

Boise Airport

14 CFR Part 150 Study Update

Updated Noise Exposure Maps
and
Noise Compatibility Program



Prepared for:
CITY OF BOISE

Prepared by:
HNTB Corporation
CSHQA
Wyle Laboratories
Synergy Consulting

JULY 2004

(EXECUTIVE SUMMARY ADDED SEPTEMBER 2006)



U.S. Department
of Transportation

**Federal Aviation
Administration**

Northwest Mountain Region
Colorado, Idaho, Montana
Oregon, Utah, Washington,
Wyoming

1601 Lind Avenue, S. W.
Renton, Washington 98055-4056

February 23, 2006

Mr. John Anderson, Airport Director
Boise Air Terminal/Gowen Field
3201 Airport Way
Boise, Idaho 83705-5096

Dear Mr. Anderson:

We have evaluated the Boise Air Terminal Noise Compatibility Program, contained in the Boise Airport Updated Noise Exposure Maps and Noise Compatibility Program, submitted to our office under the provisions of Title 49 of the United States Code (49 U.S.C.), Section 47504.

The recommended Noise Compatibility Program proposed by the Boise Air Terminal is identified by the action elements on pages 8-1 through 8-9 of the program. I am pleased to inform you that the Associate Administrator for Airports has approved 30 of the 32 proposed action elements in the Noise Compatibility Program. Our specific action for each noise compatibility program element is set forth in the enclosed Record of Approval. The effective date of approval is February 8, 2006.

Each airport Noise Compatibility Program developed in accordance with the Federal Aviation Regulations (FAR), Part 150, is a local, not federal, program. We do not substitute our judgment for that of the airport proprietor, with respect to which measures should be recommended for action. Our approval or disapproval of the FAR Part 150 program recommendations is measured according to the standards expressed in Part 150, and 49 U.S.C. Section 47504(a), and is limited to the following determinations:

- a. The Noise Compatibility Program was developed in accordance with the provisions and procedures of FAR Part 150.
- b. Program measures are reasonably consistent with achieving the goals of reducing existing non-compatible land uses around the airport, and preventing the introduction of additional non-compatible land uses.
- c. Program measures would not create undue burden on interstate or foreign commerce, unjustly discriminate against types or classes of aeronautical uses, violate the terms of airport grant agreements, or intrude into areas preempted by the federal government.

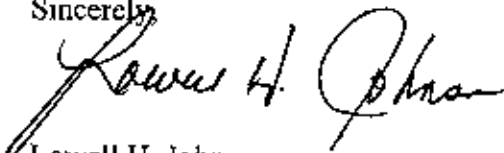
d. Program measures relating to the use of flight procedures can be implemented within the period covered by the program without derogating safety; adversely affecting the efficient use and management of the navigable airspace and airport traffic control systems; or adversely affecting other powers and responsibilities of the Administrator; as prescribed by law.

Specific limitations with respect to our approval of an airport Noise Compatibility Program are delineated in FAR Part 150, Section 150.5. Approval is not a determination concerning the acceptability of land uses under federal, state, or local laws. Approval does not by itself constitute a Federal Aviation Administration (FAA) implementing action. A request for federal action or approval to implement specific noise compatibility measures may be required, and an FAA decision on the request may require an environmental assessment of the proposed action. Approval does not constitute a commitment by the FAA to financially assist in the implementation of the program, and is not a determination that all measures covered by the program are eligible for grant-in-aid funding from the FAA. Where federal funding is sought, requests for project grants must be submitted to the FAA Northwest Mountain Region's Seattle Airports District Office in Renton, Washington.

Completion and approval of your Noise Compatibility Program is a major accomplishment, one of which the airport should be proud. The program is a blueprint presenting the means for the airport to achieve its goal of reducing or eliminating non-compatible land uses around the airport. As with all plans, we encourage the airport to periodically review and update the program as necessary, to reflect changes in the airport or its environment.

Again, congratulations on your approved Part 150 Noise Compatibility Program! We look forward to working with you on implementation of the program.

Sincerely,



Lowell H. Johnson
Manager, Airports Division
Northwest Mountain Region

Enclosure

RECORD OF APPROVAL
FEDERAL AVIATION REGULATION PART 150
NOISE COMPATIBILITY PROGRAM

BOISE AIRPORT
BOISE, IDAHO

INTRODUCTION

The Noise Compatibility Program (NCP) for Boise Airport (BOI) includes measures to abate aircraft noise, control land development, mitigate the impact of noise on non-compatible land uses, and implement and update the program. Federal Aviation Regulation (FAR) Part 150 requires that the Noise Exposure Map (NEM) contour apply to a period of no less than five years into the future, although it may apply to a longer period if the sponsor so desires. The airport sponsor has requested that the program measures be applied to the 2009 NEM (Figure 5-2) because it covers a larger area for potential mitigation.

The objective of the noise compatibility planning process has been to improve the compatibility between aircraft operations and noise-sensitive land uses in the area, while allowing the airport to continue to serve its role in the community, state, and nation. The approval actions listed herein include all those that the airport sponsor recommends be taken by the Federal Aviation Administration (FAA). It should be noted that the approvals indicate only that the actions would, if implemented, be consistent with the purposes of Part 150. These approvals do not constitute decisions to implement the actions. Subsequent decisions concerning possible implementation of these actions may be subject to applicable environmental procedures or aeronautical study requirements.

The program elements below summarize as closely as possible the airport operator's recommendations in the noise compatibility program and are cross-referenced to the program. The statements contained within the summarized program elements and before the indicated FAA approval, disapproval, or other determination, do not represent the opinions or decisions of the FAA.

The Airport sponsor has certified that the existing conditions shown in the 2003 NEM and the future 2008 NEM that were presented at the public hearing are representative of the 2004 and 2009 NEMs included in the submittal. At the time the FAA initiated its review of the NCP (mid-2005), we reaffirmed the NEMs continued to be representative of conditions at the airport for the existing and forecast year timeframes.

PROGRAM ELEMENTS A complete summary of the recommended program elements can be found in Chapter Eight of the Part 150 Update. Many of the program elements from the existing 1996 NCP were reevaluated for inclusion in this NCP update. The 1996 NCP was approved in 1997. Some of the existing measures have been slightly modified and are so noted. For reference, the complete 1997 Record of Approval for the existing program is in Appendix A of the document.

NOISE ABATEMENT MEASURES

Noise Abatement Measure 1 – Preferential Runway Use: *[This measure would revise the existing measure to include designation of preferential arrival flow, and designation of north and south parallel runways as preferential for arrivals and departures, respectively.]* This measure would designate Runways 10L and 10R as the preferential flow for departing aircraft; Runways 28L and 28R as the preferential flow for arriving aircraft, per the discretion of the Boise Air Traffic Control Tower (ATCT). During either the east or west flow, the north parallel runway (10R/28L) would be designated as the primary arrival runway, and the south parallel runway (10L/28R) as the primary departure runway. 6-5 through 6-9, including Table 6.5 and Figures 6-1, 6-2 and 6-3. Also included in Table 6.14.

FAA Determination: Approved as a voluntary measure only as air traffic, weather and airspace safety and efficiency permit. Publication in the standard operating procedures (SOP) must not be construed as a mandatory procedure for noise abatement purposes. The Tower can select runways and procedures that maximize the efficiency of air traffic flow at all times; noise abatement procedures are voluntary and may be used when operating conditions permit.

Noise Abatement Measure 2 – Departure Turn Altitudes: *[This measure would delete the provision that applies to F-4s as they are no longer operating at BOI. It also revises the existing measure to include southbound headings.]* This measure would continue directing jet departures from Runways 28L and 28R to maintain runway heading until reaching 5,000 feet MSL before turning north or south. Pages 6-9 through 6-11, including Table 6.6. Also included in Table 6.14.

FAA Determination: Approved as voluntary.

Noise Abatement Measure 3 – Departure Turn Altitudes: *[No change to existing procedure.]* This measure would continue directing non-jet aircraft over 12,500 pounds with destination headings to the north to fly runway heading to 4,500 feet MSL before turning. Pages 6-9 through 6-11, including Table 6.6. Also included in Table 6.14.

FAA Determination: Approved as voluntary.

Noise Abatement Measure 4 – Departure Turn Altitudes: *[No change to existing procedure.]* This measure would continue directing VFR departures with destination headings to the north to fly runway heading to the end of the runway before turning. Pages 6-9 through 6-11, including Table 6.6. Also included in Table 6.14.

FAA Determination: Approved as voluntary.

Noise Abatement Measure 5 – Departure Turn Altitudes: *[No change to existing procedure.]* This measure would continue to direct north and northwest bound turbojet departures from Runways 10L and 10R to fly runway heading to 5,000 feet MSL before turning north. Pages 6-9 through 6-11, including Table 6.6. Also included in Table 6.14.

FAA Determination: Approved as voluntary.

Noise Abatement Measure 6 – Downwind Arrival Flight Tracks: *[New Measure.]* During nighttime hours, this measure would voluntarily reroute aircraft to use arrival flight tracks with downwind legs to the south of BOI. This would route aircraft over relatively low-density residential and vacant land uses. Pages 6-12 and 6-13. Tables 6.7 and 6.14. Figures 6-6 and 6-7.

FAA Determination: Disapproved. No demonstrable noise benefit would accrue if this measure were implemented on a voluntary basis. Vectoring aircraft to south downwind would create operational issues. The aircraft would have to be blended with south traffic and have to be kept clear of departing traffic. The net result would be increased workload, risk of error, and increased flying time and cost for users.

Noise Abatement Measure 7 – Flight Management System (FMS)/Global Positioning System (GPS) Flight Procedures for I-84 Corridor: *[New measure.]* This measure would establish departure procedures and standard arrival routes along the I-84 corridor to the east of the airport. There are no apparent corridors with compatible land use to the west of BOI; therefore it is not likely that a beneficial flight route could be developed without substantially impacting residents under that flight route. However, use of the I-84 corridor to the east of BOI (for arrivals to Runways 28L and 28R, and departures to Runways 10L and 10R) would direct aircraft over mostly compatible land uses. Although the procedure would not reduce populations within the 65+DNL contour, establishment of the procedure would encourage aircraft noise and land use compatibility as development occurs along the corridor. Pages 6-14 and 6-15. Table 6.8 and 6.14. Figures 6-8 and 6-9.

FAA Determination: Disapproved. The NCP does not demonstrate noise benefits, even assuming 100 percent compliance. Many aircraft presently are not equipped to carry out FMS/GPS procedures, so the compliance rate is unrealistic. Also, the FAA would still need to develop airport-specific procedures, which would take some time to study and determine their feasibility. This recommendation is more appropriate to pursue outside of the Part 150 process to determine local feasibility and possible inclusion in future updates.

Noise Abatement Measure 8 – Distant Noise Abatement Departure Profile (NADP): *[New measure.]* BOI would establish the Distant NADP as the recommended NADP for all runway ends. This measure would apply to jet aircraft with a maximum takeoff weight greater than 75,000 pounds. For lighter jet aircraft, the continued use of the National Business Aviation Association noise abatement departure procedures would be encouraged. Pages 6-16 and 6-17, including Table 6.9. Also included in Table 6.14. Figure 6-10.

FAA Determination: Approved as voluntary. The sponsor will coordinate with aircraft users to highlight use of the distant procedure.

Noise Abatement Measure 9 – Visual Approach Arrival Altitudes: *[New measure.]* This measure would encourage ATCT to voluntarily route aircraft on the visual approach to runways 26L and 28R at 5,000 feet MSL until the aircraft begins final approach. Page 6-19. Table 6.11 and 6.14.

FAA Determination: Approved as voluntary. The NCP states at table 6.9 that pilots are already using this procedure. This would include it in the official NCP for BOI.

LAND USE MEASURES

Land Use Measure 1 – Airport Influence Area: *[The proposed measure maintains current boundaries.]* The Boise Airport Commission should recommend to the City of Boise and Ada County to maintain the current Airport Influence Area boundaries until such time that noise levels require their expansion. Page 7-9. Figures 7-1 and 7-2. Table 7.3 and Table 7.24.

FAA Determination: Approved. The Federal government has no authority to control local land use: implementation of this measure is considered to be within the authority of the City and County.

Land Use Measure 2 – Land Use Compatibility Standards in Airport Influence Area: *[No change to existing measure.]* This measure would have the City and County refine land use compatibility standards for the four sub-districts within the Airport Influence Area. Page 7-12 through 7-15, including Table 7.15. Also included in Table 7.24.

FAA Determination: Approved. The Federal government has no authority to control local land use: implementation of this measure is considered to be within the authority of the City and County.

Land Use Measure 3 – Commercial & Industrial Zoning in Airport Influence Area: *[No change to existing measure.]* The City of Boise and Ada County maintain existing commercial and industrial zoning within the Airport Influence Area. Page 7-16 and 7-17, including Table 7.6. Also included in Table 7.24.

FAA Determination: Approved. The Federal government has no authority to control local land use: implementation of this measure is considered to be within the authority of the City and County.

Land Use Measure 4 – Zone for Compatible Use in Apple Street Area: *[No change to existing measure.]* Rezone property and land southeast of the airport and east of Apple Street from residential to industrial. Page 7-18. Table 7.7. Figure 7-3. Table 7.24.

FAA Determination: Approved. The Federal government has no authority to control local land use: implementation of this measure is considered to be within the authority of the responsible land use control body.

Land Use Measure 5 – Zone for Compatible Use in Gowen Road Area: *[No change to existing measure.]* Rezone land southeast of the airport, east of I-84 and south of East Gowen Road from residential to industrial use. Page 7-19. Table 7.8. Figure 7-3. Table 7.24.

FAA Determination: Approved. The Federal government has no authority to control local land use: implementation of this measure is considered to be within the authority of the responsible land use control body.

Land Use Measure 6 – Encourage Clustered Residential Development: *[No change to existing measure.]* Encourage clustered residential development southeast of the airport within the Airport Influence Area. Page 7-20. Table 7.9. Figure 7-3. Table 7.24.

FAA Determination: Approved. The Federal government has no authority to control local land use: implementation of this measure is considered to be within the authority of the responsible land use control body. The property is outside the DNL 65 dB noise contour, and the airport sponsor has adopted the Federal land use compatibility standard for this NCP. Federal guidelines state residential land uses within the DNL 65 dB noise contour are not compatible with airport operations.

The FAA's policy published in the Federal Register April 3, 1998, states that the FAA will not approve Federal Funding to mitigate noise-sensitive land uses constructed after October 1, 1998.

Land Use Measure 7 – Maintain Large Lot Residential Zoning: *[No change to existing measure.]* Maintain existing large lot residential zoning within the Airport Influence Area. Page 7-21. Table 7.10. Table 7.24.

FAA Determination: Approved. The Federal government has no authority to control local land use: implementation of this measure is considered to be within the authority of the responsible land use control body. The property is outside the DNL 65 dB noise contour, and the airport sponsor has adopted the Federal land use compatibility standard for this NCP. Federal guidelines state residential land uses within the DNL 65 dB noise contour are not compatible with airport operations.

The FAA's policy published in the Federal Register April 3, 1998, states that the FAA will not approve Federal Funding to mitigate noise-sensitive land uses constructed after October 1, 1998.

Land Use Measure 8 – Maintain Rural Preservation Zoning: *[No change from existing measure.]* Maintain existing Rural Preservation zoning within the Airport Influence Area. Page 7-21. Table 7.11. Table 7.24.

FAA Determination: Approved. The Federal government has no authority to control local land use: implementation of this measure is considered to be within the authority of the responsible land use control body. The property is outside the DNL 65 dB noise contour, and the airport sponsor has adopted the Federal land use compatibility standard for this NCP. Federal guidelines state residential land uses within the DNL 65 dB noise contour are not compatible with airport operations.

The FAA's policy published in the Federal Register April 3, 1998, states that the FAA will not approve Federal Funding to mitigate noise-sensitive land uses constructed after October 1, 1998.

Land Use Measure 9 – Amend Subdivision Regulations and Building Permit Applications to Require Avigation Easements: *[The proposed measure would revise the existing measure to include building permits.]* The Airport Influence Area planning standards in the City of Boise and Ada County require the dedication of avigation easements for all permitted uses. This practice has been in place for many years, and it is recommended to be continued. In addition, this measure would be required for all (residential and commercial) development within the Airport Influence Area as part of the building permit process. Amend current subdivision regulations to require dedication of avigation easements. Page 7-24. Tables 7.12 and 7.24.

FAA Determination: Approved. The Federal government has no authority to control local land use: implementation of this measure is considered to be within the authority of the responsible land use control body.

Land Use Measure 10 – Adopt Local Building Code Amendments for Noise Level Reduction Construction in the Airport Influence Area: *[No change to existing measure.]* The Airport Influence Area planning standards in the City of Boise and Ada County have required the use of noise level reduction construction techniques for noise-sensitive uses for all permitted development for many years. Both the City and County have lacked specific guidance for implementing this requirement and should adopt noise level reduction standards to supplement their building codes. Pages 7-24 through 7-26, including Table 7.13. Also included in Table 7.24.

FAA Determination: Approved. The Federal government has no authority to control local land use: implementation of this measure is considered to be within the authority of the responsible land use control body.

Land Use Measure 11 – Adoption of Project Review Guidelines for the City of Boise and Ada County: *[No change to existing measure.]* Adopt project review guidelines for rezoning special use, conditional use, planned development and variance applications. Page 7-26. Tables 7.14 and 7.24.

FAA Determination: Approved. The Federal government has no authority to control local land use: implementation of this measure is considered to be within the authority of the responsible land use control body.

Land Use Measure 12 – Fair Disclosure of Noise Impacts in the Airport Influence Area: *[This proposed measure revises the existing measure to include the promotion of both formal and informal mechanisms.]* Promote means of providing the fair disclosure of potential noise impacts in the Airport Influence Area. Page 7-26. Tables 7.15 and 7.24.

FAA Determination: Approved. The Federal government has no authority to control local land use: implementation of this measure is considered to be within the authority of the responsible land use control body.

Land Use Measure 13 – Residential Property Acquisition within 65+DNL Contour: *[Revised to include the 2009 NEM.]* Acquire 40 existing homes within the 65+ DNL contour of the 2009 NEM. Page 7-30. Tables 7.16 and 7.24.

FAA Determination: Approved. The FAA's policy published in the Federal Register April 3, 1998, states that the FAA will not approve Federal Funding to mitigate noise-sensitive land uses constructed after October 1, 1998.

Land Use Measure 14 – Undeveloped Property Acquisition within 65+DNL Contour: *[Revised to include the 2009 NEM.]* Acquire undeveloped land with potential to be developed noncompatibly within the 65+DNL contour of the 2009 NEM. Page 7-30. Tables 7.17 and 7.24.

FAA Determination: Approved. This measure would prevent the development of land available for non-compatible use, if land use preventive controls adopted elsewhere in this NCP are not effective. Acquisition of vacant land is justified as necessary to prevent new noncompatible development when new noncompatible development is highly likely and local land use controls will not prevent such development.

Land Use Measure 15 – Purchase of Avigation Easements: *[New measure.]* Avigation easements would convey the right to the use of real property for the purpose of aircraft overflights and related noise, vibrations, and other effects caused by aircraft operations. The easement would release the local jurisdiction, aircraft operators, and the airport owner and operator for the effect of aircraft operations on the property. For existing residential and non-residential noise sensitive properties within the 65+DNL contours, BOI would seek to acquire an avigation easement from the property owner. However, homes within the 65+DNL contours of the FAA-accepted (from the 1996 study) that were constructed after October 1, 1998, are not eligible for federal funding support. Page 7-37. Tables 7.20 and 7.24.

FAA Determination: Approved The FAA's policy published in the Federal Register April 3, 1998, states that the FAA will not approve Federal Funding to mitigate noise-sensitive land uses constructed after October 1, 1998.

Land Use Measure 16 – Amend Building Permit Applications to Document and Require Compliance with Noise Level Reduction Construction Standards: *[New measure.]* The City of Boise and Ada County should amend their building code and refine their application process to require the applicant to indicate compliance with proposed standards for noise level reduction construction techniques for noise sensitive construction areas within the Airport Influence Area. Airport funding in the form of a compliance rebate to cover the increase in home construction costs may offset the negative impacts of additional housing costs. Page 7-37. Tables 7.21 and 7.24.

FAA Determination: Approved in part, Disapproved in part Amendments to building codes and local application procedures is approved. The FAA believes that prevention of additional land uses within the DNL 65 dB contour is highly preferable over allowing such uses even with sound attenuation, revised building codes or avigation easements. If prevention of incompatible development is not feasible, the airport sponsor and local land use jurisdiction are urged to pursue all possible avenues to discourage new residential development within these levels of noise exposure.

Funding incentives for new construction outside the DNL 65 dB is disapproved. Section 189 of Public Law 108-176, Vision 100-Century Of Aviation Reauthorization Act, December 12, 2003, specifically prohibits FAA approval of Part 150 program measures that require AIP funding to mitigate aircraft noise outside DNL 65 (through Fiscal Year 2007). Section 189 does not preclude the use of airport revenue or PFC funding outside DNL 65 dB.

Land Use Measure 17 – Improve City of Boise Application Process To Promote Early Recognition of Airport Influence Area within all Application Processes: *[New measure.]* The City of Boise could improve awareness of Airport Influence Areas at time of application submittal rather than at time of first comment review. Page 7-37. Tables 7.22 and 7.24.

FAA Determination: Approved. The Federal government has no authority to control local land use; implementation of this measure is considered to be within the authority of the responsible land use control body.

Land Use Measure 18 – Designate Airport Staff Liaison for Planning and Zoning Building Departments of both City of Boise and Ada County: *[New Measure.]* Airport staff should play a greater role in reviewing and participating in the development approval process inside the boundaries of the Airport Influence Area. Page 7-37. Tables 7.23 and 7.24.

FAA Determination: Approved. The Federal government has no authority to control local land use; implementation of this measure is considered to be within the authority of the responsible land use control body.

PROGRAM MEASURES

Continuing Program Measure 1 – Noise Complaint System: *[No change to existing measure.]* Boise Airport would maintain a system for recording and disseminating information on noise complaints. Pages 8-1, 8-5 and Table 8.1.

FAA Determination: Approved.

Continuing Program Measure 2 – Public Information Program: *[New measure.]* This measure would establish a program to enhance public awareness of aircraft noise issues and the Noise Compatibility Program. Pages 8-1, 8-5 and Table 8.1.

FAA Determination: Approved.

Continuing Program Measure 3 – Airport Noise Committee: *[New measure.]* This measure would establish a standing committee to encourage dialogue between community representatives, aeronautical users, and the Boise Airport. Pages 8-1, 8-5 and Table 8.1.

FAA Determination: Approved.

Continuing Program Measure 4 – Airport Noise Relations Staff: *[Revised measure.]* Boise Airport would designate a staff position with responsibility for aircraft noise and land use compatibility issues, in order to facilitate implementation of the NCP measures, coordination with the City of Boise and Ada County, and neighboring communities. Pages 8-1, 8-5 and Table 8.1.

FAA Determination: Approved.

Continuing Program Measure 5 – Periodic Evaluation of Noise Exposure Maps: *[New measure.]* This evaluation would serve to update the NEMs when needed to account for significant changes in the airport operations or procedures at the Boise Airport. Pages 8-1, 8-5 and Table 8.1. Note: The previous NCP committed the airport sponsor to updating the NCP as necessary.

FAA Determination: Approved.



Federal Aviation Administration

Memorandum

Date: FEB - 8 2006
From: Dennis E. Roberts, Director, Office of Airport Planning and Programming, APP-1
To: Acting Associate Administrator for Airports, ARP-1
Prepared by: Vicki Catlett, Environmental Specialist, APP-600, x78770
Subject: Record of Approval for Boise Airport, Idaho, Noise Compatibility Program Update

Attached for your action is the Noise Compatibility Program (NCP) update for the subject airport. On August 12, 2005 the FAA determined the Noise Exposure Maps (NEM) for this airport were prepared in compliance with the applicable requirements of 14 CFR Part 150. At the same time, the FAA started the final NCP review. If no action is taken within 180 days, all program measures are automatically approved by law, with the exception of flight procedures. The last date for FAA action is February 8, 2006.

The Northwest Mountain Region Airports Division reviewed NCP documentation presented by the City of Boise. They concluded that it is consistent with the Aviation Safety and Noise Abatement Act (ASNA, as recodified at 49 U.S.C. 47501 et. seq) and Federal Aviation Regulation Part 150.

The region coordinated with the office of Air Traffic for measures that would affect their operations. Comments have been incorporated into the final evaluation of the NCP and the Record of Approval.

The NCP includes 9 noise abatement operational elements, 18 land use management elements, and 5 program management elements. These measures are summarized in Table 8.2, Chapter 8 of the NCP.

The Assistant Administrator for Aviation Policy, Planning, and Environment and the Chief Counsel's office have concurred with the recommendations of the Northwest Mountain Region. If you agree with the recommended FAA determinations, you should sign the "approved" line on the attached memorandum. I recommend your approval.

A handwritten signature in black ink, appearing to read "Dennis E. Roberts".

Dennis E. Roberts

Attachments



Federal Aviation Administration

Memorandum

Date: December 21, 2005
To: Associate Administrator for Airports, ARP-1
From: Manager, Northwest Mountain Region,
Airports Division, ANM-600
Prepared by: Cayla Morgan
(425) 227-2653
Subject: **ACTION:** Approval of the Boise Airport Noise Compatibility Program

On August 23, 2005, a notice was published in the Federal Register announcing the FAA's determination on the noise exposure maps for the Boise Airport under 49 U.S.C. Sec. 47503(a). On August 12, 2005, we began the formal 180-day review period for the Boise Airport proposed noise compatibility program under the provisions of 49 U.S.C. Sec. 47504(a). That program must be approved or disapproved by the FAA within 180 days or it shall be deemed to be approved as provided for in 49 U.S.C. Sec. 47504 (b). The last date for such approval or disapproval is February 13, 2006.

We have reviewed and evaluated the proposed noise compatibility program and have concluded that it is consistent with the intent of these statutory provisions, and that it meets the standards set forth in FAR Part 150 for such programs. The requirements of Part 150 are itemized in a checklist, which was used to ensure that all required items were present in the proposed program.

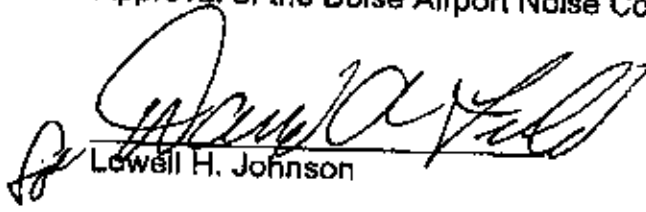
The checklist, and documentation submitted by the Airport Director of the Boise Airport, were reviewed by Airports and the Office of Assistant Chief Counsel. The study was also coordinated with Air Traffic.

Airports requested sponsor confirmation that they intend to revise the program if made necessary by revision of the NEMs, as required by 150.23(e)(9). Airports also requested further documentation that the sponsor had submitted all comments received during the study process, as well as their disposition pursuant to 150.23(e)(7).

Each proposed action in the Boise Airport's proposed noise compatibility program was then reviewed and evaluated on the basis of effectiveness and potential conflict with federal policies and prerogatives. These include safe and efficient use of the nation's airspace and undue burden on interstate commerce.

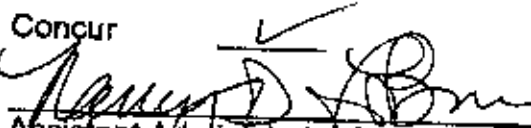
Our recommendations on each of these proposed actions are described in the attached Record of Approval. Each proposed action is described in detail in the Boise Airport FAR Part 150 Study.

Based on the evaluation procedure described above, we recommend the approval of Program Elements for which outright approval is appropriate listed in the Record of Approval of the Boise Airport Noise Compatibility Program.



Lowell H. Johnson

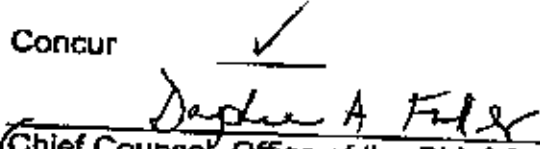
2 Attachments

Concur


Assistant Administrator for Policy, Planning, and Environment, AEP-1

1/26/06
(Date)

Nonconcur

Concur


Chief Counsel, Office of the Chief Counsel, AGC-1

2/6/06
(Date)

Nonconcur

Approve


Acting Associate Administrator for Airports, ARP-1

2/8/06
(Date)

Disapprove

RECORD OF APPROVAL**FEDERAL AVIATION REGULATION PART 150
NOISE COMPATIBILITY PROGRAM****BOISE AIRPORT
BOISE, IDAHO****INTRODUCTION**

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PROGRAM ELEMENTS A complete summary of the recommended program elements can be found in Chapter Eight of the Part 150 Update. Many of the program elements from the existing 1996 NCP were reevaluated for inclusion in this NCP update. The 1996 NCP was approved in 1997. Some of the existing measures have been slightly modified and are so noted. For reference, the complete 1997 Record of Approval for the existing program is in Appendix A of the document.

NOISE ABATEMENT MEASURES

Noise Abatement Measure 1 – Preferential Runway Use: *[This measure would revise the existing measure to include designation of preferential arrival flow, and designation of north and south parallel runways as preferential for arrivals and departures, respectively.]* This measure would designate Runways 10L and 10R as the preferential flow for departing aircraft; Runways 28L and 28R as the preferential flow for arriving aircraft, per the discretion of the Boise Air Traffic Control Tower (ATCT). During either the east or west flow, the north parallel runway (10R/28L) would be designated as the primary arrival runway, and the south parallel runway (10L/28R) as the primary departure runway, 6-5 through 6-9, including Table 6.5 and Figures 6-1, 6-2 and 6-3. Also included in Table 6.14.

FAA Determination: Approved as a voluntary measure only as air traffic, weather and airspace safety and efficiency permit. Publication in the standard operating procedures (SOP) must not be construed as a mandatory procedure for noise abatement purposes. The Tower can select runways and procedures that maximize the efficiency of air traffic flow at all times; noise abatement procedures are voluntary and may be used when operating conditions permit.

Noise Abatement Measure 2 – Departure Turn Altitudes: *[This measure would delete the provision that applies to F-4s as they are no longer operating at BOI. It also revises the existing measure to include southbound headings.]* This measure would continue directing jet departures from Runways 28L and 28R to maintain runway heading until reaching 5,000 feet MSL before turning north or south. Pages 6-9 through 6-11, including Table 6.6. Also included in Table 6.14.

FAA Determination: Approved as voluntary.

Noise Abatement Measure 3 – Departure Turn Altitudes: *[No change to existing procedure.]* This measure would continue directing non-jet aircraft over 12,500 pounds with destination headings to the north to fly runway heading to 4,500 feet MSL before turning. Pages 6-9 through 6-11, including Table 6.6. Also included in Table 6.14.

FAA Determination: Approved as voluntary.

Noise Abatement Measure 4 – Departure Turn Altitudes: *[No change to existing procedure.]* This measure would continue directing VFR departures with destination headings to the north to fly runway heading to the end of the runway before turning. Pages 6-9 through 6-11, including Table 6.6. Also included in Table 6.14.

FAA Determination: Approved as voluntary.

Noise Abatement Measure 5 – Departure Turn Altitudes: *[No change to existing procedure.]* This measure would continue to direct north and northwest bound turbojet departures from Runways 10L and 10R to fly runway heading to 5,000 feet MSL before turning north. Pages 6-9 through 6-11, including Table 6.6. Also included in Table 6.14.

FAA Determination: Approved as voluntary.

Noise Abatement Measure 6 – Downwind Arrival Flight Tracks: *[New Measure.]* During nighttime hours, this measure would voluntarily reroute aircraft to use arrival flight tracks with downwind legs to the south of BOI. This would route aircraft over relatively low-density residential and vacant land uses. Pages 6-12 and 6-13. Tables 6.7 and 6.14. Figures 6-6 and 6-7.

FAA Determination: Disapproved. No demonstrable noise benefit would accrue if this measure were implemented on a voluntary basis. Vectoring aircraft to south downwind would create operational issues. The aircraft would have to be blended with south traffic and have to be kept clear of departing traffic. The net result would be increased workload, risk of error, and increased flying time and cost for users.

Noise Abatement Measure 7 – Flight Management System (FMS)/Global Positioning System (GPS) Flight Procedures for I-84 Corridor: *[New measure.]* This measure would establish departure procedures and standard arrival routes along the I-84 corridor to the east of the airport. There are no apparent corridors with compatible land use to the west of BOI; therefore it is not likely that a beneficial flight route could be developed without substantially impacting residents under that flight route. However, use of the I-84 corridor to the east of BOI (for arrivals to Runways 28L and 28R, and departures to Runways 10L and 10R) would direct aircraft over mostly compatible land uses. Although the procedure would not reduce populations within the 65+DNL contour, establishment of the procedure would encourage aircraft noise and land use compatibility as development occurs along the corridor. Pages 6-14 and 6-15. Table 6.8 and 6.14. Figures 6-8 and 6-9.

FAA Determination: Disapproved. The NCP does not demonstrate noise benefits, even assuming 100 percent compliance. Many aircraft presently are not equipped to carry out FMS/GPS procedures, so the compliance rate is unrealistic. Also, the FAA would still need to develop airport-specific procedures, which would take some time to study and determine their feasibility. This recommendation is more appropriate to pursue outside of the Part 150 process to determine local feasibility and possible inclusion in future updates.

Noise Abatement Measure 8 – Distant Noise Abatement Departure Profile (NADP): *[New measure.]* BOI would establish the Distant NADP as the recommended NADP for all runway ends. This measure would apply to jet aircraft with a maximum takeoff weight greater than 75,000 pounds. For lighter jet aircraft, the continued use of the National Business Aviation Association noise abatement departure procedures would be encouraged. Pages 6-16 and 6-17, including Table 6.8. Also included in Table 6.14. Figure 6-10.

FAA Determination: Approved as voluntary. The sponsor will coordinate with aircraft users to highlight use of the distant procedure.

Noise Abatement Measure 9 – Visual Approach Arrival Altitudes: *[New measure.]* This measure would encourage ATCT to voluntarily route aircraft on the visual approach to runways 28L and 28R at 5,000 feet MSL until the aircraft begins final approach. Page 6-19. Table 6.11 and 6.14.

FAA Determination: Approved as voluntary. The NCP states at table 6.9 that pilots are already using this procedure. This would include it in the official NCP for BOI.

LAND USE MEASURES

Land Use Measure 1 – Airport Influence Area: *[The proposed measure maintains current boundaries.]* The Boise Airport Commission should recommend to the City of Boise and Ada County to maintain the current Airport Influence Area boundaries until such time that noise levels require their expansion. Page 7-9. Figures 7-1 and 7-2. Table 7.3 and Table 7.24.

FAA Determination: Approved. The Federal government has no authority to control local land use; implementation of this measure is considered to be within the authority of the City and County.

Land Use Measure 2 – Land Use Compatibility Standards in Airport Influence Area: *[No change to existing measure.]* This measure would have the City and County refine land use compatibility standards for the four sub-districts within the Airport Influence Area. Page 7-12 through 7-15, including Table 7.15. Also included in Table 7.24.

FAA Determination: Approved. The Federal government has no authority to control local land use; implementation of this measure is considered to be within the authority of the City and County.

Land Use Measure 3 – Commercial & Industrial Zoning in Airport Influence Area: *[No change to existing measure.]* The City of Boise and Ada County maintain existing commercial and industrial zoning within the Airport Influence Area. Page 7-16 and 7-17, including Table 7.6. Also included in Table 7.24.

FAA Determination: Approved. The Federal government has no authority to control local land use; implementation of this measure is considered to be within the authority of the City and County.

Land Use Measure 4 – Zone for Compatible Use in Apple Street Area: *[No change to existing measure.]* Rezone property and land southeast of the airport and east of Apple Street from residential to industrial. Page 7-18. Table 7.7. Figure 7-3. Table 7.24.

FAA Determination: Approved. The Federal government has no authority to control local land use; implementation of this measure is considered to be within the authority of the responsible land use control body.

Land Use Measure 5 – Zone for Compatible Use in Gowen Road Area: *[No change to existing measure.]* Rezone land southeast of the airport, east of I-84 and south of East Gowen Road from residential to industrial use. Page 7-19. Table 7.8. Figure 7-3. Table 7.24.

FAA Determination: Approved. The Federal government has no authority to control local land use; implementation of this measure is considered to be within the authority of the responsible land use control body.

Land Use Measure 6 – Encourage Clustered Residential Development: *[No change to existing measure.]* Encourage clustered residential development southeast of the airport within the Airport Influence Area. Page 7-20. Table 7.9. Figure 7-3. Table 7.24.

FAA Determination: Approved. The Federal government has no authority to control local land use; implementation of this measure is considered to be within the authority of the responsible land use control body. The property is outside the DNL 65 dB noise contour, and the airport sponsor has adopted the Federal land use compatibility standard for this NCP. Federal guidelines state residential land uses within the DNL 65 dB noise contour are not compatible with airport operations.

The FAA's policy published in the Federal Register April 3, 1998, states that the FAA will not approve Federal Funding to mitigate noise-sensitive land uses constructed after October 1, 1998.

Land Use Measure 7 – Maintain Large Lot Residential Zoning: *[No change to existing measure.]* Maintain existing large lot residential zoning within the Airport Influence Area. Page 7-21. Table 7.10. Table 7.24.

FAA Determination: Approved. The Federal government has no authority to control local land use; implementation of this measure is considered to be within the authority of the responsible land use control body. The property is outside the DNL 65 dB noise contour, and the airport sponsor has adopted the Federal land use compatibility standard for this NCP. Federal guidelines state residential land uses within the DNL 65 dB noise contour are not compatible with airport operations.

The FAA's policy published in the Federal Register April 3, 1998, states that the FAA will not approve Federal Funding to mitigate noise-sensitive land uses constructed after October 1, 1998.

Land Use Measure 8 – Maintain Rural Preservation Zoning: *[No change from existing measure.]* Maintain existing Rural Preservation zoning within the Airport Influence Area. Page 7-21. Table 7.11. Table 7.24.

FAA Determination: Approved. The Federal government has no authority to control local land use; implementation of this measure is considered to be within the authority of the responsible land use control body. The property is outside the DNL 65 dB noise contour, and the airport sponsor has adopted the Federal land use compatibility standard for this NCP. Federal guidelines state residential land uses within the DNL 65 dB noise contour are not compatible with airport operations.

The FAA's policy published in the Federal Register April 3, 1998, states that the FAA will not approve Federal Funding to mitigate noise-sensitive land uses constructed after October 1, 1998.

Land Use Measure 9 – Amend Subdivision Regulations and Building Permit Applications to Require Avigation Easements: *[The proposed measure would revise the existing measure to include building permits.]* The Airport Influence Area planning standards in the City of Boise and Ada County require the dedication of avigation easements for all permitted uses. This practice has been in place for many years, and it is recommended to be continued. In addition, this measure would be required for all (residential and commercial) development within the Airport Influence Area as part of the building permit process. Amend current subdivision regulations to require dedication of avigation easements. Page 7-24. Tables 7.12 and 7.24.

FAA Determination: Approved. The Federal government has no authority to control local land use; implementation of this measure is considered to be within the authority of the responsible land use control body.

Land Use Measure 10 – Adopt Local Building Code Amendments for Noise Level Reduction Construction in the Airport Influence Area: *[No change to existing measure.]* The Airport Influence Area planning standards in the City of Boise and Ada County have required the use of noise level reduction construction techniques for noise-sensitive uses for all permitted development for many years. Both the City and County have lacked specific guidance for implementing this requirement and should adopt noise level reduction standards to supplement their building codes. Pages 7-24 through 7-26, including Table 7.13. Also included in Table 7.24.

FAA Determination: Approved. The Federal government has no authority to control local land use; implementation of this measure is considered to be within the authority of the responsible land use control body.

Land Use Measure 11 – Adoption of Project Review Guidelines for the City of Boise and Ada County: *[No change to existing measure.]* Adopt project review guidelines for rezoning special use, conditional use, planned development and variance applications. Page 7-26. Tables 7.14 and 7.24.

FAA Determination: Approved. The Federal government has no authority to control local land use; implementation of this measure is considered to be within the authority of the responsible land use control body.

Land Use Measure 12 – Fair Disclosure of Noise Impacts in the Airport Influence Area: *[This proposed measure revises the existing measure to include the promotion of both formal and informal mechanisms.]* Promote means of providing the fair disclosure of potential noise impacts in the Airport Influence Area. Page 7-26. Tables 7.15 and 7.24.

FAA Determination: Approved. The Federal government has no authority to control local land use; implementation of this measure is considered to be within the authority of the responsible land use control body.

Land Use Measure 13 – Residential Property Acquisition within 65+DNL Contour: *[Revised to include the 2009 NEM.]* Acquire 40 existing homes within the 65+ DNL contour of the 2009 NEM. Page 7-30. Tables 7.16 and 7.24.

FAA Determination: Approved. The FAA's policy published in the Federal Register April 3, 1998, states that the FAA will not approve Federal Funding to mitigate noise-sensitive land uses constructed after October 1, 1998.

Land Use Measure 14 – Undeveloped Property Acquisition within 65+DNL Contour: *[Revised to include the 2009 NEM.]* Acquire undeveloped land with potential to be developed noncompatibly within the 65+DNL contour of the 2009 NEM. Page 7-30. Tables 7.17 and 7.24.

FAA Determination: Approved. This measure would prevent the development of land available for non-compatible use, if land use preventive controls adopted elsewhere in this NCP are not effective. Acquisition of vacant land is justified as necessary to prevent new noncompatible development when new noncompatible development is highly likely and local land use controls will not prevent such development.

Land Use Measure 15 – Purchase of Avigation Easements: *[New measure.]* Avigation easements would convey the right to the use of real property for the purpose of aircraft overflights and related noise, vibrations, and other effects caused by aircraft operations. The easement would release the local jurisdiction, aircraft operators, and the airport owner and operator for the effect of aircraft operations on the property. For existing residential and non-residential noise sensitive properties within the 65+DNL contours, BOI would seek to acquire an avigation easement from the property owner. However, homes within the 65+DNL contours of the FAA-accepted (from the 1996 study) that were constructed after October 1, 1998, are not eligible for federal funding support. Page 7-37. Tables 7.20 and 7.24.

FAA Determination: Approved The FAA's policy published in the Federal Register April 3, 1998, states that the FAA will not approve Federal Funding to mitigate noise-sensitive land uses constructed after October 1, 1998.

Land Use Measure 16 – Amend Building Permit Applications to Document and Require Compliance with Noise Level Reduction Construction Standards: *[New measure.]* The City of Boise and Ada County should amend their building code and refine their application process to require the applicant to indicate compliance with proposed standards for noise level reduction construction techniques for noise sensitive construction areas within the Airport Influence Area. Airport funding in the form of a compliance rebate to cover the increase in home construction costs may offset the negative impacts of additional housing costs. Page 7-37. Tables 7.21 and 7.24.

FAA Determination: Approved in part, Disapproved in part. Amendments to building codes and local application procedures is approved. The FAA believes that prevention of additional land uses within the DNL 65 dB contour is highly preferable over allowing such uses even with sound attenuation, revised building codes or avigation easements. If prevention of incompatible development is not feasible, the airport sponsor and local land use jurisdiction are urged to pursue all possible avenues to discourage new residential development within these levels of noise exposure.

Funding incentives for new construction outside the DNL 65 dB is **disapproved**. Section 189 of Public Law 108-176, Vision 100-Century Of Aviation Reauthorization Act, December 12, 2003, specifically prohibits FAA approval of Part 150 program measures that require AIP funding to mitigate aircraft noise outside DNL 65 (through Fiscal Year 2007). Section 189 does not preclude the use of airport revenue or PFC funding outside DNL 65 dB.

Land Use Measure 17 – Improve City of Boise Application Process To Promote Early Recognition of Airport Influence Area within all Application Processes: *[New measure.]* The City of Boise could improve awareness of Airport Influence Areas at time of application submittal rather than at time of first comment review. Page 7-37. Tables 7.22 and 7.24.

FAA Determination: Approved. The Federal government has no authority to control local land use; implementation of this measure is considered to be within the authority of the responsible land use control body.

Land Use Measure 18 – Designate Airport Staff Liaison for Planning and Zoning Building Departments of both City of Boise and Ada County: *[New Measure.]* Airport staff should play a greater role in reviewing and participating in the development approval process inside the boundaries of the Airport Influence Area. Page 7-37. Tables 7.23 and 7.24.

FAA Determination: Approved. The Federal government has no authority to control local land use; implementation of this measure is considered to be within the authority of the responsible land use control body.

PROGRAM MEASURES

Continuing Program Measure 1 – Noise Complaint System: *[No change to existing measure.]* Boise Airport would maintain a system for recording and disseminating information on noise complaints. Pages 8-1, 8-5 and Table 8.1.

FAA Determination: Approved.

Continuing Program Measure 2 – Public Information Program: *[New measure.]* This measure would establish a program to enhance public awareness of aircraft noise issues and the Noise Compatibility Program. Pages 8-1, 8-5 and Table 8.1.

FAA Determination: Approved.

Continuing Program Measure 3 – Airport Noise Committee: *[New measure.]* This measure would establish a standing committee to encourage dialogue between community representatives, aeronautical users, and the Boise Airport. Pages 8-1, 8-5 and Table 8.1.

FAA Determination: Approved.

Continuing Program Measure 4 – Airport Noise Relations Staff: *[Revised measure.]* Boise Airport would designate a staff position with responsibility for aircraft noise and land use compatibility issues, in order to facilitate implementation of the NCP measures, coordination with the City of Boise and Ada County, and neighboring communities. Pages 8-1, 8-5 and Table 8.1.

FAA Determination: Approved.

Continuing Program Measure 5 – Periodic Evaluation of Noise Exposure Maps: *[New measure.]* This evaluation would serve to update the NEMs when needed to account for significant changes in the airport operations or procedures at the Boise Airport. Pages 8-1, 8-5 and Table 8.1. Note: The previous NCP committed the airport sponsor to updating the NCP as necessary.

FAA Determination: Approved.

Boise Airport - Part 150 Study Update

Executive Summary

The Federal Aviation Administration (FAA) has approved the updated noise exposure maps and the noise compatibility program (NCP). The NCP is intended to reduce the impact of aircraft noise on people who live and work near Boise Airport. The Airport, owned and operated by the City of Boise, is the busiest air terminal in Idaho, serving 3.0 million passengers a year.

In 2004, Boise Airport completed an update to its Part 150 aircraft noise and land use compatibility program. The two central elements of the Part 150 Study Update are:

- Noise Exposure Maps, showing existing (2004) and forecast (2009) noise exposure levels due to aircraft operations at Boise Airport.
- Noise Compatibility Program, or NCP, which including noise abatement, land use, and continuing program measures to improve aircraft noise and land use compatibility.

The study presents current and future land uses in communities around the Airport and assesses the compatibility of that land use with the current and probable future noise levels. The study uses this assessment to formulate a realistic plan of land use and noise abatement measures, as outlined in the NCP, to reduce noise and its impact on people.

The Federal Aviation Administration (FAA) accepted the Noise Exposure Maps in August 2005. Then in February 2006, the FAA approved many of the elements of the comprehensive Noise Compatibility Program, which consists of 30 measures that were approved in whole or in part. The NCP includes 7 measures to limit aircraft noise; 18 measures to encourage more appropriate zoning and land use in noisy areas; and 5 measures to provide better community coordination and responses to complaints.

The study calculated aircraft noise levels, identified land uses near the Airport, and forecast the changes that are expected in the future. (The study accounts for the temporary decline in aviation activity that followed the 2001 national economic recession as well as the terrorist attacks of September 11, 2001.) A wide variety of noise abatement and land use measures were evaluated to determine which are most likely to provide the greatest benefits to the largest number of people in the future. These measures were recommended to the FAA in the final report.

STUDY PROCESS

A 14 CFR Part 150 Study, as established in the Code of Federal Regulations, is an effort to improve the overall noise environment near an airport without shifting noise from one residential community to another. In 1996, the City of Boise completed a Part 150 Study, which has been successful in reducing noise impacts for residents. In fact, Boise Airport has among the fewest number of people (about 82 individuals today) affected by significant aircraft noise (> 65 DNL) of any airport of its size in the United States.

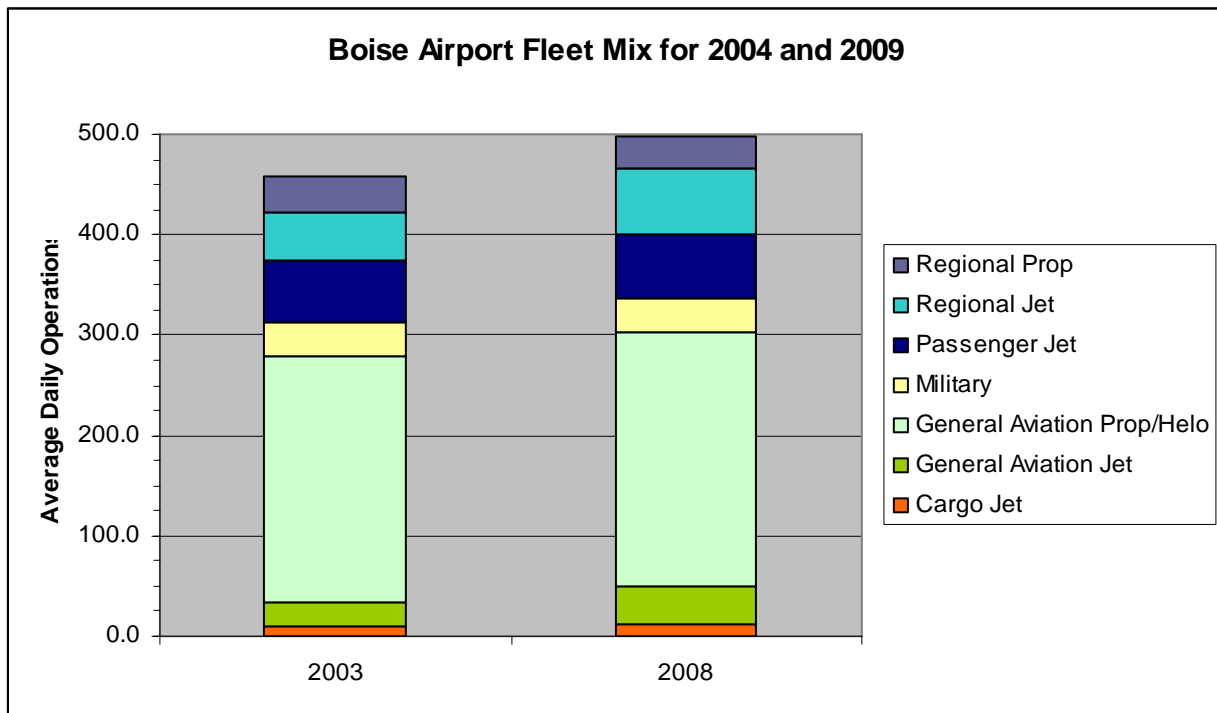
Throughout the recently completed study, the City consulted with a 20-member Advisory Committee of representatives of the community, government agencies, and other Airport stakeholders. The City also held three public workshops to explain the study process and obtain feedback on study results and proposed noise compatibility measures.

Aircraft Operations

The average number of operations (take-offs and landings) at Boise Airport is expected to increase about 1.7% from the current level of 458 per day to 498 per day by 2009. The types of

Boise Airport - Part 150 Study Update
Executive Summary

aircraft that operate at Boise Airport, known as the fleet mix, are expected to remain relatively stable as shown in the following chart:



Figures ES-1 and ES-2 show typical flight tracks of aircraft operations at Boise Airport, as well as runway use by the percentage of all operations that flow in a given direction. While flight tracks, which are generated by a statistical average of actual radar flight tracks, cover much of the area surrounding the Airport, the flight tracks are concentrated in arrival and departure corridors that are in line with the runways. The fleet mix, number of operations, runway use, and flight tracks, are entered into the Integrated Noise Model (or INM, which is the FAA’s computer program that calculates noise exposure contours presented in this study). INM accounts for variations in aircraft noise due to different models of aircraft, flight paths, seasonal variations in the weather, terrain, and the cumulative impacts of noise from multiple flight operations over a single geographic area.

Noise Exposure Maps

Figures ES-3 and ES-4 show the 2004 and 2009 Noise Exposure Maps at Boise Airport, as accepted by FAA. The Noise Exposure Maps show existing areas of aircraft noise, known as “contours” (black lines), overlaid on land uses. Land uses near the Airport include residential (yellow and tan), commercial/industrial (red and gray) and parks and open space (light and dark green). This information was the basis for the technical evaluation of aircraft noise abatement measures to determine the most effective ways to reduce the number of people exposed to noise in residential areas. Because of the relatively small number of people (82) who are currently impacted by significant aircraft noise (> 65 DNL), the study focused on land use measures, such as zoning standards and updates to building code requirements, which will minimize the number of people who could be exposed to aircraft noise in the future.

Today there are an estimated 31 homes within the geographic areas, or contours, around Boise Airport where average daily noise levels (DNL) are 65 decibels or greater. Aircraft noise begins

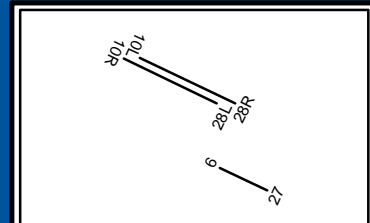
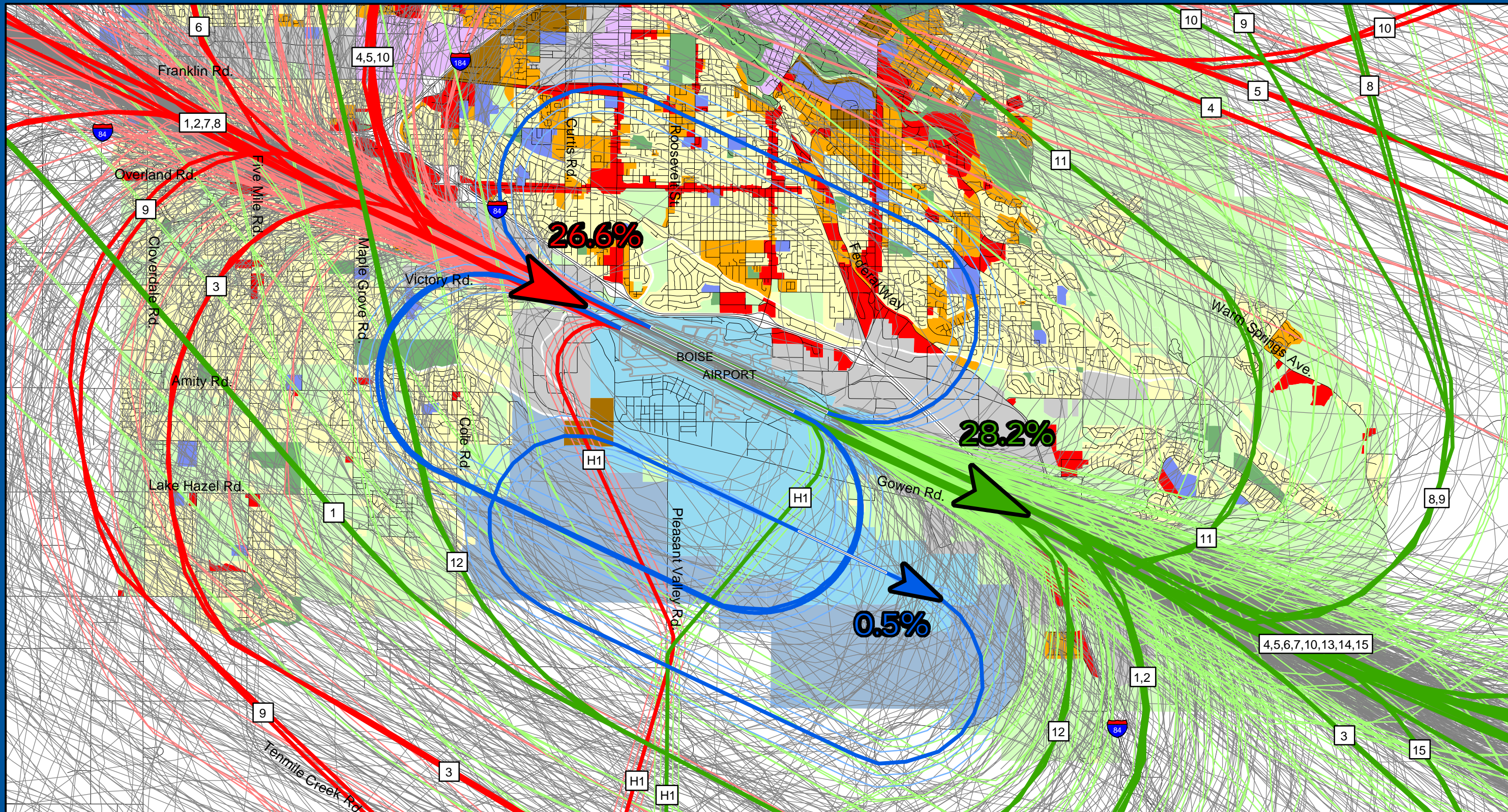
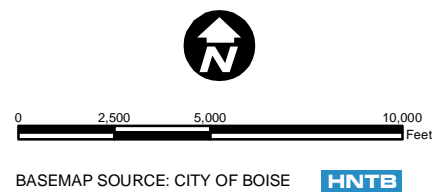


FIGURE ES-1
BOISE AIRPORT
14 CFR PART 150 UPDATE
RUNWAY 9, 10L, & 10R
MODELED & RADAR FLIGHT TRACKS



LOW DENSITY RESIDENTIAL LAND USE	VACANT/OPEN SPACE	DEPARTURE FLIGHT TRACK - PRIMARY	TOUCH & GO FLIGHT TRACK - PRIMARY
HIGH/MEDIUM DENSITY RESIDENTIAL LAND USE	AIRPORT PROPERTY	DEPARTURE FLIGHT TRACK - DISPERSED	TOUCH & GO FLIGHT TRACK - DISPERSED
COMMERCIAL LAND USE	AIRPORT CONSERVATION	ARRIVAL FLIGHT TRACK - PRIMARY	RADAR FLIGHT TRACK
INDUSTRIAL LAND USE	PARK	ARRIVAL FLIGHT TRACK - DISPERSED	
MIXED LAND USE	SCHOOL		
PUBLIC FACILITY/INSTITUTIONAL LAND USE	STREET CENTERLINE		

NOTE: THERE IS ONLY ONE SET OF TOUCH & GO TRACKS PER RUNWAY END

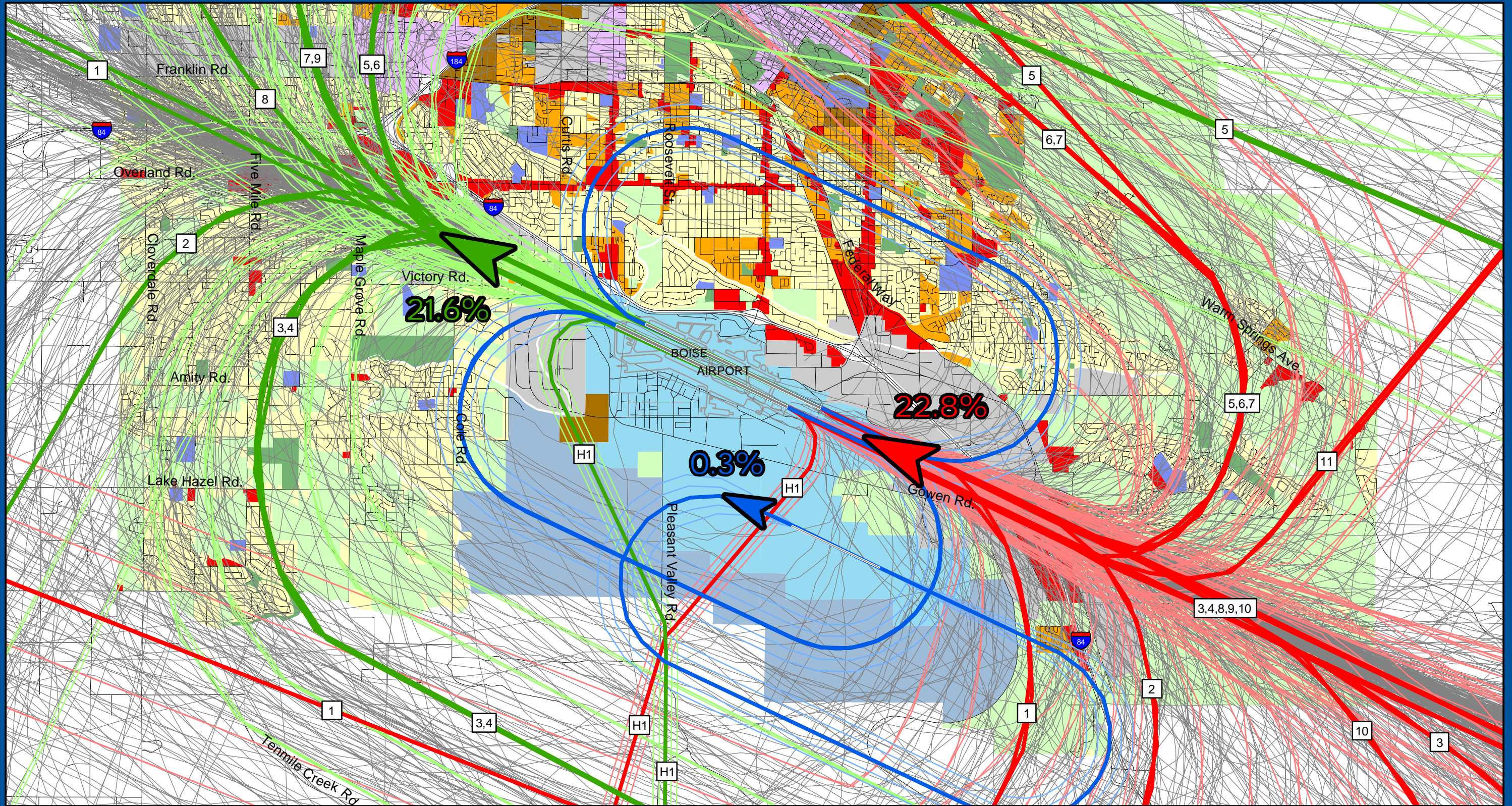
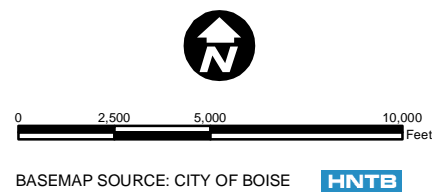
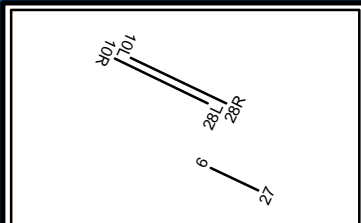
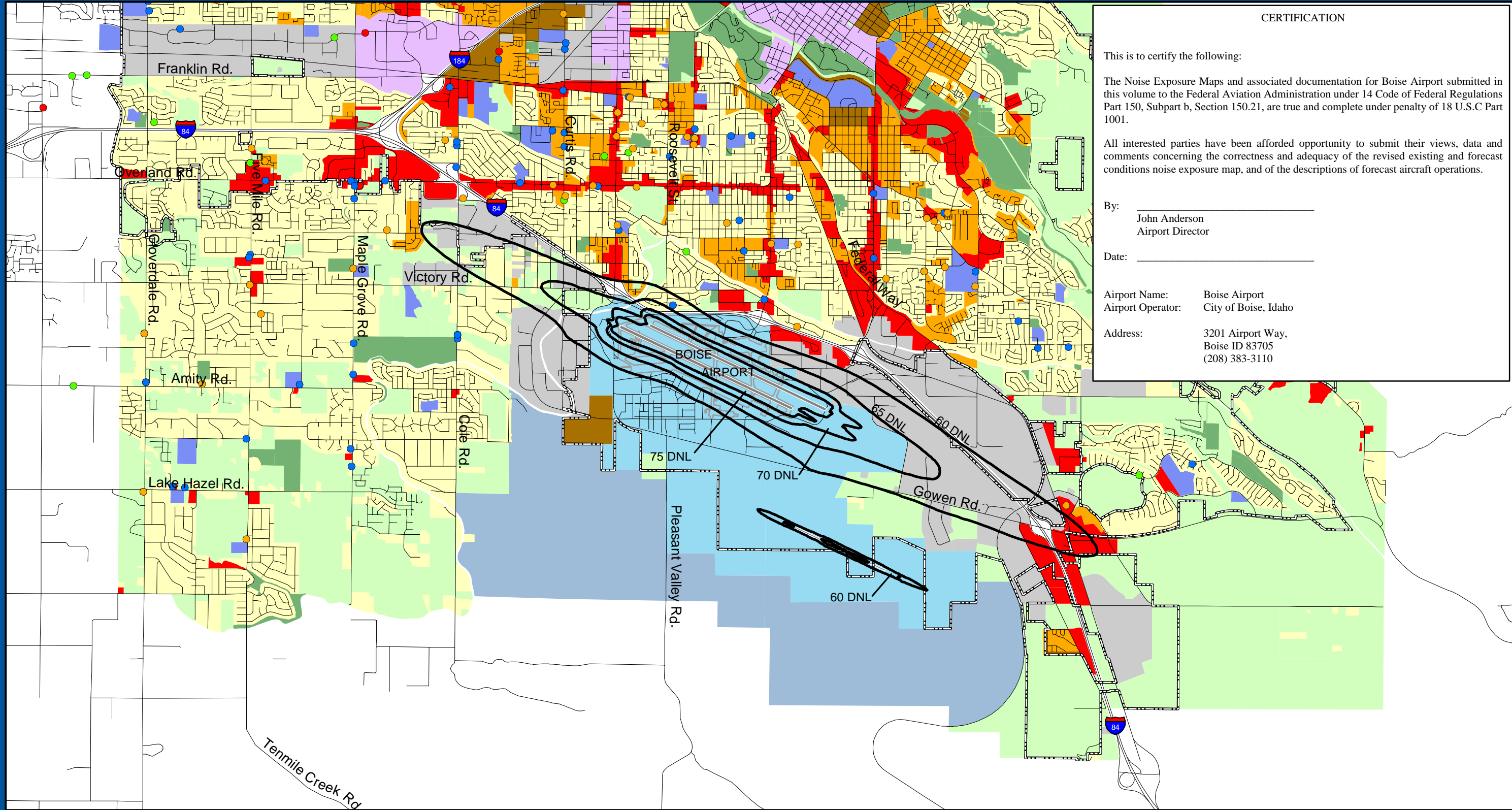


FIGURE ES-2
BOISE AIRPORT
14 CFR PART 150 UPDATE
RUNWAY 27, 28L, & 28R
MODELED & RADAR FLIGHT TRACKS



LOW DENSITY RESIDENTIAL LAND USE	OPEN SPACE	DEPARTURE FLIGHT TRACK - PRIMARY	TOUCH & GO FLIGHT TRACK - PRIMARY
HIGH/MEDIUM DENSITY RESIDENTIAL LAND USE	AIRPORT PROPERTY	DEPARTURE FLIGHT TRACK - DISPERSED	TOUCH & GO FLIGHT TRACK - DISPERSED
COMMERCIAL LAND USE	AIRPORT CONSERVATION	ARRIVAL FLIGHT TRACK - PRIMARY	TOUCH & GO FLIGHT TRACK - RADAR FLIGHT TRACK
INDUSTRIAL LAND USE	PARK	ARRIVAL FLIGHT TRACK - DISPERSED	
MIXED LAND USE	SCHOOL		
PUBLIC FACILITY/INSTITUTIONAL LAND USE	STREET CENTERLINE		

NOTE: THERE IS ONLY ONE SET OF TOUCH & GO TRACKS PER RUNWAY END



CERTIFICATION

This is to certify the following:

The Noise Exposure Maps and associated documentation for Boise Airport submitted in this volume to the Federal Aviation Administration under 14 Code of Federal Regulations Part 150, Subpart b, Section 150.21, are true and complete under penalty of 18 U.S.C Part 1001.

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

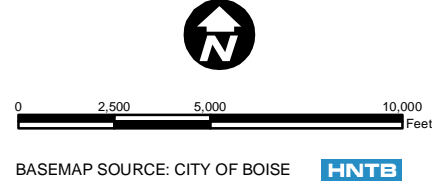
By: _____
 John Anderson
 Airport Director

Date: _____

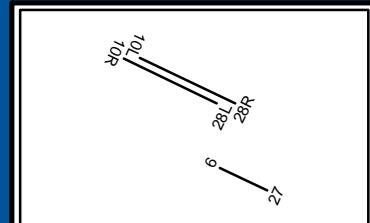
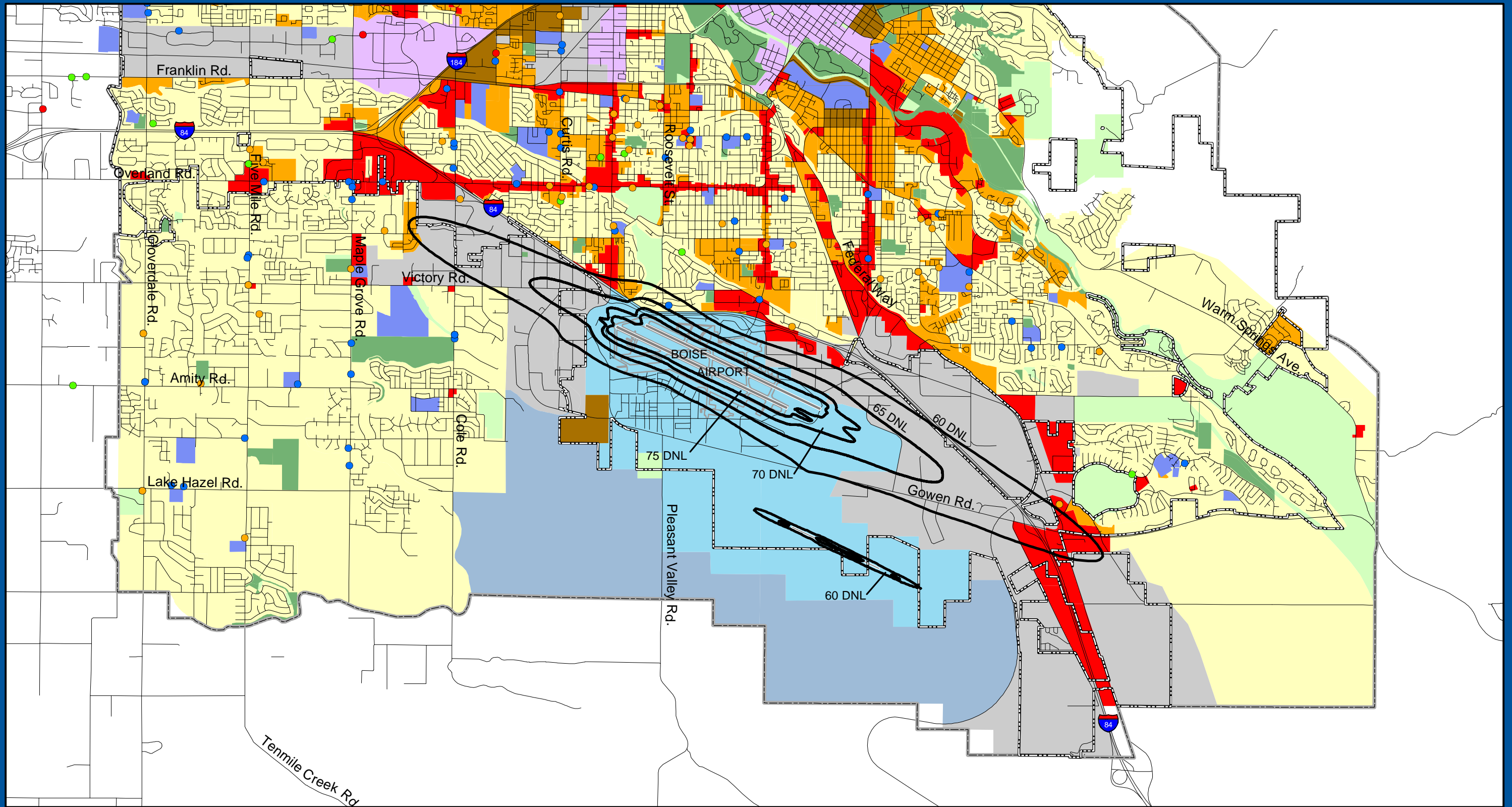
Airport Name: Boise Airport
 Airport Operator: City of Boise, Idaho
 Address: 3201 Airport Way,
 Boise ID 83705
 (208) 383-3110



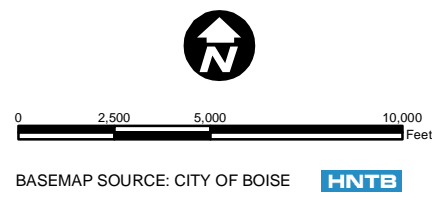
**FIGURE ES-3
 BOISE AIRPORT
 14 CFR PART 150 UPDATE
 2004 NOISE EXPOSURE
 MAP ON EXISTING LAND USE**



LOW DENSITY RESIDENTIAL LAND USE	OPEN SPACE	STREET CENTERLINE	PRE-SCHOOL/KINDERGARTEN
HIGH/MEDIUM DENSITY RESIDENTIAL LAND USE	AIRPORT PROPERTY	BOISE CITY LIMITS	NURSING HOME
COMMERCIAL LAND USE	AIRPORT CONSERVATION		HOSPITAL
INDUSTRIAL LAND USE	PARK		PLACE OF WORSHIP
MIXED LAND USE	SCHOOL		CEMETERY
PUBLIC FACILITY/INSTITUTIONAL LAND USE	2004 DNL CONTOUR		



**FIGURE ES-4
BOISE AIRPORT
14 CFR PART 150 UPDATE
2009 NOISE EXPOSURE
MAP ON FUTURE LAND USE**



LOW DENSITY RESIDENTIAL LAND USE	OPEN SPACE	STREET CENTERLINE	PRE-SCHOOL/KINDERGARTEN
HIGH/MEDIUM DENSITY RESIDENTIAL LAND USE	AIRPORT PROPERTY	BOISE CITY LIMITS	NURSING HOME
COMMERCIAL LAND USE	AIRPORT CONSERVATION	AREA OF IMPACT	HOSPITAL
INDUSTRIAL LAND USE	PARK		PLACE OF WORSHIP
MIXED LAND USE	SCHOOL		CEMETERY
PUBLIC FACILITY/INSTITUTIONAL LAND USE	2009 DNL CONTOUR		

* FUTURE LAND USE SHOWN

Boise Airport - Part 150 Study Update
Executive Summary

to interfere with everyday activities, like talking on the phone or watching TV, at approximately 65 DNL. The NCP is designed to continue the City's efforts to minimize aircraft noise and limit the types of development, such as homes, that are not compatible within the 65+ DNL contour. By 2009, with the NCP in place, there would be an estimated 9 additional homes (currently housing 23 people) within the 65+ DNL contour due to the gradual increase in the number of aircraft operations forecast at the Airport. (The 60-64 DNL contour is also shown for purposes of information; however, FAA approval of noise mitigation measures is limited only to areas within the 65+ DNL contour.)

STUDY RESULTS

The Part 150 Study found that a continued focus on improvements to zoning, designated airport influence areas, and future land use compatibility will be the most effective way to minimize the number of people affected by aircraft noise near Boise Airport. The study also found that continuing measures to improve coordination and information exchange between the public, the City of Boise and Ada County, and the Airport will help implement the NCP more effectively.

The Noise Compatibility Program included 32 measures, of which 30 measures were approved in whole or part by the FAA. Because of the success of the 1996 Part 150 Study, 19 of the measures in the newly approved NCP are carried over from 1996 with minor modifications, as needed. Significantly, the 1996 study found that residents near the Airport did not wish to participate in a home sound insulation program; therefore, this measure is not included in the new NCP.

Noise Compatibility Program: Aircraft Noise Abatement Measures		
Measure		FAA Determination
1	Designate Runway 10L/R as preferred for departing aircraft and Runway 28L/R as preferred for arriving aircraft as weather allows.	Approved as voluntary.
2	Direct departing aircraft from Runways 28L and 28R to fly straight-out headings until 5,000 feet altitude.	Approved as voluntary.
3	Direct non-jet aircraft weighing more than 12,500 lbs. and heading north to fly straight-out headings until 4,500 feet altitude.	Approved as voluntary.
4	Require departing aircraft using visual flight rules (VFR) and heading north to fly straight-out headings to end of runway.	Approved as voluntary.
5	Require jet departures on Runways 10L and 10R with destinations to the north to fly straight-out headings to 5,000 feet altitude.	Approved as voluntary.
6	Establish voluntary southern arrival approach to reduce overflights of residential areas.	Disapproved, due to lack of noise benefit and operational issues.
7	Use satellite navigation aids to concentrate aircraft arrivals and departures above I-84 and areas with fewer homes.	Disapproved, due to lack of demonstrated noise benefits.
8	Implement noise abatement takeoff procedures (i.e., thrust and flap settings) for departing jet aircraft.	Approved as voluntary.
9	Establish voluntary routing of arriving aircraft to Runways 28L and 28R to maintain 5,000 feet altitude until final approach, as permitted by weather and Air Traffic Control.	Approved as voluntary.

Boise Airport - Part 150 Study Update
Executive Summary

Noise Compatibility Program: <i>Land Use Measures</i>		
Measure		FAA Determination
1	Maintain the boundaries of currently designated Airport Influence Area.	Approved.
2	Refine land use compatibility standards for the Airport Influence Area to prevent new residential development that would be affected by aircraft noise.	Approved.
3	Maintain and preserve commercial and industrial land use in areas affected by aircraft noise.	Approved.
4	Rezone land southeast of the Airport and east of Apple Street from residential to industrial.	Approved.
5	Rezone land southeast of the Airport, east of I-84 and south of East Gown Road from residential to industrial.	Approved.
6	Maintain current clustered development zoning to minimize residential expansion southeast of the Airport.	Approved.
7	Maintain current large lot residential zoning to minimize residential expansion.	Approved.
8	Maintain rural preservation zoning to minimize residential expansion.	Approved.
9	Amend building permit and subdivision regulations to require avigation easements with new permits and approvals.	Approved.
10	Amend building codes in Airport Influence Area to set interior noise standards and sound mitigation construction measures for new buildings with noise-sensitive uses.	Approved.
11	Adopt noise-related guidelines and review criteria for city and county project review and planning processes.	Approved.
12	Develop fair disclosure procedures to inform prospective home buyers and renters about potential aircraft noise impacts.	Approved.
13	Acquire 40 existing homes that would be in the 65+ DNL in 2009.	Approved.
14	Acquire undeveloped land near Airport to insure compatible use.	Approved.
15	Acquire avigation easements from property owners within 65+ DNL to improve land use compatibility.	Approved.
16	Require building permit applicants to show new buildings in the Airport Influence Area will comply with interior noise level standards.	Approved in part; funding incentives for home construction outside the 65 DNL is disapproved.
17	Improve awareness of special zoning and building requirements related to the Airport Influence Area for development applicants.	Approved.
18	Designate Airport noise staff liaison to be more active in development processes for land near Airport.	Approved.

Boise Airport - Part 150 Study Update
Executive Summary

Noise Compatibility Program: Continuing Program Measures		
Measure		FAA Determination
1	Implement an improved system to record, respond and track noise complaints.	Approved.
2	Implement an improved public information program, including website enhancements, newsletters and public meetings.	Approved.
3	Create an Airport noise committee that would include representatives of the community, Airport stakeholders and Airport staff.	Approved.
4	Designate Airport staff position responsible for handling noise-related issues.	Approved.
5	Conduct periodic evaluation of noise exposure to determine the need for update of the Noise Exposure Maps.	Approved.

Implementing the Program

The city is now working to implement the Noise Compatibility Program. Airport staff will join forces with other departments in the City of Boise and Ada County to enhance the Airport Influence Area, provide building code information to planning staff, and support other land use and continuing program measures approved by the FAA. For example, as shown in **Figure ES-5**, the Airport Influence Area surrounding Boise Airport helps improve zoning practices and land use controls to minimize noise impacts for people who live and work near the Airport. The City will work with FAA's air traffic control tower staff to improve noise abatement procedures for aircraft operations. In addition, the Airport will begin the process of applying for federal funds to implement the NCP.

For more information, visit www.boise-airport.com, or contact us at:

Boise Airport
3201 Airport Way
Boise, Idaho 83705
Phone: (208) 383-3110
fax: (208) 343-9667
email: boi@cityofboise.org

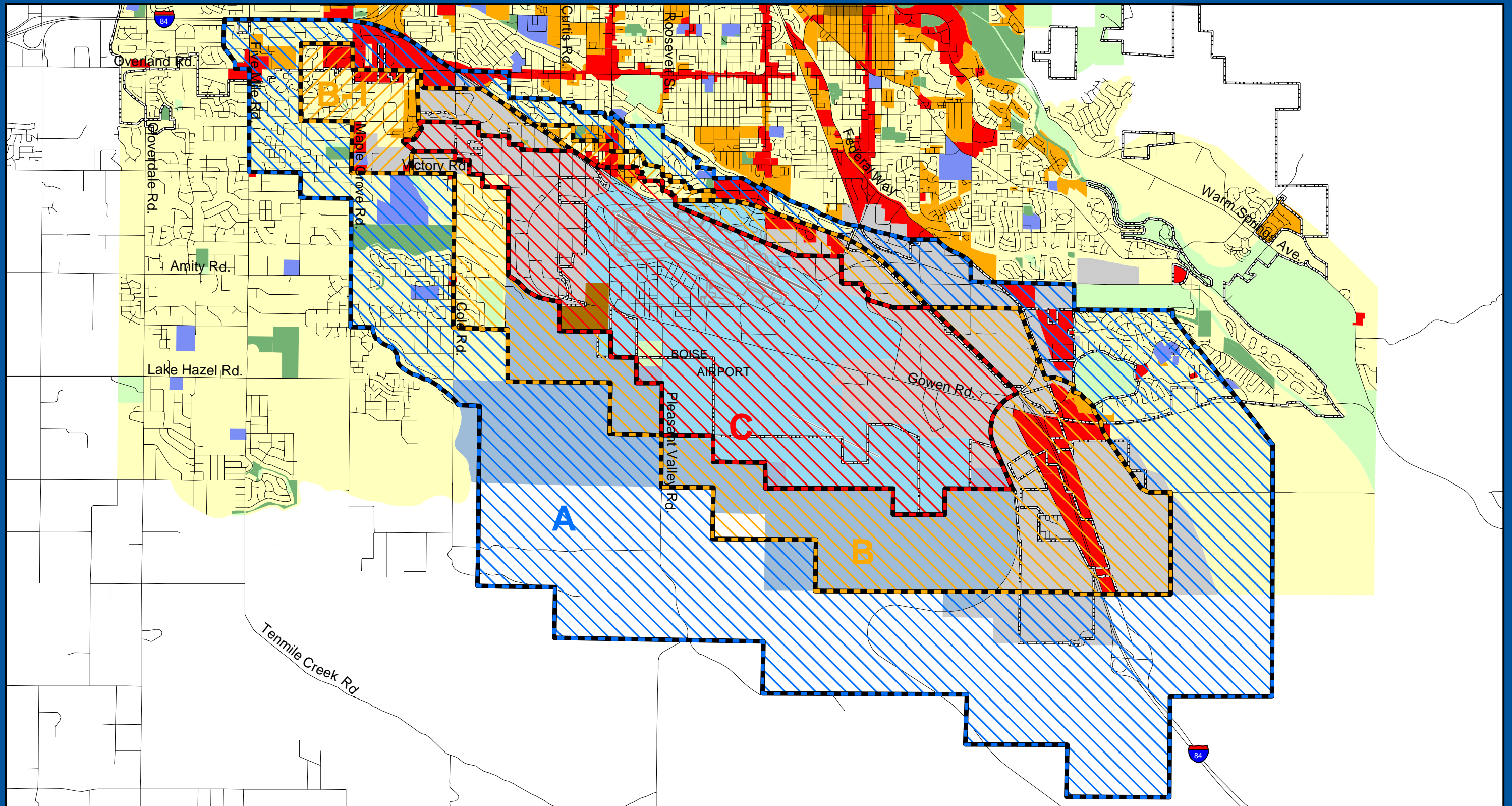
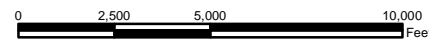
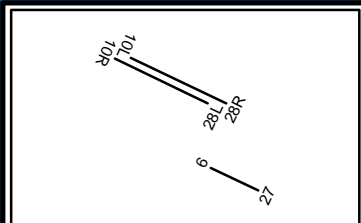


FIGURE ES-5
BOISE AIRPORT
14 CFR PART 150 UPDATE
AIRPORT INFLUENCE AREA
ON FUTURE LAND USE



BASEMAP SOURCE: CITY OF BOISE **HNTB**

- | | | |
|--|----------------------|------------------------------|
| LOW DENSITY RESIDENTIAL LAND USE | OPEN SPACE | STREET CENTERLINE |
| HIGH/MEDIUM DENSITY RESIDENTIAL LAND USE | AIRPORT PROPERTY | AIRPORT INFLUENCE AREA : A |
| COMMERCIAL LAND USE | AIRPORT CONSERVATION | AIRPORT INFLUENCE AREA : B |
| INDUSTRIAL LAND USE | PARK | AIRPORT INFLUENCE AREA : B-1 |
| MIXED LAND USE | SCHOOL | AIRPORT INFLUENCE AREA : C |
| PUBLIC FACILITY/INSTITUTIONAL LAND USE | BOISE CITY LIMITS | |



CERTIFICATION

This is to certify the following:

The Noise Exposure Maps and associated documentation for Boise Airport submitted in this volume to the Federal Aviation Administration under Title 14 Code of Federal Regulations Part 150, Subpart b, Section 150.21, are true and complete under penalty of Title 18 United States Code Part 1001.

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

By: _____

Date: _____

Airport Name: Boise Airport
Airport Operator: City of Boise, Idaho

Address: 3201 Airport Way,
Boise ID 83705
(208) 383-3110

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Boise Airport 14 CFR Part 150 Study Update

Noise Exposure Map Checklist

Source: Federal Aviation Administration, 1989

Airport Name: <u>Boise Airport</u>	REVIEWER: _____		
	Yes/No/NA	Page/Other Reference	Notes/ Comments
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	Chapter 2	
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?	Yes	Section 1.1	Year 2003 and 2008 forecasts used to develop the 2004 and 2009 NEMs
C. If the NEM and NCP are submitted together:			
1. Has the airport operator indicated whether the 5-year map is based on 5-year contours without the program vs. contours if the program is implemented?	Yes	Section 5.1 and 6.5	No change with NCP
2. If the 5-year map is based on program implementation:			
a. are the specific program measures which are reflected on the map identified?	NA		
b. does the documentation specifically describe how these measures affect land use compatibility's depicted on the map?	NA		
3. If the 5-year NEM does not incorporate program implementation, has the airport operator included an additional NEM for FAA determination after the program is approved which shows program implementation conditions and which is intended to replace the 5-year NEM as the new official 5-year map?	NA		
IV. MAP SCALE, GRAPHICS, AND DATA REQUIREMENTS: [A150.101, A150.103, A150.105, 150.21(A)]			
A. Are the maps of sufficient scale to be clear and readable (they must be not be less than 1" to 8,000'), and is the scale indicated on the maps?	Yes		Scale is 1" = 5000'
B. Is the quality of the graphics such that required information is clear and readable?	Yes		
C. Depiction of the airport and its environs.			
1. Is the following graphically depicted to scale on both the existing condition and 5-year maps:			
a. airport boundaries	Yes		Airport Property shown
b. runway configurations with runway and numbers	Yes		

Boise Airport 14 CFR Part 150 Study Update

Noise Exposure Map Checklist

Source: Federal Aviation Administration, 1989

Airport Name: <u>Boise Airport</u>	REVIEWER: _____		
	Yes/No/NA	Page/Other Reference	Notes/ Comments
I. IDENTIFICATION AND SUBMISSION OF MAP DOCUMENT			
A. Is this submittal appropriately identified as one of the following, submitted under Part 150:			
1. a NEM only	No		
2. a NEM and NCP	Yes	Sponsor Certification	
3. a revision to NEMs which have previously been determined by FAA to be in compliance with Part 150?	Yes		
B. Is the airport name and the qualified airport operator identified?	Yes	Chapter 1, Sponsor 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	Letter of Transmittal	
II. CONSULTATION: [150.21(B), A150.105(A)]			
A. Is there a narrative description of the consultation accomplished, including opportunities for public review and comment during map development?	Yes	Chapter 9	
B. Identification:			
1. Are the consulted parties identified?	Yes	Chapter 9	
2. Do they include all those required by 150.21(b) and 150.105(a)?	Yes	Chapter 9	
C. Does the documentation include the airport operator's certification, and evidence to support it, that interested persons have been afforded adequate opportunity to submit their views data, and comments during map development and in accordance with 150.21(b)?	Yes	Certification on NEMs and following Title page. See also Chapter 9 and Appendix E	
D. Does the document indicate whether written comments were received during consultation and, if there were comments, that they are on file with the FAA region?	Yes	Chapter 9	Comments provided in Appendix E
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	Section 5.1	Figures 5-1 and 5-2
B. Map currency:			
1. Does the existing condition map year match the year on the airport operator's submittal letter?	Yes		NEMs relabeled for 2004 and 2009

Boise Airport 14 CFR Part 150 Study Update

Noise Exposure Map Checklist

Source: Federal Aviation Administration, 1989

Airport Name: <u>Boise Airport</u>	REVIEWER: _____		
	Yes/No/NA	Page/Other Reference	Notes/ Comments
2. Does the depiction of the off-airport data include:			
a. a land use base map depicting streets and other identifiable geographic features	Yes		
b. area within 65 DNL (or beyond, at local discretion.)	Yes		60 DNL is provided for community reference and preventive land use measures
c. clear delineation of geographic boundaries and the names of all jurisdictions with planning and land use control authority within the 65 DNL (or beyond, at local discretion).	Yes		
D. 1. Continuous contours for at least 65, 70, and 75 DNL?	Yes		
2. Based on current airport and operational data for the existing condition year NEM, and forecast data for the 5-year NEM?	Yes	Chapter 2 and 3	
E. Flight tracks for the existing condition and 5-year forecast timeframes (these may be on supplemental graphics which must use the same land use base map as the existing condition and 5-year NEM), which are numbered to correspond to accompanying narrative?	Yes	Section 3.2.5	Based on radar data
F. Locations of any noise monitoring sties (these may be on supplemental graphics which must use the same land use base map as the official NEMs)	Yes	Appendix C	Temporary monitoring sites
G. Non-compatible land use identification:			
1. Are non-compatible land uses within at least the 65 DNL depicted on the maps?	Yes		
2. Are noise sensitive public buildings identified?	Yes		
3. Are the non-compatible uses and noise sensitive public buildings readily identifiable and explained on the map legend?	Yes		
4. Are compatible land uses, which would normally be considered non-compatible, explained in the accompanying narrative?	NA		
V. NARRATIVE SUPPORT OF MAP DATA: [150.21(A), A150.1, A150.101, A150.103]			
A. 1. Are the technical data, including data sources, on which the NEMs are based, adequately described in the narrative?	Yes	Chapters 3 and 4	

Boise Airport 14 CFR Part 150 Study Update

Noise Exposure Map Checklist

Source: Federal Aviation Administration, 1989

Airport Name: <u>Boise Airport</u>	REVIEWER: _____		
	Yes/No/NA	Page/Other Reference	Notes/ Comments
2. Are the underlying technical data and planning assumptions reasonable?	Yes	Chapters 3 and 4	
B. Calculation of Noise Contours:			
1. Is the methodology indicated?	Yes	Chapter 3	
a. is it FAA approved?	Yes		INM 6.1
b. was the same model used for both maps?	Yes		
c. has AEE approval been obtained for use of a model other than those which have previous blanket FAA approval?	NA		
2. Correct use of noise models:			
a. does the documentation indicate the airport operator has adjusted or calibrated FAA-approved noise models or substituted one aircraft type for another?	No		INM 6.1 substitution list used
b. if so, does this have written approval from AEE?	NA		
3. If noise monitoring was used, does the narrative indicate that Part 150 guidelines were followed?	Yes	Appendix C	
4. For noise contours below 65 DNL, does the supporting documentation include explanation of local reasons? (Narrative explanation is desirable but not required.)	Yes	Section 4.2	
C. Non-Compatible Land Use Information:			
1. Does the narrative give estimates of the number of people residing in each of the contours (65, 70 and 75 DNL, at a minimum) for both the existing condition and 5-year maps?	Yes	Section 5.1	Table 5.1
2. Does the documentation indicate whether Table 1 of Part 150 was used by the airport operator?	Yes	Section 4.1 describes Federal compatibility guidelines	Table 4.1 provides Federal criteria
a. If a local variation to Table 1 was used:			
(1) does the narrative clearly indicate which adjustments were made and the local reasons for doing so?	NA	Sections 4.2 and 7.2.2	Airport Influence Area uses the 60 DNL for preventive land use measures
(2) does the narrative include the airport operator's complete substitution for Table 1?	NA		

Boise Airport 14 CFR Part 150 Study Update

Noise Exposure Map Checklist

Source: Federal Aviation Administration, 1989

Airport Name: <u>Boise Airport</u>	REVIEWER: _____		
	Yes/No/NA	Page/Other Reference	Notes/ Comments
3. Does the narrative include information on self-generated or ambient noise where compatible/ non-compatible land use identifications consider non-airport/aircraft sources?	NA		
4. Where normally non-compatible land uses are not depicted as such on the NEMs, does the narrative satisfactorily explain why, with reference to the specific geographic areas?	NA		
5. Does the narrative describe how forecasts will affect land use compatibility?	Yes	Sections 4.3 and 5.1	
VI. MAP CERTIFICATIONS: [150.21(B), 150.21(E)]			
A. Has the operator certified in writing that interested persons have been afforded adequate opportunity to submit views, data, and comments concerning the correctness and adequacy of the draft maps and forecasts?	Yes	Certification following Title page and on NEMs in Chapter 5	
B. Has the operator certified in writing that each map and description of consultation and opportunity for public comment are true and complete?	Yes	Certification following Title page and on NEMs in Chapter 5	

Boise Airport 14 CFR Part 150 Study Update
Noise Compatibility Program Checklist

Source: Federal Aviation Administration, 1989

Airport Name: <u>Boise Airport</u>	REVIEWER: _____		
	Yes/No/NA	Page/Other Reference	Notes/Comments
I. IDENTIFICATION and SUBMISSION of PROGRAM:			
A. Submission is properly identified:			
1. Part 150 NCP?	No		
2. NEM and NCP together?	Yes		
3. Program Revision?	NA		
B. Airport and Airport Operator's name identified?	Yes	Chapter 1, Sponsor Certification	Section 1.4 describes roles and responsibilities
C. NCP transmitted by airport operator's cover letter?	Yes		
II. CONSULTATION: [150.23]			
A. Documentation includes narrative of public participation and consultation process?	Yes	Chapter 9	
B. Identification of consulted parties:			
1. all parties in 150.23(c) consulted?	Yes	Chapter 9	
2. public and planning agencies identified?	Yes	Chapter 9	
3. agencies in 2., above, correspond to those indicated on the NEM?	Yes	NCP and NEM combined effort	
C. Satisfies 150.23(d) requirements:			
1. documentation shows active and direct participation of parties in B., above?	Yes	Chapter 9, Appendix E	
2. active and direct participation of general public?	Yes	Chapter 9, Appendix E	
3. participation was prior to and during development of NCP and prior to submittal to FAA?	Yes	Chapter 9, Appendix E	Public Workshops and Advisory Committee meetings
4. indicates adequate opportunity afforded to submit views, data, etc.?	Yes	Chapter 9, Appendix E	Public Workshops and Advisory Committee meetings
D. Evidence included of notice and opportunity for a public hearing on NCP?	Yes	Chapter 9	

Boise Airport 14 CFR Part 150 Study Update
Noise Compatibility Program Checklist

Source: Federal Aviation Administration, 1989

Airport Name: <u>Boise Airport</u>	REVIEWER: _____		
	Yes/No/NA	Page/Other Reference	Notes/Comments
E. Documentation of comments:			
1. includes summary of public hearing comments, if hearing was held?	Yes	Chapter 9, Appendix E	Verbatim transcript provided
2. includes copy of all written material submitted to operator?	Yes	Chapter 9, Appendix E	
3. includes operator's response/disposition of written and verbal comments?	Yes	Appendix E	Responses provided in tabular format.
F. Informal agreement received from FAA on flight procedures?	Yes		
III. NOISE EXPOSURE MAPS: [150.23, B150.3; 150.35(f)] (This section of the checklist is not a substitute for the Noise Exposure Map checklist. It deals with maps in the context of the Noise Compatibility Program submission.)			
A. Inclusion of NEMs and supporting documentation:			
1. Map documentation either included or incorporated by reference?	Yes	Chapter 5	
2. Maps previously found in compliance by FAA?	NA		NEM submitted with NCP
3. Compliance determination still valid?	NA		
4. Does 180-day period have to wait for map compliance finding?	Yes		
B. Revised NEMs submitted with program: (Review using NEM checklist if map revisions included in NCP submittal)			
1. Revised NEMs included with program?	No	Chapters 5, 6, and 8	No changes in DNL with NCP
2. Has airport operator requested FAA to make a determination on the NEM(s) when NCP approval is made?	NA		
C. If program analysis uses noise modeling:			
1. INM, HNM or FAA-approved equivalent?	Yes	Chapter 3	INM 6.1
2. Monitoring in accordance with A150.5?	Yes	Appendix E	
D. Existing condition and 5-year maps clearly identified as the official NEMs?	Yes	Figures 5-1 and 5-2	

Boise Airport 14 CFR Part 150 Study Update
Noise Compatibility Program Checklist

Source: Federal Aviation Administration, 1989

Airport Name: <u>Boise Airport</u>	REVIEWER: _____		
	Yes/No/NA	Page/Other Reference	Notes/Comments
IV. CONSIDERATION of ALTERNATIVES: [B150.7, 150.23(e)]			
A. At a minimum, are the alternatives below considered?			
1. land acquisition and interests therein, including air rights, easements, and development rights?	Yes	Chapter 7	
2. barriers, acoustical shielding, public building soundproofing	Yes	Chapter 5 and 6	No noise sensitive public structures within 65 DNL of NEMs
3. preferential runway system	Yes	Chapter 6	
4. flight procedures	Yes	Chapter 6	
5. restrictions on type/class of aircraft (at least one restriction below must be checked):			
a. deny use based on Federal standard	No		
b. capacity limits based on noisiness	No		
c. noise abatement takeoff/approach procedures	Yes	Section 6.4.3	
d. landing fees based on noise or time of day	No		
e. nighttime restrictions	Yes	Section 6.4.6	
B. Responsible implementing authority identified for each considered alternative?	Yes	Chapters 6, 7, and 8	
C. Analysis of alternative measures:			
1. measures clearly described?	Yes	Chapters 6 and 7	
2. measures adequately analyzed?	Yes	Chapters 6 and 7	
3. adequate reasoning for rejecting alternatives?	Yes	Chapters 6, 7, and 8	
D. Other actions recommended by the FAA?	NA		
V. ALTERNATIVES RECOMMENDED for IMPLEMENTATION: [150.23(e), B150.7(c); 150.35(b), B150.5]			
A. Document clearly indicates:			
1. alternatives recommended for implementation?	Yes	Chapter 8	

**Boise Airport 14 CFR Part 150 Study Update
Noise Compatibility Program Checklist**

Source: Federal Aviation Administration, 1989

Airport Name: <u>Boise Airport</u>	REVIEWER: _____		
	Yes/No/NA	Page/Other Reference	Notes/ Comments
2. final recommendations are airport operator's, not those of consultant or third party?	Yes	Chapter 8, Certification following Title page	
B. Do all program recommendations :			
1. relate directly or indirectly to reduction of noise and non-compatible land uses?	Yes		
2. contain description of contribution to overall effectiveness of program?	Yes	Chapter 8	
3. noise/land use benefits quantified to extent possible?	Yes	Chapter 8	
4. include actual/anticipated effect on reducing noise exposure within non-compatible areas shown on NEM?	Yes	Section 6.5	No changes in DNL with NCP
5. effects based on relevant and reasonable expressed assumptions?	Yes	Chapters 6 and 7	
6. have adequate supporting data to support its contribution to the noise/land use compatibility?	Yes	Chapters 4-8	
C. Analysis appears to support program standards set forth in 150.35(b) and B150.5?	Yes	Chapters 6-8	
D. When use restrictions are recommended:			
1. Are alternatives with potentially significant noise/compatible land use benefits thoroughly analyzed so that appropriate comparisons and conclusions can be made?	NA		
2. use restrictions coordinated with APP-600 prior to making determination on start of 180-days?	NA		
E. Do the following also meet Part 150 analytical standards?:			
1. formal recommendations which continue existing practices?	Yes	Chapter 8	
2. new recommendations or changes proposed at end of Part 150 process?	Yes	Chapter 8	
F. Documentation indicates how recommendations may change previously adopted plans?	Yes	Chapter 8	
G. Documentation also:			
1. identifies agencies which are responsible for implementing each recommendation?	Yes	Section 8.2	

Boise Airport 14 CFR Part 150 Study Update
Noise Compatibility Program Checklist

Source: Federal Aviation Administration, 1989

Airport Name: <u>Boise Airport</u>	REVIEWER: _____		
	Yes/No/NA	Page/Other Reference	Notes/ Comments
2. indicates whether those agencies have agreed to implement?	Yes	Section 8.2	
3. indicates essential government actions necessary to implement recommendations?	Yes	Section 8.2	
H. Time frame:			
1. includes agreed-upon schedule to implement alternatives?	Yes	Section 8.2	
2. indicates period covered by the program?	Yes	Section 8.2	
I. Funding/Costs:			
1. includes costs to implement alternatives?	Yes	Chapter 6 and 7, Section 8.2	
2. includes anticipated funding sources?	Yes	Chapter 6 and 7, Section 8.2	
VI. PROGRAM REVISION: [150.23(e)(9)] Supporting documentation includes provision for revision?	Yes	Section 8.2	

Chapter One

INTRODUCTION

Title 14 Code of Federal Regulations (CFR) Part 150, “Airport Noise Compatibility Planning,” sets forth standards for airport operators to use in documenting noise exposure in airport environs and establishing programs to minimize noise-related land use incompatibilities. FAA Order 150/5020-1 “Noise Control and Compatibility Planning” establishes the framework for conducting Part 150 Studies, and notes that the goal of the study process is “to develop a balanced and cost-effective program to minimize and/or mitigate the airport’s noise impact on local communities.” Part 150 prescribes specific standards for the following purposes:

- Measuring noise;
- Estimating cumulative noise exposure using computer models;
- Describing noise exposure (including instantaneous, single-event, and cumulative levels);
- Coordinating Noise Compatibility Program (NCP) development with local land use officials and other interested parties;
- Documenting the analytical process and development of the compatibility program;
- Submitting documentation to the Federal Aviation Administration (FAA);
- Aiding the FAA and public review processes; and

- Contributing to the FAA approval or disapproval of the submission.

A full Part 150 submission to the FAA consists of two elements: Noise Exposure Maps (NEMs) and a Noise Compatibility Program (NCP). Sections 1.1 and 1.2 review the requirements of NEM and NCP submittals. Study goals are discussed in Section 1.3. Section 1.4 discusses the project roles and responsibilities.

Chapter Two presents the existing and forecast airport operations data used in determining the noise environment around BOI. Chapter Three discusses existing and forecast flight operations. Chapter Four outlines local and federal land use guidelines, as well as existing and future land uses. Chapter Five presents the NEMs. Chapter Six describes the development of an NCP, and then evaluates the existing and potential new noise abatement measures. Chapter Seven presents land use measure modifications and recommendations for existing and future measures. Chapter Eight includes the recommended NCP and implementation factors. Chapter Nine includes the record of public consultation. **Appendices A through E** provide supporting information, as outlined in the Table of Contents.

1.1 NEM REQUIREMENTS

The FAA has developed a checklist for use in reviewing NEM submittals, which must be completed prior to submission of the final NEM. As shown in the front of this document, the checklist details specific requirements for approval of NEMs, and

includes page and section references indicating the document location where those requirements are addressed.

The NEM shows the airport layout and operation, aircraft-related noise exposure, land uses in the airport environs, and the resulting noise/land use compatibility situation. The NEM includes maps of existing and future noise exposure resulting from aircraft operations and of land uses in the airport environs. As required, the maps must show existing noise conditions, and provide a projection of noise exposure five years into the future. The NEM documentation must describe the data collection and analysis undertaken in its development.

For this study, forecasts were developed with the existing condition as 2003 and the forecast condition as 2008. Due to analysis for the NCP and stakeholder involvement in the study, the submission of the Study to FAA will not occur until 2004. Accordingly, the year of submission per Part 150 is 2004, with a forecast condition of 2009. According to FAA guidelines, the 2003 and 2008 forecasts may be considered representative of 2004 and 2009, respectively, if the difference between aggregate operational levels for 2003 and 2004, and 2008 and 2009, is less than 15-percent.

This study includes 167,105 annual operations in the year 2003. According to the FAA February 2004 Terminal Area Forecast, 166, 188 annual operations are projected at BOI in 2004. Thus, the Part 150 Forecast has slightly more operations in 2003 than are projected in 2004. The difference of 917 annual operations from 2003 to 2004 is equivalent to a variance of 0.6-percent.

The study forecast's year 2008 includes 181,626 annual operations. According to the FAA February 2004 Terminal Area Forecast, 180,510 annual operations are projected at BOI in 2004. As with the existing conditions year, the Part 150 Forecast has slightly more operations in 2008 than are projected in 2009. The difference of 1,116 annual operations from 2008 to 2009 is equivalent to a variance of 0.6-percent.

Therefore, the year 2003 and 2008 Part 150 Study forecasts are considered representative of 2004 and 2009 conditions, respectively. Note that for the purposes of this study, the existing condition will be referenced to 2004 and the forecast condition to 2009. Other study data, such as airfield layout, runway use, flight track layout, existing land uses, etc. have not changed during the study development process. Thus, the Boise Part 150 Study Update includes a 2004 NEM that represents existing noise exposure, and a 2009 NEM that represents five-year forecast noise exposure.

1.2 NCP REQUIREMENTS

The NCP is essentially a list of the actions the airport proprietor, in consultation with airport users, local governments, and the FAA, proposes to undertake to minimize existing and future noise/land use non-compatibility. The NCP documentation must recount the development of the program, including a description of all measures considered, the reasons that individual measures were accepted or rejected, how measures will be implemented and funded, and the predicted effectiveness of individual measures and the overall program.

1.3 STUDY GOALS

A number of goals are used in this study to guide its development for Boise Airport. These goals include:

- Improve the overall noise environment while not shifting noise from one residential community to another;
- Develop a shared vision of land use compatibility;
- Develop an understanding of probable future noise levels; and
- Develop realistic mitigation plans within the context of Federal regulations and eligibility criteria, financial feasibility, and fairness to aviation and non-aviation interests.

1.4 PROJECT ROLES AND RESPONSIBILITIES

As highlighted in the following subsections, several groups had major roles in the Part 150 process.

1.4.1 City of Boise

As the “airport operator,” the City of Boise has responsibility over the entire Part 150 Study, including ultimate responsibility for determining what elements will be included in the NCP submitted to the FAA for review. The City of Boise and FAA are responsible for pursuing the implementation of FAA-approved measures.

1.4.2 Consulting Team

The City of Boise retained a consultant team to conduct the technical work required to fulfill the Part 150 analyses and documentation requirements.

HNTB Corporation has overall project management responsibility for the Part 150 Study, as well as responsibility for development of the NEMs and noise abatement elements of the NCP.

CSHQA was responsible for land use and zoning analyses, and development and evaluation of the land use element of the NCP.

The acoustical consulting firm of Wyle Laboratories was contracted to perform noise monitoring, radar data processing, and supplemental noise metric work for the NEMs.

Synergy Consultants, Inc. was contracted to provide strategic direction and quality assurance for the Part 150 process.

1.4.3 General Public

Two mechanisms were used to obtain public input to the study process. First, a study Advisory Committee was formed and second, general public workshops were conducted to solicit input from the public at large throughout the study process. A total of three general public workshops were conducted, in addition to the public hearing. The Advisory Committee met five times through the course of the study, and its representation consisted of airport users, representatives from local jurisdictions, and neighborhood representatives. The activity of the Advisory Committee is discussed in Chapter Nine and Appendix F.

1.4.4 Federal Aviation Administration

The FAA has ultimate review authority over the NEMs submitted under Part 150. The FAA review includes an assessment of both the adequacy of the technical documentation and the broader issues related to satisfying the Part 150 process requirements.

FAA involvement includes participation by staff from the local, regional, and national levels of the agency, as follows:

- The Airport's Air Traffic Control Tower (ATCT) provide significant input into existing and future operational procedures and trends.
- When the Airport submits the Part 150 documentation to the FAA for review, the FAA's Seattle Airport District Office will conduct an initial, local review to determine if it satisfies all NEM checklist requirements.
- On a regional level, the FAA's Northwest Mountain Region office is responsible for the final review of the NEM documentation for adequacy in satisfying technical and legal requirements.
- FAA's Washington, D.C. Headquarters will receive a copy of the study documentation.
- FAA will issue a Record of Approval noting its approval or disapproval of the actions recommended in the NCP.

Chapter Two

AIRCRAFT ACTIVITY FORECASTS

In order to evaluate existing and future noise exposure, it is important to understand the level of airport activity (operations) and types of aircraft operating at an airport. As noted in the previous chapter, the Part 150 study process requires consideration of existing (2003) noise levels, and the prediction of noise five years into the future. Therefore, this Part 150 forecast provides average daily aircraft operations by aircraft type at Boise Airport (BOI) for 2003 and 2008. The assumptions inherent in the Part 150 forecast are based on input from the Federal Aviation Administration's (FAA) March 2003 Terminal Area Forecast (TAF), aeronautical users, federal and local sources, and professional experience. *As discussed in Section 1.1, the 2003 forecast is used for the 2004 NEM and the 2008 forecast is used for the 2009 NEM.* Forecasting is not an exact science, and variances in local and national economic factors and the aviation industry could have a significant effect on the operational levels and fleet mix forecasts presented herein.

Per FAA requirements, the Boise Part 150 Study Update will use annual average daily operations to compute existing and future aircraft noise exposure. Annual average daily operations are representative of all aircraft operations that occur over the course of a year. As such, the total forecast existing and future annual operations are divided by 365 days to determine the annual average daily operations. The forecast must specify the number of operations by specific aircraft types, arrival or departure, and time of day (e.g., daytime or nighttime). For the purposes of the Day-Night Average Sound Level (DNL) metric used in Part 150

studies, daytime is defined as 7:00 a.m. to 10:00 p.m. while nighttime is defined as 10:00 p.m. to 7:00 a.m.

The FAA approved this forecast for the purposes of the Part 150 Study Update on June 12, 2003.

The following sections detail the development of annual aircraft operations forecasts and fleet mix by passenger, general aviation and air taxi, military, and cargo jet operations.

2.1 ANNUAL AIRCRAFT OPERATIONS FORECASTS

To derive the annual average daily forecasts of aircraft operations by aircraft type required for the Part 150 study, it is first necessary to generate existing and future levels of forecasts for annual operations. The annual levels of aircraft operations forecast for 2003 and 2008 were derived from the FAA's March 2003 TAF.

This study was originally scoped to use the master plan forecast to determine forecast operational levels. However, the master plan forecasts were developed prior to the steep declines in aviation activity following the events of September 11, 2001. The FAA, which has the responsibility to approve Part 150 forecasts, has revised its TAF to account for the impact of the terrorist events on operational levels. In the Part 150 acceptance process, the FAA is usually willing to allow for differences of 10-percent between an airport's forecast and the TAF. The master plan forecast for the year 2008 is about 18-percent higher than

the March 2003 TAF, with the largest difference being in the total number of general aviation operations. As a result, it became necessary to derive the operational levels for the Part 150 using the TAF, instead of the master plan forecast, in order for the study to be accepted by the FAA.

Although the March 2003 TAF incorporates the events of September 11, 2001 into operational levels, it does not consider ongoing structural changes in the airline industry, or the effect of the war in Iraq. However, as the effect of these factors is difficult to estimate in the short-term, the TAF is still a reasonable estimate of operational levels for the purpose of this Part 150 Study.

Table 2.1 shows the annual aircraft operations forecast by aircraft group in 2003 and 2008. A total of 167,105 annual operations were estimated to occur in 2003, including 72,375 air carrier and air taxi operations, 82,608 general aviation operations, and 12,122 military operations. By 2008, activity is forecast to increase to 79,761 air carrier and air taxi operations, 89,743 general aviation operations, and 12,122 military operations forecast, for a total of 181,626 annual operations.

2.2 PASSENGER AIR CARRIER OPERATIONS

This section presents the development of the forecast and fleet mix for passenger air carrier operations, including discussions of overall trends, airline and market factors, and trends in the use of specific aircraft types.

2.2.1 Overall Trends in Proportion of Mainline Jets, Regional Jets, and Turboprop Aircraft

Annual passenger aircraft operations are composed of three major aircraft equipment categories: mainline jets, regional jets, and turboprop operations. **Table 2.2** details the historic and forecast breakdown of passenger service operations within these categories. Based upon recent trends, mainline jet operations have declined from 43.2-percent of the total scheduled passenger operations in 2000 to 39.7-percent of this total in 2002. Turboprop operations declined from 23.3-percent of passenger operations to 19.1-percent during this same period. However, regional jet operations have grown from 33.6-percent to 41.2-percent of the total scheduled passenger operations.

The Official Airline Guide was used as an information source concerning the type and frequency of scheduled passenger aircraft operations.¹ While these published schedules are subject to change, they do provide a reliable guide to the future composition of passenger aircraft in 2003. Using this source as the major guide to forecasting 2003 passenger operations by aircraft type, 43.1-percent of passenger operations are forecast to be with mainline jets, 32.8-percent with regional jets, and 24.1-percent with turboprops.

Reviewing the trend in passenger aircraft operations by sub-category over the period from 2000 through 2003, the forecast for 2008 continues the trend of a declining share of mainline jet operations.

- Mainline flights are forecast to comprise 40-percent of passenger aircraft operations in 2008.
- The share of regional jet operations is projected to climb to 40-percent in 2008

Table 2.1

BOISE AIRPORT - PART 150 STUDY UPDATE

Annual Aircraft Operations

Year	Total	Air Carrier & Air Taxi	General Aviation	Military
1998	177,015	60,895	98,870	17,250
1999	179,891	64,754	100,822	14,315
2000	171,010	72,004	86,295	12,711
2001	164,741	69,150	83,313	12,278
2002	167,730	73,856	82,484	11,390
2003	<i>167,105</i>	<i>72,375</i>	<i>82,608</i>	<i>12,122</i>
2008	<i>181,626</i>	<i>79,761</i>	<i>89,743</i>	<i>12,122</i>
<i>Average Annual Growth Rates</i>				
2003 - 2008	<i>1.7%</i>	<i>2.0%</i>	<i>1.7%</i>	<i>0.0%</i>

Sources: Historical data based on Air Traffic Activity Data System (ATADS); Forecasts based on March 2003 FAA TAF

Table 2.2

BOISE AIRPORT - PART 150 STUDY UPDATE

Aircraft Operations Forecasts for Scheduled Passenger Service

Year	Scheduled Passenger Service Operations by Airline Group (a)			
	Mainline Jet	Regional Jet	Turboprop	Total
2003	22,954	17,462	12,850	53,265
2008	23,480	23,480	11,740	58,701
Year	Percentage Distribution by Airline Group (b)			
	Mainline Jet	Regional Jet	Turboprop	Total
2000	43.2%	33.6%	23.3%	100.0%
2001	45.5%	34.1%	20.4%	100.0%
2002	39.7%	41.2%	19.1%	100.0%
2003	43.1%	32.8%	24.1%	100.0%
2008	40.0%	40.0%	20.0%	100.0%

(a) 2003 data based on Official Airline Guide schedule as of March 2003 and estimated 98% completion rate;
2008 data based on forecast (derived from March 2003 FAA TAF)

(b) Historical data based on Official Airline Guide via Back Aviation Solutions; 2003 distribution based on Official Airline Guide schedule as of March 2003; 2008 distribution based on HNTB analysis of forecast

Sources: As noted

as some mainline flights are downsized to regional jets and some new routes with longer ranges are initiated.

- Turboprop operations, which have been declining dramatically throughout most of the country as many regional carriers convert turboprop fleets into regional jets, are forecast to comprise 20-percent of passenger operations in 2008.

Horizon Air has been one of only a few carriers that have continued to update their turboprop fleet with new aircraft. This fleet planning strategy continues to be successful for Horizon Air due to their unique market niche. As a result, turboprop operations are expected to continue to represent a significant-percentage of BOI passenger operations through 2008.

2.2.2 Stage Length, Airline, and Market Factors

Part 150 studies use the concept of stage length to assess typical aircraft takeoff weights and resulting takeoff performance. The FAA's Integrated Noise Model (INM), which is used to compute noise exposure, contains at least one departure profile for each aircraft type in its database. Most large, transport-category aircraft have multiple departure profiles that reflect several takeoff weights. However, accurate takeoff weight data by aircraft type is not normally available, especially on an annual average basis. Therefore, standard noise modeling methodology assumes that aircraft takeoff weights and resulting aircraft performance can be approximated based upon stage (or trip) length, a factor much more readily obtainable from airline schedules. Thus, the distribution of departure profiles assigned to an aircraft type is based on the distribution of stage lengths flown by that aircraft type. Longer distance (high stage length) flights are assumed to require more fuel and thus to

have higher takeoff weights. This increases takeoff distance and lowers the aircraft's climb rate, as compared to lighter (short trip) flights. Accordingly, information on aircraft stage lengths is incorporated into the Part 150 forecast.

Table 2.3 shows the scheduled passenger service trends by individual aircraft type and stage length for BOI from 2000 through 2003. The 2003 data is based on preliminary Official Airline Guide (OAG) schedules through December 2003. One important trend has been the increasing number of longer-range flights serving BOI. There were 4,134 scheduled stage length 2 (500-1000 nautical miles) departures in 2000. By the end of 2003, there are expected to be about 5,149 scheduled stage length 2 departures, an increase of about 25-percent.

Table 2.4 shows the annual changes in passenger service by airline and equipment category from 2000 to 2003. Major trends in mainline service include the additions of Alaska service to Seattle in 2003 and Frontier service to and from Denver in 2002, and the significant declines in both Delta and United mainline operations. Delta is expected to drop from 1,364 scheduled departures in 2000 to only about 730 departures in 2003, a decrease of about 46-percent. United is estimated to decline by about 44-percent during the same period, from 3,206 to only about 1,810 scheduled departures. However, Northwest, Southwest, and America West are all expected to maintain relative stable service patterns, with a moderate increase in scheduled departures. Northwest is expected to increase its mainline service from 818 scheduled departures in 2000 to 1,049 departures in 2003, and Southwest will maintain a stable service pattern of between 6,249 and 6,411 annual departures from 2000 to 2003. America West is

Table 2.3

BOISE AIRPORT - PART 150 STUDY UPDATE

Scheduled Passenger Service Departures by Aircraft Type and Stage Length

Airline Group and Aircraft Type	Total Annual Scheduled Departures				Stage Length 1 (0-500 nm)				Stage Length 2 (501-1000 nm)				Stage Length 3 (1001-1500 nm)			
	2000	2001	2002	2003	2000	2001	2002	2003	2000	2001	2002	2003	2000	2001	2002	2003
Mainline Jets																
A319	-	669	1,427	1,415	-	-	-	-	-	669	1,415	1,415	-	-	12	-
A320	1	61	333	38	-	-	-	-	1	61	108	7	-	-	225	31
B72Q	2,567	1,081	152	-	1,243	848	152	-	1,194	229	-	-	130	4	-	-
B73Q	94	589	388	404	-	-	-	-	94	589	388	404	-	-	-	-
B733	8,489	7,083	5,796	6,460	6,984	5,926	4,427	4,972	1,220	740	1,214	1,197	285	417	155	291
B735	1,444	2,096	1,156	1,602	1,000	1,354	914	629	403	742	238	930	41	-	4	43
B737	-	502	1,250	648	-	502	1,250	648	-	-	-	-	-	-	-	-
B738	-	30	421	730	-	30	421	730	-	-	-	-	-	-	-	-
DC9Q	10	-	-	-	-	-	-	-	10	-	-	-	-	-	-	-
MD80	-	-	-	414	-	-	-	414	-	-	-	-	-	-	-	-
Subtotal	12,605	12,111	10,923	11,711	9,227	8,660	7,164	7,393	2,922	3,030	3,363	3,953	456	421	396	365
Regional Jets																
BA46	159	-	-	-	-	-	-	-	159	-	-	-	-	-	-	-
CRJ2	1,940	2,386	4,340	4,376	1,940	2,223	3,814	4,011	-	163	467	365	-	-	59	-
CRJ7	-	739	5,647	4,432	-	575	3,957	3,539	-	164	1,328	831	-	-	362	62
F28	7,700	5,959	1,341	101	6,647	5,130	1,341	101	1,053	829	-	-	-	-	-	-
Subtotal	9,799	9,084	11,328	8,909	8,587	7,928	9,112	7,651	1,212	1,156	1,795	1,196	-	-	421	62
Turboprops																
DH8B	5,384	4,155	2,278	2,863	5,384	4,155	2,278	2,863	-	-	-	-	-	-	-	-
DH8D	-	823	2,337	2,863	-	823	2,337	2,863	-	-	-	-	-	-	-	-
E120	1,406	462	64	178	1,406	462	64	178	-	-	-	-	-	-	-	-
SW4	-	-	570	652	-	-	570	652	-	-	-	-	-	-	-	-
Subtotal	6,790	5,440	5,249	6,556	6,790	5,440	5,249	6,556	-	-	-	-	-	-	-	-
Total	29,194	26,635	27,500	27,176	24,604	22,028	21,525	21,600	4,134	4,186	5,158	5,149	456	421	817	427

Note: 2003 data based on schedules as filed in March 2003 with adjustments by HNTB to account for Alaska return and Horizon cutbacks for June 2003

Source: Official Airline Guide via Back Aviation

Table 2.4

BOISE AIRPORT - PART 150 STUDY UPDATE

Scheduled Passenger Service Departures by Airline Group and Airline

Airline Group & Airline	Total Annual Scheduled Departures				Stage Length 1 (0-500 nm)				Stage Length 2 (501-1000 nm)				Stage Length 3 (1001-1500 nm)			
	2000	2001	2002	2003	2000	2001	2002	2003	2000	2001	2002	2003	2000	2001	2002	2003
Mainline Jets																
Alaska/Horizon	-	-	-	414	-	-	-	414	-	-	-	-	-	-	-	-
America West	806	696	601	730	-	-	-	-	806	696	601	730	-	-	-	-
American	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Big Sky	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Delta	1,364	1,060	724	730	1,364	1,060	724	730	-	-	-	-	-	-	-	-
Frontier	-	-	368	729	-	-	-	-	-	-	368	729	-	-	-	-
Northwest	818	942	1,057	1,049	-	-	-	-	818	942	1,057	1,049	-	-	-	-
Southwest	6,411	6,332	6,305	6,249	6,411	6,332	6,305	6,249	-	-	-	-	-	-	-	-
United	3,206	3,081	1,868	1,810	1,452	1,268	135	-	1,298	1,392	1,337	1,445	456	421	396	365
Subtotal	12,605	12,111	10,923	11,711	9,227	8,660	7,164	7,393	2,922	3,030	3,363	3,953	456	421	396	365
Regional Jets																
Alaska/Horizon	7,700	6,698	6,626	4,471	6,647	5,705	5,297	3,640	1,053	993	1,329	831	-	-	-	-
America West	-	163	466	365	-	-	-	-	-	163	466	365	-	-	-	-
American	-	-	421	62	-	-	-	-	-	-	-	-	-	-	421	62
Big Sky	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Delta	1,940	2,223	2,543	2,551	1,940	2,223	2,543	2,551	-	-	-	-	-	-	-	-
Frontier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Northwest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Southwest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
United	159	-	1,272	1,460	-	-	1,272	1,460	159	-	-	-	-	-	-	-
Subtotal	9,799	9,084	11,328	8,909	8,587	7,928	9,112	7,651	1,212	1,156	1,795	1,196	-	-	421	62
Turboprops																
Alaska/Horizon	5,384	4,978	4,615	5,726	5,384	4,978	4,615	5,726	-	-	-	-	-	-	-	-
America West	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
American	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Big Sky	-	-	570	652	-	-	570	652	-	-	-	-	-	-	-	-
Delta	6	-	64	178	6	-	64	178	-	-	-	-	-	-	-	-
Frontier	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Northwest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Southwest	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
United	1,400	462	-	-	1,400	462	-	-	-	-	-	-	-	-	-	-
Subtotal	6,790	5,440	5,249	6,556	6,790	5,440	5,249	6,556	-	-	-	-	-	-	-	-
All Aircraft																
Alaska/Horizon	13,084	11,676	11,241	10,611	12,031	10,683	9,912	9,780	1,053	993	1,329	831	-	-	-	-
America West	806	859	1,067	1,095	-	-	-	-	806	859	1,067	1,095	-	-	-	-
American	-	-	421	62	-	-	-	-	-	-	-	-	-	-	421	62
Big Sky	-	-	570	652	-	-	570	652	-	-	-	-	-	-	-	-
Delta	3,310	3,283	3,331	3,459	3,310	3,283	3,331	3,459	-	-	-	-	-	-	-	-
Frontier	-	-	368	729	-	-	-	-	-	-	368	729	-	-	-	-
Northwest	818	942	1,057	1,049	-	-	-	-	818	942	1,057	1,049	-	-	-	-
Southwest	6,411	6,332	6,305	6,249	6,411	6,332	6,305	6,249	-	-	-	-	-	-	-	-
United	4,765	3,543	3,140	3,270	2,852	1,730	1,407	1,460	1,457	1,392	1,337	1,445	456	421	396	365
Total	29,194	26,635	27,500	27,176	24,604	22,028	21,525	21,600	4,134	4,186	5,158	5,149	456	421	817	427

Note: 2003 data based on schedules as filed in March 2003 with adjustments by HNTB to account for Alaska return and Horizon cutbacks for June 2003

Source: Official Airline Guide via Back Aviation & HNTB Analysis

expected to also maintain a fairly stable mainline service presence of annual departures ranging from 601 to 806 scheduled departures.

Table 2.5 provides details on the passenger traffic trends for scheduled passenger service by market and air carrier for three recent 12-month periods. This table provides some insights into which markets are doing well, and it also indicates which markets may not be faring so well. These trends are expected continue over the 5-year range of the forecast. For example, Horizon’s new San Francisco service started off with only a 39-percent load factor in early 2002. As of late 2002, Horizon had discontinued its San Francisco service. America West has been gradually improving its performance at BOI, so this carrier is expected to continue to serve BOI in the future with mainline aircraft of comparable size. Northwest, which had been serving BOI with aircraft averaging 147 and 143 seats per flight in the first two 12-month periods covered in Table 2.5, has decreased the average size of its aircraft serving BOI to only 126 seats during the last 12-month period shown. Based on this trend, Northwest Airlines is projected to continue to operate smaller mainline aircraft at BOI. The American Eagle service to Dallas/Ft. Worth, which had started in mid-2002, has since been discontinued due to poor traffic performance.

Table 2.6 provides details on the fleet plans for Horizon and Southwest, the carriers with the largest numbers of operations in BOI. Horizon plans on retiring its remaining Fokker F28s in 2003, and there are 14 additional orders for CRJ-700 aircraft. Southwest plans on retiring its remaining Boeing 737-200s by the end of 2005, and it has 109 additional orders for Boeing 737-700 aircraft. The forecast for BOI includes the continued increase in CRJ-700 and

Boeing 737-700 operations by Horizon Air and Southwest Airlines, respectively.

2.2.3 Trends in Passenger Aircraft Types

During FAA certification, aircraft are required to meet certain noise requirements under 14 CFR Part 36. Older aircraft such as the Boeing 727-200, 737-200, and DC9 were manufactured to “Stage 2” standards. Newer, modern aircraft such as the Boeing 737-300/500/700/800 and Airbus A319/A320 were manufactured to more stringent and quieter “Stage 3” standards. The Airport Noise and Capacity Act of 1990 required, with few exceptions, that all aircraft operating in the United States after December 31, 1999, with a gross takeoff weight greater than 75,000 pounds be certified to Stage 3 standards. As a result, many older aircraft such as the Boeing 727-200, 737-200, and DC-9 were re-certificated to Stage 3 via the installation of hushkits and/or performance requirements to ensure that the lower noise levels could be achieved. The distinction between hushkitted and manufactured Stage 3 aircraft is an important consideration in evaluating aircraft noise, as the latter tend to be much quieter than the former. At BOI, most of the passenger airline aircraft serving and projected to serve the Airport are fully manufactured Stage 3 aircraft. In fact, among mainline jet aircraft types, there are no Boeing 727 operations scheduled for 2003, and there have not been any DC-9 operations since 2000. There are only a few hushkitted Boeing 737-200 aircraft scheduled to operate at BOI in 2003. Mainline service by manufactured Stage 3 aircraft such as the Airbus A319 and Boeing 737-300/500/700/800 has been generally increasing in recent years. This increase in Stage 3 aircraft as a percentage of all mainline passenger operations is expected to continue. By 2008, there are no passenger

Table 2.5

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Scheduled Passenger Service Trends at Boise Airport by Market and Airline

Airline	Destination	Aircraft Departures			Enplanements			Seat Departures		
		YE2Q00	YE2Q01	YE2Q02	YE2Q00	YE2Q01	YE2Q02	YE2Q00	YE2Q01	YE2Q02
Air Wisconsin	Denver	339	-	-	23,720	-	-	30,302	-	-
America West	Phoenix	335	839	483	21,467	60,838	38,924	44,008	103,468	59,027
American Eagle	Dallas/Ft. Worth	-	-	59	-	-	3,134	-	-	4,130
Delta	Salt Lake City	1,341	1,369	760	141,634	143,614	80,128	194,467	202,248	109,210
Frontier	Denver	-	-	12	-	-	769	-	-	1,569
Horizon	Denver	-	-	64	-	-	3,657	-	-	4,480
	Idaho Falls	1,412	1,534	986	32,410	36,405	32,317	52,244	56,790	58,022
	Lewiston	1,164	1,330	1,269	25,570	28,477	26,404	43,068	49,242	46,986
	Los Angeles	1,036	1,018	820	41,687	42,599	35,193	71,484	70,242	57,110
	Pocatello	1,262	1,222	581	22,360	21,089	13,750	46,694	45,214	31,461
	Portland	2,005	2,008	1,972	84,404	84,586	80,978	137,993	137,602	137,082
	Sacramento	-	-	269	-	-	9,572	-	-	18,829
	San Diego	-	-	90	-	-	3,169	-	-	6,300
	San Francisco	-	-	176	-	-	4,788	-	-	12,320
	San Jose	900	979	665	34,128	35,822	23,118	62,100	67,551	46,233
	Seattle	2,730	2,751	2,572	127,644	131,390	123,302	188,082	189,725	178,484
	Spokane	1,343	1,338	1,019	43,977	41,550	34,223	74,971	68,812	56,059
Sun Valley	102	176	2	1,840	3,313	75	3,774	6,512	140	
Northwest	Minneapolis	738	853	1,006	76,197	88,243	88,089	108,541	122,329	126,396
Southwest	Las Vegas	712	728	719	79,103	80,298	80,205	97,499	99,406	98,413
	Oakland	366	366	360	33,094	32,972	29,413	49,932	49,947	49,320
	Portland	1,050	1,086	1,053	95,599	99,105	88,739	143,565	148,107	143,196
	Reno	1,062	1,029	1,040	100,746	96,772	83,767	144,069	140,763	139,420
	Salt Lake City	1,070	1,096	1,050	85,414	89,342	83,205	146,350	149,747	143,535
	Seattle	1,066	1,028	1,020	98,292	98,392	94,135	141,947	136,471	138,180
	Spokane	1,040	1,031	1,032	85,989	82,918	77,849	141,085	140,883	138,084
United	Chicago	424	444	420	49,333	44,041	42,298	57,979	54,106	51,425
	Denver	1,103	1,423	1,259	108,121	119,578	103,343	141,285	174,857	158,896
	San Francisco	1,416	1,334	726	113,811	102,786	54,687	177,628	168,332	87,454
Airline	Destination	Average Enplanements per Aircraft Departure			Average Seats per Aircraft Departure			Load Factor		
		YE2Q00	YE2Q01	YE2Q02	YE2Q00	YE2Q01	YE2Q02	YE2Q00	YE2Q01	YE2Q02
Air Wisconsin	Denver	70	-	-	89	-	-	78.3%	-	-
America West	Phoenix	64	73	81	131	123	122	48.8%	58.8%	65.9%
American Eagle	Dallas/Ft. Worth	-	-	53	-	-	70	-	-	75.9%
Delta	Salt Lake City	106	105	105	145	148	144	72.8%	71.0%	73.4%
Frontier	Denver	-	-	64	-	-	131	-	-	49.0%
Horizon	Denver	-	-	57	-	-	70	-	-	81.6%
	Idaho Falls	23	24	33	37	37	59	62.0%	64.1%	55.7%
	Lewiston	22	21	21	37	37	37	59.4%	57.8%	56.2%
	Los Angeles	40	42	43	69	69	70	58.3%	60.6%	61.6%
	Pocatello	18	17	24	37	37	54	47.9%	46.6%	43.7%
	Portland	42	42	41	69	69	70	61.2%	61.5%	59.1%
	Sacramento	-	-	36	-	-	70	-	-	50.8%
	San Diego	-	-	35	-	-	70	-	-	50.3%
	San Francisco	-	-	27	-	-	70	-	-	38.9%
	San Jose	38	37	35	69	69	70	55.0%	53.0%	50.0%
	Seattle	47	48	48	69	69	69	67.9%	69.3%	69.1%
	Spokane	33	31	34	56	51	55	58.7%	60.4%	61.0%
Sun Valley	18	19	38	37	37	70	48.8%	50.9%	53.6%	
Northwest	Minneapolis	103	103	88	147	143	126	70.2%	72.1%	69.7%
Southwest	Las Vegas	111	110	112	137	137	137	81.1%	80.8%	81.5%
	Oakland	90	90	82	136	136	137	66.3%	66.0%	59.6%
	Portland	91	91	84	137	136	136	66.6%	66.9%	62.0%
	Reno	95	94	81	136	137	134	69.9%	68.7%	60.1%
	Salt Lake City	80	82	79	137	137	137	58.4%	59.7%	58.0%
	Seattle	92	96	92	133	133	135	69.2%	72.1%	68.1%
	Spokane	83	80	75	136	137	134	60.9%	58.9%	56.4%
United	Chicago	116	99	101	137	122	122	85.1%	81.4%	82.3%
	Denver	98	84	82	128	123	126	76.5%	68.4%	65.0%
	San Francisco	80	77	75	125	126	120	64.1%	61.1%	62.5%

Source: T100 Onboard Data via Data Base Products

Table 2.6

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Fleet Plans for Horizon and Southwest Airlines

Airline & Aircraft Type	Fleet as of Dec. 31, 2000	Fleet as of Dec. 31, 2001	Projected Fleet as of Dec. 31, 2002	Firm Orders					Total
				2003	2004	2005	2006	2007	
<u>Horizon</u>									
DH8A	12	1	-	-	-	-	-	-	-
DH8B	28	28	28	-	-	-	-	-	-
DH8D	-	12	15	-	-	-	-	-	-
F28	22	10	3	-	-	-	-	-	-
CRJ7	-	9	16	2	6	6	-	-	14
Total	62	60	62						
<u>Southwest</u>									
B73Q	33	30	27	-	-	-	-	-	-
B733	194	194	194	-	-	-	-	-	-
B735	25	25	25	-	-	-	-	-	-
B737	92	106	129	17	21	24	22	25	109
Total	344	355	375						

Note: Southwest plans to retire its remaining B73Qs by end of 2005. Horizon plans on retiring its remaining F28s in 2003.

Sources: SEC filings (8-Ks) and press releases from Alaska Air Group and Southwest Airlines

operations by hushkitted aircraft forecast for BOI.

Canadair Regional Jet operations, both CRJ-200 and -700 series aircraft, have increased substantially in BOI during recent years, while there are no longer any British Aerospace 146 operations. Fokker 28 operations have been declining sharply as Horizon replaces these older, noisy aircraft with Dash 8 turboprops and Canadair Regional Jets. Note that Fokker 28s are the only remaining Stage 2 passenger aircraft operating at BOI; their continued operation is permitted under the Airport Noise and Capacity Act of 1990 as the F28s have a maximum takeoff weight that is less than 75,000 pounds.

Turboprop services at BOI have primarily consisted of Dash 8 flights operated by Horizon Air. Delta Connection does operate a few flights with Embraer 120 planes, and Big Sky entered the Boise market with Swearingen Metro service in 2002. United Express restarted regional jet services in 2002, and America West has also added new regional jets to BOI. Turboprop service from United Express was discontinued in 2001, but there have been increases in Horizon's and Delta Connection's turboprop services, as well as new turboprop service from Big Sky.

Table 2.7 provides the percentage distribution of scheduled passenger service departures by individual aircraft type and stage length for 2000 through 2003 and 2008. The table reflects the following trends in passenger airline service at BOI:

- Based on the trends to date, Airbus A319s operations in 2008 are estimated to comprise 5.0-percent of BOI passenger operations, similar to the 5.2-percent of operations scheduled in 2003. Airbus A320s, which comprised 1.2-percent of operations in

2002 and 0.1-percent of operations in 2003, are expected to no longer be present in BOI by 2008.

- Frontier has a fleet of 17 Boeing 737-300s, five Boeing 737-200s, and 13 Airbus A319s as of December 2002. America West has a fleet of 12 Boeing 737-200s, 39 Boeing 737-300s, 13 Boeing 757-200s, 49 Airbus A320s and 31 Airbus A319s. Frontier has orders for additional Airbus A319s, and America West has orders for Airbus A318s and Airbus A320s. In view of the age and relatively few numbers of Boeing 737-200s in each of these two airlines' fleets, and the new, replacement aircraft that each airline has on order, the Frontier and America West Boeing 737-200s that currently serve BOI are not expected to be in operation in 2008. Therefore, no Boeing 737-200 operations in scheduled passenger service are forecast for 2008.
- Boeing 737-300 operations declined from 29.1-percent of all scheduled passenger operations in 2000 to 23.8-percent in 2003. This trend is expected to continue, and 20-percent of all passenger operations in BOI are expected to be performed with this aircraft in 2008.
- Boeing 737-500 operations, which increased from 5.0-percent of the BOI passenger total in 2000 to 7.9-percent in 2001 and then dropped to 4.2-percent in 2002 before bouncing back up to 5.9-percent in 2003, are projected to account for 5-percent of passenger operations in 2008.
- With growing numbers of Boeing 737-700s in its fleet, Southwest has been driving the trend in this aircraft type at BOI. From zero 737-700 operations in

Table 2.7

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Percentage Distribution of Scheduled Passenger Service Departures by Aircraft Type and Stage Length

Airline Group and Aircraft Type	All Stage Lengths					Stage Length 1 (0-500 nm)					Stage Length 2 (501-1000 nm)					Stage Length 3 (1001-1500 nm)				
	2000	2001	2002	2003	2008	2000	2001	2002	2003	2008	2000	2001	2002	2003	2008	2000	2001	2002	2003	2008
Mainline Jets																				
A319	-	2.51%	5.19%	5.21%	5.00%	-	-	-	-	-	-	2.51%	5.15%	5.21%	5.00%	-	-	0.04%	-	-
A320	0.00%	0.23%	1.21%	0.14%	-	-	-	-	-	-	0.00%	0.23%	0.39%	0.03%	-	-	-	0.82%	0.11%	-
B72Q	8.79%	4.06%	0.55%	-	-	4.26%	3.18%	0.55%	-	-	4.09%	0.86%	-	-	-	0.45%	0.02%	-	-	-
B73Q	0.32%	2.21%	1.41%	1.49%	-	-	-	-	-	-	0.32%	2.21%	1.41%	1.49%	-	-	-	-	-	-
B733	29.08%	26.59%	21.08%	23.77%	20.00%	23.92%	22.25%	16.10%	18.30%	14.00%	4.18%	2.78%	4.41%	4.40%	5.00%	0.98%	1.57%	0.56%	1.07%	1.00%
B735	4.95%	7.87%	4.20%	5.89%	5.00%	3.43%	5.08%	3.32%	2.31%	2.00%	1.38%	2.79%	0.87%	3.42%	3.00%	0.14%	-	0.01%	0.16%	-
B737	-	1.88%	4.55%	2.38%	5.00%	-	1.88%	4.55%	2.38%	3.00%	-	-	-	-	2.00%	-	-	-	-	-
B738	-	0.11%	1.53%	2.69%	3.00%	-	0.11%	1.53%	2.69%	3.00%	-	-	-	-	-	-	-	-	-	-
DC9Q	0.03%	-	-	-	-	-	-	-	-	-	0.03%	-	-	-	-	-	-	-	-	-
MD80	-	-	-	1.52%	2.00%	-	-	-	1.52%	2.00%	-	-	-	-	-	-	-	-	-	-
Subtotal	43.18%	45.47%	39.72%	43.09%	40.00%	31.61%	32.51%	26.05%	27.20%	24.00%	10.01%	11.38%	12.23%	14.55%	15.00%	1.56%	1.58%	1.44%	1.34%	1.00%
Regional Jets																				
BA46	0.54%	-	-	-	-	-	-	-	-	-	0.54%	-	-	-	-	-	-	-	-	-
CRJ2	6.65%	8.96%	15.78%	16.10%	20.00%	6.65%	8.35%	13.87%	14.76%	15.00%	-	0.61%	1.70%	1.34%	5.00%	-	-	0.21%	-	-
CRJ7	-	2.77%	20.53%	16.31%	20.00%	-	2.16%	14.39%	13.02%	14.00%	-	0.62%	4.83%	3.06%	4.00%	-	-	1.32%	0.23%	2.00%
F28	26.38%	22.37%	4.88%	0.37%	-	22.77%	19.26%	4.88%	0.37%	-	3.61%	3.11%	-	-	-	-	-	-	-	-
Subtotal	33.57%	34.11%	41.19%	32.78%	40.00%	29.41%	29.77%	33.13%	28.15%	29.00%	4.15%	4.34%	6.53%	4.40%	9.00%	-	-	1.53%	0.23%	2.00%
Turboprops																				
DH8B	18.44%	15.60%	8.28%	10.54%	10.00%	18.44%	15.60%	8.28%	10.54%	10.00%	-	-	-	-	-	-	-	-	-	-
DH8D	-	3.09%	8.50%	10.54%	10.00%	-	3.09%	8.50%	10.54%	10.00%	-	-	-	-	-	-	-	-	-	-
E120	4.82%	1.73%	0.23%	0.65%	-	4.82%	1.73%	0.23%	0.65%	-	-	-	-	-	-	-	-	-	-	-
SW4	-	-	2.07%	2.40%	-	-	-	2.07%	2.40%	-	-	-	-	-	-	-	-	-	-	-
Subtotal	23.26%	20.42%	19.09%	24.12%	20.00%	23.26%	20.42%	19.09%	24.12%	20.00%	-	-	-	-	-	-	-	-	-	-
Total	100.00%	100.00%	100.00%	100.00%	100.00%	84.28%	82.70%	78.27%	79.48%	73.00%	14.16%	15.72%	18.76%	18.95%	24.00%	1.56%	1.58%	2.97%	1.57%	3.00%

Sources: Table 1.3 and HNTB Analysis

2000, this aircraft increased to 4.6-percent of BOI passenger operations in 2002 before dropping down to 2.4-percent in 2003. Five-percent of BOI passenger operations are forecast to be conducted by Boeing 737-700 aircraft in 2008.

- Boeing 737-800 aircraft operations are expected to increase from zero BOI operations in 2000 to 2.7-percent of the BOI passenger total in 2003. This trend is expected to continue, and 3-percent of all passenger operations in 2008 are forecast to be with Boeing 737-800s.
- With Alaska’s return of mainline service to BOI with MD-80s in 2003, about 1.5-percent of passenger operations were performed with this aircraft in 2003. MD-80s are projected to continue serving BOI in 2008, and are expected to comprise 2.0-percent of passenger operations.
- Regional jets serving BOI, such as the Canadair Regional Jets (both the -200s and the -700s), have grown in their share of operations. By 2008, the Canadair Regional Jets are expected to be the only regional jets serving BOI.
- Similarly, Horizon’s Dash 8s (both the -200s and the -400s) comprise the primary turboprop service at BOI. By 2008, the Dash 8 is forecast to be the only passenger service turboprops serving BOI. Due to the unattractive economics of 19 seat service for nearly all air service opportunities, it is likely that the Big Sky service will no longer be operated with this type of equipment in 2008.

2.2.4 Summary of Passenger Air Carrier Operations

The total number of passenger aircraft operations and fleet mix for 2003 is based on the published schedules that the airlines have filed with OAG and an estimated completion factor of 98 percent for all aircraft types (approximately two-percent of scheduled operations are estimated to not occur due to weather, equipment faults, and other systematic factors). As shown **Table 2.8**, there are 53,265 passenger operations were identified for 2003. **Table 2.9** shows the forecast of 58,701 annual passenger operations in 2008, as developed from the trends in passenger aircraft operations shown in Table 2.7.

Approximately 88-percent of passenger operations are projected to occur in daytime, while the remaining 12-percent are expected to occur at nighttime. Of the nighttime operations, approximately 61-percent are forecast to be arrivals and 39-percent departures.

2.3 GENERAL AVIATION AND AIR TAXI OPERATIONS

“Air taxi” typically describes unscheduled charter aircraft operations. “General aviation” refers to multiple aircraft missions, including flight training, aeromedical helicopter operations, private transport via business jets, and other missions that do not fit into air carrier, cargo, or military aircraft groups. There is typically some overlap between general aviation and air taxi operations, and both groups use many of the same aircraft types. For the purposes of this document, general aviation and air taxi aircraft operations are described as a single group, although the operations forecast and fleet mix for each were developed individually.

Table 2.8

BOISE AIRPORT - PART 150 STUDY UPDATE

Forecast 2003 Annual Passenger Service Aircraft Operations

Airline Group and Aircraft Type	Total Operations	Departures									Arrivals		
		Total	Day				Night				Total	Day	Night
			Total	SL1	SL2	SL3	Total	SL1	SL2	SL3			
<u>Mainline Jets</u>													
A319	2,773	1,387	1,078	-	1,078	-	309	-	309	-	1,387	792	595
A320	74	37	31	-	1	30	6	-	6	-	37	1	36
B73Q	792	396	396	-	396	-	-	-	-	-	396	392	4
B733	12,662	6,331	6,026	4,565	1,193	269	305	305	-	-	6,331	5,213	1,118
B735	3,140	1,570	1,570	616	895	59	-	-	-	-	1,570	1,256	314
B737	1,270	635	379	379	-	-	256	256	-	-	635	329	306
B738	1,431	715	715	715	-	-	-	-	-	-	715	358	358
MD80	811	406	406	406	-	-	-	-	-	-	406	406	-
Subtotal	22,954	11,477	10,602	6,682	3,562	358	875	561	315	-	11,477	8,747	2,730
<u>Regional Jets</u>													
CRJ2	8,577	4,288	3,615	3,258	358	-	673	673	-	-	4,288	3,931	358
CRJ7	8,687	4,343	3,424	2,100	1,263	61	919	613	307	-	4,343	3,421	922
F28	198	99	95	95	-	-	4	4	-	-	99	95	4
Subtotal	17,462	8,731	7,134	5,453	1,621	61	1,596	1,290	307	-	8,731	7,447	1,284
<u>Turboprops</u>													
DH8B	5,611	2,806	2,806	2,806	-	-	-	-	-	-	2,806	2,806	-
DH8D	5,611	2,806	2,806	2,806	-	-	-	-	-	-	2,806	2,806	-
E120	349	174	87	87	-	-	87	87	-	-	174	174	-
SW4	1,278	639	586	586	-	-	53	53	-	-	639	639	-
Subtotal	12,850	6,425	6,285	6,285	-	-	140	140	-	-	6,425	6,425	-
Total	53,265	26,632	24,021	18,419	5,183	418	2,612	1,990	621	-	26,632	22,618	4,014

Note: SL = stage length

Source: Official Airline Guide via Back Aviation with estimated 98% completion rate, and HNTB Analysis

Table 2.9

BOISE AIRPORT - PART 150 STUDY UPDATE

Forecast 2008 Annual Passenger Service Aircraft Operations

Airline Group and Aircraft Type	Total Operations	Departures									Arrivals		
		Total	Daytime			Nighttime			Total	Daytime	Nighttime		
			Total	SL1	SL2	SL3	Total	SL1				SL2	SL3
<u>Mainline Jets</u>													
A319	2,935	1,468	1,141	-	1,141	-	327	-	327	-	1,468	1,086	382
A320	-	-	-	-	-	-	-	-	-	-	-	-	-
B73Q	-	-	-	-	-	-	-	-	-	-	-	-	-
B733	11,740	5,870	5,397	3,636	1,468	294	473	473	-	-	5,870	4,670	1,200
B735	2,935	1,468	1,468	587	881	-	-	-	-	-	1,468	1,174	293
B737	2,935	1,468	1,349	762	587	-	118	118	-	-	1,468	1,168	300
B738	1,761	881	881	881	-	-	-	-	-	-	881	440	440
MD80	1,174	587	587	587	-	-	-	-	-	-	587	587	-
Subtotal	23,480	11,740	10,822	6,453	4,076	294	918	591	327	-	11,740	9,125	2,615
<u>Regional Jets</u>													
CRJ2	11,740	5,870	4,949	3,481	1,468	-	921	921	-	-	5,870	5,380	490
CRJ7	11,740	5,870	4,637	3,169	881	587	1,233	940	294	-	5,870	4,624	1,246
F28	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	23,480	11,740	9,586	6,650	2,348	587	2,155	1,861	294	-	11,740	10,004	1,736
<u>Turboprops</u>													
DH8B	5,870	2,935	2,935	2,935	-	-	-	-	-	-	2,935	2,935	-
DH8D	5,870	2,935	2,935	2,935	-	-	-	-	-	-	2,935	2,935	-
E120	-	-	-	-	-	-	-	-	-	-	-	-	-
SW4	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	11,740	5,870	5,870	5,870	-	-	-	-	-	-	5,870	5,870	-
Total	58,701	29,350	26,278	18,974	6,424	881	3,073	2,452	620	-	29,350	25,000	4,351

Source: Tables 1.2 and 1.7 and HNTB analysis

The FAA March 2003 TAF provides operational levels for general aviation and air taxi operations in 2003 and 2008.² Starting with the year 2003 forecast, radar data and information from aeronautical users was used to develop the general aviation and air taxi fleet mix and the distribution of daytime and nighttime operations. The radar data covered a 16-day period in the third quarter of 2002, and included nearly all aircraft that operated under instrument flight rules (IFR). The aircraft type and time of day distributions obtained from the radar data, as supplemented with data from aeronautical users, were multiplied by the annual operational levels for general aviation and air taxi operations to establish the 2003 fleet mix for these aircraft groups. The distribution of aircraft in the 2008 fleet mix was developed by applying FAA national growth rates for general aviation and air taxi aircraft types to the 2003 fleet mix.

Included in the general aviation operations are those operations flown by aircraft associated with the National Interagency Fire Center (NIFC). The NIFC reported that significant changes in its operations are not expected during the next five years. Accordingly, there are only very modest increases in the number of NIFC operations from 2003 to 2008. Approximately 2,938 annual NIFC operations were estimated to occur in 2003, and 2,956 in 2008.

Tables 2.10 and 2.11 show the annual operations forecasts for air taxi and general aviation operations, respectively. **Table 2.12** shows the combined air taxi and general aviation forecasts for 2003 and 2008. There are a total of 97,896 general aviation and air taxi operations in 2003, and 106,591 operations are forecast in 2008.

Several trends are important in comparing the 2003 and 2008 fleet mixes for general aviation and air taxi operations. Business

jets have the highest forecast growth rate over the period through 2008, as compared to other aircraft types, and the proportion (as a percent of operations) of business jets in the fleet mix is expected to increase from 9-percent in 2003 to 13-percent in 2008. In addition, the proportion of turboprop and multi-engine piston operations decline accordingly, although their actual numbers of operations are forecast to increase (but at a lower rate than business jets). The distribution of single-engine and multi-engine piston, helicopter, and large jet aircraft operations in 2008 is expected to be similar to 2003. Approximately 42.0-percent of the general aviation and air taxi operations in 2008 are forecast to be conducted by single-engine piston aircraft. Helicopters, turboprops, and multi-engine piston aircraft are expected to account for 3.0, 10.2, and 31.4-percent of general aviation and air taxi operations, respectively, while the large jets operated by the NIFC should only account for 0.4-percent.

2.4 MILITARY OPERATIONS

According to the March 2003 TAF, military operations are forecast to be stable at 12,122 annual operations in both 2003 and 2008. Data on the number of operations by specific aircraft types was obtained during discussions with the Idaho Air National Guard. **Table 2.13** shows the forecast of annual military operations by aircraft type, while **Table 2.14** provides the same information by arrival/departure and time of day. For fixed wing aircraft, the A10 and C130 are expected to conduct approximately 41.2- and 19.2-percent, respectively, of annual military operations. For helicopter operations, the AH64 and UH60 are expected to conduct 29.7- and 9.9-percent, respectively, of the annual military operations at BOI. Sixty-percent of the A-10s and C-130s are expected to occur during daytime, with 40-percent during the

Table 2.10

BOISE AIRPORT - PART 150 STUDY UPDATE

Aircraft Operations Forecasts for Air Taxi Operations by Aircraft Type for 2003 and 2008

Air Taxi Operations by Aircraft Type					
Year	Subtotal	Jet	Turboprop	Multi Engine Piston	Single Engine Piston
1998	12,159				
2002	<i>15,085</i>	<i>2,029</i>	<i>5,234</i>	<i>7,822</i>	-
2003	<i>15,288</i>	<i>2,217</i>	<i>5,244</i>	<i>7,827</i>	-
2008	<i>16,848</i>	<i>3,033</i>	<i>5,476</i>	<i>8,340</i>	-
Percentage Distribution by Aircraft Type					
Year	Subtotal	Jet	Turboprop	Multi Engine Piston	Single Engine Piston
2002	<i>100.0%</i>	<i>13.5%</i>	<i>34.7%</i>	<i>51.9%</i>	<i>0.0%</i>
2003	<i>100.0%</i>	<i>14.5%</i>	<i>34.3%</i>	<i>51.2%</i>	<i>0.0%</i>
2008	<i>100.0%</i>	<i>18.0%</i>	<i>32.5%</i>	<i>49.5%</i>	<i>0.0%</i>

Sources: 1998 data derived from Airport Master Plan; 2002 distributions derived from 16-days of 3Q02 radar data; 2003 and 2008 distributions based on trends in growth by aircraft type as forecasted in FAA Aerospace Forecasts FY 2002-2013

Table 2.11

BOISE AIRPORT - PART 150 STUDY UPDATE

Aircraft Operations Forecasts for General Aviation Operations by Aircraft Type for 2003 and 2008

General Aviation Operations by Aircraft Type - NIFC and All Other General Aviation Operations							
Year	Subtotal	Large Jet (NIFC)	Helicopter	Business Jet	Turboprop	Multi Engine Piston	Single Engine Piston
1998	98,870						
2002	82,484	<i>436</i>	<i>2,920</i>	<i>5,824</i>	<i>5,200</i>	<i>24,517</i>	<i>43,587</i>
2003	<i>82,608</i>	<i>438</i>	<i>2,974</i>	<i>6,196</i>	<i>5,229</i>	<i>24,369</i>	<i>43,402</i>
2008	<i>89,743</i>	<i>440</i>	<i>3,231</i>	<i>10,769</i>	<i>5,385</i>	<i>25,128</i>	<i>44,791</i>
Percentage Distribution by Aircraft Type							
Year	Subtotal	Large Jet (NIFC)	Helicopter	Business Jet	Turboprop	Multi Engine Piston	Single Engine Piston
2002	<i>100.0%</i>	<i>0.5%</i>	<i>3.5%</i>	<i>7.1%</i>	<i>6.3%</i>	<i>29.7%</i>	<i>52.8%</i>
2003	<i>100.0%</i>	<i>0.5%</i>	<i>3.6%</i>	<i>7.5%</i>	<i>6.3%</i>	<i>29.5%</i>	<i>52.5%</i>
2008	<i>100.0%</i>	<i>0.5%</i>	<i>3.6%</i>	<i>12.0%</i>	<i>6.0%</i>	<i>28.0%</i>	<i>49.9%</i>
National Interagency Fire Center (NIFC) Operations							
Year	Subtotal	Large Jet (NIFC)	Helicopter	Business Jet	Turboprop	Multi Engine Piston	Single Engine Piston
2002	<i>2,922</i>	<i>436</i>	-	<i>59</i>	<i>849</i>	<i>701</i>	<i>877</i>
2003	<i>2,938</i>	<i>438</i>	-	<i>60</i>	<i>855</i>	<i>705</i>	<i>880</i>
2008	<i>2,956</i>	<i>440</i>	-	<i>61</i>	<i>860</i>	<i>710</i>	<i>885</i>

Note: Data in regular font from Boise Airport Master Plan (Exhibit 2E) & FAA Website; data in italics are estimates/forecasts.

Sources: As noted, and: distribution of business jet and turboprop operations in 2002 derived from 16-days of 3Q02 radar data; distribution of helicopter and narrowbody jets based on local reports from NIFC and FAA; distribution of multi- and single-engine piston aircraft based on radar data and then expanded to account for VFR operations; operations growth for 2003 and 2008 based on trends in growth by aircraft type as forecasted in FAA Aerospace Forecasts FY 2002-2013.

Table 2.12

BOISE AIRPORT - PART 150 STUDY UPDATE

Forecast 2003 and 2008 Annual General Aviation and Air Taxi Operations

Aircraft Type	Year 2003							Year 2008									
	Total Operations	Departures			Arrivals			Total Operations	Departures			Arrivals					
		Total	Day	Night	Total	Day	Night		Total	Day	Night	Total	Day	Night			
<u>Large Jet</u>																	
B73Q	438	219	182	36	219	159	60	440	220	183	37	220	160	60			
<u>Helicopter</u>																	
A109	2,974	1,487	1,115	372	1,487	1,115	372	3,231	1,615	1,212	404	1,615	1,212	404			
<u>Business Jets</u>																	
ASTR	106	53	53	-	53	53	-	172	86	86	-	86	86	-			
C500	1,128	564	564	-	564	546	18	1,937	969	969	-	969	937	31			
C600	55	27	27	-	27	27	-	96	48	48	-	48	48	-			
C650	161	80	80	-	80	80	-	268	134	134	-	134	134	-			
C750	183	92	92	-	92	92	-	319	159	159	-	159	159	-			
CL61	240	120	120	-	120	120	-	370	185	185	-	185	185	-			
FL20	1,055	528	473	55	528	473	55	1,810	905	809	96	905	809	96			
GLF2	92	46	46	-	46	23	23	159	80	80	-	80	40	40			
GLF3	37	18	18	-	18	18	-	64	32	32	-	32	32	-			
GLF4	102	51	33	18	51	51	-	153	76	45	32	76	76	-			
LR25	373	186	186	-	186	186	-	612	306	306	-	306	306	-			
LR35	3,532	1,766	1,338	428	1,766	1,662	104	5,524	2,762	2,163	599	2,762	2,592	170			
MU31	1,348	674	619	55	674	610	64	2,319	1,160	1,064	96	1,160	1,048	112			
Subtotal	8,412	4,206	3,650	556	4,206	3,942	264	13,802	6,901	6,079	822	6,901	6,453	448			
<u>Turboprop</u>																	
C441	10,473	5,236	4,793	444	5,236	4,389	847	10,860	5,430	4,971	459	5,430	4,551	879			
<u>Multi Engine Piston</u>																	
BE58	32,197	16,098	14,074	2,024	16,098	14,250	1,849	33,468	16,734	14,599	2,135	16,734	14,804	1,930			
<u>Single Engine Piston</u>																	
SEP	43,402	21,701	21,191	511	21,701	20,813	888	44,791	22,395	21,868	527	22,395	21,479	917			
Grand Total	97,896	48,948	45,005	3,943	48,948	44,668	4,280	106,591	53,296	48,912	4,384	53,296	48,657	4,639			

Sources: Tables 1.10 and 1.11, 16-days of 3Q02 radar data, and HNTB analysis

Table 2.13

BOISE AIRPORT - PART 150 STUDY UPDATE

Aircraft Operations Forecasts for Military Operations by Aircraft Type for 2003 and 2008

Military Operations by Aircraft Type (a)					
Year	Subtotal	A-10 Jet	C-130 Turboprop	AH-64 Helicopter	UH-60 Helicopter
1998	17,250				
2002	11,390	<i>5,000</i>	<i>1,250</i>	<i>3,855</i>	<i>1,285</i>
2003	<i>12,122</i>	<i>5,000</i>	<i>2,322</i>	<i>3,600</i>	<i>1,200</i>
2008	<i>12,122</i>	<i>5,000</i>	<i>2,322</i>	<i>3,600</i>	<i>1,200</i>
Percentage Distribution by Aircraft Type (b)					
Year	Subtotal	A-10 Jet	C-130 Turboprop	AH-64 Helicopter	UH-60 Helicopter
2002	<i>100.0%</i>	<i>43.9%</i>	<i>11.0%</i>	<i>33.8%</i>	<i>11.3%</i>
2003	<i>100.0%</i>	<i>41.2%</i>	<i>19.2%</i>	<i>29.7%</i>	<i>9.9%</i>
2008	<i>100.0%</i>	<i>41.2%</i>	<i>19.2%</i>	<i>29.7%</i>	<i>9.9%</i>

(a) Data in regular font from ATADS data; data in italics are estimates/forecasts.

(b) 2002 distribution derived from 16-days of 3Q02 radar data with Mountain Home AFB operations excluded; 2003 and 2008 based on reports from Idaho Air National Guard

Sources: As Noted and HNTB Analysis

Table 2.14

BOISE AIRPORT - PART 150 STUDY UPDATE

Forecast Military Aircraft Annual Operations by Day and Night

Aircraft Type	Total Operations	Departures			Arrivals		
		Total	Day	Night	Total	Day	Night
<u>2003 & 2008</u>							
A10	5,000	2,500	1,500	1,000	2,500	1,500	1,000
C130	2,322	1,161	697	464	1,161	697	464
AH64	3,600	1,800	1,350	450	1,800	1,350	450
UH60	1,200	600	450	150	600	450	150
Total	12,122	6,061	3,997	2,064	6,061	3,997	2,064

Note: All departures are stage length 1 (0-500 nautical miles)

Source: Table 1.15 and HNTB Analysis

nighttime. Seventy-five percent of military helicopter operations, including the AH-64 and UH-60, are estimated to occur during the daytime and 25-percent during the nighttime.

2.5 CARGO JET OPERATIONS

Table 2.15 provides the annual forecasts for cargo jet operations in 2003 and 2008.³ FedEx has grown its share of BOI cargo jet capacity from 1998 to 2002, and this growth is expected to continue through 2003 and 2008. There are 1,376 A306 and 650 B72Q FedEx operations identified for 2003, and by 2008, FedEx is forecast to operate 1,685 A306 and 548 B72Q operations. UPS is expected to grow its operations to 1,147 B752 operations in 2003 and 1,348 B752 operations in 2008. ABX, which flies DC9Q jets in BOI, is expected to adjust its service much more modestly than FedEx or UPS, with 650 operations in 2003 and 632 operations forecast for 2008. Overall, cargo jet operations are projected to increase at an average rate of 2.0-percent from 2003 to 2008. Cargo jet fleet mix data is based on reports from individual cargo operators and the 16-day sample of radar data discussed previously in this document.⁴

Table 2.16 provides the forecasts for cargo jet operations by aircraft type, arrival or departure, and time of day. All regular cargo jet departures currently occur during the daytime and this schedule is expected to continue in the future. Approximately 63-percent of cargo arrivals occur during the daytime, and 37-percent during nighttime. Nighttime cargo arrivals account for about 6.4-percent of all nighttime arrivals.

2.6 FORECAST SUMMARY

As discussed in this document, the BOI Part 150 forecasts use the FAA's March 2003 TAF to establish forecast operational levels for the years 2003 and 2008. Fleet mix information was developed with OAG and radar data, and also with information from aeronautical users at BOI. **Tables 2.17 and 2.18** provide the annual activity summaries for 2003 and 2008. These tables combine all the individual aircraft operations forecasts for each aircraft group and compile them into one summary for each forecast year. **Tables 2.19 and 2.20** provide the annual average daily forecasts for 2003 and 2008 by aircraft type, time of day, and stage length. There were 457.8 average daily operations projected in 2003. By 2008, the annual average daily total is forecast to grow to 497.6 operations.

Total aircraft operations are expected to increase at an annual average rate of 1.7-percent from 2003 to 2008. Passenger operations are predicted to increase at an annual average rate of 2.0-percent, while combined general aviation and air taxi operations are projected to increase at an annual average rate of 1.7-percent. Military operations are expected to remain stable, and cargo jet operations to increase at an annual average rate of 2.0-percent. By 2008, hushkitted aircraft are not forecast to be used for passenger operations. The number of hushkitted cargo aircraft is expected to decline from a total of 1,300 operations in 2003 to 1,180 operations in 2008; this represents less than 0.7-percent of all aircraft operations in 2008. The proportion of daytime and nighttime operations is expected to be stable in 2003 and 2008.

Table 2.15

BOISE AIRPORT - PART 150 STUDY UPDATE

Aircraft Operations Forecasts for Cargo Jet Operations

Cargo - Jet Operations by Aircraft Type (a)							
Year	Subtotal	A306 (Fedex)	A310 (Fedex)	B72Q (Fedex)	B752 (UPS)	DC9Q (Evergreen)	DC9Q (ABX)
1998	2,976	-	172	1,178	562	526	538
2002	<i>3,771</i>	<i>1,337</i>	-	<i>669</i>	<i>1,123</i>	-	<i>642</i>
2003	<i>3,822</i>	<i>1,376</i>	-	<i>650</i>	<i>1,147</i>	-	<i>650</i>
2008	<i>4,212</i>	<i>1,685</i>	-	<i>548</i>	<i>1,348</i>	-	<i>632</i>
Percentage Distribution by Aircraft Type (b)							
Year	Subtotal	A306 (Fedex)	A310 (Fedex)	B72Q (Fedex)	B752 (UPS)	DC9Q (Evergreen)	DC9Q (ABX)
1998	100.0%	0.0%	5.8%	39.6%	18.9%	17.7%	18.1%
2002	<i>100.0%</i>	<i>35.5%</i>	<i>0.0%</i>	<i>17.7%</i>	<i>29.8%</i>	<i>0.0%</i>	<i>17.0%</i>
2003	<i>100.0%</i>	<i>36.0%</i>	<i>0.0%</i>	<i>17.0%</i>	<i>30.0%</i>	<i>0.0%</i>	<i>17.0%</i>
2008	<i>100.0%</i>	<i>40.0%</i>	<i>0.0%</i>	<i>13.0%</i>	<i>32.0%</i>	<i>0.0%</i>	<i>15.0%</i>

(a) Data in regular font from Boise Airport Master Plan (Exhibit 2E); data in italics are estimates/forecasts.

(b) 2002 distribution derived from 16-days of 3Q02 radar data

Sources: As noted, Table 1.1, and HNTB analysis

Table 2.16

BOISE AIRPORT - PART 150 STUDY UPDATE

Forecast of Cargo Jet Annual Aircraft Operations by Aircraft Type, Stage Length, and Time of Day

Aircraft Type	Total Operations	Departures								Arrivals			
		Total	Day			Night			Total	Day	Night		
			Total	SL1	SL2	SL3	Total	SL1				SL2	SL3
2003													
A306	1,376	688	688	688	-	-	-	-	-	-	688	482	206
B72Q	650	325	325	325	-	-	-	-	-	-	325	49	276
B752	1,147	573	573	287	-	287	-	-	-	-	573	344	229
DC9Q	650	325	325	325	-	-	-	-	-	-	325	325	-
Total	3,822	1,911	1,911	1,624	-	287	-	-	-	-	1,911	1,199	712
2008													
A306	1,685	842	842	842	-	-	-	-	-	-	842	590	253
B72Q	548	274	274	274	-	-	-	-	-	-	274	41	233
B752	1,348	674	674	337	-	337	-	-	-	-	674	404	270
DC9Q	632	316	316	316	-	-	-	-	-	-	316	316	-
Total	4,212	2,106	2,106	1,769	-	337	-	-	-	-	2,106	1,351	755

Note: SL = stage length

Source: Tables 1.2 and 1.15 and HNTB analysis

Table 2.17

BOISE AIRPORT - PART 150 STUDY UPDATE

Forecast 2003 Annual Aircraft Operations

Aircraft Type	Total Operations	Departures									Arrivals		
		Total	Day			Night			Total	Day	Night		
			Total	SL1	SL2	SL3	Total	SL1				SL2	SL3
Passenger Service													
<u>Mainline Jets</u>													
A319	2,773	1,387	1,078	-	1,078	-	309	-	309	-	1,387	792	595
A320	74	37	31	-	1	30	6	-	6	-	37	1	36
B72Q	-	-	-	-	-	-	-	-	-	-	-	-	-
B73Q	792	396	396	-	396	-	-	-	-	-	396	392	4
B733	12,662	6,331	6,026	4,565	1,193	269	305	305	-	-	6,331	5,213	1,118
B735	3,140	1,570	1,570	616	895	59	-	-	-	-	1,570	1,256	314
B737	1,270	635	379	379	-	-	256	256	-	-	635	329	306
B738	1,431	715	715	715	-	-	-	-	-	-	715	358	358
MD80	811	406	406	406	-	-	-	-	-	-	406	406	-
Subtotal	22,954	11,477	10,602	6,682	3,562	358	875	561	315	-	11,477	8,747	2,730
<u>Regional Jets</u>													
CRJ2	8,577	4,288	3,615	3,258	358	-	673	673	-	-	4,288	3,931	358
CRJ7	8,687	4,343	3,424	2,100	1,263	61	919	613	307	-	4,343	3,421	922
F28	198	99	95	95	-	-	4	4	-	-	99	95	4
Subtotal	17,462	8,731	7,134	5,453	1,621	61	1,596	1,290	307	-	8,731	7,447	1,284
<u>Turboprops</u>													
DH8B	5,611	2,806	2,806	2,806	-	-	-	-	-	-	2,806	2,806	-
DH8D	5,611	2,806	2,806	2,806	-	-	-	-	-	-	2,806	2,806	-
E120	349	174	87	87	-	-	87	87	-	-	174	174	-
SW4	1,278	639	586	586	-	-	53	53	-	-	639	639	-
Subtotal	12,850	6,425	6,285	6,285	-	-	140	140	-	-	6,425	6,425	-
Passenger Service Total	53,265	26,632	24,021	18,419	5,183	418	2,612	1,990	621	-	26,632	22,618	4,014
General Aviation & Air Taxi													
<u>Large Jet</u>													
B73Q	438	219	182	182	-	-	36	36	-	-	219	159	60
<u>Helicopters</u>													
A109	2,974	1,487	1,115	1,115	-	-	372	372	-	-	1,487	1,115	372
<u>Business Jets</u>													
ASTR	106	53	53	53	-	-	-	-	-	-	53	53	-
C500	1,128	564	564	564	-	-	-	-	-	-	564	546	18
C600	55	27	27	27	-	-	-	-	-	-	27	27	-
C650	161	80	80	80	-	-	-	-	-	-	80	80	-
C750	183	92	92	92	-	-	-	-	-	-	92	92	-
CL61	240	120	120	120	-	-	-	-	-	-	120	120	-
FL20	1,055	528	473	473	-	-	55	55	-	-	528	473	55
GLF2	92	46	46	46	-	-	-	-	-	-	46	23	23
GLF3	37	18	18	18	-	-	-	-	-	-	18	18	-
GLF4	102	51	33	33	-	-	18	18	-	-	51	51	-
LR25	373	186	186	186	-	-	-	-	-	-	186	186	-
LR35	3,532	1,766	1,338	1,338	-	-	428	428	-	-	1,766	1,662	104
MU31	1,348	674	619	619	-	-	55	55	-	-	674	610	64
Subtotal	8,412	4,206	3,650	3,650	-	-	556	556	-	-	4,206	3,942	264
<u>Turboprop</u>													
Subtotal	10,473	5,236	4,793	4,793	-	-	444	444	-	-	5,236	4,389	847
<u>Multi Engine Piston</u>													
Subtotal	32,197	16,098	14,074	14,074	-	-	2,024	2,024	-	-	16,098	14,250	1,849
<u>Single Engine Piston</u>													
Subtotal	43,402	21,701	21,191	21,191	-	-	511	511	-	-	21,701	20,813	888
GA & Air Taxi Total	97,896	48,948	45,005	45,005	-	-	3,943	3,943	-	-	48,948	44,668	4,280
Military													
A10	5,000	2,500	1,500	1,500	-	-	1,000	1,000	-	-	2,500	1,500	1,000
C130	2,322	1,161	697	697	-	-	464	464	-	-	1,161	697	464
AH64	3,600	1,800	1,350	1,350	-	-	450	450	-	-	1,800	1,350	450
UH60	1,200	600	450	450	-	-	150	150	-	-	600	450	150
Military Total	12,122	6,061	3,997	3,997	-	-	2,064	2,064	-	-	6,061	3,997	2,064
Cargo Jet													
A306	1,376	688	688	688	-	-	-	-	-	-	688	482	206
B72Q	650	325	325	325	-	-	-	-	-	-	325	49	276
B752	1,147	573	573	287	-	287	-	-	-	-	573	344	229
DC9Q	650	325	325	325	-	-	-	-	-	-	325	325	-
Cargo Jet Total	3,822	1,911	1,911	1,624	-	287	-	-	-	-	1,911	1,199	712
Grand Total	167,105	83,552	74,933	69,045	5,183	705	8,619	7,998	621	-	83,552	72,482	11,070

Note: SL = stage length

Sources: Tables 1.8, 1.12, 1.14 and 1.16, and HNTB analysis

Table 2.18

BOISE AIRPORT - PART 150 STUDY UPDATE

Forecast 2008 Annual Aircraft Operations

Aircraft Type	Total Operations	Departures									Arrivals		
		Total	Day			Night			Total	Day	Night		
			Total	SL1	SL2	SL3	Total	SL1				SL2	SL3
Passenger Service													
Mainline Jets													
A319	2,935	1,468	1,141	-	1,141	-	327	-	327	-	1,468	1,086	382
A320	-	-	-	-	-	-	-	-	-	-	-	-	-
B72Q	-	-	-	-	-	-	-	-	-	-	-	-	-
B73Q	-	-	-	-	-	-	-	-	-	-	-	-	-
B733	11,740	5,870	5,397	3,636	1,468	294	473	473	-	-	5,870	4,670	1,200
B735	2,935	1,468	1,468	587	881	-	-	-	-	-	1,468	1,174	293
B737	2,935	1,468	1,349	762	587	-	118	118	-	-	1,468	1,168	300
B738	1,761	881	881	881	-	-	-	-	-	-	881	440	440
MD80	1,174	587	587	587	-	-	-	-	-	-	587	587	-
Subtotal	23,480	11,740	10,822	6,453	4,076	294	918	591	327	-	11,740	9,125	2,615
Regional Jets													
CRJ2	11,740	5,870	4,949	3,481	1,468	-	921	921	-	-	5,870	5,380	490
CRJ7	11,740	5,870	4,637	3,169	881	587	1,233	940	294	-	5,870	4,624	1,246
F28	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	23,480	11,740	9,586	6,650	2,348	587	2,155	1,861	294	-	11,740	10,004	1,736
Turboprops													
DH8B	5,870	2,935	2,935	2,935	-	-	-	-	-	-	2,935	2,935	-
DH8D	5,870	2,935	2,935	2,935	-	-	-	-	-	-	2,935	2,935	-
E120	-	-	-	-	-	-	-	-	-	-	-	-	-
SW4	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	11,740	5,870	5,870	5,870	-	-	-	-	-	-	5,870	5,870	-
Passenger Service Total	58,701	29,350	26,278	18,974	6,424	881	3,073	2,452	620	-	29,350	25,000	4,351
General Aviation & Air Taxi													
Large Jet													
B73Q	440	220	183	183	-	-	37	37	-	-	220	160	60
Helicopters													
A109	3,231	1,615	1,212	1,212	-	-	404	404	-	-	1,615	1,212	404
Business Jets													
ASTR	172	86	86	86	-	-	-	-	-	-	86	86	-
C500	1,937	969	969	969	-	-	-	-	-	-	969	937	31
C600	96	48	48	48	-	-	-	-	-	-	48	48	-
C650	268	134	134	134	-	-	-	-	-	-	134	134	-
C750	319	159	159	159	-	-	-	-	-	-	159	159	-
CL61	370	185	185	185	-	-	-	-	-	-	185	185	-
FL20	1,810	905	809	809	-	-	96	96	-	-	905	809	96
GLF2	159	80	80	80	-	-	-	-	-	-	80	40	40
GLF3	64	32	32	32	-	-	-	-	-	-	32	32	-
GLF4	153	76	45	45	-	-	32	32	-	-	76	76	-
LR25	612	306	306	306	-	-	-	-	-	-	306	306	-
LR35	5,524	2,762	2,163	2,163	-	-	599	599	-	-	2,762	2,592	170
MU31	2,319	1,160	1,064	1,064	-	-	96	96	-	-	1,160	1,048	112
Subtotal	13,802	6,901	6,079	6,079	-	-	822	822	-	-	6,901	6,453	448
Turboprop													
Subtotal	10,860	5,430	4,971	4,971	-	-	459	459	-	-	5,430	4,551	879
Multi Engine Piston													
Subtotal	33,468	16,734	14,599	14,599	-	-	2,135	2,135	-	-	16,734	14,804	1,930
Single Engine Piston													
Subtotal	44,791	22,395	21,868	21,868	-	-	527	527	-	-	22,395	21,479	917
GA & Air Taxi Total	106,591	53,296	48,912	48,912	-	-	4,384	4,384	-	-	53,296	48,657	4,639
Military													
A10	5,000	2,500	1,500	1,500	-	-	1,000	1,000	-	-	2,500	1,500	1,000
C130	2,322	1,161	697	697	-	-	464	464	-	-	1,161	697	464
AH64	3,600	1,800	1,350	1,350	-	-	450	450	-	-	1,800	1,350	450
UH60	1,200	600	450	450	-	-	150	150	-	-	600	450	150
Military Total	12,122	6,061	3,997	3,997	-	-	2,064	2,064	-	-	6,061	3,997	2,064
Cargo Jet													
A306	1,685	842	842	842	-	-	-	-	-	-	842	590	253
B72Q	548	274	274	274	-	-	-	-	-	-	274	41	233
B752	1,348	674	674	337	-	337	-	-	-	-	674	404	270
DC9Q	632	316	316	316	-	-	-	-	-	-	316	316	-
Cargo Jet Total	4,212	2,106	2,106	1,769	-	337	-	-	-	-	2,106	1,351	755
Grand Total	181,626	90,813	81,292	73,651	6,424	1,217	9,521	8,900	620	-	90,813	79,004	11,809

Note: SL = stage length

Sources: Tables 1.9, 1.12, 1.14 and 1.16, and HNTB analysis

Table 2.19

BOISE AIRPORT - PART 150 STUDY UPDATE

Forecast 2003 Annual Average Daily Aircraft Operations

Aircraft Type	Total Operations	Departures									Arrivals		
		Total	Day			Night			Total	Day	Night		
			Total	SL1	SL2	SL3	Total	SL1				SL2	SL3
Passenger Service													
<u>Mainline Jets</u>													
A319	7.60	3.80	2.95	-	2.95	-	0.85	-	0.85	-	3.80	2.17	1.63
A320	0.20	0.10	0.09	-	0.00	0.08	0.02	-	0.02	-	0.10	0.00	0.10
B72Q	-	-	-	-	-	-	-	-	-	-	-	-	-
B73Q	2.17	1.08	1.08	-	1.08	-	-	-	-	-	1.08	1.07	0.01
B733	34.69	17.34	16.51	12.51	3.27	0.74	0.84	0.84	-	-	17.34	14.28	3.06
B735	8.60	4.30	4.30	1.69	2.45	0.16	-	-	-	-	4.30	3.44	0.86
B737	3.48	1.74	1.04	1.04	-	-	0.70	0.70	-	-	1.74	0.90	0.84
B738	3.92	1.96	1.96	1.96	-	-	-	-	-	-	1.96	0.98	0.98
MD80	2.22	1.11	1.11	1.11	-	-	-	-	-	-	1.11	1.11	-
Subtotal	62.89	31.44	29.05	18.31	9.76	0.98	2.40	1.54	0.86	-	31.44	23.96	7.48
<u>Regional Jets</u>													
CRJ2	23.50	11.75	9.90	8.92	0.98	-	1.84	1.84	-	-	11.75	10.77	0.98
CRJ7	23.80	11.90	9.38	5.75	3.46	0.17	2.52	1.68	0.84	-	11.90	9.37	2.53
F28	0.54	0.27	0.26	0.26	-	-	0.01	0.01	-	-	0.27	0.26	0.01
Subtotal	47.84	23.92	19.55	14.94	4.44	0.17	4.37	3.53	0.84	-	23.92	20.40	3.52
<u>Turboprops</u>													
DH8B	15.37	7.69	7.69	7.69	-	-	-	-	-	-	7.69	7.69	-
DH8D	15.37	7.69	7.69	7.69	-	-	-	-	-	-	7.69	7.69	-
E120	0.96	0.48	0.24	0.24	-	-	0.24	0.24	-	-	0.48	0.48	-
SW4	3.50	1.75	1.61	1.61	-	-	0.14	0.14	-	-	1.75	1.75	-
Subtotal	35.20	17.60	17.22	17.22	-	-	0.38	0.38	-	-	17.60	17.60	-
Passenger Service Total	145.93	72.97	65.81	50.46	14.20	1.15	7.16	5.45	1.70	-	72.97	61.97	11.00
General Aviation & Air Taxi													
<u>Large Jet</u>													
B73Q	1.20	0.60	0.50	0.50	-	-	0.10	0.10	-	-	0.60	0.44	0.16
<u>Helicopters</u>													
A109	8.15	4.07	3.06	3.06	-	-	1.02	1.02	-	-	4.07	3.06	1.02
<u>Business Jets</u>													
ASTR	0.29	0.15	0.15	0.15	-	-	-	-	-	-	0.15	0.15	-
C500	3.09	1.55	1.55	1.55	-	-	-	-	-	-	1.55	1.50	0.05
CL60	0.15	0.08	0.08	0.08	-	-	-	-	-	-	0.08	0.08	-
C650	0.44	0.22	0.22	0.22	-	-	-	-	-	-	0.22	0.22	-
C750	0.50	0.25	0.25	0.25	-	-	-	-	-	-	0.25	0.25	-
CL61	0.66	0.33	0.33	0.33	-	-	-	-	-	-	0.33	0.33	-
FL20	2.89	1.45	1.29	1.29	-	-	0.15	0.15	-	-	1.45	1.29	0.15
GLF2	0.25	0.13	0.13	0.13	-	-	-	-	-	-	0.13	0.06	0.06
GLF3	0.10	0.05	0.05	0.05	-	-	-	-	-	-	0.05	0.05	-
GLF4	0.28	0.14	0.09	0.09	-	-	0.05	0.05	-	-	0.14	0.14	-
LR25	1.02	0.51	0.51	0.51	-	-	-	-	-	-	0.51	0.51	-
LR35	9.68	4.84	3.67	3.67	-	-	1.17	1.17	-	-	4.84	4.55	0.29
MU31	3.69	1.85	1.70	1.70	-	-	0.15	0.15	-	-	1.85	1.67	0.18
Subtotal	23.05	11.52	10.00	10.00	-	-	1.52	1.52	-	-	11.52	10.80	0.72
<u>Turboprop</u>													
Subtotal	28.69	14.35	13.13	13.13	-	-	1.22	1.22	-	-	14.35	12.02	2.32
<u>Multi Engine Piston</u>													
Subtotal	88.21	44.11	38.56	38.56	-	-	5.55	5.55	-	-	44.11	39.04	5.06
<u>Single Engine Piston</u>													
Subtotal	118.91	59.46	58.06	58.06	-	-	1.40	1.40	-	-	59.46	57.02	2.43
GA & Air Taxi Total	268.21	134.10	123.30	123.30	-	-	10.80	10.80	-	-	134.10	122.38	11.73
Military													
A10	13.70	6.85	4.11	4.11	-	-	2.74	2.74	-	-	6.85	4.11	2.74
C130	6.36	3.18	1.91	1.91	-	-	1.27	1.27	-	-	3.18	1.91	1.27
AH64	9.86	4.93	3.70	3.70	-	-	1.23	1.23	-	-	4.93	3.70	1.23
UH60	3.29	1.64	1.23	1.23	-	-	0.41	0.41	-	-	1.64	1.23	0.41
Military Total	33.21	16.61	10.95	10.95	-	-	5.66	5.66	-	-	16.61	10.95	5.66
Cargo Jet													
A306	3.77	1.88	1.88	1.88	-	-	-	-	-	-	1.88	1.32	0.57
B72Q	1.78	0.89	0.89	0.89	-	-	-	-	-	-	0.89	0.13	0.76
B752	3.14	1.57	1.57	0.79	-	0.79	-	-	-	-	1.57	0.94	0.63
DC9Q	1.78	0.89	0.89	0.89	-	-	-	-	-	-	0.89	0.89	-
Cargo Jet Total	10.47	5.24	5.24	4.45	-	0.79	-	-	-	-	5.24	3.29	1.95
Grand Total	457.82	228.91	205.30	189.16	14.20	1.93	23.61	21.91	1.70	-	228.91	198.58	30.33

Note: SL = stage length

Source: Table 1.17

Table 2.20

BOISE AIRPORT - PART 150 STUDY UPDATE
Forecast 2008 Annual Average Daily Aircraft Operations

Aircraft Type	Total Operations	Departures									Arrivals		
		Total	Day			Night			Total	Day	Night		
			Total	SL1	SL2	SL3	Total	SL1				SL2	SL3
Passenger Service													
<u>Mainline Jets</u>													
A319	8.04	4.02	3.12	-	3.12	-	0.90	-	0.90	-	4.02	2.98	1.05
A320	-	-	-	-	-	-	-	-	-	-	-	-	-
B72Q	-	-	-	-	-	-	-	-	-	-	-	-	-
B73Q	-	-	-	-	-	-	-	-	-	-	-	-	-
B733	32.16	16.08	14.79	9.96	4.02	0.80	1.30	1.30	-	-	16.08	12.79	3.29
B735	8.04	4.02	4.02	1.61	2.41	-	-	-	-	-	4.02	3.22	0.80
B737	8.04	4.02	3.70	2.09	1.61	-	0.32	0.32	-	-	4.02	3.20	0.82
B738	4.82	2.41	2.41	2.41	-	-	-	-	-	-	2.41	1.21	1.21
MD80	3.22	1.61	1.61	1.61	-	-	-	-	-	-	1.61	1.61	-
Subtotal	64.33	32.16	29.65	17.68	11.17	0.80	2.51	1.62	0.90	-	32.16	25.00	7.16
<u>Regional Jets</u>													
CRJ2	32.16	16.08	13.56	9.54	4.02	-	2.52	2.52	-	-	16.08	14.74	1.34
CRJ7	32.16	16.08	12.70	8.68	2.41	1.61	3.38	2.57	0.80	-	16.08	12.67	3.41
F28	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	64.33	32.16	26.26	18.22	6.43	1.61	5.90	5.10	0.80	-	32.16	27.41	4.76
<u>Turboprops</u>													
DH8B	16.08	8.04	8.04	8.04	-	-	-	-	-	-	8.04	8.04	-
DH8D	16.08	8.04	8.04	8.04	-	-	-	-	-	-	8.04	8.04	-
E120	-	-	-	-	-	-	-	-	-	-	-	-	-
SW4	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	32.16	16.08	16.08	16.08	-	-	-	-	-	-	16.08	16.08	-
Passenger Service Total	160.82	80.41	71.99	51.98	17.60	2.41	8.42	6.72	1.70	-	80.41	68.49	11.92
General Aviation & Air Taxi													
<u>Large Jet</u>													
B73Q	1.20	0.60	0.50	0.50	-	-	0.10	0.10	-	-	0.60	0.44	0.16
<u>Helicopters</u>													
A109	8.85	4.43	3.32	3.32	-	-	1.11	1.11	-	-	4.43	3.32	1.11
<u>Business Jets</u>													
ASTR	0.47	0.24	0.24	0.24	-	-	-	-	-	-	0.24	0.24	-
C500	5.31	2.65	2.65	2.65	-	-	-	-	-	-	2.65	2.57	0.09
CL60	0.26	0.13	0.13	0.13	-	-	-	-	-	-	0.13	0.13	-
C650	0.73	0.37	0.37	0.37	-	-	-	-	-	-	0.37	0.37	-
C750	0.87	0.44	0.44	0.44	-	-	-	-	-	-	0.44	0.44	-
CL61	1.01	0.51	0.51	0.51	-	-	-	-	-	-	0.51	0.51	-
FL20	4.96	2.48	2.22	2.22	-	-	0.26	0.26	-	-	2.48	2.22	0.26
GLF2	0.44	0.22	0.22	0.22	-	-	-	-	-	-	0.22	0.11	0.11
GLF3	0.17	0.09	0.09	0.09	-	-	-	-	-	-	0.09	0.09	-
GLF4	0.42	0.21	0.12	0.12	-	-	0.09	0.09	-	-	0.21	0.21	-
LR25	1.68	0.84	0.84	0.84	-	-	-	-	-	-	0.84	0.84	-
LR35	15.14	7.57	5.93	5.93	-	-	1.64	1.64	-	-	7.57	7.10	0.47
MU31	6.35	3.18	2.92	2.92	-	-	0.26	0.26	-	-	3.18	2.87	0.31
Subtotal	37.81	18.91	16.65	16.65	-	-	2.25	2.25	-	-	18.91	17.68	1.23
<u>Turboprop</u>													
Subtotal	29.75	14.88	13.62	13.62	-	-	1.26	1.26	-	-	14.88	12.47	2.41
<u>Multi Engine Piston</u>													
Subtotal	91.69	45.85	40.00	40.00	-	-	5.85	5.85	-	-	45.85	40.56	5.29
<u>Single Engine Piston</u>													
Subtotal	122.71	61.36	59.91	59.91	-	-	1.44	1.44	-	-	61.36	58.85	2.51
GA & Air Taxi Total	292.03	146.02	134.00	134.00	-	-	12.01	12.01	-	-	146.02	133.31	12.71
Military													
A10	13.70	6.85	4.11	4.11	-	-	2.74	2.74	-	-	6.85	4.11	2.74
C130	6.36	3.18	1.91	1.91	-	-	1.27	1.27	-	-	3.18	1.91	1.27
AH64	9.86	4.93	3.70	3.70	-	-	1.23	1.23	-	-	4.93	3.70	1.23
UH60	3.29	1.64	1.23	1.23	-	-	0.41	0.41	-	-	1.64	1.23	0.41
Military Total	33.21	16.61	10.95	10.95	-	-	5.66	5.66	-	-	16.61	10.95	5.66
Cargo Jet													
A306	4.62	2.31	2.31	2.31	-	-	-	-	-	-	2.31	1.62	0.69
B72Q	1.50	0.75	0.75	0.75	-	-	-	-	-	-	0.75	0.11	0.64
B752	3.69	1.85	1.85	0.92	-	0.92	-	-	-	-	1.85	1.11	0.74
DC9Q	1.73	0.87	0.87	0.87	-	-	-	-	-	-	0.87	0.87	-
Cargo Jet Total	11.54	5.77	5.77	4.85	-	0.92	-	-	-	-	5.77	3.70	2.07
Grand Total	497.61	248.80	222.72	201.78	17.60	3.34	26.08	24.38	1.70	-	248.80	216.45	32.35

Note: SL = stage length

Source: Table 1.18

NOTES

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- ¹ Official Airline Guide data as of March 2003.
- ² The FAA TAF combines air carrier and air taxi operations into one group. In order to determine the number of air taxi operations, the 53,265 published passenger air carrier operations and the projected 3,822 cargo jet operations for 2003 (which are derived independently of the TAF) are subtracted from the 2003 TAF total of 72,375 air carrier and air taxi operations. Thus, 15,288 air taxi operations are forecast for 2003. The same methodology is used to determine that 16,848 air taxi operations are forecast in 2008.
- ³ For the purposes of this forecast, cargo operations are defined as all cargo operations, as opposed to combination cargo and passenger cargo operations.
- ⁴ Since FedEx does not file schedules with the Official Airline Guide, OAG data could not be used to forecast cargo flights.

Chapter Three

EXISTING FLIGHT OPERATIONS

This chapter describes the existing and future aircraft flight operations at Boise Airport (BOI), and the related inputs and assumptions needed to generate DNL noise contours for the 2004 and 2009 Noise Exposure Maps (NEMs).

The FAA requires the analyses of subsonic aircraft noise exposure around airports to be accomplished using a computer program known as the Integrated Noise Model (INM, which is distributed by the FAA). The latest version of INM, version 6.1, was used for this study.

INM uses annual average daily operations to compute existing and forecast noise. Annual average daily operations are representative of all aircraft operations that occur over the course of a year. The total annual operations are divided by 365 days to determine the annual average daily operations. Runway and flight track use is also averaged over one year.

Annual average daily operations consist of departures and arrivals, by daytime and nighttime. For the purposes of INM and DNL, daytime is defined as 7:00 a.m. to 9:59 p.m., and nighttime is defined as 10:00 p.m. to 6:59 a.m. The DNL metric applies a 10-dB penalty to nighttime flights due to the added intrusiveness of these operations. Runway use, flight track location and use, and aircraft profiles define the paths that aircraft use as they fly to and from the Airport.

The Aviation Safety and Noise Abatement Act of 1979 required the FAA to establish a consistent measurement of airport noise

exposure. In developing the Part 150 study process, the FAA adopted the use of the Day-Night Average Level (DNL) as the primary measurement of aircraft noise exposure, and in cooperation with other federal agencies, identified land use compatibility guidelines using the DNL metric. Therefore, the INM computes the overall annual average daily noise exposure (e.g., DNL) at points on the ground around the Airport. From the grid of points, contours of equal daily sound level are drawn by INM for overlay onto land use maps.

The use of INM and computer-based noise modeling allow for the projection of future, forecast noise exposure. When the calculations are made in a consistent manner, INM is most accurate for comparing “before-and-after” noise effects resulting from forecast changes or potential alternatives. INM allows noise predictions for such forecast change actions without the actual implementation and noise monitoring of those actions.

3.1 AIRPORT LOCATION AND LAYOUT

BOI is located approximately three miles south of downtown Boise, Idaho. The Airport currently has three active runways. Runways 10L/28R and 10R/28L are oriented in an east-west direction and have lengths of 10,000 and 9,763 feet, respectively. They serve as the airports primary arrival and departure runways. Runway 9/27 is a new runway located to the southeast of the Airport center that serves as a training field for military C130 operations.

The elevation of BOI is 2,868 feet above Mean Sea Level (MSL). The current magnetic declination (the difference between magnetic north and true geographic north) is 15 degrees east as of March 2003.¹ Air Traffic Control (ATC) and pilots use magnetic headings to direct and fly aircraft.

Terrain data for the Boise area at 10-foot intervals is included in the noise model. This data improves the calculation of noise exposure, as INM can more accurately compute the distance between airborne aircraft and points on the ground. For elevations higher than the Airport, the terrain data improves the accuracy of the noise exposure calculation because it reflects the reduced distance between source and receiver.

3.1.1 Weather and Climate

Weather has a significant impact on noise exposure and propagation. Runway use and the operational characteristics of aircraft are heavily influenced by weather. The following subsections detail modeled weather conditions and related impact on aircraft operations.

Temperature

Temperature is an important factor in aircraft performance. As temperature increases, air density decreases, reducing wing lift and engine thrust which results in increased takeoff distance and a lower climb rate; departing aircraft are thus at a lower altitude and noise exposure thereby generally increases. Conversely, noise exposure is decreased on cold days when aircraft have improved performance capabilities. An annual average daily temperature of 51.4°F was used in the noise model.²

Humidity

Humidity does not have a significant impact on aircraft performance. In conjunction with temperature, however, it does impact the propagation of noise through the air. In general, sound travels farther in more humid conditions. Relative humidity is highest at night and gradually drops during the day. It is generally at its lowest point in the afternoon. An annual average daily humidity of 58-percent was used in the noise model.³

Wind

Wind speed and direction primarily determine runway selection and operational flow. Aircraft generally takeoff and land into the wind (known as a headwind) whenever possible. Headwinds reduce an aircraft's takeoff and landing distance and increase climb rate. Aircraft can operate with considerable crosswinds (a wind blowing at the side of the aircraft)—up to about 20 knots for a typical air carrier jet aircraft. Aircraft can operate with limited tailwinds (a wind blowing on the rear of the aircraft)—up to five to seven knots for a typical air carrier aircraft. Tailwinds increase takeoff and landing distance. Winds in excess of crosswind and tailwind limits generally force aircraft to use a different runway. The winds at BOI are generally out of the northwest and southeast and favor operations on the existing runways, which are aligned accordingly.

3.2 MODELED AIRCRAFT OPERATIONS

This section describes noise model operational inputs, including flight operations, runway use, and flight track location and use. INM uses these inputs to compute noise exposure on the ground. The data in this section provides an overview of

the aircraft operations included in the noise model.

3.2.1 Flight Operations and Fleet Mix

This subsection presents the annual average daily flight operations forecast for BOI in 2003 and 2008, as developed by the Part 150 forecasting effort described in Chapter Two. *As discussed in Section 1.1, the 2003 forecast is used for the 2004 NEM and the 2008 forecast is used for the 2009 NEM.*

2003 Fleet Mix

Table 3.1 shows the year 2003 annual average daily flight operations. A total of approximately 167,105 annual operations, or about 457 average daily operations, are forecast to operate at BOI in 2003. Jet aircraft are forecast to conduct approximately 37-percent of total operations. Of jet aircraft, Stage 2 or hushkit Stage 3 jet aircraft are forecast to conduct only about three percent of total operations. Approximately 12-percent of total operations are forecast to occur during nighttime, and about four percent of operations are touch-and-goes. Passenger Air Carrier, Regional, Cargo, General Aviation and Military operations are forecast to conduct 14-percent, 18-percent, two percent, 59-percent, and seven-percent of total operations, respectively.

2008 Fleet Mix

Table 3.2 shows the year 2008 annual average daily flight operations. A total of approximately 181,626 annual operations, or about 498 average daily operations, are forecast to operate at BOI in 2008. Jet aircraft are forecast to conduct approximately 40-percent of total operations. Of jet aircraft, Stage 2 or hushkit Stage 3 jet aircraft are forecast to conduct only about two percent of total operations. Approximately 12-percent of

total operations are forecast to occur during nighttime, and about four percent of operations are touch-and-goes. Passenger Air Carrier, Regional, Cargo, General Aviation and Military operations are forecast to conduct 13-percent, 19-percent, two percent, 59-percent, and seven-percent of total operations, respectively.

Comparison of the 2003 and the 2008 BOI fleet mixes illustrate an increase in total annual operations of approximately 14,521 operations by 2008, or an increase of 8.7-percent. The proportion of Stage 2 and hushkit Stage 3 jet aircraft in the 2008 fleet mix will decrease slightly as comparison to the 2003 fleet mix. Additional discussion on forecasted trends in aircraft operations at BOI is contained in Chapter Two.

Table 3.3 defines the aircraft identifiers used in this document, while **Table 3.4** describes the operational categories into which each aircraft type is grouped. The use of operational categories is described in Sections 3.2.4 and 3.2.5.

3.2.2 INM Aircraft Database

INM contains reference noise and performance data on nearly all aircraft types that operate at BOI, including hushkit aircraft. Aircraft manufacturers such as Boeing and Airbus provide the data to the FAA. The data is used to model an aircraft's departure and arrival flight profiles, and resultant noise exposure. Aircraft that are not specifically included in the database (such as those with unique engine combinations) are modeled using appropriate substitution aircraft and criteria per the FAA's pre-approved substitution list.

3.2.3 Aircraft Flight Profiles

Flight profiles model the vertical paths of aircraft during departure and arrival to determine the altitude, speed, and engine

Table 3.1

BOISE AIRPORT - PART 150 STUDY UPDATE

Existing Condition Annual Average Daily Flight Operations and Fleet Mix

Aircraft Group	Aircraft Type	Operational Category	Total Operations	Departures			Arrivals			Touch and Goes			p
				Daytime	Nighttime	Total	Daytime	Nighttime	Total	Daytime	Nighttime	Total	
Passenger Air Carrier	A319	PJ	7.60	2.95	0.85	3.80	2.17	1.63	3.80	-	-	-	-
	A320	PJ	0.20	0.09	0.02	0.10	0.00	0.10	0.10	-	-	-	-
	B733	PJ	34.69	16.51	0.84	17.34	14.28	3.06	17.34	-	-	-	-
	B735	PJ	8.60	4.30	-	4.30	3.44	0.86	4.30	-	-	-	-
	B737	PJ	3.48	1.04	0.70	1.74	0.90	0.84	1.74	-	-	-	-
	B738	PJ	3.92	1.96	-	1.96	0.98	0.98	1.96	-	-	-	-
	B73Q	PJ	2.17	1.08	-	1.08	1.07	0.01	1.08	-	-	-	-
	MD83	PJ	2.22	1.11	-	1.11	1.11	-	1.11	-	-	-	-
	Total		62.89	29.05	2.40	31.44	23.96	7.48	31.44	-	-	-	-
Regional	CARJ	RJ	47.30	19.29	4.36	23.65	20.14	3.51	23.65	-	-	-	-
	DHC6	RP	3.50	1.61	0.15	1.75	1.75	-	1.75	-	-	-	-
	DHC8	RP	30.75	15.37	-	15.37	15.37	-	15.37	-	-	-	-
	E120	RP	0.96	0.24	0.24	0.48	0.48	-	0.48	-	-	-	-
	F28	RJ	0.54	0.26	0.01	0.27	0.26	0.01	0.27	-	-	-	-
	Total		83.04	36.76	4.76	41.52	38.01	3.52	41.52	-	-	-	-
Cargo Jet	A306	CJ	3.77	1.88	-	1.88	1.32	0.57	1.88	-	-	-	-
	B72Q	CJ	1.78	0.89	-	0.89	0.13	0.76	0.89	-	-	-	-
	B752	CJ	3.14	1.57	-	1.57	0.94	0.63	1.57	-	-	-	-
	DC9Q	CJ	1.78	0.89	-	0.89	0.89	-	0.89	-	-	-	-
		Total		10.47	5.24	-	5.24	3.29	1.95	5.24	-	-	-
General Aviation	A109	GP	8.15	3.06	1.02	4.07	3.06	1.02	4.07	-	-	-	-
	ASTR	GJ	0.29	0.15	-	0.15	0.15	-	0.15	-	-	-	-
	B73Q	PJ	1.20	0.50	0.10	0.60	0.44	0.16	0.60	-	-	-	-
	BE58	GP	88.21	37.79	5.44	43.22	38.26	4.96	43.22	1.55	0.21	1.76	-
	C441	GP	28.69	13.13	1.22	14.35	12.02	2.32	14.35	-	-	-	-
	C500	GJ	3.09	1.55	-	1.55	1.50	0.05	1.55	-	-	-	-
	C600	GJ	0.15	0.08	-	0.08	0.08	-	0.08	-	-	-	-
	C650	GJ	0.44	0.22	-	0.22	0.22	-	0.22	-	-	-	-
	C750	GJ	0.50	0.25	-	0.25	0.25	-	0.25	-	-	-	-
	CL61	GJ	0.66	0.33	-	0.33	0.33	-	0.33	-	-	-	-
	FL20	GJ	2.89	1.29	0.15	1.45	1.29	0.15	1.45	-	-	-	-
	GLF2	GJ	0.25	0.13	-	0.13	0.06	0.06	0.13	-	-	-	-
	GLF3	GJ	0.10	0.05	-	0.05	0.05	-	0.05	-	-	-	-
	GLF4	GJ	0.28	0.09	0.05	0.14	0.14	-	0.14	-	-	-	-
	LR25	GJ	1.02	0.51	-	0.51	0.51	-	0.51	-	-	-	-
	LR35	GJ	9.68	3.67	1.17	4.84	4.55	0.29	4.84	-	-	-	-
	MU31	GJ	3.69	1.70	0.15	1.85	1.67	0.18	1.85	-	-	-	-
	SEP	GP	118.91	52.25	1.26	53.51	51.32	2.19	53.51	11.51	0.38	11.89	-
		Total		268.21	116.72	10.55	127.28	115.89	11.38	127.28	13.06	0.60	13.66
Military	A10A	MJ	13.70	4.11	2.74	6.85	3.08	2.05	5.14	1.03	0.68	1.71	-
	AH64	MH	9.86	3.70	1.23	4.93	3.70	1.23	4.93	-	-	-	-
	C130	MP	6.36	0.77	0.51	1.29	0.77	0.51	1.29	2.27	1.52	3.79	-
	UH60	MH	3.29	1.23	0.41	1.64	1.23	0.41	1.64	-	-	-	-
		Total		33.21	9.81	4.90	14.71	8.79	4.21	13.00	3.30	2.20	5.50
Total Daily Operations			457.82	197.58	22.61	220.19	189.93	28.54	218.48	16.36	2.80	19.16	-
Total Annual Operations			167,105	72,118	8,251	80,369	69,326	10,418	79,744	5,972	1,021	6,993	-

Note: Derived from year 2003 forecasts for development of 2004 NEM

Sources: 2002 Terminal Area Forecast, OAG, ANG, BOI ATCT, radar data, and HNTB analysis

Table 3.2

BOISE AIRPORT - PART 150 STUDY UPDATE

Five-Year Forecast Annual Average Daily Flight Operations and Fleet Mix

Aircraft Group	Aircraft Type	Operational Category	Total Operations	Departures			Arrivals			Touch and Goes		
				Daytime	Nighttime	Total	Daytime	Nighttime	Total	Daytime	Nighttime	Total
Passenger Air Carrier	A319	PJ	8.04	3.12	0.90	4.02	2.98	1.05	4.02	-	-	-
	A320	PJ	-	-	-	-	-	-	-	-	-	-
	B733	PJ	32.16	14.79	1.30	16.08	12.79	3.29	16.08	-	-	-
	B735	PJ	8.04	4.02	-	4.02	3.22	0.80	4.02	-	-	-
	B737	PJ	8.04	3.70	0.32	4.02	3.20	0.82	4.02	-	-	-
	B738	PJ	4.82	2.41	-	2.41	1.21	1.21	2.41	-	-	-
	B73Q	PJ	-	-	-	-	-	-	-	-	-	-
	MD83	PJ	3.22	1.61	-	1.61	1.61	-	1.61	-	-	-
	Total		64.33	29.65	2.51	32.16	25.00	7.16	32.16	-	-	-
Regional	CARJ	RJ	64.33	26.26	5.90	32.16	27.41	4.76	32.16	-	-	-
	DHC6	RP	-	-	-	-	-	-	-	-	-	-
	DHC8	RP	32.16	16.08	-	16.08	16.08	-	16.08	-	-	-
	E120	RP	-	-	-	-	-	-	-	-	-	-
	F28	RJ	-	-	-	-	-	-	-	-	-	-
		Total		96.49	42.34	5.90	48.25	43.49	4.76	48.25	-	-
Cargo Jet	A306	CJ	4.62	2.31	-	2.31	1.62	0.69	2.31	-	-	-
	B72Q	CJ	1.50	0.75	-	0.75	0.11	0.64	0.75	-	-	-
	B752	CJ	3.69	1.85	-	1.85	1.11	0.74	1.85	-	-	-
	DC9Q	CJ	1.73	0.87	-	0.87	0.87	-	0.87	-	-	-
		Total		11.54	5.77	-	5.77	3.70	2.07	5.77	-	-
General Aviation	A109	GP	8.85	3.32	1.11	4.43	3.32	1.11	4.43	-	-	-
	ASTR	GJ	0.47	0.24	-	0.24	0.24	-	0.24	-	-	-
	B73Q	PJ	1.20	0.50	0.10	0.60	0.44	0.16	0.60	-	-	-
	BE58	GP	91.69	39.20	5.73	44.93	39.75	5.18	44.93	1.61	0.22	1.83
	C441	GP	29.75	13.62	1.26	14.88	12.47	2.41	14.88	-	-	-
	C500	GJ	5.31	2.65	-	2.65	2.57	0.09	2.65	-	-	-
	C600	GJ	0.73	0.37	-	0.37	0.37	-	0.37	-	-	-
	C650	GJ	0.87	0.44	-	0.44	0.44	-	0.44	-	-	-
	C750	GJ	0.26	0.13	-	0.13	0.13	-	0.13	-	-	-
	CL61	GJ	1.01	0.51	-	0.51	0.51	-	0.51	-	-	-
	FL20	GJ	4.96	2.22	0.26	2.48	2.22	0.26	2.48	-	-	-
	GLF2	GJ	0.44	0.22	-	0.22	0.11	0.11	0.22	-	-	-
	GLF3	GJ	0.17	0.09	-	0.09	0.09	-	0.09	-	-	-
	GLF4	GJ	0.42	0.12	0.09	0.21	0.21	-	0.21	-	-	-
	LR25	GJ	1.68	0.84	-	0.84	0.84	-	0.84	-	-	-
	LR35	GJ	15.14	5.93	1.64	7.57	7.10	0.47	7.57	-	-	-
	MU31	GJ	6.35	2.92	0.26	3.18	2.87	0.31	3.18	-	-	-
	SEP	GP	122.71	53.92	1.30	55.22	52.96	2.26	55.22	11.88	0.40	12.27
		Total		292.03	127.21	11.75	138.96	126.61	12.35	138.96	13.49	0.62
Military	A10A	MJ	13.70	4.62	3.08	7.71	3.60	2.40	5.99	-	-	-
	C130	MH	6.36	0.60	0.40	0.99	0.60	0.40	0.99	2.63	1.75	4.38
	AH64	MP	9.86	3.70	1.23	4.93	3.70	1.23	4.93	-	-	-
	UH60	MH	3.29	1.23	0.41	1.64	1.23	0.41	1.64	-	-	-
		Total		33.21	10.15	5.12	15.27	9.12	4.44	13.56	2.63	1.75
Total Daily Operations			497.61	215.13	25.29	240.42	207.93	30.78	238.71	16.11	2.37	18.48
Total Annual Operations			181,626	78,522	9,231	87,753	75,894	11,234	87,128	5,881	865	6,746

Note: Derived from year 2008 forecasts for development of 2009 NEM

Sources: 2002 Terminal Area Forecast, OAG, ANG, BOI ATCT, radar data, and HNTB analysis

Table 3.3

BOISE AIRPORT - PART 150 STUDY UPDATE

Aircraft Identifiers

Aircraft Identifier	Aircraft Name
A109	Augusta 109 Helicopter
A10A	A10 Warthog Jet
A306	Airbus A300-600
A319	Airbus A319
A320	Airbus A320
AH64	AH64 Apache Helicopter
ASTR	Israeli Aircraft 1125 Jet
B72Q	Boeing 727-200 Hushkit
B733	Boeing 737-300
B735	Boeing 737-500
B737	Boeing 737-700
B738	Boeing 737-800
B73Q	Boeing 737-200 Hushkit
B752	Boeing 757-200
BE58	Beech 58 Piston Prop
C130	C130 Hercules
C441	Cessna 441 Turboprop
C500	Cessna 500 Jet
C600	Cessna 600 Jet
C650	Cessna 650 Jet
C750	Cessna 750 Jet
CARJ	Canadair Regional Jet
CL61	Canadair CL601 Jet
DC9Q	DC9 Hushkit Jet
DHC6	Dash-6 Turboprop
DHC8	Dash-8-30 Turboprop
E120	Embraer 120 Turboprop
F28	Fokker 28 Jet
FL20	Falcon 20 Jet
GLF2	Gulfstream II Jet
GLF3	Gulfstream III Jet
GLF4	Gulfstream IV Jet
LR25	Learjet 25
LR35	Learjet 35
MD83	McDonnell-Douglas MD83
MU31	Mitsubishi 300-10 Jet
SEP	General Aviation Single Engine Piston
UH60	UH60 Blackhawk

Source: FAA Order 7110.65N, Appendix A, and HNTB

Table 3.4

Aircraft Operational Categories

Operational Category	Description
PJ	Passenger Air Carrier Jet
CJ	Cargo Air Carrier Jet
GJ	General Aviation Jet
GP	General Aviation Propeller-Driven/Helicopter
MH	Military Helicopter
MP	Military Propeller-Driven
MJ	Military Jet
RJ	Regional Jet
RP	Regional Propeller-Driven

Source: HNTB

thrust of an aircraft at any point along a flight track. INM uses this information to calculate noise exposure on the ground.

Profiles are unique to each aircraft type and are based on airline operating procedures, temperature and aircraft operating weight. Detailed information on aircraft flight profiles, under varying conditions, is stored in the INM aircraft database.

The climb rate and flight profile of departing aircraft can vary considerably. New, modern aircraft have higher thrust engines and improved wing designs which results in an increased climb rate as compared to older aircraft. Modern jet engines are also much quieter than their predecessors, even though they can produce more thrust. Temperature, takeoff weight and airline operating procedures are also important factors that affect climb rate.

Pilots use their respective airline’s operating procedures to maneuver an aircraft during takeoff. The procedures are unique to each aircraft type. Airlines develop their own procedures with aircraft manufacturer and FAA approval. As a result, operating procedures among most airlines are

essentially similar. Standard INM departure profiles, which approximate Distant Noise Abatement Departure Profile (NADP)/ICAO-B profiles as published in FAA Advisory Circular (AC) 91-53A, were used in this study.

The INM aircraft database groups aircraft-specific profiles by stage length. Stage length refers to the length of the trip to be made by the aircraft type. INM assumes aircraft weight increases with stage, or trip length, due to the need for more fuel and that each aircraft type’s takeoff distance and climb performance is different for each stage length. High-weight (long trip, high stage length) aircraft have increased takeoff distances and lower climb rates than lighter (short trip) aircraft, for a given aircraft type. **Table 3.5** shows the distribution of departure stage length and profiles by aircraft type.

Arriving aircraft do not use stage lengths, as they are modeled using a standard three-degree approach path. INM has a database of standard arrival flight profiles for each modeled aircraft type.

Table 3.5

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Distribution of Departure Stage Lengths/Profiles

Aircraft Group	Aircraft Type	Departure Distribution of Stage Length/Profiles							
		Day				Night			
		1	2	3	Total	1	2	3	Total
Air Carrier	A319	-	100%	-	100%	-	100%	-	100%
	A320	-	3%	97%	100%	-	100%	-	100%
	B733	76%	20%	4%	100%	100%	-	-	100%
	B735	39%	57%	4%	100%	-	-	-	-
	B737	100%	-	-	100%	100%	-	-	100%
	B738	100%	-	-	100%	-	-	-	-
	B73Q	-	100%	-	100%	-	-	-	-
	MD83	100%	-	-	100%	-	-	-	-
Regional	CARJ	100%	-	-	100%	100%	-	-	100%
	DHC6	100%	-	-	100%	100%	-	-	100%
	DHC8	100%	-	-	100%	-	-	-	-
	E120	100%	-	-	100%	100%	-	-	100%
	F28	100%	-	-	100%	100%	-	-	100%
Cargo Jet	A306	100%	-	-	100%	-	-	-	-
	B72Q	100%	-	-	100%	-	-	-	-
	B752	50%	-	50%	100%	-	-	-	-
	DC9Q	100%	-	-	100%	-	-	-	-
General Aviation	A109	100%	-	-	100%	100%	-	-	100%
	ASTR	100%	-	-	100%	-	-	-	-
	B73Q	100%	-	-	100%	100%	-	-	100%
	BE58	100%	-	-	100%	100%	-	-	100%
	C441	100%	-	-	100%	100%	-	-	100%
	C500	100%	-	-	100%	-	-	-	-
	C600	100%	-	-	100%	-	-	-	-
	C650	100%	-	-	100%	-	-	-	-
	C750	100%	-	-	100%	-	-	-	-
	CL61	100%	-	-	100%	-	-	-	-
	FL20	100%	-	-	100%	100%	-	-	100%
	GLF2	100%	-	-	100%	-	-	-	-
	GLF3	100%	-	-	100%	-	-	-	-
	GLF4	100%	-	-	100%	100%	-	-	100%
	LR25	100%	-	-	100%	-	-	-	-
	LR35	100%	-	-	100%	100%	-	-	100%
MU31	100%	-	-	100%	100%	-	-	100%	
SEP	100%	-	-	100%	100%	-	-	100%	
Military	A10A	100%	-	-	100%	100%	-	-	100%
	AH64	100%	-	-	100%	100%	-	-	100%
	C130	100%	-	-	100%	100%	-	-	100%
	UH60	100%	-	-	100%	100%	-	-	100%

Stage Length 1 = 0 to 499 nautical miles

Stage Length 2 = 500 to 999 nautical miles

Stage Length 3 = 1,000 to 1,500 nautical miles

Sources: 2002 Terminal Area Forecast, OAG, ANG, BOI ATCT, radar data, INM 6.1, and HNTB analysis

3.2.4 Runway Use

Runway use is determined by several factors including safety, wind, weather, traffic demand, runway capacity, direction of flight, and prescribed runway use procedures. ATC assigns runway use with consideration to all of these factors.

Table 3.6 shows average daily runway use for the 2004 and 2009 NEMs. The identical aircraft runway use was used to develop the 2004 and 2009 NEMs, as the existing trends in runway use are not expected to change substantially from 2004 to 2009. As with aircraft flight operations, the INM runway use input is average daily runway use based on typical operations over the course of the entire year. Runway use is the proportion of aircraft that use a runway for departure, arrival, or touch-and-goes, expressed as a percentage.

Runway use is derived primarily from a 16-day sample of FAA Automated Radar Terminal System (ARTS) data obtained during August and September 2002. A total of 2,326 operations are contained in the sample of radar data. The proportion of aircraft, by operational category, in the radar data sample is used to determine the runway use percentages that are applied to the flight operations discussed in Section 3.2.1. The comprehensive information available in radar data allows for development of detailed runway use and flight track data inputs for the NEMs. Runway use information gathered from discussions with the Idaho Air National Guard (including use of Runway 9/27) and BOI Air Traffic Control Tower (ATCT) is also factored into the average daily runway use. In addition, a 10-year period of wind data was used to verify that overall runway flows (east versus west) reflected in the radar data sample are representative of typical conditions.⁴

Because some of the radar data sample includes periods during which military aircraft from Mountain Home Air Force Base (AFB) were temporarily based at BOI, an evaluation was conducted to assess if this deployment had a significant effect on the runway use trends developed using the radar data. During the deployment of the Mountain Home AFB aircraft, arresting gear was sometimes used on Runway 10L. When the arresting gear was in use, civil aircraft generally did not use Runway 10L. A sensitivity analysis compared the affect of runway use trends on the DNL contours during periods of activity and inactivity by the Mountain Home AFB aircraft, and also with the runway use assumptions from the 1995 Part 150 Study. The analysis indicates that the radar sample is representative of typical average operations.

Due to the availability of detailed operational data, runway use is modeled by aircraft operational category. Aircraft types are grouped into operational categories by operator (airline, military, general aviation, etc.). Average runway use of air carrier operations, such as passenger and cargo carriers, can differ from general aviation operators due to the different locations on the airfield from which these aircraft operate. General aviation and air carrier aircraft also tend to use different arrival and departure routes, and this can affect their respective runway use. Operational categories allow these unique trends to be incorporated into development of the NEMs. Table 3.6 also shows overall runway use by operation type and time of day; this information is useful for discerning overall runway use trends.

Note that the absence of projected aircraft operations on a runway does not preclude future use of that runway for such operations.

Table 3.6

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Average Daily Runway Use

Operation Type	Time of Day	Operational Category	Runway						Total
			10L	10R	28L	28R	9	27	
Arrival	Daytime	CJ	32.4%	29.4%	20.6%	17.6%	-	-	100.0%
		GJ	30.3%	17.1%	25.0%	27.6%	-	-	100.0%
		GP	26.5%	23.7%	29.4%	20.3%	-	-	100.0%
		MH	-	58.3%	41.7%	-	-	-	100.0%
		MJ	22.2%	16.7%	61.1%	-	-	-	100.0%
		MP	11.1%	66.7%	22.2%	-	-	-	100.0%
		PJ	31.2%	21.4%	23.2%	24.1%	-	-	100.0%
		RJ	32.5%	22.5%	18.6%	26.4%	-	-	100.0%
		RP	43.5%	18.5%	13.4%	24.5%	-	-	100.0%
	Overall	28.9%	23.4%	26.5%	21.2%	-	-	100.0%	
	Nighttime	CJ	27.6%	34.5%	34.5%	3.4%	-	-	100.0%
		GJ	20.0%	40.0%	40.0%	-	-	-	100.0%
		GP	45.2%	35.5%	16.1%	3.2%	-	-	100.0%
		MH	-	58.3%	41.7%	-	-	-	100.0%
		MJ	22.2%	16.7%	61.1%	-	-	-	100.0%
		MP	11.1%	66.7%	22.2%	-	-	-	100.0%
		PJ	43.8%	9.0%	14.6%	32.6%	-	-	100.0%
		RJ	19.0%	50.0%	14.3%	16.7%	-	-	100.0%
		RP	-	-	-	-	-	-	-
	Overall	34.8%	30.4%	22.6%	12.1%	-	-	100.0%	
Arrival Overall			29.6%	24.4%	26.0%	20.0%	-	-	100.0%
Departure	Daytime	CJ	45.4%	20.4%	25.0%	9.1%	-	-	100.0%
		GJ	35.1%	20.3%	23.0%	21.6%	-	-	100.0%
		GP	24.1%	27.7%	25.9%	22.3%	-	-	100.0%
		MH	-	71.1%	28.9%	-	-	-	100.0%
		MJ	38.5%	53.8%	7.7%	-	-	-	100.0%
		MP	25.0%	25.0%	50.0%	-	-	-	100.0%
		PJ	43.1%	17.6%	16.3%	23.0%	-	-	100.0%
		RJ	40.0%	12.1%	25.0%	22.8%	-	-	100.0%
		RP	36.4%	11.5%	18.2%	33.9%	-	-	100.0%
	Overall	30.4%	24.3%	23.3%	22.0%	-	-	100.0%	
	Nighttime	CJ	-	-	-	-	-	-	-
		GJ	40.0%	40.0%	10.0%	10.0%	-	-	100.0%
		GP	60.0%	15.0%	5.0%	20.0%	-	-	100.0%
		MH	-	71.1%	28.9%	-	-	-	100.0%
		MJ	38.5%	53.9%	7.7%	-	-	-	100.0%
		MP	25.0%	25.0%	50.0%	-	-	-	100.0%
		PJ	55.8%	2.3%	14.0%	27.9%	-	-	100.0%
		RJ	62.3%	3.8%	15.1%	18.9%	-	-	100.0%
		RP	77.0%	7.7%	-	15.3%	-	-	100.0%
	Overall	51.1%	22.5%	11.0%	15.4%	-	-	100.0%	
Departure Overall			32.6%	24.2%	22.0%	21.3%	-	-	100.0%
Touch-and-Go	Daytime	CJ	-	-	-	-	-	-	-
		GJ	-	-	-	-	-	-	-
		GP	5.1%	45.9%	44.1%	4.9%	-	-	100.0%
		MH	-	-	-	-	-	-	-
		MJ	-	-	-	-	-	-	-
		MP	-	7.2%	4.1%	-	56.6%	32.0%	100.0%
		PJ	-	-	-	-	-	-	-
		RJ	-	-	-	-	-	-	-
		RP	-	-	-	-	-	-	-
	Overall	4.2%	39.5%	37.4%	4.1%	9.5%	5.4%	100.0%	
	Nighttime	CJ	-	-	-	-	-	-	-
		GJ	-	-	-	-	-	-	-
		GP	7.8%	69.9%	20.0%	2.3%	-	-	100.0%
		MH	-	-	-	-	-	-	-
		MJ	-	-	-	-	-	-	-
		MP	-	7.2%	4.1%	-	56.7%	32.0%	100.0%
		PJ	-	-	-	-	-	-	-
		RJ	-	-	-	-	-	-	-
		RP	-	-	-	-	-	-	-
	Overall	2.0%	23.2%	8.1%	0.6%	42.3%	23.9%	100.0%	
Touch-and-Go Overall			4.0%	37.3%	33.6%	3.6%	13.7%	7.8%	100.0%

Note: Totals may not equal 100-percent due to rounding

Sources: Radar data, wind data, ANG, BOI ATCT, and HNTB analysis

3.2.5 Flight Track Layout and Use

Modeled flight tracks depict the approximate paths, or ground tracks, that aircraft use as they travel to and from the Airport. Flight tracks are intended to be representative of typical aircraft operations at BOI. As with runway use, flight track use reflects the percentage of annual operations that use a specific flight route, grouped by arrival or departure and daytime or nighttime.

To account for the fact that all aircraft do not follow a single precise track to and from an airport, INM uses primary (e.g., backbone) and dispersed flight tracks to model actual arrival and departure flight tracks. Since aircraft fly through a moving air mass, a given heading will result in different paths over the ground under different wind conditions. Weather, traffic levels, pilot technique and differing aircraft performance capabilities make an infinite number of ground tracks possible. Neither ATC nor pilots, for example, currently have the technology available to direct all aircraft operations along a narrow highway corridor or over other specific points on the ground. The primary flight track is the mean, or average, track for a specific heading or route; multiple dispersed flight tracks reflect the dispersion that occurs to either side of the primary track.

Figure 3-1 shows the modeled departure, arrival, and touch-and-go flight tracks for Runways 9, 10L, and 10R for both the 2004 and 2009 NEMs. **Figure 3-2** shows the same information for Runways 27, 28L, and 28R. The figures show modeled flight tracks superimposed over the actual radar flight tracks, in order to demonstrate that the modeled flight tracks are comprehensive and representative of actual operations.

Departure flight track use for 2004 and 2009 is shown in **Tables 3.7 and 3.8**, while arrival flight track use is shown in **Tables 3.9 and 3.10**. The modeled flight track names shown in Figures 3-1 and 3-2 and Tables 3.7 through 3.10 indicate the general route that aircraft take when arriving or departing from the Airport.

As existing trends in flight track layout and use are expected to remain constant for the foreseeable future, the identical aircraft flight track layout and use were used to develop the 2004 and 2009 NEMs. As with flight operations and runway use, modeled flight track use is on an average annual basis. Note that for touch-and-go operations, flight track use is equivalent to runway use as shown in Table 3.6.

Flight track location and use for the Runways 10L/28R and 10R/28L was derived from analysis of a 16-day sample of radar data (the same sample used for runway use discussed in Section 3.2.4). Flight track location and use for Runway 9/27, and military helicopter use, was developed through discussions with the Idaho Air National Guard.

Due to the complex and increased dispersion of aircraft flight tracks as they leave the immediate vicinity of BOI, modeled flight tracks are only intended to represent actual operations up to the 60 DNL contour. Deviation from typical flight tracks will occur due to safety requirements, emergencies, weather, traffic demand, capacity, and aircraft performance.

3.2.6 Summary of INM Inputs

The annual average daily number of aircraft modeled on any given flight track can be derived by multiplying the average daily flight operations by the runway use percentages, and then by the flight track use percentages. Please note that this is

Table 3.7

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Average Daily Daytime Departure Flight Track Use

Runway	Track	Operational Category									Overall
		CJ	GJ	GP	MH	MJ	MP	PJ	RJ	RP	
10L	1	-	7.7%	-	-	-	-	11.6%	16.1%	-	5.0%
	2	-	26.9%	11.1%	-	-	100.0%	10.7%	31.3%	-	12.9%
	3	-	7.7%	22.2%	-	20.0%	-	10.7%	5.4%	8.3%	14.3%
	4	45.0%	23.1%	7.4%	-	-	-	19.4%	27.7%	8.3%	14.8%
	5	35.0%	3.8%	-	-	-	-	21.4%	3.6%	20.0%	8.7%
	6	5.0%	3.8%	3.7%	-	-	-	-	-	18.3%	3.9%
	7	5.0%	7.7%	-	-	-	-	9.7%	-	3.3%	3.0%
	8	-	-	7.4%	-	-	-	-	0.9%	18.3%	5.2%
	9	-	3.8%	18.5%	-	-	-	1.0%	6.3%	5.0%	9.6%
	10	-	-	3.7%	-	-	-	1.9%	1.8%	3.3%	2.6%
	11	-	-	11.1%	-	-	-	-	2.7%	10.0%	6.1%
	12	-	-	3.7%	-	-	-	1.0%	2.7%	1.7%	2.3%
	13	5.0%	3.8%	7.4%	-	-	-	3.9%	1.8%	1.7%	4.8%
	14	-	7.7%	-	-	-	-	-	-	1.7%	0.6%
	15	5.0%	3.8%	3.7%	-	80.0%	-	8.7%	-	-	6.2%
10L Total		100.0%	100.0%	100.0%	-	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
10R	1	-	-	9.7%	-	-	-	9.5%	8.8%	-	7.4%
	2	11.1%	6.7%	12.9%	-	-	-	4.8%	38.2%	-	10.9%
	3	-	13.3%	19.4%	-	28.6%	100.0%	14.3%	11.8%	10.5%	16.6%
	4	33.4%	26.7%	9.7%	-	-	-	26.2%	29.4%	5.3%	12.4%
	5	-	20.0%	6.5%	-	-	-	23.8%	3.0%	31.6%	8.9%
	6	-	13.3%	-	-	-	-	-	-	10.5%	1.0%
	7	33.3%	-	6.5%	-	-	-	9.5%	-	5.3%	6.0%
	8	-	-	3.2%	-	-	-	-	-	26.3%	3.1%
	11	-	-	19.4%	-	-	-	-	-	5.3%	12.1%
	12	-	13.3%	3.2%	-	-	-	2.4%	5.9%	5.3%	3.3%
	13	-	6.6%	3.2%	-	-	-	2.4%	3.0%	-	2.7%
	14	11.1%	-	3.2%	-	-	-	-	-	-	2.2%
	15	11.1%	-	3.2%	-	71.4%	-	7.2%	-	-	6.1%
	H1	-	-	-	100.0%	-	-	-	-	-	7.3%
	10R Total		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
28L	1	-	11.8%	3.4%	-	-	-	17.9%	20.0%	-	6.7%
	2	-	29.5%	6.9%	-	100.0%	50.0%	23.1%	21.4%	-	11.3%
	3	-	-	6.9%	-	-	-	2.6%	7.2%	10.0%	5.8%
	4	72.7%	-	10.3%	-	-	-	17.9%	20.0%	3.4%	12.5%
	5	-	5.9%	10.3%	-	-	-	20.5%	4.3%	23.3%	10.7%
	6	27.3%	5.9%	3.4%	-	-	-	5.1%	-	13.3%	4.6%
	7	-	11.7%	6.9%	-	-	-	5.1%	2.8%	23.3%	7.2%
	8	-	11.8%	27.6%	-	-	50.0%	5.1%	24.3%	20.0%	21.9%
	9	-	23.5%	24.1%	-	-	-	2.6%	-	6.7%	16.3%
	H1	-	-	-	100.0%	-	-	-	-	-	3.1%
28L Total		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
28R	1	-	18.7%	8.0%	-	-	-	18.2%	25.0%	-	10.7%
	2	-	6.2%	-	-	-	-	20.0%	25.0%	-	6.0%
	3	-	-	8.0%	-	-	-	5.5%	3.1%	7.1%	6.5%
	4	50.1%	-	8.0%	-	-	-	9.1%	12.5%	10.7%	9.1%
	5	49.9%	18.7%	4.0%	-	-	-	14.6%	4.7%	21.4%	9.3%
	6	-	6.2%	-	-	-	-	9.1%	-	16.1%	3.9%
	7	-	6.3%	20.0%	-	-	-	7.3%	4.7%	23.2%	15.9%
	8	-	37.5%	40.0%	-	-	-	16.4%	21.9%	16.1%	30.7%
	9	-	6.3%	12.0%	-	-	-	-	3.1%	5.4%	7.9%
28R Total		100.0%	100.0%	100.0%	-	-	-	100.0%	100.0%	100.0%	100.0%

Note: Totals may not equal 100-percent due to rounding

Sources: Radar data, BOI ATCT, and HNTB analysis

Table 3.8

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Average Daily Nighttime Departure Flight Track Use

Runway	Track	Operational Category									Overall
		CJ	GJ	GP	MH	MJ	MP	PJ	RJ	RP	
10L	1	-	-	16.7%	-	-	-	-	18.2%	-	11.9%
	2	-	25.0%	-	-	-	100.0%	-	24.2%	-	7.8%
	3	-	25.0%	75.0%	-	20.0%	-	-	9.1%	40.0%	40.9%
	4	-	-	-	-	-	-	41.7%	30.3%	10.0%	12.3%
	5	-	25.0%	-	-	-	-	4.2%	-	-	1.8%
	7	-	-	-	-	-	-	20.8%	-	40.0%	3.5%
	10	-	-	-	-	-	-	12.5%	9.1%	-	3.6%
	11	-	-	8.3%	-	-	-	-	3.0%	-	4.5%
	12	-	25.0%	-	-	-	-	8.3%	-	-	2.3%
	13	-	-	-	-	-	-	4.2%	6.1%	-	1.9%
	14	-	-	-	-	-	-	4.2%	-	10.0%	0.8%
15	-	-	-	-	80.0%	-	4.2%	-	-	8.6%	
10L Total		-	100.0%	100.0%	-	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
10R	1	-	-	33.3%	-	-	-	-	-	-	9.2%
	2	-	25.0%	-	-	-	-	-	49.9%	-	4.9%
	3	-	25.0%	33.3%	-	28.6%	100.0%	100.0%	-	100.0%	24.3%
	4	-	-	-	-	-	-	-	50.1%	-	1.7%
	6	-	25.0%	-	-	-	-	-	-	-	3.2%
	8	-	-	33.3%	-	-	-	-	-	-	9.2%
	14	-	24.9%	-	-	-	-	-	-	-	3.2%
	15	-	-	-	-	71.4%	-	-	-	-	20.1%
H1	-	-	-	100.0%	-	-	-	-	-	24.2%	
10R Total		-	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
28L	1	-	-	-	-	-	-	-	37.5%	-	10.0%
	2	-	-	-	-	100.0%	50.0%	-	12.5%	-	15.2%
	4	-	100.0%	-	-	-	-	-	12.5%	-	9.5%
	6	-	-	-	-	-	-	16.7%	-	-	2.4%
	7	-	-	100.0%	-	-	-	33.3%	-	-	22.7%
	8	-	-	-	-	-	50.0%	50.0%	37.5%	-	21.0%
	H1	-	-	-	100.0%	-	-	-	-	-	19.2%
28L Total		-	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	-	100.0%
28R	1	-	-	75.0%	-	-	-	-	40.0%	50.0%	48.3%
	2	-	-	-	-	-	-	-	10.0%	-	2.3%
	3	-	-	-	-	-	-	-	-	50.0%	0.8%
	4	-	-	-	-	-	-	-	10.0%	-	2.3%
	6	-	100.0%	-	-	-	-	8.4%	-	-	6.0%
	7	-	-	-	-	-	-	50.0%	-	-	9.9%
	8	-	-	-	-	-	-	41.6%	40.0%	-	17.6%
	9	-	-	25.0%	-	-	-	-	-	-	12.7%
	28R Total		-	100.0%	100.0%	-	-	-	100.0%	100.0%	100.0%

Note: Totals may not equal 100-percent due to rounding

Sources: Radar data, BOI ATCT, and HNTB analysis

Table 3.9

BOISE AIRPORT - PART 150 STUDY UPDATE

Average Daily Daytime Arrival Flight Track Use

Runway	Track	Operational Category									Overall
		CJ	GJ	GP	MH	MJ	MP	PJ	RJ	RP	
10L	1	-	13.1%	6.4%	-	-	-	10.0%	25.3%	1.1%	8.6%
	2	9.1%	8.7%	2.1%	-	25.0%	-	11.4%	22.0%	-	6.4%
	3	63.6%	13.0%	36.2%	-	-	100.0%	20.0%	31.9%	19.1%	29.8%
	4	27.3%	13.1%	2.1%	-	-	-	17.2%	4.4%	13.8%	7.2%
	5	-	8.7%	8.5%	-	-	-	7.1%	-	23.4%	9.1%
	6	-	17.4%	8.5%	-	-	-	12.9%	8.8%	20.2%	11.0%
	7	-	-	14.9%	-	-	-	-	1.1%	14.9%	9.7%
	8	-	4.4%	6.4%	-	-	-	14.3%	6.6%	1.1%	6.4%
	9	-	-	8.5%	-	75.0%	-	4.3%	-	-	6.0%
	10	-	21.7%	6.4%	-	-	-	2.9%	-	6.4%	5.8%
10L Total		100.0%	100.0%	100.0%	-	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
10R	1	-	23.1%	9.5%	-	-	-	16.7%	25.4%	5.0%	11.2%
	2	-	23.1%	2.4%	-	-	-	4.2%	27.0%	-	5.5%
	3	100.0%	23.1%	33.3%	-	-	66.7%	27.1%	19.1%	35.0%	30.1%
	4	-	-	-	-	-	-	12.5%	1.6%	10.0%	2.4%
	5	-	-	4.8%	-	-	16.7%	10.4%	-	12.5%	4.9%
	6	-	-	9.5%	-	-	-	12.5%	6.4%	22.5%	9.1%
	7	-	7.7%	23.8%	-	-	16.7%	2.1%	3.2%	10.0%	15.1%
	8	-	-	4.8%	-	-	-	4.2%	15.9%	2.5%	5.0%
	9	-	23.1%	-	-	100.0%	-	10.4%	1.6%	-	3.4%
	10	-	-	11.9%	-	-	-	-	-	2.5%	6.8%
H1	-	-	-	100.0%	-	-	-	-	-	-	6.5%
10R Total		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
28L	1	-	5.3%	5.8%	-	-	-	5.8%	17.3%	-	5.8%
	2	-	10.5%	3.8%	-	9.1%	50.0%	9.6%	30.8%	-	6.8%
	3	14.3%	5.3%	32.7%	-	18.2%	-	15.4%	28.9%	20.7%	26.2%
	4	71.4%	21.0%	9.6%	-	-	-	17.3%	3.8%	17.2%	11.1%
	5	-	-	7.7%	-	-	-	11.5%	5.8%	10.4%	7.0%
	6	-	21.0%	21.2%	-	-	-	-	3.8%	10.4%	14.9%
	7	-	10.5%	-	-	-	-	11.5%	9.6%	-	2.6%
	8	-	15.8%	3.8%	-	-	-	11.5%	-	10.4%	5.0%
	9	14.3%	10.5%	11.5%	-	-	50.0%	-	-	17.2%	8.8%
	10	-	-	-	-	72.7%	-	17.3%	-	-	4.6%
	11	-	-	3.8%	-	-	-	-	-	13.8%	3.0%
H1	-	-	-	100.0%	-	-	-	-	-	-	4.1%
28L Total		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
28R	1	-	4.8%	8.3%	-	-	-	3.7%	9.5%	-	6.5%
	2	-	14.3%	2.8%	-	-	-	11.1%	21.6%	-	7.0%
	3	33.4%	19.0%	52.8%	-	-	-	20.4%	39.2%	22.7%	40.3%
	4	66.6%	23.8%	5.6%	-	-	-	16.7%	6.8%	20.8%	11.2%
	5	-	4.8%	11.1%	-	-	-	20.4%	10.8%	9.4%	11.6%
	6	-	14.3%	5.6%	-	-	-	1.9%	2.7%	11.3%	5.8%
	7	-	-	2.8%	-	-	-	5.6%	9.5%	3.8%	3.9%
	8	-	9.5%	-	-	-	-	9.2%	-	15.1%	3.7%
	9	-	9.5%	5.6%	-	-	-	-	-	7.5%	4.4%
	10	-	-	2.8%	-	-	-	11.1%	-	-	3.1%
	11	-	-	2.8%	-	-	-	-	-	9.4%	2.5%
28R Total		100.0%	100.0%	100.0%	-	-	-	100.0%	100.0%	100.0%	100.0%

Note: Totals may not equal 100-percent due to rounding

Sources: Radar data, BOI ATCT, and HNTB analysis

Table 3.10

BOISE AIRPORT - PART 150 STUDY UPDATE

Average Daily Nighttime Arrival Flight Track Use

Runway	Track	Operational Category									Overall	
		CJ	GJ	GP	MH	MJ	MP	PJ	RJ	RP		
10L	1	-	100.0%	57.1%	-	-	-	25.6%	50.0%	-	40.4%	
	2	-	-	-	-	25.0%	-	2.6%	50.0%	-	5.5%	
	3	62.5%	-	-	-	-	100.0%	12.8%	-	-	8.1%	
	4	25.0%	-	-	-	-	-	10.3%	-	-	4.8%	
	5	12.5%	-	-	-	-	-	15.4%	-	-	5.8%	
	6	-	-	28.6%	-	-	-	-	-	-	13.5%	
	7	-	-	-	-	-	-	5.1%	-	-	1.7%	
	8	-	-	7.1%	-	-	-	23.1%	-	-	11.1%	
	9	-	-	-	-	75.0%	-	2.6%	-	-	4.8%	
	10	-	-	7.1%	-	-	-	2.6%	-	-	4.2%	
10L Total		100.0%	100.0%	100.0%	-	100.0%	100.0%	100.0%	100.0%	-	100.0%	
10R	1	-	-	45.5%	-	-	-	12.5%	42.9%	-	29.2%	
	2	10.0%	-	9.1%	-	-	-	-	14.3%	-	7.6%	
	3	80.0%	-	-	-	-	66.6%	25.1%	-	-	10.2%	
	4	10.0%	-	-	-	-	-	-	-	-	0.8%	
	5	-	-	18.2%	-	-	16.7%	12.5%	-	-	9.3%	
	6	-	-	27.3%	-	-	-	12.5%	-	-	12.7%	
	7	-	-	-	-	-	16.7%	-	-	-	0.5%	
	8	-	50.0%	-	-	-	-	12.5%	42.9%	-	11.3%	
	9	-	50.0%	-	-	100.0%	-	25.1%	-	-	7.4%	
	H1	-	-	-	100.0%	-	-	-	-	-	11.0%	
10R Total		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	-	100.0%	
28L	1	-	-	40.0%	-	-	-	15.4%	-	-	13.6%	
	2	-	-	-	-	9.1%	50.2%	23.1%	83.4%	-	13.3%	
	3	70.0%	-	40.0%	-	18.2%	-	23.1%	-	-	26.0%	
	4	30.0%	50.0%	-	-	-	-	15.4%	-	-	8.3%	
	6	-	-	20.0%	-	-	-	-	-	-	5.4%	
	7	-	-	-	-	-	-	-	16.6%	-	1.3%	
	8	-	50.0%	-	-	-	-	15.4%	-	-	5.1%	
	9	-	-	-	-	-	49.8%	-	-	-	0.7%	
	10	-	-	-	-	72.7%	-	7.6%	-	-	15.3%	
	H1	-	-	-	100.0%	-	-	-	-	-	11.0%	
	28L Total		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	-	100.0%
28R	2	-	-	-	-	-	-	10.4%	57.2%	-	17.0%	
	3	-	-	100.0%	-	-	-	41.4%	14.3%	-	41.7%	
	4	100.0%	-	-	-	-	-	17.3%	-	-	14.3%	
	5	-	-	-	-	-	-	3.4%	-	-	2.5%	
	7	-	-	-	-	-	-	3.4%	28.6%	-	7.3%	
	8	-	-	-	-	-	-	13.8%	-	-	9.9%	
	9	-	-	-	-	-	-	3.4%	-	-	2.5%	
	10	-	-	-	-	-	-	6.9%	-	-	4.9%	
	28R Total		100.0%	-	100.0%	-	-	-	100.0%	100.0%	-	100.0%

Note: Totals may not equal 100-percent due to rounding

Sources: Radar data, BOI ATCT, and HNTB analysis

representative of an average annual day only; in reality, the actual number of operations that use a specific flight track can vary significantly due to wind and operational factors.

The data discussed in this chapter is integrated into INM to generate the DNL contours shown on the 2004 and 2009 NEMs, as presented in Chapter Five.

NOTES

- ¹ Source: NOAA National Geophysical Data Center
- ² Source: Hourly weather observations between 1992-2001, National Climatic Data Center
- ³ Ibid.
- ⁴ Ibid.

Chapter Four

LAND USE GUIDELINES AND COMPATIBILITY

This chapter reviews the Federal and local land use guidelines related to compatibility with aircraft noise exposure and aeronautical uses, and the development of land use data needed for the analyses required in Part 150. The chapter concludes with a discussion of development of the population and housing unit counts for the 2004 and 2009 NEMs, which is used in support of the existing and future land use compatibility determination that is presented in Chapter Five.

4.1 FEDERAL GUIDELINES

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

In a Part 150 study, the DNL noise contours have the following two principal uses:

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

Both of these functions require the application of objective criteria for evaluating noise impacts. Part 150 provides the FAA’s recommended guidelines for noise-land use compatibility evaluation. **Table 4.1** reproduces these guidelines. As noted in an earlier chapter, the Aviation Safety and Noise Abatement Act of 1979 required the FAA to select a single measure for evaluating airport noise. FAA through the Part 150 Study process adopted the DNL metric and guidelines for compatibility of various land uses with various intensities of DNL, as shown in the table.

The FAA’s guidelines represent a compilation of the results of scientific research into noise-related activity interference and attitudinal response. However, reviewers of DNL contours should recognize the highly subjective nature of an individual’s response to noise, and that special circumstances can affect individual tolerances. For example, a high, non-aircraft background noise level can reduce the significance of aircraft noise, such as in areas constantly exposed to relatively high levels of vehicular traffic noise. Alternatively, residents of areas with unusually low background noise levels may find relatively low levels of aircraft noise annoying.

Response may also be affected by expectation and experience. People may become accustomed to a level of exposure that guidelines typically indicate may be unacceptable. Conversely, minor changes in

Table 4.1

Part 150 Noise/Land Use Compatibility Guidelines

Land Use	Yearly Day-Night Average Sound Level, DNL, in Decibels					
	<65	65-70	70-75	75-80	80-85	>85
<i>Residential Use</i>						
Residential, other than mobile homes and transient lodgings	Y	N(a)	N(a)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N(a)	N(a)	N(a)	N	N
<i>Public Use</i>						
Schools	Y	N(a)	N(a)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(b)	Y(c)	Y(d)	Y(d)
Parking	Y	Y	Y(b)	Y(c)	Y(d)	N
<i>Commercial Use</i>						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail--building materials, hardware and farm equipment	Y	Y	Y(b)	Y(c)	Y(d)	N
Retail trade--general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(b)	Y(c)	Y(d)	N
Communication	Y	Y	25	30	N	N
<i>Manufacturing and Production</i>						
Manufacturing, general	Y	Y	Y(b)	Y(c)	Y(d)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(f)	Y(g)	Y(h)	Y(h)	Y(h)
Livestock farming and breeding	Y	Y(f)	Y(g)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
<i>Recreational</i>						
Outdoor sports arenas and spectator sports	Y	Y(e)	Y(e)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	Y	N	N	N
Golf courses, riding stables, and water recreation	Y	Y	25	30	N	N
SLUCM	Standard Land Use Coding Manual					
Y(Yes)	Land use and related structures compatible without restrictions.					
N(No)	Land use and related structures are not compatible and should be prohibited.					
NLR	Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.					
25, 30, or 35	Land use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structure.					

See following page for Table Notes.

Notes for Table 4.1

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

- (a) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor-to-indoor NLR of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.
- (b) Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas or where the normal noise level is low.
- (c) Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas or where the normal noise level is low.
- (d) Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas or where the normal noise level is low.
- (e) Land use compatible provided special sound reinforcement systems are installed.
- (f) Residential buildings require an NLR of 25.
- (g) Residential buildings require an NLR of 30.
- (h) Residential buildings not permitted.

Source: 14 CFR Part 150

exposure may generate a response that is far greater than that which the guidelines suggest.

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

despite the seeming maintenance of the noise status quo.

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

Part 150 guidelines indicate that all uses are normally compatible with aircraft noise exposure levels at or below 65 DNL. This limit is supported formally by standards adopted by the Department of Housing and Urban Development (HUD). HUD standards address whether sites are eligible for Federal funding support for development. These standards, set forth in 24 CFR Part 51, define areas with DNL exposure not exceeding 65 dB as acceptable for funding. Areas exposed to noise levels between 65 and 75 DNL are “normally unacceptable,” and require special abatement measures and review. Those at 75 DNL and above are “unacceptable” except under limited circumstances.

According to Part 150, the federal land use guidelines are to be used unless local land use authorities have adopted alternative land use compatibility guidelines. Section 4.2 below notes that while local land use guidelines have been adopted by the City of Boise, they are consistent with the federal guidelines. Therefore, the BOI Part 150 Study used the Federal Part 150 and local guidelines to assist in identifying potential land use incompatibilities in the BOI environs.

4.2 LOCAL LAND USE GUIDELINES

In the State of Idaho, counties and municipalities each have individual control to amend their comprehensive plans and municipal zoning ordinances. The City of Boise and Ada County (both having jurisdiction within the BOI Influence Area) have adopted land use initiatives that protect aviation and land use planning within the Boise Influence Area, and can restrict the development of non-compatible land uses as described in this section. Although Boise City and Ada County each enact and enforce zoning regulations, each jurisdiction does

not coordinate or synchronize their specific requirements with the other.

4.2.1 The City of Boise

The January 1997 Comprehensive Plan - Land Use Chapter 8, identifies land use goals, objectives and development policies specific to the Airport area, stating that all development within the Airport Influence Area shall be required to adhere to specific standards for development. Those standards are outlined in the comprehensive plan’s Chapter 3 - Environmental Quality, regarding noise, goals, objectives and policies.

In preventing and mitigating adverse impacts of excessive noise exposure, policies indicate that all new development and existing structures within the Airport Influence Area must be soundproofed according to specific Influence Area Standards in zones “A” (60-65 DNL), “B” (65-70 DNL), “B-1” (65-70 DNL), and “C” (70+ DNL). Residential and new school development is allowed in Area “A”, provided that a sound level reduction of 25 dB is provided. Residential development is not allowed in Area “B” or “C”. However, residential development is allowed in Area “B-1”, provided that a sound level reduction of 30 dB is provided. Office and commercial uses are allowed in Area “B-1”, while non-sensitive manufacturing, industrial and commercial uses are allowed in Area “C”.

A major purpose of Boise’s Comprehensive Plan is to protect existing noise generating uses (such as the aircraft operations at BOI) from the encroachment of noise-sensitive uses by promoting non-residential development as a primary goal of the environmental quality objectives of the comprehensive plan. In addition, Comprehensive Plan Chapter 6 -

Transportation protects the long-term viability of BOI as part of the city’s multi-modal transportation system.

Unlike Boise’s Comprehensive Plan document, the City’s Municipal Code, Zoning Ordinance, Chapter 11, offers no specific reference guidelines pertaining to the Airport Influence Area. Protection of airport operations has fallen to staff diligence regarding the implementation of the Comprehensive Plan and the 1996 Part 150 Study.

Additional guidelines found in Chapter 12, cited as “Boise Air Terminal Ordinance”, define the Airport District and the legal implementation of the continued comprehensive planning process. The description of the established zones differ from those of the comprehensive plan and impose limitations within each zone such as height restrictions, conforming and non-conforming uses and general land use limitations.

Those Chapter 12 zones include Zone “A” – Landing Strip and Overrun Area (Open Space); Zone “B” – Inner Approach Zone (Agriculture, Rural Residential, Sand and Gravel pits, and Sanitary Land fills); Zone “C” – Outer Approach Zone (no use permitted); Zone “E” – Transition Zone (no use permitted); Zone “F” – Horizontal Zone (no use permitted); Zone “G” – Conical Zone; Zone “H” – Noise Transition Zone (Residential, Industrial and Commercial); Zone “I” – Landing Strip Transition Zone; and Zone “J” – the Outer Area Limitation Zone (any use permitted by zoning regulations).

4.2.2 Ada County

Development of properties within Ada County is regulated by their June 1996 County Comprehensive Plan, Land Use

Chapter 5, providing for land uses that are compatible with aircraft noise, approach zones, and operation activities in the protection of the health, safety and welfare of the general public.

Ada County defines the Airport Influence Area as that area within the 65+ DNL contours projected to the year 2005, including zones “A”, “A-1”, “B”, “C”, “B-1” and “C-1” of the airport, found in the Noise Mitigation Plan, Boise Air Terminal, Boise, Idaho, 1986.

Residential development is permitted within Area “A” and “A-1”, with evidence that a minimum noise level reduction of 25 dB is provided by the builder.

Places of public assembly such as schools, hospitals, day care centers, theaters, nursing homes and churches are prohibited and are considered non-compatible land use developments within Area “A”.

The development of schools are permitted only in Area “A-1”, where soundproofing is determined to be sufficient.

Commercial and industrial non-sensitive developments are allowed on a limited basis within Areas “B” and “C”, with residential development within existing residential subdivisions allowed requiring evidence of a minimum noise level reduction of 30 dB by the builder.

Residential rezones and / or the approval of new residential subdivision plats within this zone are not permitted. Shopping centers, auditoriums, motel/hotel complexes, restaurants and other similar uses that cause the concentration of people (3 to 5 employees per 1,000 square feet) are considered a safety hazard and are not allowed within the “B-1” zone.

The majority of the land within Area “C” is now owned by Boise City, but is governed by the Land Use Chapter of the County Comprehensive Plan. No residential or quasi-public uses are permitted within this zone. Avigation easements are required for all permitted uses and open spaces such as greenways, parks, agriculture and recreation are considered compatible uses within the Airport Influence Area.

In comparison, the purpose of the June 2000 Ada County Code Ordinance, Title 3 - Boise Air Terminal Article, is to implement the goals, objectives, and policies of the applicable comprehensive plan as it relates to the Airport Influence Areas. It also provides for land uses that are compatible with aircraft noise, approach zones and airport operations. Additional restrictions are placed on land use development within the BOI Airport Influence Area overlay district, consistent with the federal aviation regulations of the Part 150 Noise Compatibility Study Update.

The Airport Influence Area overlay district is divided into four zones including Area “A” (65 DNL), “B-1” (70 DNL), “B” (70 DNL), and “C” (75+ DNL), establishing land use restrictions and noise attenuation standards for those areas. These regulations apply to new subdivisions and new construction, alterations, a use change of residential, commercial or industrial structures within the airport overlay district and as identified on the BOI Airport Influence Area maps. Prior to issuance of a zoning certificate, an applicant must provide written documentation that the applicant has filed an avigation easement with BOI. The process further clarifies that no uses shall be permitted within the Airport Influence Area that create hazards to aircraft and/or impairs landing, takeoff or maneuvering of aircraft.

Each of the four zones stated above establishes allowable uses compatible within each specific Airport Influence Area and sets additional standards for sound attenuation measures to achieve required noise level reductions into the design and construction of uses that contain noise sensitive areas (either in-part or in-total).

4.3 EXISTING AND FUTURE LAND USE COMPATIBILITY

This section describes the development of land use and demographic data, and existing and forecast land use relative to the BOI noise environment. Noise impact analyses for the BOI Part 150 Study were conducted using a Geographic Information System (GIS). GIS facilitated a detailed analysis of land use compatibility and noise exposure to communities near BOI. The land uses near BOI, including land within the 60 DNL contours, fall within the political jurisdictions of Ada County and the City of Boise.

The FAA requires that the NEMs show existing and projected land uses. Existing land use data was developed in reference to data provided by the City of Boise and in reference to year 2003 aerial photography. Future land use data was provided by the City of Boise by means of the City’s comprehensive plan. The future land uses are meant to illustrate the projected future uses as envisioned by the comprehensive planning process completed by the City of Boise.¹ The location of noise-sensitive buildings such as schools, places of worship, and hospitals was determined through land use data and by field surveys.

Demographic data, such as housing units and population, were developed from 2000 U.S. Census block data. Demographic data was correlated to residential land use data

using the GIS. This data served as the land use database for the Part 150 Study Update.

Figures 4-1 and 4-2 depict existing and future land uses in the vicinity of BOI. Land use categories include residential, commercial, industrial, mixed, public facility/institutional, open space, airport property, airport conservation, park, and school. DNL noise contours, when superimposed on the land use base maps, allow assessment of land use compatibility for existing and future noise exposure conditions at BOI. GIS was used to delineate non-compatible land uses, including residential housing units.

In addition to future land use, Figure 4-2 also shows the City of Boise Impact Area. Land within the impact area is part of Ada County and is subject to potential annexation by the City of Boise. The City of Boise and Ada County coordinate and consult with each other on development proposals and land use changes within the impact area.

As discussed in Section 4.1, the Federal standard for noise compatibility for most noise-sensitive land uses is 65 DNL. This study uses the Federal standard, but also shows contours out to the 60 DNL as a guideline for preventive land use measures.

Chapter Five presents the residential population and housing unit counts, and noise-sensitive counts, for each NEM by government jurisdiction and DNL contour interval for the existing and future land use.

Although it is difficult to estimate the future number of dwellings and people that are likely to live in the area predicted to be exposed to aircraft noise, the projected data are useful in gauging the potential future impacts from aviation operations. Future dwelling and population counts were

determined by applying 2000 U.S. Census data to planned future land use. The future land uses are meant to illustrate the projected future uses as envisioned by the comprehensive planning process completed by the City of Boise.

NOTE

- ¹ For areas in which the current zoning differs from the proposed future zoning and the existing zoning permits development of non-compatible land uses, Federal monies will not be available for future mitigation per 14 CFR Part 150.

Chapter Five

NOISE EXPOSURE MAPS

This chapter presents the Noise Exposure Maps (NEMs). The NEMs were developed with the information discussed in Chapters Three and Four, and represent existing and five-year forecast noise exposure at Boise Airport (BOI).

5.1 NOISE EXPOSURE MAPS

This section presents the BOI NEMs for 2004 and 2009, developed in accordance with the provisions of 14 CFR Part 150, Airport Noise Compatibility Planning. The certification page at the front of this document and on the NEMs addresses Part 150 requirements regarding the accuracy of the maps and the opportunities provided for public review and input.

5.1.1 Year 2004 Noise Exposure Map

Figure 5-1 represents the NEM for existing conditions for the year of submission (2004), assuming the existing land use, operational procedures, airport layout, flight operations and fleet mix, and other noise modeling considerations described in Chapter Three. Figure 5-1 is referred to as the 2004 NEM.

As shown in **Table 5.1**, there are 82 people and 31 housing units within the 65 DNL contour of the 2004 NEM. Within the 60-64 dB DNL contour, there are 797 people and 297 housing units. As the 65 DNL is the Federal threshold for impact to residential areas, the counts within the 60 to 64 DNL contour are provided for informational purposes only.

There are no non-residential noise sensitive locations (schools, hospitals, places of worship, etc) within the 65 dB DNL contour of the 2004 NEM. There is a single place of worship and park within the 60 DNL contour.

5.1.2 Year 2009 Noise Exposure Map

Figures 5-2 and 5-3 represent the NEMs for forecast conditions for the fifth year following the year of submission (2009), on existing and future land use respectively, assuming the existing operational procedures, recommended noise abatement measures, airport layout, flight operations and fleet mix, and other noise modeling considerations described in Chapter Three. Figure 5-2 is referred to as the 2009 NEM. As the recommended noise abatement measures discussed in the next chapter are not estimated to result in a substantive change in noise exposure within the 60 DNL contour, the 2009 NEM represents both the unmitigated and mitigated conditions.

From the estimates in Table 5.3, the 65 DNL contour of the 2009 NEM contains 105 people and 40 housing units relative to the existing land use. Within the 60-64 dB DNL contour, there are 818 people and 304 housing units. There are 23 more people and nine more housing units in the 2009 NEM than in the 2004 NEM, due to the increase in forecasted flight operations discussed in Chapters Two and Three. Note that the reduction of people and housing units with the future land use, as compared to the existing land use, is a reflection of the more generalized nature of the future land use.

There are no non-residential noise sensitive locations within the 65 dB DNL contour of the 2009 NEM. There is a single place of

worship and park within the 60 DNL contour.

Table 5.1

Summary of Non-Compatible Land Use within Noise Exposure Maps

Noise Exposure Map	60-64 dB DNL		65-69 dB DNL		70-74 dB DNL		Within 75 dB DNL		Total	
	Population	Housing Units	Population	Housing Units	Population	Housing Units	Population	Housing Units	Population	Housing Units
Existing Land Use										
2004 NEM	797	297	82	31	-	-	-	-	879	328
2009 NEM	818	304	105	40	-	-	-	-	923	344
Future Land Use										
2009 NEM	720	273	103	38	-	-	-	-	823	311

Note: Population data rounded to the nearest whole number, except for values less than one which are rounded up.

Source: HNTB analysis

Chapter Six

NOISE ABATEMENT MEASURES

This chapter discusses existing noise abatement flight procedures, and potential new procedures to reduce noise exposure to communities surrounding Boise Airport (BOI). The analysis of noise abatement measures considered changes to runway use, flight track use, and other operational procedures that determine where aircraft fly in the immediate vicinity of the Airport.

In this chapter, Section 6.1 discusses elements of a Noise Compatibility Program (NCP). Section 6.2 outlines the development of the noise abatement elements of the NCP, including evaluation criteria. Section 6.3 evaluates potential modifications to the existing noise abatement measures at BOI, while Section 6.4 evaluates potential new noise abatement measures. Section 6.5 summarizes the noise abatement measures recommended for inclusion in the NCP.

6.1 GENERAL ELEMENTS OF THE NOISE COMPATIBILITY PROGRAM

The development of an NCP begins with an evaluation of all reasonable, feasible actions that could reduce potential land use non-compatibilities identified in the NEMs. Part 150 specifies the range of alternatives that must be considered. NCP measures fall into three principal categories:

- Noise abatement measures seek changes to operational flight procedures to reduce the size or change the shape of the noise contours so as to minimize non-compatibilities.

- Land use measures are intended to correct existing non-compatible land uses and prevent future non-compatibilities.
- Continuing program measures may be useful for implementing and evaluating the recommended noise abatement and land use measures. They can also serve to enhance community and airport dialogue regarding aviation noise, improve public understanding of aviation noise, and provide of ongoing evaluation of noise generated from aircraft flight operations

Noise abatement measures are evaluated in this chapter; land use measures are contained in Chapter Seven while continuing program measures are included in Chapter Eight.

Currently, an estimated 304 homes and 818 people are estimated to reside within the 60+ DNL contour of the 2009 NEM, while only 40 homes and 105 people are estimated to be within the 65+ DNL contour (which is defined by FAA guidelines as significant aircraft noise exposure). BOI is thus in the enviable position of having a relatively small population that is impacted by significant aircraft noise, per the Federal standards. Accordingly, this study focuses primarily on preventing future non-compatible development through land use measures, while also addressing existing noise and land use conflicts with noise abatement and land use measures as appropriate.

Part 150 requires that an airport operator consider, at a minimum, the seven categories of NCP measures shown in **Table 6.1**. The BOI Part 150 Study considers NCP measures in each category, including beneficial actions proposed by the FAA, other study participants, and the public.

The measures described in this chapter, Chapter Seven, and Chapter Eight reflect the airport operator’s recommendations for the NCP. The proposed NCP measures are presented prior to the FAA’s review for approval or disapproval and as such do not represent the opinions or decisions of the FAA.

6.2 EVALUATION OF NOISE ABATEMENT MEASURES

Noise abatement measures may reduce aircraft noise levels or mitigate noise affecting sensitive areas. The proposed

aircraft noise abatement measures for BOI in this document were developed and analyzed per Part 150 guidelines and with input from airport staff, the advisory committee, and the general public. **Table 6.2** presents the aircraft noise abatement measures considered in this study, organized in the five principal types of noise abatement measures required for consideration by 14 CFR Part 150.

Although several members of the advisory committee and some participants at the public meetings commented on the noise produced by military aircraft, military operations are essentially beyond the scope of a Part 150 study. The representatives of the Idaho Air National Guard have publicly committed to consider noise abatement in their flight operations, to the extent possible. As a result, the measures recommended in this study do not specifically address abatement measures for military aircraft,

Table 6.1

Categories of Noise Compatibility Planning Measures

Category	Description	Measure Type
1	Land acquisition and interests therein	Land Use
2	Barriers, shielding, public building soundproofing	Land Use and Noise Abatement
3	Preferential runway use system	Noise Abatement
4	Flight procedures	Noise Abatement
5	Restrictions on type/class of aircraft	Noise Abatement
6	Other actions with beneficial impact	Miscellaneous, Land Use, or Noise Abatement
7	Other FAA recommendations	Miscellaneous, Land Use, or Noise Abatement

Source: 14 CFR Part 150, paragraphs B150.7 (b) (1) through (7)

although military aircraft may participate in voluntary measures such as preferential runway use and departure flight track turn altitudes.

Aircraft noise abatement alternatives are analyzed for their potential to reduce the noise-impacted population primarily within the 65+ DNL contour. Benefits within the 60-65 DNL contour are considered to the extent that they are cost-effective and do not increase population within the 65+ DNL. For a measure to be recommended in the NCP, it must be operationally feasible and follow existing FAA regulations regarding

air traffic. Furthermore, the measure cannot unduly increase ATC workload and must be usable by aircraft pilots. In addition, the impact of an alternative on airport efficiency is an important consideration in alternative development, as proposed improvements cannot significantly reduce the airport’s capacity or increase delay. Above all other considerations, any alternative must maintain the safety of aircraft operations.

Section 6.2.1 outlines the evaluation criteria for each noise abatement measure. Sections 6.3 and 6.4 review each potential measure in detail.

Table 6.2

Noise Abatement Measures Considered in Boise Airport Part 150 Study

Type of Noise Abatement Measure	Specific Measure
Preferential Runway Use Measures	<ul style="list-style-type: none"> • East Flow • West Flow • Nighttime Flows
Preferential Flight Track Measures	<ul style="list-style-type: none"> • Departure Turn Altitudes • Downwind Arrival Flight Tracks • FMS & GPS Flight Tracks
Flight Procedure Modification Measures	<ul style="list-style-type: none"> • Noise Abatement Departure Profiles • Noise Abatement Arrival Profiles • Visual Approach Altitude
Airport Use Restriction Measures	<ul style="list-style-type: none"> • Curfews/Restrictions on Operations of Noisiest Aircraft during Nighttime or 24 Hours: <ul style="list-style-type: none"> • Restrictions on non-Stage 3 jet operations • Restrictions on hushkitted Stage 3 Air Carrier operations
Airport Layout Modification Measures	<ul style="list-style-type: none"> • Noise Barriers

Source: HNTB with input from the City of Boise, FAA, airport tenants, and the general public.

6.2.1 Evaluation Criteria

Potential noise abatement measures must be evaluated in terms of effectiveness, feasibility, and cost. The specific criteria that are used in this Part 150 Study to evaluate potential noise abatement measures

are shown in **Table 6.3**. Much of the evaluation conducted in this chapter is organized in the form of tables. This is done to provide structure and consistency for comparison and thus enhance the readability of the evaluation.

Table 6.3

Evaluation Criteria for Potential Noise Abatement Measures

Description	Brief formal description of the proposed measure.
Potential Noise Impacts	Estimate potential population changes within the 65+ DNL contour of the 2009 NEM and relevant Single Event Sound Exposure Level (SEL) contours, in reference to existing land use, which could result from a proposed measure. Population changes within the 60-64 DNL contour may also be considered, if appropriate to evaluate the effect of a measure on a wider area. However, the federal standard of 65 DNL is recognized by this study as the threshold of noise impact for noise abatement.
ATC and Operational Feasibility, and Safety Considerations	Assess ATC and operational feasibility of a proposed measure, in reference to safety, ATC and airline guidelines, aircraft performance, navigation technology, etc. The evaluation of this criterion would be conducted in consultation with ATC and aeronautical users, as appropriate.
Effects on Airport Operations and Impact on Airport Users	Quantitative cost of measure to aeronautical users, including airlines, resulting from increased delay, taxi distance, or additional flight distance.
Regional Economic Impacts	Qualitative assessment of regional impacts stemming from the measure; for example, airport access restrictions that would cause reduced airline service.
Quality of Service Impacts	Qualitative assessment of potential impacts to service for passengers, including reduced airline schedules and competition, increased delays, etc.
Costs and Anticipated Funding Sources	Quantitative costs of a measure, including infrastructure improvements, equipment acquisition, operating expenses, etc.
Ease of Implementation and Enforcement	Assessment of probability of successful and effective implementation and any environmental documentation required for FAA approval. To the extent possible, this criterion will also identify the parties responsible for enforcement of the measure.
Legal Factors	Legal constraints to implementation of a measure, including, but not limited to Part 161, federal grant assurances, airline lease agreements with Airport, etc.
Responsible Parties	Identification of party or parties responsible for implementation of measure.
Conclusion	Positive or negative recommendation on inclusion of measure in NCP.

6.3 POTENTIAL MODIFICATIONS TO EXISTING NOISE ABATEMENT MEASURES

This section discusses the existing noise abatement measures developed for the 1996 NCP. The measures are then re-evaluated by this study for their continued use at BOI.

6.3.1 Status of Existing Noise Abatement Measures

As shown in **Table 6.4**, five noise abatement measures were recommended by the 1996 NCP and approved as voluntary by the FAA. Voluntary measures indicate that pilot and ATC use of the procedure is voluntary as operational, performance, and weather conditions permit. Key elements of the 1996 NCP measures include preferential runway use to the east and recommended turning altitudes for departing aircraft.

An important consideration in the development of the revised NCP is the distinction between formal and informal procedures. Informal procedures are typically implemented on a voluntary basis, in cooperation with the airport, aircraft operators, and ATC. Formal procedures require letters of agreement between the airport, aircraft operators, and ATC, and have historically been difficult to coordinate, implement, and enforce. As a result, many noise abatement measures are implemented on a voluntary basis.

6.3.2 Preferential Runway Use

Existing measure NA-1 includes the use of Runways 10L and 10R as preferential for departures and arrivals. Essentially, the existing measure is intended to direct the louder noise produced by departing aircraft to less-populated areas east of the Airport.

This section re-evaluates this preferential runway use measure.

Several alternative preferential runway use scenarios are considered:

- Maximize east flow operations with arrivals and departures on Runways 9, 10L and 10R, during both 24-hour and nighttime periods;
- Maximize west flow operations with arrivals and departures on Runways 27, 28L and 28R, during both 24-hour and nighttime periods; and
- During nighttime periods and times of low traffic volume, use cross-direction traffic to route aircraft to the east or west of the Airport, to the maximum extent possible.

As discussed in Chapter Three, wind speed and direction primarily determine runway selection and operational flow. Aircraft generally takeoff and land into the wind (known as a headwind) whenever possible. Headwinds reduce an aircraft's takeoff and landing distance and increase climb rate. Aircraft can operate with considerable crosswinds (a wind blowing at the side of the aircraft)—up to about 20 knots for a typical air carrier aircraft. Aircraft can operate with limited tailwinds (a wind blowing on the rear of the aircraft)—up to five knots for a typical air carrier aircraft. Tailwinds increase takeoff and landing distance. Winds in excess of crosswind and tailwind limits generally force aircraft to use a different runway.

Table 6.4

Existing NCP Noise Abatement Measures

Measure	FAA Determination	Status
NA-1. Continue designation of Runways 10L/R as preferential runways. This puts a majority of the louder departures over the relatively least populated area southeast	Approved as Voluntary	Implemented
NA-2. Continue directing jet departures from Runways 28L/R to maintain runway heading until reaching 5,000 MSL (6,000 feet MSL for F-4s) before turning north. This directs the larger aircraft south of a concentrated residential neighborhood before turning north. This procedure prevents low overflight of dense residential areas by aircraft with high single event noise levels.	Approved as Voluntary	Implemented
NA-3. Continue directing non-jet aircraft over 12,500 pounds with destination headings to the north to fly runway heading 4,500 feet MSL before turning. This procedure helps prevent propeller aircraft over 12,500 pounds from overflight of dense residential areas.	Approved as Voluntary	Implemented
NA-4. Continue directing VFR departures with destination headings to the north to fly runway heading to the end of the runway before turning.	Approved as Voluntary	Implemented
NA-5. Direct north and northwest bound turbojet departures from Runways 10L/R to fly runway heading to 5,000 MSL before turning north.	Approved as Voluntary	Implemented

Source: FAA Record of Approval, Boise ATCT

To assess the maximum use of west or east flow, hourly historic weather data for BOI from 1992-2001 was analyzed. The weather data was obtained from the National Climatic Data Center. There are considerable periods during which the winds are relatively calm, and operations in either east or west flow are possible. This analysis used the calm wind conditions and conditions when winds are stronger to estimate the percentage of operations that could operate in a maximum east or west flow configuration. With a maximum tailwind of five knots and crosswind of 20

knots, east flow can be used up to 65.5-percent during the daytime and 85.9-percent during the nighttime. West flow can be used up to 77.9-percent during the daytime and 64.4-percent during the nighttime.

An interesting point to consider is that maximization of east flow is essentially the measure that is currently in place with the NCP, with Runways 10L and 10R designated as the preferential runways. Based upon radar data, approximately 56-percent of aircraft operate on Runways 10L and 10R in east flow. This is less than the

65 to 85 percent suggested by weather data as the maximum potential east flow. However, this discrepancy is realistic, given the voluntary nature of the preferential runway use program. According to discussions with Boise ATCT staff, during calm wind conditions, aircraft will often request and be permitted to use the runway that is most convenient to their direction of flight. In addition, the sample size of radar data is smaller than the 10-year period covered by the weather data, which could explain a portion of the difference between operations and weather data.

Another preferential runway scenario was developed in which aircraft would use cross-direction operations during the nighttime hours. Aircraft operations could be maximized to the east of the airport, with arrivals to Runways 28L and 28R, and departures from Runways 10L and 10R. Alternatively, aircraft could be routed to and from the west, with arrivals on Runways 10L and 10R, and departures on 28L and 28R. This kind of procedure could only be used during periods of low traffic volume, as ATC would need to ensure adequate and safe separation between aircraft on converging flight routes. Accordingly, this procedure would not be expected to be used frequently, but the analysis undertaken is useful in determining nighttime runway use trends that would be beneficial in terms of noise exposure.

In addition to the scenarios described in this section, another scenario was developed to reduce the impact of aircraft noise on to the homes along West Saint Andrews Drive, which borders I-84 to the north of the Airport. In terms of aircraft noise, these homes are primarily impacted by takeoff ground noise. The scenario would designate use of the north parallel runway as primary

for arrivals, and the south parallel runway as primary for departures, in order to reduce the impact of ground noise to this neighborhood (ground noise is louder for departures than arrivals due to the higher thrust settings on takeoff). Up to 90-percent of aircraft are assumed to use the primary arrival and departure runway designations. Based on the noise analysis results, this scenario would have the potential to reduce population within the 65+ DNL contour of the 2009 NEM by up to 83-percent, or 87 people. In the context of this analysis, it is important to note that the residents of the neighborhood that would benefit with this measure have historically been more concerned with highway noise, and that aircraft operators may incur some additional costs due to slightly longer taxi distances. The need for operational flexibility by the Boise ATCT in assigning runway use would also have to be considered in implementing this measure. Given these factors, this scenario would provide benefit, although minimal, in designating primary arrival and departure runways.

Further evaluation of preferential runway use is included in **Table 6.5**. **Figures 6-1, 6-2, and 6-3** demonstrate DNL contours with maximum west, east, and nighttime cross-directional flows, respectively.

Figures 6-4 and 6-5 use supplemental metrics to further analyze the potential benefits of the using a nighttime cross-directional flow to and from the east. Figure 6-4 shows the number of events above 65 dB that occur on the average annual day. Figure 6-5 shows the time above 65 dB in minutes that occurs on the average annual day, with the unmitigated and nighttime cross-directional east flow runway use. Note that Part 150 does not directly address the use of supplemental metrics, and that

Table 6.5

Evaluation of Measure NA-1: Preferential Runway Use

Description	<p>The revised description of the existing measures follows:</p> <p>BOI would designate Runways 10L and 10R as preferential for departing aircraft. Runways 28L and 28R would be preferential for arriving aircraft. ATC would determine the appropriate runway selection given traffic demand, weather, and direction of flight. Overall, the continued designation of east flow as preferential is beneficial.</p> <p>Also, during both east and west flow, the north parallel runway (10R/28L) would be designated as the primary arrival runway and the south parallel (10L/28R) as the primary departure runway.</p> <p>Essentially, this is a continuation of the existing measure NA-1, with adjustments for arrival runway use.</p>
Potential Noise Impacts	<p>Maximizing west flow operations would add up to 691 people to the 60 DNL contour of the 2009 NEM. Maximizing east flow would add up to 299 people to the 60 DNL contour.</p> <p>With cross-directional nighttime runway use, maximizing routings to and from the west would add about 1,018 people to the 60 DNL contour. For routings to and from the east, up to 199 people would be removed from the 60+ DNL contour.</p> <p>Designation of the north parallel runway as primary for arrivals and the south parallel runway as primary for departures would provide benefit in ground noise reductions (especially during the nighttime when vehicular noise is also reduced) to the neighborhood bordering the airport to the north along I-84.</p>
ATC and Operational Feasibility, and Safety Considerations	<p>As a voluntary measure, the Boise ATCT would have the authority to operate a preferential runway use measure in a manner that ensures the safety of aircraft operations. Factors such as weather, aircraft separation, runway crossings, and capacity are important and dominant considerations in runway selection. This measure is primarily intended to give ATC and pilots guidance on noise sensitive runway selection as operational conditions permit.</p>
Effects on Airport Operations and Impact on Airport Users	<p>Aircraft operations would continue to voluntarily comply with the preferential runway use designations. As a voluntary measure, aircraft operators could continue to request the most convenient runway end given their direction of flight during calm wind conditions.</p>
Regional Economic Impacts	<p>None.</p>
Quality of Service Impacts	<p>Small increases in flight and taxi times are possible.</p>
Costs and Anticipated Funding Sources	<p>If re-routed into an alternative operational flow, aircraft operators would incur additional costs related to the additional flight and taxi distance.</p> <p>BOI and ATCT would incur administrative costs with updating the measure as a result of staff time.</p>
Ease of Implementation and Enforcement	<p>BOI would request the ATCT to update their standard operations procedures and tower order to include preferential runway use. As a voluntary measure, enforcement would not be a factor.</p>

Table 6.5

Evaluation of Measure NA-1: Preferential Runway Use

Legal Factors	None as a voluntary measure. As the action would be undertaken for noise purposes, any changes in runway usage would require the Airport operator to prepare the requisite environmental analysis under the National Environmental Policy Act for submittal to the FAA for an environmental determination. However because this action would not change the existing procedures, no new analysis would be required
Responsible Parties	BOI would be responsible for coordinating with ATC and aircraft operators. ATC and aircraft operators would be responsible for implementing the procedure.
Conclusion	This measure gives guidance to the Boise ATCT on the runway selection that is most beneficial in terms of reduce noise impact on the community surrounding the airport. Collectively, the preferential runway use measure would seek to route aircraft to and from the east of the airport over generally compatible land use. Accordingly, this measure is recommended for continued inclusion in the NCP, with modifications.

from an FAA perspective the metrics do not describe significant noise impact. However, the metrics are useful in describing noise levels outside the 65 DNL contours, and they show that the nighttime cross-directional preferential runway use would provide some benefit to communities west of the Airport.

An interesting feature of the aircraft noise environment at BOI is that arrivals, on the whole, contribute more to noise exposure within the DNL contours than do departures. This is an expected result of the continued modernization of the air carrier jet fleet, which (as compared to older aircraft) have improved climb performance during takeoff but must maintain higher thrust settings during arrival. With this in mind, maximizing west flow operations to route the louder arrivals over generally compatible land use to the east of the Airport would seem to be the appropriate noise sensitive choice. However, as shown in Table 6.5, maximizing west flow operations would add nearly 700 people to the 60+ DNL contour. This unexpected result is due to the wind constraints, described previously, and land use patterns relevant to the west flow, in

comparison to existing runway use. Maximizing east flow would also increase population within the 60+ DNL contour by almost 300 people.

As a result, the runway use analysis indicates that the existing runway use procedures are the optimum procedure in terms of noise abatement. In addition, the population reductions with nighttime cross-directional analysis, with routings to and from the east, indicate that Runways 10L and 10R are preferential for departures, and Runways 28L and 28R are preferential for arrivals. Note that with this measure, no substantial changes in runway use are expected as the measure is currently in use and is voluntary in nature.

6.3.3 Departure Turn Altitudes

Existing measures NA-2, -3, -4, and -5 specify recommended altitudes for which aircraft are to begin their turns to assigned flight tracks out of BOI. The measures are a practical mechanism to encourage aircraft to climb-out over generally compatible land uses before beginning their turns to assigned headings. Moreover, the different climb

gradients of departing aircraft results in aircraft reaching the altitude for turns at varying distances from the Airport, which disperses noise exposure and avoids repeated impacts to specific, localized areas.

There are other potential operational procedures that could be used to direct departing aircraft to fly a specific distance before turning, including the use of designated turn points. For example, the use of the outer marker of the ILS has been suggested as a potential turn point. However, the use of turn points (as opposed to a turn altitude) requires that the ATCT assign subsequent departing aircraft to the same heading on takeoff. As a result, ATCT cannot assign aircraft to divergent headings in order to guarantee separation from one another. With the same departure headings, ATC must instead allow more time and space between departures. This reduced the capacity of the airfield, increases aircraft delay, and limits the operational flexibility of the ATCT. As a result, turn altitudes are generally more feasible and practical as a procedure for directing aircraft on departure.

For the revised NCP, measure NA-2 would be revised to delete the provision that applies to F-4s as these aircraft are no longer operating at BOI. NA-2 would also be revised to apply the 5,000 feet MSL turn altitude to aircraft destined for southerly headings; this revision would be appropriate as considerable residential development has occurred to the southwest of the airport. Measures NA-3, -4, and -5 would be unchanged.

The departing aircraft turn altitude measures are re-evaluated in **Table 6.6**. An important consideration in the evaluation of this measure is that few options exist for preferential departure flight tracks for departures from Runways 28L and 28R, given the residential land use that encircles southerly, northerly, and straight-out headings. Turn altitudes are a practical noise abatement mechanism, as described in the preceding paragraphs. More options exist for departures from Runways 10L and 10R, as evaluated in Section 6.4.2.

Table 6.6

Evaluation of Measures NA-2, -3, -4, and -5: Departure Turn Altitudes

Description	<p>The revised description of the measures follows:</p> <ul style="list-style-type: none"> • NA-2: Continue directing jet departures from Runways 28L and 28R to maintain runway heading until reaching 5,000 MSL before turning north or south. • NA-3: Continue directing non-jet aircraft over 12,500 pounds with destination headings to the north to fly runway heading 4,500 feet MSL before turning. • NA-4: Continue directing VFR departures with destination headings to the north to fly runway heading to the end of the runway before turning. • NA-5: Direct north and northwest bound turbojet departures from Runways 10L and 10R to fly runway heading to 5,000 MSL before turning north.
Potential Noise Impacts	<p>The turn altitudes recommended in these measures occur at distances from the runways that are near or outside the 60 DNL contour of the 2009 NEM. The continued use of these procedures would not change the population within the</p>

Table 6.6

Evaluation of Measures NA-2, -3, -4, and -5: Departure Turn Altitudes

	contours, but would provide benefits in terms of single-event noise. Public comments during study meetings indicated the continued need to encourage aircraft to achieve higher altitudes before turning over residential areas.
ATC and Operational Feasibility, and Safety Considerations	As a voluntary measure, the Boise ATCT would have the authority to designate flight procedures that ensure the safety of aircraft operations. ATC and aircraft use of the turn altitudes is dependent upon weather, wind, aircraft performance, and traffic demand. As the measures are already in use, and due to their voluntary nature, there are no significant ATC constraints to continued use.
Effects on Airport Operations and Impact on Airport Users	Aircraft operations would continue to voluntarily comply with the recommended turn altitudes.
Regional Economic Impacts	None.
Quality of Service Impacts	None.
Costs and Anticipated Funding Sources	Minimal administrative costs related to updating ATCT standard operating procedures for NA-2.
Ease of Implementation and Enforcement	BOI would request the ATCT to update their standard operations procedures and tower order to include the revised measures. As a voluntary measure, enforcement would not be a factor.
Legal Factors	None as a voluntary measure. As the action would be undertaken for noise purposes, but would not affect any existing users of the Airport, this action may be categorically excluded from an environmental analysis under the National Environmental Policy Act.
Responsible Parties	BOI would be responsible for coordinating with ATC and aircraft operators. ATC and aircraft operators would be responsible for implementing the procedure.
Conclusion	This measure gives guidance to the Boise ATCT and aircraft operators on turn altitudes that help departing aircraft to reduce noise exposure to noise sensitive areas near the airport. Accordingly, these measures are recommended for continued inclusion in the NCP, with modifications as noted.

6.4 POTENTIAL NEW NOISE ABATEMENT MEASURES

This section evaluates several potential new noise abatement measures (whereas the prior actions reflected improvements to existing procedures) for the revised NCP, including flight tracks, noise abatement arrival and departure profiles, airport use restrictions, and noise barriers. The measures are evaluated to determine if they would provide a noise benefit within the NCP.

6.4.1 Downwind Arrival Flight Tracks

This measure evaluates changes to the downwind arrival flight tracks to runways at BOI. This measure was recommended by BOI staff, with the goal of reducing overflight noise to the densely populated residential areas in the City of Boise that are north of the Airport.

On the downwind arrival leg, the arriving aircraft is flying parallel, but in the opposite direction, of the intended runway. For example, an aircraft that is landing on Runway 28R, which is a westerly direction runway, will fly east on the downwind leg. Once the downwind leg of the arrival track is complete, the aircraft will commence its “base leg” 180-degree turn to line up for final approach to the runway.

Most of the flight tracks in use at BOI are routed to expediently serve aircraft flying to or from a specific destination. For example, aircraft arriving at Boise from Seattle and the Pacific Northwest will typically be routed onto a downwind arrival leg to the north of the airport when landing on Runways 28L or 28R. Similarly, aircraft arriving from Denver would typically be routed to a south downwind leg when arriving on Runways 10L or 10R.

To reduce overflights of high-density areas within the City of Boise, this measure evaluated the potential for rerouting aircraft at some distance (40 miles or so) from the Airport, so that they would use downwind arrival legs to the south of the Airport. For Runways 10L and 10R, aircraft on arrival tracks 4, 5, and 10 would be rerouted to an arrival track south of the Airport (track 3) while track 6 would be rerouted to straight in track 7. For Runways 28L and 28R, aircraft on arrival tracks 5, 6, and 7 would be rerouted to track 1 south of the Airport. Flight tracks are shown in Figures 3-1 and 3-2.

Figures 6-6 and 6-7 use supplemental metrics to further analyze the potential benefits of the downwind arrival flight tracks. Figure 6-6 shows the number of events above 65 dB that occur on the average annual day, while Figure 6-7 shows the time above 65 dB in minutes. The metrics demonstrate that the benefits from the measure would involve single event reductions in overflight noise for areas not in proximity to the Airport.

This measure could impose considerable additional flight costs on aircraft operators as aircraft would not fly the most expedient route to the Airport. Also, the measure would not be feasible during times of peak operations use, due to the need to separate and sequence aircraft for arrival. As such, this measure would be most successfully used during the nighttime and with voluntary compliance by aircraft operators.

This measure is evaluated in **Table 6.7**.

Table 6.7

Evaluation of Potential Measure: Downwind Arrival Flight Tracks

Description	During nighttime hours, aircraft would be voluntarily routed to use arrival flight tracks with downwind legs to the south of BOI. This would route aircraft over relatively low-density residential and vacant land uses, as compared to areas north of the Airport.
Potential Noise Impacts	As the changes in flight routes would occur outside the 60+ DNL contour of the 2009 NEM, there would be no change in population within the contours. However, the procedure could reduce overflight noise, especially at night, for communities outside the DNL contours.
ATC and Operational Feasibility, and Safety Considerations	ATC may need to determine the feasibility and practicality of modifying the airspace structure serving BOI to reroute arriving aircraft onto downwind legs south of the airport. For the purposes of this measure, it is assumed that this procedure would only apply during the nighttime during periods of low traffic volume.
Effects on Airport Operations and Impact on Airport Users	Aircraft operators would incur increases in flight distance and costs with this measure. The additional flight distance would range from approximately two to seven nautical miles, depending on the flight track, and could incur additional costs to the aircraft operator of up to about \$200 per flight. However, only those aircraft operators that voluntary choose to comply with the measure would incur the extra costs. As would be expected, weather and other operational conditions may occasionally preclude use of this measure.
Regional Economic Impacts	None.
Quality of Service Impacts	Slight increases in flight time with the additional distances flown.
Costs and Anticipated Funding Sources	Aircraft operators flying the south downwind arrival legs would incur additional flight costs. FAA and ATC would incur the costs needed to implement the procedure. BOI would incur the administrative costs needed to pursue voluntary compliance of the procedure with aircraft operators.
Ease of Implementation and Enforcement	ATC would investigate the feasibility of modifying the airspace structure. Once FAA established the flight procedures, BOI would pursue negotiations with the aircraft operators to use the procedure. Aircraft operators would then pursue letters of agreement with the ATCT to use the procedure. As a voluntary measure, enforcement would not be a factor.
Legal Factors	Review of the flight procedure modifications may be required per the National Environmental Policy Act.
Responsible Parties	BOI, FAA ATC, and aircraft operators would coordinate to implement the measure.
Conclusion	Although this measure would only be used during nighttime and with voluntary compliance by aircraft operators, it would reduce overflight noise to high-density residential areas. Accordingly, the measure is recommended for inclusion in the NCP.

6.4.2 FMS/GPS Flight Procedures

This potential measure investigates the utility of precision arrival and departure flight tracks to and from BOI using satellite based navigation technology. With the use of Global Positioning System (GPS) and Flight Management Systems (FMS), it is possible to direct aircraft with relative precision over specific points on the ground. GPS is a system of satellites that provide precision location information to aircraft. FMS is part of an aircraft’s guidance and autopilot system. For example, Alaska Airlines and Horizon Airlines are making significant investment into the use of satellite based area navigation (RNAV) navigation.

Although there are potential benefits with FMS/GPS flight tracks, the location of the tracks can cause considerable impacts to people located under the new precision routes. With existing flight tracks, aircraft tend to disperse as they travel farther from the airport. With precision tracks, many aircraft would fly over the same points, resulting in increased overflights and impacts for homes underlying the flight track.

For this analysis, several precision flight tracks are evaluated. **Figure 6-8** shows the

effect of implementing precision Standard Terminal Arrival Routes (STARs) on all arrival flight tracks currently in use at BOI. As the STARs would more tightly concentrate aircraft within arrival corridors as FMS/GPS procedures, both the 60 and 65 DNL contours elongate and increase the number of people exposed to aircraft noise.

Figure 6-9 shows the effect of several potential precision departure procedures (DPs) and STARs. From Runways 28L and 28R, DPs would fly west over the Overland Road and I-84 corridors. Although these corridors include residential use, they also include transportation and commercial land uses. A DP would also be established for the I-84 corridor east of BOI for aircraft departing from Runways 10L and 10R. A STAR would route aircraft over the I-84 corridor to arrivals on Runways 28L and 28R. The alternative DNL contours shown in **Figure 6-9** assume 100-percent compliance by jet aircraft with the DPs and STARs. Although this is not entirely realistic given the equipment limitations in some older aircraft that do not allow use of FMS and GPS, it serves as a useful gauge of the potential noise benefits with widespread use of precision flight tracks.

Further evaluation of this measure is contained in **Table 6.8**.

Table 6.8

Evaluation of Potential Measure: FMS/GPS Flight Procedures for I-84 Corridor

Description	Use of FMS and GPS to establish precision arrival and departure flight tracks, and thus concentrate aircraft operations into specific corridors.
Potential Noise Impacts	The use of STARs on existing arrival routes would add 168 people to the 60-64 DNL contour and would not reduce population within the 65+ DNL contour of the 2009 NEM. The use of DPs from Runways 28L and 28R would add about 22 people to the 60+ DNL contour. The use of STARs and DPs over the I-84 contour east of BOI, for arrivals to Runways 28L and 28R, and departures from 10L and 10R, would not substantially change the population within the 60+ DNL contours of the 2009 NEM.

Table 6.8

Evaluation of Potential Measure: FMS/GPS Flight Procedures for I-84 Corridor

ATC and Operational Feasibility, and Safety Considerations	The feasibility of the DPs and STARs would need to be determined by ATC. Also, it may not be possible to assign all departing aircraft to a single DP or STAR during peak operations times, as the required spacing between aircraft may add to congestion and aircraft delay at BOI.
Effects on Airport Operations and Impact on Airport Users	Aside from potential delays referenced in the previous criterion, impacts on airport users would be expected to be minimal. Aircraft with the proper equipment would be able to use the DPs and STARs. Aircraft without the necessary equipment would continue to use existing flight tracks.
Regional Economic Impacts	None.
Quality of Service Impacts	There would be potential for an increase in flight delays.
Costs and Anticipated Funding Sources	BOI and FAA would incur the administrative costs needed to implement the precision flight tracks. Aircraft operators that choose to retrofit their aircraft would also incur costs.
Ease of Implementation and Enforcement	Once BOI requested implementation of the flight tracks, FAA would analyze and evaluate the feasibility of the DPs and STARs, and establish the specific flight procedures.
Legal Factors	The precision flight tracks would require environmental documentation under the National Environmental Policy Act.
Responsible Parties	BOI would be responsible for requesting the change in flight procedures. FAA would be responsible for studying and implementing the flight procedures.
Conclusion	<p>The use of STARs and DPs for existing flight tracks would increase population within the DNL contours and so are not recommended. There are no apparent corridors with compatible land use to the west of BOI; therefore it is not likely that a beneficial flight route could be developed without substantially impacting residents under that flight route.</p> <p>Use of the I-84 corridor to the east of BOI (for arrivals to Runways 28L and 28R, and departures to Runways 10L and 10R) would direct aircraft over mostly compatible land uses. Although the procedure would not reduce population within the 65+ DNL contour, establishment of the procedure would encourage aircraft noise and land use compatibility as development occurs along the corridor. Therefore this measure recommends that BOI pursue implementation of precision flight tracks along the I-84 corridor.</p>

6.4.3 Noise Abatement Departure Profiles

This measure would specify the specific Noise Abatement Departure Profile (NADP) to be used on each runway end at BOI. The purpose of this measure is to determine the appropriate NADP that exposes the fewest people to aircraft noise.

Communities and airports have long sought operating procedures that reduce takeoff noise. FAA Advisory Circular (AC) 91-53A, published in 1993, establishes guidelines for Noise Abatement Departure Profiles (NADP). The AC is general, and defines guidelines and minimum operating parameters for airlines to use in developing operating procedures. Due to their complexity, the AC does not detail exact, aircraft type-specific procedures.

The AC establishes the following distinct NADPs:

- Close-In NADP provides a slight reduction in noise exposure for homes in the immediate vicinity of the Airport, generally within 3 miles.
- Distant NADP provides a slight reduction in noise for homes that are not in the immediate vicinity of the Airport.

When using the Distant NADP, which is the normal takeoff procedure, at 1,000 feet AGL the aircraft would maintain takeoff power, lower rate of climb, and accelerate to retract flaps. Once the flaps are retracted, power would be reduced to climb power and the aircraft would continue its departure climb-out.

When using a Close-In NADP, an aircraft departs using takeoff power and flaps. At 800-1000 feet AGL, power is reduced to climb thrust, while maintaining takeoff

flaps. This results in a quick climb, and allows the aircraft to be at a higher altitude over communities close to the airport and thus reduce noise exposure. This slightly reduces noise exposure for homes within in the immediate vicinity of the airport. After reaching 3000 feet, aircraft using the Close-In NADP must substantially reduce rate of climb and accelerate to a sufficient airspeed to retract flaps and slats. Although the aircraft is slightly higher, it is also slower and at a higher thrust setting than aircraft using a Distant NADP. Beyond the immediate vicinity of the airport, this results in a slight increase in noise exposure.

The FAA does not allow airports to develop their own unique procedures due to safety concerns. AC 91-53A establishes a standardized system so that an aircraft type will use the same generalized operating procedures throughout the nation. Each airline develops their specific NADPs, which are approved by the FAA. Airports are permitted to select the appropriate NADP to use on each runway end. Unless otherwise instructed, airlines typically use the Distant NADP. Accordingly, this measure could recommend the continued use of the Distant NADP at BOI, or a change to the Close-In NADP.

For this study, single-event sound exposure level (SEL) contours were generated for Boeing 737-700 operations at BOI. The Boeing 737-700 is a good aircraft to use in evaluating NADPs, as it is representative of the modern, quiet, high-performance aircraft that are increasingly in use at BOI. Both the Distant and Close-In NADP are evaluated using the SELs. As shown in **Figure 6-10**, the 80 and 85 dB SEL contour with use of the Close-In NADP would affect a larger area than with the Distant NADP. In other words, the Close-In NADP would increase noise exposure for most areas around BOI. The Boeing 737-700 SELs

were generated for the most frequently used straight-out flight tracks at BOI.

Table 6.9 contains a detailed evaluation of this measure.

Table 6.9

Evaluation of Potential Measure: Noise Abatement Departure Profiles

Description	BOI would establish the Distant Noise Abatement Departure Profile as the recommended NADP for all runway ends. This measure would apply to jet aircraft with a maximum takeoff weight greater than 75,000 pounds. For lighter jet aircraft, the continued use of the National Business Aviation Association noise abatement departure procedures would be encouraged.
Potential Noise Impacts	Off of Runway 10L and 28R, the Distant NADP affects 2,716 and 3,851 less people, respectively, than the Close-In NADP. This analysis is based on a 80 dB SEL contour of a Boeing 737-700, which encompasses the 60 DNL contour of the 2009 NEM. As the Distant NADP is currently the standard procedure, there would be no increase in population within the DNL contours with adoption of this measure.
ATC and Operational Feasibility, and Safety Considerations	None. Distant NADP is currently in use.
Effects on Airport Operations and Impact on Airport Users	None. Aircraft operators and pilots are currently have procedures for the Distant NADP.
Regional Economic Impacts	None.
Quality of Service Impacts	None.
Costs and Anticipated Funding Sources	None.
Ease of Implementation and Enforcement	Procedure is already in place. BOI would coordinate with aircraft users to indicate in pilot operating specifications that the Distant NADP is the preferred procedure.
Legal Factors	None
Responsible Parties	BOI would be responsible for coordinating with aircraft operators. Aircraft operators would then be responsible for adopting the procedure.
Conclusion	As the Distant NADP has a noise benefit versus the Close-In NADP, the Distant NADP is recommended for inclusion in the NCP.

6.4.4 Noise Abatement Arrival Profiles

Aircraft landing at BOI contribute up to 60-percent of the total noise exposure within the DNL contours of the 2009 NEM. As a result, measures to reduce arrival noise exposure could prove beneficial. As arriving aircraft must use straight-in approach paths generally within 3-6 miles from the end of the runway to establish stabilized approaches, it is not possible to develop preferential arrival flight tracks for areas within the 60 DNL contour of the 2009 NEM. Arrival flight profiles, however, have more long-term potential for noise abatement.

Today, jet aircraft typically arrive at BOI on 3-degree approach slopes. This is the standard approach slope used nationwide, for both visual and instrument landing system approaches. With noise abatement arrival profiles, aircraft would use a combination of steeper approaches and reduced thrust settings, flap settings, and delayed land gear deployment to reduce noise exposure to the ground.

The FAA and UPS recently conducted tests of continuous descent approaches (CDA) at Louisville International Airport. The CDA

reduced arrival noise by 3 to 6 dB SEL, mostly for areas away from the immediate vicinity of the airport. The tests were considered successful and the FAA is continuing to research CDAs. Formal standards for implementing CDA at airports have not yet been established.

With existing policy, the FAA will not approve a steeper approach slope unless needed for terrain or obstruction clearance. Steeper approach slopes are not implemented for noise factors, due to safety concerns over non-standard operating procedures and airspeeds. Additionally, the FMS guidance systems in many aircraft may not be capable of flying steeper approaches. At present, there are no standardized procedures for implementing noise abatement arrival profiles. Until standards are approved by the FAA, it would not be possible to implement a revised arrival procedure at BOI.

However, BOI could track the development of noise abatement arrival profiles, and investigate the procedures once standards are issued. **Table 6.10** summarizes the evaluation of noise abatement arrival profiles.

Table 6.10

Evaluation of Potential Measure: Noise Abatement Arrival Profiles

Description	BOI would investigate the use of noise abatement arrival profiles as applicable standards are developed.
Potential Noise Impacts	Arriving aircraft currently contribute up to 60-percent of the total noise exposure at BOI. Accordingly, noise abatement arrival profiles could be useful in mitigating noise exposure.
ATC and Operational Feasibility, and Safety Considerations	The use of CDA and steeper approach profiles would have to be coordinated with ATC to ensure safety and feasibility with the airspace structure serving BOI.

Table 6.10

Evaluation of Potential Measure: Noise Abatement Arrival Profiles

Effects on Airport Operations and Impact on Airport Users	Due to non-standard operating procedures and airspeeds, safety concerns currently preclude use of higher approach slope than 3-degrees unless needed for terrain clearance. Once noise abatement arrival profile standards are available, aircraft operators may need to update aircraft guidance systems and train pilots in the use of noise abatement arrival profiles.
Regional Economic Impacts	None.
Quality of Service Impacts	None.
Costs and Anticipated Funding Sources	BOI would be responsible for administrative costs needed to fund subsequent study when noise abatement arrival profile standards are available. The analysis could be part of a subsequent Part 150 NCP update.
Ease of Implementation and Enforcement	Applicable standards need to be developed for this measure to be implemented.
Legal Factors	None.
Responsible Parties	FAA, BOI, and airport users would be responsible for coordinating the use of noise abatement arrival profiles.
Conclusion	BOI should investigate the use of noise abatement profiles when standards become available. As formal standards have not yet been developed, it is not possible to implement noise abatement arrival profiles. Accordingly, the measure is not recommended for the NCP.

6.4.5 Visual Approach Arrival Altitudes

Aircraft arriving to Runways 28L and 28R from the east are currently directed by the Boise ATCT to maintain an altitude of 4500 feet MSL until beginning their final approach.

Some of the residential areas to the east of the Airport, such as Warm Springs Mesa, are at elevations that are several hundred feet higher than BOI's elevation of 2,871-feet MSL. During public workshops, residents living in these areas requested consideration that arriving aircraft use higher altitudes in order to reduce noise levels during aircraft

overflights. BOI supports consideration of this measure.

Table 6.11 summarizes the evaluation of visual approach arrival altitudes.

Table 6.11

Evaluation of Potential Measure: Visual Approach Arrival Altitudes

Description	Aircraft arriving to Runways 28L and 28R would be directed to maintain an altitude of 5000 feet MSL until established on final approach, to the extent possible.
Potential Noise Impacts	The measure would not affect DNL levels, but it would help to reduce single event noise for areas east to the Airport. The measure would primarily be used during periods of low traffic demand when the ATCT has increased flexibility in directing air traffic. This would include operations during the nighttime when residents would benefit most from the measure.
ATC and Operational Feasibility, and Safety Considerations	The Boise ATCT would use this procedure when operational conditions and aircraft performance factors permit its use. At other times, such as during peak operations, the current procedure of routing aircraft at 4,500 feet MSL would be used. The Boise ATCT has indicated support for the measure as a voluntary mechanism.
Effects on Airport Operations and Impact on Airport Users	None.
Regional Economic Impacts	None.
Quality of Service Impacts	None.
Costs and Anticipated Funding Sources	BOI would be responsible for administrative costs needed to fund subsequent study when noise abatement arrival profile standards are available.
Ease of Implementation and Enforcement	BOI would request the ATCT to update their standard operations procedures and tower order to include the revised measures. As a voluntary measure, enforcement would not be a factor.
Legal Factors	None as a voluntary measure. As the action would be undertaken for noise purposes, but would not affect any existing users of the Airport, this action may be categorically excluded from an environmental analysis under the National Environmental Policy Act.
Responsible Parties	BOI would be responsible for coordinating with ATC and aircraft operators. ATC and aircraft operators would be responsible for implementing the procedure.
Conclusion	This measure would cost-effectively reduce single event noise exposure for higher elevation areas to the east of the Airport. Accordingly, the measure is recommended for inclusion in the NCP.

6.4.6 Airport Use Restrictions

Airport use restrictions could include curfews and restrictions on some of the noisiest aircraft operating at BOI. Restrictive measures have the potential to greatly reduce noise exposure impacts as they would restrict operations by especially noisy aircraft and nighttime operations, which are a significant source of noise and annoyance for the community. Although airport use restrictions are required to be evaluated per Part 150, their adoption and implementation is strictly regulated by other laws and regulations that generally prohibit airports from restricting traffic out of concerns for impacts to interstate commerce.

The Airport Noise and Capacity Act of 1990 established a national aviation noise policy that mandated the phase-out of the oldest and noisiest jet aircraft in the U.S. air carrier fleet. Aircraft such as the DC8, Boeing 727, and DC9 that were certified as “Stage 2” per 14 CFR Part 36 and have a maximum takeoff weight greater than 75,000 pounds were prohibited from operating in the U.S. after 1999.¹ While some of these aircraft were retired, many were retrofitted with hushkits and recertificated as Stage 3 aircraft. Today, many of the noisier hushkitted aircraft have been retired due to their higher operating and maintenance costs in comparison to modern and fuel-efficient aircraft, such as the Boeing 737s and Airbus A320s. In addition to improved economics, these aircraft that are manufactured to the more stringent Stage 3 noise standards have improved climb-out performance and are quieter. Consequently, the DNL contours at many airports, including BOI, have shrunk as older and noisier aircraft have gradually left the fleet and been replaced with quieter aircraft.

In addition and in exchange for the mandated phase-out of Stage 2 aircraft, the

Airport Noise and Capacity Act of 1990 directed the FAA to establish a national program to review and approve local airport use restrictions. This program was enacted through FAA’s 14 CFR Part 161 regulation, which governs noise and access restrictions. With Part 161, airport operators must demonstrate that the noise benefits of restricting noisy aircraft operations outweigh the economic impacts of denying access. FAA approval is not required to restrict Stage 2 aircraft, but it is required for Stage 3 aircraft.

The FAA has generally opposed efforts to enact aircraft use restrictions at airports, and has threatened removal of grant funds at airport that have proposed to restrict Stage 2 operations. In addition, the courts have held that mandatory use restrictions must be reasonable, non-arbitrary, and non-discriminatory. Essentially, the legal and regulatory environment establishes a difficult and high standard from which to develop a workable airport use restriction.

Within the regulatory framework, this measure is evaluated for potential 24-hour and nighttime (10:00 p.m. to 7:00 a.m.) restrictions on Stage 2 aircraft weighing less than 75,000 pounds, as these aircraft were not phased-out with the Airport Noise and Capacity Act of 1990. In addition, the potential phase-out of remaining hushkitted Stage 3 aircraft at BOI is also evaluated. In order to develop a conservative analysis, this study assumes that “restricted” aircraft would be replaced by comparable but quieter aircraft, rather than reducing total airport operations. For example, the Learjet 25, Gulfstream 2, and Boeing 727s are assumed to be replaced by Learjet 35s, Gulfstream 4s, and Boeing 757s, respectively. DNL contours generated with the airport use restrictions are shown in **Figures 6-11 and 6-12**. Note that as discussed in Chapter 3, Stage 2 and

hushkitted Stage 3 aircraft constitute only two percent of the flight operations forecasted in 2009. This measure is evaluated in **Table 6.12**.

Table 6.12

Evaluation of Potential Measure: Airport Use Restrictions

Description	BOI could potentially seek restrictions on: <ul style="list-style-type: none"> • Stage 2 jets during 24-hour and nighttime periods (10 p.m. to 7 a.m.); and • Stage 2 and hushkitted Stage 3 jets during 24-hour and nighttime periods.
Potential Noise Impacts	In comparison to the 2009 NEM, restrictions on Stage 2 jets during 24-hour and nighttime periods would reduce the population within the 65+ DNL contour by 26 and zero people, respectively. Within the 60-64 DNL contour, the Stage 2 restrictions would reduce population by 122 and 31 people respective to the nighttime and 24-hour restrictions. Restrictions on Stage 2 and hushkitted Stage 3 jets would reduce the population within the 65+ DNL contour by 28 and six people, respectively. Within the 60-64 DNL contour, the Stage 2 and hushkitted Stage 3 restrictions would reduce population by 124 and 52 people respective to the nighttime and 24-hour restrictions.
ATC and Operational Feasibility, and Safety Considerations	None. ATC would not be responsible for enforcing the restrictions.
Effects on Airport Operations and Impact on Airport Users	Use restrictions could impose significant fleet replacement costs upon users of Stage 2 and hushkitted Stage 3 aircraft. Some users may opt to leave the Boise market rather than replace their aircraft.
Regional Economic Impacts	Potentially significant economic impacts are possible with this measure given the benefits of corporate and cargo aviation.
Quality of Service Impacts	If some aircraft users were to exit the Boise market due to restrictions, the quality of service options would potentially deteriorate.
Costs and Anticipated Funding Sources	BOI would be responsible for the administrative costs needed to conduct a Part 161 study to evaluate the costs and benefits of a restriction; the airport would also be responsible for funding the legal challenges that would likely result with an attempt to implement the restrictions. Other airports have incurred costs in excess of \$1 million to pursue such studies.
Ease of Implementation and Enforcement	As discussed in this section, there are significant legal constraints and economic impacts with use restrictions. Implementing the restrictions would be a difficult process.
Legal Factors	Significant legal constraints exist for implementing use restrictions, per 14 CFR Part 161, FAA grant agreements, and legal precedence.
Responsible Parties	BOI would be responsible for implementing and establishing the use restrictions, following FAA review of a Part 161 study.
Conclusion	Although these measures are required to be evaluated per Part 150, there are significant economic and legal constraints that essentially preclude the adoption of use restrictions. As the noise benefit would be limited, this measure is not recommended for the NCP.

6.4.7 Noise Barriers

Although noise barriers are not an operational procedure used by an aircraft, they are classified in this study as “noise abatement” in that they can reduce ground noise for homes bordering an airport.

Aircraft operations on the ground can be a source of noise, including the noise produced during the ground roll portions of takeoffs and landings (particularly start-of-takeoff-roll and reverse-thrust noise), noise from aircraft ground movements on taxiways and aprons, engine idle noise, auxiliary or ground power units, and engine maintenance run-up noise.

The DNL contours developed for this study take into account the noise produced by aircraft during takeoff ground roll and the use of reverse thrust for deceleration during

landing. The noise contours do not account for the noise produced by aircraft taxiing, and INM has limited ability to calculate the noise attenuation that could be provided by a noise barrier. Thus, it is not possible in this study to quantitatively evaluate noise barriers.

However, the benefits of noise barriers at BOI would appear to be limited. To be most effective, a barrier would need to be located close to the noise receivers (the noise affected residences). Most of the land bordering the Airport is used for compatible uses, including industrial and commercial use. The only residential area bordering the Airport, along West St. Andrews Drive, also borders Interstate 84. Residents in the neighborhood have previously stated that they were more concerned with highway noise (see Chapter Seven). An evaluation of this measure is contained in **Table 6.13**.

Table 6.13

Evaluation of Potential Measure: Noise Barriers

Description	This measure consists of the combined use of sound barrier walls and/or berms and natural landscaping to reduce aircraft ground noise for the communities in proximity to BOI.
Potential Noise Impacts	Any noise benefit provided by noise barriers would be limited to homes bordering the Airport, and would apply only to noise exposure from ground operations. Noise barriers do not mitigate noise from airborne aircraft.
ATC and Operational Feasibility, and Safety Considerations	None.
Effects on Airport Operations and Impact on Airport Users	None.

Table 6.13

Evaluation of Potential Measure: Noise Barriers

Regional Economic Impacts	None.
Quality of Service Impacts	None.
Costs and Anticipated Funding Sources	Construction costs would be determined in a ground noise and engineering study.
Ease of Implementation and Enforcement	BOI would conduct a ground noise study to determine levels and potential noise barrier locations. Conclusions from the analysis are required to determine feasibility and benefits.
Legal Factors	None.
Responsible Parties	BOI would be responsible for constructing noise barriers. FAA approval would be required for Federal funding.
Conclusion	Because the only residential area that could potentially benefit from noise barriers is more highly impacted by highway noise, this measure would not be effective at BOI and it is not recommended for the NCP.

6.5 SUMMARY OF RECOMMENDED NOISE ABATEMENT MEASURES

As stated in the beginning of this Chapter, BOI is in the fortunate position of having a small number of impacted residents within the 65+ DNL contours. The noise abatement evaluation did not identify measures that would eliminate these people from impact. However, the NCP did identify current favorable trends in the operational procedures at BOI that are recommended for continued use. **Table 6.14** summarizes the recommended noise abatement measures for inclusion in the NCP.

Table 6.14

Summary of Recommended Noise Abatement Measures

Measure	Description	Recommendation
Existing NA-1	<u>Preferential Runway Use</u> : Designate Runways 10L and 10R (east flow) as preferential for departing aircraft; Runways 28L and 28R (west flow) as preferential for arriving aircraft. Also, during both east and west flow, the north parallel runway (10R/28L) would be designated as the preferred arrival runway, and the south parallel (10L/28R) as the preferred departure runway to the extent possible.	Recommended for inclusion in the revised NCP, as modified.
Existing NA-2	<u>Departure Turn Altitudes</u> : Continue directing jet departures from Runways 28L and 28R to maintain runway heading until reaching 5,000 MSL before turning north or south.	Recommended for inclusion in the revised NCP, as modified.
Existing NA-3	<u>Departure Turn Altitudes</u> : Continue directing non-jet aircraft over 12,500 pounds with destination headings to the north to fly runway heading 4,500 feet MSL before turning.	Recommended for inclusion in the revised NCP.
Existing NA-4	<u>Departure Turn Altitudes</u> : Continue directing VFR departures with destination headings to the north to fly runway heading to the end of the runway before turning.	Recommended for inclusion in the revised NCP.
Existing NA-5	<u>Departure Turn Altitudes</u> : Direct north and northwest bound turbojet departures from Runways 10L and 10R to fly runway heading to 5,000 MSL before turning north.	Recommended for inclusion in the revised NCP.
Potential New	<u>Downwind Arrival Flight Tracks</u> : During nighttime hours, voluntarily reroute aircraft to use arrival flight tracks with downwind legs to the south of BOI.	Recommended for inclusion in the revised NCP with voluntary use by aircraft operators.
Potential New	<u>FMS/GPS Flight Procedures for I-84 Corridor</u> : This measure would establish DPs and STARs along the I-84 corridor to the east of the Airport.	Recommended for inclusion in the revised NCP.
Potential New	<u>Noise Abatement Departure Profile</u> : Designate the Distant NADP as the preferred NADP	Recommended for inclusion in the NCP.
Potential New	<u>Noise Abatement Arrival Profiles</u> : Continuous Descent Approaches	Not recommended for inclusion in the revised NCP. Could be considered in future NCP.
Potential New	<u>Visual Approach Arrival Altitudes</u> : Encourage the ATCT to voluntarily route aircraft on the visual approach to Runways 28L and 28R at 5,000 feet MSL until the aircraft begins the final approach.	Recommended for inclusion in the NCP.
Potential New	<u>Airport Use Restrictions</u> : 24-hour and nighttime restrictions on hushkitted Stage 3 and/or Stage 2 jet aircraft.	Not recommended for inclusion in the NCP.
Potential New	<u>Noise Barriers</u> : Construction of noise barriers or berms.	Not recommended for inclusion in the NCP.

NOTE

- ¹ The oldest and loudest jet aircraft, known as Stage 1, were prohibited from operating in the U.S. after 1984. There are no Stage 1 aircraft currently or forecast to operate at BOI.

Chapter Seven

LAND USE MEASURES

Boise Airport (BOI), in cooperation with the City of Boise and Ada County, has worked to minimize new non-compatible land uses and to mitigate existing non-compatible land uses in the Airport surroundings. The jurisdictions have cooperatively prepared and implemented land use regulations, as discussed in Chapter Four, which have proven to be effective in limiting new non-compatible development. Since the initiation of the first Part 150 program in 1986 and update in 1996, the population within the 60 DNL contour area has declined from 6,593 to 700 people. Currently, an estimated 304 homes and 818 people are estimated to reside within the 60-64 DNL contours of the 2009 NEM, while only 40 homes and 105 people are estimated to be within the 65+ DNL contour. BOI thus has a relatively small population that is impacted by aircraft noise, per the Federal standards. *Since there is limited existing non-compatible development within the noise exposure contours, the focus of this study will be on preventing future non-compatible development, while also addressing existing non-compatibilities.*

In an evaluation of land use measures, it is important to discuss the lines of authority for implementing any of the measures that are recommended in this study. The land within the established influence areas of BOI encompasses both the City of Boise and Ada County. Land use, planning, zoning, and building department authority remain with both City of Boise and Ada County, depending on the project location.

BOI is one of nine departments within the City of Boise management structure under direct supervision of the City Mayor. The airport remains a recommending department

with regards to land planning and building department matters, and has at times offered assistance in the oversight of rules and regulations required by the FAA regarding safety in airport operations.

Through mutual agreement, airport staff is offered an opportunity to comment and review applications for development (both planning and building) as said applications are forwarded to BOI as part of a routing/review process. Airport staff is generally a recommending entity only and does not have any land use or building regulation authority.

The City of Boise owns land within the Airport Influence Area, including that utilized exclusively for airport operations. The matter of maintaining the condition and safety of the land within the airport operations zones or “airport property” has been and would continue to be part of BOI operations. The requirement to maintain safe airport operations remains part of the staff and operations budget. Land purchased by the airport as part of the previous Part 150 Study is currently maintained by airport operations, even though it remains outside of the immediate “airport property” that is used for airport operations.

This chapter first reviews the existing land use measures developed for the 1996 NCP. The existing measures are then re-evaluated and revised as necessary for their potential continued benefit. Potential new land use measures to further reduce non-compatibility are then considered for addition to the NCP.

7.1 REVIEW OF LAND USE ELEMENTS IN 1996 NCP

This section reviews the land use measures contained in the 1996 NCP and their current implementation status. The individual measures are organized according to their overall purpose (e.g., zoning, land acquisition, etc.).

The 1996 NCP for BOI recommended three corrective and 12 preventive land use measures. *Corrective* land use measures are efforts to address existing non-compatible land uses within the 65+ DNL contour of the NEM. *Preventive* land use measures seek to prevent the introduction of new non-compatible land uses within the Airport Influence Area. For the purposes of this study, noise-sensitive uses such as residential development, schools, and places of worship within the 65+ DNL contour are considered to be non-compatible. Additional information on non-compatible uses per the Part 150 guidelines is shown in Table 4.1.

7.1.1 Airport Influence Area and Comprehensive Planning

The 1996 NCP recommended that the local land use agencies develop and update their Comprehensive Master Plans to address the issue of aircraft noise and compatibility on existing and proposed land uses as identified by the Part 150 guidelines. Specifically, the 1996 Study recommended the following land use (LU) measures: (a) **LU-1**, that both the City of Boise and Ada County address and revise boundaries of the Airport Influence Area; and (b) **LU-2**, refine land use compatibility standards within the Airport Influence Area;

Implementation Status. Ada County references the Airport Influence Area in their zoning ordinance, while the City of Boise includes it in their comprehensive plan. There

are no scheduled amendments associated with either the City of Boise or Ada County comprehensive plan and zoning ordinance regarding the Airport Influence Area and related land use compatibility standards. **Figures 7-1 and 7-2** show the Airport Influence Area as defined by Ada County and the City of Boise, on existing and future land use, respectively.

7.1.2 Airport Zoning

The 1996 NCP recommended several zoning measures for areas within the Airport Influence Area, in an effort to prevent the development of non-compatible land uses.

The Study recommended: (a) **LU-3**, that both Boise City and Ada County maintain existing commercial and industrial zoning within the Airport Influence Area; (b) **LU-4**, rezone airport property and land southeast of the Airport and east of Apple Street from residential to industrial; (c) **LU-5**, rezone land southeast of the Airport, east of I-84 and south of East Gowen Road; (d) **LU-6**, encourage clustered residential development southeast of the airport within the Airport Influence Area, away from runway centerline and outside the 60 DNL Contour; and (e) **LU-11**, adopt project review guidelines for rezoning, special use, conditional use, planned development and variance applications.

Two zoning measures were not approved by the FAA in the 1997 Record of Approval. These measures include: (a) **LU-7**, to maintain existing large lot residential zoning within the Airport Influence Area; and (b) **LU-8**, to maintain existing Rural Preservation (RP) zoning within the Airport Influence Area. These measures were disapproved for purposes of Part 150 because residential development, even at lower densities, is incompatible with Part 150's purpose to prevent the introduction of non-compatible

land uses. However, as the FAA does not have land use planning authority, the disapproval of these measures does not preclude their implementation by the local jurisdictions.

Implementation Status. The Airport does not have authority to rezone land under private ownership. There have been several parcels referenced in LU-4 that have been rezoned to industrial zoning. However, there are still parcels referenced in LU-4 that are Zoned RUT (Ada County designation for Rural Urban Transition), which by definition would allow residential densities up to one dwelling unit per five acres. The overall growth plan of the City of Boise is to capture that area and maintain its comprehensive planning overlay of industrial use. The land continues to be undeveloped and it is unlikely that either the City of Boise or Ada County would support residential development for that land. The area's proximity to the Airport, Interstate 84, and the Union Pacific railroad spur make residential development non-compatible.

The area of land associated with LU-5 is located within current Airport Influence Area 'C' and has remained undeveloped. However, unlike the parcel in LU-4, this area could be subjected to residential development with the conditions of avigation easements and implementing noise level reduction construction requirements. The future land use in the area is indicated as Planned Community Residential in the City of Boise's comprehensive plan. This type of development would be supported by the City of Boise's planning department.

7.1.3 Avigation Easements

Provisions for avigation easements and disclosure requirements have been included (with minimal success) for many years in the Airport Influence Area planning standards in the City of Boise and Ada County.

Recommendations were made in the 1996 NCP for LU-9 to amend current subdivision regulations to require dedication of avigation easements and recording of fair disclosure agreements for new subdivisions. The easements would ensure the Airport's right to use navigable airspace, generate noise associated with aircraft operations, and to prohibit future airspace obstructions. The avigation easements would be obtained on residential properties and non-compatible commercial property located between the 65 DNL and 70 DNL contours.

Implementation Status: Building Permits. Ada County requires that all building permit applications (new construction or permit level remodeling) receive a Zoning Certificate of Compliance. All permit applications filed with the Office of Development Services are reviewed for not only the Airport Influence Area, but also for property encumbrances with an avigation easement. If a permit application does not have a recorded avigation easement, it is returned to the permit holder with the requirement of meeting with Airport staff to obtain an easement on the property.

The City of Boise codified development in a much broader sense; their comprehensive plan establishes restrictions on noise sensitive uses intended to prevent future non-compatible development. Unlike Ada County, the City of Boise Building Department has no established guidelines or requirements that would require the applicant to execute an avigation easement. As such, new non-compatible development could occur without an avigation easement on land that is already planned or zoned for such development. Essentially, current procedures for the City of Boise require only applications for new development or significant remodeled development that would require a City of Boise planning action to accept an avigation

easement. Building permit applications are not required to accept an easement.

Implementation Status: Subdivision Regulations. BOI has made significant progress with regards to aviation easements for planning and subdivision actions. The Airport has established requirements with both the City of Boise and Ada County that all new subdivision or land planning actions within the recognized Airport Influence Area be reviewed by the Airport staff. The process ensures that, if necessary, the applicant would be required to enter into and fully execute an aviation easement.

7.1.4 Building Codes / Noise Level Reduction Construction Standards

The 1996 study recommended **LU-10** to adopt local building code amendments setting sound insulation construction standards (also known as noise level reduction standards) for noise sensitive buildings within the Airport Influence Area. The purpose of the measure was for noise sensitive buildings to meet the Part 150 and EPA guidelines for interior noise level reductions, as described in Chapter Four and Appendix B.

Implementation Status. Growth around the BOI continued to accelerate in the late 1990's including both residential and non-residential uses. That growth occurred on land that was located within both the jurisdictional boundaries of both the City of Boise and Ada County. Much of the planning and development staff in both agencies concentrated on “keeping up with growth” rather than refining current regulations that offered additional, more restrictive permitting measures. However, the two agencies did recognize the need for varied noise level reduction standards for development in the respective Airport Influence Area zone, but did not create strict guidelines or measures of

compliance in response to the published Part 150 Study.

Since much of the new development had occurred in Ada County, county staff did discuss ways of improving the sound attenuation provided by new construction. In cooperation with the Building Contractors of Southwest Idaho, it was suggested (without established test data) that a structure meeting the requirements of the International Energy Conservation Code (which regulates the thermal envelop of the building) offered adequate sound transmission loss through the building envelop. Thus, the International Energy Conservation Code has been used as an informal standard for noise level reduction construction.

7.1.5 Disclosure

Measure **LU-12** would promote informal means of providing the fair disclosure of potential noise exposure in the Airport area. This would be in addition to the disclosure requirements of the aviation easements in **LU-9**.

Implementation Status. Recently the BOI has requested that planning and zoning staff as well as City Council and County Commissioners implement a requirement for an applicant for new development to present to prospective home buyers within his/her subdivision, a “Marketing Disclosure Statement” that reads as follows:

***Marketing Disclosure:** All prospective buyers of this property should be aware that the property is presently located in the vicinity or flight path of an airport within what is known as an airport influence area. For that reason, the property may be subject to some of the annoyances or inconveniences associated with proximity to*

airport operations (for example noise, vibration, dust, fuel particles, lights aircraft and other machinery or odors). Individual sensitivities to those annoyances can vary from person to person, so you may wish to consider what airport annoyances, if any, are associated with the property before you complete your purchase and determine whether they are acceptable to you. You should also be aware that the deed conveying title will restrict certain uses of the property and prohibit challenging the operations references above, so long as they are lawfully conducted.

BOI also requested that the aforementioned Marketing Disclosure statement as well as a “Right to Conduct Activities Acknowledgment” be included in all Codes, Covenants and Restrictions (referred to as CC&Rs) for the subdivision and be included and signed off at closing in perpetuity.

Right to Conduct Activities Acknowledgment:

The undersigned acknowledge and agree that the property described in Exhibit A is located in the vicinity and/or flight path of the Boise Airport. This is an area in which commercial, private, and military flight operations are on-going. Such operations include, but are not limited to: overflight and take-off and landing of aircraft, noise, vibrations, odors and fumes, dust, fuel particles, lights aircraft and other machinery in the nighttime hours and other inconveniences.

Each of the undersigned acknowledges that they understand and acknowledge the inconveniences that will arise from these lawfully conducted operations and accept such inconveniences as part of living in this area. Each of the undersigned further acknowledges that the deed conveying title will contain an avigation easement with restrictions that will prohibit challenging the operations referenced above if they are lawfully conducted.

The Boise City Council did not support these two conditions being placed on recent subdivision applications even though the Airport had recommended them. The planning staff at Ada County indicated that they do not review CC&R’s for subdivisions, so there would not be a mechanism to verify applicant’s compliance.

7.1.6 Land Acquisition and Relocation

These measures were recommended to eliminate non-compatible residential land uses in the areas subject to 70 to 75 DNL noise exposures. In total the study recommended: (a) **LU-13:** acquire homes south of I-84 within 70 DNL contours, with the purchase of 56 single-family homes, 6 mobile homes on individual lots, and 26 mobile homes in a mobile home park; and (b) **LU-14:** acquire undeveloped, residential-zoned land within the 70 DNL contour, with the purchase of 8 vacant lots zoned for residential use.

Implementation Status. Land acquisition and relocation of non-compatible properties within the affected areas has been implemented with limited success, according to interviews with Airport staff. Airport staff created a “Buy-Out” program that offered

appraisal, purchase and relocation expenses for those willing homeowners. The program was facilitated through a local real estate company.

The program met with mixed success. Of those identified in **LU-13**, five (5) single-family homes and twenty-four (24) mobile homes were purchased under this program. Some of the structures were moved off-site and the remaining structures were demolished, leaving the sites vacant of development. Further analysis of the single family home sites that were outlined within the 1996 study identified several properties that actually contained both a commercial business and single family home (or mobile home) on the same property; thus making the commercial aspect of the land ineligible for buyout.

With respect to **LU-14**, BOI continues to promote land purchases and since the 1996 NCP has acquired three vacant lots. In addition, BOI continues to purchase through other mechanisms vacant land not previously identified as adversely affected by aircraft noise, but within the Airport Influence Area, to further enhance compatibility with adjacent properties.

7.1.7 Corrective Residential Sound Insulation Program

A sound insulation program was recommended “to make compatible” non-compatible land uses in the areas subject to 65 to 70 DNL. Sound insulation and improvements would be made to existing homes to achieve the required 25 to 35 decibels of noise level reduction. The 1996 NCP recommended **LU-15** to provide sound insulation in 76 existing homes within the 70 DNL contour, located north of Interstate 84.

Implementation Status. BOI staff met with several neighbors including representatives of

the surrounding neighborhood association. Although the homeowners recognized the sound generated by the aircraft, their specific noise concern was not that of aircraft noise, but that of ambient road/traffic noise generated by the adjacent freeway. The residents declined participation in a sound insulation program.

It should be noted that even if there was a significant interest by the affected residents to accept the insulation program, it was estimated that the average insulation retrofit was \$20,000 per home (in 1996). Current assessor records indicate that the average appraised value of both the homes and property was valued at approximately \$83,500, suggesting that the retrofit expense may not be a justified improvement for the current building value.

7.1.8 Summary of 1996 NCP Land Use Measures

The BOI continues to broaden its engagement with the codified actions and requirements of Planning and Development agencies for both the City of Boise and Ada County. This will be an ongoing process as the BOI continues to operate and surrounding properties continue to develop from farmland to commercial and residential uses.

Establishing procedures for noise mitigation within the building envelop, disclosure of airport operations to all affected property developers, and acquisition of improved land within noise-impacted areas have also been effective in achieving better compatibility between the Airport and its environs.

Table 7.1 summarizes each of the fifteen land use measures of the 1996 NCP and identifies their current implementation status.

Table 7.1

Summary of 1996 NCP Land Use Measures

Land Use Measure		Description	Implementation Status
1	Boundary Revision	The City of Boise and Ada County would address and revise boundaries of the Airport Influence Area.	Airport Influence Area boundaries were adjusted as a result of the 1996 Noise Exposure Maps. Ada County references them in their zoning ordinance; City of Boise in their comprehensive plan.
2	Land Use Compatibility Standards	Refine land use compatibility standards within the Airport Influence Area	Sub-districts have not been implemented as suggested. Ada County and City of Boise simply identify the four Airport Influence Area zones and their respective dB reduction requirements.
3	Commercial & Industrial Zoning	The City of Boise and Ada County maintain existing commercial and industrial zoning within the Airport Influence Area.	The City of Boise and Ada County continue to work with the Airport to maintain existing zoning requirements for commercial and industrial construction within the Airport Influence Area.
4	Rezone of Airport Property / Adjacent Land Use	Rezone property and land southeast of the Airport and east of Apple Street from residential to industrial.	The area remains undeveloped and has been partially re-zoned (approx. 115 acres) to industrial zoning M-1. The remaining 120 acres is an RUT (Rural Urban Transition) zoning classification. All land is within Ada County, Boise Area of Impact.
5	Rezone Property from Residential to Industrial	Rezone land southeast of the Airport, east of I-84 and south of East Gowen Road.	The area has remained undeveloped and has an Ada County zoning classification of RUT which permits residential uses.
6	Clustered Residential Development	Encourage clustered residential development southeast of the airport within the Airport Influence Area.	The area has remained undeveloped and has an Ada County zoning classification of RUT.
7	Large Lot Residential Zoning	Maintain existing large lot residential zoning within the Airport Influence Area to prevent residential intensification.	Not approved by FAA since residential development is incompatible with Part 150 purpose. No action taken.
8	Rural Preservation Zoning	Maintain existing Rural Preservation (RP) zoning within the Airport Influence Area.	Not approved by FAA since residential development is incompatible with Part 150 purpose. No action taken.

Table 7.1

Summary of 1996 NCP Land Use Measures

Land Use Measure	Description	Implementation Status	
9	Subdivision Regulations / Avigation Easements / Disclosure Agreements	Amend current subdivision regulations to require dedication of avigation easements and recording of fair disclosure agreements for new subdivisions.	The City of Boise and Ada County have established requirements for new subdivisions within the Airport Influence Area by subjecting the applicant to the acquisition of a recorded Avigation Easement. No fair disclosure agreement standard has been codified.
10	Building Codes / Sound Insulation Standards	To adopt local building code amendments setting sound insulation standards for noise sensitive buildings within the Airport Influence Area.	No formal action has been taken regarding this program.
11	Project Review Guidelines	Adopt project review guidelines for rezoning, special use, conditional use, planned development and variance applications.	Most land planning applications for both Ada County and City of Boise include opportunity for airport staff review.
12	Fair Disclosure Statement	Promote informal means of providing the fair disclosure of potential noise impacts in the Airport Influence Area.	The Airport has attempted to require applicants to establish a disclosure statement as part of subdivision approval.
13	Property Acquisition	Acquire homes south of I-84 within the 70 DNL contours, with the purchase of 56 single-family homes, 6 mobile homes on lots, and 26 mobile homes in a mobile home park.	BOI created a “Buy-out” program that offered appraisal, purchase and relocation expenses for interested homeowners. To date, five (5) single-family homes and twenty-four (24) mobile homes have been purchased.
14	Undeveloped Property Acquisition	Acquire undeveloped, residential-zoned land within the 70 DNL contours, with the purchase of 8 vacant lots zoned for residential use.	BOI continues to promote land purchase and has acquired three (3) vacant lots since 1996.
15	Sound Insulation Program.	To install sound insulation in 76 homes within the 70 DNL contour, located north of Interstate 84.	No action taken.

Source: 1996 NCP, FAA ROA, and CSHQA analysis

7.2 EVALUATION OF EXISTING LAND USE MEASURES

This section evaluates changes to the land use element of the existing NCP. The evaluation reflects the following developments since the adoption of the current program:

1. Implementation of the previously recommended corrective measures, which greatly reduces the scope of such measures in the future.
2. Changes in the FAA policy regarding the eligibility of new residential development in published NEMs for FAA funding of remedial measures, as well as changes in FAA policy regarding the valuation of aviation easements.
3. Recognition of potential noise and overflight concerns associated with future residential development identified in the Comprehensive Plans for the City of Boise and Ada County.

The existing land use measures were re-evaluated to determine their continued utility at Boise. Potential revisions to the measures will also be considered.

7.2.1 Evaluation Criteria

For a land use measure to be recommended in the NCP, its anticipated benefits must be evaluated and compared to costs and effects on existing land uses. Legal constraints and political acceptability must also be considered. **Table 7.2** shows the qualitative and quantitative criteria that are used in the evaluation of the existing and potential new land use measures. Much of the evaluation conducted in this chapter is organized in the form of tables. This is done to provide structure and consistency for comparison and thus enhance the readability of the evaluation.

7.2.2 Airport Influence Area and Noise Compatibility Standards

The measures described in this section serve to define the area of existing and potential future noise exposure, and also to define the standards which are used to judge if a land use within the noise exposure area is compatible or non-compatible with noise generated by aircraft operations at BOI.

LU-1: Airport Influence Area

The Airport Influence Area was developed with the 1996 NCP as a depiction of potential future noise exposure as a scenario in which BOI would be operating at maximum capacity. The Airport Influence Area also includes the long-term development and extension of Runway 9/27 to enable air carrier use. When established as an overlay zone, the Airport Influence Area can assist the City of Boise and Ada County in determining if a potential land use is potentially non-compatible with existing and future aircraft operations. Thus, the intent of the Airport Influence Area as a preventive measure is to guard against the development of future non-compatible land uses that could encroach upon future operations and development of the Airport.

The 2009 NEM is smaller than the area covered by the Airport Influence Area; this is logical, as the airport is not yet operating near capacity. For this update to the NCP, the Airport Influence Area is recommended to continue without change to its borders. As such, LU-1 is recommended to be modified to maintain the current boundaries of the Airport Influence Area. **Table 7.3** provides an evaluation of the measure.

Table 7.2

Evaluation Criteria for Land Use Measures

Criterion	Description
Area to which measure would be applied	This factor defines the DNL contour intervals within which the measure would be applied and/or the types of land uses within the applicable contour intervals that would be addressed.
Anticipated Benefits	Assessment of potential benefit of measure in terms of land use compatibility with noise exposure from aircraft operations. Specifically, potential to promote compatibility with: physical features; existing or future needs of the Airport; community development goals; and airport design and airspace criteria. Potential benefits could be of a direct nature (restricting additional residential development in areas impacted by airport noise), indirect nature (permitting informed decisions by potential buyers), or remedial nature (providing acceptable interior noise levels).
Costs and Anticipated Funding Sources	Costs and funding sources, as can be reasonably estimated, that would be needed to implement a measure. Funding availability is also considered, especially in regard to federal funds.
Effect on Existing Land Uses	Assessment of existing, non-compatible land uses and zoning affected by the measure, and a means to transition, if possible, such areas to compatible land uses.
Effect on Property Values and Tax Base	Qualitative assessment of measure’s potential impact on affected real property values and tax base.
Legal Factors	Legal constraints to implementation of a measure.
Political Acceptability	Input and recommendations from the public at large, local jurisdictions and their planning agencies, advisory committee, and Airport staff. This factor also describes the interests that may be adversely affected by the potential measure. Such interests could include existing landowners concerned about potential impacts on property values or developers opposed to limitations or conditions that might be placed on the development of land.
Implementation Factors	Steps needed to implement the measure.
Responsible Parties	This factor identifies the federal, state and local agencies and/or jurisdictions responsible for the implementation of a proposed measure.
Conclusion	Positive or negative recommendation on inclusion of measure in NCP.

Table 7.3

Evaluation of Measure LU-1: Airport Influence Area

Description	The Boise Airport Commission should make a recommendation to the City of Boise and Ada County to maintain the current Airport Influence Area boundaries until such time that noise levels require expansion of the boundaries. The Airport Influence Area has been established as an airport noise overlay zone for Ada County and the City of Boise.
Area to which measure would be applied	The Airport Influence Area has four (4) sub-districts; A, B, B-1 and C. Influence Area A represents the outer perimeter potentially affected by future average noise exposure levels in the 60-65 DNL, while C represents the inner core potentially affected by future DNLs greater than 70 dB. Areas B-1 and B represent the land area between A and C that could be potentially affected by future DNLs of 65-70 dB.
Anticipated Benefits	When established as an overlay zone, the Airport Influence Area can assist the City of Boise and Ada County in determining if an impending land use is potentially non-compatible with existing and future aircraft operations. Also, the Airport Influence Area establishes a recorded jurisdictional boundary for airport staff to review and comment on proposed planning and zoning actions as well as building development within City of Boise and Ada County.
Costs and Anticipated Funding Sources	This measure would involve only relatively small administrative expenses from operation budgets as needed for ongoing implementation of the measure.
Effect on Existing Land Uses	No effect on existing land uses.
Effect on Property Values and Tax Base	Possible impact on market value of properties involved, although experience with appraisals within the Airport Influence Area indicates that this effect is minimal. Avigation easements and fair disclosure agreements would be required within the Airport Influence Area. Noise level reduction construction techniques would be required on new development over existing properties that are located within the appropriate DNL contours in the Airport Influence Area.
Legal Factors	It may be necessary for Boise Airport Commission to accept current boundaries and request that the existing boundaries be maintained. Also, it will be necessary for local planning and zoning officials, attorneys and governing bodies to consult in refining and accepting a final ordinance.
Political Acceptability	Developers and/or property owners may oppose the measure due to the perceived potential for reducing marketability. However, public education of the property owners within the Airport Influence Area should dispel much of that opposition.
Implementation Factors	The City of Boise and Ada County would maintain the current Airport Influence Area in their Comprehensive Plans and Municipal Code Ordinances.
Responsible Parties	The City of Boise and Ada County.
Conclusion	This measure is recommended for continued inclusion in the NCP.

LU-2: Land Use Compatibility Standards in Airport Influence Area

This preventive measure defines the criteria used to determine if a land use within the Airport Influence Area is compatible or non-compatible with the noise generated by aircraft operations. For the purposes of potential future non-compatible development, residential development within the 65-70 DNL of the Airport Influence Area is permitted in Zone B-1 if built to achieve a noise level reduction of 30 dBA. Similarly, residential development is permitted within the 60-65 DNL (Zone A) of the Airport Influence Area if built to achieve a noise level reduction of 25 dBA. As the 2009 NEM does not extend to the DNL levels estimated in the Airport Influence Area, the intent of LU-2 is to guard against future expansion of the contours and resultant noise non-compatibility by requiring that noise-sensitive development meet noise level reduction construction goals.

As part of the coordination for implementing this measure, BOI staff along with the City of Boise and Ada County Planners and Building Officials, should consider creating an Aviation Task Force to re-evaluate current designated land planning uses within both Boise and Ada County. In addition, the task force should determine appropriate and consistent land use designations and zoning classifications that create consistency within the comprehensive planning and zoning ordinance guidelines of both jurisdictions. This should be done so that future development requirements within the Airport Influence Area are in harmony with one another.

Table 7.4 defines the land uses permitted within each zone of the Airport Influence Area, while **Table 7.5** provides an evaluation of this measure.

During the May 11, 2004, public hearing, several residents suggested changes to their particular influence area designation. The area in question is the Zone B bounded to the west by Cole Road, to the south by West Snohomish Road, to the east by the Indian Lakes Golf Course, and to the north by Victory Road. The land area in question is approximately 500-acres and much of it has been established residential development for over 20 years. Many of the homes in the area surround the Indian Lakes Golf Course that acts as the catalyst and center of the development. The similar location of the individuals seeking a change in the Airport Influence Area designation suggests the need for a revision. The current Zone B designation makes remodeling or expansion activities of existing developed area non-compliant. Residents have stated that they experience significant difficulty in the regulatory agency approval process for both land planning and building applications.

While a boundary change to the Airport Influence Area designation from B to B-1 would satisfy the request, the change would also potentially permit existing undeveloped land that is now zoned commercial to be subdivided into residential development. New residential development is prohibited within the Zone B but permitted in the Zone B-1 of the Airport Influence Area. Accordingly, the NCP does recommend a change in the zones of the Airport Influence Area. However, the NCP does recommend a change to the land use compatibility standards for the Zone B, as outlined in Table 7.4, to permit the expansion of any existing primary residential structure. The expansion must achieve a NLR of 30 dBA. New residential development in the B zone would continue to be prohibited.

Revision of the Zone B land use compatibility standard better aligns with current land

planning and existing uses within both the City of Boise and Ada County jurisdictions.

Table 7.4

Land Use Compatibility Standards for Noise Sensitive and Recreational Uses in Airport Influence Area

SLUCM No.	Land Use Name	Zone & Influence Areas/DNL Levels ¹			
		A 60-65	B-1 65-70	B 65-70	C 70+
10	Residential				
11	Household Units	Y ²	Y ^{3,6}	N ^{3,9}	N
11.11	Single Units – detached	Y ²	Y ^{3,6}	N ^{3,9}	N
11.12	Single Units – semi-detached	Y ²	Y ^{3,6}	N ^{3,9}	N
11.13	Single Units – attached row	Y ²	Y ^{3,6}	N ^{3,9}	N
11.21	Two Units – side by side	Y ^{2,7}	Y ^{3,7}	N ^{3,9}	N
11.22	Two Units – one above another	Y ^{2,7}	Y ^{3,7}	N ^{3,9}	N
11.31	Apartments – walk up	Y ²	N	N	N
11.32	Apartments – elevator	Y ²	N	N	N
12	Group Quarters	Y ²	N	N	N
13	Residential Hotels	Y	N	N	N
14	Mobile Home Park or Courts	N	N	N	N
15	Transient Lodging	Y	N	N	N
16	Other Residential	Y ^{2,7}	Y ^{3,6,7}	N	N
60	Services				
65.1	Hospitals, nursing homes	Y	N	Y ⁵	Y ⁴
65.2	Other medical facilities	Y	Y ⁴	Y ⁵	Y ⁵
68	Educational services	Y ²	N	N	N
70	Cultural, Entertainment, and Recreational				
71	Cultural activities (including churches)	Y	Y ⁴	N	N
71.2	Nature exhibits	Y	Y ⁴	Y ⁵	N
72	Public Assembly	Y	Y ⁴	N	N
72.1	Auditoriums, concert halls	Y	Y ⁴	N	N
72.11	Outdoor music shells, amphitheaters	N	N	N	N
72.2	Outdoor sports arenas, spectator sports	Y ⁸	N	N	N
73	Amusements	Y	N	N	N
74	Recreational activities (including golf courses, riding stables, water recreation)	Y	Y ⁴	Y ⁵	Y ⁵
75	Resorts and group camps	Y	N	N	N
76	Parks	Y	Y	Y ⁵	N
79	Other cultural, entertainment	Y	Y ⁴	Y ⁵	N

Notes

- 1 Avigation easements shall be dedicated to the City of Boise and fair disclosure covenants shall be recorded for all permitted uses in Airport Influence Area.
- 2 Sound attenuation measures to achieve an NLR of 25 dBA are required.
- 3 Sound attenuation measures to achieve an NLR of 30 dBA are required.
- 4 Measures to achieve NLR of 25 dBA must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, sleeping areas, and other noise sensitive areas.
- 5 Measures to achieve NLR of 30 dBA must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, sleeping areas, and other noise sensitive areas.

Table 7.4

Land Use Compatibility Standards for Noise Sensitive and Recreational Uses in Airport Influence Area

- 6 New residential development (maximum density) limited to three (3) residential units per acre.
 - 7 Existing land planning base zoning (R-2) standards would be maintained in City of Boise to allow duplex residential development complying with bulk setback and planning standards. No conditional uses, variances or rezones would be permitted that intensify current zoning.
 - 8 Land use is compatible provided special sound reinforcement systems are installed.
 - 9 Expansion or remodel of existing single-family or two-family residential structures (constructed and occupied at the time of this document publication) shall be permitted under the standards established for note 3.
-

Key

- SLUCM Standard Land Use Coding Manual, (U.S. Urban Renewal Administration and Bureau of Public Roads, 1965, 1977).
 - Y (Yes) Land Use and related structures are compatible without restrictions, unless otherwise noted.
 - N (No) Land Use and related structures are not compatible and shall be prohibited, unless otherwise noted.
 - NLR (Noise level reduction) Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
-

Source: 1996 NCP with amendments as noted.

Table 7.5

Evaluation of Measure LU-2: Land Use Compatibility Standards in Airport Influence Area

Description	The City of Boise and Ada County should refine their land use compatibility standards for the four sub-districts within the Airport Influence Area.
Area to which measure would be applied	The Airport Influence Area has four (4) sub-districts; A, B, B-1 and C. Influence Area A represents the outer perimeter affected by average sound levels in the 60-65 DNL and C represents the inner core affected by average sound levels greater than 70 DNL. Areas B-1 and B represent the land area between A and C.
Anticipated Benefits	The adoption of a model ordinance that both the City of Boise and Ada County can enforce in unison with local builders and developers. This would avoid the appearance of one jurisdiction having more power over the other by imposing different standards upon the public.
Costs and Anticipated Funding Sources	This measure would require administrative expenses from City and County operating budgets as needed for refinement and ongoing implementation.
Effect on Existing Land Uses	The standards would ensure that new development would be designed to promote compatibility with the Airport.
Effect on Property Values and Tax Base	Possible impact on market value of properties involved, although experience with appraisals within the Airport Influence Area indicates that this effect is slight.
Legal Factors	It will be necessary for local planning and zoning officials, attorneys and governing bodies to consult in refining and accepting a final ordinance.
Political Acceptability	Developers and/or property owners may oppose the measure due to the perceived potential for reducing marketability. However, public education of the property owners within the Airport Influence Area should dispel much of that opposition.
Implementation Factors	The City of Boise and Ada County have refined land use compatibility standards within the Airport Influence Area, per their respective Comprehensive Plans and Municipal Code Ordinances.
Responsible Parties	City of Boise and Ada County
Conclusion	This measure is recommended for continued inclusion in the NCP.

7.2.3 Zoning Measures

These preventive measures would amend existing zoning maps and zoning regulations for areas within the Airport Influence Area and 2009 NEM. The zoning amendments would discourage new non-compatible residential development and other noise-sensitive structures from being constructed within certain areas of the Airport Influence Area, while supporting favorable trends in other areas to enhance compatibility with future aircraft operations.

The land use policy plan described in Chapter Four has been reflected in the land use and development regulations of Ada County and the City of Boise. The adoption of the plan has greatly reduced the potential for new non-compatible development in the Airport environs.

Within the Airport Influence Area, there is land (both within the City of Boise and Ada County, developed and undeveloped) zoned for non-compatible, noise sensitive uses. This land is outside of “airport property”, but within areas of the 60, 65 and 70 DNL contours. The City of Boise and Ada County have indicated a planning position of maintaining those non-compatible uses and allowing noise sensitive development in conformance with current zoning and execution of aviation easements even though the airport staff could recommend against this type of development.

Planning staff would not support a request for conditional use or re-zone that would further intensify the noise sensitive use, such as taking single family residential and permitting multi-family development. Property that is already zoned to permit non-compatible development could not be re-zoned

involuntarily by request of the airport staff. Developers are made aware as part of the aviation easement acquisition that FAA funding for soundproofing would not be made available for non-compatible, noise sensitive development constructed within these areas.

As discussed in Chapter Four, vacant land within the 65+ DNL contour which is not designated for industrial or commercial use should be considered at risk for non-compatible development. In addition, consideration should be given to the potential for development of noise sensitive land uses in the area between 60 and 65 DNL contours. Although enforcing compatible land uses within this area would not rely upon FAA guidelines, limiting noise sensitive land use within this area would provide a greater degree of protection for the Airport and future residents, and would be consistent with established regional policies.

Figures 3-1 and 3-2 superimpose flight tracks on current land uses. Although planned residential area would remain outside the projected 60 DNL contours, experience in the local community demonstrates that most current noise concerns at BOI are associated with heavily used flight tracks beyond the area addressed by the current land use policy plan. Since no residential development has occurred to date, it is still possible to maintain this beneficial noise tolerant corridor.

LU-3: Commercial & Industrial Zoning in Airport Influence Area

The City of Boise and Ada County continue to work with the Airport staff to maintain existing zoning for commercial and industrial development within the Airport Influence Area. **Table 7.6** provides an evaluation of this preventive measure.

Table 7.6

Evaluation of Measure LU-3: Commercial & Industrial Zoning in Airport Influence Area

Description	Maintain existing commercial and industrial zoning within the Airport Influence Area. This land should be preserved for compatible future development and to avoid rezoning of these areas for residential use.
Area to which measure would be applied	Current commercial and industrial property zoning within the Airport Influence Area. Thus, no changes in the use would occur. This land use recommendation would ensure that these areas remain as compatible land uses.
Anticipated Benefits	Preservation of existing zoning for compatible land uses within the Airport Influence area and to avoid new non-compatible development.
Costs and Anticipated Funding Sources	The measure may require small administrative expenses from operating budgets within the City of Boise and Ada County as needed for ongoing implementation of the measure.
Effect on Existing Land Uses	No effect on existing land uses.
Effect on Property Values and Tax Base	Possible impact on market value of properties involved, although experience with appraisals within the Airport Influence Area indicates that this effect is minimal.
Legal Factors	No impact on local governing agencies.
Political Acceptability	Surrounding residents may support decreased development potential.
Implementation Factors	The City of Boise and Ada County maintains existing zoning requirements for commercial and industrial development within the Airport Influence Area, as outlined in their respective Comprehensive Plans and Municipal Code Ordinances.
Responsible Parties	The City of Boise and Ada County.
Conclusion	This measure is recommended for continued inclusion in the NCP.

LU-4: Zone for Compatible Use in Apple Street Area

As evaluated in **Table 7.7**, this preventive measure seeks

to promote the rezoning of land within the specified areas of the Airport Influence Area from residential to industrial. The specific area applicable to this measure is shown in **Figure 7-3**.

Table 7.7

Evaluation of Measure LU-4: Zone for Compatible Use in Apple Street Area

Description	Rezone private property and land southeast of BOI that is within the Airport Influence Area.
Area to which measure would be applied	Encourage rezoning of a large track of land southeast of the Airport, east of Apple Street from residential zoning to industrial use (M-1, M-2, or M-4).
Anticipated Benefits	This measure would decrease the potential for non-compatible development in the Airport Influence Area.
Costs and Anticipated Funding Sources	Minor administrative expenses from the City of Boise’s operating budget.
Effect on Existing Land Uses	Rezoning or authorizing conditional uses for any new residential development in the Airport Influence Area is prevented.
Effect on Property Values and Tax Base	Possible impact on market value of properties involved, although experience with appraisals within the Airport Influence Area, indicates that this effect is slight.
Legal Factors	It will be necessary for local planning and zoning officials and attorneys to consult in the event the remaining land zoned RUT, is proposed for residential or non-compatible development.
Political Acceptability	Developers and/or property owners may oppose the measure due to the potential for reducing marketability. Surrounding residents may support decreased development potential.
Implementation Factors	This area has been partially re-zoned (approx. 115 acres) to Industrial Zone M-1. The remaining 120 acres is bare land, undeveloped with an RUT (Rural Urban Transition) zoning classification.
Responsible Parties	Ada County and City of Boise.
Conclusion	This measure is recommended for inclusion in the revised NCP.

LU-5: Zone for Compatible Use in Gowen Road Area

Figure 7-3. The land considered in this measure is within the Airport Influence Area. The measure is evaluated in **Table 7.8**.

This preventive measure would seek to rezone land southeast of the airport, east of I-84, and south of East Gowen Road as shown in

Table 7.8

Evaluation of Measure LU-5: Zone for Compatible Use in Gowen Road Area

Description	Rezone a large track of land from residential to industrial within the Airport Influence Area.
Area to which measure would be applied	Land located off the extended runway centerlines east of I-84 and south of East Gowen Road. An Industrial Zoning District currently borders the property to the east.
Anticipated Benefits	This measure would decrease the amount of noise sensitive land use within the Airport Influence Area.
Costs and Anticipated Funding Sources	This measure would involve modest administrative expenses from operation budgets for drafting the amending ordinance and notification through a public hearing, as well as mapping preparation for neighborhood presentation and final platting.
Effect on Existing Land Uses	Currently comprehensive planning documents recommend planned community development within this particular property area. It is not likely that planning commission would support rezone of property to industrial.
Effect on Property Values and Tax Base	Area has remained undeveloped since the 1996 NCP. Planning agencies would support the current residential zoning of this area.
Legal Factors	If industrial zoning classification is pursued, BOI staff would need to lobby planning agencies, property owners, city council, and county commissioners to support amendment to comprehensive plan.
Political Acceptability	City/county staff, developers and/or property owners may oppose the measure due to the potential for reducing marketability.
Implementation Factors	This area has remained undeveloped and has a zoning classification of RUT (Rural Urban Transition). It is within the City of Boise’s area of impact.
Responsible Parties	The City of Boise and Ada County.
Conclusion	<p>Although it is not likely that this measure will result in the rezoning of the affected area to industrial use, the measure is recommended for continued inclusion in the NCP due to the Airport’s desire to decrease the potential for noise sensitive land uses within the Airport Influence Area.</p> <p>The property is located within Airport Influence Area A, permitting residential use with the inclusion of an aviation easement and noise level reduction construction. City of Boise Comprehensive Planning identifies this area as Planned Community Development that could be constructed to conform to the aforementioned conditions. This underscores the need to maintain the existing airport influence boundaries per LU-1 in order to protect future residential development.</p>

LU-6: Encourage Clustered Residential Development

This preventive measure seeks to encourage clustered residential development away from the extended runway centerlines for the specified area (as shown in Figure 7-3) that is

currently zoned for residential use within the Airport Influence Area. If measure LU-5 is not implemented to rezone part of the subject area to industrial use, LU-6 would then apply to encourage clustered residential development. An evaluation of the measure is contained in **Table 7.9**.

Table 7.9

Evaluation of Measure LU-6: Encourage Clustered Residential Development

Description	This measure addresses land to be considered for clustered residential development within a current residential zone inside the Airport Influence Area.
Area to which measure would be applied	Land southeast of the airport and north of East Gowen Road, which is directly south of an approved residential neighborhood development. This property should be considered for clustered residential development, with homes being clustered away from the runway centerline. Open space should be reserved in the 60 DNL contour. Property directly south of Gowen Road should also be recommended if the rezoning of that property from residential to industrial is not implemented per LU-5.
Anticipated Benefits	This measure would reduce the number of future residential homes along the runway centerline and thus homes exposed to noise.
Costs and Anticipated Funding Sources	This measure would require limited administrative expenses from the jurisdiction’s operating budget.
Effect on Existing Land Uses	No effect on existing land uses.
Effect on Property Values and Tax Base	No effect on present property values.
Legal Factors	Initiation of this measure is at the discretion of the developer. The local governing agencies cannot mandate this process.
Political Acceptability	Developers and/or property owners may oppose the measure due to the potential for reducing marketability. Surrounding residents may support decreased development potential.
Implementation Factors	Development in this area is part of the Columbia Village Subdivision master plan. There are several housing components of the development that offer “clustered” housing as well as high-density housing. The land remains under residential zoning classification.
Responsible Parties	The City of Boise and Ada County.
Conclusion	This measure is recommended for inclusion in the revised NCP.

LU-7: Maintain Large Lot Residential Zoning

This preventive measure would encourage the continued use of low-density residential development in certain areas of the Airport Influence Area, as shown in Figure 7-3. This measure was disapproved in the FAA's review of the 1996 NCP, even though it applies to areas outside of the 65 DNL of the 2009 NEM. The measure is intended to discourage intensive residential development that could be affected by the long-term expansion of the Airport. Although this measure was disapproved, the Airport as policy continues to discourage intensive residential development in areas that could be affected by frequent future overflights. This includes portions of the Airport Influence Area as described in this measure, and also other undeveloped areas further south of the Airport, including the Birds of Prey area.

It is recognized that it would be politically difficult to rezone these areas to a non-noise sensitive use, with only the potential for future noise effects. The intent of the measure is to reduce the number of dwellings that could be affected by future growth in the size of the Airport's noise contours, as described in **Table 7.10**.

LU-8: Maintain Rural Preservation Zoning

Similar to LU-7, this preventive measure would encourage the continued use of low-density residential development in certain areas of the Airport Influence Area, as shown in Figure 7-3. This measure was disapproved in the FAA's review of the 1996 NCP. However, the measure applies to areas outside of the 65 DNL of the 2009 NEM. The measure is intended to discourage intensive residential development that could be affected

by the long-term expansion of the Airport. Although this measure was disapproved, the Airport as policy continues to discourage intensive residential development in areas that could be affected by frequent future overflights. This includes portions of the Airport Influence Area as described in this measure, and also other undeveloped areas further south of the Airport, including the Birds of Prey area.

Similar to the rationale for LU-7, it is recognized that it would be politically difficult to rezone the specified areas to a non-noise sensitive use, with only the potential for future noise effects. The intent of measure LU-8 is to reduce the number of dwellings that could be affected by future growth in the size of the Airport's noise contours, as evaluated in **Table 7.11**.

Table 7.10

Evaluation of Measure LU-7: Maintain Large Lot Residential Zoning

Description	Large lot, low-density residential development in the Airport Influence Area should be maintained to discourage intensive residential development in areas that could be affected by future growth at BOI.
Area to which measure would be applied	Land currently zoned for residential development northwest and south of the Airport Influence Area in the City of Boise and Ada County. Property includes minimum lot sizes of one acre or more.
Anticipated Benefits	To reduce or minimize future numbers of people residing in potential noise exposure areas.
Costs and Anticipated Funding Sources	This measure would require only relatively small administrative expenses from current operating budgets as needed for continued implementation of the measure.
Effect on Existing Land Uses	No effect on existing land uses.
Effect on Property Values and Tax Base	No effect on present property values.
Legal Factors	No impact on local governing agencies.
Political Acceptability	Developers and/or property owners may oppose the measure due to the potential for reducing marketability. Surrounding residents may support decreased development potential.
Implementation Factors	The City of Boise and Ada County would establish this policy by amending their Comprehensive Plans or by adopting a resolution into the Municipal Code Ordinances. The NCP or relevant parts could be adopted as part of an airport vicinity land use plan. Also, comments from the City of Boise indicate that due to ground water contamination and the lack of treated water and sewer systems, residential development in the area will generally be of lower-density.
Responsible Parties	The City of Boise and Ada County.
Conclusion	This measure was disapproved by the FAA for purposes of Part 150, as residential development is incompatible with the Part 150’s purpose to prevent the introduction of non-compatible land uses. However, the measure is valid in that it would encourage low-density development in areas that are within the 60-65 DNL zone of the Airport Influence Area but outside of the 65 DNL of the 2009 NEM. Thus, the measure would protect against future non-compatible land uses with expanded noise contours. The measure would be preventive in nature and would not permit non-compatible development within the 2009 NEM. As a result, the measure is recommended for inclusion in the revised NCP.

Table 7.11

Evaluation of Measure LU-8: Maintain Rural Preservation Zoning

Description	To maintain unincorporated land currently zoned for Rural Preservation within the Airport Influence Area to ensure that such lands do not become more intensively residentially developed.
Area to which measure would be applied	Land is located south of the Airport Influence Area in Ada County. Property includes nominal lot sizes of forty acres, with as many as three, one-acre lots may be split from any 40-acre tract.
Anticipated Benefits	Current zoning district limits the amount of housing and other urban uses that can be developed. This would thus reduce or minimize future numbers of people residing in potential noise exposure areas.
Costs and Anticipated Funding Sources	This measure would require only relative small administrative expenses from current operating budgets as needed for continued implementation of the measure.
Effect on Existing Land Uses	No effect on existing land uses.
Effect on Property Values and Tax Base	No effect on present property values.
Legal Factors	No impact on local governing agencies.
Political Acceptability	Developers and/or property owners may oppose the measure due to the potential for reducing marketability. Surrounding residents may support decreased development potential.
Implementation Factors	The City of Boise and Ada County would establish this policy by amending their Comprehensive Plans or by adopting a resolution into the municipal code ordinances. The NCP or relevant parts could be adopted as part of an airport vicinity land use plan.
Responsible Parties	The City of Boise and Ada County.
Conclusion	This measure was disapproved by the FAA for purposes of Part 150, as residential development is incompatible with the Part 150's purpose to prevent the introduction of non-compatible land uses. However, the measure is valid in that it would encourage low-density development in areas that are within the 60-65 DNL zone of the Airport Influence Area but outside of the 65 DNL of the 2009 NEM. Thus, the measure would protect against future non-compatible land uses with expanded noise contours. The measure would be preventive in nature and would not permit non-compatible development within the 2009 NEM. As a result, the measure is recommended for inclusion in the revised NCP.

7.2.4 Regulatory Measures

Regulatory measures serve to enable preventive measures, such as avigation easements and noise level reduction construction, to be included in new development within the Airport Influence Area. Disclosure of noise exposure to prospective homebuyers is also considered.

LU-9: Amend Subdivision Regulations and Building Permit Applications to Require Avigation Easements

An avigation easement is the right to the use of real property for the purpose of aircraft overflights and related noise, vibrations, and other effects caused by aircraft operations. An avigation easement is a permanent encumbrance on the land. Although the use of navigable airspace by aircraft is a federal prerogative, an avigation easement provides an additional mechanism of right-of-way and disclosure.

As discussed in Section 7.1, both Ada County and the City of Boise currently have procedures in place to ensure that avigation easements are obtained for new subdivision development within the Airport Influence Area. However, as a preventive action, this measure would encourage Ada County and the City of Boise to mandate that avigation easements be required for all (residential and commercial) development within the Airport Influence Area as part of the building permit application. Although the zoning measures described in Section 7.2.3 would seek to prevent future noise-sensitive development within the most sensitive portions of the Airport Influence Area, there are instances in which development could nonetheless take place (such as development on already zoned parcels). In addition, the current procedures requiring easements with subdivision development do not apply to building permit procedures. An avigation easement would

thus serve to ensure notice of aircraft noise and the right of aircraft overflight. Ada County currently includes easements with its building permits, but the City of Boise does not.

An evaluation of this preventive measure is contained in **Table 7.12**.

LU-10: Adopt Local Building Code Amendments for Noise Level Reduction Construction in the Airport Influence Area

This preventive measure would seek to amend building codes for areas within the Airport Influence Area to require residential and non-residential noise-sensitive buildings to be constructed to achieve an interior noise level at or below 45 dBA. This interior noise level would meet the EPA guideline for avoiding sleep and speech interference due to aircraft noise.

As this measure would address the building code, it could be applied to new development on already zoned property. The measure would thus apply to all new construction within the NEMs, and ensure that new development would be constructed to reduce the effects of aircraft noise. Substantial additions (those that would require agency review and permit issue) to existing buildings would also be subject to the amended building codes.

Typical wood or masonry residential construction is estimated to achieve a noise level reduction of about 20 dBA with windows closed (attenuation provided by the building when measuring noise levels on the outside versus inside), although many structures may achieve up to 25 dBA. This means that the construction techniques for most buildings within the Airport Influence Area would already meet the interior noise levels advocated by this measure.

Table 7.12

Evaluation of Measure LU-9: Amend Subdivision Regulations and Building Permit Applications to Require Avigation Easements

Description	The Airport Influence Area planning standards in the City of Boise and Ada County require the dedication of avigation easements for all permitted uses. This practice has been in place for many years, and it is recommended to be continued. In addition, this measure would be revised to encourage Ada County and the City of Boise to mandate that avigation easements be required for all (residential and commercial) development within the Airport Influence Area as part of the building permit application.
Area to which measure would be applied	Current and future permitted residential subdivision uses and new development requiring building permits within the Airport Influence Area.
Anticipated Benefits	Would empower local planning, zoning and building officials to ensure that easement and disclosure requirements were met at time of a property being subdivided or when a building permit is issued. The avigation easement would grant to the Airport unabridged right to airspace above the property and the right to make noise inherent in the operation of aircraft.
Costs and Anticipated Funding Sources	This measure would require administrative expenses from the jurisdictions operating budgets as needed for revision and continued implementation.
Effect on Existing Land Uses	No effect on existing land uses since the measure is already in place and only needs enhanced implementation.
Effect on Property Values and Tax Base	Possible impact on market value of properties involved.
Legal Factors	It will be necessary for local planning and zoning officials and attorneys to consult in refining the existing ordinance.
Political Acceptability	Developers, real estate brokers, and/or property owners may oppose the measure due to the potential for reducing marketability.
Implementation Factors	The City of Boise and Ada County have established requirements for new subdivisions such that if a permit application is located within the Airport Influence Area and without a recorded Avigation Easement, the application is returned to the permit holder until an easement for the property is obtained.
Responsible Parties	The City of Boise and Ada County.
Conclusion	This measure is recommended for inclusion in the revised NCP but needs modification to revise approval procedures relative to obtaining the easement, application to building permits, and subsequent disclosure of avigation easements through the subdivision permit approval process.

Nonetheless, this measure would ensure that all new buildings would meet the interior noise level goal. Appendix E discusses construction techniques and materials needed to achieve the noise level reduction goals. The measure would seek to require new

construction within the Airport Influence Area to use noise level reduction construction techniques to achieve noise level reduction goals of 25 dBA (for areas within the 60-65 DNL) and 30 dBA (for areas within the 65-70 DNL). The purpose of the noise level

reduction construction is to achieve the EPA recommendation of an interior noise level at or below 45 dBA, if the airport's noise contours were to expand in the future. This measure is evaluated in **Table 7.13**.

LU-11: Adoption of Project Review Guidelines for the City of Boise and Ada County

As evaluated in **Table 7.14**, this preventive measure would establish project review guidelines to assist local planning staff and governments in assessing the potential compatibility of future development projects with aircraft noise.

LU-12: Fair Disclosure of Noise Impacts in the Airport Influence Area

This preventive measure would inform potential buyers that the property they are purchasing is located within the BOI NEMs and/or Airport Influence Area, and thus subject to aircraft noise exposure. This measure would permit buyers to make an informed decision about the property. This measure is in addition to the disclosure requirements per aviation easements included in measure LU-9.

Property owners and their agents with noise-sensitive properties within the 2009 NEM or Airport Influence Area would be requested to disclose aircraft noise levels in sales and leasing agreements. Existing properties would be subject to the disclosure requirements upon the sale and purchase of those properties. Although more formal methods of noise disclosure would be desirable from the Airport's perspective, there is little apparent viability for implementing formal procedures.

In a formal program, aircraft noise exposure information would be included in a property's real estate listing, sales contract, and sales

documents. By including noise disclosure information in the real estate listing and sales contract, the buyer would be made aware of aircraft noise exposure levels well in advance of the time of closing. This would also help to ensure that the buyer does not overlook noise disclosure at closing. In addition, the buyer would be required to sign an affidavit at the time of closing acknowledging that they are aware that the property being purchased is in an area potentially subjected to aircraft noise exposure of 60 DNL or greater. Similarly, lease agreements would contain a provision notifying the leaser that the property is potentially subject to aircraft noise exposure of 60 DNL or greater.

Note that this disclosure policy would not relinquish any of the buyers legal rights; it would only serve as a means to ensure that buyers are aware of potential aircraft noise exposure levels before purchasing or leasing the property. In concert with measure LU-10, the disclosure documents could also indicate the noise level reduction and interior noise level provided by the building, if known.

As a related effort, BOI could pursue an aggressive public education program directed towards notifying potential homebuyers of potential aircraft noise exposure levels. This program could include both printed and online pamphlets and maps. This measure is described in further detail in Chapter Eight. **Table 7.15** provides an evaluation of this measure.

Table 7.13

Evaluation of LU-10: Adopt Local Building Code Amendments for Noise Level Reduction Construction in the Airport Influence Area

Description	The Airport Influence Area planning standards in the City of Boise and Ada County have required the use of noise level reduction construction techniques for noise-sensitive uses for all permitted development for many years. Both the City and County have lacked specific guidance for implementing this requirement and should adopt noise level reduction standards to supplement their building codes.
Area to which measure would be applied	All permitted uses within the Airport Influence Area per the noise compatibility recommended guidelines.
Anticipated Benefits	Achieve the EPA recommendation of an interior noise level at or below 45 dBA.
Costs and Anticipated Funding Sources	Testing for current noise level reduction standards is roughly estimated to be \$50,000. The cost of training local building officials is estimated to be around \$10,000. A portion of the acquisition costs may be eligible for federal funding if this measure is part of an approved Part 150 NCP, although actual funding would be dependent upon availability. After adoption of this noise level reduction construction program, the City and County would incur administrative costs for the physical review of building plan permit applications and on-site construction inspections.
Effect on Existing Land Uses	No effect on already developed properties.
Effect on Property Values and Tax Base	No effect to present property values. This measure could increase property values for new construction.
Legal Factors	It will be necessary for local building officials and attorneys to consult in refining the existing building code ordinances.
Political Acceptability	No opposition is expected from affected property owners or from other interests.
Implementation Factors	No formal action has been taken regarding this program. The City of Boise and Ada County have the authority to implement this measure. Ada County has adopted the International Energy Conservation Code as a surrogate for noise level reduction construction techniques.
Responsible Parties	The City of Boise and Ada County.
Conclusion	This measure is recommended for inclusion in the revised NCP but needs modification to develop standards that have been tested and documented, including sound testing of completed residential construction.

Table 7.14

Evaluation of Measure LU-11: Adoption of Project Review Guidelines for the City of Boise and Ada County

Description	<p>The adoption of special project review criteria, specifically addressing airport land use compatibility standards and continued enforcement in future land use deliberations.</p> <p>Specifically, to determine whether a projected land use is non-sensitive or non-compatible:</p> <ol style="list-style-type: none"> 1. Local land use authorities would notify Airport management of proposed noise sensitive land development within the Airport Influence Area; 2. Local land use authorities would notify Airport management of propose location of noise-sensitive public facilities within the Airport Influence Area; 3. Discourage the approval of rezoning, conditional uses and variances which introduce noise-sensitive development into areas impacted by 60 DNL or above within the Airport Influence Area; and 4. Locate noise-sensitive development within the 60 DNL contour that must be permitted in areas away from the extended runway centerlines.
Area to which measure would be applied	<p>Project review criteria would be included in local comprehensive plans or as checklists for local planners, commissions and governing boards. Criteria would be specifically suggested for use in the review of planned development, rezoning, conditional use and variance applications within the Airport Influence Area.</p>
Anticipated Benefits	<p>To determine whether a projected land use is potentially non-compatible in reference to the NEMs and Airport Influence Area.</p>
Costs and Anticipated Funding Sources	<p>This measure would require minor administrative expenses from the jurisdiction’s operating budgets.</p>
Effect on Existing Land Uses	<p>Projected land uses within the Airport Influence Area could potentially be discouraged upon reference to the project review guidelines.</p>
Effect on Property Values and Tax Base	<p>Possible impact on market value of properties involved, although experience with appraisals within the Airport Influence Area, indicates that this effect is minimal.</p>
Legal Factors	<p>It will be necessary for local planning and zoning officials and attorneys to consult in refining the existing ordinance.</p>
Political Acceptability	<p>Developers and/or property owners may oppose the measure due to the potential for reducing marketability.</p>
Implementation Factors	<p>Current land planning policies for both the City of Boise and Ada County include opportunity for airport staff review as part of the application process.</p>
Responsible Parties	<p>The City of Boise and Ada County.</p>
Conclusion	<p>This measure is recommended for inclusion in the revised NCP, with modifications to help control new residential development under heavily used departure and arrival corridors as part of the Airport Influence Area.</p>

Table 7.15

Evaluation of Measure LU-12: Fair Disclosure of Noise Impacts in the Airport Influence Area

Description	Informal means of ensuring fair disclosures for both new and existing properties of the potential noise impacts to buyers within the Airport Influence Area. Additional collaboration with the local Board of Realtors to develop voluntary ways of disclosing airport impacts to buyers before they are committed to purchasing that property.
Area to which measure would be applied	Residential, noise sensitive and commercial properties located within the Airport Influence Area.
Anticipated Benefits	Provide accurate, balanced information for property buyers considering the purchasing of property within the influence area to make informed decisions.
Costs and Anticipated Funding Sources	City administrative costs for the development of informational materials and the posting of signage, estimated to be in the range of \$20,000. A portion of the acquisition costs may be eligible for federal funding if this measure is part of an approved Part 150 NCP, although actual funding would be dependent upon availability.
Effect on Existing Land Uses	Potential reduced marketability with disclosure procedures.
Effect on Property Values and Tax Base	Possible impact on market value of properties involved, although experience with appraisals within the Airport Influence Area, indicates that this effect is slight.
Legal Factors	Minor impacts on local governing agencies to revise current disclosure forms.
Political Acceptability	Homeowners and developers may oppose measure due to potential negative effect on marketing residential units.
Implementation Factors	Formal disclosure programs have proven difficult to implement. Additional promotion of the disclosure process should be examined through the preparation of informal brochures and presentations to local real estate agents and the public on an ongoing basis.
Responsible Parties	Ada County and the City of Boise, with coordination from BOI.
Conclusion	This measure is recommended for inclusion in the revised NCP.

7.2.5 Land Acquisition Measures

Both of the land acquisition measures in the 1996 NCP provide mechanisms for BOI to acquire developed and undeveloped lands within the 70 DNL contour. For this update to the NCP, the measures are recommended to be revised to include acquisition of non-compatible residential dwellings and vacant land within the 65+ DNL contour of the 2009 NEM.

LU-13: Residential Property Acquisition within the 65+ DNL Contour

With this corrective measure, BOI could acquire selected parcels of developed land within the 65+ DNL contours of the 2009 NEM. Acquired developed properties could be leased or converted into compatible uses with deed restrictions and easements, and then resold.

This measure would apply to areas within the 65+ DNL contour, as FAA guidelines define noise sensitive uses within the 65+ DNL contour as non-compatible. Properties would primarily be acquired through the voluntary sale of the owner. Although BOI already has the option of pursuing acquisition of developed land without this measure, the inclusion of this measure in the NCP would permit the Airport to seek federal grant funds to aid in the acquisition cost.

There are currently 40 residential dwellings within the 65+ DNL contours of the 2009 NEM. Most of these homes are near the approach end of Runway 10L, north of I-84. Alternatively, the Airport could seek to purchase avigation easements, as outlined in Section 7.3.2. An evaluation of this measure is included in **Table 7.16**.

LU-14: Undeveloped Property Acquisition within 65+ DNL Contour

With this corrective measure, BOI could acquire selected parcels of undeveloped land within the 65+ DNL contours of the 2009 NEMs. This measure is similar to LU-13, except that it applies to undeveloped property instead of already developed property. This would be done for the purpose of maintaining the land as vacant, selling the property for development into compatible uses with deed restrictions, or developing the property for a compatible public use.

This measure would apply to undeveloped areas within the 65+ DNL contour with the risk of non-compatible development. Properties would primarily be acquired through the voluntary sale of the owner. Although BOI already has the option of pursuing acquisition of developed land without this measure, the inclusion of this measure in the NCP would permit the airport to seek federal grant funds to aid in the acquisition cost.

There are currently limited areas of vacant land within the 65+ DNL contours of the 2009 NEM. An evaluation of this measure is included in **Table 7.17**.

Table 7.16

Evaluation of Measure LU-13: Residential Property Acquisition within 65+ DNL Contour

Description	BOI may seek to acquire selected parcels of developed non-compatible land within the 65+ DNL contours of the 2009 NEMs for the purpose of leasing or converting the properties into compatible uses with deed restrictions and easements.
Area to which measure would be applied	Residential areas within the 65+ DNL contour, primarily to the west of the Airport and north of I-84. Per FAA policy, the program would apply only to existing non-compatible properties within the 65+ DNL contours of the 1994 NEM that were constructed and occupied before October 1, 1998.
Anticipated Benefits	The measure would seek to eliminate non-compatible land uses within the 65+ DNL contour.
Costs and Anticipated Funding Sources	BOI may incur program administration and land acquisition costs. Cost of home and related property is estimated to be \$44 million with an average cost of \$110,000 per home. Average cost for demolition, moving and relocation per home is \$20,000, which includes a 25% contingency factor. A portion of the acquisition costs may be eligible for federal funding if this measure is part of an approved Part 150 NCP, although actual funding would be dependent upon availability. The balance of funding could be provided through the airport capital budget. BOI may seek to purchase eligible homes and then apply for Federal reimbursement through the grant process.
Effect on Existing Land Uses	Homes purchased through this program could be razed or converting into compatible uses with deed restrictions and easements. Fair market value would be offered for the acquisitions.
Effect on Property Values and Tax Base	Relatively low level of residential impacts would ensure continued neighborhood stability and potential property value increases to the surrounding properties. Although acquired lands would be removed from the local jurisdiction’s tax base, only a few properties would be expected to be acquired by BOI. Also, properties resold for compatible use would be returned to the tax base.
Legal Factors	There are no significant legal constraints, as properties would typically be acquired through the voluntary sale of the owner. Regional FAA offices prefer that the airport sponsor secure title to or at a minimum obtain an option on the property before a grant for Federal assistance is issued.
Political Acceptability	Since the program would be voluntary and property owners would receive fair market value for their properties, little opposition would be anticipated from affected property owners.
Implementation Factors	BOI would coordinate with property owners to determine the fair market value of the selected properties and to acquire the property. BOI would pursue federal funding support. The local jurisdiction would also be consulted on the acquisition. In the past, BOI staff created a “Buy-out” program that offered appraisal, purchase and relocation expenses for interested homeowners.
Responsible Parties	BOI would be responsible for purchase and disposition of developed properties eligible for acquisition.
Conclusion	This measure is recommended for inclusion in the revised NCP, with revision to include developed residential property within the 65+ DNL contour of the 2009 NEM. All 40 homes are recommended for acquisition.

Table 7.17

Evaluation of LU-14: Undeveloped Property Acquisition within 65+ DNL Contour

Description	<p>BOI may seek to acquire selected parcels of undeveloped land within the 65+ DNL contours of the 2009 NEM for the purpose of:</p> <ul style="list-style-type: none"> • Maintaining the land as vacant; • Selling the property for development into compatible uses with deed restrictions; or • Developing the property for a compatible public use. <p>Undeveloped land acquired would have the potential for future non-compatible use, such as residential or other noise-sensitive use.</p>
Area to Which Measure Would Be Applied	<p>Parcels with the potential for noise-sensitive development within the 65+ DNL noise contour of the 2009 NEM may be considered for acquisition.</p>
Anticipated Benefits	<p>This measure would aid in the prevention of new non-compatible development within the NEMs.</p>
Costs and Anticipated Funding Sources	<p>BOI may incur program administration and land acquisition costs. A portion of the acquisition costs may be eligible for federal funding if this measure is part of an approved Part 150 NCP, although actual funding would be dependent upon availability. BOI may seek to purchase eligible properties and then apply for Federal reimbursement through the grant process.</p>
Effect on Existing Land Uses	<p>None. Only vacant parcels would be acquired.</p>
Effect on Property Values and Tax Base	<p>This measure would not affect property values. Although acquired lands would be removed from the corresponding jurisdiction’s tax base, only a few properties would be expected to be acquired by BOI. Also, properties resold for compatible use would be returned to the tax base.</p>
Legal Factors	<p>There are no significant legal constraints, as parcels would typically be acquired through the voluntary sale of the owner.</p>
Political Acceptability	<p>Since the program would be voluntary and property owners would receive fair market value and relocation assistance for their properties, little opposition would be anticipated from affected property owners.</p>
Implementation Factors	<p>BOI would coordinate with property owners to determine the fair market value of the selected parcels and to acquire the property. BOI would pursue federal funding support. The corresponding local jurisdiction would also be consulted on the acquisition.</p>
Responsible Parties	<p>BOI would be responsible for purchase and disposition of undeveloped properties selected for acquisition, and for maintenance of the property while under the control of BOI. Disposition of any property purchased by BOI would need to be coordinated with City of Boise purchasing staff to ensure legal guidelines (public auction, minimum bidding, etc.) are met.</p>
Conclusion	<p>This measure would provide a mechanism to seek federal funds to support the acquisition of vacant parcels. Accordingly, the measure is recommended for inclusion in the NCP.</p>

7.2.6 Corrective Residential Sound Insulation Measure

This measure considers the installation of sound insulation to provide noise level reduction in existing homes that are impacted by aircraft noise.

LU-15: Corrective Residential Sound Insulation Program

The goal of this corrective measure would be to alleviate the level of aircraft noise affecting residents inside their homes by providing indoor environments where normal activities could be conducted without interruption by aviation noise. The sound insulation program would fund structural modifications to residential dwellings and public buildings that would reduce the amount of noise entering the interior from the outside. The program would seek to reduce interior noise levels by

five dB by utilizing a combination of structural modifications including replacement of exterior windows and doors, additional insulation, baffles, and other measures.

Per FAA policy under Part 150, the program would apply only to existing non-compatible properties within the 65+ DNL contours of the 1994 NEMs that were constructed and occupied before October 1998. Eligible residential properties would be required to accept an avigation easement in order to participate in the program. Homes that currently achieve the EPA recommendation of a maximum 45 dBA interior noise level may not be eligible, as they are already considered to provide adequate insulation from aviation noise.

A comprehensive evaluation of the measure is provided in **Table 7.18**.

Table 7.18

Evaluation of LU-15: Residential Sound Insulation Program

Description	<p>This corrective measure would alleviate the impact of aircraft noise by providing indoor environments where normal activities could be conducted without interruption by aviation noise. The sound insulation program would fund structural modifications to homes and noise-sensitive public buildings that would reduce the amount of noise entering the interior from the outside. The program would seek to reduce interior noise levels by 5 dBA by utilizing a combination of structural modifications including replacement of exterior windows and doors, additional insulation, baffles, and other measures.</p> <p>Eligible residential properties would be required to accept an aviation easement in order to participate in the program. Homes that currently achieve a maximum 45 dBA interior noise level would not be eligible.</p>
Area to Which Measure Would Be Applied	Residential dwellings and noise-sensitive public buildings located within the 65+ DNL contours of the 2009 NEM. Per FAA policy, the program would apply only to existing non-compatible properties within the 65+ DNL contours of the 1994 NEM that were constructed and occupied before October 1, 1998.
Anticipated Benefits	The measure would reduce interior noise levels and thus improve the compatibility of residential dwellings and public buildings within the 65+ DNL contours of the 2009 NEM.
Costs and Anticipated Funding Sources	<p>BOI would incur program administration and construction costs. A portion of the acquisition costs may be eligible for federal funding if this measure is part of an approved Part 150 NCP, although actual funding would be dependent upon availability.</p> <p>Approximately 40 residential dwellings are estimated to be potentially eligible for the program. At an estimated cost of \$30,000 per dwelling in 2003 dollars, total program cost would approach \$1.2 million. A pilot program would be needed to establish exact costs. The program could also involve considerable consultant cost expertise and large amounts of administrative time.</p>
Effect on Existing Land Uses	There are 40 residential dwellings and zero public noise sensitive buildings within the 65+ DNL contour of the 2009 NEM.
Effect on Property Values and Tax Base	Property values or residential properties could increase slightly due to the noise attenuation that would be provided by the program.
Legal Factors	No significant legal constraints would be expected.
Political Acceptability	With the 1996 NCP, property owners showed little to no interest in participation of the program. Success with type of program necessarily begins with homeowner willingness. No action has taken place with this measure due to adjacent roadway noise generated from Interstate 84 that is of greater concern to the neighborhood than aircraft noise. The residents requested not to participate in the program.
Implementation Factors	BOI would determine program guidelines and the eligibility of homes for the program. BOI would pursue federal funding support. The actual implementation of the sound insulation program could be conducted under contract with a management company.
Responsible Parties	BOI would be responsible for establishing, funding, and managing the sound insulation program.
Conclusion	BOI is not supportive of this measure, and does not believe it should be included in the NCP. Moreover, measure LU-13 would seek to purchase the existing homes within the 65+ DNL contour, in lieu of a sound insulation program.

7.3 EVALUATION OF POTENTIAL NEW LAND USE MEASURES

This section evaluates four new measures to determine if they would be a valuable addition to the existing land use measures currently in place at BOI. If recommended, the intent of these measures would to enhance the overall effectiveness of the NCP.

7.3.1 Transfer or Purchase of Development Rights

This measure would establish a program to transfer development rights from areas inside

the NEMs to areas outside of the NEMs. Development rights enable the landowner to develop their property with a certain density of dwelling units. By creating a mechanism to transfer development rights outside of the NEMs, this program would help to prevent future non-compatible development within the Airport Influence Area. At the same time, the sale of the development rights would also provide compensation to landowners within the NEMs that would not be able to develop their land due to aircraft noise. Alternatively, the airport could seek to purchase and extinguish development rights for parcels within the Airport Influence Area. This measure is evaluated in **Table 7.19**.

Table 7.19

Evaluation of Potential Measure: Transfer or Purchase of Development Rights

<p>Description</p>	<p>This preventive, voluntary measure would establish a program to transfer residential development rights from areas inside the NEMs to areas outside of the NEMs. Landowners in the receiving zones (as defined in the subsequent criterion) would be eligible to purchase development rights from the sending zone, and thus develop their properties at a higher density than would otherwise be permitted. A bank would be established to facilitate the sale and purchase of development rights. In addition to receiving monetary compensation for the sale of their development rights, landowners in the sending zone would agree to place a permanent deed restriction on their land that would prohibit future non-compatible development. The landowner in the sending zone would still be permitted to construct a single residential structure on their property.</p> <p>Alternatively, BOI could seek to purchase and extinguish the development rights for selected parcels.</p>
<p>Area to Which Measure Would Be Applied</p>	<p>Areas within the Airport Influence Area that could potentially be developed into non-compatible land uses, including existing agricultural areas and future residential areas, would be designated as the “sending zone.” Areas outside of the NEMs that are appropriate for receipt of development rights, as decided by the local jurisdiction, would be designated as the “receiving zone.”</p>
<p>Anticipated Benefits</p>	<p>The measure would establish a market-based system for transfer of development rights from non-compatible to compatible areas, thus reducing land use non-compatibility. Agricultural landowners would have a viable alternative to selling their property for residential development. Landowners in areas designated for future residential development would have a means to be compensated for their development interests while preventing non-compatible use. Finally, developers in a compatible receiving zone would be able to increase the density of their projects; this development would occur in areas that can best support it.</p>

Table 7.19

Evaluation of Potential Measure: Transfer or Purchase of Development Rights

Costs and Anticipated Funding Sources	Local jurisdictions would incur program administration costs. If it chose to do so, BOI could fund the purchase of development rights for selected parcels for the purpose of extinguishing those rights. These costs may be eligible for federal funding if part of an approved Part 150 NCP, although actual funding would be dependent upon availability.
Effect on Existing Land Uses	None; the measure would apply to the development of future land uses.
Effect on Property Values and Tax Base	Properties in sending zones that transfer development rights would not increase in value as much as if they had been developed. However, property values in the receiving zone would likely increase with higher-density development.
Legal Factors	A TDR mechanism is not currently used in the zoning and planning practices of the local jurisdictions.
Political Acceptability and Local Approval	Since the program would be voluntary and property owners would receive compensation for their development rights, little opposition would be anticipated from affected property owners. Additionally, property owners in receiving areas would likely support the program.
Implementation Factors	The provision to transfer development rights would be included in the zoning regulations of each jurisdiction. A TDR measure was evaluated in the 1996 NCP with the recommendation that TDRs not be considered as part of the NCP since there were no independent local efforts underway to implement a TDR scheme. To date, there has not been any additional effort by jurisdictions within or around the airport to consider a TDR.
Responsible Parties	Ada County and the City of Boise would be responsible for implementing and enforcing the measure within their jurisdictions. BOI would be responsible for purchasing development rights from selected properties.
Conclusion	As TDR is not in use in the Boise area, the transfer provisions of this measure are not applicable for the NCP. The Airport does not desire the option to purchase development rights. Accordingly, this measure is not recommended for inclusion in the NCP.

7.3.2 Purchase of Avigation Easements

As discussed in LU-9, an avigation easement is a permanent encumbrance on the right to the use of real property for the purpose of aircraft overflights and related noise, vibrations, and other effects caused by aircraft operations. Although the use of navigable airspace by aircraft is a federal prerogative, an avigation easement provides an additional mechanism of right-of-way and disclosure. Measure LU-9 would seek to obtain easements for new construction; this new measure would seek the purchase of easements for properties without an avigation easement.

In the past, avigation easements have been viewed by the FAA as a means of compensating property owners for the effects of noise. The present FAA policy regarding valuation of avigation easements bases the easement value on the effect of the easement on the value of the property. In other words, the cost of the easement is intended to compensate the property owner for the additional difficulty of selling property having an avigation easement, not for the effect of noise on property. To illustrate this concept, the value of an easement could be assessed by comparing the property values for two similar properties experiencing the same level of noise aircraft; one with and one without an avigation easement. The value of the easement would be equal to the difference in property values due to the effects of the easement alone. Although there has been limited experience in the application of this policy at Boise, the value of avigation easements on existing development obtained under this policy have ranged from \$500 to \$1000 per residential property. This measure is evaluated in **Table 7.20**.

7.3.3 Amend Building Permit Applications to Document and Require Compliance with Noise Level Reduction Construction Standards

In support of measure LU-10, this measure would amend the building permit applications for Ada County and the City of Boise to require the applicant to indicate compliance with an interior noise level goal of at or below 45 dBA for noise sensitive construction areas within the Airport Influence Area. An evaluation of this measure is contained in **Table 7.21**.

7.3.4 Improve City of Boise Application Process to Promote Early Recognition of Airport Influence Area within all Application Processes

This measure would build upon measure LU-11, and encourage early acknowledgement of the Airport Influence Area in the application process for new development. **Table 7.22** provides an evaluation of the measure. The processes already in place in Ada County provide sufficient review.

7.3.5 Designate Airport Staff Liaison for Planning and Zoning and Building Departments of both City of Boise and Ada County

This measure would result in the establishment and identification of a specific airport staff position(s) responsible for communication between the Airport management and local planning agencies. **Table 7.23** provides an evaluation of this measure.

Table 7.20

Evaluation of Potential Measure: Purchase of Avigation Easements

Description	<p>Avigation easements would convey the right to the use of real property for the purpose of aircraft overflights and related noise, vibrations, and other effects caused by aircraft operations. The easement would release the local jurisdiction, aircraft operators, and the airport owner and operator for the effect of aircraft operations on the property. The easements would also require structures constructed on affected parcels to meet 14 CFR Part 77 requirements.</p> <p>For existing residential and non-residential noise sensitive properties within the 65+ DNL contours, BOI would seek to acquire an avigation easement from the property owner. However, homes within the 65+ DNL contours of the FAA-accepted NEMs (from the 1996 study) that were constructed and first occupied after October 1, 1998, are not eligible for federal funding support.</p>
Area to which measure would be applied	<p>Noise-sensitive uses within the 65+ DNL contours of the 2009 NEM.</p>
Anticipated Benefits	<p>The easements would notify property owners of the aircraft noise exposure levels and the right of aircraft overflight. The easement would also release local jurisdictions, aircraft operators, and the airport owner and operator for the effect of aircraft operations on noise-sensitive properties.</p>
Costs and Anticipated Funding Sources	<p>BOI would incur program administration and easement acquisition costs. Easement acquisition costs would be determined by an independent appraisal. A portion of the acquisition costs may be eligible for federal funding if this measure is part of an approved Part 150 NCP, although actual funding would be dependent upon availability. At \$1000 per easement, the cost of the program for 40 homes would be \$40,000.</p>
Effect on Existing Land Uses	<p>There are 40 homes within the 65+ DNL contours of the 2009 NEMs. This measure could apply to these homes if the owner is unwilling to sell their property per LU-13.</p>
Effect on Property Values and Tax Base	<p>An avigation easement purchased for an existing home could reduce its property value slightly.</p>
Legal Factors	<p>None significant. The homeowner would voluntarily agree to accept the easement in return for compensation.</p>
Political Acceptability	<p>Some homeowners may oppose the measure due to the potential for reduced marketability.</p>
Implementation Factors	<p>For existing noise sensitive properties within the 65+ DNL contours, BOI would coordinate with property owners to determine the appropriate purchase price for the avigation easements. BOI would pursue federal funding support.</p>
Responsible Parties	<p>BOI would be responsible for purchasing avigation easements for existing noise sensitive properties within the 65+ DNL contours.</p>
Conclusion	<p>This measure is recommended for inclusion in the NCP. The measure would provide BOI with a viable mechanism for mitigating non-compatible property for homeowners not willing to sell their property via LU-13.</p>

Table 7.21

Evaluation of Potential Measure: Amend Building Permit Applications to Document and Require Compliance with Noise Level Reduction Construction Standards

Description	The City of Boise and Ada County should refine their application process to require the applicant to indicate compliance with an interior noise level goal of at or below 45 dBA for noise sensitive construction areas within the Airport Influence Area. This measure would help to ensure compliance with LU-10.
Area to which measure would be applied	Varying degrees of noise level reduction in correlation with the subdistricts in the Airport Influence Area. Noise level reductions would vary from 25 to 30 decibels.
Anticipated Benefits	Compatibility of development within Airport Influence Area.
Costs and Anticipated Funding Sources	Adoption of this measure would require additional administrative expenses from operation budgets of Development Services within both the City of Boise and Ada County. Published standards should be required as part of the application process. Airport funding in the form of a compliance rebate to cover the increase in home construction costs may offset the negative impacts of additional housing costs. Estimated cost for compliance is approximately \$7,500 per typical residence. Assuming average development in and around Airport Influence Area of 100 homes per year, a budget of \$750,000 would be required.
Effect on Existing Land Uses	The Standards would ensure that new development is designed to promote compatibility with the Airport. Noise level reduction measures would be required when improvements of existing properties that are located within the appropriate DNL contours are brought before agency for permit approval.
Effect on Property Values and Tax Base	Additional construction costs needed to comply would increase assessed building value at an insignificant level, offering no significant effect on either property value or tax base.
Legal Factors	It will be necessary for local building officials to seek certification by permit holders that compliance was achieved prior to final permit sign-off by the authority having jurisdiction.
Political Acceptability	Construction of single-family residences in either the City of Boise or Ada County does not require either design professional or builder to certify home construction. State of Idaho legislative actions requiring licensure of builders have met defeat in previous sessions. Builders associated with the Building Contractors of Southwest Idaho (a dues membership association) have previously supported across the board sound insulation of 25 dB through compliance with International Energy Code.
Implementation Factors	The City of Boise and Ada County would need to amend their Municipal Code Ordinances. Public process would offer resistance from building contractors.
Responsible Parties	City of Boise, Ada County, and BOI.
Conclusion	Additional noise level reduction construction techniques have historically been defeated due to builders concerns regarding increases costs. Offering builders and developers financial incentives would remove some negative impacts. Accordingly, this measure is recommended for inclusion in the revised NCP.

Table 7.22

Evaluation of Potential Measure: Improve City of Boise Application Process to Promote Early Recognition of Airport Influence Area within all Application Processes

Description	The City of Boise could improve awareness of the Airport Influence Area at time of application submittal rather than at time of first comment review.
Area to which measure would be applied	Applicants that are required to submit to either Boise City Planning or Building departments would benefit with early notification of encumbrances that would be required of development within the Airport Influence Area.
Anticipated Benefits	Improved land use compatibility.
Costs and Anticipated Funding Sources	Adoption of this measure would require administrative expenses from city and county operating budgets.
Effect on Existing Land Uses	The current process for permit submittal does offer the chance for development to occur without notification of airport authority for review. Additional notification at time of permit submittal would improve that process.
Effect on Property Values and Tax Base	None.
Legal Factors	It will be necessary for local planning and zoning officials and attorneys to consult in refining ordinance and application processes.
Political Acceptability	Substantial opposition to this measure would not be expected.
Implementation Factors	The City of Boise would need to amend their application forms, application software, and procedures on a limited basis.
Responsible Parties	City of Boise.
Conclusion	This measure is recommended for inclusion in the NCP.

Table 7.23

Evaluation of Potential Measure: Designate Airport Staff Liaison for Planning and Zoning and Building Departments of both City of Boise and Ada County

Description	Airport staff would assume a greater role in reviewing and participating in the development approval process inside the boundaries of the Airport Influence Area.
Area to which measure would be applied	Development review within designated influence areas.
Anticipated Benefits	Greater cooperation between airport staff and surrounding development staff from land use authorities.
Costs and Anticipated Funding Sources	Adoption of this measure would require administrative expenses from the Airport .
Effect on Existing Land Uses	None.
Effect on Property Values and Tax Base	None.
Legal Factors	This measure would seek to identify the airport as a recommending and not authoritative entity.
Political Acceptability	Active participation of airport staff in land planning actions would offer little conflict and has proven beneficial to the approval process.
Implementation Factors	BOI would need to reassign or retain additional staff duties to accommodate this measure.
Responsible Parties	Airport staff and City of Boise.
Conclusion	This measure is recommended for inclusion in the NCP.

7.4 SUMMARY OF RECOMMENDED LAND USE MEASURES

The recommended land use element of the NCP reflects a refinement of the existing land use measures contained in the current NCP and inclusion of additional measures. The updated land use element of the NCP would contain a total of 18 measures, if approved by BOI and accepted by the FAA. Reflecting the focus of this study on preventing future non-compatible development, while also addressing existing non-compatibilities, there are 14 preventive measures and four corrective measures. The corrective sound insulation program (existing LU-15) from the 1996 NCP is not recommended for inclusion in the revised NCP.

Measures LU-1 and LU-2 would seek to define an Airport Influence Area and appropriate noise compatibility standards to prevent the development of future non-compatible land uses that could encroach upon future operations and development of the Airport. The zoning and planning measures in LU-3 through LU-8 would seek to encourage favorable trends in promoting aircraft noise and land use compatibility within the Airport Influence Area.

Table 7.24 provides a summary of the recommended land use measures. Please note that the table renumbers the recommended measures, as the sound insulation program measure not recommended for inclusion in the NCP has been eliminated.

The regulatory measures contained in LU-9 through LU-12 would seek aviation easements, noise level reduction construction, and project review standards to aid in development that is compatible with aircraft operations. Disclosure of aircraft noise to potential homebuyers is also addressed.

Corrective measures LU-13 and LU-14 would encourage the acquisition of existing non-compatible development within the 65+ DNL contour of the 2009 NEM, and also vacant properties with the potential for non-compatible development.

New measure LU-15 would provide for acquisition of aviation easements. New measures LU-16 through LU-18 would add to the regulatory measures, by enhancing building code compliance, and development and coordination procedures between BOI and the building and planning departments for Ada County and the City of Boise.

Overall, the recommended land use measures for the revised NCP will enable the BOI and local jurisdictions to continue to advance the goal of aircraft noise and land use compatibility.

Table 7.24

Land Use Measures Recommended for Inclusion in the NCP

Land Use Measure	Description	Action Needed or Implementation Status	NCP Update Recommendation
1	Airport Influence Area	The Boise Airport Commission should recommend to the City of Boise and Ada County to maintain the current Airport Influence Area boundaries until such time that noise levels require their expansion.	Airport Influence Area boundaries were adjusted as a result of the 1996 Noise Exposure Maps and updated noise contours. Ada County references them in their zoning ordinance; City of Boise in their comprehensive plan. The City of Boise and Ada County would need to maintain the existing Airport Influence Area boundaries.
2	Land Use Compatibility Standards in Airport Influence Area	Refine land use compatibility standards within the Airport Influence Area	Sub-districts have not been implemented as suggested. Ada County and City of Boise would identify the four airport influence area zones and their respective dB reduction requirements.
3	Commercial & Industrial Zoning in Airport Influence Area	The City of Boise and Ada County maintain existing commercial and industrial zoning within the Airport Influence Area.	The City of Boise and Ada County continue to work with the Airport to maintain existing zoning requirements for commercial and industrial construction within the Airport Influence Area.
4	Zone for Compatible Use in Apple Street Area	Rezone property and land southeast of the Airport and east of Apple Street from residential to industrial.	The area remains undeveloped and has been partially re-zoned (approx. 115 acres) to industrial zoning M-1. The remaining 120 acres is an RUT zoning classification. All land is within Ada County, Boise Area of Impact. Property is located in Airport Influence Area B, indicating that residential is not permitted. City of Boise Comprehensive Plan indicates Industrial Zoning preferred. Airport cannot rezone property under private ownership. Recommend influence area boundaries be maintained for future development.

Table 7.24

Land Use Measures Recommended for Inclusion in the NCP

Land Use Measure		Description	Action Needed or Implementation Status	NCP Update Recommendation
5	Zone for Compatible Use in Gowen Road Area	Rezone land southeast of the Airport, east of I-84 and south of East Gowen Road.	The area has remained undeveloped and has an Ada County zoning classification of RUT.	The property is located within Airport Influence Area A, permitting residential with the inclusion of an aviation easement and sound insulation. City of Boise Comprehensive Planning identifies this area as Planned Community Development that could be constructed to conform to their aforementioned conditions. It is recommended that airport influence boundaries be maintained for protection of future residential development.”
6	Encourage Clustered Residential Development	Encourage clustered residential development southeast of the airport within the Airport Influence Area.	The area has remained undeveloped and has an Ada County zoning classification of RUT.	Area is located in Airport Influence Area C, indicating that residential is permitted with sound insulation. City of Boise’s Comprehensive Plan indicates planned residential development. Recommend influence area boundaries be maintained for future development.
7	Maintain Large Lot Residential Zoning	Maintain existing large lot residential zoning within the Airport Influence Area.	Maintain existing zoning for low-density development.	The measure would be intended to discourage intensive residential development that could be affected by the long-term expansion of the Airport.
8	Maintain Rural Preservation Zoning	Maintain existing Rural Preservation (RP) zoning within the Airport Influence Area.	Maintain existing zoning for low-density development.	The measure would be intended to discourage intensive residential development that could be affected by the long-term expansion of the Airport.

Table 7.24

Land Use Measures Recommended for Inclusion in the NCP

Land Use Measure		Description	Action Needed or Implementation Status	NCP Update Recommendation
9	Amend Subdivision Regulations and Building Permit Applications to Require Avigation Easements	Amend current subdivision regulations to require dedication of avigation easements and recording of fair disclosure agreements for new subdivisions.	The City of Boise and Ada County has established requirements for new subdivisions within the Airport Influence Area by subjecting the applicant to the acquisition of a recorded Avigation Easement. No fair disclosure agreement standard has been codified.	Encourage the City of Boise to revise approval procedures relative to the acquisition of and subsequent disclosure of avigation easements through permit approval processes. Maintain current approval procedures for Ada County related to new construction and major remodeling.
10	Adopt Local Building Code Amendments for Noise Level Reduction Construction in the Airport Influence Area	To adopt local building code amendments setting sound insulation standards for noise sensitive buildings within the Airport Influence Area.	No formal action has been taken regarding this program.	Foster cooperative efforts with local jurisdictions, including sound testing of completed residential construction to develop building code standards for noise level reduction that have been tested and documented
11	Adoption of Project Review Guidelines for the City of Boise and Ada County	Adopt project review guidelines for rezoning, special use, conditional use, planned development and variance applications.	Most land planning applications for both Ada County and City of Boise include opportunity for airport staff review.	Coordinate with City of Boise and Ada County planning and building departments to strengthen application policies that do not intensify land development with noise sensitive uses.
12	Fair Disclosure of Noise Impacts in the Airport Influence Area	Promote means of providing the fair disclosure of potential noise impacts in the Airport Influence Area.	Airport attempting to require applicants to establish disclosure statement as part of subdivision approval.	Airport Commission should continue to recommend that the Boise City Council and Ada County Commissioners require fair disclosure statement as part of property ownership.
13	Residential Property Acquisition within 65+ DNL Contour	Acquire 40 existing homes within the 65+ DNL contour of the 2009 NEM.	Following the 1996 NCP, BOI staff created a “Buy-out” program that offered appraisal, purchase and relocation expenses for interested homeowners. To date, five (5) single-family homes and twenty-four (24) mobile homes were purchased.	Continue “Buy-Out” program for interested and eligible homeowners.

Table 7.24

Land Use Measures Recommended for Inclusion in the NCP

Land Use Measure		Description	Action Needed or Implementation Status	NCP Update Recommendation
14	Undeveloped Property Acquisition within 65+ DNL Contour	Acquire undeveloped land with potential for non-compatible development within the 65+ DNL contour of the 2009 NEM.	BOI continues to promote land purchase and have acquired three (3) vacant lots since 1996.	Continue to pursue purchase of undeveloped land within the 70 DNL.
-	Residential Sound Insulation Program	Provide sound insulation to homes within the 65 dB DNL contour of the 2009 NEM.	No participation requested by eligible homeowners.	Remove from consideration.
-	Purchase of Development Rights	For undeveloped land within the 65+ DNL contour of the 2009 NEM, the airport could pursue acquisition of development rights on selected properties with the potential for non-compatible development.	The measure would apply if the owner of undeveloped property was not interested in an outright purchase of the property.	Not recommended for inclusion in the NCP.
15	Purchase of Avigation Easements	BOI would seek to purchase avigation easements on developed non-compatible property within the 65+ DNL contour of the 2009 NEM.	The measure would apply if the owner of undeveloped property was not interested in an outright purchase of the property.	New measure, recommended for inclusion in the NCP.
16	Amend Building Permit Applications to Document and Require Compliance with Noise Level Reduction Construction Standards	The City of Boise and Ada County should refine their application process to require the applicant to indicate compliance with proposed standards for noise level reduction construction techniques for noise sensitive construction areas within the Airport Influence Area.	The City of Boise and Ada County would need to amend their municipal code ordinances. Public process would offer resistance from building contractors.	New measure, recommended for inclusion in the NCP.

Table 7.24

Land Use Measures Recommended for Inclusion in the NCP

Land Use Measure		Description	Action Needed or Implementation Status	NCP Update Recommendation
17	Improve City of Boise Application Process To Promote Early Recognition Of Airport Influence Area within all Application Processes	The City of Boise could improve awareness of Airport Influence Area at time of application submittal rather than at time of first comment review.	The City of Boise would need to amend their application forms, application software and procedures on a limited basis.	New measure, recommended for inclusion in the NCP
18	Designate Airport Staff Liaison for Planning and Zoning and Building Departments of both City of Boise and Ada County	Airport staff should play a greater role in reviewing and participating in the development approval process inside the boundaries of the Airport Influence Area.	The airport would need to reassign or retain additional staff duties to accommodate this measure.	New measure, recommended for inclusion in the NCP

Chapter Eight

NOISE COMPATIBILITY PROGRAM

This chapter summarizes the measures recommended for inclusion in the Noise Compatibility Plan (NCP). Section 8.1 presents continuing program measures that could serve to enhance the recommended noise abatement and land use measures. Section 8.2 reviews the recommended NCP and implementation procedures.

8.1 CONTINUING PROGRAM MEASURES

Continuing program measures may be useful for implementing and evaluating the recommended noise abatement and land use measures. They can also serve to enhance community and airport dialogue regarding aviation noise, improve public understanding of aviation noise, and provide of ongoing evaluation of noise generated from aircraft flight operations. **Table 8.1** discusses and evaluates the continuing program measures considered at BOI. All of the continuing program measures are recommended for inclusion in the NCP. Note that the program management measures included in the 1996 NCP are integrated into the proposed continuing program measures; as such, the program management measures are not specifically re-evaluated in this study.

8.2 RECOMMENDED NOISE COMPATIBILITY PROGRAM

As discussed in Section 1.4, The City of Boise had overall responsibility for the conduct of the Part 150 update, including ultimate responsibility for the recommendation of measures for inclusion in the NCP. *All of the final NCP measures*

that this document proposes for implementation are recommendations of the Boise Airport (BOI), as a department of the City of Boise.

Section 8.2.1 summarizes the noise abatement and land use measures that the BOI proposes for inclusion in the NCP. Section 8.2.2 summarizes NCP implementation and related requirements.

8.2.1 Recommended Measures

The recommended noise abatement measures would continue existing operational procedures at BOI that provide benefit to neighboring communities and maintain the Airport's small number of impacted residents within the 65+ DNL contours. The proposed land use element includes corrective measures to address currently non-compatible land uses, while the preventive measures will serve to deter future non-compatibility. The NCP for BOI includes 32 measures: nine noise abatement measures, 18 land use measures, and five continuing program measures. Chapters Six and Seven present the analyses that led to the selection of the noise abatement and land use measures, respectively.

8.2.1.1 Recommended Noise Abatement Measures

Noise Abatement Measure 1 - Preferential Runway Use: This measure would designate Runways 10L and 10R as the preferential flow for departing aircraft; Runways 28L and 28R as the preferential flow for arriving aircraft, per the discretion of the Boise ATCT. During either the east or west flow, the north parallel runway (10R/28L) would

Table 8.1

Continuing Program Measures

Measure	Description	Costs and Implementation Responsibility
<p>1. Noise Complaint System</p>	<p>BOI would continue to maintain a system for receiving and responding to noise complaints. Complaints should continue to be recorded on forms designed for that purpose. A summary report should be compiled at least quarterly and provided to the airport commission at least annually.</p>	<p>Administrative costs would be the responsibility of BOI.</p>
<p>2. Public Information Program</p>	<p>Program to increase public awareness of aircraft noise exposure issues and provide input concerning the implementation of the NCP. The program would potentially include a NCP website, quarterly newsletters, and public meetings as needed.</p>	<p>Administrative costs would be the responsibility of BOI.</p>
<p>3. Airport Noise Committee</p>	<p>As an extension of the public information program, regular (e.g., semi-annually or quarterly) meetings between Airport staff and representatives of local governments, citizen groups, neighborhood associations, aeronautical users, etc. would serve to enhance communication between the airport and neighboring communities.</p>	<p>Administrative costs would be the responsibility of BOI.</p>
<p>4. Aircraft Noise Relations Staff</p>	<p>BOI would designate an existing staff position, or fund a new full-time staff position, to be responsible for aircraft noise and land use compatibility issues. The position would enable the airport to coordinate the implementation of the recommended NCP measures, especially the implementation of the land use measures with the local jurisdictions (such as LU-16). The position would also enable the airport to better respond to community concerns regarding aircraft noise and noise complaints. This staff person would be needed to manage the continuing program measures. Alternatively, the airport would also seek contract support as needed for implementation of the land use measures.</p>	<p>Staffing costs and implementation would be the responsibility of BOI.</p>
<p>5. Periodic Evaluation of Noise Exposure</p>	<p>BOI would analyze aircraft operations on a periodic basis (e.g. yearly) to determine if significant changes in operations at BOI have occurred, and if the NEMs would need to be updated accordingly.</p>	<p>Costs for updating the NEMs would be eligible for federal funds; costs not eligible for federal funding would be the responsibility of BOI.</p>

be designated as the primary arrival runway, and the south parallel (10L/28R) as the primary departure runway, during both east and west flow. *[This measure would revise the existing measure to include designation of preferential arrival flow, and designation of north and south parallel runways as preferential for arrivals and departures, respectively].*

Noise Abatement Measure 2 – Departure Turn Altitudes: This measure would continue directing jet departures from Runways 28L and 28R to maintain runway heading until reaching 5,000 feet MSL before turning north or south. *[This measure would revise the existing measure to include southbound headings].*

Noise Abatement Measure 3 – Departure Turn Altitudes: This measure would continue directing non-jet aircraft over 12,500 pounds with destination headings to the north to fly runway heading to 4,500 feet MSL before turning. *[No change to existing measure.]*

Noise Abatement Measure 4 – Departure Turn Altitudes: This measure would continue directing VFR departures with destination headings to the north to fly runway heading to the end of the runway before turning. *[No change to existing measure.]*

Noise Abatement Measure 5 – Departure Turn Altitudes: This measure would continue to direct north and northwest bound turbojet departures from Runways 10L and 10R to fly runway heading to 5,000 feet MSL before turning north. *[No change to existing measure.]*

Noise Abatement Measure 6 – Downwind Arrival Flight Tracks: Mostly during nighttime hours, this measure would voluntarily reroute aircraft to use arrival

flight tracks with downwind legs to the south of BOI. *[New measure.]*

Noise Abatement Measure 7 – FMS/GPS Flight Procedures for I-84 Corridor: This measure would establish DPs and STARs along the I-84 corridor to the east of the Airport. *[New measure.]*

Noise Abatement Measure 8 – Distant Noise Abatement Departure Profile: This measure would designate the Distant NADP as the preferred departure profile. *[New measure.]*

Noise Abatement Measure 9 – Visual Approach Arrival Altitudes: This measure would encourage the ATCT to voluntarily route aircraft on the visual approach to Runways 28L and 28R at 5,000 feet MSL until the aircraft begins the final approach. *[New measure.]*

8.2.1.2 Recommended Land Use Measures

Land Use Measure 1 – Airport Influence Area: The Boise Airport Commission should recommend to the City of Boise and Ada County to maintain the current Airport Influence Area boundaries until such time that noise levels require their expansion. *[The proposed measure modifies the existing measure to maintain current boundaries].*

Land Use Measure 2 - Land Use Compatibility Standards in Airport Influence Area: This measure would refine land use compatibility standards within the Airport Influence Area. *[No change to the existing measure.]*

Land Use Measure 3 - Commercial & Industrial Zoning in Airport Influence Area: The City of Boise and Ada County maintain existing commercial and industrial zoning

within the Airport Influence Area. *[No change to the existing measure.]*

Land Use Measure 4 - Zone for Compatible Use in Apple Street Area: Rezone property and land southeast of the airport and east of Apple Street from residential to industrial. *[No change to the existing measure.]*

Land Use Measure 5 – Zone for Compatible Use in Gowen Road Area: Rezone land southeast of the airport, east of I-84 and south of East Gowen Road from residential to industrial use. *[No change to the existing measure.]*

Land Use Measure 6 – Encourage Clustered Residential Development: Encourage clustered residential development southeast of the airport within the Airport Influence Area. *[No change to the existing measure.]*

Land Use Measure 7 – Maintain Large Lot Residential Zoning: Maintain existing large lot residential zoning within the Airport Influence Area. *[No change to the existing measure.]*

Land Use Measure 8 – Maintain Rural Preservation Zoning: Maintain existing Rural Preservation zoning within the Airport Influence Area. *[No change to the existing measure.]*

Land Use Measure 9 - Amend Subdivision Regulations and Building Permit Applications to Require Avigation Easements: Amend current subdivision regulations to require dedication of avigation easements. *[The proposed measure would revise the existing measure to include building permits.]*

Land Use Measure 10 - Adopt Local Building Code Amendments for Noise Level

Reduction Construction in the Airport Influence Area: To adopt local building code amendments setting sound mitigation standards for noise sensitive buildings within the Airport Influence Area. *[No change to the existing measure.]*

Land Use Measure 11 - Adoption of Project Review Guidelines for the City of Boise and Ada County: Adopt project review guidelines for rezoning, special use, conditional use, planned development and variance applications. *[No change to the existing measure.]*

Land Use Measure 12 - Fair Disclosure of Noise Impacts in the Airport Influence Area: Promote means of providing the fair disclosure of potential noise impacts in the Airport Influence Area. *[This proposed measure revises the existing measure to include the promotion of both formal and informal mechanisms.]*

Land Use Measure 13 - Residential Property Acquisition within 65+ DNL Contour: Acquire 40 existing homes within the 65+ DNL contour of the 2009 NEM. *[This proposed measure would revise the existing measure per the 2009 NEM to include 40 homes].*

Land Use Measure 14 - Undeveloped Property Acquisition within 65+ DNL Contour: Acquire undeveloped land with potential for non-compatible development within the 65+ DNL contour of the 2009 NEM. *[Revised to include 2009 NEM].*

Land Use Measure 15 - Purchase of Avigation Easements: For selected developed non-compatible properties within the 65+ DNL contour of the 2009 NEM, the airport could pursue acquisition of avigation easements. *[New measure].*

Land Use Measure 16 - Amend Building Permit Applications to Document and Require Compliance with Noise Level Reduction Construction Standards: The City of Boise and Ada County should refine their application process to require the applicant to indicate compliance with proposed standards for noise level reduction construction techniques for noise sensitive construction areas within the Airport Influence Area. *[New measure]*.

Land Use Measure 17 - Improve City of Boise Application Process To Promote Early Recognition Of Airport Influence Area within all Application Processes: The City of Boise could improve awareness of Airport influence areas at time of application submittal rather than at time of first comment review. *[New measure]*.

Land Use Measure 18 - Designate Airport Staff Liaison for Planning and Zoning and Building Departments of both City of Boise and Ada County: Airport staff should play a greater role in reviewing and participating in the development approval process inside the boundaries of the Airport Influence Area. *[New measure]*.

8.2.1.3 Continuing Program Measures

Continuing Program Measure 1 – Noise Complaint System: BOI would maintain a system for recording and disseminating information on noise complaints. *[No change]*.

Continuing Program Measure 2 - Public Information Program: This measure would establish a program to enhance public awareness of aircraft noise issues and the NCP. *[New measure]*.

Continuing Program Measure 3 - Airport Noise Committee: This measure would establish a standing committee to encourage

dialogue between community representatives, aeronautical users, and BOI. *[New measure]*.

Continuing Program Measure 4 – Airport Noise Relations Staff: BOI would designate a staff position with responsibility for aircraft noise and land use compatibility issues, in order to facilitate implementation of the NCP measures, coordination with the City of Boise and Ada County, and communication with neighboring communities. *[Revised measure]*.

Continuing Program Measure 5 – Periodic Evaluation of Noise Exposure: This evaluation would seed to update the NEMs when needed to account for significant changes in the airport operations or procedures at BOI. *[New measure]*.

8.2.2 NCP Implementation

Part 150 details extensive requirements related to NCP implementation, including:

- Identification of the time period covered by the program.
- Identification of parties responsible for implementation of each program element.
- Indication that responsible parties have agreed to implement the measure.
- Schedule for implementation of the program.
- Essential government actions.
- Anticipated funding sources.

Table 8.2 summarizes implementation details for each proposed element of the NCP.

8.2.2.1 Time Period Covered by the Noise Exposure Maps

In the absence of unanticipated changes in forecast conditions, the NEMs would typically cover a period of five years from the date of submission. The NCP would remain valid until revised in a subsequent NCP update.

8.2.2.2 Implementation Responsibility

Part 150 requires that the NCP clearly identify the agency(-ies) responsible for implementing each recommended element.

According to the FAA’s definition of implementation responsibility¹, the City of Boise, as airport operator, must initiate the implementation of all noise abatement measures. Clearly, however, the FAA and ATC have key roles in the implementation of aircraft operational measures. Since the FAA is responsible for air traffic control, it must develop and provide instructions to pilots related to preferred runway use and noise abatement flight tracks. Both air carriers and pilots have supporting roles in the implementation of aircraft operational measures, as they must support and comply with noise abatement procedures, consistent with the safe operation of aircraft.

BOI and local governments share responsibility for the implementation of land use measures. BOI will seek assistance from local governments in the publicity and administration of land use measures. Local jurisdictions are responsible for the implementation and enforcement of land use controls. The FAA is involved in the implementation of land use measures through program approval and funding assistance.

BOI has the lead responsibility for continuing program measures. The FAA may assist by providing funding and in ongoing program review.

Local governments would assist in ongoing program review.

8.2.2.3 Indication of Agreement to Implement

As the lead agency in the implementation of all measures, BOI agrees to its responsibilities. Through airport staff, the consulting team members have discussed the proposed NCP elements with the FAA and local government representatives.

8.2.2.4 Further Environmental Review

Federal or local regulations may require environmental review prior to the implementation of some NCP measures (e.g., downwind arrival flight tracks). BOI will not initiate the implementation of any measure until it, the FAA, or other responsible agency has satisfied any such requirements.

In particular, the FAA may approve some noise abatement measures “subject to environmental review” per the National Environmental Policy Act, as described in FAA Order 1050.1E Policies and Procedures for Considering Environmental Impacts. The FAA will determine environmental review requirements when an official FAA “action” is contemplated. In the case of the BOI NCP, the triggering FAA action would likely be the development of air traffic procedures for aircraft at altitudes of less than 3,000 feet above ground level.

Table 8.2

Implementation Summary for NCP

Proposed Measure	Implementation Actions and Responsible Parties	Anticipated Costs and Funding Sources	Anticipated Schedule
Noise Abatement Measures			
NA-1: Preferential Runway Use	BOI would request amendment of ATCT standard operating procedures to include alternative flight procedures. FAA reviews, approves, and implements.	BOI and FAA administrative costs.	Initiate process following NCP approval.
NA-2: Departure Turn Altitudes	BOI would request amendment of ATCT standard operating procedures to include alternative flight procedures. FAA reviews, approves, and implements.	BOI and FAA administrative costs.	Initiate process following NCP approval.
NA-3: Departure Turn Altitudes	BOI to coordinate with ATCT on the continued use of the measure.	BOI and FAA administrative costs.	Currently in place.
NA-4: Departure Turn Altitudes	BOI to coordinate with ATCT on the continued use of the measure.	BOI and FAA administrative costs.	Currently in place.
NA-5: Departure Turn Altitudes	BOI to coordinate with ATCT on the continued use of the measure.	BOI and FAA administrative costs.	Currently in place.
NA-6: Downwind Arrival Flight Tracks	BOI would request amendment of ATCT standard operating procedures to include alternative flight procedures. FAA reviews, approves, and implements.	BOI and FAA administrative costs.	Currently in place.
NA-7: FMS/GPS Flight Procedures for I-84 Corridor	BOI would coordinate with ATCT and FAA on design and implementation of flight procedures.	BOI and FAA administrative costs.	Initiate process following NCP approval.
NA-8: Distant Noise Abatement Departure Profile	BOI coordinates with airlines to ensure implementation of the Distant NADP.	BOI administrative costs.	Distant NADP already in use at BOI.
NA-9: Visual Approach Arrival Altitudes	BOI would request amendment of ATCT standard operating procedures to include alternative flight procedures. FAA reviews, approves, and implements.	BOI and FAA administrative costs.	Initiate process following NCP approval.
Land Use Measures			
LU-1: Airport Influence Area	The City of Boise and Ada County would be responsible for maintaining the current Airport Influence Area boundaries, with support from the BOI Commission.	Jurisdiction administrative costs.	Upon local approval.
LU-2: Land Use Compatibility Standards in Airport Influence Area	The City of Boise and Ada County would be responsible for implementing the land use compatibility standards within the Airport Influence Area.	Jurisdiction administrative costs.	Upon local approval.
LU-3: Commercial & Industrial Zoning in Airport Influence Area	The City of Boise and Ada County would be responsible for maintaining existing zoning.	Jurisdiction administrative costs.	Upon local approval.

Table 8.2

Implementation Summary for NCP

Proposed Measure	Implementation Actions and Responsible Parties	Anticipated Costs and Funding Sources	Anticipated Schedule
LU-4: Zone for Compatible Use in Apple Street Area	The City of Boise would be responsible for the zoning amendments.	Jurisdiction administrative costs.	Upon local approval.
LU-5: Zone for Compatible Use in Gowen Road Area	The City of Boise and Ada County would be responsible for the zoning amendments.	Jurisdiction administrative costs.	Upon local approval.
LU-6: Encourage Clustered Residential Development	The City of Boise and Ada County would be responsible for encouraging use of this measure while reviewing proposed projects.	Jurisdiction administrative costs.	Upon local approval.
LU-7: Maintain Large Lot Residential Zoning	The City of Boise and Ada County would be responsible for maintaining existing zoning.	Jurisdiction administrative costs.	Upon local approval.
LU-8: Maintain Rural Preservation Zoning	The City of Boise and Ada County would be responsible for maintaining existing zoning.	Jurisdiction administrative costs.	Upon local approval.
LU-9: Amend Subdivision Regulations and Building Permit Applications to Require Avigation Easements	Ada County already has measure in place. The City of Boise would need to amend the building permit process.	Jurisdiction administrative costs.	Upon local approval.
LU-10: Adopt Local Building Code Amendments for Noise Level Reduction Construction in the Airport Influence Area	The City of Boise and Ada County would be responsible for amending their building code ordinances to require noise level reduction construction. BOI would assist in coordinating testing.	FAA AIP and BOI funds with testing; jurisdiction administrative costs for developing ordinances.	Process initiated after NCP approval
LU-11: Adoption of Project Review Guidelines for the City of Boise and Ada County	The City of Boise and Ada County would be responsible for ensuring use of project review guidelines, and coordinating with BOI.	Jurisdiction administrative costs.	Upon local approval.
LU-12: Fair Disclosure of Noise Impacts in the Airport Influence Area	Ada County and the City of Boise, with coordination from the BOI and the local Board of Realtors.	Jurisdiction administrative costs.	Upon local approval.
LU-13: Residential Property Acquisition within 65+ DNL Contour	BOI in consultation with local jurisdictions.	FAA AIP and BOI funds	Process initiated after NCP approval
LU-14: Undeveloped Property Acquisition within 65+ DNL Contour	BOI in consultation with local jurisdictions.	FAA AIP and BOI funds	Process initiated after NCP approval
LU-15: Purchase of Avigation Easements	BOI in consultation with local jurisdictions.	FAA AIP and BOI funds	Process initiated after NCP approval.

Table 8.2

Implementation Summary for NCP

Proposed Measure	Implementation Actions and Responsible Parties	Anticipated Costs and Funding Sources	Anticipated Schedule
LU-16: Amend Building Permit Applications to Document and Require Compliance with Noise Level Reduction Construction Standards	The City of Boise and Ada County would be responsible for amending the building permit application process.	Jurisdiction administrative costs; BOI subsidy costs.	Upon local approval.
LU-17: Improve City of Boise Application Process To Promote Early Recognition Of Airport Influence Area within all Application Processes	The City of Boise would be responsible for amending project application process.	Jurisdiction administrative costs.	Upon local approval.
LU-18: Designate Airport Staff Liaison for Planning and Zoning and Building Departments of both City of Boise and Ada County	BOI would be responsible for designating a staff liaison.	Boise administrative costs.	Upon local approval.
Continuing Program Measures			
CP-1: Noise Complaint System	BOI would implement measure	BOI administrative costs	Currently in place.
CP-2: Public Information Program	BOI would implement measure	BOI administrative costs	Initiate following NCP approval
CP-3: Airport Noise Committee	BOI would implement measure	BOI administrative costs	Initiate following NCP approval
CP-4: Aircraft Noise Relations Staff	BOI would implement measure	BOI administrative costs	Initiate following NCP approval
CP-5: Periodic Evaluation of Noise Exposure	BOI would implement measure	FAA grant and BOI funds	Initiate process following NCP approval at such time that operations or procedures significantly change at BOI

Source: Chapters Six and Seven

NOTE

¹ As set forth in FAA Advisory Circular (AC) 150/5020-1, “Noise Control and Compatibility Planning for Airports”, August 5, 1982.

Chapter Nine

RECORD OF CONSULTATION

The public consultation program for the Boise Airport (BOI) Part 150 Study was developed in accordance with the public consultation requirements contained in 14 CFR Part 150 Subpart B, Development of Noise Exposure Maps (NEMs) and Noise Compatibility Programs (NCPs). The opportunity for comment on the NEMs and NCP is afforded through consultation with the study’s Advisory Committee, distribution of the draft study document, public workshops, and public hearing. The Public Comment Response Matrix provided in Appendix E summarizes comments received from Advisory Committee members and other members of the public, and presents individual responses to those comments.

9.1 ADVISORY COMMITTEE

BOI established an Advisory Committee to provide an opportunity for public consultation during the Part 150 process. Members of the Advisory Committee included local governments in the general vicinity of the Airport, airport and aviation industry representatives, FAA representatives, and community and neighborhood representatives. A complete listing of Advisory Committee members is provided in Appendix E. The Advisory Committee is the principal channel for public and agency involvement. Committee members provide two-way communication with their respective constituent groups and organizations.

The Advisory Committee fulfills the role, as defined by Part 150 guidelines and federal law, as an advisory body to the airport

operator on matters related to the study. The committee provides feedback on the information and measures presented by BOI and the consultant team during the course of the study, including the NEMs, land use and noise compatibility, and the NCP. The Advisory Committee is involved in reviewing, critiquing and advising on these topics and information; however, BOI has the legal responsibility for determining the acceptance and implementation of recommended measures and policies.

The project team worked with the Advisory Committee to obtain “their views, data, and comments concerning the correctness and adequacy of the draft noise exposure maps,” as required in Subpart B of the Part 150 requirements. The process included meetings and distribution of memos, handouts and graphics, as described in the following chronology:

- April 24, 2002 – In the first meeting, the project team outlined the purpose and process for the Part 150 Study.
- July 30, 2002 – In the second meeting, the project team discussed the noise monitoring program and sought input on noise monitoring locations. Noise metrics and potential NCP measures were also discussed.
- April 1, 2003 – In the third meeting, the Advisory Committee reviewed the draft existing condition NEM, including fleet mix, runway use, and flight track inputs.
- July 8, 2003 – In the fourth meeting, the Advisory Committee reviewed the

forecast and 2008 fleet mix, the draft five-year forecast NEM, and provided input on potential NCP measures.

- January 22, 2004 – At the fifth meeting, input was sought from the Advisory Committee on the draft recommended NCP measures.

Copies of the meeting materials are included in Appendix E.

9.2 PUBLIC WORKSHOPS

Three public workshops have been held for the Part 150 Study Update, in order to provide the public the opportunity to discuss the draft NEMs and NCP with project team members and provide comments:

- April 1, 2003, 5 p.m. to 8 p.m. – The workshop included discussion of the development of NEMs, draft existing condition NEM, land use base mapping, aircraft flight tracks, and the noise monitoring program.
- July 8, 2003, 5 p.m. to 7 p.m. – The workshop included discussion of the draft five-year forecast NEM, flight operations forecast and fleet mix, potential noise abatement and land use measures for the NCP.
- January 22, 2004, 5 p.m. to 7 p.m. – The workshop included discussion of the draft recommended NCP measures.

The public workshops were held at the BOI. Project team members staffed stations with information and displays on the study. According to the sign-in sheets, four people attended the first workshop, 11 the second workshop, and none at the third workshop. Several people submitted written comments on comment forms at the workshop or through letters or comment forms submitted following the workshop. Appendix E

contains a description of the comments received.

Notification for the workshop included a legal notice in local newspapers, individual telephone contacts, and a mailing to the Advisory Committee and other potentially interested individuals. Notification materials are included in Appendix E.

9.3 PUBLIC HEARING

The public and agency involvement program included a public hearing, as specified in Part 150 regulations. The hearing was held on May 11, 2004, from 4:00 p.m. to 7:00 p.m. at the Boise City Hall, City Council Chambers, 150 North Capitol Blvd., Boise ID 83702.

Notices of the public hearing were sent to the advisory committee and other interested persons and published in local newspapers.

In accordance with Part 150 regulations, the draft Part 150 Study document was made available to the public for review prior to the public hearing. The document was made available in electronic format on-line at www.boise-airport.com. The document was also made available for review during business hours at the Airport offices and the Boise Downtown Library, located at 715 South Capitol Blvd., Boise ID 83702.

Information on the NEMs and NCP was reviewed at the hearing. Beginning at 4:00 p.m., there was a brief presentation by Airport staff and project consultants in the City Council Chambers. The Boise City Council reviewed the study recommendations and then adjourned from the hearing. Airport staff and consultants were then available in a workshop format to answer questions from the public. A court reporter was available to receive both written and spoken comments from the public.

Approximately 20 people attended the public hearing. Transcripts of the hearing, as well as formal comments and the study's response to comments, are provided in Appendix E.