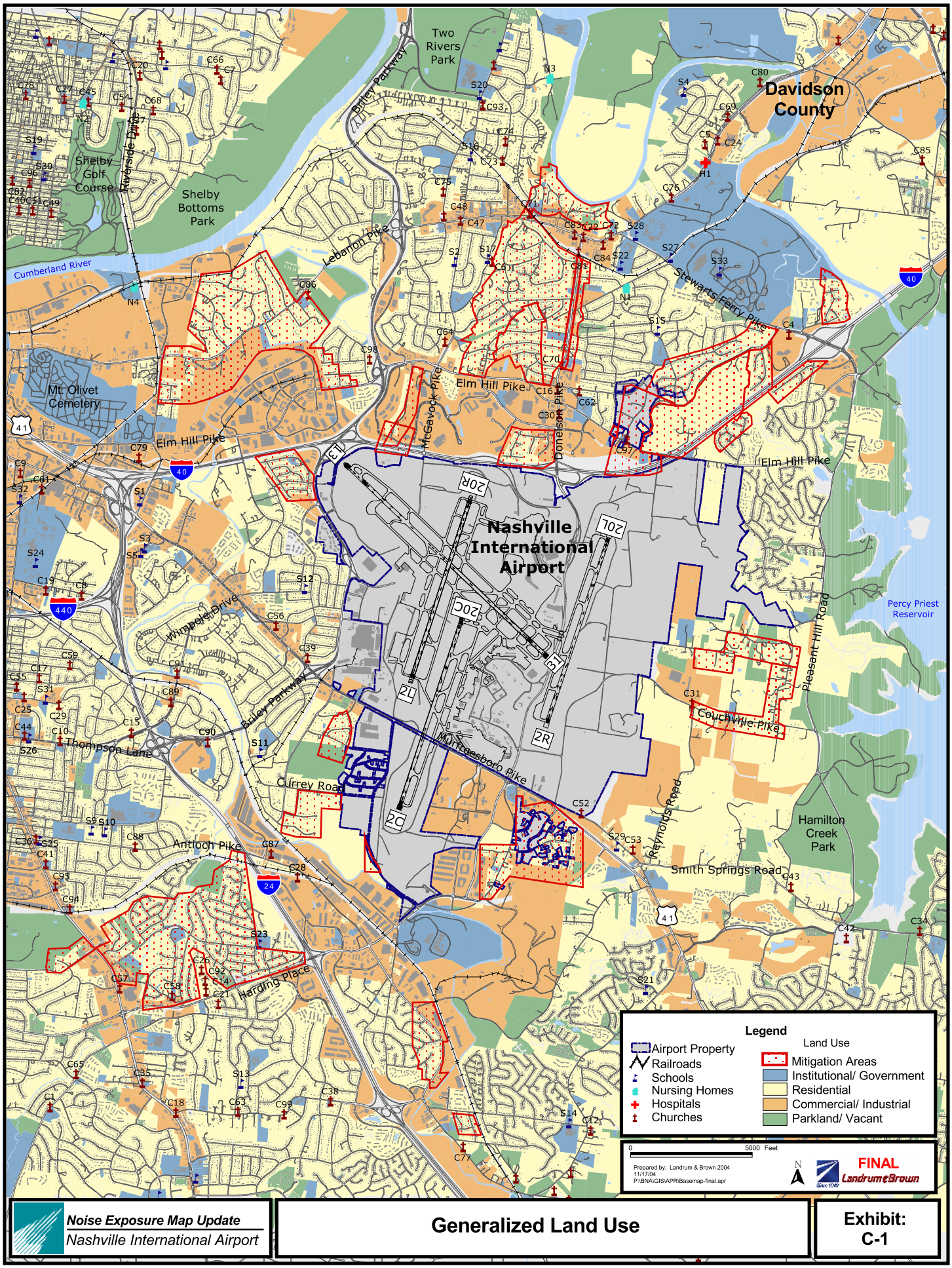
MAP CODE	NAME
C 40	Church in Nashville
C 41	Smith Springs Baptist Church
C 42	Smiths Springs Church of Christ
C 43	St Edward Church
C 44	Church of Christ for the Aged
C 45	St Matthas Episcopal
C 46	St. John's Lutheran Church
C 47	St. Philip's Episcopal Church
C 48	Tabernacle of Faith
C 49	Agape Restoration Assembly
C 50	Church of God in Christ TN
C 51	Trinity First Church of God
C 52	Una Church of Christ
C 53	Valley View Baptist
C 54	Vine Glenn Baptist
C 55	Vultee Blvd Trinity Church of the Nazarene
C 56	Church of God in Christ
C 57	Welch Road Christian
C 58	Whitley Memorial
C 59	Woodbine Baptist
C 60	Woodbine Church of Christ
C 61	Church of God-Donelson
C 62	Church of Jesus Christ
C 63	Church Triumphant
C 64	Community Bible Church
C 65	Aldersgate United Methodist
C 66	Cross of Life of Lutheran
C 67	Dalebrook Lane Church of Christ
C 68	Donelson Christian School
C 69	Donelson Church
C 70	Donelson Church of Christ
C 71	Donelson Cumberland
C 72	Donelson Fellowship
C 73	Donelson Freewill Baptist
C 74	Donelson Heights United Methodist
C 75	Donelson Presbyterian
C 76	Antioch Church of Christ
C 77	Eastwood Christian Church
C 78	Ebenezer AME
C 79	Emanuel Church of Christ

Table C-1 *(Continued)*
NOISE-SENSITIVE COMMUNITY FACILITIES
Nashville International Airport

MAP CODE	NAME
C 80	Blessed Savior Prayer CMNTY
C 81	Fatherland Street Church
C 82	First Baptist Church-Donelson
C 83	First Baptist Church
C 84	First Baptist Church
C 85	Foster Chapel Missionary
C 86	Full Gospel Mission
C 87	Glencliff
C 88	Glencliff Tabernacle
C 89	Glencliff United Methodist
C 90	Glenwood Baptist
C 91	Grace Presbyterian
C 92	Calvary Assembly of God Church
C 93	Grandview Baptist
C 94	Grandview Church of Christ
C 95	Greater Life Ministries
C 96	Harper Road Freewill Baptist
C 97	Harsh Chapel Baptist Church
C 98	Haywood Hills Baptist
C 99	Souls Harbor Assembly of God
Hospitals	
H 1	Donelson Hospital
Nursing Home	
N 1	Donelson Health Care Center
N 2	Eastland Health Care Center
N 3	Lakeshore Retirement & Nursing Home
N 4	Sycamores Terrace Retirement Community

Note: Map Code corresponds to Exhibits NEM-1, NEM-2, and C-1 *Generalized Existing Land Use*.

Source: Landrum & Brown, 2004



Noise Exposure Map Update
Nashville International Airport

Generalized Land Use

Exhibit: C-1

Appendix D

APPENDIX D
FAA POLICIES, GUIDANCE, AND REGULATIONS

D.1 NOISE CONTROL POLICIES AND GUIDANCE

The FAA has promulgated a series of regulations based on directions from Congress as provided in a series of authorizing statutes. Four separate Federal Aviation Regulations (FAR) have been developed to specifically address permissible aircraft noise levels, operating procedures, and studies of aircraft noise levels. These regulations apply to activity within the U.S. Additionally, the International Civil Aviation Organization (ICAO) has developed and accepted similar regulations, which control the noise levels generated by aircraft operating in international airspace.

D.1.1 Federal Aviation Regulations (FAR) Part 36

Part 36 of the FAR sets forth noise levels that are permitted for aircraft of various weights, engine number, and date of certification. Originally released in 1974 as a result of Congress' modification of the Federal Aviation Act of 1958 through the Noise Control Act of 1972, aircraft were divided into three classes, based on the amount of noise they produced at three specific noise measurement locations during certification testing. These classes (or stages) were:

Stage 1 – the oldest and loudest aircraft, typically of the first generation of jets, designed before 1974, and having measured noise levels that exceed the standards set for the other classes of aircraft. This group included many of the first generation of jet aircraft used in passenger and cargo service, including the B-707, and early B727, B737, and DC-8 aircraft. Under FAR Part 91, all such aircraft weighing more than 75,000 pounds were removed from the U.S. operating fleet by 1985, unless modified to meet Stage 2 noise standards. In 2001, less than 100 Stage 1 aircraft remained active in the domestic fleet; all are business jet aircraft weighing less than 75,000 pounds.

Stage 2 – aircraft that were type certified before November 15, 1975 that met noise levels defined by the FAA at takeoff, sideline and approach measurement locations. The permissible amount of noise increased with the weight of the aircraft above 75,000 pounds and the number of engines. This category included many of the second-generation jet aircraft such as the B-727, B-737-200, and DC-9 that were extensively used in passenger and cargo service. Under FAR Part 91, all such aircraft weighing more than 75,000 pounds were removed from the U.S. operating fleet by 2000, unless modified to meet Stage 3 noise standards. In 2004, many Stage 2 business jet aircraft weighing less than 75,000 pounds remain operational.

Stage 3 – aircraft that meet the most stringent noise level requirements at takeoff, sideline, and approach measurement locations for their weight and engine number. This category includes the great majority of active business jet aircraft and all aircraft in passenger and cargo service that weigh more than 75,000 pounds. Although discussions have taken place on establishing more restrictive noise levels, no action has yet been taken to establish a phase out schedule for Stage 3 aircraft.

Stage 4 – aircraft that meet a composite noise level several dB less than the levels established for Stage 3 aircraft. Although a Stage 4 category is the subject of considerable discussion on the world stage and is a point of negotiation between the U.S. and the European Union, Stage 4 rules and noise levels have not been formalized. In 2001, the U.S. participated in negotiations through the Committee on Aviation Environmental Protection (CAEP), an ICAO subcommittee, recommending that the composite reduction of noise should be 10 dB below Stage 3 standards.

D.1.2 FAR Part 91

Part 91 of the FAR, as applied to noise, established schedules for phasing louder equipment out of the operating fleet of aircraft weighing more than 75,000 pounds. The schedules called for all Stage 1 aircraft over 75,000 pounds to be removed from the fleet by 1982, with the exception of two-engine aircraft in small city service, which were allowed to continue in service until 1985. The schedule for the retirement of Stage 2 aircraft called for the removal of all such aircraft by the end of 1999, with interim retirement dates of 1994, 1996, and 1998 for the removal of portions of the Stage 2 fleet.

No retirement schedules have been imposed for aircraft weighing less than 75,000 pounds.

D.1.3 FAR Part 150

Part 150 of the FAR sets forth the standards under which a Part 150 Noise Compatibility Study is conducted. The background and requirements for such studies are presented earlier in this chapter. Notably, the preparation of a Noise Compatibility Plan under FAR Part 150 is a voluntary action by an airport proprietor. The process of preparing the plan is intended to open/enhance lines of communication between the airport, its neighbors, and users. It is the only mechanism to provide for the mitigation of aircraft noise impacts on noise-sensitive surrounding areas that is not directly tied to airfield development or airspace utilization conducted subject to the rules for preparation of an Environmental Impact Statement or Environmental Assessment.

Through Fiscal Year 2003, airports receiving Federal AIP grant monies as a result of approved Part 150 NCPs completed since 1982 have received grants totaling more than $3.5 billion for the implementation of Part 150 NCP recommendations. Additionally, another $2.7 billion has been committed to noise mitigation actions funded by Passenger Facility Charges authorized for collection for as many as 49 years into the future at different airports.[1].

D.1.4 FAR Part 161

Part 161 of the FAR was published in 1991, subsequent to passage of the Airport Noise and Capacity Act of 1990 (ANCA). That act established the requirement and schedule for the phase out of Stage 2 aircraft over 75,000 pounds. In return for that action, Congress severely restricted the ability of local communities to impose actions that would restrict aircraft access to any airport. Different levels of requirements were established for voluntary restrictions, restrictions on Stage 2 aircraft and restrictions on Stage 3 aircraft. These requirements are applicable to all aircraft except propeller-driven aircraft weighing less than 12,500 pounds, supersonic aircraft, and Stage 1 aircraft.

Restrictive Agreements

Subpart B sets notification requirements for the implementation of Stage 3 restrictions through agreements between airport operators and all affected airport users. (Presumably, this same procedure would be followed for implementing agreements for Stage 2 restrictions.) Before going into effect, notice of these proposed agreements must be published in local newspapers of area wide circulation, posted prominently at the airport, and sent directly to all regular airport users, the FAA, Federal, state and local agencies with land use control authority, community groups and business organizations, and any aircraft operators that are known to be interested in providing service to the airport (new entrants). After this notification period, the agreement can be implemented if all current users and any new entrants proposing to serve the airport within 180 days sign on to the proposed restriction.

Stage 2 Restrictions

Subpart C sets forth the requirements for establishing restrictions on Stage 2 aircraft operations. It requires a study of the proposed restriction that must include:

- an analysis of the costs and benefits of the proposed restriction;
- a description of the alternative restrictions;

[1] Through Fiscal Year 2003

- a description of non-restrictive alternatives that were considered and a comparison of the costs and benefits of those alternatives to the costs and benefits of the proposed restriction.

It further requires that the study use the noise methodology and land use compatibility criteria established in FAR Part 150.[2] The study must also use currently accepted economic methodology. Where restrictions on Stage 2 aircraft weighing less than 75,000 pounds are involved, the study must include separate detail on how the restriction would apply to aircraft in this class.

After completing the study, the airport operator must publish a notice of the proposed restriction and an opportunity for public comment in a newspaper of general circulation in the area, post a notice prominently in the airport, and notify the FAA, local governments, all airport tenants whose operations might be affected by the proposed restrictions, and community groups and business organizations.[3] The FAA must publish an announcement of the proposed restriction in the *Federal Register*.[4]

The required study and public notice must be completed at least 180 days before the airport operator implements the proposed restriction.[5] There is no specific provision in ANCA or Part 161 for FAA action on the airport's proposed Stage 2 restriction. In practice, the FAA has reviewed Stage 2 Part 161 Studies for completeness. No specific deadlines for this review process are set in Part 161.

Stage 3 Restrictions

Subpart D establishes the requirements that an airport operator must follow in order to implement a noise or access restriction on Stage 3 aircraft. The required analysis must include the same elements required for a proposed restriction on Stage 2 aircraft. In addition, the required Part 161 Study must demonstrate "by substantial evidence that the statutory conditions are met." These six conditions, specified in ANCA are:

- **Condition 1:** The proposed restriction is reasonable, non-arbitrary, and non-discriminatory.
- **Condition 2:** The proposed restriction does not create an undue burden on interstate or foreign commerce.
- **Condition 3:** The proposed restriction maintains safe and efficient use of the navigable airspace.
- **Condition 4:** The proposed restriction does not conflict with any existing Federal statute or regulation.

[2] 14 CFR Part 161, Secs. 161.9, 161.11, and 161.205(b).
[3] 14 CFR Part 161, Sec. 161.203(b).
[4] 14 CFR Part 161, Sec. 161.203(e).
[5] 14 CFR Part 161, Sec. 161.203(a).

- **Condition 5:** The applicant has provided adequate opportunity for public comment on the proposed restriction.
- **Condition 6:** The proposed restriction does not create an undue burden on the national aviation system.[6]

The applicant must also prepare an environmental assessment or documentation supporting a categorical exclusion.[7]

After submission by an airport operator of a complete Part 161 application package, the FAA has 30 days to review it for completeness. Notice of the proposed restriction must be published by the FAA in the *Federal Register*. After reviewing the application and public comments, the FAA must issue a decision approving or disapproving the proposed restriction within 180 days after receipt of the complete application. This decision is a final decision of the FAA Administrator for purposes of judicial review.[8]

Consequences of Failing to Comply with Part 161

Subpart F describes the consequences of an airport operator's failure to comply with Part 161. The sanction provided for in Subpart F is the termination of the airport's eligibility to receive airport grant funds and to collect passenger facility charges.[9] Most of Subpart F describes the process for notifying airport operators of apparent violations, dispute resolution, and implementation of the required sanctions.

D.1.5 ICAO Rules

The Convention on International Civil Aviation (also known as the *Chicago Convention*), was signed on December 7, 1944 by 52 states. Pending ratification of the Convention by 26 states, the Provisional International Civil Aviation Organization (PICAO) was established. It functioned from June 6, 1945 until April 4, 1947. By March 5, 1947 the 26th ratification was received. ICAO came into being on April 4, 1947. In October of the same year, ICAO became a specialized agency of the United Nations. ICAO is now 185 nations strong.

During 2000 and 2001, ICAO's Committee on Aviation Environmental Protection (CAEP) has evaluated the introduction of a new noise standard. In September 2001, the ICAO Council met and agreed to the following:

- Established a new Stage 4 standard that is 10 dB quieter than Stage 3 for aircraft newly-certified after 2006.

6 14 CFR Part 161, Sec. 161.305(e).
7 14 CRF Part 161, Sec. 161.305(c).
8 14 CFR Part 161, Sec. 161.313(b)(2).
9 14 CFR Part 161, Sec. 161.501.

- If a member state decides to permit noise restrictions on any Stage 3 aircraft, the ICAO Assembly recommends that such restriction:
  - Be based on the noise performance of the aircraft (the EU has imposed a restriction based on engine by-pass ratio);
  - Be tailored to the noise problem of the airport concerned in accordance with the balanced approach;
  - Be partial in nature, whenever possible, rather than the complete withdrawal of operations at an airport;
  - Take into account possible consequences for air transport services for which there are no suitable alternatives, such as long-haul service;
  - Consider the special circumstances of operators from developing countries in order to avoid undue economic hardship on them and by granting them exemptions;
  - Introduce such restrictions gradually over time, where possible, in order to take into account the economic impact on affected operators;
  - Give operators a reasonable period of advance notice;
  - Take into account the economic and environmental impact on civil aviation in terms of recent events; and
  - Inform ICAO and other states of all such restrictions imposed

The balanced approach to noise management endorsed by the ICAO Assembly consists of "identifying the noise problem at an airport and then analyzing the various measures available to reduce noise through the exploration of four principal elements with the goal of addressing the noise problem in the most cost-effective manner." The four principal elements of the balanced approach are:

- Reduction of noise at the source
- Land-use planning and management
- Noise abatement operational procedures
- Operating restrictions

D.2 NOISE RESEARCH AND DEVELOPMENT ACTIVITY

The National Aeronautics and Space Administration (NASA) has been charged with providing pre-competitive research endeavors in long-term, high-risk, high-payoff technologies and to "provide revolutionary advancements that protect U.S. leadership for future generations. The impact of NASA's research on our

national transportation system, our national security, the environment, and our economy demonstrates a clear government role in support of the public good."[10]

To that end, NASA has conducted the Advanced Subsonic Transport (AST) program, which has now transformed into the Quiet Aircraft Technology (QAT) program. To help conduct research, NASA has created the Technical Working Group made up of NASA and FAA experts, industry leaders, and academia.

The goal of the QAT Program is to develop technology that, when implemented, reduces the impact of aircraft noise to benefit airport neighbors, the aviation industry, and travelers. NASA's goals for the QAT program include a balanced approach to noise reduction through determining "Community Noise Impact," "Airframe System Noise Reduction," and "Engine System Noise Reduction."

Noise Reduction Goal: Reduce the perceived noise levels of future aircraft by a factor of two (10 dB) from today's subsonic aircraft within 10 years, and by a factor of four (20 dB) within 25 years relative to 1997 "best in fleet" (757, 777 aircraft).

D.3 LAND USE POLICIES AND GOVERNANCE

This section discusses the role of land use controls, who is responsible for implementing those controls, and the FAA mitigation policy.

D.3.1 The Role of Land Use Controls in Part 150 Plans

The Federal Aviation Regulation (FAR) Part 150 Program was established under the Aviation Safety and Noise Abatement Act of 1979 and allows airport operators to voluntarily submit noise exposure maps and noise compatibility programs to the FAA for review and approval. An NCP sets forth the measures that an airport operator "has taken" or "has proposed" for the reduction of existing incompatible land uses and the prevention of additional incompatible land uses within the area covered by noise exposure maps. Typically, recommended noise abatement measures fall into three categories:

1. **Operational** measures – these measures are applied at the airfield or to aircraft operations and include changes in runway use or changes in flight-track location.
2. **Preventive** measures – land use control measures to prevent new noise-sensitive land uses from occurring in the existing and future airport noise contours; such measures include compatible land use zoning or noise overlay zoning within off-airport noise exposure areas.

[10] Excerpt from NASA's Aeronautics & Space Transportation Technology : Three Pillars for Success, "Message from the Administrator", Daniel S. Goldin, March 1997

3. **Corrective (Remedial)** measures – mitigation measures applied to existing incompatible land uses; such measures include acquisition or sound insulation of noise-sensitive property. (Noise-sensitive property is defined as houses, schools, churches, nursing homes, hospitals, and libraries.)

The FAA adopted land use compatibility guidelines relating types of land use to airport sound levels when it promulgated FAR Part 150 in 1985. These guidelines, reproduced as **Table D-1**, *Land Use Compatibility Guidelines – FAR Part 150*, show the compatibility parameters for residential, public (schools, churches, nursing homes, hospitals, libraries), commercial, manufacturing and production, and recreational land uses.

The Part 150 guidelines are the basis for defining areas potentially eligible for Federal funding through the Airport Improvement Program. The *Airport Improvement Handbook* states, "Noise compatibility projects usually must be located in areas where noise measured in day-night average sound level (DNL) is 65 (dB) or greater."[11] Federal funding is available at noise levels below 65 DNL if the airport operator (Sponsor) determines that incompatible land uses exist below 65 DNL and the FAA concurs with the Sponsor's determination.

As shown in Table D-1, all land uses within areas below 65 DNL are considered to be compatible with airport operations. Residential land uses are generally incompatible with noise levels above 65 DNL. In some areas, residential land use may be permitted in the 65-70 DNL with appropriate sound insulation measures implemented. This is done at the discretion of local communities. Schools and other public use facilities located between 65 and 75 DNL are generally incompatible without sound insulation. Above 75 DNL, schools, hospitals, nursing homes, and churches are considered incompatible land uses. The information presented in Table D-1 is meant to act as a guideline. According to FAR Part 150, "Adjustments or modifications of the descriptions of the land-use categories may be desirable after consideration of specific local conditions."[12]

Therefore, specific land use controls are implemented at the discretion of local governments. An airport Sponsor typically does not have the authority to implement local land use controls.

Land use management measures used for Part 150 purposes include both preventive and corrective techniques. Preventive land use management techniques seek to prevent the introduction of additional noise-sensitive land uses within existing and future airport noise contours. Preventive measures include two categories – regulatory and policy:

[11] FAA Order 5100.38A, Chapter 7, paragraph 710.b.
[12] FAR Part 150, Part B *Noise Exposure Map Development*, Section A150.101 *Noise contours and land usages*, paragraph (c).

Table D-1
LAND USE COMPATIBILITY GUIDELINES - FAR PART 150

	YEARLY DAY-NIGHT AVERAGE SOUND LEVEL (DNL) IN DECIBELS					
LAND USE	**BELOW 65**	**65-70**	**70-75**	**75-80**	**80-85**	**OVER 85**
RESIDENTIAL						
Residential, other than mobile homes and transient lodgings	Y	N[1]	N[1]	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N[1]	N[1]	N[1]	N	N
PUBLIC USE						
Schools, hospitals, 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]	N[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	Y[5]	N[5]	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

Table D-1 (Continued)
LAND USE COMPATIBILITY GUIDELINES - FAR PART 150

The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable 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.

Key To Table D-1

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, 35 Land use and related structures generally compatible; measures to achieve a NLR of 25, 30, or 35 decibels must be incorporated into design and construction of structure.

Notes for Table D-1

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 decibels and 30 decibels 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 decibels 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 decibels 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 decibels 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 decibels 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 a NLR of 25 dB.
7. Residential buildings require a NLR of 30 dB.
8. Residential buildings not permitted.

Source: FAR Part 150 Airport Noise Compatibility Planning, Appendix X, Table X.

Regulatory

- Compatible Use Zoning: commercial, industrial, or farmland zoning
- Zoning Changes, Residential Density: large-lot zoning, planned development, multi-family zoning
- Noise Overlay Zoning: special regulations within high-noise areas
- Transfer of Development Rights: zoning framework to authorize private sale of development rights to encourage sparse development in high-noise areas
- Environmental Zoning: environmental protection zoning to support airport land use compatibility
- Subdivision Regulation Changes: require dedication of noise and avigation easements, plat notes
- Building Code Changes: require soundproofing in new construction
- Dedicated Noise and Avigation Easements: require for development permits
- Fair Disclosure Regulations: require seller to notify buyer of aircraft noise

Policy

- Comprehensive Planning: policies supporting land use compatibility. Can involve specific land use plans and policies to guide rezoning, variances, conditional uses, public projects
- Capital Improvement Programming: public investments which support airport land use compatibility

Corrective land use management techniques seek to remedy existing and projected future unavoidable noise impacts in existing areas of incompatible land use. Corrective land use management techniques can also be classified in one of two general categories: modify use and maintain use. Corrective measures include:

Modify Existing Use

- Guaranteed Purchase (Fee Simple): outright purchase of property with the intent of removing incompatible use by demolition of structure
- Development Rights Purchase: purchase of rights to develop property
- Land Banking: acquisition of vacant land for long-term airport facility needs
- Redevelopment: acquisition and redevelopment of property

Maintain Existing Use

- Purchase Assurance: airport Sponsor acts as buyer of last resort, sound insulates house, sells property, retains easement
- Sales Assistance: airport Sponsor sound insulates house, guarantees that the property owner will receive the appraised value, or some increment thereof, regardless of final sales value that is negotiated with a buyer, retains easement
- Sound Attenuation: sound insulation of homes, noise-sensitive public facilities, retains easement
- Noise and Avigation Easement Purchase: purchase of easement only

D.3.2 FAA Final Policy On Part 150 Noise Mitigation Measures

The FAA issued a final policy to establish a distinction between remedial and preventive noise mitigation measures proposed by airport operators and submitted for approval by the FAA under noise compatibility planning regulations. In the notice of final policy[13] effective October 1, 1998, the FAA stated the following:

As of October 1, 1998, the FAA will approve under 14 CFR Part 150 only remedial noise mitigation measures for existing incompatible development and only preventive noise mitigation measures in areas of potential new incompatible development.

The FAA will not approve remedial noise mitigation measures for new incompatible development that occurs in the vicinity of airports.

- The use of AIP funds will be affected to the extent that such use depends on approval under Part 150.

The Airport Noise Compatibility Planning Program (14 CFR Part 150) was established under the Aviation Safety and Noise Abatement Act of 1979 (49 U.S.C. 47501 through 47509, hereinafter referred to as ASNA). The Part 150 program allows airport operators to submit noise exposure maps and noise compatibility programs to the FAA voluntarily. According to the ASNA, an NCP sets forth the measures that an airport operator has taken or has proposed for the reduction of existing incompatible land uses and the prevention of additional incompatible land uses within the area covered by NEMs.

The ASNA embodies strong concepts of local initiative and flexibility. The submission of NEMs and NCPs is left to the discretion of local airport operators. Airport operators also may choose to submit NEMs without preparing and submitting an NCP. The types of measures that airport operators may include in an

[13] FAA Notice of Final Policy, October 1, 1998.

NCP are not limited by the ASNA, allowing airport operators substantial latitude to submit a broad array of measures--including innovative measures--that respond to local needs and circumstances.

The criteria for approval or disapproval of measures submitted in a Part 150 program are set forth in the ASNA. The ASNA directs the Federal approval of an NCP, except for measures relating to flight procedures: (1) if the program measures do not create an undue burden on interstate or foreign commerce; (2) if the program measures are reasonably consistent with the goal of reducing existing incompatible land uses and preventing the introduction of additional incompatible land uses; and (3) if the program provides for its revision if necessitated by the submission of a revised NEM. Failure to approve or disapprove an NCP within 180 days, except for measures relating to flight procedures, is deemed to be an approval under the ASNA. Finally, the ASNA sets forth criteria under which grants may be made to carry out noise compatibility projects, consistent with ASNA's overall deference to local initiative and flexibility.

The FAA is authorized, but not obligated, to fund projects via the Airport Improvement Program (AIP) to carry out measures in an NCP that are not disapproved by the FAA. Such projects also may be funded with local Passenger Facility Charges (PFC) revenue upon the FAA's approval of an application filed by a public agency that owns or operates a commercial service airport, although the use of PFC revenue for such projects does not require an approved NCP under Part 150.

In establishing the airport noise compatibility planning program, which became embodied in FAR Part 150, the ASNA did not change the legal authority of state and local governments to control the uses of land within their jurisdictions. Public controls on the use of land are commonly exercised by zoning. Zoning is a power reserved to the states under the U. S. Constitution. It is an exercise of the police powers of the states that designates the uses permitted on each parcel of land. This power is usually delegated in state enabling legislation to local levels of government.

Many local land use control authorities (cities, counties, etc.) have not adopted zoning ordinances or other controls to prevent incompatible development (primarily residential) within the noise impact areas of airports. An airport noise impact area, identified within noise contours on a NEM, may extend over a number of different local jurisdictions that individually control land uses.

While airport operators have included measures in NCPs submitted under Part 150 to prevent the development of new incompatible land uses through zoning and other controls under the authorities of appropriate local jurisdictions, success in implementing these measures has been mixed.

One or more of the factors hindering effective land use controls may be of sufficient importance to preclude some jurisdictions from following through on the land use recommendations of an airport's Part 150 NCP. When either an airport sponsor's or

a non-airport sponsor's jurisdiction allows additional incompatible development within the airport noise impact area, it can result in noise problems for the people who move into the area. This can, in turn, result in noise problems for the airport operator in the form of inverse condemnation or noise nuisance lawsuits, public opposition to proposals by the airport operator to expand the airport's capacity, and local political pressure for airport operational and capacity limitations to reduce noise. Some airport operators have taken the position that they will not provide any financial assistance to mitigate aviation noise for new incompatible development. Other airport operators have determined that it is a practical necessity for them to include at least some new residential areas within their noise assistance programs to mitigate noise impacts that they were unable to prevent in the first place. Over a relatively short period of time, the distinctions blur between what is "new" and what is "existing" residential development with respect to airport noise issues.

Airport operators currently may include new incompatible land uses, as well as existing incompatible land uses, within their Part 150 NCPs and recommend that remedial noise mitigation measures--usually either property acquisition or noise insulation--be applied to both situations. These measures have been considered to qualify for approval by the FAA under 49 USC 47504 and 14 CFR Part 150. The Part 150 approval enables noise mitigation measures to be considered for Federal funding under the AIP, although it does not guarantee that Federal funds will be provided.

Final Policy

Therefore, as of October 1, 1998, the FAA will approve remedial noise mitigation measures under Part 150 only for incompatible development, which exists as of that date. Incompatible development that potentially may occur on or after October 1, 1998, may only be addressed in Part 150 programs with preventive noise mitigation measures. This policy will affect the use of AIP funds to the extent that such funding is dependent on approval under Part 150. Approval of remedial noise mitigation measures for bypassed lots or additions to existing structures within noise impacted neighborhoods, additions to existing noise impacted schools or other community facilities required by demographic changes within their service areas, and formerly noise compatible uses that have been rendered incompatible as a result of airport expansion or changes in airport operations, and other reasonable exceptions to this policy on similar grounds must be justified by airport operators in submittals to the FAA and will be considered by the FAA on a case-by-case basis. This policy does not affect AIP funding for noise mitigation projects that do not require Part 150 approval, that can be funded with PFC revenue, or that are included in FAA-approved environmental documents for airport development.

Appendix E

APPENDIX E
AIRCRAFT NOISE: HOW WE MEASURE IT AND ASSESS ITS IMPACT

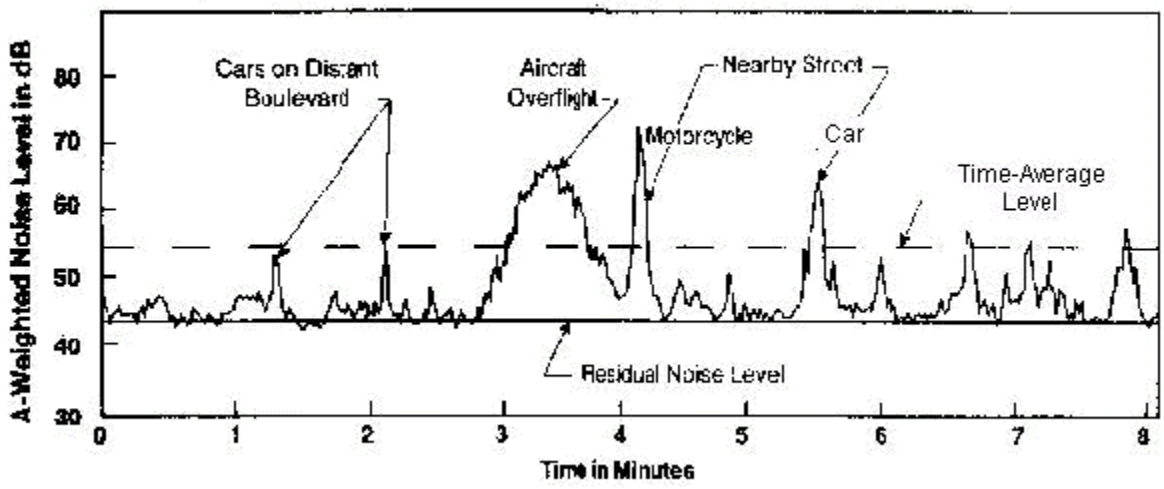
The FAA has produced the following summary document that explains the definition of noise, the metrics used to measure noise, and the rationale for using DNL as the standard metric.

NOISE - UNWANTED SOUND

Noise is usually regarded as unwanted sound - sound that disturbs our routine activities or peace and quiet, and perhaps causes a feeling of annoyance. Which sounds are NOISE is obvious to each listener, and he or she has no need to measure it. It's there, and it's bothersome.

But those who work to abate noise, to minimize its effects, or to develop quieter vehicles, need to measure noise. And that is not an easy task. Consider sounds typical of a suburban neighborhood on a "quiet" afternoon. If a short time history of those sounds is plotted on a graph, it would look very much like Figure 1.

Figure 1



The sound levels are plotted in units of A-weighted decibels (abbreviated dB, or sometimes dBA), a logarithmic measure of the magnitude of a sound as the average person hears it. The "A-weighting" accounts for the fact that humans do not hear low frequencies and high frequencies as well as they hear middle frequencies, and it corrects for the relative efficiency of the human ear at the different frequencies. A logarithmic measure is used in order to cover efficiently the wide range of sound magnitudes encountered daily.

In this example, the background, or residual sound level in the absence of any identifiable noise sources, is about 45 dB. During roughly three-quarters of the time, the sound level is 50 dB or less. The highest sound level, caused by a nearby motorcycle, is 73 dB, while an aircraft generates a maximum sound level of about 68 dB. The question then becomes: how do we "measure" this variable community noise?

MAXIMUM SOUND LEVEL

One obvious way of describing this sound environment is to measure the maximum sound level - in this case, the nearby motorcycle at 73 dB. But the aircraft sound, although not as loud as the motorcycle, lasts longer. Studies have shown that human response to noise involves both the maximum level and its duration, so the maximum sound level alone is not sufficient to evaluate the effect of noise on people.

SOUND EXPOSURE LEVEL

A second way of describing this sound environment is to measure the sound exposure level (abbreviated SEL), which is the total sound energy of a single sound event and takes into account both its intensity and duration. One way to understand SEL is to think of it as the sound level you would experience if all of the sound energy of a sound event occurred in one second. This normalization to a duration of one second allows the direct comparison of sounds of different durations. In the sample time history in Figure 1, the motorcycle generates an SEL of about 77 dB, while the aircraft generates an SEL of about 81 dB.

EQUIVALENT SOUND LEVEL

The maximum sound levels and sound exposure levels measure individual sound events that may occur only once, or may occur several times during the day in our neighborhood. The number of times these events occur is also important in measuring the noise environment. One way to describe this factor might be to count the number of events per day for which the SELs exceed 80 dB, plus the number which exceed 75 dB, plus the number which exceed 70 dB, and so on. A more efficient way to describe both the number of such events and the sound exposure level of each is the time-average of the total sound energy over a specified period, referred to as the equivalent sound level (symbolized Leq). In the example shown in Figure 1, the time-average sound level is roughly 56 dB. This accounts for all of the sound energy during the sample period, and provides a single-number descriptor in terms of sound energy per second.

DAY-NIGHT AVERAGE SOUND LEVEL

One additional factor is also important in "measuring" a sound environment - the occurrence of sound events during nighttime. People are normally more sensitive to intrusive sound events at night, and the background sound levels are normally lower at night because of decreased human activity. Therefore a "penalty" may be added to sound levels which occur during night hours, to include these factors. By convention, a 10 dB penalty is added to sound levels occurring between 10:00 p.m. and 7:00 a.m. the following morning. The 24-hour average sound level, including this 10 dB penalty, is known as the day-night average sound level (abbreviated DNL). This 10 dB penalty means that one nighttime sound event is equivalent to 10 daytime events of the same level.

COMMUNITY ANNOYANCE

Annoyance is a summary measure of the general, adverse reactions of people to noises which disrupt their daily activities - telephone conversations, TV/radio listening, sleep, or simple tranquility. Currently, the best measure of this reaction is the percentage of people who characterize themselves as "highly annoyed" by long-term exposure to their noise environments.

Extensive research has found that day-night average sound level correlates very well with community annoyance from most environmental noise sources. Figure 2 summarizes the relationship between DNL and percentage of people who said they were highly annoyed by transportation noise, based on 453 surveys conducted worldwide. Some of these studies found that communities report themselves slightly more annoyed by aircraft noise than by surface transportation noises.

NOISE COMPATIBILITY GUIDELINES

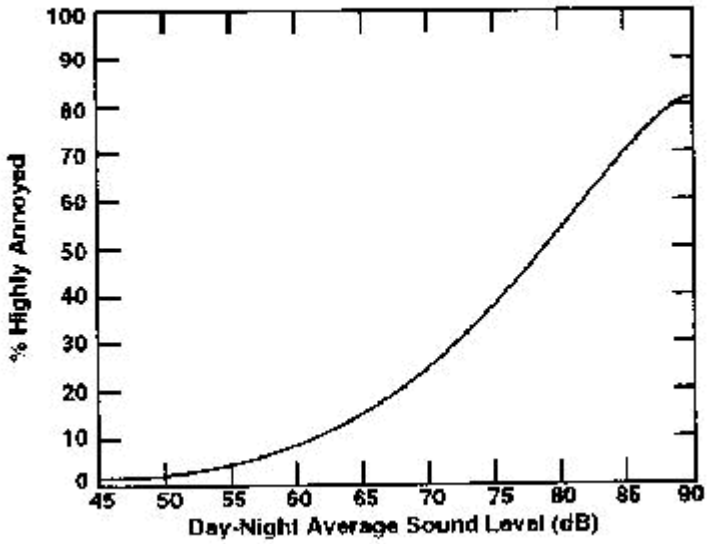
Using this research, federal agencies have adopted certain guidelines for compatible land uses and environmental sound levels. Land use is normally determined by property zoning, such as residential, industrial, or commercial. Noise levels that are unacceptable for homes may be quite acceptable for stores or factories. The Federal Aviation Administration has issued these guidelines as part of its Airport Noise Compatibility Program, found in Part 150 of the Federal Aviation Regulations.

In general, most land uses are considered to be compatible with DNLs that do not exceed 65 dB, although Part 150 declares that "acceptable" sound levels should be subject to local conditions and community decisions. Nevertheless, a DNL of 65 dB is generally identified as the threshold level of aviation noise, and other sources of community noise, which are "significant."

In adopting a threshold criterion for noise impact, we must keep several important factors in mind. First, a day-night average sound level below 65 dB does not mean that no one is annoyed by that level of noise from transportation sources. To the

contrary, as shown in Figure 2, about 12 percent of people living with a DNL of 65 dB report themselves to be "highly annoyed." About 3 percent are highly annoyed at a DNL of 55 dB. This is understandable, because the same research on noise effects has found that the physical amount of noise is only one element in feelings of annoyance with environmental noise. Activities which may be disrupted by noise events (study, conversation, listening to music, watching TV, solitude, etc.); beliefs that such noise could be better controlled; attitudes toward the noise maker; and personal fears regarding the source of the noise, are all important factors in people's perception of annoyance. Additionally, a small percentage of people are simply more sensitive to noise than most other people, while a small percentage are little annoyed even at high noise levels. The combination of these factors causes different people to interpret sounds as "unwanted" noise in different ways. A measure of noise impact, such as day-night average sound level, provides a reliable indicator of overall community response, but does not tell how any single individual will respond.

FIGURE 2



As a result there is probably no minimum level of transportation noise at which no one is annoyed. General guidelines for noise compatibility identify day-night average sound levels between 55 and 65 dB as "moderate exposure" and as generally acceptable for residential use. Above a DNL of 65 dB, these guidelines identify the noise impact as "significant," and this designation is currently a factor in decisions to provide federal funds for mitigation projects.

Because DNL combines both the intensity and number of single noise events (along with nighttime weighting), it also is not a good estimator of the single-event sound levels which are experienced. For example, a DNL of 65 dB may be generated by any of the following combinations of average sound exposure level and the effective number of those events, where "effective" number is the sum of the number of daytime events plus 10 times the number of nighttime events:

Average SEL	Effective Number of Events	DNL
87.4 dB	500	65 dB
94.4 dB	100	65 dB
97.4 dB	50	65 dB

Consider two communities: one near a large airport, the other near a small one. Both are exposed to a DNL of 65 dB. Although people near the small airport experience only 50 aircraft operations in a day, the average SEL of each of these is about 97 dB. On the other hand, the community near the large airport is impacted by 500 daily operations, but each of these has an average SEL of about 87 dB. This does not invalidate the usefulness of the DNL measure, but should be considered, for example, in determining needs for structural sound insulation.

Some criticism of DNL stems from beliefs that the levels identified with land-use compatibility are too high. Any compatibility guideline, such as a DNL of 65 dB, must represent a balance between that level which is most desirable to protect communities and that which can be achieved with cost-effective mitigation measures and available technology. There is no single criterion which can fit all airports and all communities. Local communities may choose to mitigate impacts below a DNL of 65 dB.

SUPPLEMENTAL MEASURES

A time-average measure of noise impact, such as day-night average sound level, is also criticized because people feel that they are annoyed by individual sound events, rather than some "fictitious" average level. Clearly, people are bothered by individual noise events, but their sense of annoyance increases with the number of those noise events, and those which occur late at night.

DNL provides a combined "measure" of these factors which can be used to evaluate existing and predicted future conditions on an unambiguous, single-number basis. Other measures, such as maximum sound level, or sound exposure level, give valuable supplemental information in analyzing airport noise. For example, as noted above, in designing sound insulation for dwellings and schools, single-event measures are necessary. Nevertheless, day-night average sound level remains the best single measure for assessing the effects of airport noise on communities, and allows a standardized and effective means for measuring transportation noise.

Appendix F

APPENDIX F
RESPONSE TO COMMENTS

The comment period for the Noise Exposure Map Update Study began on September 27, 2004 and ended on October 29, 2004. A total of two comments were received during the comment period. A copy of each comment that was received and its response is included below.

Public Comments Received and Response to Comments

Comment 1

From: MARTINLAIGHT@aol.com [mailto:MARTINLAIGHT@aol.com]
Sent: Tuesday, October 19, 2004 7:58 AM
To: COTHRON, LEE
Cc: james.m.smith@faa.gov; radams@landrum-brown.com
Subject: Where is this in your future report for 2009?

Dear Mr. Cothron,

This morning at 0625HRS a large passenger jet passed over my house. It was so low that the noise drowned out our conversation inside the house. The windows actually shook and my wife and I looked at each other as startled as if we were about to take some kind of evasive action. I find it hard to believe that it would take two weeks to determine who is responsible for this lack of consideration. Also it is an unfortunate coincidence that the information we requested on average altitudes in this area on the 8th and 9th of October 2004 will not be available until after the 29th of October.

From reading your report for 2009 I cannot see any mention of this current noise problem for hundreds of residents in Hendersonville - Except for the fact that the **frequency** of this kind of navigation and flight path usage is going to drastically increase. Since we are 10 miles away, I'm sure the residents are not aware of the impact your plan is going to have on their quality of life. It may keep the airport within the 65 DNL Contours but it also forecasts a serious depreciation in the quality of life we are to expect in the coming years.

I would like to see the closing date for public comment extended past the 29th of October so that the residents are able to have a chance to respond to the report along side their respective Aldermen.

Mr. Cothron, what have you done as planning manager, to notify the residents of Hendersonville, of your intended expansion over the next five years?

RESPONSE TO COMMENT 1

The commenter resides approximately 9 miles north of the airport. The average altitude of aircraft flying within 0.5 statute mile of the commenter's residence is approximately 2,300 feet for passenger jet arrivals and 5,600 feet for passenger jet departures.

According to the Memorandum of Agreement with the Air Traffic Control Tower, MNAA staff receive radar data from the Tower within a 15-18 day period.

This NEM Update study evaluated current and forecasted operations within a five–year time frame and defined the boundaries of the 65 DNL noise exposure contour. According to the EPA, residential uses within the 65 DNL noise exposure contour are considered incompatible with airport operations unless some form of mitigation is performed (reference Table D-1 in Appendix D, *FAA Policies, Guidance, and Regulations,* for a more detailed explanation of compatible and non-compatible land uses).

Following the MNAA's first noise study in 1989, extensive mitigation efforts, including sound insulation and property acquisition, were completed in areas within the 1993 Noise Compatibility Program 65DNL contour. The 1993 Part 150 study, the 1997 NEM Update Study, and this current NEM Update study agree that, according to federal guidelines, land uses in Hendersonville are compatible with airport operations.

The MNAA recognizes that aircraft operations may cause occasional disturbances outside of the 65 DNL and strives to minimize those impacts through the continuing use of preferential flight corridors and noise abatement procedures for departing turbojet aircraft with the goal of directing air traffic over the most compatible land use corridors.

The intent of the NEM Update study is to evaluate the noise impact of existing and forecasted aircraft operations at the Airport, using existing FAA-approved forecasts for a five-year planning period. This NEM Update does not recommend, approve, or suggest any physical development at BNA, including development that would have the potential to increase the number of operations. The Future (2009) Noise Exposure Map reflects a moderate ten (10) percent annual increase in aircraft operations from the Existing (2004) period.

The public comment period officially closed on October 29, 2004. During the public comment period, two comments were reported to the MNAA. Because adequate notice was given regarding the availability of the Draft document, and few comments were received, the comment period was not extended. Any comment received prior to the final printing of this document would have been included; however, no additional comments were received.

Federal guidelines require public participation as an essential element of a noise study. Appendix A, *Public Coordination,* includes a detailed list of the public coordination efforts related to the NEM Update study. All Federal requirements were met in the preparation of this study.

Comment 2

From: tminzak@comcast.net [mailto:tminzak@comcast.net]
Sent: Saturday, October 23, 2004 3:11 PM
To: Rob Adams
Subject: noise!

I am writing to ask about the noise pollution problem at my house due to the airport. I live in Lakewood 37138 zip code. I planes are very very loud at my house. They wake me and the children up at all hours of the night. I am very tired of it. It honestly sounds like they are landing on the roof. I think someone needs to step up and do something about this problem. Please contact me and give me some helpful advice. Thanks Tim

RESPONSE TO COMMENT 2

The commenter resides in Lakewood, approximately 7.5 statute miles north of the Airport, and most likely experiences aircraft overflights during nighttime hours from arrivals to Runway 20R. Approximately 20% of nighttime turbojet aircraft arrivals utilize Runway 20R.

The current nighttime runway use program recommends that turbojet aircraft arrivals and departures utilize Runway 13-31 whenever air traffic and weather conditions permit, which directs air traffic over the most compatible land use corridors.

Because the Future (2009) Noise Exposure Contour does not include any previously unmitigated property, no additional land use mitigation is being proposed as a result of this study. The 1993 Part 150 study, the 1997 NEM Update Study, and this current NEM Update study agree that, according to federal guidelines, land uses in Lakewood are compatible with airport operations.