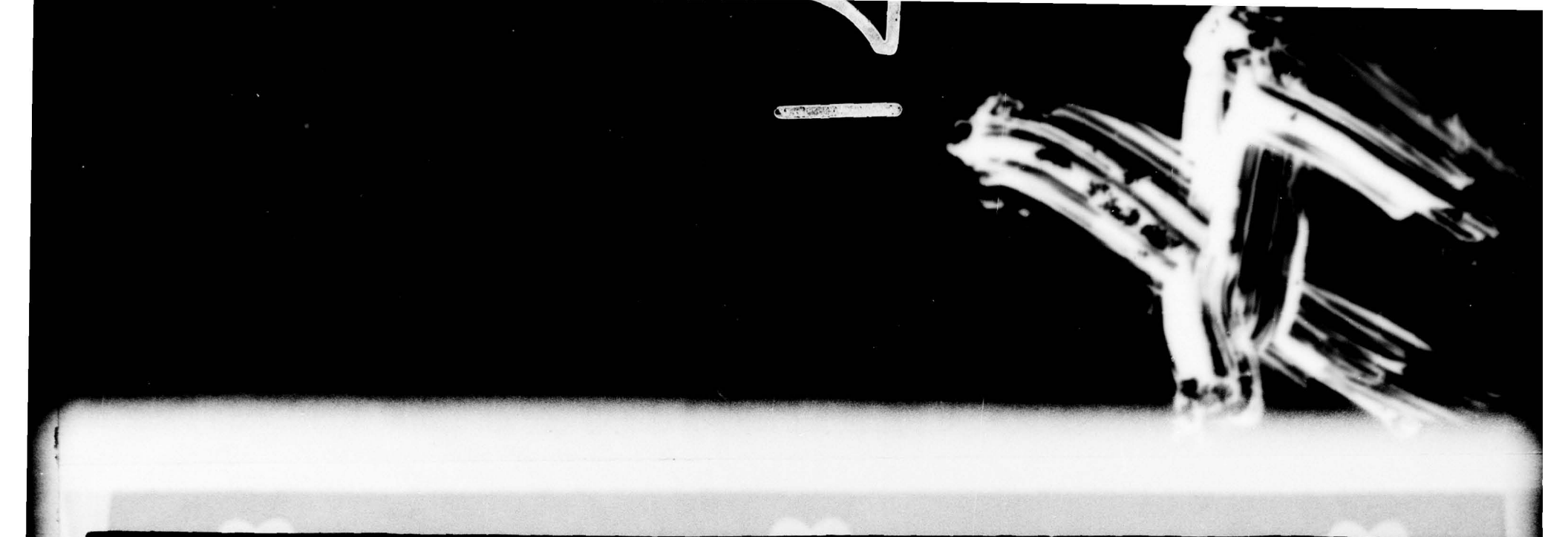
AD-A049 171 GREINER ENVIRONMENTAL SCIENCES INC BALTIMORE MD F/G 5/5
ENVIRONMENTAL IMPACT STATEMENT FOR BICENTENNIAL INTERNATIONAL A--ETC(U)
NOV 77 DOT-FA75WA-3703

UNCLASSIFIED FAA-AAP-78-2-1 NL

1 OF 4
AD A049171





AD NO.
DDC FILE COPY

AD A049171

(19) 78-2-1

Technical Report Documentation Page

1. Report No. (18)	2. Government Accession No.	3. Recipient's Catalog No.
FAA-AAE-78-2 (1) ✓		

4. Title and Subtitle
Model Environmental Impact Statement No. 1
Bicentennial International Airport,
Northeast, America

(11) 5. Report Date: Nov[redacted]77

6. Performing Organization Code

(12) 351p.

8. Performing Organization Report No.

(6) Environmental Impact Statement for Bicentennial International Airport Northeast, America. Model Environmental Impact Statement No. 1.

7. Author(s)

9. Performing Organization Name and Address
Greiner Environmental Sciences, Inc.
One Village Square
Village of Cross Keys
Baltimore, Maryland 21210

Number (15) 10. Work Unit No. (TRAIS): DOT-FA75WA-3703

11. Contract or Grant No.: DOT-FA-75W-3703 ✓

(9) 13. Type of Report and Period Covered: Final Report

12. Sponsoring Agency Name and Address
Department of Transportation/Federal Aviation Adminis.
Office of Airports Programs
800 Independence Avenue, S. W.
Washington, D. C. 20591

14. Sponsoring Agency Code

15. Supplementary Notes: The document is one of four model environmental impact statements which illustrates the guidance presented in Report Nos. FAA-AP-77-1 and -1A, dated March 1977 and entitled "Environmental Assessment of Airport Development Actions" and Appendix Volume.

16. Abstract: This model describes a hypothetical air carrier airport at which the development of a new 10,000-foot parallel runway is proposed. The document describes the project, the purpose, and the setting. It includes background information including the project history and community involvement. Fifteen impact categories are analyzed together with a description of measures to be taken to minimize adverse effects. Emphasis in this case is given to noise impacts, direct socioeconomic effects (especially relocation of 130 families) and replacement of a public playground. The latter involves application of the Department of Transportation Act Section 4(f). Alternatives to the proposed runway are included in the environmental impact statement. Letters received from Federal agency review are included in the document as are responses to comments. Also included in the document is a sample decision paper and Federal Finding. ←

DDC RECEIVED JAN 27 1978 F

17. Key Words	18. Distribution Statement
Environmental Assessment, EIS, Airport Development, noise, land use, relocation, DOT Section 4(f).	Document is available to the public through the National Technical Information Service, Springfield, VA 22151

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
		383	

Form DOT F 1700.7 (8-72) Reproduction of completed page authorized

-A- 410 185

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

WASHINGTON, D.C. 20591

DATE:

IN REPLY REFER TO:

NOTE: THIS SAMPLE DECISION PAPER IS FOR ILLUSTRATION PURPOSES ONLY. USE OF THIS MATERIAL AND THE ACCOMPANYING MODEL ENVIRONMENTAL IMPACT STATEMENT BY VERBATIM OR OUT OF CONTEXT APPLICATION TO A REAL SITUATION SHOULD BE AVOIDED.

SUBJECT: Decision Paper for Parallel Runway and Other Development, Bicentennial International Airport, Northeast, America

FROM: Chief, Airports Planning Division, AAP-400

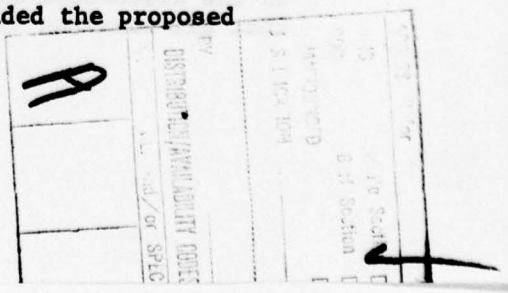
TO: AAP-1

PROPOSED ACTION. The proposed action is approval of the final environmental impact statement (EIS) for a 10,000-foot parallel Runway 2R-20L, taxiway, lighting, instrument landing system, new air carrier terminal, new access road and related improvements at the existing Bicentennial International Airport (BIA), as more particularly described on pages I-1 and -2 of the EIS.

The development is proposed to accommodate forecast growth in air carrier activity in the metropolitan areas, which include the State capital at Carrollton and the City of Federalsburg with its many manufacturing, research, and development facilities. The existing airport is a major air service center for a 12-county region. Forecast growth in air activity reflects the expected continued high rate of growth in the area served.

BACKGROUND. Population and economic growth in the Carrollton/Federalsburg area and related pressures for improvements in air service facilities were recognized in the mid-60's. A study in 1967 recommended major expansion at BIA. An Airport Zoning Board was established in 1970. A report by the Capitol Regional Planning Commission in 1973 included a statement that expansion of BIA should be given ". . .highest priority to assure comprehensive transportation services for the region."

Public involvement began in 1974 with presentation of a preliminary planning report, including three possible alternative expansion schemes, at open meetings of regional, county, and local officials. Numerous other meetings were held with civic and service organizations throughout the area. The issues of increased noise exposure and availability of relocation housing for those persons potentially displaced were raised at a general public information meeting in July 1974. An advisory committee on airport expansion was established soon thereafter and met monthly throughout the environmental analysis and review period. This committee included representatives of neighborhood organizations, parks and planning officials, the Federal Aviation Administration (FAA), airline and airport representatives and the Airport Authority's planning and environmental consultants. The committee reviewed alternatives and recommended mitigation measures which could best reduce environmental impacts. It ultimately recommended the proposed development (identified as Alternative 3).



A formal public hearing was held in September 1975. A principal issue of concern was that the recommendations of the advisory committee relative to impact mitigations be, in fact, implemented. It was recommended that the committee keep working to monitor development and to find additional ways to reduce impacts.

The Office of Management and Budget Circular A-95 clearinghouse review was completed in September 1975. State and county agencies which commented requested some additional information but raised no substantial issue or indicated no objections to the project. Their comments and responses to them are given in Section VIII of the EIS. Other correspondence with State and local agencies on specific matters raised during the course of the environmental assessment are referenced in the text and included in Appendix E of the EIS.

Our review of the record supports the following conclusions (per Sections 16(c)(1)(A) and 16(c)(3) of the Airport and Airway Development Act of 1970 (P.L. 91-258), as amended):

1. The proposed development is consistent with existing plans of planning agencies for development of the area, and

2. fair consideration has been given to the interest of communities in the vicinity of the airport.

Evidence upon which these conclusions are based include: (1) The fact that Boone County, in which the airport is located, has a comprehensive master plan and County-wide zoning ordinances which have recognized the expansion of BIA and, since 1970, provided for compatible land use in the airport vicinity and (2) the planning and environmental assessment process has included participation by the counties and residential communities most directly affected by the development.

Pursuant to Section 16(c)(4) of P.L. 91-258 and Section 102(2)(C) of the National Environmental Policy Act of 1969 (P.L. 91-190), the draft EIS was circulated to the Environmental Protection Agency, the Department of the Interior, and other Federal agencies with jurisdiction by law or special expertise with respect to the environmental impacts involved. Commenting letters received are included in the back of the final EIS. Each comment is annotated by a number in the right margin. Following each agency letter are the FAA's responses to comments, cross-referenced to the corresponding number of the comment. The comments received covered a broad range of topics included by this EIS. As appropriate, changes were made in the text of the EIS or additional information or clarification was provided in the responses. The more significant issues raised are referenced in the discussion below on specific impacts. Our review indicates that all concerns expressed have been satisfactorily resolved.

NOTE: In the model EIS, a section has been added at the end which includes a side-by-side comparison of the text of the draft EIS and corresponding portion of the final EIS to illustrate sections which were changed substantially as a result of review. This is done for instructional purposes only and would not normally be included in a final EIS for an actual project where the draft is available for reviewers as needed.

As indicated above, the public hearing opportunity required by Section 16(d) of P.L. 91-258 has been fulfilled. Our review of the air and water quality impacts of the proposed development indicates that the project will be located, designed, constructed and operated so as to comply with applicable air and water standards and that the certification by the State to this effect, as required by Section 16(e), will be provided prior to submission of the project application.

COMPATIBLE LAND USE AND NOISE MITIGATION. Section 18(a)(4) of P.L. 91-258, as amended, requires assurances that appropriate action has or will be taken to the extent reasonable to restrict the use of land in the airport vicinity to purposes compatible with airport operations. The present site of Bicentennial International Airport, totally within Boone County, has been recognized and protected by zoning for compatible land uses as provided in the Boone County Master Plan published initially in 1970.

Considerable development had occurred in the airport vicinity prior to the imposition of zoning controls, some of which should preferably have been located further from the airport. The Mill Creek State Mental Hospital, about two miles southwest of the existing north-south runway, is just outside the present and future Noise Exposure Forecast (NEF) 30 contour. Although, as such, it is in an area where most land uses are considered compatible with airport operations, a more distant location from the airport would have been desirable. Relocation of the existing facility is not feasible; however, correspondence with State and hospital officials, documented in the EIS, has elicited support of the proposed development and a pledge not to add to the existing Mill Creek facilities.

Most of the residential development around the airport took place in the 1950's and 60's. Prior to issuance of the County Master Plan, down zoning of these areas was considered but rejected on the basis that they had developed into stable, cohesive neighborhoods which should be maintained. The assessment of noise impacts for the proposed development is presented in detail in Section III of the EIS starting on page III-1. The analysis concludes that noise impacts will increase over residential areas by 1985 but that this increase will be kept to a minimum by a noise abatement program. A right turn departure

procedure for aircraft taking off to the north from the new runway will avoid much of the built-up areas in North Revere which would otherwise be exposed to cumulative noise exposure levels above NEF 30. Nonetheless, an increase of 80 homes over the present 200 experiencing this level of noise exposure will accure by 1985.

The project construction itself will require the acquisition of about 700 acres of land and the relocation of 130 families in the South Revere Park and Nathan Hills areas. Details of the relocation program and application of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 provisions are contained in the EIS--starting on page III-34--and in Appendix D. The extensive socioeconomic analysis for the areas affected concluded that demand for comparable replacement housing in the South Revere Park area exceeded supply by 19 units. Eleven new units will be provided in the vicinity and eight existing units will be renovated to meet this deficiency under the last resort housing provisions of the Uniform Act.

One institution, the First Baptist Church in the South Revere Park community, will also require relocation. Construction of a new church has been planned and a capital fund drive has been underway for some time. Funds received from acquisition of the property will be used to complete the fund drive and enable the new facility to be built. This church serves as a center for the religious and social life of the predominant minority and low income community. The new church will be located a short distance from its present location but outside the NEF 30 noise contour.

The only other noise sensitive institution to be adversely affected by the proposed project is the Paul Revere Junior High School located almost three miles due north of the new north-south runway. About eight acres of the 20-acre school property is used for active sports associated with the school and neighborhood recreation programs. A portion of the property will fall within the projected NEF 30 contour. The severity of the noise impact is being mitigated by the right turn procedure. Further, the nature of the outdoor recreational activity is such that the impact does not constitute a "use" requiring a finding per Section 4(f) of the Department of Transportation Act for this facility.

The Boone County Department of Planning has indicated that some of the land to the north and east of the airport is zoned for commercial and manufacturing uses and is expected to remain as such. Other vacant lands will be developed with the objective of providing compatible uses with the airport and other adjacent activities. Cooper County, whose northern boundary is over two miles south of the airport, has advised that it will establish a special zoning category--airport use--in the areas closest to the airport.

DOT SECTION 4(f). A separate portion of the impact section, starting on page III-74 of the EIS, summarizes the effects on public parks and recreation lands in the airport vicinity. The only facility which is sufficiently affected by the proposed development to constitute a "use" within the meaning of the DOT Act, Section 4(f), is the 1.5 acre playground located adjacent to the First Baptist Church in South Revere Park and to be acquired for project construction. The play lot is owned and maintained by the Boone County Department of Recreation and Parks. A site adjacent to the relocated First Baptist Church has been selected to preserve its function as a neighborhood playground and to serve the recreation needs of the children attending the church's day care center.

On-site alternatives to the proposed project which would have obviated the need to relocate this public recreation facility would have created severe noise impact over the Pierce State Park--just west of BIA--and were specifically opposed by the park director. The alternative of constructing a new site which would offer a reasonably comparable air transportation facility for the area served would have entailed costs and siting problems which, when weighed against preservation of the play lot in its present location, would reach extraordinary magnitude and would not be feasible or prudent.

In kind replacement of the play lot is considered an acceptable measure to minimize the adverse effect of the project. The Department of the Interior (DOI) had raised questions on this matter during its review of the draft EIS. The final document includes correspondence from appropriate officials, including approval of the play lot replacement by DOI because the existing lot had received financial assistance through the Land and Water Conservation Fund Act administered by DOI.

OTHER ENVIRONMENTAL CONSIDERATIONS. Both DOI and the Advisory Council for Historic Preservation raised questions concerning noise impact on the General Boone House, an historic building located about three miles due north of the proposed new runway and listed in the National Register of Historic Places. Mitigation of the noise exposure over this location by the right turn on departures to the north from the new runway was found satisfactory in subsequent correspondence with the Advisory Council pursuant to its established procedures for such consultation.

A number of other impact areas were analyzed in detail in the EIS including the effects on air and water quality, wildlife, ground access and traffic on surrounding highways, and energy supply. Our review of the EIS confirms that all applicable environmental impacts have been satisfactorily documented together with resolution of questions raised and identification of measures to be taken to minimize adverse effects.

ALTERNATIVES. The construction alternatives considered are summarized briefly in the discussion under DOT Section 4(f) above and are documented in Section V of the EIS. Alternative modes of transportation were also considered along with the do-nothing alternative. The alternatives of rail or surface highway transportation were determined not to be feasible principally because of the distance to the major national markets served by the airport and the efficiency of air service.

Two on-site alternative runway configurations were considered in detail; namely, a parallel north-south runway to the west of existing Runway 2-20 and a runway parallel and to the south of existing cross-wind Runway 11-29, plus extension of this runway. Related changes in the terminal area plan and highway access were included. A summary of the effects of these two cases and the do-nothing alternative on each impact category are contained at the end of Section V. Our review supports the conclusion that there is no feasible and prudent alternative to the proposed development.

ASSURANCES. Various measures to minimize adverse effects from the proposed expansion and operation of BIA are included throughout the EIS and summarized in Section IV. Appropriate provisions will be incorporated in the project plans and specifications to minimize harm during construction. The grant agreement will reflect the commitments which are a vital condition of this environmental determination; specifically, the runway use and departure procedures as given on Page IV-1 and the measures to be taken with respect to land uses, housing replacement, relocation assistance and relocation of the South Revere play lot as outlined in Section IV.

OPTIONS AVAILABLE. The proposed action may be approved with respect to environmental requirements. There is also the disapproval option.

FEDERAL FINDING. After careful and thorough consideration of the facts contained herein and following consideration of the views of those Federal agencies having jurisdiction by law or special expertise with respect to the environmental impacts described, the undersigned finds that the proposed Federal action is consistent with existing national environmental policies and objectives as set forth in Section 101(a) of the National Environmental Policy Act of 1969. It is also determined that there is no feasible and prudent alternative to the proposed action and to use of land covered by Section 4(f) of the Department of Transportation Act of 1966, as amended; and further, the proposed action includes all possible steps to minimize any adverse effects and all possible planning to minimize harm to such 4(f) land. Having met all

relevant requirements for environmental consideration and consultation, the proposed action is authorized to be taken at such time as other requirements have been met and subsequent to expiration of waiting periods established to inform the Council on Environmental Quality and the public of this action.

RECOMMENDATION. I recommend that you approve the environmental impact statement with respect to environmental requirements.

NOTE: This action would be subject to final approval by the Assistant Administrator, Office of Airports Programs and concurrence by the Assistant Secretary for Environment, Safety, and Consumer Affairs and Office of General Counsel per the requirement of paragraph 64c, Appendix 6, Order 1050.1B. For a similar actual project, the recommendation would be signed by the Chief, Airports Planning Division, AAP-400, with signature blocks as follows:

CONCUR: _____ DATE: _____
Assistant Secretary for Environment, Safety and Consumer Affairs, TES-1

CONCUR: _____ DATE: _____
General Counsel, TGC-1

CONCUR: _____ DATE: _____
Deputy Assistant Administrator, Office of Airports Programs, AAP-2

APPROVED: _____ DATE: _____
Assistant Administrator, Office of Airports Programs, AAP-1

DISAPPROVED: _____ DATE: _____
Assistant Administrator, Office of Airports Programs, AAP-1

NOTE: The file copy grid would include a space for initialing by the Office of the Chief Counsel, AGC-1, to signify his review for legal sufficiency. It should not be assumed that either AGC, TES, TGC or the Office of Airports Programs would necessarily concur or approve without further modification.

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
FINAL ENVIRONMENTAL IMPACT STATEMENT

Model Environmental Impact Statement No. 1
Bicentennial International Airport
Northeast, America

SUMMARY SHEET

For additional information, contact:

Mr. Elliott B. Perrett, Jr., AAP-410
Federal Aviation Administration
800 Independence Avenue, S. W.
Washington, D. C. 20591
(Telephone: 202-426-3263)

1. This action is (X) Administrative ( ) Legislative

2. Proposed Action: Construction of a new 10,000-foot parallel runway including lighting and instrument landing system, new air carrier terminal, new access road and related improvements to the Bicentennial International Airport in Boone County, serving Carrollton and Federalsburg, Northeast, America. These improvements are intended to accommodate increased air traffic and passenger demand.

3. Summary of Environmental Impacts and Adverse Environmental Effects: Principal impacts are as follows: Increased noise exposure over residential communities in North and South Revere, relocation of 130 families and the First Baptist Church and replacement of a 1.5 acre South Revere playground.

4. Summary of Major Alternatives Considered: Two alternative new sites were considered in the Carrollton/Federalsburg area. In addition, two alternative configurations of a new runway on the existing airport were explored. Alternative transportation modes and the no project alternative were also considered.

5. List of Agencies from Which Comments Have Been Received:* Department of Transportation (Office of the Secretary); Advisory Council on Historic Preservation; Environmental Protection Agency; Department of Health, Education and Welfare; Department of the Interior; Federal Highway Administration; and Department of Housing and Urban Development.

6. Date Final Statement Made Available to CEQ and the Public:

7. Date of Public Hearing: September 15, 1975.

*This Summary Sheet accompanies a Model EIS prepared under contract with FAA based on a hypothetical situation. The A-95 process and public hearing were simulated to add realism. Normal distribution of the draft statement to state and local agencies which had commented earlier or announcement of its availability to the general public either directly or through CEQ, therefore, is not appropriate in this case.

Table of Contents

		Page No.
Table of Contents		i
List of Exhibits		iii
List of Tables		iv
List of Appendices		vi
Section I:	Project Description	I-1
	Description of Proposed Action	I-1
	Project Purpose	I-2
	Project Setting	I-6
Section II:	Project Background Information	II-1
	History of the Project	II-1
	Community Involvement	II-2
	Public Hearing	II-4
Section III:	Probable Impact on the Environment	III-1
	Noise	III-1
	Land Use	III-12
	Vegetation and Wildlife	III-16
	Water Resources - Water Quality	III-21
	Water Resources - Hydrology	III-26
	Flood Hazard Evaluation	III-31
	Direct Socioeconomic Impacts	III-33
	Traffic and Surface Transportation	III-47
	Induced (Secondary) Socioeconomic Impacts	III-52
	Air Quality	III-55
	Section 4(f) Public Lands	III-74
	Historical and Archaeological Sites	III-79
	Public Utilities and Services	III-82
	Energy Supply and Natural Resource Development	III-88
	Construction Impacts	III-91
Section IV:	Actions to Minimize Unavoidable Adverse Effects	IV-1

Table of Contents--Cont'd

		Page No.
Section V:	Alternatives to the Proposed Action	V-1
	Introduction	V-1
	Alternative Modes of Transportation	V-1
	Alternative Sites	V-2
	Alternative Configurations	V-4
	Noise	V-6
	Land Use	V-10
	Vegetation and Wildlife	V-11
	Water Resources - Water Quality	V-12
	Water Resources - Hydrology	V-13
	Flood Hazard Evaluation	V-15
	Direct and Indirect Socioeconomic Impacts	V-16
	Air Quality	V-18
	Utilities	V-19
	Energy Supply	V-19
Section VI:	Relationship Between Short-term Use of Man's Environment and the Maintenance and Enhancement of Long-term Productivity	VI-1
Section VII:	Irreversible and Irretrievable Commitments of Resources	VII-1
Section VIII:	A-95 Review and Public Hearing	VIII-1
Appendices		
Draft EIS Coordination Comments and FAA Responses		
Model Statement Instructional Guidance		

List of Exhibits

Exhibit No.		Following Page
1	Location Map	I-1
2	Vicinity Map	Exhibit 1
3	Airport Layout Plan	Exhibit 2
4	Existing Zoning Map	I-7
5	Sensitive Areas	III-2
6	Existing NEF and Zoning	III-3
7	Existing NEF and Sensitive Areas	Exhibit 6
8	Existing 85 dBA	III-4
9	1985 NEF and Zoning	III-6
10	1985 NEF and Sensitive Areas	III-7
11	1985 85 dBA	III-8
12	Biotic Communities	III-16
13	Drainage Map	III-26
14	Stationary Sources and Monitoring Stations	III-58
15	Dispersion Receptor Points	III-65
16	Alternate Configuration No. 1	V-4
17	Alternate Configuration No. 2	V-5
18	Alternate 1 - 1985 NEF and Zoning	V-6
19	Alternate 1 - 1985 NEF and Sensitive Areas	Exhibit 18
20	Alternate 1 - 1985 85 dBA	Exhibit 19
21	Alternate 2 - 1985 NEF and Zoning	V-7
22	Alternate 2 - 1985 NEF and Sensitive Areas	Exhibit 21
23	Alternate 2 - 1985 85 dBA	V-8
24	No Project Alternative - 1985 NEF and Zoning	V-9

List of Tables

Table No.		Page No.
1	Forecast of Activity at BIA, 1970 - 1990	I-4
2	Annual Enplaned Cargo and Mail Activity at BIA	I-5
3	Land Uses Adjacent to Airports and the Relationship to NEF Contours	III-4
4	Existing Exterior Noise Exposure	III-5
5	Projected Exterior Noise Levels	III-8
6	Design Noise Level/Activity Relationships	III-10
7	Vegetation Alteration Resulting from BIA Expansion	III-19
8	Peak Flood Flows	III-29
9	Projected Airport Revenues	III-43
10	Projected Airport Expenses - All Sources	III-44
11	Accumulative Net Monies to Two-County Region Over Five Year Intervals	III-45
12	Total Monies Received by Jurisdiction Over Five Year Intervals	III-46
13	Emission Inventory Summary - Boone County	III-56
14	Major Stationary Sources in the Carrollton-Federalsburg Area	III-57
15	Monitoring Stations in the Carrollton-Federalsburg Area	III-58
16	Wind Direction and Wind Speed	III-61
17	BIA 1975 Emission Inventory	III-63
18	Existing On-Site Air Pollution Impact	III-64
19	Existing Air Pollution Impact on Sensitive Areas	III-65
20	BIA 1980 Emission Inventory	III-67
21	BIA 1985 Emission Inventory	III-68
22	Projected On-Site Air Pollution Impact	III-70
23	1980 Air Pollution Impact on Sensitive Areas	III-71
24	1985 Air Pollution Impact on Sensitive Areas	III-72
25	Projected Volume of Airport Solid Waste	III-86

List of Tables--Cont'd

Table No.		Page No.
26	Alternate 1 - 1985 Noise Impact on Sensitive Areas.	V-6
27	Alternate 2 - 1985 Noise Impact on Sensitive Areas.	V-8
28	Alternative Impacts on Site Vegetation.	V-11

List of Appendices

Appendix		
A	Noise	
		Impact of Noise on People
		A Discussion of Aircraft Noise
		Existing and Future Operational Data
		Sample of Integrated Noise Model Output Data
B	Natural Environment	
		Species Lists
		Receiving Water Quality Standards
		Water Quality Monitoring Results
C	Air Pollution from Airports	
D	Socioeconomic Impacts	
		Relocation Housing Supply/Demand Analysis
		Economic Analysis of Airport Development
E	Correspondence	

SECTION I
PROJECT DESCRIPTION

SECTION I: PROJECT DESCRIPTION

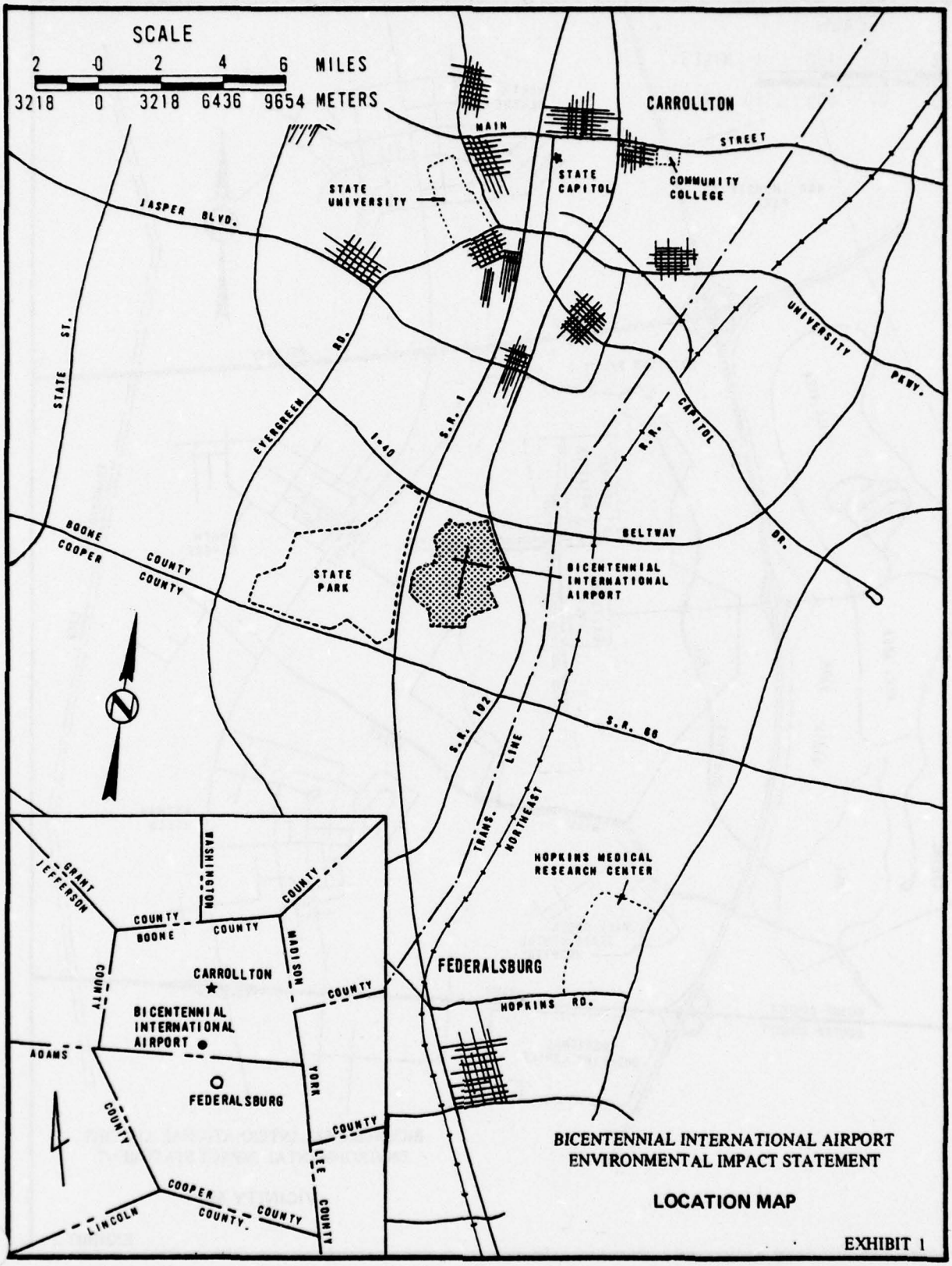
DESCRIPTION OF PROPOSED ACTION

The Airport Authority of Northeast America seeks Federal approval of an Airport Layout Plan to expand and improve Bicentennial International Airport (BIA) through construction of an additional runway, associated taxiways, a new air carrier terminal building and airport access road.

Bicentennial Airport serves a twelve county region including the major metropolitan areas of Carrollton and Federalsburg. Exhibit 1 is a location map showing the existing airport's position in the region. Exhibit 2 is a vicinity map of the airport area.

The proposed Layout Plan is illustrated in Exhibit 3. Specific work elements are summarized below:

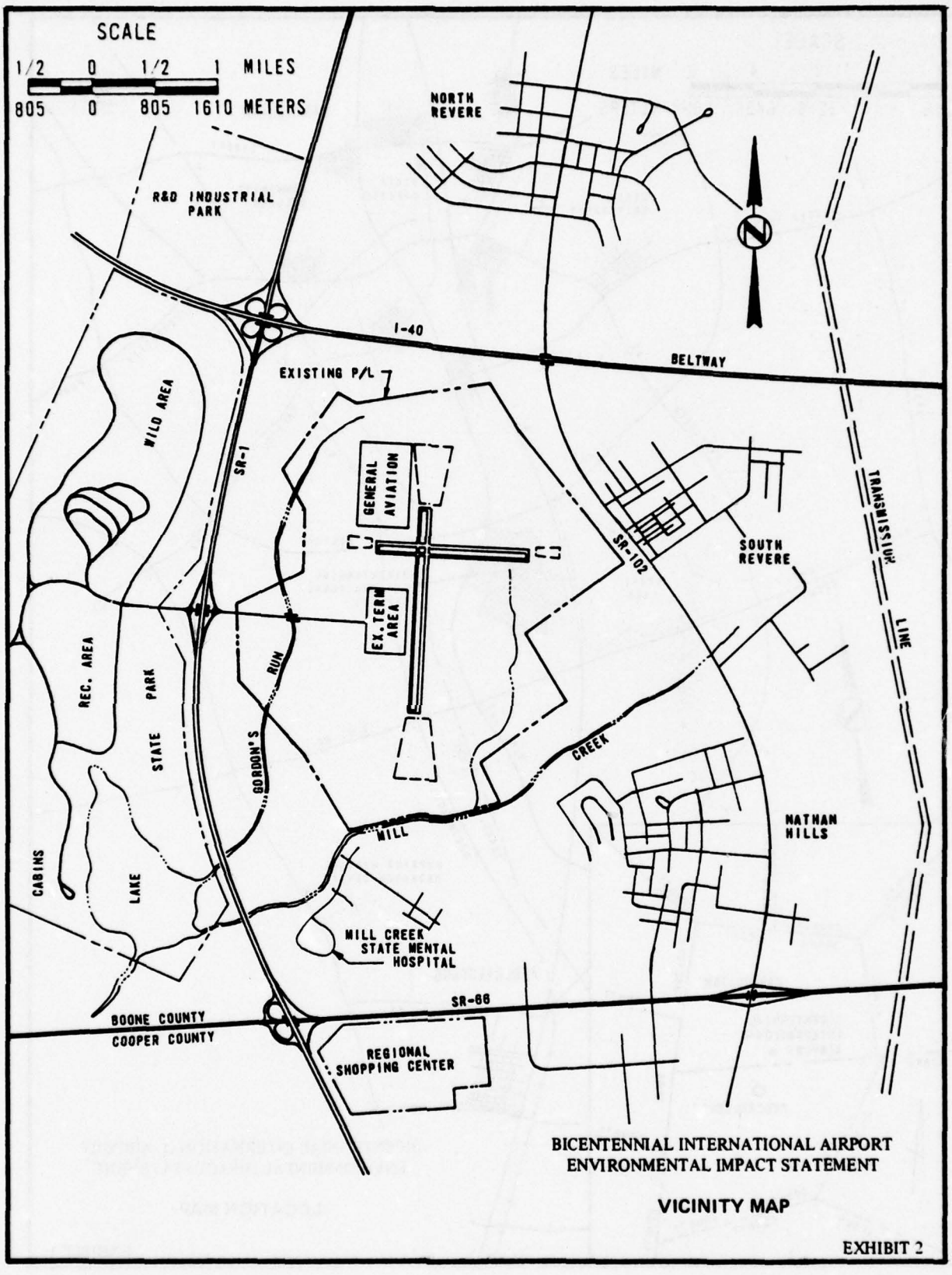
- Acquisition of approximately 700 acres of land for total site development.
- Construction of a 10,000-foot by 200-foot runway (designated 2R-20L) parallel to and 5,500 feet east of the existing air carrier runway. In addition, a lighted parallel taxiway and apron connections will be provided.
- Construction of a new air carrier terminal between the parallel 2-20 runways. The new complex will include the latest innovations in passenger and baggage handling and the aprons will be designed to accommodate 60 to 70 aircraft parking positions.
- Construction of a new four-lane airport access road.
- Construction of new auto parking facility adjacent to the terminal.
- Installation of high intensity runway edge and centerline lights; touchdown zone lighting; an approach lighting system (ALSF-1); a category



BICENTENNIAL INTERNATIONAL AIRPORT
ENVIRONMENTAL IMPACT STATEMENT

LOCATION MAP

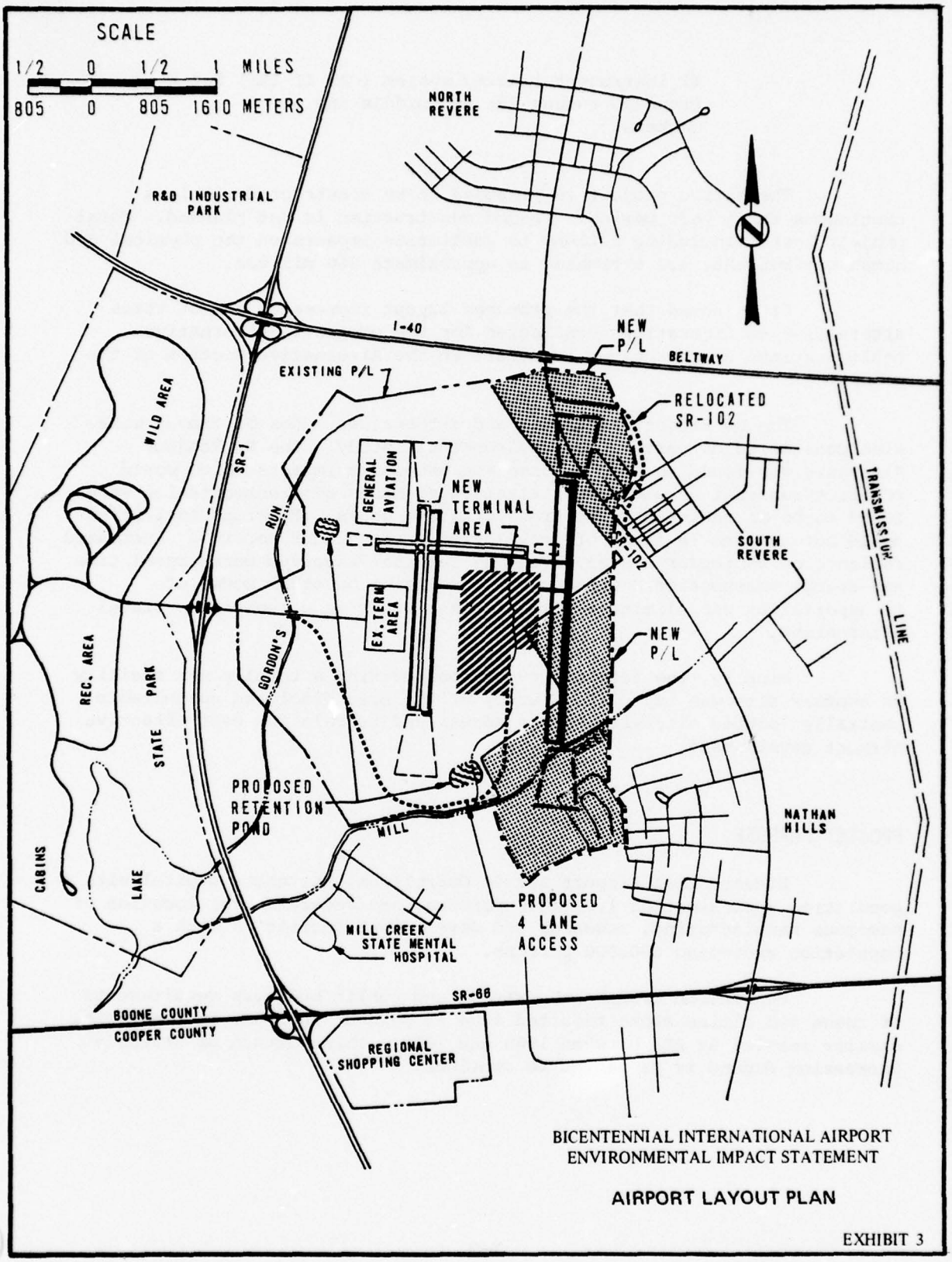
EXHIBIT 1



BICENTENNIAL INTERNATIONAL AIRPORT
ENVIRONMENTAL IMPACT STATEMENT

VICINITY MAP

EXHIBIT 2



BICENTENNIAL INTERNATIONAL AIRPORT
ENVIRONMENTAL IMPACT STATEMENT

AIRPORT LAYOUT PLAN

EXHIBIT 3

II instrument landing system (CAT II-ILS) for proposed runway 2R; and middle and outer markers.

The entire project is proposed to be constructed within a continuous three year period. Staged construction is not planned. Total project costs, including actions to ameliorate impacts on the physical and human environment, are estimated to approximate $60 million.

It is noted that the proposed layout represents one of three alternative configurations considered for the project. Alternative configurations are discussed in detail in the Alternative Section of the report.

The No Project Alternate and alternative modes of travel were also considered as part of the environmental study. The No Project Alternate was found to have adverse socioeconomic impacts which would restrict regional development. Alternative modes of transportation were found to be inconsistent with transportation goals. Railroad facilities could not compete in terms of travel time or passenger service. Increased reliance on vehicular travel, even bus service, involved more travel time and energy consumption. Consequently, reliance on other modes of transportation was eliminated from further study as a legitimate travel alternative.

Finally, the feasibility of constructing a totally new facility on another site was explored. Survey of the area disclosed no suitable centrally located site with proper access and terrain for cost-effective airport development.

PROJECT PURPOSE

Bicentennial Airport serves Carrollton, the state capitol with a population approximating 1,000,000 persons, and Federalsburg, location of numerous manufacturing, research and development facilities with a population exceeding 800,000 persons.

Population growth and private and public business requirements of these two cities alone resulted in a 14 percent increase in commercial carrier service at BIA between 1960 and 1970. This pattern of steadily increasing demand is projected to continue.

Tables 1 and 2 show forecasts of BIA air carrier and enplaned passenger expansion from 1970 to 1990 and projected air cargo activity. By 1990, it can be seen that commercial carrier service is anticipated to increase by 86 percent, enplaned passengers by almost 200 percent, and general aviation activity is forecast to more than triple. Instrument operations will more than double their 1975 level. The forecasts shown correlate well with the terminal area forecasts developed by the FAA.

The practical annual capacity (PANCAP) of the existing runways is 200,000 operations per year. This capacity was exceeded in 1975 when 232,500 total operations took place. Also of importance are the airfield's hourly capacities under visual and instrument flight rules (VFR and IFR). The airfield's hourly capacity under VFR is 91 operations per hour, while its capacity under IFR is 52 operations per hour. The airfields's hourly VFR capacity was exceeded in 1975 when busy hour activity reached 109 operations. By 1980, the airfield's hourly IFR capacity will virtually be reached.

Construction of an additional runway is essential to accommodate the projected number of flight operations. Improvements in surface access and terminal facilities are needed to support increased cargo and passenger operations. The proposed project provides the comprehensive improvements required to handle forecast growth in operations. Construction of the parallel runway allows simultaneous Instrument Flight Rule (IFR) landings during low ceiling and visibility conditions. The improved terminal facilities and access will provide better service to the travelling public. Demand projections indicate that passenger traffic will double between 1970 and 1980 alone. The new terminal complex will offer convenient parking, curb frontage pick-up and check-in, and passenger handling facilities designed to minimize walking distances. Improved cargo facilities will expedite handling and enhance security.

The project is needed to permit BIA to accommodate forecast air carrier growth efficiently and safely. Failure to expand the airport will result in increasing congestion, delay and ultimate saturation of the facility. Briefly, increased congestion means more flights waiting to take off and land are stacked in the air or in line on the ground. Delay is undesirable for four basic reasons. These are:

- Passenger inconvenience.
- Safety hazards.
- Increase in energy consumption.
- Increase in air and noise pollution.

Table 1

Forecast of Activity at BIA, 1970-1990

Annual Activity by Category	*(Actual) 1970*	*(Actual) 1975*	*1980*	*1985*	*1990*
Air Carrier	70,200	80,400	94,800	110,000	131,600
General Aviation					
Itinerant	66,960	96,800	131,000	173,000	218,900
Local	30,231	41,300	58,700	81,200	108,200
Military	13,551	14,000	14,000	14,000	14,000
Total Operations	180,942	232,500	298,500	378,200	472,700
Instrument Operations	67,294	78,000	99,000	127,300	164,000

Total Operations by Aircraft Class	*Number*	*%*	*Number*	*%*	*Number*	*%*	*Number*	*%*	*Number*	*%*
A (Lge. Commercial)	0	0	2,325	1.0	3,582	1.2	5,673	1.5	9,454	2.0
B (Med. Commercial)	43,967	24.3	58,125	25.0	75,520	25.3	96,441	25.5	120,539	25.5
C (Exec. Aircraft)	3,880	2.2	5,812	2.5	8,060	2.7	10,968	2.9	14,181	3.0
D&E (Gen. Aviation)	133,095	73.5	166,238	71.5	211,338	70.8	265,118	70.1	328,527	69.5
Total Operations	180,942	100%	232,500	100%	298,500	100%	378,200	100%	472,700	100%

Busy Hour Activity					
VFR	101	109	135	172	216
IFR	32	39	50	64	83

Annual Enplaned Passengers	1,750,000	2,600,000	3,450,000	4,300,000	5,150,000

Table 2

Annual Enplaned Cargo and Mail Activity at BIA

	(Actual) 1970	*(Actual) 1975*	*1980*	*1985*	*1990*
Annual Enplaned Cargo (Tons)	3,870	5,500	8,000	11,500	16,500
Annual Enplaned Mail (Tons)	2,285	3,100	4,200	5,300	6,800

As can be seen, the saturation point is rapidly being approached. If service is not permitted to exceed this point, regional socioeconomic opportunities and development will reflect this restriction.

Consequently, the project is justified for reasons more far reaching than just better operational efficiency. The airport is the major air service center for a twelve county region. Included in its primary market area are two major metropolitan communities, one of which is the state capitol, several universities and the renowned Hopkins Medical Research Center.

The entire region is continuing to expand. The populations in the Carrollton-Federalsburg metropolitan areas alone have increased an average of 30 percent over the last ten years. Recent economic studies prepared by airport consultants documented that the demand for commercial services in the region had grown at a faster rate than projected in earlier (1967) airport feasibility reports.

The purpose, need and justification for the Bicentennial Airport expansion is to keep pace with the projected population growth and sustain the economic viability of the region.

PROJECT SETTING

Bicentennial Airport is located in Boone County, 13 miles south of the Carrollton Central Business District (CBD) and 16 miles north of the Federalsburg CBD. State Route (S. R.) 66, a regional east-west highway just south of the airport property, is the boundary line separating Boone County and Cooper County. The site is bordered on the north by Interstate 40, the circumferential beltway serving Carrollton; by S. R. 102 on the east; and by S. R. 1 on the west. S. R. 1 is a major north-south arterial connecting the greater Carrollton and Federalsburg areas.

Exhibit 2 provides a vicinity map relating the project site to key facilities in the region. The 3,000-acre Cyrus Pierce State Park borders S. R. 1 west of the Airport.

Mill Creek State Mental Hospital, with an in-patient population of approximately 400, is located in the northeast quadrant of the S. R. 66/S. R. 1 intersection, one mile south of the airport site.

Commercial development borders S. R. 66 and residential development occurs in areas to the southeast, northeast and north of the airport. Nathan Hills, the residential subdivision to the southeast, was

constructed in the 1960's and is predominantly a middle to upper-middle income neighborhood. South Revere Park, located northeast of the site, was constructed in the 1940's to serve as off-base housing for non-commissioned officers in the Army Air Corps. Today, this neighborhood remains fairly stable and is occupied by lower income black and Spanish-speaking families.

The more recent, higher cost subdivision of North Revere Park, is located north of I-40, approximately four miles north of proposed runway 2R-20L. Paul Revere Junior High School and the General Boone House, a registered historic landmark, are located in the North Revere community.

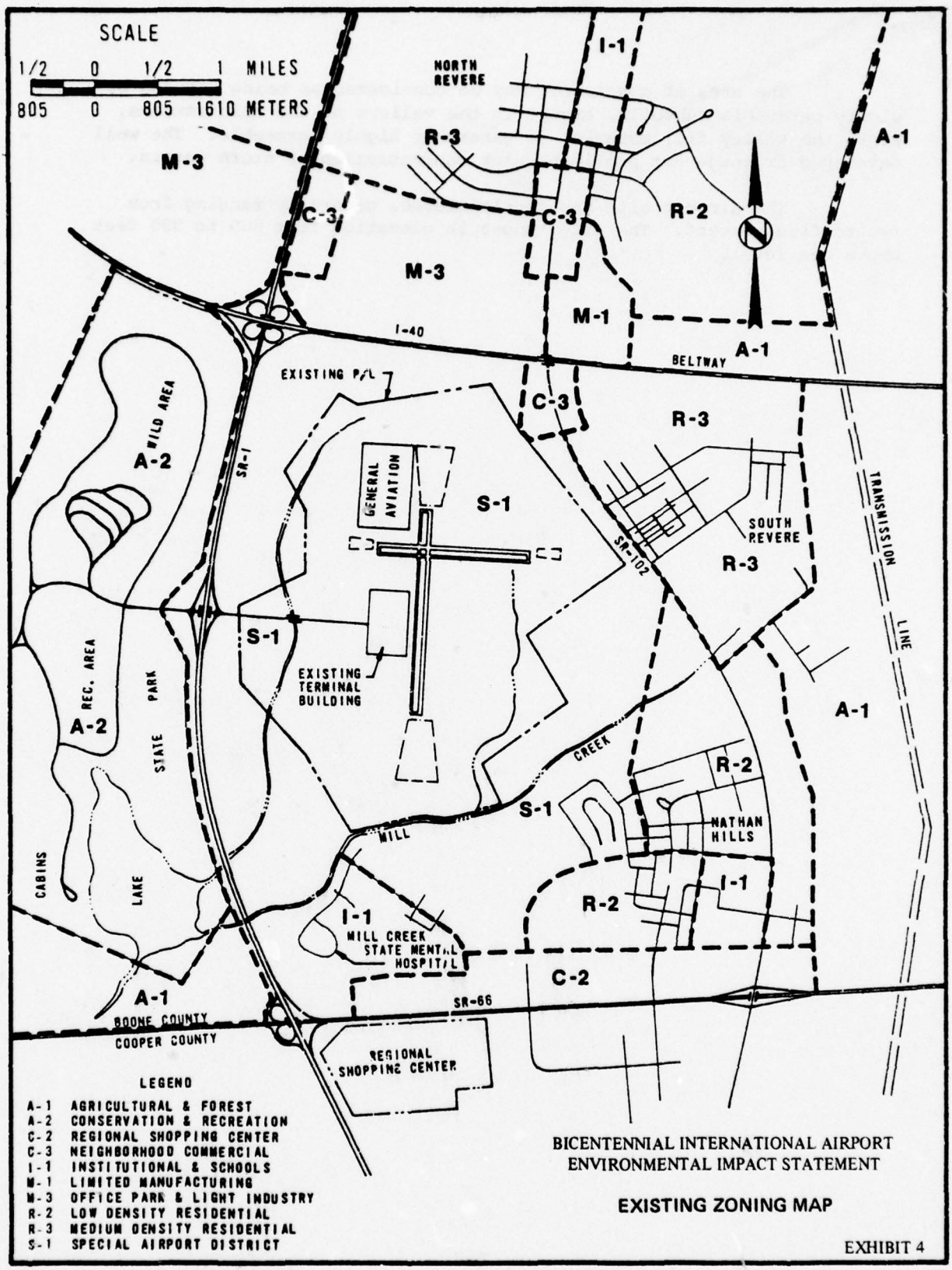
With the exception of these residential and commercial enclaves, land surrounding the project site is predominantly unoccupied overgrown areas or agricultural fields. A power transmission line and the Northeast Railroad follow a parallel north-south alignment east of the site. Exhibit 4 indicates present zoning in the airport vicinity.

Carrollton, the state capitol, is also the home of the State University with a student population of 15,000, Carrollton Community College and several smaller private colleges with a collective enrollment approaching 8,000. While state government is the principal employer, Carrollton also has thriving textile and hardware manufacturing industries.

Federalsburg to the south is the national home office for ABC Computers with personnel exceeding 5,000. The city is also the center for numerous research and development (R & D) industries in the fields of electronics, aeronautics and communication. Further, the nationally renown Hopkins Medical Research Center along with three affiliated hospitals are located in Federalsburg.

The natural topography of the project area is dominated by the foothills of the Jefferson Mountains which begin to rise east of the site. Mill Creek flows through the southern perimeter of the airport property to the lake in Cyrus Pierce State Park, and Gordon's Run flows through the airport's western perimeter, also terminating in the Park's lake. With the exception of the Park's woodlands, there are no significant or valuable expanses of vegetation in the airport area.

The counties are located in the Middle Western Upland Plain physical subdivision of the Appalachian Highlands physiographic division. Glaciers covered the greater part of the area in the ancient past. They modified hills, filled in valleys, left masses of glacial debris, and produced soil types which have an identifiable effect on ground water supplies and rates of surface runoff.



BICENTENNIAL INTERNATIONAL AIRPORT
ENVIRONMENTAL IMPACT STATEMENT

EXISTING ZONING MAP

EXHIBIT 4

The area of glaciation may be considered as being covered by slowly permeable subsoils, except in the valleys of the main streams, where the valley fill material is generally highly permeable. The well developed drainage net provides quick concentration of storm waters.

The airport site has gentle slopes, generally ranging from two to five percent. The site ranges in elevation from 660 to 900 feet above sea level.

SECTION II
PROJECT BACKGROUND INFORMATION

SECTION II: PROJECT BACKGROUND INFORMATION

HISTORY OF THE PROJECT

Bicentennial Airport (formerly Wilson Field) was originally constructed in 1941-42 as a flight training center for the U. S. Army Air Corps. At the termination of World War II, military operations were phased out and the base was turned over to the state. The Northeast Airport Authority was established to run the facility and in 1948, the original bond issue was passed to convert the base to a combined commercial carrier-general aviation facility with some military operations, primarily National Guard, remaining. This issue permitted reconstruction of the military headquarters-hangar building to the present terminal facility and improvements to a hangar-maintenance area to include office space for general aviation.

By 1965, population and economic growth in the Carrollton-Federalsburg region had resulted in strong demand for improved commercial carrier and general aviation service. Recognizing that BIA would inevitably require expansion, the Northeast Airport Authority hired the consulting firm of Elliott, Budd, and Perr (EBP) to prepare a feasibility study documenting necessary improvements. This study, completed in 1967, forecast increases in commercial carrier service and general aviation operations which would parallel anticipated Federalsburg and Carrollton growth. In recognition of the expanding needs of state government, industry, research and educational institutes in the region, the EBP report recommended that the Airport Authority begin plans for major facility expansion. Results of the 1970 census showed that EBP had been conservative in their projections. Population in Carrollton increased 36 percent between 1960 and 1970, while population in Federalsburg rose 32 percent during the same decade.

In 1970, Boone County, recognizing the need for airport expansion, established an Airport Zoning District. The District is bordered by Pierce State Park on the west, I-40 on the north, S. R. 102 on the east, and other public and private lands on the south. (See Exhibit 4).

In 1971, the state authorized funds for a preliminary engineering feasibility study for BIA expansion, and, in 1972, the airport consulting firm of Skyways Associates was retained by the Airport Authority to accomplish this effort. Initial findings by Skyways indicated that extension of site boundaries warranted further investigation.

The 1973 Capitol Regional Planning Commission report reinforced public commitment to BIA expansion. The economic section of the report noted:

> "Expansion of Bicentennial International Airport is given the highest priority to assure comprehensive transportation services for the region. Expanded commercial carrier service, in particular, is integral to economic expansion of the Capitol Planning Region."[1]

COMMUNITY INVOLVEMENT

In March 1974, Skyways Associates delivered its preliminary planning report to the Airport Authority. The report, indicating three possible expansion alternatives, was made public and was officially presented by the Airport Authority at open meetings of the Capitol Regional Planning Commission, the Board of Cooper County Supervisors, the Boone County Council, and the Carrollton and Federalsburg City Councils. In addition, between March and December 1974 the BIA manager and members of the Authority presented the plan at local meetings of the Chamber of Commerce, the Jaycees, and numerous other civic interest and service organizations in BIA's twelve county service area.

Simultaneous to the scheduling of specific meetings for potentially displaced families, a general public information meeting was held on July 7, 1974. This meeting, held at the Paul Revere Junior High School, resulted in the identification of the following areas of public concern:

- Increased noise levels within the flightpath for a new runway was a major concern.
- The availability of relocation housing was a matter of concern to the general community as well as persons potentially displaced by the project.

---

[1] Capitol Regional Planning Commission 1973 Comprehensive Report, Capitol Regional Planning Commission, Carrollton, October, 1973. p. 38.

- The need to expand the airport was expressed by numerous representatives of civic interest groups and local industry.

As a result of issues and suggestions raised at this meeting, an advisory committee on Airport Expansion was established. This group generally met once a month throughout the environmental analysis and review period. The ten member committee was composed of representatives of the following agencies and interest groups:

- President of the Revere Neighborhood Association.
- President of the Nathan Hills Improvement Association.
- FAA representatives from the Airports District Office and the BIA Air Traffic Control Tower.
- Commercial Air Carrier (Airline) representative.
- Director of Cyrus Pierce State Park.
- Director of the Boone County Planning Commission.
- Director of the Cooper County Department of Planning and Zoning.
- BIA Airport Manager, representative for the Northeast Airport Authority.
- A representative of Skyways Associates, the Authority's Master Planning Consultant.
- A representative of Thomas, Richards and Michaels (TRM), the Authority's Environmental Consultant.

The advisory committee was charged with the responsibility of reviewing alternatives and proposing viable ameliorative measures to reduce anticipated impacts for each.

Upon completion of the environmental studies, the committee recommended Alternate 3 (the proposed project). This selection was based on the fact that this configuration would have the least impact on Pierce State Park and Mill Creek State Mental Hospital. Alternative 3 was also most conducive to amelioration in that air traffic control procedures could be safely implemented to minimize noise exposure north of the expansion runway. Further, the commitment to provide new housing for those displaced satisfied most objections to Alternate 3.

Detailed information on committee recommendations incorporated into the development plan is provided in the Noise, Land Use and Community Impact Sections of this report.

PUBLIC HEARING

On September 15, 1975, the formal public hearing for the project was held at the Paul Revere Junior High School auditorium. As a result of Authority efforts and community representation on the Advisory Committee, the public was reasonably well informed prior to the hearing.

Comments at the hearing included some complaints on existing levels of airport noise, and some individuals were not convinced that expansion was actually required.

A number of speakers--individuals and group representatives--wanted to insure that all recommendations would, in fact, be implemented. It was specifically requested that the advisory committee continue meeting during project construction and for sometime thereafter as a public watchdog to assure all recommended actions were enforced. It was further suggested that the committee find additional ways to reduce airport associated impacts and should review and investigate possible future violations of recommended procedures.

More details on the hearing are contained in Section VIII.

SECTION III
PROBABLE IMPACT ON THE ENVIRONMENT

SECTION III: PROBABLE IMPACT ON THE ENVIRONMENT

NOISE

Introduction

The noise portion of the environmental investigation included the following elements:

- Identification of particularly noise sensitive areas such as parks, hospitals, schools, churches, and residences.
- Development of Noise Exposure Forecast (NEF) and Integrated Noise Model (INM) values to indicate areas of various levels of noise exposure.
- Consideration of non-aircraft noise impact induced by the project i.e., noise generated by construction operations and noise resulting from increased surface traffic on main access and bordering roads.

Prior to reviewing this section, it may be helpful to read a brief report entitled Impact of Noise on People provided in Appendix A of this document. The report includes an explanation of noise and its measurement and discusses public reaction to various levels of aircraft generated noise.

The NEF method used was the Airport Noise Prediction Model - MOD 7 developed by the U. S. Department of Transportation, Transportation System Center. The NEF methodology has undergone continuous improvement with revisions in input parameters published as recently as 1975. The INM method was accomplished using the FAA Integrated Noise Model User's Guide, FAA Report No. FAA-EQ-76-2, March, 1976. A discussion of the noise methodologies is contained in Appendix A.

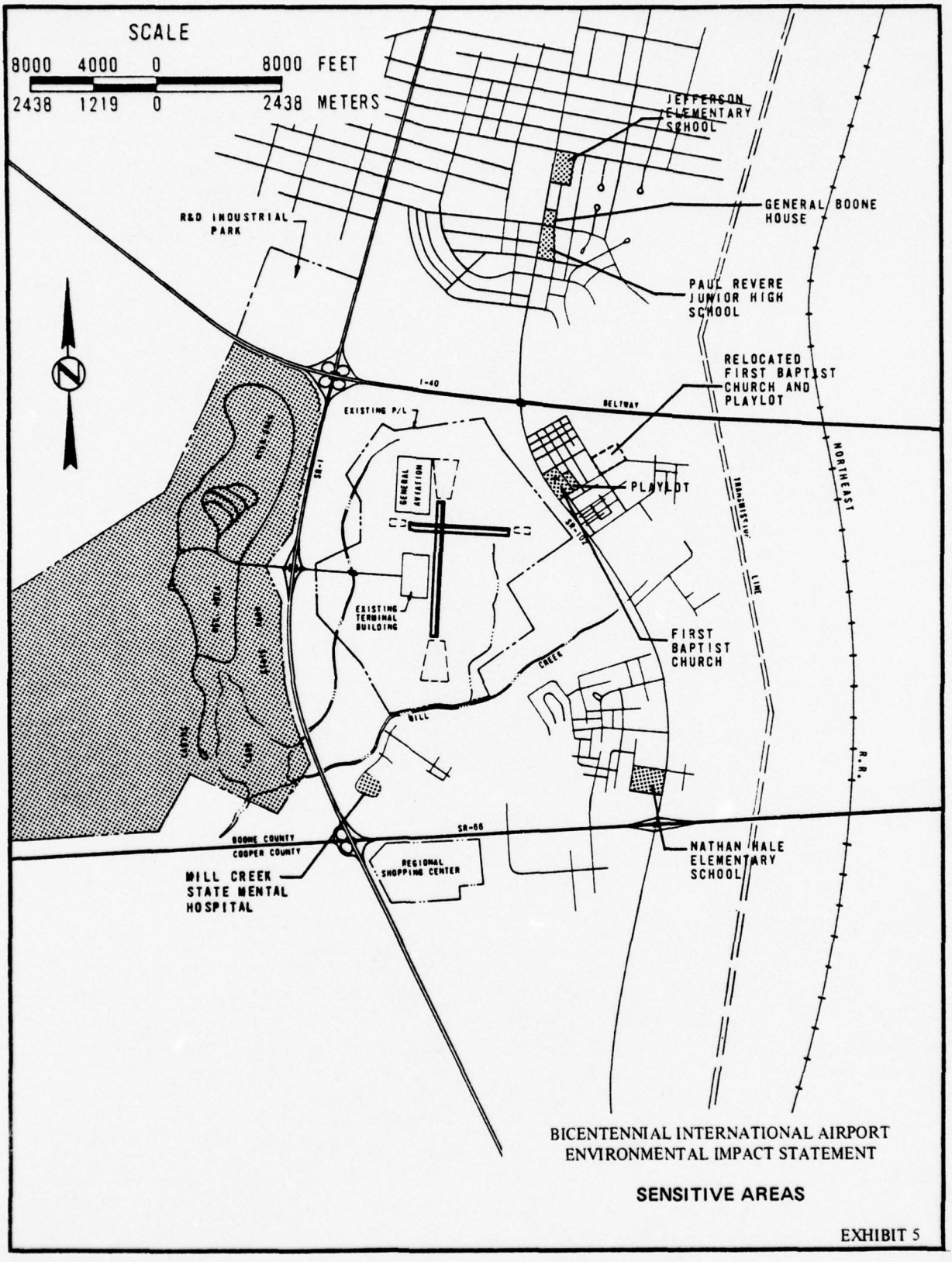
The aircraft noise evaluation models combined quantative and qualitative input of various impact factors. Results can be plotted in the form of noise exposure contours. These may be superimposed upon the study area to indicate exposure and impact in relation to land use and noise sensitive areas. Input parameters include aircraft mix, runway configurations, flight path descriptions, number of operations per day, and time of day (that is, daytime or nighttime). The noise contours which result from these analyses are expressed in either NEF values (30, 40) or INM criteria (the amount of time aircraft noise exceeds a threshold level during the day).

The following sections discuss existing conditions and anticipated future conditions resulting from project construction, and increased aircraft and vehicular traffic.

Existing Conditions

The project area includes three residential communities--Nathan Hills, North and South Revere Park--and the following noise sensitive areas which are shown on Exhibit 5:

- Cyrus Pierce State Park
- Mill Creek State Mental Hospital
- Nathan Hale Elementary School and adjacent recreation area.
- First Baptist Church - South Revere
- South Revere Playlot
- Paul Revere Junior High School and adjacent recreation area - North Revere
- Jefferson Elementary School and adjacent recreation area - North Revere
- General Boone House - historic site and museum - North Revere



BICENTENNIAL INTERNATIONAL AIRPORT
ENVIRONMENTAL IMPACT STATEMENT

SENSITIVE AREAS

EXHIBIT 5

Noise exposure for existing conditions at BIA was first analyzed by identifying existing aircraft types using the airport on a average day and by estimating the normal runway usage and operational patterns. This base data is included in Appendix A and is reflected in the NEF contours shown in Exhibits 6 and 7. Table 3 explains the relationship of noise exposure and compatible land uses.

The contours for existing operations (1975) are shown on a zoning map of the area (Exhibit 6) and an estimate was made of the number of housing units experiencing noise exposure greater than NEF 30. It was estimated that as a result of current operations, approximately 200 residences experience exposure greater than 30 NEF. These residents are primarily located north of the existing runway in North Revere.

Exhibit 7 and Table 4 indicate the existing NEF levels at sensitive areas. The NEF level indicates a cumulative daily exposure.

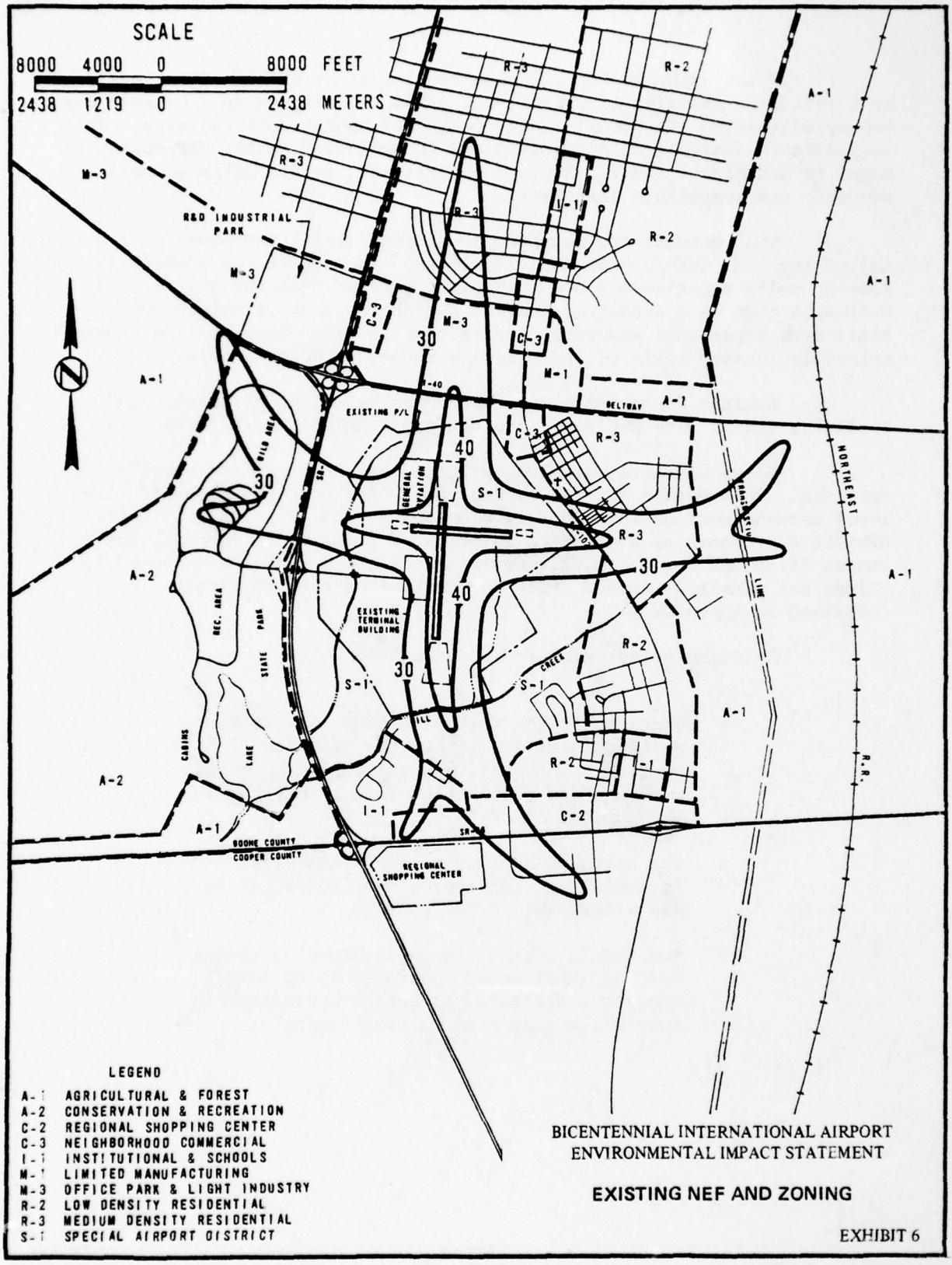
Noise exposure was also evaluated using the INM methodology and criteria. This method determines the total time that the aircraft sound level exceeds various threshold levels (65, 75, 85, 95, 105, 115 dBA). Exhibit 8 presents an evaluation in terms of total daily time exposure in excess of 85 dBA for existing conditions. Table 4 contains selected INM values for sensitive areas. More information on the INM results is contained in Appendix A.

Existing noise exposure is summarized below:

- Sections of the North and South Revere Park neighborhoods are within the existing 30 NEF contour. In total, approximately 200 homes within these communities fall within the 30 NEF contour.

- The northern half of Pierce State Park including camping and natural forest areas are within the 30 NEF contour.

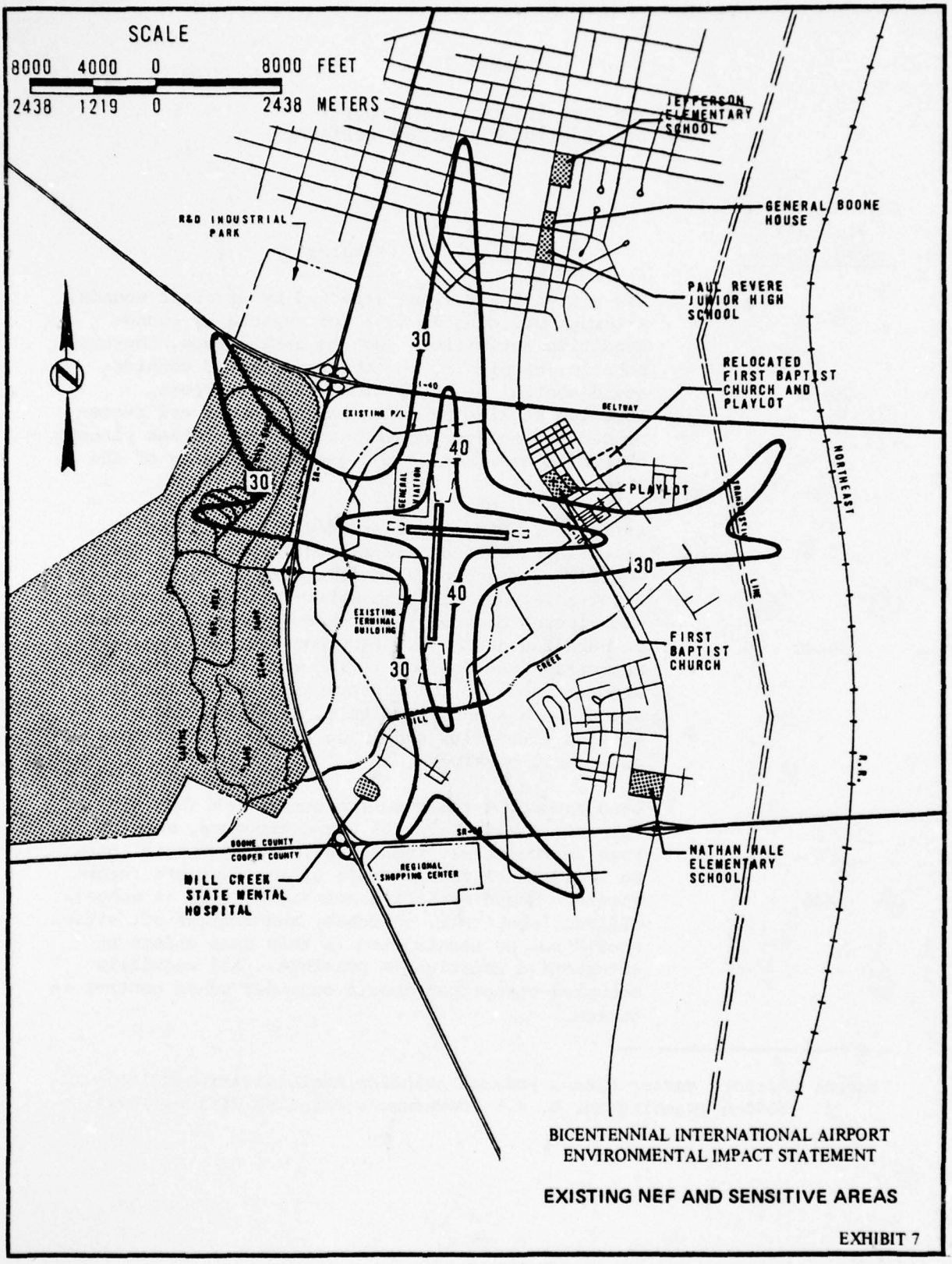
- The NEF 30 contour for operations on runway 2-20 and influenced considerably by the B707/DC 8 aircraft and extend approximately four miles from each runway threshold.



BICENTENNIAL INTERNATIONAL AIRPORT
ENVIRONMENTAL IMPACT STATEMENT

EXISTING NEF AND ZONING

EXHIBIT 6



BICENTENNIAL INTERNATIONAL AIRPORT
ENVIRONMENTAL IMPACT STATEMENT

EXISTING NEF AND SENSITIVE AREAS

EXHIBIT 7

Table 3

Land Uses Adjacent to Airports and the Relationship to NEF Contours

Noise Exposure Forecast (NEF) Values	*Remarks*
20-30	Few activities will be affected by aircraft sounds, although building designs for especially sound-sensitive activities, such as auditoriums, churches, schools, hospitals, and theatres should consider sound control in areas close to the airport. Detailed studies by qualified personnel are recommended for outdoor amphitheatres and similar places of public assembly in the general vicinity of the airport.
30-40	Activities where uninterrupted communication is essential should consider sound exposure in design. Generally, residential development is not considered a suitable use, although multi-family developments where sound control features have been incorporated in building design might be considered. Open-air activities and outdoor living will be affected by aircraft sound. The construction of auditoriums, schools, churches, hospitals, theatres, and similar activities should be avoided within this zone where possible.
>40	Land should be reserved for activities that can tolerate a high level of sound exposure, such as some agricultural, industrial, and commercial uses. No residential developments of any type are recommended. Sound-sensitive activities such as schools, offices, hospitals, churches, and similar activities should not be constructed in this area unless no alternative location is possible. All regularly occupied structures should consider sound control in design.

Source: *Airport Master Plans*, Federal Aviation Administration AC150/5070-6 (Washington, D. C.: Government Printing Office, 1971), Table 3, p. 47.

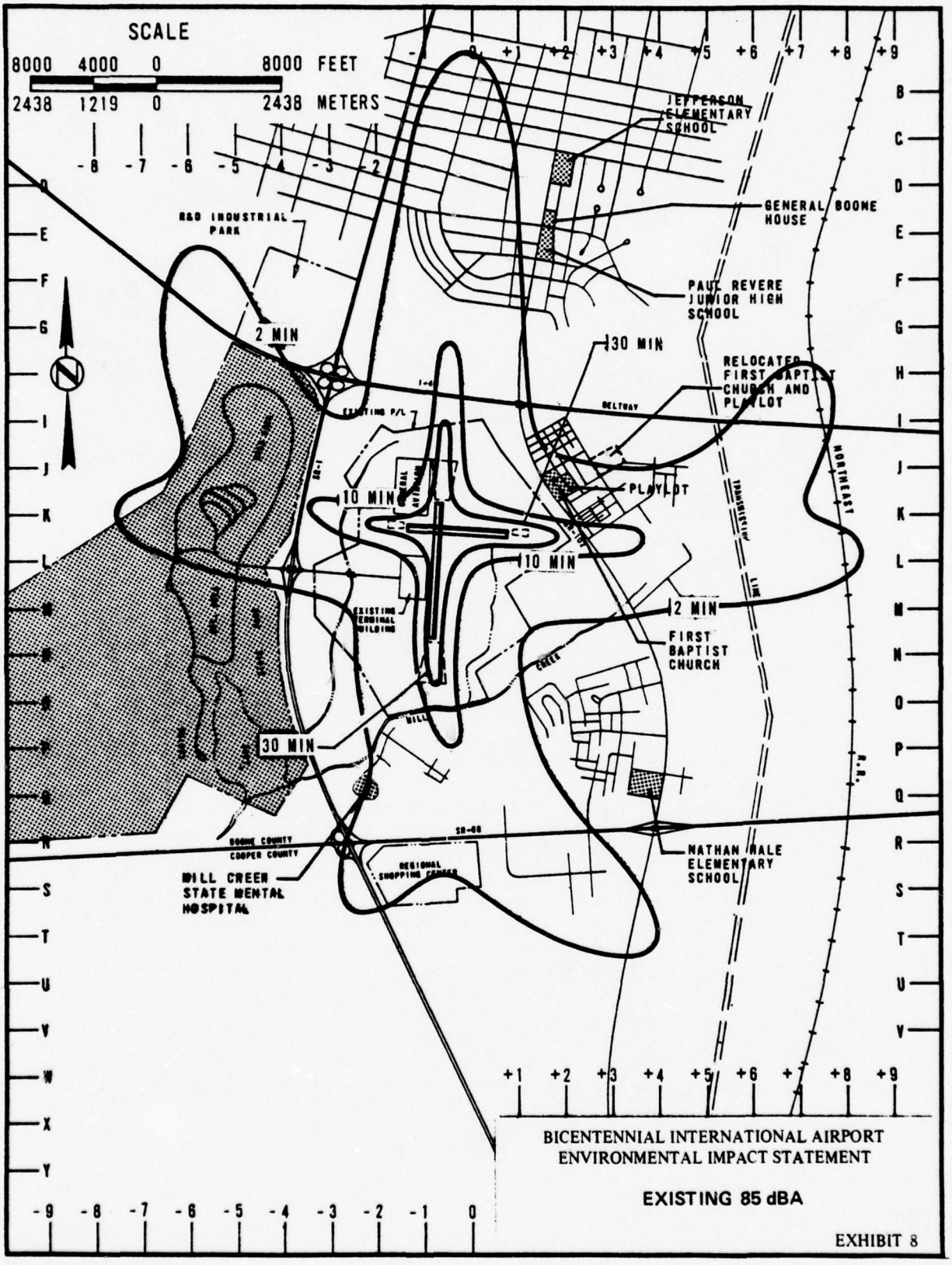

SCALE
8000 4000 0 8000 FEET
2438 1219 0 2438 METERS
JEFFERSON ELEMENTARY SCHOOL
GENERAL BOONE HOUSE
R&D INDUSTRIAL PARK
PAUL REVERE JUNIOR HIGH SCHOOL
2 MIN
30 MIN
RELOCATED FIRST BAPTIST CHURCH AND PLAYLOT
DELTOWAY
PLAYLOT
10 MIN
10 MIN
2 MIN
FIRST BAPTIST CHURCH
EXISTING TERMINAL BUILDING
30 MIN
BOONE COUNTY
COOPER COUNTY
SR-40
NATHAN HALE ELEMENTARY SCHOOL
REGIONAL SHOPPING CENTER
BILL CREER STATE MENTAL HOSPITAL
BICENTENNIAL INTERNATIONAL AIRPORT
ENVIRONMENTAL IMPACT STATEMENT
EXISTING 85 dBA

EXHIBIT 8

Table 4

Existing Exterior Noise Exposure

Sensitive Areas	*NEF*	*Time in Minutes Above Indicated dBA Level For 24-Hour Day*		
		65 dBA	*85 dBA*	*105 dBA*
Cyrus Pierce State Park (eastern boundary)	35	40	8	0
Mill Creek State Mental Hospital	<30	29	2	0
Nathan Hale Elementary School and Recreation Area	<30	17	0	0
First Baptist Church and South Revere Playlot	30	31	5	0
Paul Revere Junior High School and Recreation Area	<30	23	1	0
Jefferson Elementary School and Recreation Area	<30	18	0	0
General Boone House	<30	23	1	0

- Land area to the south is relatively undeveloped and provides a potential for development with airport related zoning.
- The daily exposure to aircraft noise greater than 85 dBA ranges from 2 to 10 minutes in the State Park and in the North Revere and South Revere communities.

Impact of Expansion

Construction of runway 2R-20L will permit parallel landing and takeoff operations in the north-south direction. Daily operations and runway distributions for future (1985) expansion conditions are given in Appendix A.

Exhibit 9 shows the 1985 Noise Exposure Forecast for the project area based on input data provided for future conditions. The contours reflect procedural revisions resulting from citizen input. A public information meeting was held on July 7, 1975 to discuss the proposed expansion plans. Prior to the meeting, a noise exposure forecast (NEF) was prepared and contours were developed for the proposed facility's 1985 operations. These contours were made available for public comment at the meeting. Most of the discussion centered on the effect aircraft noise would have on the residential areas north of the airport and on Cyrus Pierce State Park.

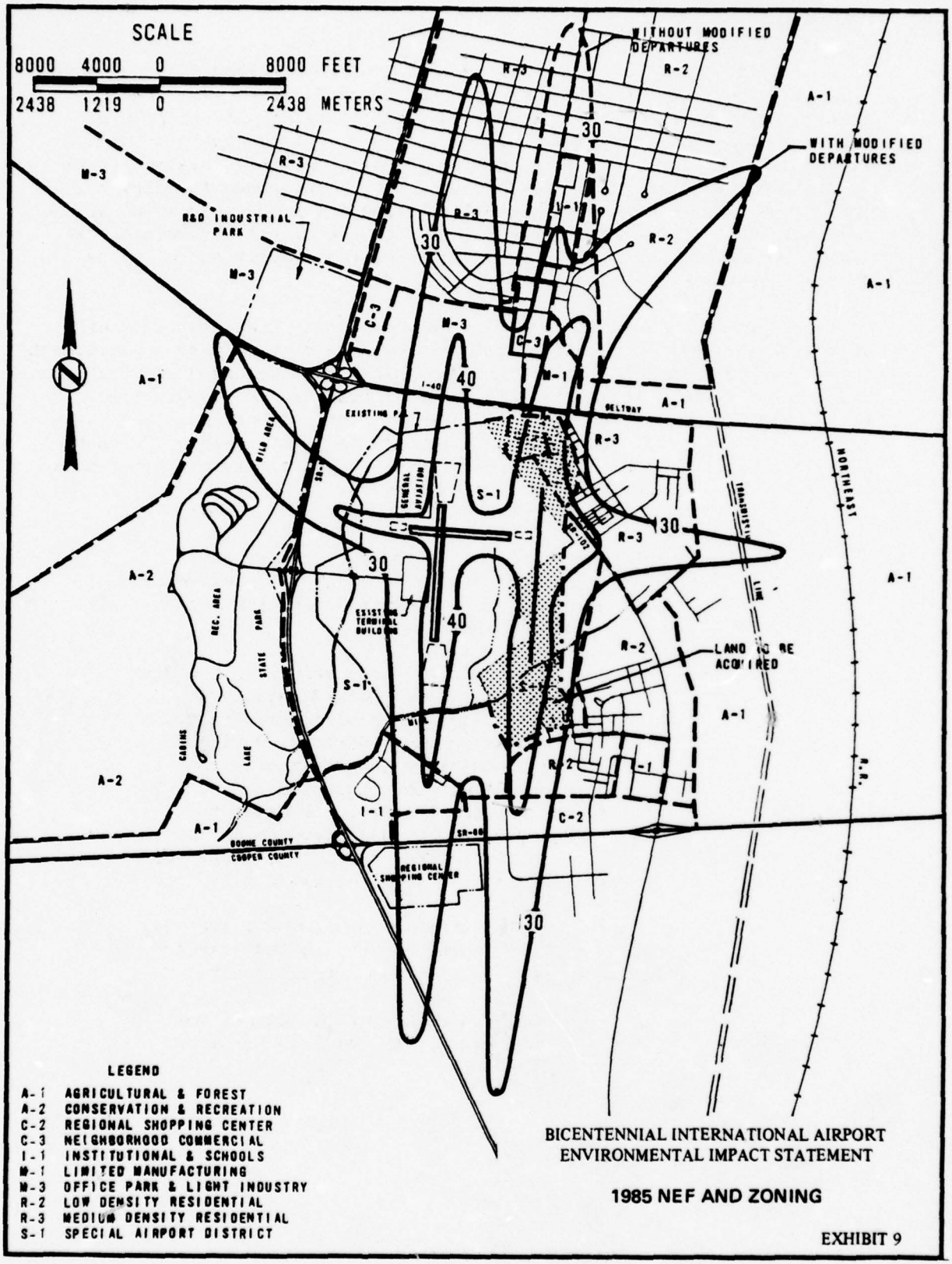
There was considerable discussion on the impact that takeoffs of especially noisy aircraft (707/DC 8) now have on park uses. Subsequent to the public discussion, a meeting was held with a selected airport advisory committee and air traffic control personnel to discuss measures that could safely be taken to minimize the effect on both park and the residential areas to the north. These measures, summarized below, have been incorporated into the planning process and thus, are reflected noise forecasting procedures and impact predictions.

- Elimination of all 707/DC 8 type aircraft operations over the Park. This will reduce peak noise levels now experienced within the Park by about 5 dBA.

- *Restricting* jet aircraft takeoffs over the Park to an absolute minimum. Consideration was given to total elimination of jet aircraft use of the crosswind runway. However, during certain wind conditions (approximately two percent of the time) the crosswind runway will have to receive jet traffic. In order to realistically describe the influence on the Park during this period, the NEF contours for runway 11-29 include some jet traffic.

- Placement of ILS approach system on runway 2R, thus directing approaches during ILS weather landings over open land in Cooper County.

- Institute modified departure procedures for flights taking off to the north on new runway 2R-20L.



BICENTENNIAL INTERNATIONAL AIRPORT
ENVIRONMENTAL IMPACT STATEMENT

1985 NEF AND ZONING

EXHIBIT 9

The departure procedures would require that a right turn be made for all jet traffic using runway 2R for takeoff. This control would minimize noise exposure within the suburban residential neighborhood north of runway 2R and direct traffic on an easterly course after takeoff. Meetings with the airport's traffic control personnel indicated that the procedures recommended could be safely instituted.

Further, the procedure has received a favorable response from an informal FAA airspace review. Formal proceedings to institute the control procedures would be initiated during the construction of the new runway. The results of this noise abatement control procedure, as seen in the noise exposure forecast on Exhibit 10, would be to reduce the noise exposure on schools and recreational fields and the General Boone House north of the airport.

The project will increase noise exposure in neighborhoods within the Airport study area. The estimated total of units which will be exposed to greater than NEF 30 is 280.

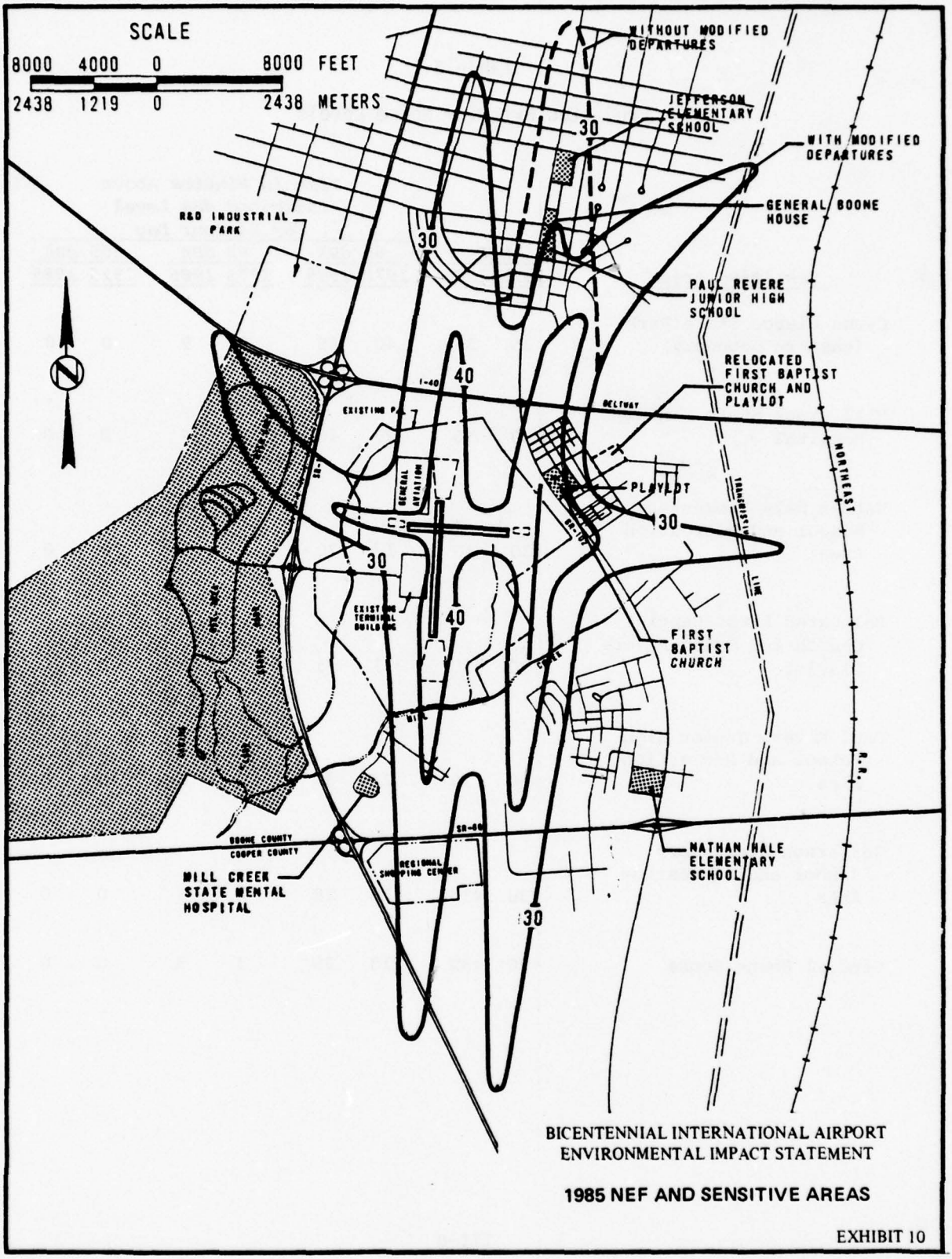
Table 5 gives NEF values at noise sensitive areas for existing and 1985 conditions. Existing NEF values are included in the table for comparative purposes.

Using the INM approach, Exhibit 11 indicates future noise impact in terms of daily exposure to greater than 85 dBA from future airport operations. Compared to existing conditions, daily exposure in the communities of South Revere and Nathan Hills, east of the expanded airport, would increase from less than two minutes per day to a level in the range of 2-10 minutes per day. Total exposure in the State Park would remain approximately the same as the present condition. Much of North Revere would experience between 2 and 10 minutes of aircraft noise greater than 85 dBA with project development. Table 5 also contains results from the INM analysis, showing the level of aircraft noise impact at sensitive areas for existing and 1985 conditions.

Impact of Construction Operations

In addition to aircraft noise, project construction will result in a temporary increase in noise levels bordering the site.

Construction noise impact will be short-term and most discernible in immediate proximity to the active work area. On-site grading for the runway and terminal facilities will constitute the most significant construction noise sources. These operations generate noise levels in the



BICENTENNIAL INTERNATIONAL AIRPORT
ENVIRONMENTAL IMPACT STATEMENT

1985 NEF AND SENSITIVE AREAS

EXHIBIT 10

Table 5

Projected Exterior Noise Levels

Sensitive Areas	NEF		Time in Minutes Above Indicated dBA Level For 24-Hour Day					
			65 dBA		85 dBA		105 dBA	
	1975	1985	1975	1985	1975	1985	1975	1985
Cyrus Pierce State Park (eastern boundary)	35	36	40	45	8	9	0	0
Mill Creek State Mental Hospital	<30	<30	29	40	2	4	0	0
Nathan Hale Elementary School and Recreation Area	<30	<30	17	20	0	1	0	0
Relocated First Baptist Church and South Revere Playlot	30	<30	31	31	5	5	0	0
Paul Revere Junior High School and Recreation Area	<30	30	23	36	1	6	0	0
Jefferson Elementary School and Recreation Area	<30	<30	18	28	0	3	0	0
General Boone House	<30	<30	23	35	1	5	0	0

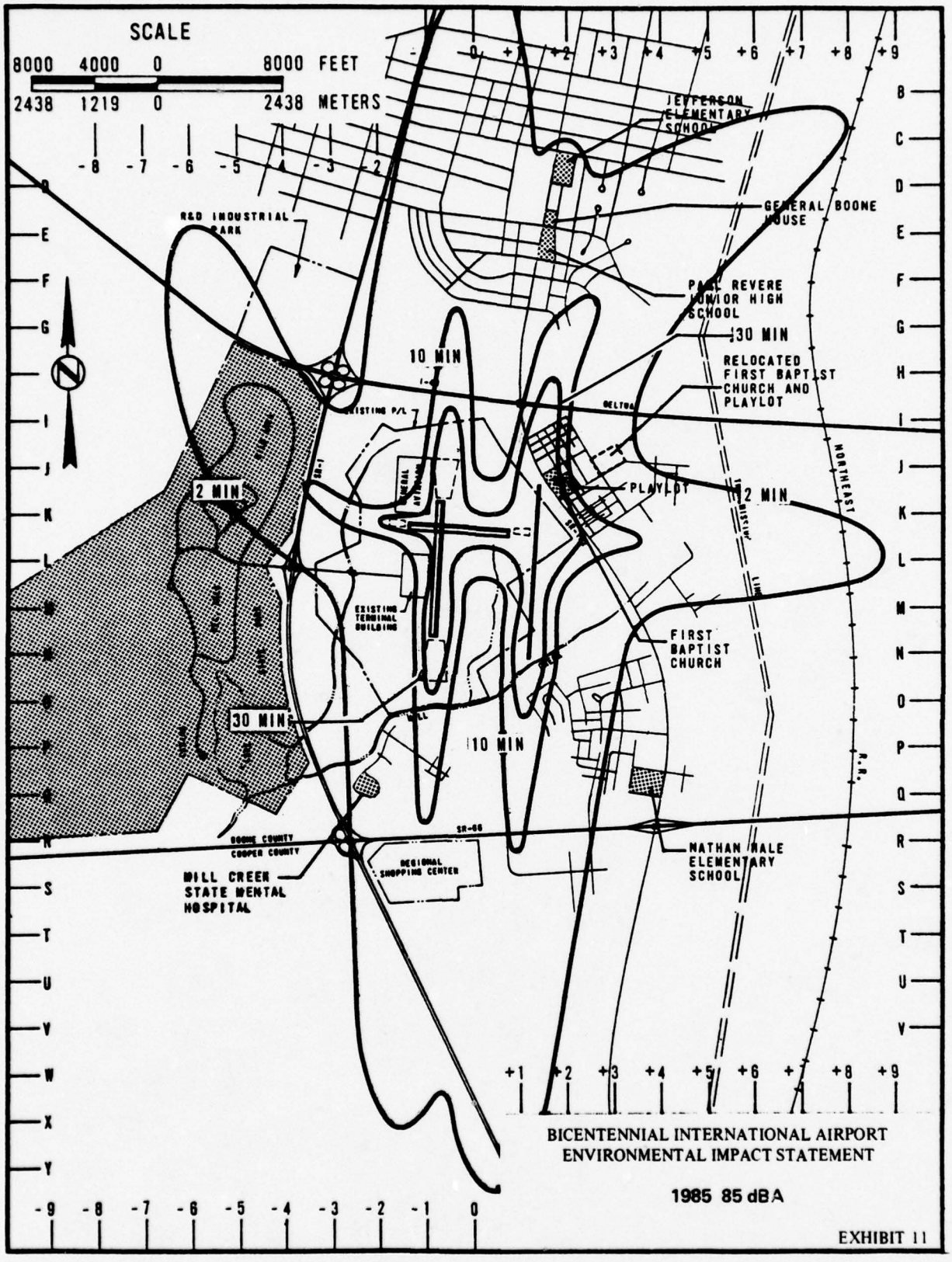

SCALE
8000 4000 0 8000 FEET
2438 1219 0 2438 METERS
JEFFERSON ELEMENTARY SCHOOL
GENERAL BOONE HOUSE
R&D INDUSTRIAL PARK
PAUL REVERE JUNIOR HIGH SCHOOL
30 MIN
10 MIN
RELOCATED FIRST BAPTIST CHURCH AND PLAYLOT
EXISTING P/L
PLAYLOT
2 MIN
NORTHEAST
EXISTING TERMINAL BUILDING
FIRST BAPTIST CHURCH
30 MIN
10 MIN
R.R.
SR-66
BOONE COUNTY
COOPER COUNTY
NATHAN HALE ELEMENTARY SCHOOL
REGIONAL SHOPPING CENTER
MILL CREEK STATE MENTAL HOSPITAL
BICENTENNIAL INTERNATIONAL AIRPORT
ENVIRONMENTAL IMPACT STATEMENT
1985 85 dBA

EXHIBIT 11

range of 70 to 95 dBA measured 50 feet from the equipment. The closest residential neighborhood is located approximately 2,500 feet from the runway construction area. Construction equipment noise will be reduced due to distance attenuation to a range of 50 to 75 dBA within these neighborhoods. Most important, it is emphasized that construction noise exposure will be short-term and will reduce significantly and steadily after completion of grading and paving operations.

Impact of Increased Surface Traffic

Motor vehicle traffic induced by the project, however, will result in a permanent elevation in noise levels on roads serving the airport site. The four-lane access road planned as part of BIA expansion will carry an estimated 25,000 vehicles per day (vpd) by 1985. Present airport access road traffic is 15,000 vpd with associated peak hour L_{10} noise levels of 66 dBA at distances of 100 feet from the roadway.

A doubling of traffic volumes results in an approximate 3 dBA increase in noise levels directly bordering the road. Consequently, airport-generated traffic in 1985 will increase noise levels from the new access road by approximately 3 dBA.

Table 6 shows FHWA criteria for highway noise in relation to land use. As can be seen, noise levels should not exceed 70 dBA in passive parkland. Present ambient levels bordering S. R. 1 on the eastern perimeter of Pierce State Park show 72 dBA, slightly in excess of FHWA parkland criteria. Project-generated traffic is anticipated to increase this noise level to approximately 74 dBA by 1985. However, distance attenuation to passive recreation areas would bring the traffic noise within criteria.

Thus, increased highway noise resulting from airport traffic is not regarded as a severe impact.

Increased highway noise along other roads serving the site will not result in ambient conditions exceeding FHWA standards.

SUMMARY

Noise impact analysis indicated the following alterations in existing noise levels. These findings presume implementation of modified departure procedures and other recommended ameliorative measures.

Table 6

Design Noise Level/Activity Relationships

Activity Category	*Design Noise Level - L_{10}*	*Description of Land Use Category*
A	60 dBA (Exterior)	Tracts of lands in which serenity and quiet are of extraordinary significance and serve an important public need, and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose. Such areas could include amphitheaters, particular parks or portions of parks, open spaces, or historic districts which are dedicated or recognized by appropriate local officials for activities requiring special qualities of serenity and quiet.
B	70 dBA (Exterior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and picnic areas, recreation areas, playgrounds, active sports areas, and parks which are not included in Category A above.
C	75 dBA (Exterior)	Developed lands, properties or activities not included in categories A and B above.
D	--	Undeveloped lands.
E	55 dBA (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals and auditoriums.

Source: Federal-Aid Highway Program Manual; Transmittal 192, May 14, 1976; Vol. 7, Chapter 7, Section 3.

- 1985 aircraft traffic at an expanded facility will increase the number of homes in North and South Revere Park within the NEF 30 contour from 200 to 280.

- Paul Revere Junior High School will lie within the NEF 30 contour border and its abutting recreation area will be partially located within the NEF contour border.

- The relocated First Baptist Church and South Revere playlot as well as all other noise sensitive facilities in the study area will be outside the NEF 30 contour.

- Residential areas in the airport vicinity will experience a 1-5 minute increase in the time each day that aircraft noise exceeds 85 dBA.

- Construction operations will result in a transient but steadily diminishing noise elevation in proximity to the project expansion area.

- Increased vehicular traffic induced by airport expansion will result in a maximum 3 dBA increase in noise levels bordering site access roads. With the exception of the western border of S. R. 1 on Pierce State Park property, these increased levels will not exceed FHWA criteria.

LAND USE

Existing Conditions

The present Airport site is located totally within Boone County and is zoned for airport use. Boone County has a comprehensive master land use plan and county-wide zoning ordinances in effect. Cooper County, which lies immediately south of S. R. 66, has initiated a master planning study but, to date, does not have zoning ordinances outside the Federalsburg city limits.

Exhibit 4 shows the present zoning and Exhibit 2 illustrates existing land use in the study area.

The Boone County Master Plan was first published in 1970 and zoning has continuously been revised to conform with master plan objectives. Expansion of BIA was a major master plan objective and Airport zoning was promulgated in 1970 to fulfill this objective. In addition, all unoccupied land surrounding the Airport was planned and zoned for compatible use. For example, property abutting S. R. 66 was zoned C-2 for commercial use.

However, considerable development occurred prior to zoning. Mill Creek State Mental Hospital, southwest of the site, is a major complex housing expensive therapeutic facilities. It was the state's first public mental hospital. Three new clinic-halfway houses were added to the campus in 1968--one for alcoholism, one for drug addiction and one exclusively for adolescent care. While location of this institution at a considerable distance from BIA would be desirable for county planning purposes, the two facilities have co-existed compatibly for two decades and state authorities see no hope of relocation in the immediate future. The state has recognized the importance of BIA expansion and has pledged not to develop additional facilities at Mill Creek. Correspondence from state and hospital officials is provided in Appendix E.

With the exception of the South Revere Park community on the airport's northeast border, all residential development occurred after BIA was an active commercial airport. South Revere was constructed as part of the original U. S. Army Air Corps Base to provide off-base housing. Subsequent development occurred in the 1950's and 1960's prior to county zoning controls. Prior to publication of the county master plan, consideration was given to down zoning these areas. However, the high degree of stability, cohesiveness and well-developed social infra-structures of these neighborhoods was felt to justify maintenance of residential zoning.

Planning officials believe that these neighborhoods have always and will continue to co-exist comfortably with airport activity.

Cyrus Pierce State Park lies west of S. R. 1 and the airport site. The size and physical layout of the park minimize conflicts with airport activity. A total of 6,000 acres are available for Park users. The boating lake, beach, recreation area and campsites are all over two miles away from existing runway 2-20. Present airport impact is limited to noise exposure within the campsite area from operations on the cross-wind runway. The Director of Pierce State Park was a member of the Airport Advisory Committee and has endorsed the proposed project as the most acceptable expansion alternative. A letter to this effect is found in the Appendix.

The northwest quadrant of the I-40/S. R. 1 interchange is zoned for light industrial development and is occupied by the 350-acre R & D Industrial Park. The Park presently includes twenty research-oriented and light manufacturing facilities employing an estimated 3,000 persons. The Boone County Master Plan calls for further commercial and light industrial development along the S. R. 1 and I-40 corridors.

Land east of S. R. 102 and south of I-40 is largely unoccupied or cultivated for agricultural purposes and carries an agricultural zoning classification.

There are several elementary and secondary schools in the study area. The Nathan Hale Elementary School is located in the Nathan Hills Community southeast of the airport site. Jefferson Elementary and Paul Revere Junior High are located in North Revere Park. The State University at Carrollton and Carrollton Community College are located further to the north within the Carrollton city limits. Existing airport activities have no impact on local schools.

Only one historic site, the General Boone House, lies within the study area - on S. R. 102 in North Revere. Finally, there are three churches--the First Baptist in South Revere Park; Redeemer Episcopal and St. Elizabeth Catherine Seton Catholic Church in North Revere.

Land use in Cooper County within the airport's influence area is largely agricultural. A newly constructed regional shopping center and isolated small commercial structures along S. R. 66 represent the only significant development at this time. Hopkins Medical Research Center and its affiliated hospitals (St. Luke, Federalsburg General and Veterans Retreat) are all over nine miles from BIA and well outside existing and proposed noise contours.

Residential development is gradually spreading north and east from the Federalsburg CBD. A 1,000 unit garden apartment and high-rise subdivision, in the southwest quadrant of the Evergreen Road/S. R. 102 intersection, eight miles southwest of the Airport site represents the closest residential development in Cooper County.

IMPACT OF THE PROPOSED PROJECT

The project will require the acquisition of housing from the South Revere Park and Nathan Hills communities and bring new areas of North Revere Park within the 30 NEF contour.

Community involvement has resulted in ameliorative provisions which should reinforce neighborhood stability. These include:

- Traffic control procedures which will establish a flightpath from the proposed runway over a largely unoccupied area between North and South Revere, thereby diminishing noise impact on residences.

- Relocation of all displaced South Revere families within the South Revere community through the provision of Last Resort Housing.

- Funds received from property acquisition may be used toward the construction of a new First Baptist church and community center complex in South Revere. This institution is the focal point of South Revere's social as well as spiritual life and the new facility will reinforce community stability.

Zoning ordinances and existing land use will govern future development patterns bordering the site. Correspondence from the Directors of Pierce State Park and Mill Creek Hospital document their support of the project.

In conformance with provisions of the 1970 Airport and Airway Development Act (as amended), land use control assurances or airport zoning should be enacted, to the extent reasonable, to restrict land uses in the

vicinity of the airport to those activities compatible with airport operations. The counties have pledged to enact zoning, and correspondence to this effect is provided in Appendix E. Most important, the need to create airport zoning should stimulate good planning and expedite controls for all property within the study area. Due to its present undeveloped nature Cooper County has the chance to prevent incompatible development and open lucrative areas for off-site support industry.

Consideration should be given to zoning all property abutting S. R. 66 for commercial and light industrial development. This will facilitate use for highly compatible airport support services such as motels, off-site rental car maintenance, in-flight catering and terminal food processing and warehousing. Utilities to support this type of development are available without costly extension and construction of these facilities will provide new jobs and expand the county's commercial-industrial tax base.

Thus, airport expansion represents a positive catalyst to stimulate intelligent planning and zoning in Cooper County. Further, the project can induce compatible development which will create new jobs and generate an increased, balanced tax base.

VEGETATION AND WILDLIFE

Existing Conditions

The project's impact on the surrounding area's ecology was determined by establishing an approximately 7,000-acre study area surrounding the existing airport site. The study area is bounded on the north by I-40, on the east by the overhead power transmission line, on the south by S. R. 66 and on the west by S. R. 1. Cyrus Pierce State Park, west of S. R. 1, has been excluded from the study area because the proposed project will not alter Park vegetation and inclusion of the Park's extensive woodlands would have distorted study findings by showing a negligible impact on the overall regional inventory of natural vegetation.

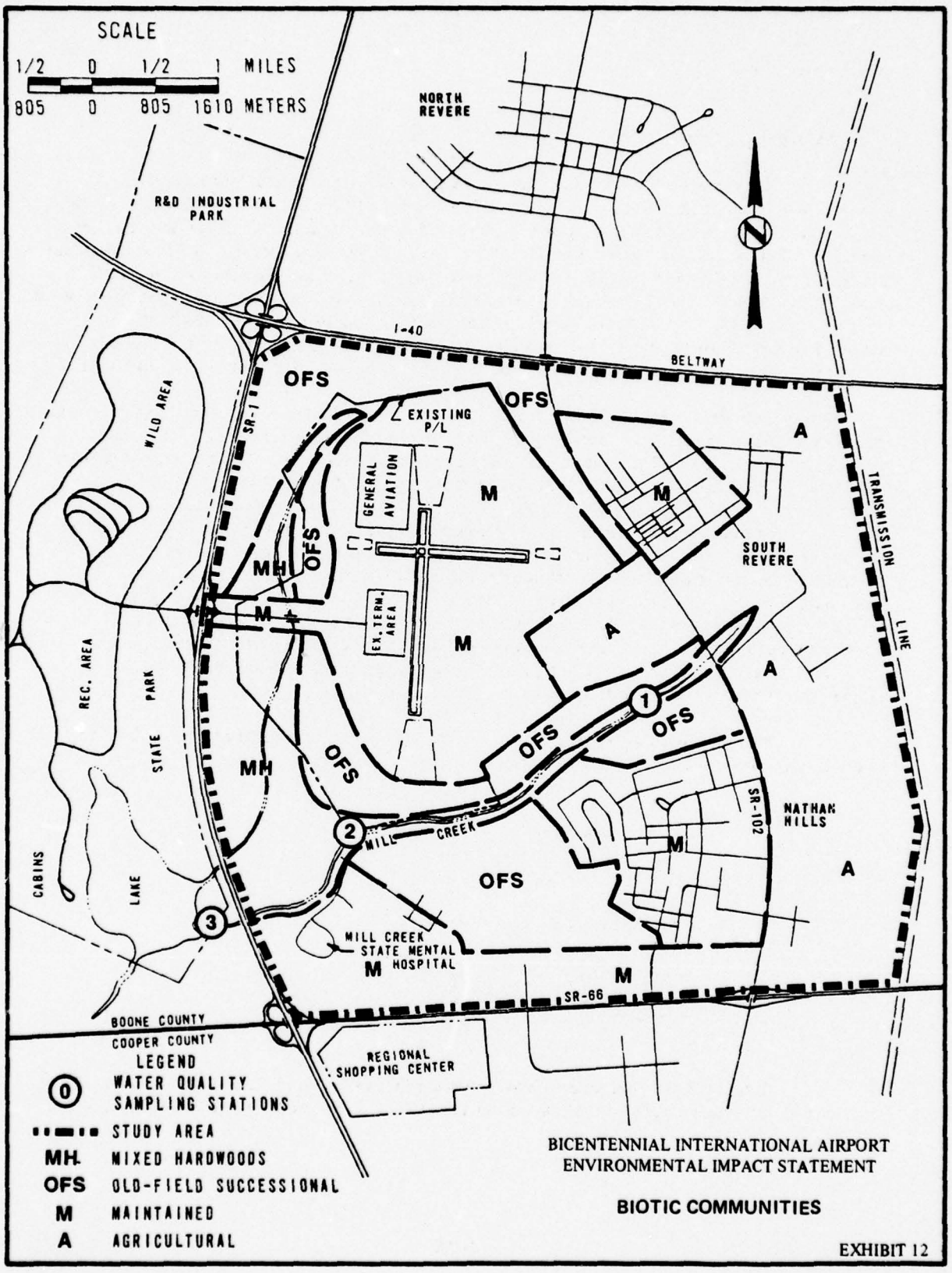
Two streams cross the study area. Mill Creek flows from east to west along the southern portion of the project site, draining to the lake in Pierce Park. Gordon's Run flows from north to south along the western portion of the airport site before entering the State Park.

Aerial photography at a scale of 1-inch = 1,000 feet for stereo interpretation and at 1-inch = 400 feet enlargements was employed to delineate vegetation associations within the study area. Wildlife inventories typical to the region and study area habitat were obtained from the State Department of Natural Resources and the State Chapter of the Audobon Society. These are listed in Appendix B. Field reconnaissance provided verification of photographic findings and actual observance of wildlife species or their traces.

Five major vegetation types or biotic communities were identified within the study area. These are:

- Mixed Hardwoods
- Old Field Successional
- Agricultural
- Maintained
- Stream

Exhibit 12 locates these communities within the study area. The principal characteristics of each vegetation type are summarized below.



BICENTENNIAL INTERNATIONAL AIRPORT
ENVIRONMENTAL IMPACT STATEMENT

BIOTIC COMMUNITIES

EXHIBIT 12

Mixed Hardwoods

Approximately 1,200 acres of mixed hardwoods occur within the study area, primarily concentrated on the western perimeter with a small ribbon-like band following the Mill Creek floodplain.

Characteristic tree species found here include sycamore, silver maple, black willow, red elm and wild cherry. Understory species are those which do not usually reach the stature of canopy trees. Typical understory species in this community include flowering dogwood, redbud, hornbeam, sourwood and devil's walking stick. Woody vines occur throughout the forest strata. Those most frequent are yellow jasmine, poison ivy, sawbriar, muscadine and coral honeysuckle. Shrub and herb species also occur, principally strawberry bush and vibernum species.

Support is available for only a small number of vertebrates. Raccoon, oppossum, wood mice, grey and red squirrel species can be found here as residents but none are abundant.

There is some evidence that whitetail deer occasionally pass through these strips of woodland. However, field reconnaissance disclosed no evidence of permanent residence or adequate habitat to support a large deer population.

Old Field Successional Communities

The 2,000 acres of old field successional community generally borders the existing airport site and represents abandoned farmland in early stages of succession.

Goldenrod, sedges, grasses, asters, ragweed, clovers and other herbaceous plants are dominant while blackberry is found in scattered sections typifying invading woody species.

The area provides moderate habitat for such herbivores as the cottontail rabbit and meadow vole. It does not, however, provide suitable cover for whitetail deer passing through the area enroute to bordering mixed hardwood communities.

Maintained Areas

Maintained areas indicate communities kept at a constant phase of successional development due to the intervention of man.

The approximately 3,200 acres of maintained area within the study area include airport clear zones, the power line corridor, lawns and landscaped areas surrounding private residences and other building sites, roadway easements, paved highways, runways, taxiways, aprons, etc.

Residential properties, roadsides and most of the existing airport property are controlled by mechanical mowing and pruning. Shrubs and trees in the residential areas were either planted, or, in the case of mature specimens, left when the original community was developed. Herbaceous vegetation includes cultivated grasses, tolerant invasion species and ornamental species used to enhance landscaping.

Maintained communities are the dominant cover type in the study area. Yet this community provides little or no suitable breeding, feeding or cover habitat for wildlife.

Agricultural Communities

A total of 558 acres of periodically cultivated fields or pasture primarily occur within the eastern section of the study area. Most tilled fields contain homogeneous populations of cultigens during the growing season. These cultigens may vary from year to year depending on agricultural practices.

The fairly intense level of agricultural practices minimizes this area's value as habitat. No hedgerow exist within the study area and annual cutting or cropping eliminates cover during the winter months. The agricultural lands in the study area represent less than five percent of the two counties' total farmland. None of the farmland in the study is classified as prime or unique farmland.

Stream Communities

Mill Creek and Gordon's Run flow through the project area. According to State Department of Natural Resources records, the stream does support populations of fish species common to the area. During field reconnaissance, it was observed that the water was clear and generally fit for aquatic invertebrates although no survey or sampling of aquatic invertebrates was conducted. Green frogs (Rana clamitans), leopard frogs (Rana pipens) and raccoon tracts were observed along the stream.

A listing of fish sampled by the state from Cyrus Pierce State Park and site streams prior to entry to the Park's lake is provided in Appendix B.

Project Impact on Study Area Vegetation

Table 7 summarizes alteration in biotic communities anticipated to result from the project.

Table 7

Vegetation Alteration Resulting From BIA Expansion

Vegetation Type	*Existing Area (Acres)*	*Alteration (Acres)*	*Post-Project Area (Acres)*	*Percent Change*
Mixed Hardwoods	1,174	- 78	1,096	- 6%
Old Field Successional	1,998	-449	1,549	-22%
Maintained	3,214	+783	3,997	+24%
Agricultural	558	-256	302	-46%
Total	6,944	0	6,944	

As can be seen from Table 7, the greatest gross loss occurs in old field successional communities. The greatest percent loss occurs with the agricultural fields. However, mixed hardwood communities, which are the best wildlife habitat show the least loss. No physical alteration will occur to the on-site streams due to the project.

From the broader perspective of the regional biotic community inventory, vegetation taken for project development constitutes a negligible loss. Pierce State Park has almost 6,000 acres of woodland and water communities. Old field successional communities are common place in the urbanizing outlying areas of greater Carrollton and Federalsburg--and large agricultural tracts extend east to the Jefferson Mountains.

Impact on Wildlife and Endangered Species

The small amount of marginal habitat removed by the project will displace the very small number of resident small mammals, reptiles and

birds supported within the study area. A complete listing based on literature search of typical birds, mammals, reptiles, amphibian and fish typical to the area is provided in Appendix B.

Most of the displaced types are hardy individuals used to coexisting within a man-influenced region and may be able to relocate. While the abundant adjacent habitat of Pierce State Park and of future runway clear zones could absorb some of the displaced species, a net reduction in area wildlife population is expected to occur.

No endangered species of flora or fauna were reported to exist in the study area nor observed during field reconnaissance.

While not on the endangered species list, the remnant whitetail deer, using the study area as part of their home range, are a matter of concern. These animals are increasingly victimized by urbanization and, therefore, special measures have been provided for their protection.

Consultation with State Game Biologists resulted in the estimate of five to eight deer in the study area. State Game personnel have agreed to remove these individuals to a remote area where no overcrowding or mortality is anticipated to result. The Airport Authority has agreed to cooperate in this operation.

Aquatic communities may suffer temporary disruption during the construction period as a result of increased stream turbidities from sediment runoff. Erosion and sedimentation controls planned for the project should minimize dislocation and mortality. With the termination of construction operations, the installation of permanent water quality and erosion controls, paving, and the planting of cover, stream turbidities should rapidly be restored to pre-construction levels.

Consequently, the project's impact on regional flora and fauna should be temporary and minimal. Ameliorative measures will minimize mortality.

WATER RESOURCES - WATER QUALITY

Existing Conditions

The expansion site includes two streams, Mill Creek and Gordon's Run, both draining to the lake in Cyrus Pierce State Park. As indicated in Exhibit 12, Gordon's Run crosses the western perimeter of the present site, originating slightly north of the General Aviation facility and flowing south-southwest to its terminus in the Park Lake. Mill Creek originates east of S. R. 102 and flows southwest along the southern border of the existing airport property to its terminus in the Park Lake. Both streams receive airport runoff and their quality influences the quality of Pierce Park's Lake. Since the Park Lake is used for swimming as well as boating, its water must meet the State's highest standard (Class I) for human contact recreation.

The State Department of Natural Resources maintains a single sampling station on Mill Creek, west of S. R. 1 prior to the watercourse's entry into the Pierce Park Lake. As a primary feeder for the Park Lake, Mill Creek is also designated as a Class I Water and therefore subject to the State's Water Contact Recreation and Aquatic Life Class I Standards. Specific criteria for Class I Standards are given in Appendix B. According to data obtained from the State monitoring program over the last five years water quality in Mill Creek has continuously been within acceptable limits for Class I Waters.

Gordon's Run was not monitored by the State since a sampling station is located on Pierce Lake immediately north of the Gordon Run confluence. Monitoring data from this station also indicates all test parameters are within the Class I criteria.

Both streams support some aquatic life. Since Mill Creek would be impacted by project construction in the new runway 2-20 clear zone, additional monitoring was conducted during the environmental study period to provide detailed information on the stream's existing condition.

Three sampling stations were selected. Station 1 was located upstream, slightly northeast, of the proposed construction area. Station 2 was southwest of the proposed construction site. Station 3 was due west of S. R. 1, the same station used by the State in their continuous sampling program. The station locations are shown in Exhibit 12.

Monitoring continued for a two month period, March-April 1975, with samples obtained on a weekly basis. Parameters studied were:

- Dissolved Oxygen
- pH
- Water Temperature
- Turbidity

Bacteriological samples were collected and analyzed for the first, fourth, and seventh weeks of the sampling period. Monitoring results are presented in Appendix B. All findings confirmed state data that Mill Creek water quality was acceptable and within Class I criteria.

Impact of the Proposed Project

Both project construction and operation pose hazards to receiving stream quality. Potential impacts and planned ameliorative measures for each period are summarized below.

Temporary Construction Hazards

Clearing and excavation during construction will cause sedimentation hazards which will result in a temporary increase in Mill Creek turbidity. The following ameliorative actions are planned to minimize this construction impact.

- Continuous monitoring of Mill Creek during construction to assure proposed controls are effectively limiting sedimentation.
- Extensive temporary erosion controls to minimize sedimentation hazards. Specific provisions include ponding, sediment traps, slope drains, diversion ditches, and temporary ground cover.

The sedimentation hazard will be greatest during the construction period when excavated soils are exposed prior to paving or the planting of permanent cover. Even with the extensive erosion controls planned for the project, a slight increase in Mill Creek turbidity is expected. Continuous monitoring will assure that levels do not exceed acceptable limits. Should parameters be exceeded, construction operations will be altered, based on

the implementation of even more stringent measures. However, it is emphasized that large scale sedimentation detrimental to aquatic invertebrates and fish is not anticipated, and increased turbidity is expected to steadily diminish as permanent erosion controls are installed and excavated areas are paved or planted with cover.

Permanent Operation Hazards

The disposal of aircraft-oriented wastes represents the primary threat to water quality. Petroleum spills or wastes are a principal concern. These can occur in the following ways:

- Leaks and spills from tank trucks and hoses in apron service areas;
- Leaks and spills in hangar and apron areas where repairs and maintenance operations are conducted.
- Leaks, spills and ruptures around fuel storage areas above and below ground;
- Accidental spills and ruptures of fuel and oil from trucks and aircraft.

The most efficient method of treating petroleum wastes is containment at the source, before they spread or become diluted in storm water runoff. In most cases, quantities are small and removal can be achieved by absorbent chemicals or mechanical means.

Leaks and spills occurring from tank service trucks on apron service areas, will be contained through the use of absorbents. A storage area for petroleum absorbent material will be provided in order to be readily available for this use. The resulting solid mass will be shoveled and swept into containers for solid waste disposal.

Apron service areas will be constructed to manage spills and to preclude storm water runoff from adjacent areas entering the apron area. Apron drainage outfalls near the edge of the apron will contain oil separators to trap all residue oils and fuels not absorbed by petroleum absorbents from spills occurring just before or during a rainfall. Oil collected by separators will be pumped into salvage vehicles on a regular basis.

New hangars and aprons used for repairs and maintenance of aircraft will be constructed to contain wastes from routine aircraft maintenance and cleaning. These wastes contain grease, oils, some heavy metals, strong detergents and sediments. Every effort will be made to contain heavy metals at each source, to be disposed of in solid waste containers.

Underground fuel tanks will be constructed of coated metal designed to prevent corrosive type leaks that account for the many occasions that fuels find their way into sanitary and storm drains.

In order to prevent fuel spills from entering receiving waters, an interceptor system similar to that existing with catch basins will be constructed for each new drainage area with spill potential. Flow from the interceptor will be to the holding ponds which will be equipped with emergency gates to contain spills.

Sanitary wastes from the expanded terminal building and wastes pumped from air carriers will be carried via the project's sanitary sewer system to the on-site interim treatment plant which presently provides secondary treatment. As part of project expansion, plant capacity will be increased and upgraded to provide tertiary treatment. Further, treated effluent is not discharged on-site but transmitted via underground pipes to a discharge point on Tonytank Creek, a tributary of the Niomi River. This provision protects water quality of on-site streams and Pierce Park's Lake. The entire on-site/off-site wastewater collection, treatment, transmission system is sized to accommodate the projected increased demand resulting from airport expansion. Thus, no surcharges or overflows should occur which might affect Mill Creek or Gordon's Run. The site area is within the Carrollton Municipal District's 1980 Sanitary Sewer Expansion Program. When connection with the municipal system is permitted, on-site interim tertiary treatment operations will be terminated.

Solid waste disposal impact on water quality was also investigated. All site-generated solid waste will be transported by a licensed private contractor to a County-regulated landfill off-site. Consequently, the project poses no runoff or leachate hazards to local surface streams or groundwater systems.

Summary

With the exception of a temporary increase in Mill Creek turbities during construction, the project represents no hazard to water quality in Mill Creek, Gordon's Run or the lake in Pierce Park. Extensive

erosion controls and monitoring will assure that increased turbidities during construction are not detrimental to aquatic life or recreational use of the Park Lake.

Multiple safeguards are provided within the project to protect on-site streams and off-site receiving waters from pollution due to routine operations and accidental or emergency spills. Sanitary wastes will be subject to tertiary treatment and treated effluent discharged in Tonytank Creek so as not to impact on-site Class I waters. Solid waste will be disposed of in off-site county-regulated landfills.

WATER RESOURCES - HYDROLOGY

Existing Conditions

The existing Bicentennial Airport area - approximately 4,400 acres - is located on a plateau bordered by Mill Creek to the south and Gordon's Run to the west both within the Tonytank Creek Watershed. Gordon's Run originates on the airport property and flows southerly passing under the airport entrance road in a twin 12' x 8' box culvert. The stream then turns southwesterly until it passes under S. R. 1 via a twin 11' x 10' box culvert and enters Pierce Park Lake. Mill Creek originates south of South Revere Park and east of S. R. 102, flowing generally southwest along the southern border of the airport property. Mill Creek also passes under S. R. 1 via a twin 15' x 10' box culvert before entering Pierce Park Lake. From the Lake, the flow into Tonytank Creek continues southwesterly for about four miles before reaching a confluence with the Niomi River.

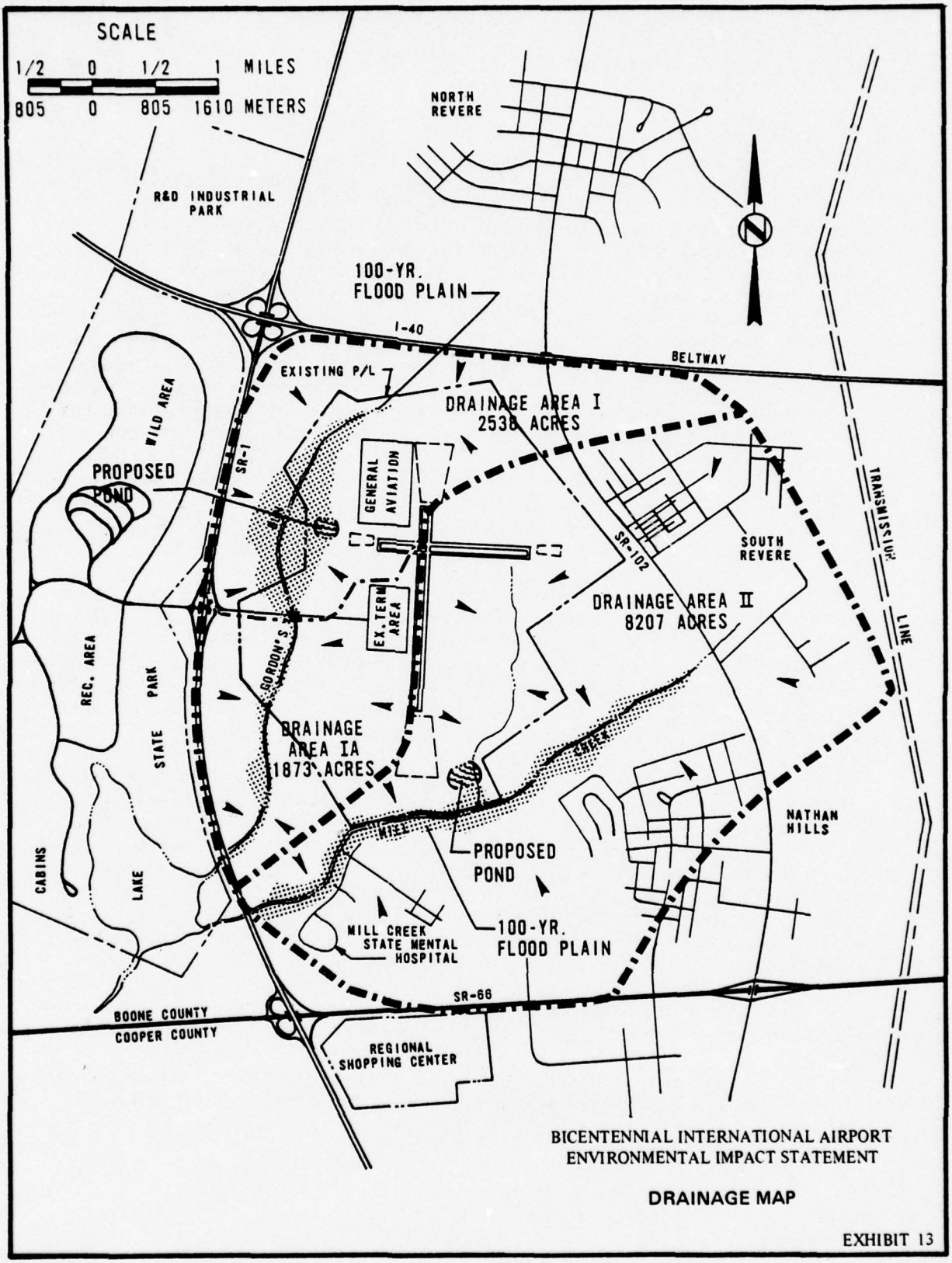
Rainfall statistics for the area show that the mean annual rainfall is 46.21 inches. However, annual rainfall has varied from 30.13 inches to 65.12 inches over the past 40 years. The maximum 24-hour rainfall recorded is 6.67 inches, which occurred in October, 1930.

Existing storm drain runoff facilities at Bicentennial Airport consist of three major systems and several smaller isolated sub-systems. Exhibit 13 provides a drainage map of the area. The first major drainage system is located west of and parallel to runway 2-20 between the taxiway and the runway and also serves the existing terminal building area. This system consists of a network of inlets and pipes which outlet into Gordon's Run by way of an existing 30-inch storm sewer.

The second major system consists of a network of inlets and storm sewers located throughout the General Aviation area and also serves the northern end of runway 2-20. This system also discharges by way of a 30-inch pipe into Gordon's Run. The third major system consists of a network of inlets and sewers between runway 11-29 and the parallel taxiway. This system discharges by means of a 24-inch outfall to a drainage swale along the eastern property line of the airport to Mill Creek. The underdrain system for the runways are connected to these three major storm sewer networks.

All of the existing drainage facilities, on-site were designed for a five-year storm (in accordance with FAA Circular No. AC150/5320-5B).

There are no retention ponds presently existing on the airport site. The twin box culverts under the airport entrance road and S. R. 1



BICENTENNIAL INTERNATIONAL AIRPORT
ENVIRONMENTAL IMPACT STATEMENT

DRAINAGE MAP

EXHIBIT 13

were designed by the State Highway Administration to handle a 10-year storm with no surcharge and checked for a 50-year storm with a maximum of two feet of surcharge at the culvert entrance.

Project Evaluation

The hydrology of the project vicinity was fully investigated as referenced below and major drainage areas identified. These drainage areas are directed to Mill Creek and Gordon's Run. Both eventually flow into Tonytank Creek and are part of the Tonytank Creek Watershed. In 1972, a Watershed Work Plan was developed to control damages to agricultural areas along Tonytank Creek and its tributaries. The investigation as to the effect of the proposed airport improvements on a segment of this plan was a major part of the hydrological investigation performed for this report.

Sources of information for the hydrologic study included local climatological data recorded by the U. S. Weather Bureau[1], reports of the U. S. Geological Survey[2], and floodplain studies of the Tonytank Creek Watershed conducted by the Corps of Engineers[3].

In addition to the analysis of the above information, studies were also made of the individual drainage basins to include a field survey of existing facilities. Studies of topographic maps, aerial photography and analysis of soil survey information were made in order to ascertain the general characteristics of each major watercourse.

Flows from the drainage area were calculated by the Rational Formula. Using this method, the expected flow (Q) is obtained by multiplying the coefficient of runoff (c) by the rainfall intensity (i) in inches per hour, for the desired frequency storm, and then multiplying their product by the drainage area (a) in acres.

---

[1] 1973 Local Climatological Data - Annual Summary with Comparative Data - Boone County, Northeast America - U. S. Department of Commerce.

[2] 1972 Water Resources Data for Northeast America (Parts 1, and 2) - U. S. Department of the Interior - Geological Survey.

[3] Floodplain Evaluation Study for the Tonytank Creek Watershed in Boone and Cooper Counties, Northeast America, Corps of Engineers, 1972.

Project Impact

The construction of additional runway facilities and new Terminal Area under the project Alternative will effect a change in the rate of rainfall runoff for the project area. The coefficient of runoff (c) used as described above will increase; and in some cases the times of concentration will be reduced. The reduced time of concentration will produce a greater design rainfall intensity for the same recurrence interval. The net effect of these changes, without control, would be an increase in the quantity of flow in cubic feet per second (cfs) in Mill Creek. Without additional controls, Gordon's Run will not experience a change in flow volume. A comparative analysis of the effect of increased runoff on the quantities of flow for the project is presented in Table 8.

Examination of the aforementioned table reveals a net increase of 8.5 percent in runoff over the area for a 100-year storm. The increase in discharge of storm drainage to Mill Creek, with no control, will be about 19 percent. Due to modification of the collection system, as described below, the discharge of storm runoff into Gordon's Run will actually be reduced by about seven percent.

The additional area to be cleared or altered for the project alternative is estimated to be about 700 acres.

The change in coefficient of runoff will vary from 0.25 for areas that are presently wooded and heavily vegetated to 0.90 when the same areas become part of the paved runways or taxiways. For the composite area, the weighted coefficient of runoff will change from 0.35 to 0.40. The time of concentration for the various areas are estimated to vary from one-hour and 40 minutes to two hours and 45 minutes.

Drainage facilities planned in connection with the airport improvements will be designed on the basis of these higher values. One such improvement will involve the removal of the existing drainage swale presently paralleling the eastern property line. This swale will be occupied by the new runway with additional inlets and storm sewer system used to provide drainage in the area of the proposed terminal and new runway 2R-20L. In order to reduce peak off-site flows and help prevent degradation of off-site water quality, a 14-acre pond and a five-acre storage/holding pond will be constructed near the southern and western boundaries of the property, respectively. In addition, runoff from the southern end of existing runway 2L-20R, presently flowing directly into Gordon's Run, will be redirected by a new pipe system to outfall into the southern retention pond before entering Mill Creek.

Table 8

Peak Flood Flows
(cfs)

Watercourse	Drainage Area (Acres)	Existing			After Project Development Without Retention Ponds		
		Q10	Q50	Q100	Q10	Q50	Q100
Gordon's Run Above Airport Entrance Road	2,538	1,421	1,821	1,954	1,421	1,821	1,954
Gordon's Run	4,411	1,930	2,316	2,625			
Above S. R. 1	4,090				1,789	2,147	2,434
Mill Creek	8,207	2,585	3,734	4,021			
Above S. R. 1	8,528				3,070	4,435	4,776
Total Area and Peak Flows	12,618	4,515	6,050	6,646	4,859	6,582	7,210

Flow from the General Aviation area presently draining directly into Gordon's Run will empty into the five-acre retention pond before release.

The proposed five-acre pond, which receives drainage from an area of 127 acres, will have a storage capacity of approximately 40-acre-feet with flow controlled by a six-foot weir.

The proposed 14-acre pond, draining an area of 506 acres, will have a storage capacity of approximately 70-acre-feet and will have flow controlled by a 12-foot weir.

To halt flow in the advent of a spill of oil or other contaminant, a roll gate approximately one-foot high, seated against the upstream face of the weir structure, is provided at both pond locations.

These changes and/or additions have been coordinated with the Corps of Engineers design of the Watershed Work Plan and in consideration of the quality of discharge leaving the site.

FLOOD HAZARD EVALUATION

According to information obtained from the District office of the Corps of Engineers and the U. S. Soil Conservation Service, Gordon's Run is very susceptible to flooding during peak rainfall periods. This is mainly due to the fact that the channel of the Run itself is not deep and generally has very wide over bank areas which causes periods of high flow to inundate areas both to the east and west of its main channel. As the Run approaches the airport entrance road from the north the channel has been improved so as to direct the flows into the existing twin box culvert. South of the airport entrance road, the channel is sufficiently deep, except in two small areas, to retain 100-year peak flows within its banks. The two areas referred to above flood an area to the west about 500 feet beyond the top of the banks but do no damage to the primarily wooded area.

Mill Creek, like the northern reaches of Gordon's Run, is susceptible to overflowing its banks in various areas throughout its length. However, these areas are confined to undeveloped lands controlled by airport zoning.

In 1972, the District Corps of Engineers, the Niomi River Soil and Water Conservation Authority (NRSWCA) and the County Commissioner of both Cooper and Boone Counties developed, as part of a regional flood evaluation study, the Tonytank Creek Watershed Work Plan.

This plan was developed to control damages due to flooding in the agricultural areas bordering Tonytank Creek and its tributaries. The watershed itself contains about 85,376 acres or 133.4 square miles of area and extends through both Boone and Cooper County. At present, the plan is in the process of being finalized to include not only the main branch of Tonytank Creek and the lower tributaries, but also Pierce Park Lake and the two tributaries near the Airport, Gordon's Run and Mill Creek.

In analyzing historical rainfall information for the watershed, the Corps of Engineers have determined that design for flood control structures should be based on a 100-year recurrence interval. Using this criteria, the Corps of Engineers have recommended construction of numerous flood control structures throughout the watershed area.

One structure, in particular, will be affected by the proposed airport improvements. This is Dam No. 6 at the discharge point from Pierce Park Lake. The structure is planned to control flow from a drainage area of 16,480 acres. Its spillway elevation would be 310.6 and the spillway structure would have a width of approximately 85 feet. The normal pool elevation has been established at 298.6.

Project Impact

As shown in the Hydrology section, peak 100-year flows from the drainage areas above S. R. 1 will increase 8.5 percent after development of the project without any on-site controls. In coordinating the results of the hydrologic study for the project with the Corps of Engineers and the Niomi River Soil and Water Conservation Authority, it was agreed that retention ponds would be constructed on-site by the Airport Authority to limit post development 50-year peak flows to predevelopment levels. Therefore the project includes two retention ponds. Although only one pond is necessary for peak flow retention, both ponds will play an important part in preventing pollution of Gordon's Run and Mill Creek by providing an opportunity for all airport runoff to be subject to settlement.

Since the project alternative is not affected by the flooding of either Gordon's Run or Mill Creek, coupled with the fact that the areas prone to flooding are protected by Special Airport Zoning, no modifications are planned for the two creeks, except the construction of the retention ponds as previously noted.

DIRECT SOCIOECONOMIC IMPACTS

General Considerations

Socioeconomic impacts encompass a broad range of considerations which cumulatively influence a community's quality of life. Social considerations alone cover all facilities and amenities which give a community its character and identity. These include housing type and mix; transportation patterns; esthetics; parks and recreation areas; schools; churches; shopping centers, etc.

Economic considerations include housing costs and employment opportunities in the private sector and increased revenue opportunities in the public sector.

Expansion of BIA will positively improve socioeconomic conditions throughout its service area. However, the project will most immediately affect communities bordering the airport site and the economy of Boone and Cooper Counties. This section focuses on direct socioeconomic impacts resulting from the project while the following section reviews the more diffuse long-term indirect benefits to the region.

Direct impacts are diverse. Thus, for the sake of clarity, this section separates social and economic considerations. Social factors include the project's impact on housing, institutions, parks and neighborhood stability. Economic factors follow, focusing on the project's impact on the private and public sectors of the economy.

A separate discussion of public utilities and services is provided in a subsequent section of this statement.

Existing Social/Community Conditions

Three specific neighborhoods border the project site. These are identified in Exhibit 2. The principal characteristics of each community are summarized below.

Nathan Hills

This neighborhood lies southeast of the present airport property, and is bordered on the north by the Mill Creek floodplain and on the east by S. R. 102. Open space lies between the neighborhood community and Mill Creek State Mental Hospital to the west, with commercial properties on S. R. 66 to the south.

Nathan Hills is a middle to upper-middle income, predominantly white, neighborhood. Housing in Nathan Hills was constructed in the early 1960's to accommodate the influx of young families affected by the area's expanding R & D industries, particularly those employed at R & D Industrial Park. Residents are in the 25-40 year old range. Most families have young children who attend Nathan Hale Elementary School, located at the subdivision's southeast corner near S. R. 102.

South Revere Park

This low income, predominantly black and spanish-speaking neighborhood lies northeast of the airport property, immediately east of S. R. 102. Although homes in this neighborhood are much older and less expensive than those in Nathan Hill to the south, the neighborhood is fairly stable, due in some part to the spiritual-social functions centered around the First Baptist Church. In contrast to its neighborhing subdivisions, South Revere Park has a large elderly population.

North Revere Park

This community borders S. R. 102, north of I-40, three miles north of the present airport site. This relatively large, highly stable middle income community is supported by a well-developed infrastructure including a commercial shopping plaza, elementary and junior high schools, and the newly constructed Saint Seton's Catholic Church. While some older housing dates back to World War II, the neighborhood is predominantly comprised of single unit and garden apartment subdivisions constructed during the 1960's.

Housing Impact

Expansion of BIA will require the relocation of 130 families from the area to be acquired--100 from South Revere Park and 30 from Nathan Hills (See Exhibits 3 and 9). Detailed study was made of displaced families and meetings were held for all affected in their respective communities. Results of relocation study efforts are described below.

South Revere Park

General Characteristics: Only 10 percent of the displaced families are elderly. The balance are middle aged couples with one or two children. Approximately fifty elementary school children are affected, and

all presently attend Jefferson Elementary School in North Revere. An additional 25 children of displaced families attend Paul Revere Junior High. The County Board of Education provides bus transportation for all children not within walking distance of their designated school.

Income Characteristics: All displaced families have incomes above the poverty level. The mean annual income in South Revere is $8,400.

Employment Characteristics: Nearly 85 percent of the working heads-of-households to be relocated are employed as semi-skilled workers at the R & D Industrial Park, located in the northwest quadrant of the I-40/S. R. 1 interchange. Most are not union members, working as custodians, junior level technicians, or metal fabricators in prototype shops. The remaining 15 percent are employed as teachers, professional or municipal workers.

In addition, there is a high rate of secondary employment with many secondary wage earners working full-time either at the BIA terminal or as service and clerical workers at R & D Industrial Park.

Property Values: Housing in South Revere Park was constructed in the 1940's to provide off-base housing for non-commissioned officers and their families at a time when BIA was a military facility. With the curtailment of military operations, housing became increasingly occupied by employees of the new commercial/general aviation airport. However, it was the opening of R & D Industrial Park in the late 1950's that provided the necessary catalyst to keep the neighborhood fully occupied.

Housing values range from a low of $4,500 for unrehabilitated World War II cottages to a high of $16,000 for recently renovated homes. Virtually all of the residents are homeowners.

Relocation Assistance Program

The Airport Authority initiated meetings with relocated homeowners to furnish information concerning their rights under the 1970 Uniform Housing Act and to learn their preferences for "comparable" relocation housing.

The meetings brought out critical information which would never have been found from review of local housing data. Specific points raised at the meeting were:

- Although no public transit is available, a valuable private community transportation system exists within South Revere Park. Nearly 85 percent of South Revere Park residents work at the R & D Industrial Park and almost the same percentage either does not own or cannot afford to drive to work daily in the family automobile. Consequently, efforts sponsored by the Brotherhood of the First Baptist Church resulted in the purchase of three 51 seat buses from the Federal government's surplus inventory. The Brotherhood oversees maintenance and repair and workers share in the daily driving duties and contribute a nominal sum related to earnings for gas and maintenance.

  It is estimated that relocated workers, if no longer able to ride the community bus system, would incur at minimum an additional expense of $250 per year--presuming public transportation were available to them.

- Slightly over 25 percent and virtually all of the elderly relocated families are spanish-speaking and attend services at St. Seton Catholic Church in North Revere Park. Parishioners from South Revere represent approximately 25 percent of St. Seton's congregation and St. Seton's is the only Church in the region which offers services in English and Spanish as well as Latin. Thus, proximity to St. Seton's was extremely important to relocated Spanish families.

- Approximately 60 percent of relocated families worship at the First Baptist Church. The balance, about 15 percent, are black families, who worship at Redeemer Episcopal Church in North Revere, but have a social life concentrated around activities at First Baptist Church.

- The First Baptist Church will have to be relocated as part of BIA expansion. The congregation presently occupies a building formerly used as the Air Force Base's Interdenominational Chapel and intended only as a

temporary structure. The building long has been inadequate and the congregation has spent the last six years raising funds to construct a new church and community center complex. In 1970, the congregation purchased a site on the northeast perimeter of South Revere and to date have collected 75 percent of the funds necessary to construct the new church facility. Acquisition of the church for airport expansion will permit the congreation to commence construction ahead of schedule.

However, relocated residents desire to find housing in proximity to the church which is the center of community social life. In addition, to the bus service sponsored by the active Brotherhood, the church sponsors a local little league team, a ladies auxiliary, a Bible study group, a choir and choral concerts, Sunday night Gospel meetings, and Saturday night socials.

As a result of information brought forth at relocation meetings, the Authority recognized that no other neighborhood in the Carrollton metropolitan area could provide a "comparable" environment for relocated residents. The importance of the First Baptist and St. Seton Churches to the social as well as spiritual lives of relocated families virtually dictated replacement housing be found within the vicinity of South Revere Park.

The next task was to determine "comparable" housing requirements of dislocated families and compare this to the available housing supply in South Revere. Step-by-step details on this study process, performed in cooperation with the Boone County Office of Housing and Community Development, Division of Relocation Assistance, are found in Appendix D of this EIS. Study results and steps taken to accommodate all dislocated families within South Revere are summarized below:

- Even with the $15,000 provision to adjust between fair market value of displaced housing and actual purchase cost of comparable replacement housing, demand exceeded South Revere Park's supply by 19 units.

- The Airport Authority agreed to apply for Last Resort Housing for these 19 units.

- Of the 19 units, eight will be accommodated by renovation of available existing structures to bring them up to "comparable" standards.

- The balance, 11 three bedroom units, will be replaced by the erection of new units.

Thus, all dislocated families will be provided "comparable" replacement housing within the South Revere community in conformance with the Uniform Relocation and Real Property Acquisition Policies Act of 1970 as well as all state and local codes.

Nathan Hills

General Characteristics: The 30 families to be displaced in Nathan Hills include 20 couples without school age children. Of this total, 12 are in the older middle aged group whose children are married or attend college and eight are in the 20-30 years old age group with pre-school children or childless. The ten remaining families include 16 school age children. Of the 16, ten attend Nathan Hale Elementary School within the neighborhood and six attend Ethan Allen High School, located approximately one-half mile west of Pierce State Park.

Income Characteristics: Relocated families annual incomes range from a low of $18,000 to a high of $33,000 with the mean annual income being $26,500.

Employment Characteristics: All primary wage earners are employed in a professional or middle management capacity at R & D Industrial Park. Many working spouse's are also professional level employees. Approximately 50 percent of secondary wage earners are teachers in the Boone or Cooper County School system, 12 percent have professional or managerial positions at R & D Industrial Park, 18 percent work for State or County government, 15 percent are employed at the nearby regional shopping center and five percent are technicians at either Hopkins Medical Center or the Mill Creek Mental Hospital.

Property Values: Fair market value for homes taken by the project range from a low of $24,000 to a high of $62,500 with the mean being $36,000. All relocated families own or are buying their homes.

Relocation Assistance Program

Meetings with relocated families indicated that their primary concern was access to work.

The same steps to inventory need and supply taken for South Revere Park were applied to Nathan Hills. Details of the Nathan Hills analysis are also given in Appendix D. Results of the study showed a large surplus of available housing consistent with relocated Nathan Hills residents requirements.

General Neighborhood Impact

Increased noise exposure is the primary adverse off-site impact resulting from the project. This problem is covered in detail in the Noise Section earlier in this report. However, a few points merit reiteration.

- With the exception of South Revere Park, all residential development has occurred since BIA has been an active commercial carrier facility. However, the stability and desirability of the three neighborhoods testifies to the fact that homeowners are not discouraged by airport noise.

- All three neighborhoods already have noise levels influenced by BIA operations. Exhibit 6 illustrates existing noise exposure. The proposed project will increase noise exposure in the three communities (See Exhibit 9).

- Ameliorative traffic control procedures known as standard instrument departure (SID) procedures will permit aircraft taking off from new runway 2-20 to make a northeast right turn. This will focus maximum noise within the narrow unoccupied corridor between North and South

Revere Park. As a result, homes exposed to new noise have been kept to an absolute minimum.

Project construction will result in temporary disruption to homes on the western fringe of the South Revere and Nathan Hill communities. Every effort will be made to minimize and confine construction impact on the neighborhoods. Steps planned to ameliorate construction impact are listed in the Measures to Mitigate Impact and Construction Impact Sections of the EIS. The expansion of BIA will have some positive impacts.

Residents of Nathan Hills, South Revere Park and, to some extent, North Revere Park are largely employed at R & D Industrial Park. Sales volumes (thus profits and employee earnings) are anticipated to rise as a result of increased national and international access afforded by the project.

Residents of the entire region will benefit by the increased mobility resulting from airport expansion. Swift access should expand not only travel options but cultural/educational opportunities as a result of more direct flight service.

Additional social, cultural, educational benefits induced by the project's positive impact on the regional economy are discussed later in this section.

Impact on Institutions

Only one institution, the First Baptist Church, will require relocation. As previously noted, plans have long been underway to construct a new church and community center. The six year fund raising drive has netted 75 percent of the capital necessary for the new facility. Funds received from property acquisition should more than complete the balance of the construction budget.

Only one institution, Paul Revere Junior High School, will experience an alteration in existing noise levels. The traffic control procedures proposed should reduce the noise exposure of Revere Junior High to the NEF 30 level of exposure.

Nathan Hale Elementary School, Jefferson Elementary School, Ethan Allen High School, St. Seton's Church, and Mill Creek State Mental Hospital are all outside the project's 30 NEF contour.

Construction operations should be too distant to affect any institutions in the project area. Well in advance of the relocation of S. R. 102, the Airport Authority will notify the County School Board of detour and maintenance-of-traffic provisions to facilitate planning for new bus routes and pick-up points in the South Revere and Nathan Hills areas.

Existing Economic Conditions

There is a strong interrelationship between the private and public economy in the study area. Government is the principal employer in the Carrollton region, because Carrollton is the State Capitol. Because government is not subject to the strong fluctuations of the private marketplace, Carrollton's employment and economy are highly stable. With national 1975 unemployment averaging seven percent and major urban area unemployment exceeding 12 percent, Carrollton had an annual unemployment rate of only 3.9 percent. The overall private economy of Carrollton has continued to grow at a steady annual rate of five percent reflecting a combination of new R & D industrial influx and local commercial expansion.

Federalsburg, while presenting a less expansive profile, still has maintained a fairly stable posture without the support of major government employment. While the late 1960-early 1970's growth spurt has tapered off due to the national recession, major industries have maintained employment. However, unlike Carrollton, there has been no influx of new industry and construction starts in 1975 were down a dramatic 78 percent. As a result Federalsburg registered an average unemployment rate of 7.8 percent primarily composed of construction and construction-dependent type workers.

The public economy of both Boone and Cooper Counties are typically dependent on the property tax revenue base. In addition, both Counties benefit from revenues generated by BIA operations. In 1975, the Airport produced $15,251,000 in revenues. After deducting $3,156,350 for operating costs, this represented slightly over $12 million in net revenues accruing to the Airport Authority. Based on the original authorizing state legislation, year end profits after bond retirement revert to Boone and Cooper County on a 55-45 percent split. State credit bonds were retired in 1968 and since that time the counties have assumed control over the Airport Authority and BIA benefits and liabilities.

Impact on the Private Economy

Construction of BIA improvements will inject thousands of dollars into the region's lagging construction industry within a three year period. This one single public works project is of sufficient scope to reduce construction-related unemployment in the Federalsburg area by a sizable amount.

In addition, the completed facility will result in the creation of permanent full-time jobs in diversified fields ranging from highly skilled air traffic controllers to unskilled custodial service workers. This will be supplemented by the creation of spin-off jobs ranging from taxi/limousine maintenance repairmen to food service workers.

Impact on Public Economy

The primary sources of airport revenue are:

- Airfield Area Revenues
- Hangar and Building Area Revenues
- Terminal Area Revenues
- Systems and Services
- Concessions

Each primary source is discussed in Appendix D.

Table 9 shows revenue projections for the expanded BIA by five-year intervals and indicates total cumulative revenues for five-year periods.

Operating expenses are distributed among the following areas:

- Airfield Area
- Hangar and Building Area
- Terminal Area
- General and Administrative Expenses

Table 9

Projected Airport Revenues
(Dollars)

Sources of Operating Revenues	Year of Operation				
	1970	1975	1980	1985	1990
Airfield Area	970,800	1,385,750	1,787,000	2,178,300	2,561,800
Hanger and Building Area	582,450	828,000	1,079,900	1,332,950	1,591,600
Terminal Area	11,542,200	16,972,700	22,311,200	27,631,100	32,920,400
Systems and Services	82,550	110,250	135,600	159,250	181,700
Concessions	2,073,100	3,119,650	4,124,650	5,081,050	5,992,400
Total Revenues	15,251,100	22,416,350	29,436,350	36,382,650	43,247,900

Projected Total Cumulative Revenue
(From All Sources)
Received Over Intervals of Five Years
(Dollars)

Five Year Range			
1970-1974	1975-1979	1980-1984	1985-1989
90,586,000	126,121,750	161,074,350	195,643,750

Subcomponents for each are discussed in Appendix D. In addition, new facilities carry bond interest and retirement, generally extending over a twenty-year period.

Airport operating expenses are very sensitive to the variations in airport design. For this reason, the four individual areas of expense vary widely, and a separate estimating equation for each expense area has no really consistent meaning. To compensate for the wide variance within each separate expense category, the categories are summed to represent total operating expenses - and a single relationship is used to estimate expenses. In a manner which is identical to that for estimating operating revenues, total operating expenses are related to (a) annual numbers of passengers handled, and (b) total annual general aviation movements.

Table 10 shows the total annual operating expenses for Bicentennial International Airport.

Table 10

Projected Airport Expenses - All Sources
(Dollars)

Year of Operation				
1970	*1975*	*1980*	*1985*	*1990*
2,356,550	3,156,350	3,814,950	4,372,650	4,855,500

Projected Total Cumulative Expenses
(From All Sources)
Over Intervals of Five Years
(Dollars)

Five Year Range			
1970-1974	*1975-1979*	*1980-1984*	*1985-1989*
13,382,350	17,098,950	20,190,150	22,828,950

The total monies available for the Boone-Cooper County Region are the net excess of revenues over expenses. Table 11 shows the total money available to the Two-County Region over the five-year intervals of time between the indicated reference years.

Table 11

Cumulative Net Monies to Two-County Region Over Five Year Intervals (Dollars)

Five Year Range			
1970-1974	*1975-1979*	*1980-1984*	*1985-1989*
77,203,650	109,022,800	140,884,200	172,814,800

Since the Bicentennial International Airport is jointly owned by the counties, all net monies remain within the two-county area for distribution. Table 12 shows the total amount of money that each city and county will receive over the five-year period of time between each successive interval date.

SUMMARY

The project provides long-term positive benefits to the private and public economy.

While 130 families will have to be relocated, last resort housing provisions have been made to keep residents of South Revere within their tightly knit community.

Traffic control procedures will minimize noise impact on residential communities to the north.

Funds received as a result of property acquisition may permit construction of the new First Baptist Church and community building ahead of schedule.

Table 12

Total Monies Received by Jurisdiction
Over Five Year Intervals
(Dollars)

	Five Year Intervals			
Receiving Jurisdiction	*1970-1974*	*1975-1979*	*1980-1984*	*1985-1989*
Net to Region	77,203,650	109,022,800	140,884,200	172,814,800
Net to Boone County	42,462,000	59,962,550	77,486,300	95,048,150
Net to Carrollton	25,477,200	35,977,500	46,491,800	57,028,900
Net to Remainder	16,984,800	23,985,050	30,994,500	38,019,250
Net to Cooper County	34,741,650	49,060,250	63,397,900	77,766,650
Net to Federalsburg	29,182,990	41,210,600	53,254,250	65,324,000
Net to Remainder	5,558,660	7,849,650	10,143,650	12,442,650

Project construction will provide a desperately needed stimulus to the locally depressed construction industry. The completed project will create permanent new skilled and unskilled jobs. Boone County and Cooper County revenues will increase as a result of expanded Airport operations.

TRAFFIC AND SURFACE TRANSPORTATION

Introduction

Expansion of Bicentennial Airport will result in increased vehicular traffic on roads leading to the Airport and improvements will be required to accommodate anticipated volumes at a satisfactory level of service.

In order to determine necessary improvements, characteristics of the existing external highway network supporting the site were evaluated.

The State Highway Administration, located in Carrollton, provided traffic counts for each link in the network. These traffic counts were used to supplement the Regional Planning Council's 1975 Transportation Study.

Existing Conditions

Bicentennial International Airport is bounded on the north by Interstate 40 (I-40); on the south by State Route 16 (S. R. 66); on the east by State Route 102 (S. R. 102); and on the west by State Route 1 (S. R. 1). Characteristics of each of these bordering arteries are described below.

Interstate 40

Interstate 40 is a six-lane, controlled access, divided highway which serves as a beltway around the State Capital. I-40 provides access to the airport vicinity from points north, east and west. Exhibit 1 illustrates the Beltway's function in linking the airport area with points to the north.

During the evening peak hour, I-40 currently carries about 2,850 vehicles eastbound and 2,000 vehicles westbound. At present volumes of peak hour traffic, I-40 operates at level of service "B" (stable flow - higher speed range). The interchange connecting I-40 and S. R. 1 provides service at level "C" (stable flow) on all ramps except that which channels southbound S. R. 1 traffic onto the eastbound lanes of I-40. The eastbound ramp breaks down when workers return home from Carrollton in the evening. Improvements for the I-40/S. R. 1 interchange are scheduled in the State Highway Administration's 1975-1980 capital budget. These will upgrade the interchange to accommodate existing and projected levels of traffic.

In the absence of airport development, projected increases in economic activity alone are expected to cause a 12 percent increase in peak hour traffic volumes along I-40 by 1990. At 50 percent capacity, the roadway will still maintain a level of service "C" or better. Mean operating speeds in the vicinity of S. R. 1 are 55 mph.

State Route 1

State Route 1 is a four-lane controlled access divided highway for its entire length between Jasper Boulevard (south of Carrollton) and Hopkins Road (in North Federalsburg). North of Jasper Boulevard and south of Hopkins Road, S. R. 1 becomes a limited access facility. Access is provided between S. R. 1 and I-40 via a full cloverleaf interchange.

S. R. 1 is currently the only means of entering the airport. Access to the Airport and Pierce State Park is provided from S. R. 1 via full diamond interchange, located approximately midway between I-4 and S. R. 66.

The segment of S. R. 1 which is north of the airport access road and south of I-40 is the heaviest travelled section of the road. Traffic counts show nearly 3,200 vehicles during the peak hour on the segment of S. R. 1 between I-40 and the Airport access road. This peak hour directional volume is approximately 18 percent greater than that on segments of S. R. 1 north of I-40 and 70 percent greater than peak hour volumes on the segment of S. R. 1 between the Airport access road and S. R. 66. As a result of this heavy volume, the peak hour service level of S. R. 1 between I-40 and the Airport access road is rated level "D" (approaching unstable flow) or lower.

Natural economic growth within the two-county region is expected to cause peak hour volumes along S. R. 1 to approach capacity by 1990. At levels of service "E" (unstable flow), S. R. 1 will carry nearly 4,000 vehicles per hour between the access road and I-40. The State Highway Administration has plans to upgrade this segment of S. R. 1 to a six-lane facility by 1990.

The northbound ramp of the airport access road interchange is presently operating at levels of service "D". By 1990 the expected volumes of 1,700 vehicles during peak hour will require widening of the facility. The State Highway Administration has already programmed these improvements into its long range development plans.

State Route 66

State Route 66 is a two-lane limited access highway which links those areas southeast and southwest of the airport with the north-south highway (S. R. 1).

During the evening peak hour, S. R. 66 provides a level of service "B" - operating at less than 45 percent capacity in its heaviest travelled segment. Natural economic growth in the region will not severely affect service along the road. During 1990 peak hours, with the volumes predicted, levels of service "C" or better will still be provided along the route.

State Route 102

State Route 102 is a two-lane arterial facility. The road serves North Revere Park, South Revere Park, and Nathan Hills neighborhoods, and provides local access to Carrollton and Federalsburg in the north and south, respectively. Current levels of service along S. R. 102 approach level "D" during peak hour. Economic growth in the region is not expected to significantly alter the level of service on S. R. 102.

Project Impact

Capacity analysis indicated that traffic induced by airport expansion will impact S. R. 1 north of the airport access road to I-40 and the S. R. 1-Airport and Park access road interchange. In addition, the extension of the present four-lane airport access road to the new terminal will be required.

State Route 1

Airport-generated traffic is expected to cause a breakdown in performance of S. R. 1 by 1985. Projected volumes of peak hour airport vehicular traffic and through traffic will cause this route to be over capacity. Consequently, to maintain S. R. 1 at an acceptable level of service, the State Highway Administration will have to widen the roadway to a six-lane facility much earlier than planned in the long-range development program.

Meetings have been held with State, County and Regional planning officials. As a result of these meetings, the State Highway Administration is considering advancing improvements to S. R. 1, the S. R. 1/Airport

access road interchange and S. R. 1/I-40 interchange to its 1980-85 capital program. Correspondence to this effect is provided in the Appendix. Due to diminishing gasoline tax revenues, Boone County has agreed to contribute a portion of its 1980-1985 primary road allocations to fund these improvements. The Capital Regional Planning Commission endorses this overall concept.

Airport Access Road-S. R. 1 Interchange

Peak hour traffic from the airport is anticipated to be beyond the capacity of both the northbound and southbound ramps of the S. R. 1 Airport access road interchange by 1985. As previously noted, improvements to the northbound ramp have been scheduled in the State's long range improvement program. The State would also have to advance this improvement as well as improvements to the southbound ramp presently in its 1980-85 capital program.

The left turn movement onto the southbound ramp must also be considered. By 1985, nearly 1,140 vehicles will attempt to make this turn during the peak hour. Consequently, consideration is currently being given to upgrade the interchange to add an internal loop for southbound airport traffic.

It is noted that both the widening of S. R. 1 and construction of a southbound loop at Airport access road interchange will not require the taking of land from Pierce State Park. A document executed in 1960 in conjunction with I-40 construction gave the State Highway Administration right-of-way for expansion to full cloverleaf interchange intersections along the Park perimeters bordered by State or Interstate facilities.

Airport Access Road

A four lane divided access road will be constructed from the existing access road to the new terminal facility. All access to the airport will be via S. R. 1. The road will widen in the area of the terminal to allow for passenger discharge and pick up. The road will run south from the existing access road (at a point east of Gordon's Run) around the end of the existing runway and then northerly to the new terminal. See Exhibit 3.

Summary

Capacity analysis indicates that airport-induced traffic will add significant volumes to S. R. 1. Consideration by the State Highway Administration to advance planned improvements would assure that project-generated traffic will not degrade desirable levels of service on S. R. 1. Improvements include:

- Widening S. R. 1 to a six-lane facility between the Airport access road and I-40.
- Addition of an internal loop for southbound airport traffic at the S. R. 1-Airport access road interchange to eliminate the existing left turn movement.

Improvements to the S. R. 1-I-40 interchange scheduled within the State's 1975-1980 program assure that the facility will be able to accommodate airport-induced and through traffic volumes.

INDUCED (SECONDARY) SOCIOECONOMIC IMPACTS

General Considerations

Indirect impacts induced by airport expansion are diffuse in nature. Unlike primary impacts which are felt almost immediately and affect properties in proximity to the airport site, secondary impacts occur after the project is in operation and influence a far greater geographic region. In fact, secondary impacts are largely the product of direct impacts. For example, one direct impact of the project is to create new jobs. The indirect impact of this action is to generate more expendable income in the private sector thereby increasing demand for goods and services and more taxable income for the public sector, thereby increasing the revenue base.

This section examines secondary impacts induced by the proposed expansion of BIA. Due to their deferred and diffuse nature, these are more difficult to predict and almost impossible to quantify. Nonetheless, certain consequences can be anticipated to occur which will affect social and economic opportunities throughout the region. These are discussed, respectively, in the following sub-sections.

Social Opportunities

Boone County residential development patterns may be somewhat altered by the project. While present agricultural zoning northeast of the Airport site could be anticipated to give way to residential use, revised patterns of noise exposure should discourage further residential development in this area. Thus, growth of both the North and South Revere Park communities will be limited, and property values in these stable neighborhoods in proximity to the R & D Industrial Park should increase to reflect this restricted supply of well-located housing.

The project is anticipated to act as a catalyst stimulating Cooper County to promulgate land use and zoning controls. This action, induced by the project, should enhance neighborhood stability throughout the greater Federalsburg area.

Increased airport activity resulting from the project will expand social opportunities in three ways.

- New jobs and expanded commerce will create more expendable income which will have the affect of

AD-A049 171 GREINER ENVIRONMENTAL SCIENCES INC BALTIMORE MD F/G 5/5
ENVIRONMENTAL IMPACT STATEMENT FOR BICENTENNIAL INTERNATIONAL A--ETC(U)
NOV 77 DOT-FA75WA-3703

UNCLASSIFIED FAA-AAP-78-2-1 NL

2 OF 4
AD
A049171



a positive multiplier throughout the region's private economy.

- Increased public revenues generated by the project will enable County governments to expand amenities without imposing substantially increased tax burdens on residents.

- Increased commercial carrier service will enhance mobility and interaction between the BIA service area and the rest of the nation. Individual residents will be able to travel more places, more conveniently. In addition, expanded direct flight service will enable the region to attract and support more cultural events.

Thus, the project will indirectly increase the standard of living and quality of life throughout the region by facilitating mobility, inducing more private consumer income and public revenues to expand social amenities.

Economic Opportunities

Improved flight service resulting from the project will permit and attract more commercial interaction between the BIA service area and national markets. More persons will be able to conveniently visit regional businesses and regional businesses will be able to deploy their salesmen more efficiently. This increased sales activity will expand markets and demand for local goods. This, in turn, will stimulate production, employment and profit. The cumulative effect is one of introducing a positive multiplier throughout the private economy.

A greater demand for goods creates jobs. More jobs means more consumer income which stimulates retail sales and services. Ultimately increased demand requires plant expansion which assures steady stimulus of the capital goods economy. Thus, the action of airport expansion keeps in motion numerous demand forces which assure steady growth and sustenance of a viable regional economy.

Revenue generated by the project also open long-term options for the public economy. Government can increase services without a corresponding increase in the tax base. The ability of a community to provide quality services without tax burdens places the region in a favorable

competitive position for further economic development. Industry is attracted to areas which offer amenities without excessive taxation, and the location of new industries further strengthens a balanced revenue base.

Thus, revenues generated by the project provide the basis for continued balanced revenue growth over future decades. Overall growth can be controlled by public land use policies and capital investment to restrict unwanted development and encourage the influx of non-polluting R & D type industries. These, in turn, create a steady demand for skilled workers which can be sustained by population growth and supported by the public education system.

Summary

Induced socioeconomic impacts are highly interrelated. The project's positive impact on the economy, in turn, expands social opportunities implicit in an improved standard of living. Increased public revenues permit expanded amenities without a commensurate expansion in local taxes. This, in turn, attracts new industry which further secures a balanced regional tax base.

Land use controls, regional master plans and public policy must be intelligently used to channel growth into desirable areas and to restrict growth to levels which may be supported by the revenue base without deficits. If this can be achieved, the airport expansion will have kept in motion long-term positive forces to sustain viable, socioeconomic development for future decades.

AIR QUALITY

The principal air pollutants resulting from airport and aircraft operations are:

- Carbon Monoxide (CO).
- Hydrocarbons (HC).
- Nitrogen Oxides (NO_x).
- Photochemical Oxidants (Ozone).
- Sulfur Dioxide (SO_2).
- Particulate Matter.

Details on Federal aircraft emission standards and National Ambient Air Quality Standards are given in Appendix C.

The Bicentennial International Airport is in Boone County and lies within the Carrollton Metropolitan Air Quality Control Region (AQCR). Table 13 provides an emission inventory summary for Boone County. Major stationary sources of air pollution in the vicinity of the airport were identified and are listed in Table 14. Table 15 lists locations of state and local air monitoring and sampling. The stationary sources and monitoring stations are shown in Exhibit 14.

The Carrollton Metropolitan AQCR is the largest AQCR in the state, consisting of 12 counties and a total area of 7,560 square miles. The region, except for Carrollton and Federalsburg corridor, is primarily agricultural or timber land, and the air quality in the region is considered good. This is indicated by the fact that in the State Plan for Implementing National Air Quality Standards, the Carrollton Metropolitan AQCR is classified as Priority III for all pollutants (CO, HC, NO_x, SO_2 and photochemical oxidants), except suspended particulates, for which the area is classified as Priority I. Priority III classification indicates pollutant levels well within state criteria. The Priority I designation means that pollutant levels presently exceed criteria. This designation (I) indicates that particulate concentrations exceed the critical levels at sampling stations in the region. Particulate pollutant concentrations exceeded the critical levels at Station A and Station B.

Table 13

Emission Inventory Summary (Tons/Year) - Boone County
Data Representative of Calendar Year 1974

Source	Carbon Monoxide	Hydrocarbons	Nitrogen Dioxide	Sulfur Dioxide	Particulates
Fuel Combustion	200	140	1,430	1,603	1,165
Product Losses	50	2,122	21	10	1,278
Solid Waste Disposal	750	240	120	89	319
Transportation	118,470	16,690	15,320	698	1,580
Miscellaneous	1,070	390	37	5	336
Total	120,540	19,582	16,928	2,405	4,678

Source: Semi-Annual Report -
State Plan for Implementing National Air Quality Standards, February 1975

Table 14

Major Stationary Sources in the Carrollton-Federalsburg Area
Annual Emissions (Tons)

Map Code No.	Stationary Source	Major Pollutants Emitted and Quantity[1]				
		CO	HC	NO_x	SO_2	Particulates
1	State University Physical Plant	--	12	97	301	29
2	SA-TEL Communications Co.	--	--	--	---	420
3	Hopkins Medical Research Center	--	--	--	--	190
4	Mill Creek State Mental Hospital	14	16	85	190	310
5	D&E Textiles	35	21	218	369	171
6	Rowecraft Manufacturing Company	--	88	--	74	210

[1]Pollutants Emitted in 1973

Source: Northeast America Department of Natural and Economic Resources, Board of Water and Air Resources.

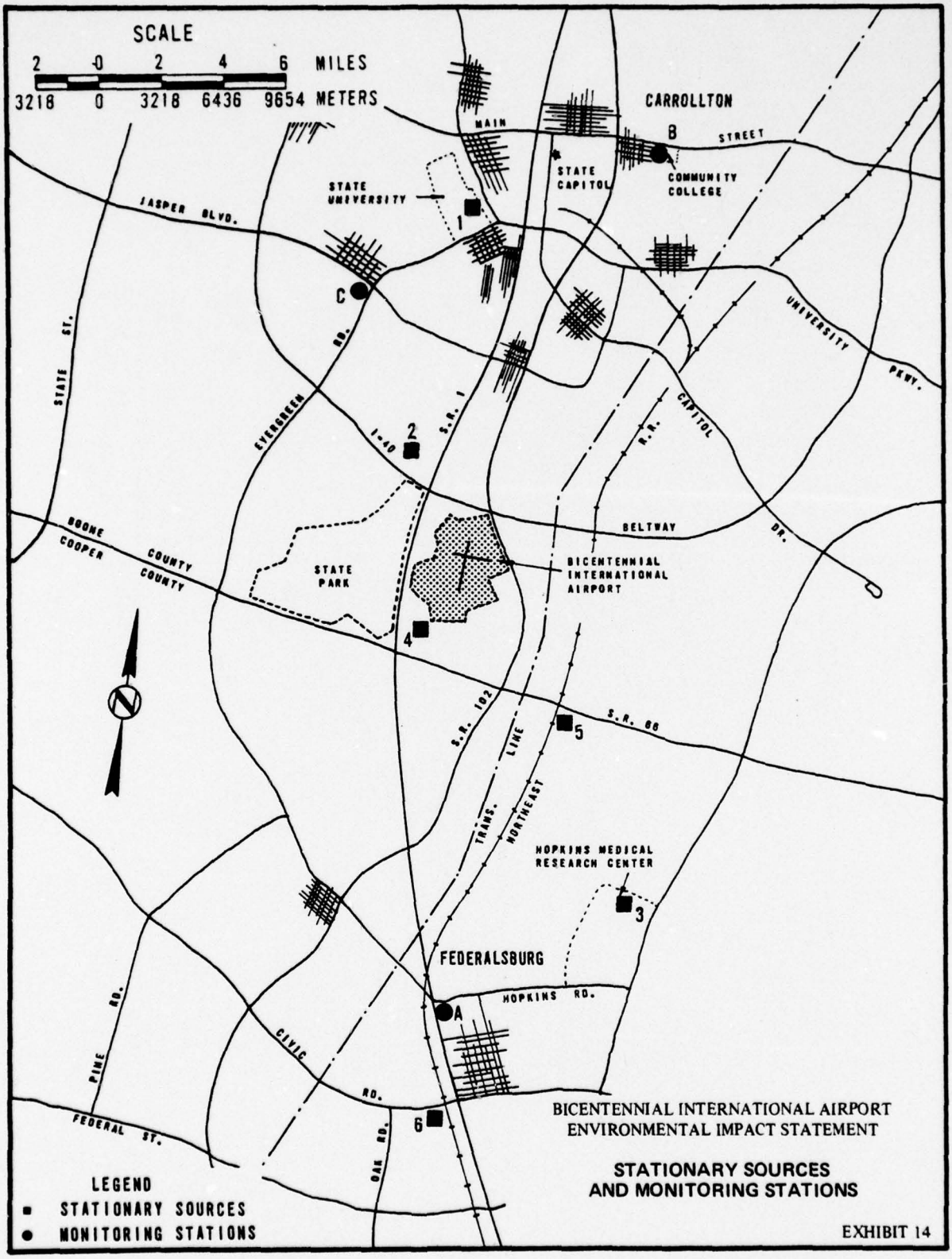
Table 15

Monitoring Stations in the Carrollton-Federalsburg Area

Map Code No.	Station	Major Pollutants Monitored			
		1973*		1974*	
		SO_2 Arith. Mean $\mu g/m^3$	Particulate Geom. Mean $\mu g/m^3$	SO_2 Arith. Mean $\mu g/m^3$	Particulate Geom. Mean $\mu g/m^3$
A	Federalsburg-Hopkins Rd. & S.R. 1	29	74	32	81
B	Carrollton-Community College	20	80	23	83
C	Carrollton-Jasper Blvd. & Evergreen Rd.	15	67	19	75

Source: Northeast America Department of Natural and Economic Resources, Board of Water and Air Resources

* Annual Means



BICENTENNIAL INTERNATIONAL AIRPORT
ENVIRONMENTAL IMPACT STATEMENT

STATIONARY SOURCES AND MONITORING STATIONS

EXHIBIT 14

In the State Implementation Plan it was stated that standard measures, i.e., stationary source licensing regulations, vehicular emission control regulations, planned new roads, and improvements on existing roads, are sufficient to reduce the suspended particulate concentration in the region to levels within Federal and state criteria.

The region is not now classified as an Air Quality Maintenance Area (AQMA). An AQMA is any area or region that has the potential for exceeding any National Ambient Air Quality Standards because of present air quality and/or projected growth over the ten-year period 1975 to 1985. The State Department of Health has indicated that the increase in particulate concentration will level off and that sufficient control measures exist in the State Implementation Plan to control these levels during the ten-year period.

Ambient conditions in proximity to BIA are influenced by on-site and off-site stationary sources and by traffic and aircraft emissions. Of the multiple sources in the region, aircraft emissions are minor.

Aircraft emissions (particularly jet exhausts) were highly visible against the light background of the sky. This led to the assumption that aircraft operations contribute heavily to air pollution. However, aviation operations contribute comparatively little pollution (only 4 percent of the total emissions in the United States.) Furthermore, pollution from jet engines has been steadily reduced over the past twelve years due to advances in technology.

Conditions will further improve as a result of new EPA standards to control aircraft emissions. These regulations were announced by the EPA Administrator in the Federal Register, July 17, 1973.

Factors Affecting Air Quality

The total volume of the atmosphere available for air contaminant dispersion is significantly influenced by local meteorological and topographical factors.

Mixing depths provide a measure of the volume within which pollutants may mix without restriction. In the subject region, pollutant dilution is most restricted during the morning and least restricted during the afternoon. The U. S. Environmental Protection Agency publication, "Mixing Heights, Wind Speeds, and Potential For Urban Air Pollution

Throughout the Contiguous United States," indicates a mean annual morning mixing height of 400 meters and a mean annual afternoon mixing height of 1,600 meters in the area.

The temperature structure is one of the factors which determine the stability of the atmosphere. There are very few days in the area when the temperature falls below the 20° F mark. Summertime afternoon temperatures reach 90° F or higher an average of about every third day in the middle of the summer but reach 100° F an average of less than once per year. Even in the hottest weather, early morning temperatures almost always drop into the lower seventies.

In addition to the transport and dilution of pollutants, precipitation also has an effect on ambient concentrations. Rainfall in the area is well distributed throughout the year. July has, on an average, the greatest amount of rainfall, while October has the least amount. Snow and sleet usually occur each year, though excessive accumulations of snow are rare.

The product of the mixing layer height and the horizontal wind speed gives a measure of the ventilation rate or the dilution capacity of the lower atmosphere. Percentage frequencies of annual wind direction and wind speeds, based on data collected at Bicentennial International Airport between 1951 and 1960, are given in Table 16. The wind data shown indicate that between 1951 and 1960 the site was affected by winds from the north, northeast and northwest 34.0 percent of the time; from the east 26.3 percent of the time; from the south and southwest 14.0 percent of the time; and from the west 14.5 percent of the time. Table 16 also indicates that for 11.2 percent of the time wind conditions were classified as calm.

Wind distribution and stability class analysis, using the STAR Computer Program and based on weather data collected at Bicentennial International Airport between 1955 and 1970, was obtained from the National Oceanic and Atmospheric Administration Environmental Data Service. This analysis indicated that the worst nighttime dispersion conditions (Stability Class F with low wind velocities) occurred 10.21 percent of the time, and the worst daytime dispersion conditions (Stability Class D with low wind velocities) occurred only 1.71 percent of the time.

Existing Airport Pollution

Ambient pollutant loadings originating in the airport area result from five sources. These are:

Table 16

Wind Direction and Wind Speed
Bicentennial International Airport (1951-1960)

Direction	Hourly Observations of Wind Speed (in Miles per Hour) 0-3	4-7	8-12	13-18	19-24	25-31	32-38	39-46	47 Over	Total	Avg. Speed
N	0.6	2.6	2.7	1.3	0.1	+	+	+	--	7.3	8.7
NNE	0.7	4.0	4.0	1.6	0.2	+	+	--	--	10.6	8.7
NE	0.6	2.3	3.0	1.3	0.1	+	--	--	--	7.3	8.9
ENE	0.5	3.1	3.5	1.1	0.1	+	--	--	--	8.3	8.6
E	0.5	3.2	3.3	1.3	0.2	+	--	--	--	8.5	8.7
ESE	0.2	1.2	1.1	0.2	+	+	+	--	--	2.8	7.9
SE	0.3	1.5	1.4	0.3	+	--	--	--	--	3.6	7.6
SSE	0.2	1.2	1.2	0.4	0.1	+	--	--	--	3.1	8.4
S	0.3	1.2	1.5	0.5	+	+	--	--	--	3.6	8.7
SSW	0.4	1.9	1.8	0.4	+	+	+	--	--	4.5	7.9
SW	0.4	1.9	2.3	1.1	0.1	+	+	--	--	5.9	9.2
WSW	0.5	2.1	1.4	1.0	0.1	+	--	--	--	5.0	8.2
W	0.5	2.0	1.8	0.9	0.1	+	--	--	--	5.4	8.6
WNW	0.3	1.2	1.4	1.0	0.2	+	+	--	+	4.1	9.9
NW	0.4	1.6	1.6	1.1	0.2	+	+	--	+	4.9	9.6
NNW	0.3	1.3	1.5	0.7	0.1	+	--	--	--	3.9	9.0
Calm	11.2	--	--	--	--	--	--	--	--	11.2	--
Total	18.0	32.5	33.8	13.9	1.7	0.2	+	+	+	100	7.7

+ Indicates more than 0 but less than 0.05

Source: U.S. Department of Commerce National Oceanic and Atmospheric Administration Environmental Data Service. Data collected between 1951 and 1960 at Bicentennial International Airport Northeast America

- Aircraft emissions.
- Service vehicles emissions.
- Passenger and employee traffic on-site.
- Through traffic on major roads off-site.
- Fuel storage and transfer.

Analysis was made of existing pollutional loadings in the airport area. (For the purpose of this analysis, 1975 was used as the base study year.) It included off-site traffic on primary arteries bordering the airport and aircraft emissions during take-off and landing. Ambient loadings by source are given in Table 17. This indicates the following conditions:

- Total pollution loadings in the airport influence area are 59,442 pounds per day. This figure can be extended to show an annual pollutional loading level of 10,850 tons per year.
- Aircraft emissions--including approach and take-off--contribute an average of 13,296 pounds per day.
- Service vehicles emissions account for 2,824 pounds per day.
- On-site vehicular traffic--including passengers and airport personnel--produce 6,652 pounds per day.
- Through traffic--primarily on I-40, S.R. 1, S.R. 102, and S.R. 66 represent 36,331 pounds per day.

Calculations were also made of existing airport related pollutant levels. Table 18 indicates the resultant maximum hourly concentrations of carbon monoxide (CO), sulfur dioxide (SO_2) and particulates expected on-site while Table 19 lists the pollutant levels from existing airport operations at several adjacent sensitive areas. These adjacent areas are shown on Exhibit 15. The concentrations shown in Table 19 are well below the Federal and local standards for CO, SO_2 and particulates.

Table 17

BIA 1975 Emission Inventory
(lbs/Day)

Sources	*CO*	*HC*	*NO_x*	*SO_2*	*Particulates*	*Total*
Non-Airport Vehicular Traffic in Vicinity[1]	28,043	2,754	5,225	134	175	36,331
Airport Related:						
Aircraft Traffic[2]	8,449	2,605	1,908	219	115	13,296
Vehicular Traffic[3]	5,265	506	827	23	31	6,652
Service Vehicles[4]	2,200	490	128	2	4	2,824
Working Losses[5]	-----	339	-----	---	---	339
Total	43,957	6,694	8,088	378	325	59,442

[1]The emission rates for autos and aircraft were computed using EPA publication AP-42.
[2]Daily aircraft operations are given in Appendix A.
[3]Includes passenger, visitor and employee traffic, total site-generated vehicle traffic = 15,123 vehicles/day.
[4]Gasoline-fueled ground service equipment, emission rates compueted from APTD-1470.
[5]Losses that occur during aircraft and ground service vehicle refueling.

Table 18

Existing On-Site Air Pollution Impact

Location	*CO (ppm)*	*SO_2 (ppm)*	*Particulates ($\mu g/m^3$)*
In the Parking Area	3.77	0.029	0.015
End of the Runways	8.06	0.062	0.032
50 feet off of the Edge of the Runways	1.88	0.018	0.012

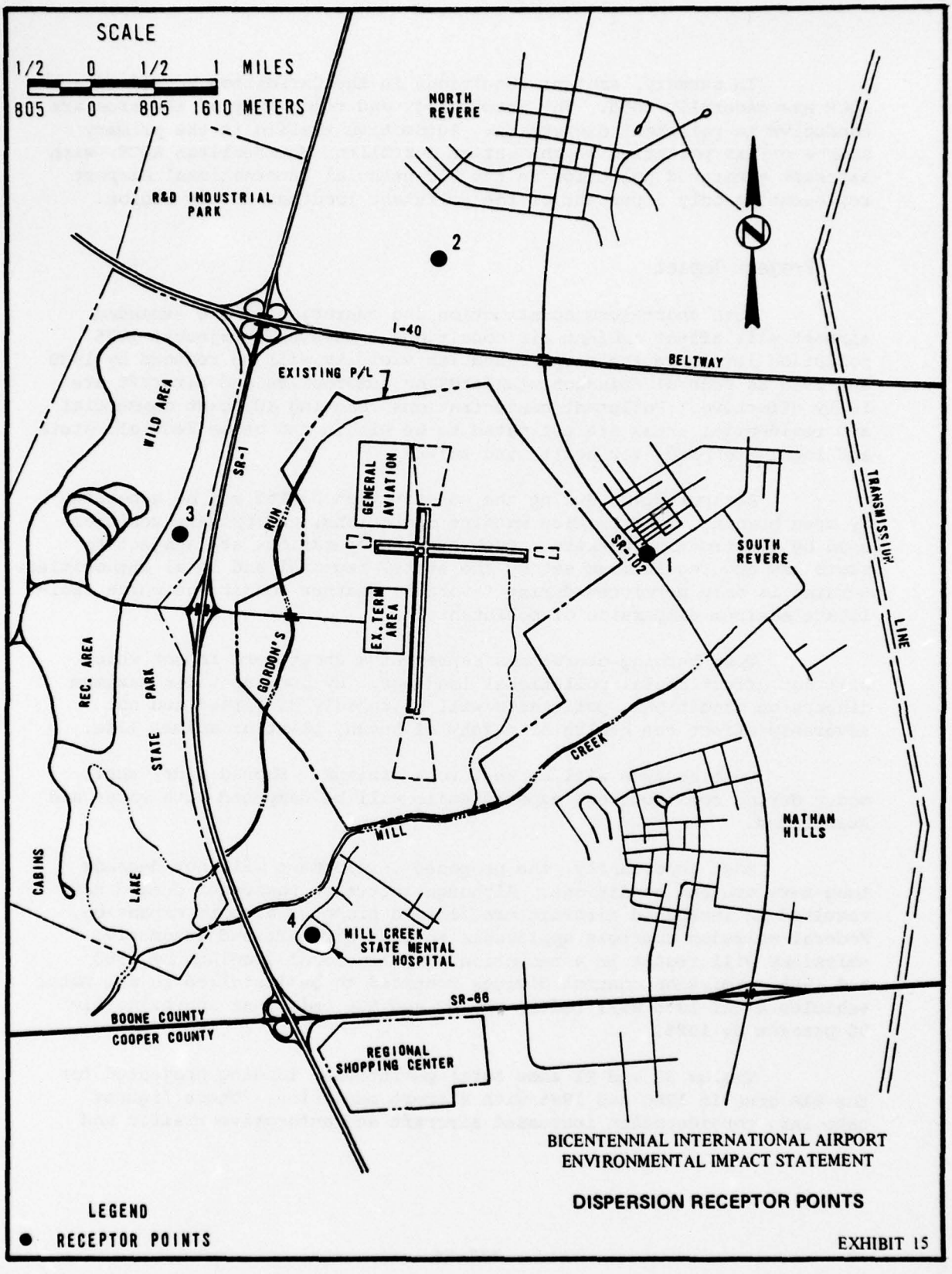
Table 19

Existing Air Pollution Impact on Sensitive Areas[1]

Receptor Point	Location[2]	CO (ppm)	SO_2 (ppm)	Particulates ($\mu g/m^3$)
1	Residential Area East of Airport	0.87	.0028	4.15
2	Residential Area North of Airport	0.92	.0029	4.35
3	State Park West of Airport	1.73	.0057	7.88
4	Mill Creek State Mental Hospital South of Airport	0.77	.0025	3.52

[1]Aircraft impact on the sensitive areas are very small, less than 0.01 ppm for CO, less than 0.0001 ppm for SO_2 and less than 0.01 $\mu g/m^3$ for Particulates. The listed emissions are generally due to airport-generated vehicular traffic on the major roadways and in the parking area.

[2]See Exhibit 15.


SCALE
1/2 0 1/2 1 MILES
805 0 805 1610 METERS
NORTH REVERE
R&D INDUSTRIAL PARK
2
I-40
BELTWAY
EXISTING P/L
WILD AREA
SR-1
3
RUN
GENERAL AVIATION
SR-102
1
SOUTH REVERE
TRANSMISSION LINE
EX. TERM AREA
GORDON'S
REC. AREA
STATE PARK
CREEK
MILL
NATHAN HILLS
CABINS
LAKE
4
MILL CREEK STATE MENTAL HOSPITAL
SR-66
BOONE COUNTY
COOPER COUNTY
REGIONAL SHOPPING CENTER
BICENTENNIAL INTERNATIONAL AIRPORT
ENVIRONMENTAL IMPACT STATEMENT
DISPERSION RECEPTOR POINTS
LEGEND
● RECEPTOR POINTS
EXHIBIT 15

In summary, ambient conditions in the Carrollton Metropolitan AQCR are generally good. The meteorology and topography of the area are conducive to pollutant dispersion. Automotive traffic is the primary source of air pollution in the entire Carrollton Metropolitan AQCR, with aircraft generated pollution in the Bicentennial International Airport representing only 5 percent of the pollutant loadings in the region.

Project Impact

Both short-term construction and operation of the expanded airport will affect ambient air conditions. However, projected 1975 pollution levels in the airport and its vicinity will be reduced by 1980 and 1985 as Federal emission standards on automobiles and aircraft are fully effective. Pollutant concentrations reaching adjacent commercial and residential areas are estimated to be within and below Federal, state and local standards for health and safety.

Air pollution during the construction period may be generated by open burning, construction machine operations, and private vehicles used by construction workers. Open burning operations are subject to state law and regulations set by the state, regional and local authorities. Burning is only permitted during favorable weather conditions which facilitate maximum dispersion of pollutants.

Open burning operations represent a short-term impact which will not affect annual pollutional loadings. By burning under maximum dispersion conditions, pollutants will be rapidly dispersed and not adversely affect the health or safety of human, plant or animal life.

Dust hazards will be kept to a minimum. Should a dry spell occur during construction, exposed soils will be dampened with water and stabilized.

Most importantly, the proposed development will not degrade long-term ambient conditions. Although increased passenger demand has resulted in increased aircraft traffic and proposed airport expansion, Federal emission controls applicable to both aircraft and automotive emissions will result in a reduction of pollutional loadings by 1980 and 1985. Emission control devices required to be installed in all motor vehicles after 1975 will reduce CO, HC and NO_x emissions approximately 90 percent by 1985.

Tables 20 and 21 show total pollutional loading projected for the BIA area in 1980 and 1985 with airport expansion. These figures take into consideration increased aircraft and automotive traffic and

Table 20

BIA 1980 EMISSION INVENTORY
(lbs/Day)

Sources	CO	HC	NO_x	SO_2	Particulates	Total
Non-Airport Vehicular Traffic in Vicinity[1]	14,532	1,384	3,196	120	182	19,414
Airport Related:						
Aircraft Traffic[2]	3,086	497	1,694	322	172	5,771
Vehicular Traffic[3]	3,609	342	645	322	43	4,661
Service Vehicles[4]	494	82	154	2	3	735
Working Losses[5]	------	438	-----	---	---	438
Total	21,721	2,743	5,689	466	400	31,019

[1]The emission rates for autos and aircraft were computed using EPA publication AP-42.
[2]Daily aircraft operations are given in Appendix A.
[3]Includes passenger, visitor and employee traffic, total site-generated vehicular traffic = 20,069 vehicles/day.
[4]Gasoline-fueled ground service equipment, emission rates computed from APTD-1470.
[5]Losses that occur during aircraft and ground service vehicle refueling.

Table 21

BIA 1985 Emission Inventory
(lbs/Day)

Sources	*CO*	*HC*	*NO_x*	*SO_2*	*Particulates*	*Total*
Non-Airport Vehicular Traffic in Vicinity[1]	2,233	555	1,112	57	126	4,083
Airport Related:						
Aircraft Traffic[2]	3,894	1,947	2,085	389	208	8,523
Vehicular Traffic[3]	665	165	269	16	32	1,147
Service Vehicles[4]	129	47	120	2	3	301
Work Losses[5]	-----	529	-----	---	---	529
Total	6,921	3,243	3,586	464	369	14,583

[1]The emission rates for autos and aircraft were computed using EPA publication AP-42.
[2]Daily aircraft operations are given in Appendix A.
[3]Includes passenger, visitor and employee traffic, total site-generated vehicular traffic = 25,015 vehicles/day.
[4]Gasoline-fueled ground service equipment, emission rates computed from APTD-1470.
[5]Losses that occur during aircraft and ground service vehicle refueling.

decreased pollutant emissions resulting from Federal controls. Emissions from ground service vehicles must also be taken into consideration. Ground service vehicles are those pieces of motorized equipment which operate in the gate areas to load and unload aircraft and otherwise prepare the airplane for its next departure. The activity level and mix of equipment is dependent on the type of aircraft being serviced.

A pollutant dispersion analysis was conducted to determine the CO, SO_2 and particulate pollutant concentrations generated by aircraft and other airport-related activities in the airport and at sensitive areas within the vicinity of the airport. For dispersing the aircraft emissions from runways, the Puff Line Source Model was used. For dispersing the pollutants from the roadways, the California Line Source Model was used, and for dispersing the pollutants from areal sources, Hanna's Areal Source Model was utilized.

Table 22 shows the maximum one hour CO, SO_2 and particulate concentrations on-site with project expansion. Tables 23 and 24 list the maximum concentrations at the sensitive areas for 1980 and 1985, respectively. The receptor points for which concentrations were determined were shown on Exhibit 15.

By comparing existing conditions with 1980 and 1985 conditions, with the assumption that aircraft emission control standards announced by the EPA in the Federal Register, July 17, 1973, will be met on schedule, the following conclusions can be made:

- Airport expansion will not increase gross pollutional loadings.
- In spite of increased aircraft traffic, aircraft emissions will decrease by 56 percent in 1980 and 36 percent in 1985. These are tabulated to include a 3,500 foot altitude for climb-out and 3,500 foot altitude for touchdown.
- Dispersion analysis showed that the maximum one-hour aircraft-generated CO concentrations will occur on and in the vicinity of runway 2/20. Under 1 meter/second wind speed and

Table 22

Projected On-Site Air Pollution Impact

	1980			1985		
Location	CO (ppm)	SO_2 (ppm)	Particulates ($\mu g/m^3$)	CO (ppm)	SO_2 (ppm)	Particulates ($\mu g/m^3$)
In the Parking Area	1.73	0.021	0.012	1.54	0.015	0.011
End of the Runways	1.67	0.020	0.011	1.50	0.014	0.010
50 feet off of the Edge of the Runways	0.26	0.012	0.0079	0.15	0.0080	0.0038

Table 23

1980 Air Pollution Impact on Sensitive Areas[1]

Receptor Point	Location	CO (ppm)	SO_2 (ppm)	Particulates ($\mu g/m^3$)
1	Residential Area East of Airport	.33	.0023	3.36
2	Residential Area North of Airport	.34	.0023	3.60
3	State Park West of Airport	.61	.0042	6.09
4	Mill Creek State Mental Hospital South of Airport	.28	.0020	2.78

[1]Aircraft impact on the sensitive areas are very small, less than 0.01 ppm for CO, less than 0.0001 ppm for SO_2 and less than 0.01 $\mu g/m^3$ for Particulates. The listed emissions are generally due to airport generated vehicular traffic on the major roadways and in the parking area.

Table 24

1985 Air Pollution Impact on Sensitive Areas[1]

Receptor Point	Location	CO (ppm)	SO_2 (ppm)	Particulates ($\mu g/m^3$)
1	Residential Area East of Airport	.27	.0012	2.67
2	Residential Area North of Airport	.29	.0012	2.73
3	State Park West of Airport	.57	.0024	4.75
4	Mill Creek State Mental Hospital South of Airport	.26	.0011	2.15

[1]Aircraft impact on the sensitive areas are very small, less than 0.01 ppm for CO, less than 0.0001 ppm for SO_2 and less than 0.01 $\mu g/m^3$ for Particulates. The listed emissions are generally due to airport generated vehicular traffic on the major roads and in the parking area.

Stability Class D[1], maximum 1975 aircraft-generated CO concentrations during the hour would reach 8.06 ppm. This is 23 percent of the state and county CO standard for a one-hour period. In 1980, the aircraft generated peak-hour CO concentration for the project would reach 1.67 ppm.

- On-site vehicular traffic emissions will decrease from present levels by about 30 percent by 1980 and 83 percent by 1985.

- Off-site traffic emissions on arteries within the airport influence area will decrease from present levels by 46 percent by 1980 and 87 percent by 1985.

The results of the daily airport-generated pollutant load inventory and the CO pollutant dispersion analyses indicate that the expansion of BIA will not adversely affect ambient air quality in its vicinity. A significant improvement over ambient conditions is anticipated for the projected years as Federal controls take effect.

Northeast America has its own indirect source regulations approved by the Environmental Protection Agency for indirect source permit applications. The airport, under the state regulations, is required to file an Indirect Source Permit Application after the design phase of the project is completed and prior to construction.

---

[1] According to Pasquill Stability Classification, Class D represents overcast conditions during day and night and is required by the State of North Carolina Board of Water and Air Resources to be studied as the worst dispersion stability class with 1 m/sec. wind speed.

SECTION 4(f) PUBLIC LANDS

Section 4(f) of the DOT Act of 1966, as Amended, states that approval will not be given for projects requiring use of publicly owned land from a public park, recreation area, or wildlife or waterfowl refuge, or any land from an historic site unless (1) there is no feasible and prudent alternative to the use of such land, and (2) such program includes all possible planning to minimize harm to such area.

Existing Conditions

Exhibit 5 showed parks, recreation areas and public lands within the study area. Correspondence concerning the significance of the recreation areas and the necessary coordination is provided in Appendix E.

A 1.5-acre playground is located in South Revere Park adjacent to the First Baptist Church. This Park will be acquired for project construction. The 4(f) statement for the South Revere Playlot has been prepared as part of this environmental statement and is included in this section of the report.

The effects of proposed airport development on the other public recreation lands in the area as discussed below are not sufficient to constitute a "use" of the lands within the meaning of Section 4(f). The lands are active parks and the level of noise increase will not affect their normal activities.

Cyrus Pierce State Park is the major recreational area in proximity to the project. This 6,000-acre facility includes natural forest areas, streams, campsites, picnic areas, an active recreation area, a boating lake and beach. Pierce Park, the largest State Park in the twelve county area, recorded 50,000 visitors in 1974.

Mr. Jonas Trilling, Director of Pierce State Park served on the Airport Advisory Committee. He noted that increased traffic on S. R. 1 and population growth to the south have resulted in plans to open a second access road from S. R. 66. This action, totally unrelated to BIA expansion, will divert some user traffic from S. R. 1. Park officials supported the proposed project at the public hearing as the only alternative which would not adversely impact Pierce Park.

Neighborhood recreation areas in North Revere and Nathan Hills border school sites simultaneously serving physical education and community purposes. The Revere Junior High playing fields are located north of the school structure on land once part of the General Boone Estate.

Section 4(f) Statement for South Revere Playlot

Project Description

Expansion of BIA as proposed will result in the acquisition of the South Revere playlot to construct the new 2R-20L runway. New terminal facilities are planned between the parallel runways and a new access road would be constructed.

Description of South Revere Playlot

This 1.5-acre playground, owned and maintained by the Boone County Department of Recreation and Parks, is located northeast of the First Baptist Church. Access is available by Military Road and Lindbergh Lane. Facilities are limited to playground equipment and two unlighted multi-purpose courts. There are also several benches and the playlot borders are maintained in flowering shrubs.

The facility is primarily used by children attending the Church's Day Care Center and older neighborhood children after school. The Church Brotherhood sponsors a Saturday teen sports club which uses the multi-purpose courts for organized basketball games.

Playground equipment includes a jungle gym, eight swings, two slides, parallel bars and large sand box. It is estimated that daily usage averages 50-60 persons.

Relationship to Other Local, State or National Parks

Numerous local recreational facilities are in close proximity to the airport. A seven acre developed sports area abuts Nathan Hale Elementary School, 3.5 miles south of South Revere playlot. The Nathan Hale facility primarily serves the Nathan Hills Community and includes two baseball fields, a soccer/football field, two lighted multi-purpose courts and playground equipment. It is estimated that approximately 10,000 persons use the facilities annually.

A similar six-acre facility is located adjacent to Jefferson Elementary School, 1.5 miles north of Revere Junior High in North Revere.

Paul Revere Junior High, operated by the Boone County Board of Education, is located east of S. R. 102 and south of the General Boone House in North Revere. The school includes grades 7-9 with a 1975 enrollment of slightly over 800 students.

Originally part of the Boone Estate, the school is located on a 20-acre campus with eight acres developed for active sports. Facilities include two baseball fields, a football field, four tennis courts, a track and two multi-purpose courts. One of the baseball fields is lighted for nighttime little league and interscholastic competition and both the lighted baseball field and football field have spectator bleachers. The school has its own gym in addition to the outdoor facilities.

The school playfields are used for physical education programs, interscholastic competition and neighborhood after-school recreation. In addition to local little league competition, community residents of all ages use the facilities on weekends and evenings. A county tennis clinic for ages 10-15 is offered during the summer and the Greater Carrollton Red Cross uses the school for adult education programs on First Aid and Boating Safety.

The County Department of Recreation and Parks contributes 50 percent to playfield maintenance. The Director of the Department estimates that some 6,000 persons from the surrounding communities use Revere recreation facilities annually.

A regional recreational complex adjoins Ethan Allen High School in the northeast quadrant of the Jasper Boulevard/S. R. 102 intersection north of North Revere. This twenty-acre active sports facility includes two lighted baseball fields, twelve tennis courts, a football field with bleachers, six lighted multi-purpose courts, playground equipment, and picnic tables. Structures within the complex include a bath-house and locker room facility, additional restrooms and craft house. In addition, the school's gym and auditorium are available to community organizations when school activities are not scheduled. Non-school structures and fields are operated by the County Department of Recreation and Parks. This facility is located one-mile from Revere Junior High and six miles from South Revere Park. The Ethan Allen recreation area is used by an estimated 15,000 residents of the Greater Carrollton area annually.

Pierce State Park, previously described, is an estimated six miles southwest of North Revere and four miles west of South Revere.

The State also maintains an 1,800-acre ski and hiking recreation area in the Jefferson Mountains approximately 18 miles east of Carrollton.

There are no National Parks in the twelve county service area.

Impact of the Project on South Revere Playlot

The project will completely take the South Revere playlot. A relocation site has been selected adjacent to the proposed site of the relocated First Baptist Church in South Revere, which will permit the playlot to continue to function as a neighborhood playground and recreation area for children attending the church's day care center.

Alternatives

The consideration of alternatives to the proposed action included other sites and other on-site configurations. The initial feasibility study begun in 1972 explored the development of a totally new site for air carrier operations. All available contiguous tracts of land between Carrollton and Federalsburg were identified and evaluated in detail. None of the sites were found to be suitable for development based on the evaluation criteria that included location, access, topography, soil characteristics, navigation constraints, compatible land use, and noise exposure.

Three on-site alternative configurations were evaluated as part of the continuing feasibility study. Alternative 1 and 2 to the proposed project are shown on exhibits in Section V. Alternative 1 would place the parallel runway to the west of the existing runway. Noise exposure in some parts of Pierce State Park would increase to NEF 39 and that for the Mental Hospital to the south would increase from a level less than 30 under existing conditions to a level of NEF 39 with Alternative 1. The noise analysis also indicated that more residences would be exposed to NEF values greater than 30 with Alternative 1 than with the proposed action.

Alternative 2 provides for a parallel runway system in an orientation perpendicular to the existing major runway. This alternative's most severe noise impact is on Pierce State Park where the noise exposure at a level of NEF 40 extends well into the park boundaries. Aircraft on final approach would be flying directly over the park's interior.

Under the No Project Alternative, noise exposure will continue along the axis of the existing major runway. The level of exposure will increase in adjacent areas due to the increase in total operations.

The No Project Alternative would result in more gross daily pollution than the other alternates since no improvements are made while operations continue to increase. The relatively greater pollutant loading would result from increased periods of aircraft idling in the aprons and from congestion of surface traffic in the terminal area.

The delays experienced at the airport due to insufficient capacity would increase daily energy consumption in the air, on the taxiways, and in the terminal loading zone.

Regional economic development is linked with expansion into national markets. Without airport expansion, regional growth would be steadily restricted.

The proposed project, originally Alternate 3, represents the most feasible and prudent alternative since it has the least impact on the most significant parkland in the study area and is conducive to amelioration with respective to the South Revere Playlot.

Steps to Minimize Harm

The following actions are planned to mitigate impact on public parks and recreation areas:

- South Revere playlot will be replaced in kind. A 2.65-acre relocation site has been selected adjacent to the relocated First Baptist Church site.

- As a result of citizen involvement, the Airport Advisory Committee will continue to oversee the project and assure all commitments to mitigate impact are fulfilled.

HISTORICAL AND ARCHAEOLOGICAL SITES

Existing Conditions

The General Boone House, constructed circa 1770 and listed in the National Register of Historic Places, is located in the North Revere community, four miles due north of the proposed new parallel runway 2R-20L. Noise forecast analysis shows that the General Boone House would potentially fall within the project's NEF 30 contour. As a result, special actions were taken to comply with Section 106 of the 1966 National Historic Preservation Act. This included Airport Authority consultation with the Advisory Council on Historic Preservation (ACHP), the State Historic Preservation Officer, and the Boone County Historical Society. Meetings were held to determine if aircraft noise would cause an adverse impact on the Boone House and whether ameliorative measures could eliminate or mitigate this adverse impact.

As a result of these meetings, it became apparent that the project could impact the Boone House, based on the criteria contained in "Procedures for the Protection of Historic and Cultural Resources" 36 C.F.R. Part 800, published in the Federal Registers of January 25 and February 19, 1974. Consequently, a more detailed study was prepared to enable state and Federal authorities to make an informed judgement of the project's impact on preservation and operation of the Boone House.

Contact was also made with the State Archaeologist, the Boone County Historical Society and the Director of the Department of Archaeology at the State University's Carrollton campus to determine whether any local sites of archaeological significance occurred within the study area. All persons contacted responded negatively. No sites are known or believed to exist within the project area.

However, it is noted that unanticipated finds occasionally occur. The Airport Authority has stated that in the event archaeological relics are uncovered, construction operations will temporarily terminate, pending notification of and investigation by the State Archaeologist. Correspondence concerning archaeological resources is provided in the Appendix.

Project Impact on the Boone House

Construction of a new parallel 10,000-foot by 200-foot runway, designated 2R-20L, planned as part of Bicentennial International Airport expansion will divert commercial carrier traffic from existing runway 2-20.

As a result, flight activity will increase over the historic General Boone House. The General Boone House is shown in relation to the project in Exhibit 5.

Noise forecast analysis for the project indicated that without ameliorative action, the Boone House would lie within the project's NEF 30 contour. However, with the implementation of modified departure procedures, a right turn could be instituted for jet traffic using the new runway. This would divert aircraft northeast and place the Boone House outside the NEF 30 contour. Exhibit 10 shows noise impact on the Boone House with and without modified departure procedures.

Historic Site Description

The General Boone House, owned and operated by the Boone County Historical Society, is located east of S. R. 102 directly north of the Paul Revere Junior High School campus. The house, presently located on a half-acre site, once was part of a 1,000-acre estate--a land grant to Robert Boone, Earl of Carrollton, from King Charles II of England. While the original manor house was destroyed by fire in 1730, the present house constructed circa 1770 has a rich history, recognized by the site's inclusion in the National Register of Historic Places.

The twenty-five room stately Georgian home was constructed by General Boone, great-grandson of Robert Boone. General Boone is best remembered for his courage in repudiating British rule by renouncing his claim to the title Earl and joining the Revolutionary Army. The Boone family remained a prominent and successful force within the County for over a century and a half.

The home was purchased after the 1929 Depression by Sidney Maxwell, founder of a successful Carrollton hardware manufacturing plant. Mr. Maxwell's son ultimately gave the Boone House and its twenty surrounding acres to the County. The house and its half-acre of formal gardens were subsequently turned over to the Boone County Historical Society while the remaining land was allocated for construction of Revere Junior High and adjacent playfields.

The Boone House is presently a museum, restored to its colonial decor with period paintings, artifacts and an extensive collection of colonial furniture. The House is a classic example of Georgian architecture and has become a major focal point for colonial and Revolutionary period preservation efforts in the metropolitan area.

The County Historical Society opens the house to the public Tuesday through Saturday from 10:00 a.m. to 4:00 p.m. and on Sundays between 1:00 and 5:30 p.m. Approximately 250 visitors tour the house each week during summer months. During the fall and winter months, when schools are in session, between 60 and 70 persons visit the house each week. Guided tours are also provided for groups throughout the year. An admission charge of $1.00 is requested for adults to defray maintenance costs.

Measures to Mitigate Impact

Use of modified departure procedures are planned to reduce noise exposure north of the new parallel runway. Initial FAA review resulted in a favorable response to this proposal. As indicated in Exhibit 10, implementation of the departure procedures will place the Boone House outside the NEF 30 contour. Under these conditions, the historic site will not be impacted by expanded airport operations to any greater extent than it is by present airport activity.

County Determination of Project Impact

The Boone County Historical Society has reviewed the project and the implications of the site's location with respect to the NEF 30 contour.

Trustees of the Society have met in formal session and agreed that, in light of ameliorative procedures, operation of the Boone House will not be significantly affected by the project. Correspondence to this effect is included in the Appendix. The State Historic Preservation Officer has concurred in this view and transmitted his approval by way of the A-95 clearinghouse comments included in this EIS.

PUBLIC UTILITIES AND SERVICES

Existing Conditions

Water Supply

The airport is presently served by an extension of the City of Carrollton's water supply system. Existing 10-and 12-inch water lines parallel S. R. 1 to supply the airport facility. The existing on-site water distribution system consists of 6-inch and smaller mains serving the terminal complex. An existing elevated storage tank on the Airport site has a capacity of 450,000 gallons to provide for peak usage and fire protection demands. The tank is supplied by a water pumping station on the City of Carrollton's system. Present airport water usage is approximately 190,000 gallons per day.

The City of Carrollton's water supply is taken from Lake Dobson, situated on the Niomi River. The existing municipal water treatment plant has a present capacity of 145 million gallons per day (mgd). Under a regional development plan for the area (encompassing the existing airport site), the existing City of Carrollton's water treatment plant may be expanded. A new water treatment plant is to be constructed on Manhattan Creek, downstream from the proposed Red River Reservoir, prior to 1980. Eventually, the existing water treatment facility is to be abandoned and the new treatment facility will be enlarged to a total capacity of about 175 mgd by the year 2010. Daily water use in the Carrollton water system now averages about 124 mgd.

Sanitary Sewerage

The Bicentennial Airport presently operates and maintains its own sewage treatment plant. The treatment facility, situated on the northeastern corner of the site, provides secondary treatment with an activated sludge plant equipped with a heated digester. Treated effluent is chlorinated and discharged below the State Park into Tonytank Creek, below Pierce Park Lake. The on-site treatment plant has a capacity of 200,000 gallons per day (gpd). All facilities at the Airport are connected to the existing gravity collection system discharging into the sewage treatment plant.

The existing sanitary sewer collection system serving the Airport facilities have experienced excessive infiltration problems in the past. However, repairs have recently been accomplished to correct this problem.

Recent Airport Authority records indicate that the sewage treatment plant is operating near its rated capacity of 200,000 gpd.

Although the City of Carrollton has a Water and Wastewater Development Plan, the extension of services to the existing site are not proposed until 1980. Therefore, any additional capacity needed by future airport development before this time, will require expansion of the existing on-site sewerage system.

Solid Waste

The Bicentennial Airport is served by two private solid waste collectors. All facilities, with the exception of the restaurant, are serviced by Valera Refuse Contractors of Carrollton. The restaurant is served by Industrial Trash Disposal, Inc. of Federalsburg. Bulk items, such as lumber and pipe, are stockpiled on-site for reuse.

Trash, garbage, and paper from all airport services except the restaurant are placed in 21 dumpster containers located at various places throughout the airport facility. The majority of containers are six-cubic yard (c.y.) in size. Three 30-cubic yard containers are also used. The disposed material is collected twice per week by Valera Refuse Contractors, and amounts to an estimated solid waste generation of 364 c.y. of uncompacted material per week. Disposal is made in sanitary landfills in both Boone and Cooper Counties.

The Airport solid waste from the restaurant is placed in two 30-cubic yard dumpster containers and is collected four times per week. The estimated 182 c.y. of uncompacted material per week is disposed of in a private landfill owned by the Johnson Company, located approximately two miles south of the town of Federalsburg.

The total uncompacted waste generated per week by the Airport is estimated to be 546 c.y. Using a compaction ratio of 3.5 to 1 (based on simple truck and landfill compaction techniques), it is estimated that the weekly airport solid waste generation would approximate 156 c.y. of compacted material.

Project Impact

Water Supply

As noted previously, based on historic water meter readings at the existing airport facility, water usage in 1974 averaged about 189,100

gpd. This average daily water usage rate accounts for restaurant, air-conditioning, restrooms, general services, aircraft washing and servicing and general hangar maintenance. Based on the 1974 average daily number of enplaned passengers, the average per capita water usage rate amounts to 28.4 gallons per passenger per day. This compares favorably with the national daily water usage average rate for airports, which is about 30 gallons per passenger per day, with a low of around 25 gallons in the winter and a high of 45 gallons in the summer.*

The projected average water demand for the airport was estimated based on the projected increase in the number of general aviation and air carrier operations and the increase in enplaned passengers. Using an average daily usage rate of 25 to 30 gallons per passenger for projected enplaned air carrier and general aviation passengers utilizing the main terminal facilities, projected average daily water damands for the airport are as follows:

	Range of Estimated Average Daily Water Demand
1975	178,100 gpd to 213,700 gpd
1980	236,300 gpd to 283,600 gpd
1985	294,500 gpd to 353,400 gpd
1990	352,700 gpd to 423,300 gpd

Planned improvements of the public water supply system will be more than ample to accommodate anticipated expanded airport facilities and increased water demands. An additional on-site elevated storage tank with a capacity of 100,000 gallons at a height to overflow of 135 feet above ground to provide for additional peak usage and fire protection demands will have to be constructed prior to 1990.

Since the Bicentennial Airport serves as a potable water point for the airlines, the expanded water distribution system will have to continue to meet the requirements of the Federal Food and Drug Administration.

---

* CLM Systems, Inc., "Airports and Their Environment", NTIS Technical Document PB-219957 (September, 1972).

Sanitary Sewerage

Sanitary sewage demands for the airport facilities have been projected based on the assumption that 90 percent of the water used is returned to the sanitary system. Using the water demands shown in the Water Supply Section of this report, sewer demands are estimated as follows:

	Range of Estimated Average Daily Sewer Demand
1975	160,300 gpd to 192,300 gpd
1980	212,700 gpd to 255,200 gpd
1985	265,100 gpd to 318,100 gpd
1990	317,400 gpd to 381,000 gpd

At present the existing sewage treatment plant is operating at near capacity levels. Since the City of Carrollton's Water and Wastewater Development Plan does not include extension of service to the airport facility until 1980, it will be necessary to expand plant capacity to accommodate estimated airport needs until connection to the City of Carrollton's can be accomplished. The Airport Authority is actively coordinating with representatives of the State Office of Water and Air Resources to carry out expansion plans which would satisfy the airport's needs and at the same time meet State requirements.

In keeping with current EPA requirements, the existing sewage treatment plant will require upgrading to tertiary or advance treatment consistent with water resources requirements for the area and scheduling of the proposed regional sewerage system scheduled for completion in 1980.

Upon completion of the extension of the municipal sanitary sewerage system to the airport, the now independent airport system will be connected to the expanded municipal sewerage system.

Solid Waste

Estimated total annual quantities of solid waste to be generated by Bicentennial Airport are indicated in Table 25 for the various study

Table 25

Projected Volume of Airport Solid Waste

	Passengers		Pounds Per	Tons Refuse		Daily Cubic Yards		Annual Cubic Yards in Landfill[4]	
	Annual[1]	Daily	Passenger	Annual	Daily	Loose[2]	Compacted[3]	W/Project	W/O Project[5]
1970	1.75	4,795	1.63	1,426	3.9	78	22.3	8,149	8,149
1975	2.60	7,123	1.75	2,275	6.2	124	35.2	13,000	13,000
1980	3.45	9,452	1.75	3,019	8.3	166	47.4	17,250	17,250
1985	4.30	11,781	1.75	3,763	10.3	206	58.9	21,500	17,250
1990	5.15	14,110	1.75	4,506	12.3	246	70.3	25,750	17,250

---

1 Annual Passengers in Millions.

2 Loose Refuse in Containers @ 100 pounds per cubic yard.

3 Compacted Refuse in Trucks @ 350 pounds per cubic yard.

4 No further reduction assumed for landfill.

5 Assumes capacity of existing facility by 1980.

years. The 1974 estimates of the total annual tonnage are based on estimates provided by solid waste collectors presently serving the airport.

Using these estimates, current weekly volumes of uncompacted solid waste generated at Bicentennial Airport were converted into total annual tons and projected as a function of the total estimated passenger volumes for each year. Results were checked for accuracy and credibility by using data from other similar facilities throughout the United States. This independently correlated data related total annual quantities of solid waste to total enplaned and deplaned passenger volumes. The results of these independent studies were in very close agreement with generation rates ranging from 1.5 to 2.0 pounds per passenger. Therefore a rate of 1.75 pounds per passenger was used to evaluate the project impact.

Existing authorized disposal sites within Boone County include three county sanitary landfills, two municipal landfills and one privately owned landfill. Cooper County presently has two county sanitary landfills and one privately owned landfill. Each county has plans for an additional landfill to be opened by 1980.

The Boone County Planning Commission is presently conducting a regional solid waste study to outline future disposal programs which will extend beyond the present sanitary landfill system. Consideration is being given to such processes as compaction, recycling and waste separation--processes which would siphon off unusable material and optimize landfill operations.

Based on the use of existing disposal sites, and on the projected life (20 years) of proposed disposal sites in both Boone and Cooper Counties, it is anticipated that the solid waste disposal requirements of the airport expansion can adequately be met.

The amount of solid waste generation will not vary among expansion alternates.

ENERGY SUPPLY AND NATURAL RESOURCE DEVELOPMENT

The existing airport and proposed expansion site do not occupy land which holds any potential for or obstructs natural resource development.

Airport activities directly or indirectly induce the following types of energy resource consumption:

- Electric power to support overall operations.
- Fuel for maintenance vehicles.
- Fuel for surface vehicle traffic generated by the facility.
- Fuel for aircraft using the facility.

Existing Conditions

Electric power is the energy source for all on-site systems including terminal building heating, restaurant stoves, etc. The facility does not have any natural gas or oil burner systems.

On-site electric power is provided by the Capital Power and Light Company. Transmission is from their control plant located in northeast Carrollton to a substation north of R & D Industrial Park which serves both the Airport and Industrial Park facilities. Based on 1974 records, total BIA electric power demand amounted to five million kilowatt hours annually.

Other on-site energy consumption attributed to airport operation is that associated with all airport service and maintenance vehicles. It is estimated that the existing daily consumption for these vehicles approximates 900 gallons per day.

Estimates of quantities consumed by airport traffic and aircraft are difficult to establish since there are so many variables which influence this usage. It is understood that the amount of fuel used by airport traffic and aircraft is a direct function of the level of service provided by the airport and the number of operations which take place. As air traffic has continued to grow at BIA, it has been noted that delays in the air and on the taxiways have resulted in an increasing amount of wasted fuel.

Project Impact

Expansion of Bicentennial International Airport will increase gross consumption of energy at the site. The construction of a parallel runway and subsequent operation of a parallel runway system will accommodate more aircraft operations than presently exist. The total annual power demand is projected to amount to eight million kilowatt hours in 1985. Capital Power and Light reports that this requirement can be supplied.

The increase in aircraft fuel consumption, as a direct result of expansion, is difficult to quantify, however. For example, there are other factors which could increase consumption at the site, regardless of expansion plans. These factors include change in stage length of aircraft serving BIA, differences in aircraft pay load, and individual airline policy.

Thus, the potential for an increase in fuel consumption in direct proportion to airport operations is inherent in expansion. However, the proposed project layout itself and measures to be imposed by the Airport Authority will have a reducing effect on the amount of fuel to be consumed in the future at BIA. The components of the energy reduction plan are summarized below:

- Construction of the new parallel runway optimizes efficiency by permitting increased flight operations without aircraft stacking procedures or ground traffic delays which are wasteful of fuel resources.

- Runway and taxiway configurations optimize fuel conservation. Placement of the terminal facility between the runways minimizes taxi-distance to the gates.

- Internal and external roadway improvements have been coordinated to prevent unnecessary fuel consumption resulting from inefficient circulation or congestion.

- The expanded terminal facility design includes extensive energy reduction systems.

- The Airport Authority is presently working with Carrollton and Federalsburg Public Transit Authorities to develop scheduled express bus and extended limousine service from the two business districts to the site as a means to reduce private trips. In addition, car pool incentive programs will be provided for Airport employees and relatively high parking charges are planned to discourage individual motor vehicle use.

- The site, in itself, represents an optimum location to minimize surface traffic fuel consumption. It is centrally located almost midway between the Carrollton and Federalsburg CBDs and served by adequate highways to expedite traffic movement.

CONSTRUCTION IMPACTS

Project construction will cause specific impacts resulting solely from construction operations and limited exclusively to the construction period. These are short-term and temporary in nature. Construction impacts are distinct in that their degree of adversity steadily diminishes as work progresses and totally disappears within a short time after the project is completed.

The following list indicates adverse impacts anticipated to result from construction operations and measures planned to mitigate their effects:

- Noise from construction operations will increase ambient acoustic levels. Grading and scraping operations are the noisiest activities with equipment generating noise levels as high as 70-95 dBA within 50 feet of operations. However, distance and intervening topography should rapidly attenuate and reduce noise levels experienced at residences to the east, so that only a slight increase in ambient background conditions is anticipated.

  Construction operations will be confined to weekday, daylight hours as not to affect hours normally reserved for quiet and leisure activities.

- Construction operations will result in disruption of resident wildlife in the study area. The clearing of mixed hardwood and old field successional habitats will displace wildlife which will be forced to relocate in adjacent habitat. Further, the noise of construction operations may temporarily cause resident wildlife to vacate habitat adjacent to the active line of work. Consequently, this will be the period of maximum disruption when competition among territorial species will be greatest. Some mortality may occur among less mobile and weaker individuals.

- Erosion controls should permit stream habitat to continue to support aquatic communities.

- A temporary increase in stream turbidities may occur during the period when excavated areas are exposed prior to paving or the planting of cover.

  Extensive erosion controls are planned to limit sediment transport. Provisions include temporary settlement ponds; straw or brush type barriers; temporary shoulder drains, check dams and sediment traps; and temporary grassing. Further, effort will be made to schedule construction operations to minimize the expanse of excavated areas at any one time and restore them as soon as possible.

- A temporary degradation of air quality will result from construction equipment emissions, fugitive dust pollution from excavated areas, and open burning operations of cleared materials. The total pollutional load generated from all construction sources is estimated to be less than one percent of the total regional pollution.

  Measures are planned to minimize particulate pollution by treating excavated areas with water.

  Open burning operations will only be conducted on days where weather conditions optimize rapid dispersion. Boone County Open Burning Regulations will be strictly followed and all operations conducted in cooperation with Health Department officials.

- Residents in South Revere Park may be temporarily disrupted by relocation of individual families and the First Baptist Church. Effort will be made to delay demolition of the Church until the new facility is completed so that Church activities may continue without interruption.

- Residents of both South Revere and Nathan Hills in closest proximity to the line of work may experience temporary increases in noise levels,

dust and dirt from runway and road construction. The proposed relocation of S. R. 102 would only cause temporary disruption to neighborhood traffic patterns.

Provisions are planned to maintain traffic in this area during realignment of S. R. 102. Local road closings and detours will be posted well in advance.

- Improvements to the S. R. 1-Airport access road interchange may temporarily inconvenience users of Pierce State Park. Access to the Park will be maintained. Construction noise will increase ambient acoustic levels within the Park over these experienced as a result of normal traffic. However, distance, intervening topography and thick tree cover should absorb and attenuate construction noise before it reaches the lake and recreation areas.

  Further, construction operations will be prohibited on weekends--the time of peak park use.

- Users and employees of BIA will not be significantly affected by construction operations since activities are oriented considerably to the east of the present terminal building. Further, the project design facilitates virtually uninterrupted operations of the existing facility. Temporary access to the construction area will be provided off the old S. R. 102 alignment to prevent equipment crossing in proximity to runways 2-20 and 11-29.

  These steps assure that the region will experience no economic losses as a result of delays or disruption of air carrier service.

SECTION IV
ACTIONS TO MINIMIZE UNAVOIDABLE ADVERSE EFFECTS

SECTION IV: ACTIONS TO MINIMIZE UNAVOIDABLE ADVERSE EFFECTS

The following section summarizes unavoidable adverse impacts and measures taken to minimize their effects for each environmental impact category studied. Ameliorative actions related to construction impacts have been deleted from this section since they were listed previously. All impacts covered represent permanent, long-term alterations to the natural or human environment resulting from the project.

NOISE

Flight operations on new runway 2R-20L will result in increased noise exposure in the North and South Revere communities. However, the following steps are planned to minimize noise impact:

- Implementation of modified departure procedures for flights on runway 2R-20L will reduce exposure on homes, the historic Boone House, the Paul Revere Junior High School and recreation area and the Jefferson Elementary School.
- Development of the ILS approach system on runways 2R and 2L will direct approaches during ILS weather landings over undeveloped land in Cooper County.
- Jet aircraft takeoffs over Pierce State Park will be limited to the time when conditions mandate use of the crosswind runway. Use of crosswind runway 11-29 will be primarily by light piston aircraft except under special weather conditions.

LAND USE

While Boone County had provided special airport zoning for the existing site, the project area itself is largely surrounded by incompatible land uses including residential subdivisions constructed after BIA was a commercial carrier facility. Steps planned to minimize impact on land use objectives are:

- Relocation of the First Baptist Church and provision of "last resort housing" for dislocated residents to maintain stability of the South Revere neighborhood.

- Implementation of traffic control procedures to reduce noise impact on residences and sensitive areas in the North Revere subdivision.

- Establishment of zoning ordinances in Cooper County which will assure future development south of the site is compatible with airport activities.

- Proposed up-zoning of unoccupied land in Boone County adjacent to the site to permit future development that is consistent with and supportive of airport operations.

VEGETATION AND WILDLIFE

The project will eliminate mixed hardwood and old field successional habitats. Based on the extensive habitat available in Cyrus Pierce State Park and other undeveloped areas nearby, this does not constitute a significant loss. However, steps are planned to minimize the effects on the area's wildlife inventory:

- All cleared areas not required to be paved will be restored to be consistent with FAA clear zone and transition zone criteria. Landscaped areas on the airport site's expanded eastern border will provide forage area for resident wildlife as well as an esthetic buffer for the Nathan Hills and South Revere communities.

- Individual whitetail deer known to use the site area will be inventoried, trapped, and relocated in Pierce State Park.

- Erosion and water quality controls should maintain site and Park aquatic habitat at levels capable of supporting existing fish and amphibian populations.

WATER QUALITY

With the exception of a temporary increase in stream turbidities, the project is not anticipated to adversely affect on-site or off-site water quality.

HYDROLOGY AND FLOOD HAZARDS

Clearing vegetated areas for the paved project will result in an increase in runoff. The weighted runoff coefficient for the composite area will change from 0.35 to 0.40. Major modifications to the on-site drainage system are planned to minimize impact on on-site and off-site hydrology.

AIR QUALITY

When necessary during the construction period, exposed areas will be sprayed with water to minimize dispersal of dust. Any open burning of cleared materials will be done during periods of most favorable atmospheric conditions and in conformance with State and local standards and ordinances.

Federal emission controls for airport engines will have a positive effect on the reduction of the future emission inventory of the airport. Improvements in the airport's immediate access road system will reduce congestion and delays associated with increased airport-generated traffic.

DIRECT SOCIAL IMPACTS

The project will require the acquisition of 130 homes--100 residences from the South Revere Park and 30 from Nathan Hills. The First Baptist Church and South Revere Playlot will also have to be relocated. Noise exposure will increase in the North and South Revere communities. The following steps have been taken to minimize these impacts:

- Detailed analysis indicated that the supportive infrastructure of the South Revere community mandated relocation of all residents within this same neighborhood. By applying the

$15,000 relocation assistance provision to adjust between fair market value of displaced housing and actual purchase cost of "comparable" replacement housing, a total of 81 families can be relocated within the immediate inventory of available housing in South Revere.

- Last resort housing will be provided so that the balance--19 families--may continue to reside within South Revere. This will be accomplished through the renovation of eight existing structures to bring them up to "comparable" standards and the construction of eleven new three bedroom units.

- Funds received from acquisition of the First Baptist Church may expedite a long standing congregation goal to construct a new church and community center complex on a site purchased by the congregation for this purpose in 1970.

- A surplus of replacement housing was identified for Nathan Hills residents.

- Air traffic control procedures, previously listed, should minimize noise impact on residences and institutions in North Revere.

- Community information meetings have been conducted as part of the study process and constructive citizen suggestions resulting from these sessions have been incorporated into the project's final plans. In addition, the Airport Advisory Committee created as a result of a community meeting will continue to meet to assure all ameliorative commitments are implemented.

SECTION 4(f) LANDS

Expansion of BIA will result in the acquisition of the South Revere Playlot. South Revere Playlot will be replaced in kind.

HISTORICAL AND ARCHAEOLOGICAL SITES

Only one historical or archaeological site, the General Boone House, is located within the study area. Departure procedures proposed for the project will place the Boone House outside the NEF 30 contour.

PUBLIC SERVICES

Expanded airport operations will result in increased demand for water supply, wastewater treatment and solid waste disposal. Present and planned facilities will provide adequate capacity to meet these requirements.

TRAFFIC AND TRANSPORTATION

Capacity analysis showed that long-term airport operations would significantly increase traffic volumes on S. R. 1. The following steps are planned to maintain on-site and off-site circulation at an acceptable level of service:

- Construction of a four-lane divided access road to the new terminal facility.
- Widening of S. R. 1 to a six-lane facility between the Airport access road and I-40.
- Improvements to the existing S. R. 1-Airport access road interchange.

ENERGY SUPPLY AND NATURAL RESOURCES

While expanded airport operations will increase demand for both electric power and fuel, the following steps are proposed to conserve energy resources:

- The airfield-terminal configuration is designed to minimize fuel consumption by limiting taxiing distances and maintenance vehicle access to parked aircraft.
- The availability of multiple runways reduces unproductive fuel consumption by aircraft idling or circling while waiting authorization to land or takeoff.
- The terminal building design incorporates advanced energy reduction techniques.
- Expanded limousine service is planned and negotiations are underway with Carrollton and Federalsburg Mass Transit Authorities to extend express bus service to the site.

SECTION V
ALTERNATIVES TO THE PROPOSED ACTION

SECTION V: ALTERNATIVES TO THE PROPOSED ACTION

INTRODUCTION

Four types of alternative action were considered for the project.

- Alternative modes of transportation to accomplish project objectives.
- Alternative sites to permit expanded flight service to the study area.
- Alternative airport layout plans utilizing the existing BIA site.
- The No Project Alternative.

This section evaluates the capabilities and/or implications of each alternative to achieve project objectives. The need for the project and the inability of alternative modes of transportation to meet this need were, in fact, the original stimulus for early BIA expansion feasibility studies. Alternate expansion sites and alternate layout configurations were evaluated as part of the feasibility study process with more detailed investigation as to alternate configuration impact provided by this environmental study. Subsequently, findings of the environmental study verified previous work which selected the proposed project as the superior alternative.

ALTERNATIVE MODES OF TRANSPORTATION

In order for alternative modes of transportation to fulfill project objectives, these modes would have to provide quantitatively and qualitatively comparable service. Theoretically, there are three types of alternative modes to air transportation--railroads, highways and navigable waterways. The last alternative can be immediately eliminated because none exist in proximity to the study area.

Railroad service is available via the Northeast Railroad. However, a distance of over 200 miles separates the study area from the nearest major market center in the eastern United States and the service

area is over 500 miles from other key urban communities east of the Mississippi River. Passenger service, even to the closest metropolitan market, is limited to six non-express trains. As a result, it takes over three hours to travel between Carrollton and the closest metro-market center and over two hours from Federalsburg. Conversely, between 8:00 a.m. and 6:00 p.m. there is almost hourly direct flight service with an in-flight commuting time of approximately one hour.

The environmental investigation included discussion with representatives of Amtrak as to the possibility of improved passenger service for Carrollton. Amtrak officials stated that costs precluded extension of high speed service to the Carrollton area for the foreseeable future and while consideration would be given to semi-express service, interim stops would still result in a two-hour trip minimum.

Given the restrictions on regional inter-city rail transportation, implications on a nationwide scale are all the more obvious. Present direct flight or connecting service permit a businessman to travel between BIA and such centers as Chicago, Atlanta, and Dallas. Further, BIA is the port of entry and departure for three international flights a week. These flights continue on to other major cities with additional connecting service to those metropolitan areas provided within a two-hour flight from BIA. Railroad transportation simply cannot compete with this efficient service and, therefore, cannot be considered a viable alternative to airport expansion.

The second transportation alternative is private car, bus or truck service via the surface highway system. Again distance and travel time are the overriding disadvantages. Even with a superior, uninterrupted interstate network linking Carrollton to the closest metropolitan market area, it is impossible to accomplish the trip under four hours. Further, once in the metropolitan area delays are inevitable due to central business district (CBD) traffic. Automotive travel to places like Dallas and Los Angeles involve days versus hours via commercial carrier service.

In summary, due to the study area's distance from major national markets, air service is the most efficient mode of transportation.

ALTERNATIVE SITES

The initial feasibility study by Skyways Associates explored the possibility of discontinuing commercial operations at BIA and developing a wholly new facility at a different location. It was agreed that this action would only be feasible if a comparable site were available. Comparable was defined by the following criteria:

- A central location between Carrollton and Federalsburg.
- Good existing or planned highway access between the new airport and its two major service cities.
- Adequate terrain to permit cost-effective development.
- Minimal navigational constraints or hazards.
- Compatible land use and/or negligible potential environmental impact to result from the introduction of airport operations.

This criteria limited the search for a possible expansion site in the area between Carrollton and Federalsburg. Unoccupied land immediately east of the present airport was eliminated by the existence of the north-south high mast overhead power transmission corridor, a clear navigational hazard. Further, topography east of the present site grows increasingly steep as the foothills of the Jefferson Mountains are encountered. Costly excavation required in this area, as well as hazards due to fairly rapid descent/ascent over the Jefferson range, eliminated properties to the east from consideration as viable site alternatives.

The possibility of developing a new site on available farm land in Boone County three miles northwest of Cyrus Pierce State Park was explored. This site would have required construction of an approximately 6.5 mile four-lane divided highway to provide access to I-40 and S. R. 66. The cost for this road right-of-way and construction was estimated in 1972 to exceed $8 million. This cost would not include interchange and grade separation structure costs. Further sub-surface soil exploration indicated large areas of deep muck indicating poor bearing capacity over an area of one-half to two-thirds of the site. Costs to compensate for these problems along with access road requirements made it impossible to justify use of this site on a cost-effective basis.

A site also appeared available in Cooper County approximately 3.5 miles south of Pierce State Park and only 1.5 miles east of S. R. 1. This would have brought the airport within eight miles of the Federalsburg CBD. Objections were immediately raised by Carrollton City officials on the grounds of distance (18 miles) to the city of principal use. Federalsburg also objected vigorously fearing flight paths from the east and south would

inevitably impact St. Luke's Hospital and Hopkins Medical Research Center. The site also conflicted with basic planning goals being formulated by the County which envisioned use of the site area for residential development.

Since the investigation exhausted the inventory of available contiguous tracts meeting basic study criteria, the development of a wholly new facility on a new site was eliminated as a prudent alternative.

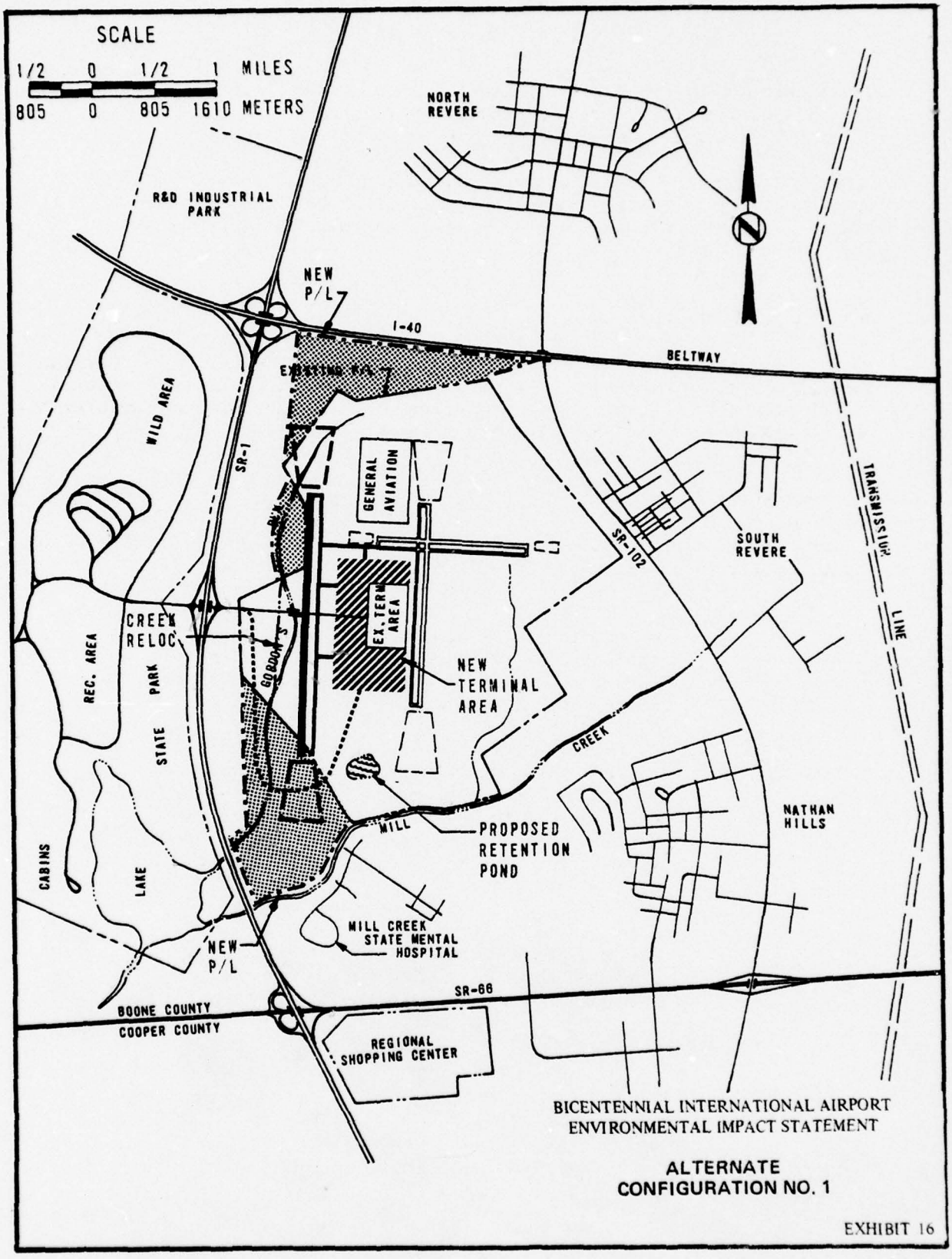
ALTERNATIVE CONFIGURATIONS

Three alternative expansion layouts were prepared as part of the feasibility study process. Alternate 3, shown on Exhibit 3, was selected as the proposed project. Alternates 1 and 2 are illustrated in Exhibits 16 and 17 and their major work elements are described below.

Alternate 1

This configuration would have resulted in an orientation of major airport activity to the west. Specific design elements included:

- Construction of a new 10,000-foot runway (designated 2L-20R) parallel to and 5,000 feet west of the existing air carrier runway in the Gordon's Run floodplain.
- The existing terminal building would be expanded between the parallel 2-20 runways with apron's designed to provide 60 aircraft parking positions. Interior design would accommodate identical passenger amenities and baggage handling innovations to those proposed for the selected project.
- An extension of the existing four-lane access road would travel south from the present entrance, through the new runway clear zone and turn north to the enlarged terminal area.



BICENTENNIAL INTERNATIONAL AIRPORT
ENVIRONMENTAL IMPACT STATEMENT

ALTERNATE CONFIGURATION NO. 1

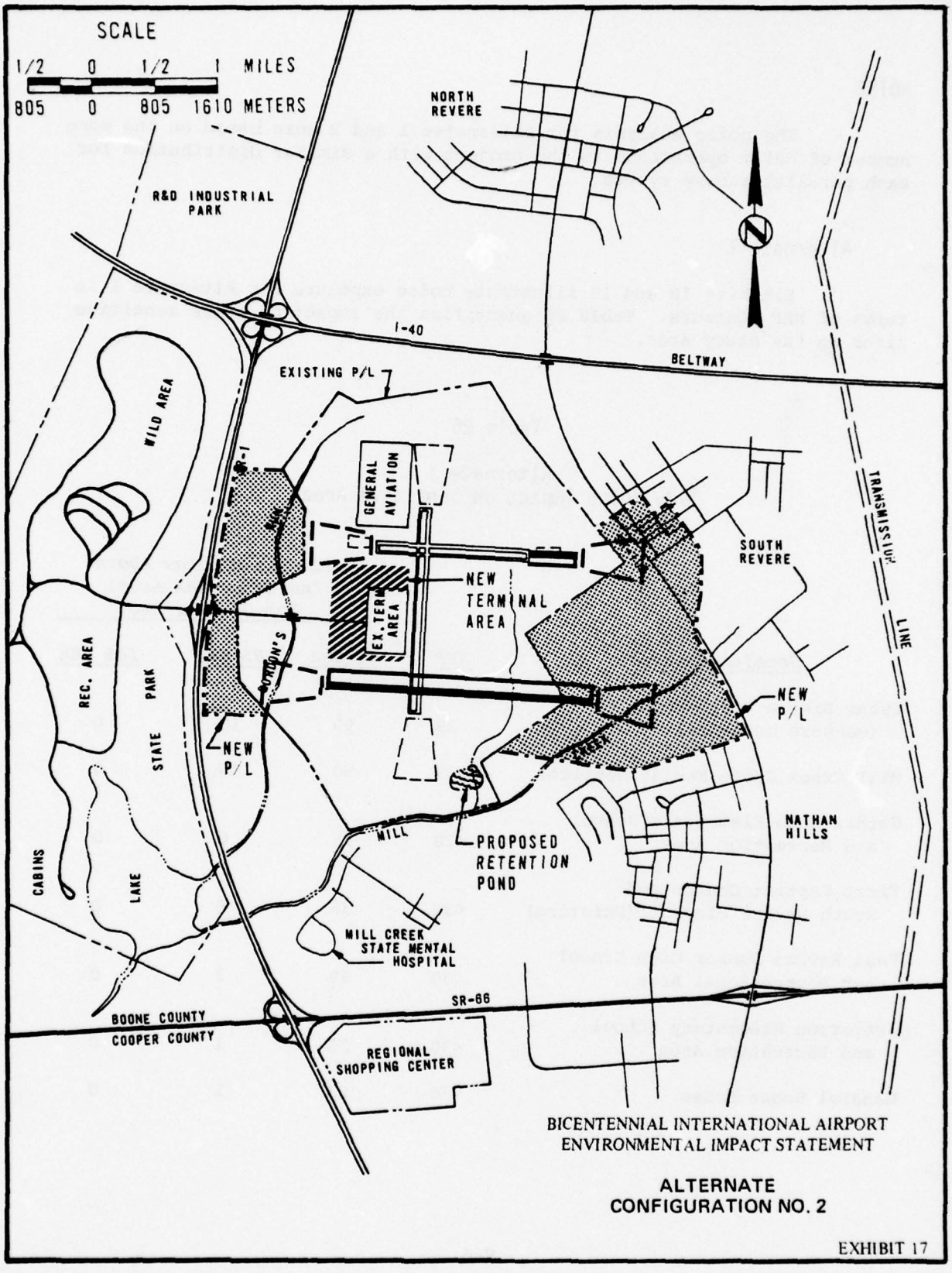
EXHIBIT 16

Alternate 2

This alternative would have expanded airport operations to the south and resulted in increased flight operations to the east and west of the existing site. Specific project components include the following:

- Construction of a new 10,000-foot runway parallel to a 5,500 feet south of existing crosswind runway 11-29.
- Extension of the existing crosswind runway and taxiway to 8,500 feet. The extension would occur at its eastern end, accompanied by land acquisition.
- Expansion of the existing terminal building between the parallel 11-29 runways with aprons designed to provide parking for 60 to 70 aircraft. Interior terminal amenities would be identical to those planned for the project.

The environmental impacts of alternative configurations are discussed in the following section. The No Project Alternate was also considered. Impacts resulting from inaction--failure to expand BIA--are discussed at the conclusion of each impact category.



BICENTENNIAL INTERNATIONAL AIRPORT
ENVIRONMENTAL IMPACT STATEMENT

ALTERNATE CONFIGURATION NO. 2

EXHIBIT 17

NOISE

The noise analysis for Alternates 1 and 2 were based on the same number of daily operations as the project with a similar distribution for each parallel runway system.

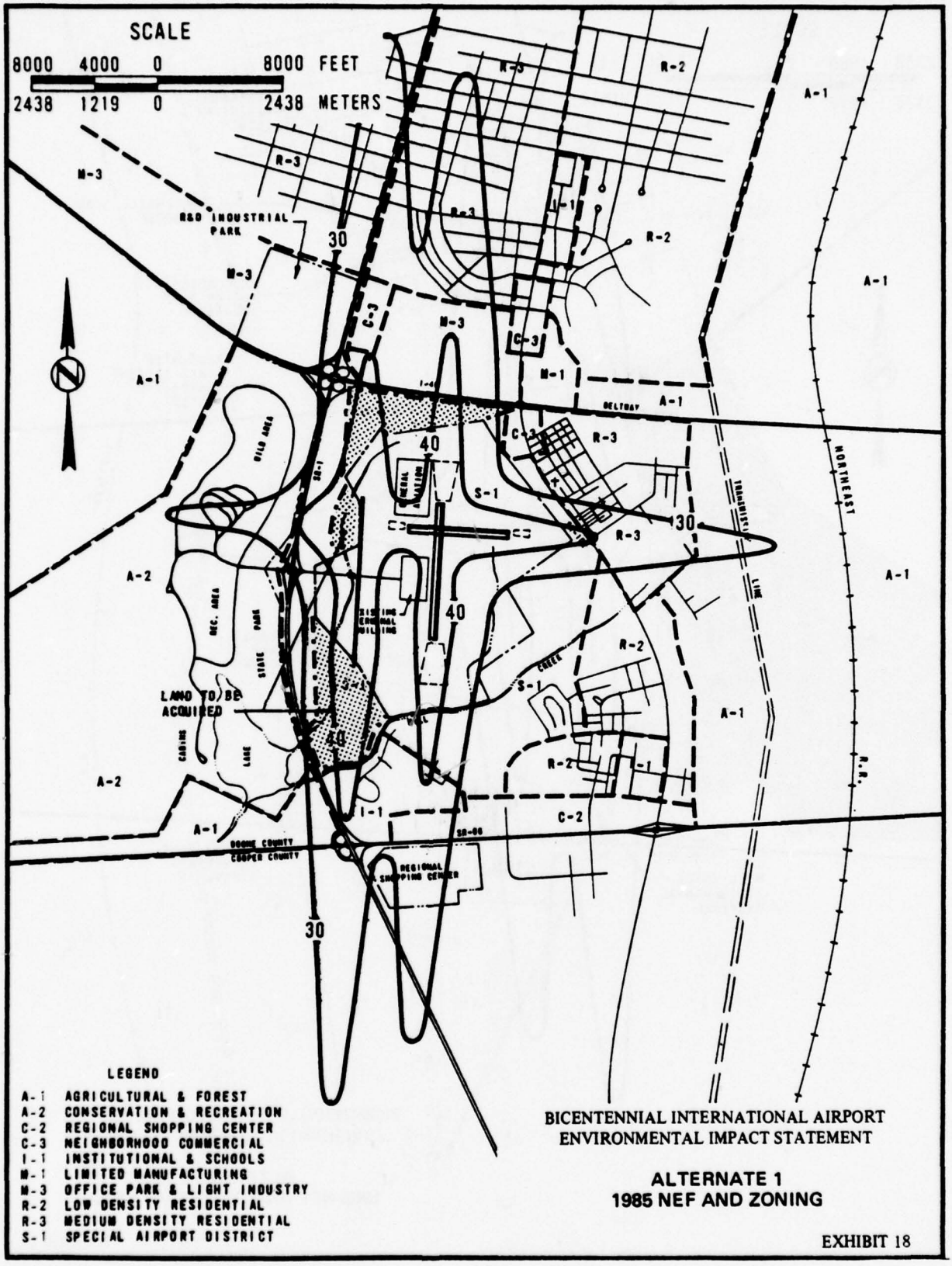
Alternate 1

Exhibits 18 and 19 illustrate noise exposure for Alternate 1 in terms of NEF contours. Table 26 quantifies the impact on noise sensitive sites in the study area.

Table 26

Alternate 1
1985 Noise Impact on Sensitive Areas

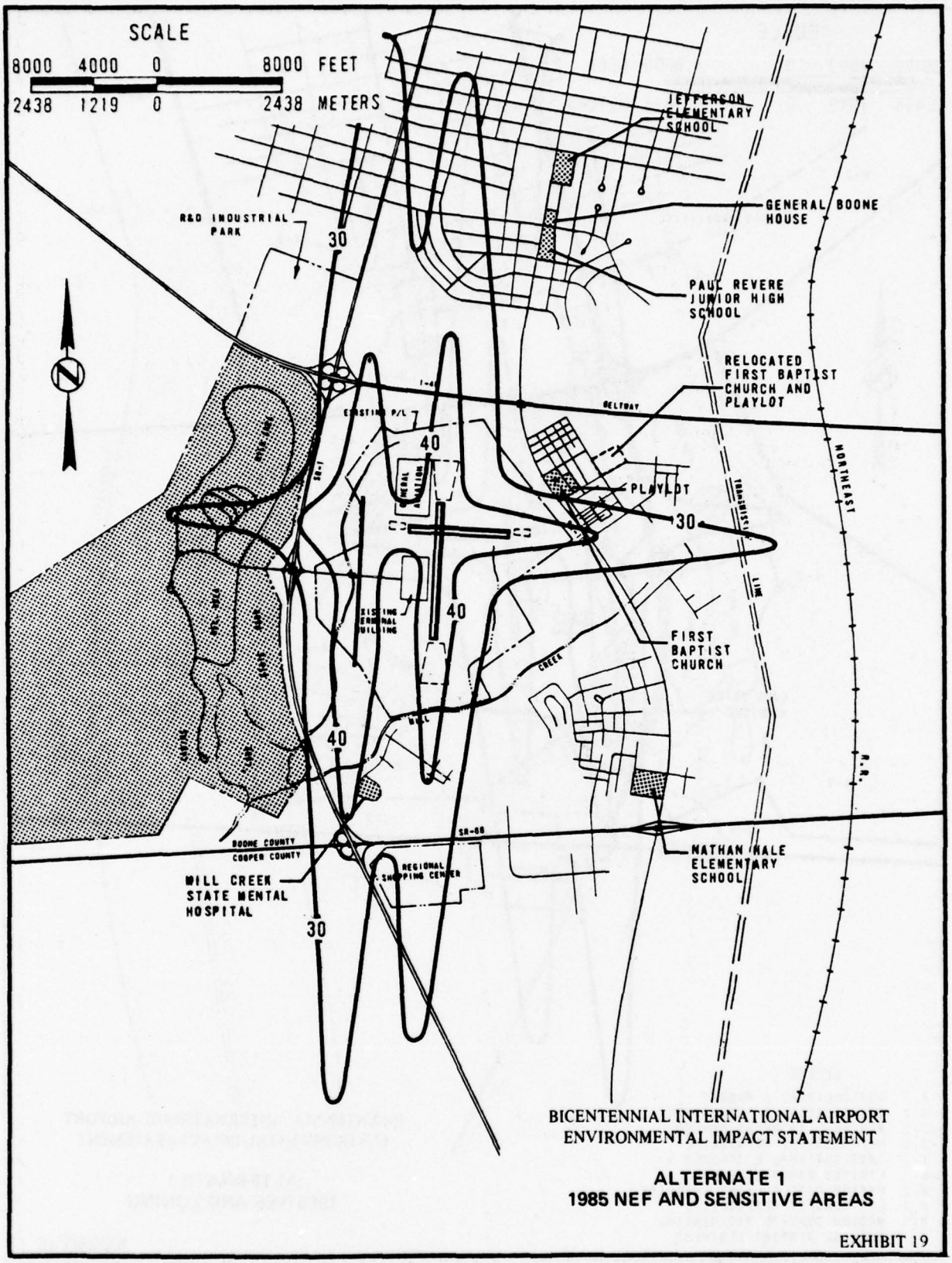
		Time in Minutes Above Indicated dBA Level For 24-Hour Day		
Sensitive Areas	*NEF*	*65 dBA*	*85 dBA*	*105 dBA*
Cyrus Pierce State Park (eastern boundary)	39	50	10	0
Mill Creek State Mental Hospital	39	50	10	0
Nathan Hale Elementary School and Recreation Area	<30	15	0	0
First Baptist Church and South Revere Playlot (Existing)	<30	36	6	0
Paul Revere Junior High School and Recreational Area	<30	29	2	0
Jefferson Elementary School and Recreation Area	<30	23	1	0
General Boone House	<30	23	1	0



BICENTENNIAL INTERNATIONAL AIRPORT
ENVIRONMENTAL IMPACT STATEMENT

ALTERNATE 1
1985 NEF AND ZONING

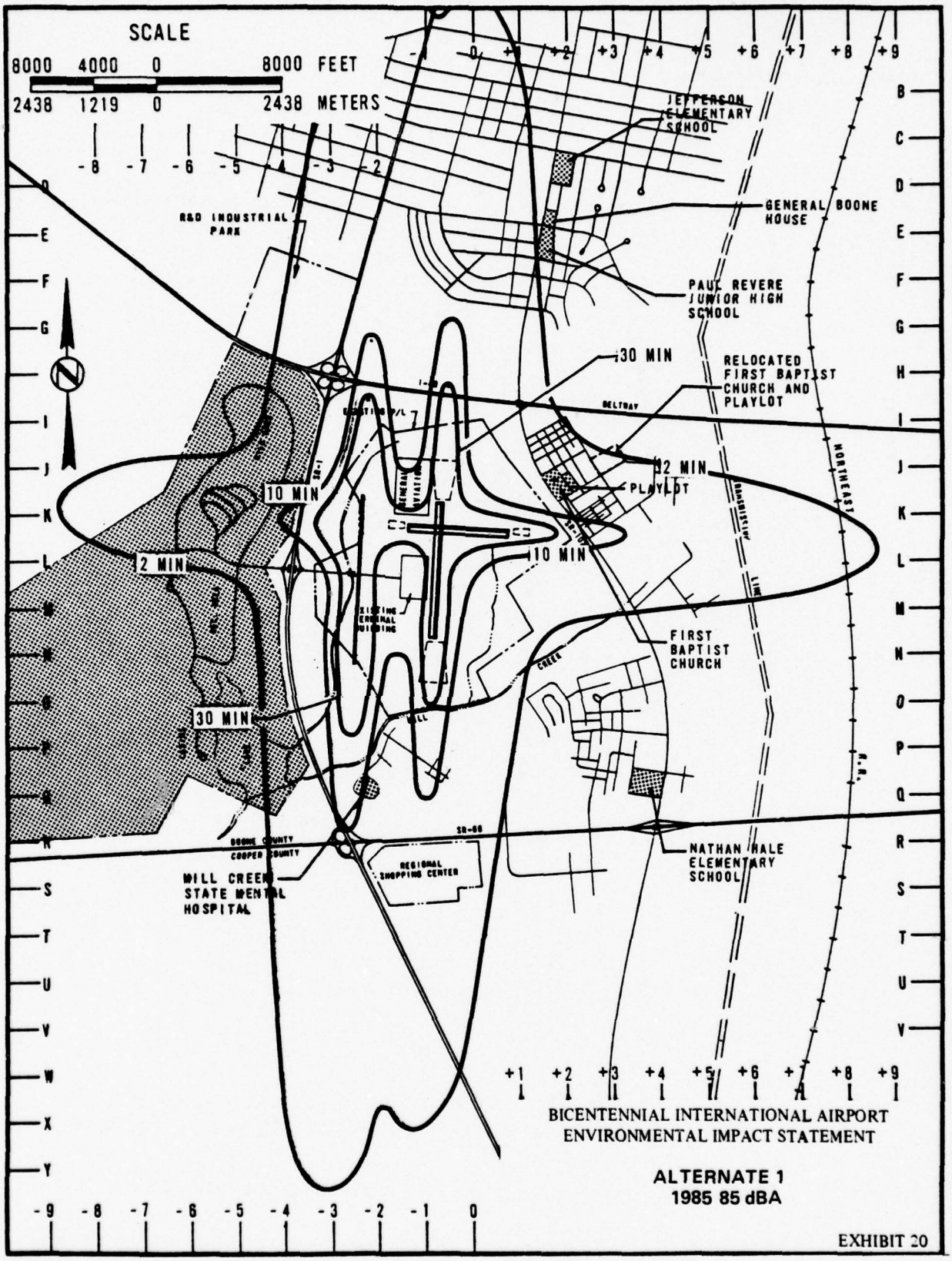
EXHIBIT 18



BICENTENNIAL INTERNATIONAL AIRPORT
ENVIRONMENTAL IMPACT STATEMENT

ALTERNATE 1
1985 NEF AND SENSITIVE AREAS

EXHIBIT 19


SCALE
8000 4000 0 8000 FEET
2438 1219 0 2438 METERS
JEFFERSON ELEMENTARY SCHOOL
GENERAL BOONE HOUSE
R&D INDUSTRIAL PARK
PAUL REVERE JUNIOR HIGH SCHOOL
30 MIN
RELOCATED FIRST BAPTIST CHURCH AND PLAYLOT
BELTWAY
32 MIN
PLAYLOT
10 MIN
2 MIN
10 MIN
FIRST BAPTIST CHURCH
30 MIN
BOONE COUNTY
COOPER COUNTY
SR-88
NATHAN HALE ELEMENTARY SCHOOL
WILL CREEK STATE MENTAL HOSPITAL
REGIONAL SHOPPING CENTER
BICENTENNIAL INTERNATIONAL AIRPORT
ENVIRONMENTAL IMPACT STATEMENT
ALTERNATE 1
1985 85 dBA
EXHIBIT 20

Alternate 1 significantly increases noise exposure on Mill Creek State Mental Hospital and more residences within the North Revere Park area west of S. R. 1. Further, this Alternate will increase sideline noise in Pierce State Park.

Approximately 300 residences would lie within the NEF 30 contour for Alternate 1, as opposed to 280 residences under the proposed project.

The sensitivity of Mill Creek State Mental Hospital cannot be overemphasized. Uninterrupted communication is critical to therapy. Take-off noise, at least, could disrupt concentration of patient and analyst.

By using the INM criteria, Exhibit 20 indicates future exposure to aircraft noise in terms of total daily time greater than 85 dBA. Daily exposure in South Revere and Nathan Hills would show little change from existing conditions. Exposure on the Mental Hospital and State Park would increase to more than 10 minutes daily. Residential areas east and west of S. R. 1 to the north would also experience increased exposure of up to 5 minutes daily.

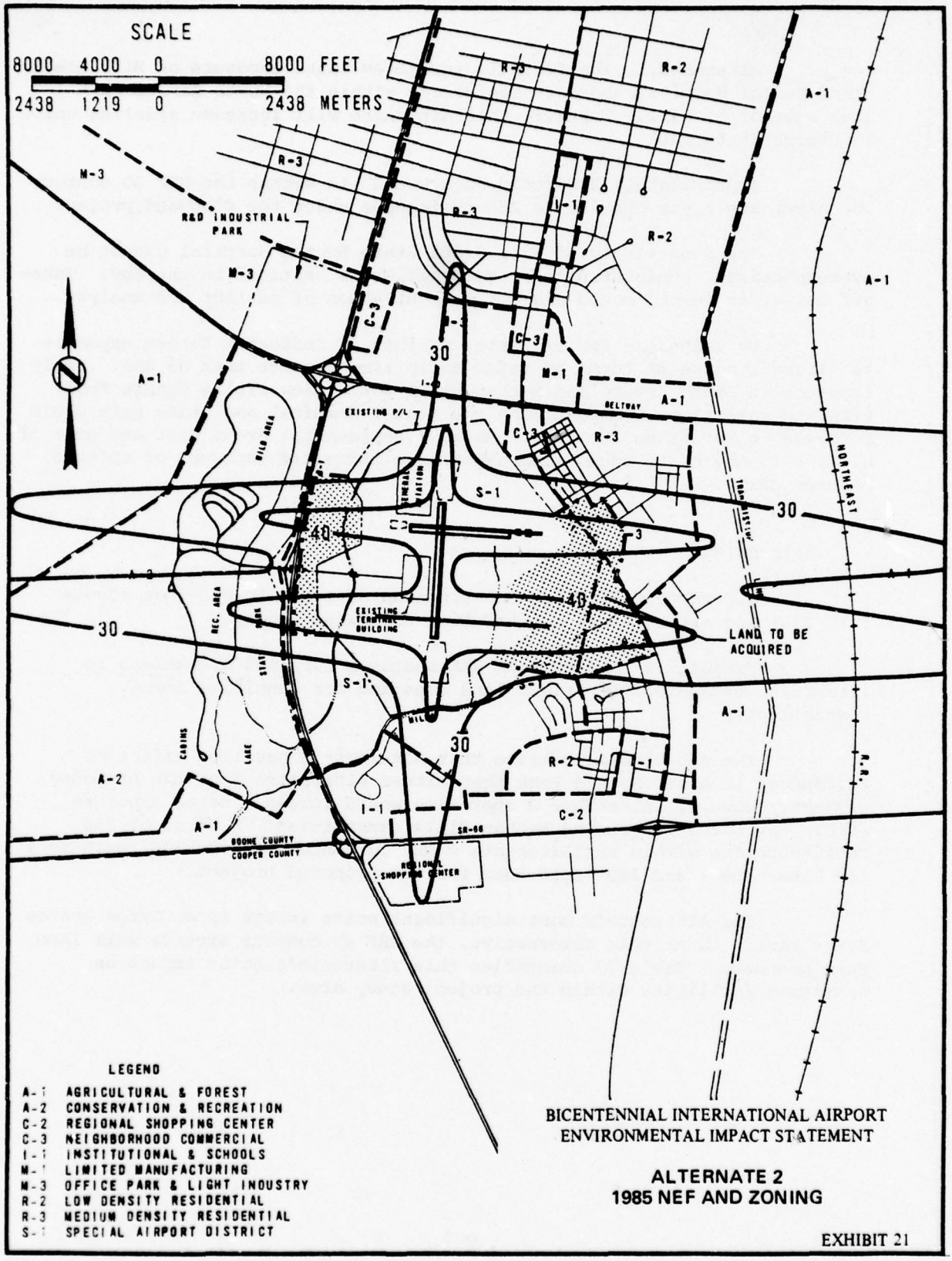
Alternate 2

Alternate 2 provides construction of a new 10,000-foot runway (11R-29L) and extension of the existing crosswind runway.

Exhibits 21 and 22 show NEF contours for 1985 operations to illustrate exposure for various land uses and for sensitive areas, respectively.

The exhibits illustrate that Alternate 2 has less affect on residences in North Revere Park than either Alternates 1 or the proposed project. However, Alternate 2 operation would increase noise exposure within the South Revere and Nathan Hills communities. A total of 150 residences lie within the Alternate 2 NEF 30 contour versus 300 residences for Alternate 1 and 280 residences for the proposed project.

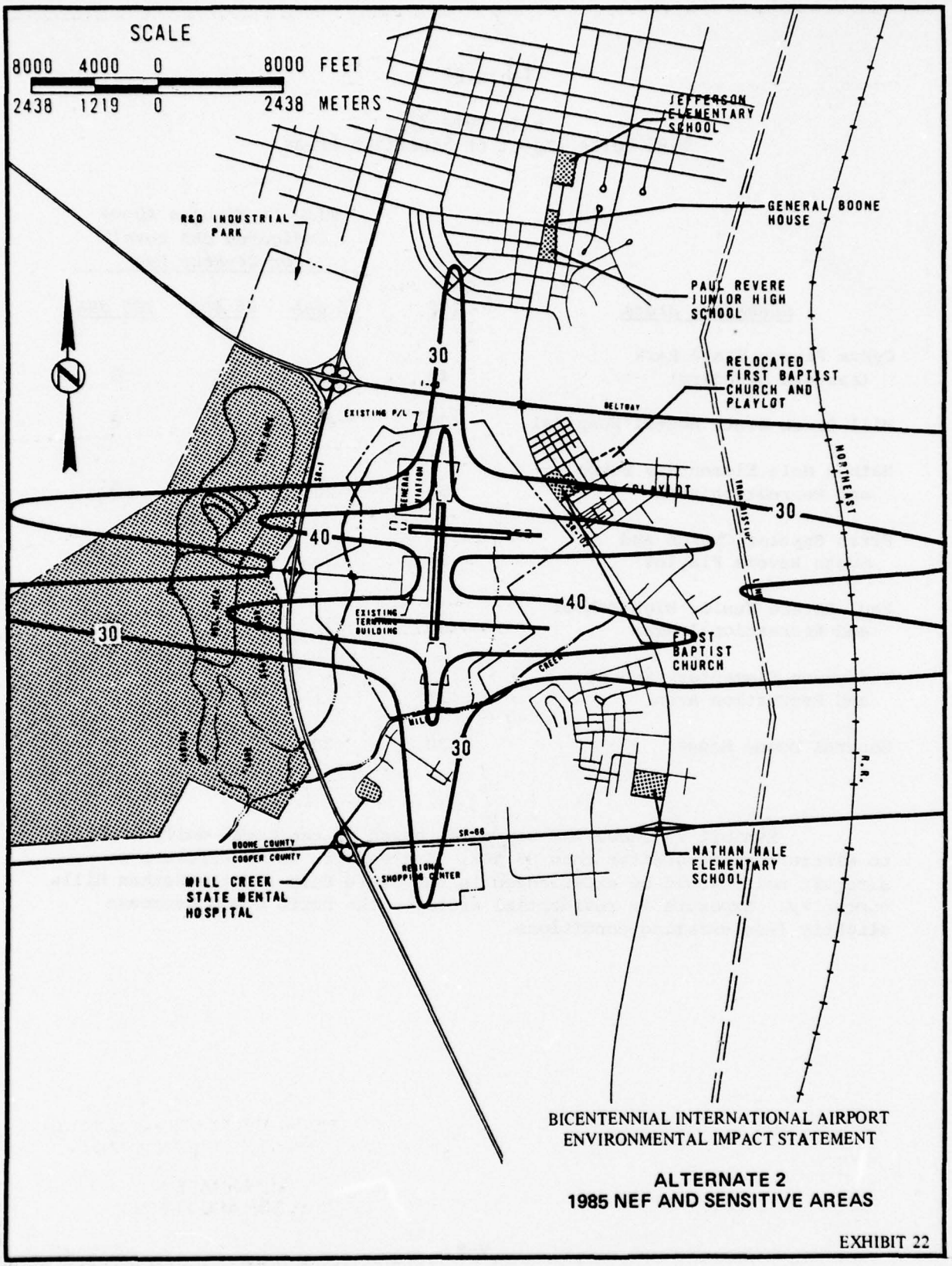
The Alternate's most significant noise impact is on Cyrus Pierce State Park. Under this alternative, the NEF 40 contour extends well into Park property. Table 27 quantifies this alternate's noise impact on sensitive facilities within the project study area.



BICENTENNIAL INTERNATIONAL AIRPORT
ENVIRONMENTAL IMPACT STATEMENT

ALTERNATE 2
1985 NEF AND ZONING

EXHIBIT 21



BICENTENNIAL INTERNATIONAL AIRPORT
ENVIRONMENTAL IMPACT STATEMENT

ALTERNATE 2
1985 NEF AND SENSITIVE AREAS

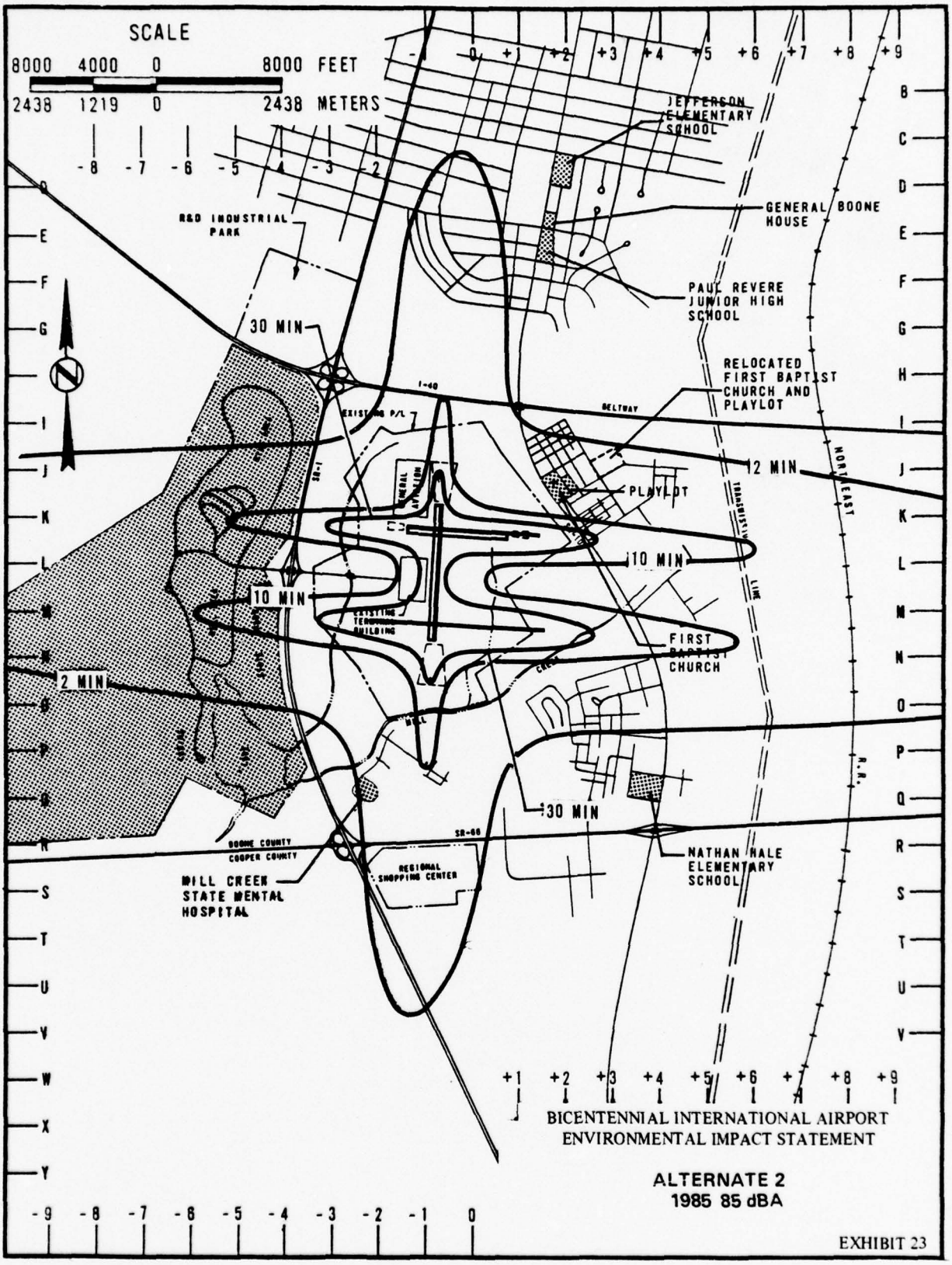
EXHIBIT 22

Table 27

Alternate 2
1985 Noise Impact on Sensitive Areas

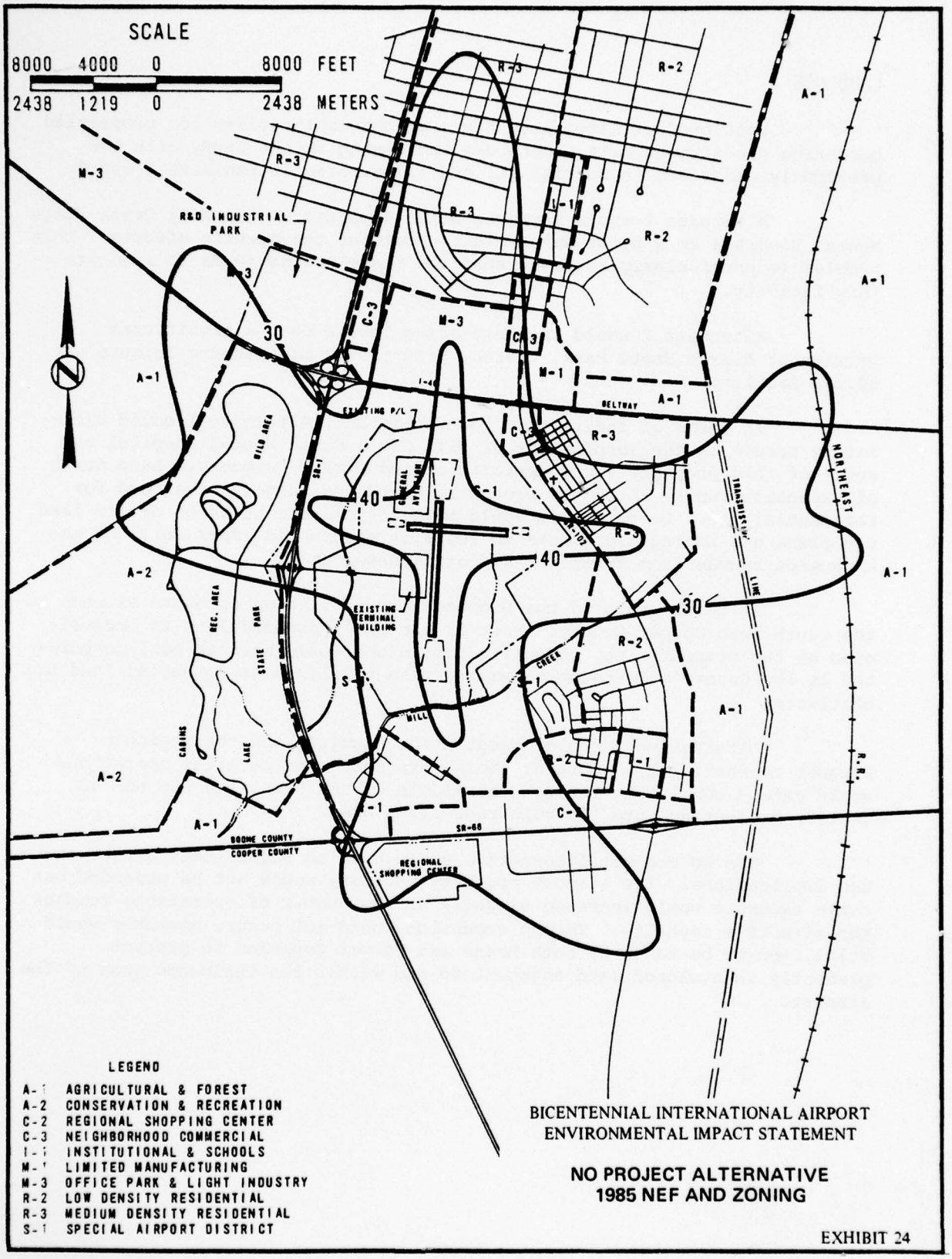
Sensitive Areas	NEF	Time in Minutes Above Indicated dBA Level For 24-Hour Day		
		65 dBA	85 dBA	105 dBA
Cyrus Pierce State Park (eastern boundary)	42	65	15	3
Mill Creek State Mental Hospital	<30	30	3	0
Nathan Hale Elementary School and Recreation Area	<30	20	1	0
First Baptist Church and South Revere Playlot	35	36	6	0
Paul Revere Junior High School and Recreational Area	<30	21	1	0
Jefferson Elementary School and Recreation Area	<30	21	1	0
General Boone House	<30	20	1	0

Exhibit 23 shows INM contours, based on the total daily exposure to aircraft noise greater than 85 dBA. Increase in daily exposure to aircraft noise would be experienced in the State Park and the Nathan Hills community. Exposure in residential areas to the north would decrease slightly from existing conditions.


SCALE
8000 4000 0 8000 FEET
2438 1219 0 2438 METERS
JEFFERSON ELEMENTARY SCHOOL
GENERAL BOONE HOUSE
R&D INDUSTRIAL PARK
PAUL REVERE JUNIOR HIGH SCHOOL
30 MIN
RELOCATED FIRST BAPTIST CHURCH AND PLAYLOT
I-40
BELTWAY
EXISTING P/L
12 MIN
PLAYLOT
10 MIN
10 MIN
FIRST BAPTIST CHURCH
2 MIN
30 MIN
BOONE COUNTY
COOPER COUNTY
SR-66
REGIONAL SHOPPING CENTER
NATHAN HALE ELEMENTARY SCHOOL
MILL CREEK STATE MENTAL HOSPITAL
BICENTENNIAL INTERNATIONAL AIRPORT
ENVIRONMENTAL IMPACT STATEMENT
ALTERNATE 2
1985 85 dBA
EXHIBIT 23

No Project Alternative

Under the No Project Alternative, noise exposure will continue primarily along the axis of the existing major runway. Exhibit 24 indicates exposure in 1985 based on operations at the site with the existing configurations. Noise exposure will increase over existing conditions in North Revere based on an increase in operations. It is estimated that 265 residences will be located within the NEF 30 contour.



BICENTENNIAL INTERNATIONAL AIRPORT
ENVIRONMENTAL IMPACT STATEMENT

NO PROJECT ALTERNATIVE
1985 NEF AND ZONING

EXHIBIT 24

LAND USE

Both project alternates have serious implications for properties bordering the Airport site. Land use and zoning in the study area was previously described in Section III and illustrated in Exhibits 2 and 4.

Alternate 1 would increase noise exposure at the Mill Creek State Mental Hospital to a point which might undermine therapeutic efforts. This problem is particularly acute in that the State has no funds to relocate this facility.

Alternate 2 would increase noise levels over a significant portion of Pierce State Park, thereby potentially diminishing leisure use of the facility.

In terms of indirect or induced impact, Alternate 1 could ultimately result in the abandonment of Mill Creek State Mental Hospital and reuse of this property for commercial or industrial purposes. Land north of expansion runway 2L-20R is presently zoned and largely developed for residential use. Boone County would have to consider revision of its land use plans and zoning ordinances to restrict unoccupied areas north of the expansion runway from further residential development.

As in the case of the proposed project, noise exposure extends to the south into Cooper County. Most of the newly exposed land is undeveloped at the present time. Specific provisions would have to be incorporated in the County's forthcoming master plan to eliminate potential land use conflicts.

Alternative 2 would threaten the character of the region's largest recreational resources. Noise exposure from parallel operations would extend completely through the middle of the park with the NEF 40 contour projecting into the main recreation area.

The No Project Alternative would have no significant direct land use implications. The airport property boundary would not be expanded but noise exposure would increase slightly as the number of operations reaches the airport's capacity. Though expansion would not occur, measures would still need to be taken by both Boone and Cooper Counties to protect presently undeveloped land adjacent to and within the influence area of the airport.

VEGETATION AND WILDLIFE

Table 28 indicates acreage taken from dominant on-site biotic communities as a result of construction of Alternates 1 and 2. The recommended project's impact on site vegetational associations is also shown for comparative purposes.

Table 28

Alternative Impacts on Site Vegetation

	Alternate 1		*Alternate 2*		*Recommended Project Alternate 3*	
Vegetation Association	*Alteration (Acres)*	*Percent Change*	*Alteration (Acres)*	*Percent Change*	*Alteration (Acres)*	*Percent Change*
Mixed Hardwoods	-542	-46%	- 287	-24%	- 78	- 6%
Old Field Successional	-391	-20%	- 563	-28%	-449	-22%
Agricultural	0	0	- 485	-87%	-256	-46%
Maintained	+933	+29%	+1,355	+42%	+783	+24%

As can be seen from the Table, Alternate 1 results in the largest loss of mixed hardwoods--the most valuable on-site community. Mixed hardwoods are the most difficult vegetation to replace in terms of time required to be restored through natural succession.

Further, location of the new runway to the west would require relocation of a portion of Gordon's Run and would disrupt aquatic habitat. While provisions to protect stream water quality would ultimately restore the condition of the watercourse, stream habitat would be lost.

Alternate 2 results in the greatest taking of total biotic communities. This configuration reduces the study area's agricultural land inventory, and removes over 800 acres of mixed hardwood and old field successional habitat.

However, Alternate 2's most damaging impact results from increased noise exposure in Pierce State Park. While research has not fully documented the effects of aircraft noise on wildlife, the steady low altitude overflight of the park from the new and extended runways will degrade the facility's passive recreation and natural value.

Comparatively, the proposed project is superior in that it takes both the least acreage of total biotic communities and the least acreage of the most valuable biotic community. Alternate 1 takes almost half the study area's hardwood habitat and would cause a disruption in on-site and off-site aquatic communities. While Alternate 2 will eliminate almost all of the study area's agricultural communities, it would require about 200 acres more of the hardwoods than the proposed project.

Under the No Project Alternative, no biotic losses would occur as a direct result of the airport. However, it can be assumed that development of a different nature would occur in the study area, thereby reducing the area's biotic inventory on a piecemeal basis.

WATER RESOURCES - WATER QUALITY

Alternate 1

Even with the implementation of erosion controls, construction of Alternate 1 will significantly increase turbidities in Gordon's Run. Extensive precautions will be required to prevent sediment transport to the Park's lake. Further measures will be required to safeguard against fuel leaks or accidental spills of construction-associated materials which could runoff to this watercourse. Problems are also anticipated in the area at which a half-million cubic yards of material must be excavated in Gordon's Run to replace lost flood storage volume.

Alternate 2

Construction of Alternate 2 does not require stream relocation and thus, poses less consequences. However, in comparative terms, Alternate 2 lies closer to both Mill Creek and Gordon's Run then the proposed project and greater volumes of embankment material must be moved. As a result there is a greater chance for untrapped sediment transport from excavated areas of Alternate 2 than from the proposed project.

Storm water and sanitary wastewater collection and treatment systems are comparable for all alternatives.

WATER RESOURCES - HYDROLOGY

The hydrological and drainage impacts among the project alternates do not vary significantly. However, the impact on floodplain storage along Gordon's Run would vary significantly depending on the alternative chosen. The floodplain effects will be discussed in the Flood Hazard Evaluation Section.

The impacts of the alternates, including the No Project Alternative, are detailed below.

Alternate 1

Storm drainage from the new runway 2L-20R, new taxiway, and new terminal area will be carried in a closed system of inlets and storm drain conduits to a 14-acre retention pond situated about one-half mile south of the new terminal area and midway between the two major runways. The storm runoff collected by the existing drainage system for runway 2R-20L will be intercepted by the retention pond and redirected to Mill Creek instead of Gordon's Run. In addition, storm drainage from the General Aviation area to the north will be intercepted by the new storm sewer system diverted to the retention pond.

Construction of this Alternate will require the relocation of Gordon's Run to include removal of the existing box culvert and the construction of a new twin 10' x 6' box culvert under the relocated airport entrance road near the southern end of runway 2L-20R.

Alternate 2

Storm drainage from the general aviation area will be combined with the drainage system for the new terminal area and will be piped southward under the new runway 11R-29L to a proposed retention pond located just to the southeast of the existing runway 2-20.

Storm runoff collected from existing runway 2-20 will be redirected to the proposed retention pond rather than continue to its present outfall in Gordon's Run.

Drainage from the runway 11L-29R extension will be collected in an addition to the existing system. This will outfall into the existing drainage swale flowing to Mill Creek, previously discussed.

In the area of the proposed new crosswind runway 11R-29L, a 60" culvert will be installed under the runway. From this point the existing swale will be improved and slightly redirected to carry flow to the proposed retention pond.

No Project Alternative

The No Project Alternate would mean that all existing drainage patterns would remain the same and therefore the construction of the proposed retention ponds under the various project alternatives would not be accomplished. Therefore, because the retention ponds planned for the project alternative have been included in the Watershed Work Plan, the control structure planned for Pierce Park Lake would have to be modified to provide additional storage capacity.

The proposed modifications to the drainage systems and the ponding provided for both alternatives assure that project development will not alter off-site hydrological patterns.

FLOOD HAZARD EVALUATION

The flood hazard potential of each of the alternatives is discussed below. As previously noted, the project alternative will not require any modification of either Mill Creek or Gordon's Run. However, the alternatives to the project will result in a loss of floodplain storage which will require replacement.

Alternate 1

From a flood hazard potential standpoint, this alternative poses problems which are not insurmountable but which must be resolved. By constructing the new runway adjacent to Gordon's Run, over 300-acre-feet of floodplain storage for a 100-year storm will be occupied by the new runway. In order to replace this previously available storage, a volume of 484,000 cubic yards of material below the 100-year flood elevation must be excavated in a location approximately two miles downstream. In addition, it will be necessary to relocate approximately 3,000 feet of the channel. The new airport entrance road must be constructed on a 15-foot fill section for the first two miles to avoid flooding.

Alternate 2

The construction of this alternative will not create any additional flood hazard potential for the airport facility. All drainage collected from the airport facility presently discharging into Gordon's Run will be redirected to the proposed retention pond for this alternative and thereby reducing the peak flows in Gordon's Run.

No Project Alternative

Since there will be no modification to the existing facility under this alternative the existing floodplains will be unchanged and therefore will not create any additional impacts.

DIRECT AND INDIRECT SOCIOECONOMIC IMPACTS

With the exception of construction costs, direct and indirect economic impacts will be similar for any of the expansion alternatives.

Social consequences, however, do vary significantly among alternative configurations.

Alternate 1

This configuration will have the least impact on the human environment in that it does not require the acquisition of any homes or institutions. Noise exposure analysis shows that it increases exposure to residences in the North Revere community north of I-40.

However, Alternate 1 will most adversely affect operations at Mill Creek State Mental Hospital and impinge on the present setting of Pierce State Park. Finally, the complex earthwork involved in construction of the new runway within the Gordon's Run floodplain will prolong the construction period and its related disruptive impacts on the surrounding community.

Alternate 2

This configuration will have less noise impact on North Revere but will increase exposure within Nathan Hills. Further, acoustic analysis shows that this alternative will degrade Pierce State Park as a recreational resource.

Alternate 2 would require the acquisition of 20 homes--all in the South Revere Park community. This configuration would not require the acquisition of the First Baptist Church. A replacement housing analysis, similar to that conducted for the proposed project was prepared for Alternate 2. By comparing the known demand to available supply (as shown in the Appendix), there are found to be comparable sufficient replacement units available directly within the South Revere community without implementation of the "Last Resort Housing" provisions required for the proposed project.

No Project Alternative

The No Project Alternative would not require the acquisition of any homes or institutions in communities surrounding the airport site. However, no expansion will result in the following adverse impacts:

- Increased safety hazards as delays prolong flight patterns over residential communities.

- Increased air pollution from prolonged aircraft and motor vehicle emissions due to traffic congestion.

- Loss of jobs, private consumer income and public revenues directly resulting from project construction and operation.

- Steadily reducing economic, educational and cultural opportunities as expansion of service becomes limited.

Regional economic development is linked with expansion into national markets. Without airport expansion, regional growth would be steadily constricted. Public revenues dependent on income, sales and property tax base growth will also reflect this shortfall and in turn, will result in reduced services or increased taxes. Neither situation is conducive to attracting new industry which spins-off new jobs. Thus, the No Project Alternative will slow economic growth.

Carrollton will be somewhat less affected than Federalsburg due to the predominance of State government as its primary employer. However, State service will also be impacted by limitations on flight service.

AIR QUALITY

The results of the air pollution inventory and dispersion analyses, based on Federal emission standards, indicated that expansion of BIA will not adversely affect the air quality in its vicinity.

Gross pollutional loadings for expansion as shown in Tables 21 and 22 for the proposed project, will not vary significantly among alternatives. Increased aircraft, automotive and service vehicle traffic projected for alternative configurations are approximately the same as that for the project. The only variation among expansion alternates will be the pollutant concentrations in the areas that will experience direct aircraft overflight.

The No Project Alternative would result in more gross daily pollution than that associated with the other alternates since it permits no expansion while permitting air traffic to increase. The ambient air quality in the area would improve somewhat by 1980 and 1985 under the No Project Alternate due to the Federal aircraft emission controls. Improvement in air quality under the expansion alternatives is related to reduced taxiing and idling periods, and larger operating areas, as well as aircraft emission controls.

Alternate 1 would primarily affect the eastern end of the State Park. The location of the runway near S. R. 1 would increase pollutant levels in the State Park. Alternate 2 would have a greater impact on the State Park since the alignment of the runways would put the Park in the glide path of the majority of aircraft that would be using BIA.

UTILITIES

On-site variations in water and sewer service connections would occur due to the varying location of facilities required under alternate configurations.

However, all alternatives except the No Project will have the same net effect on water supply, sewerage and solid waste system.

ENERGY SUPPLY

Gross energy consumption at BIA would not vary significantly among expansion alternatives. However, energy consumption from project expansion must be placed in the proper perspective by comparison to the No Project Alternative. Under this option, the number of operations would increase up to a point. Overall airport operation would experience tolerable delays; but these delays, whether in the air, on the taxiways, or in the unloading zone at the terminal, would also increase daily energy consumption. Since this increase is not associated with productive phases of operation, it becomes a wasted resource.

SECTION VI
SHORT-TERM USES AND LONG-TERM PRODUCTIVITY

SECTION VI: RELATIONSHIP BETWEEN SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

This section examines tradeoffs between short-term impacts and long-term gains anticipated to result from the project. Short-term impacts are largely confined to the construction period and involve temporary disruptions, whereas long-term impacts involve the permanent alterations which are associated with the completed operational project.

Short-term impacts on the natural environment include dislocation of wildlife as vegetation is cleared, and an increase in on-site stream turbidities.

Construction equipment will increase noise levels in proximity to the active line of work. However, distance and intervening topography should diminish impact on residences to the east of the project.

Open burning of cleared tree and ground cover will briefly increase daily air pollution loads in the site area. Burning operations will only be scheduled for days when weather conditions optimize dispersion and will be consistent with all State and local regulations. Most importantly, air quality at the airport will improve over the long-term as a result of Federal automotive and aircraft emission standards.

Short-term disruptions to the human environment include dislocation of 130 families within the South Revere Park and Nathan Hills communities. Relocation of the First Baptist Church does not represent a short-term impact since this move has been long planned and desired.

However, local traffic patterns and traditional school bus stops on S. R. 102 may be disrupted and residences in both South Revere and Nathan Hills may experience increased noise as a result of construction operations associated with the relocation of S. R. 102. Access to Pierce State Park may also be temporarily disrupted by improvements to S. R. 1 and the S. R. 1-Airport/Park access road interchange. In all cases, traffic will be maintained, detours clearly signed and residents notified well in advance.

These short-term adverse impacts must be measured by long-term gains anticipated to result from the project. Airport expansion is directly related to economic, social and cultural development of the service area. The project will directly create numerous new employment opportunities and indirectly generate other spin-off jobs in support

industries. In addition, increased commercial carrier service will extend local industry's ability to sell their goods to the national market. New jobs and expanded commerce create more expendable income which will have the effect of a positive multiplier on the regional economy.

Further, the public sector of the economy will benefit from revenues generated by the Airport. Between 1985 and 1989, airport net revenues are projected to exceed $172 million with Boone County receiving $95 million and Cooper County $77 million. These funds will enable local governments to expand amenities without imposing substantially increased tax burdens on residents.

Thus, short-term disruption imposed by the project on the small geographically limited environment surrounding the airport site represents a tradeoff for the long-term economic vitality and improved standard-of-living anticipated to occur throughout the Carrollton-Federalsburg area as a result of the project.

Finally, the project will have one important positive short-term impact. Expansion of BIA will inject thousands of dollars into the region's lagging construction industry. This single public works project is of sufficient scope to reduce unemployment in the Federalsburg area.

SECTION VII
IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

SECTION VII: IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Project development will not preclude future use or enjoyment of regional natural or cultural resources. The project site does not contain any valuable natural resources nor will project development significantly deplete the region's natural resource inventory.

Expansion of BIA will result in an irreversible reduction of a limited amount of habitat and agricultural fields. Construction will involve the permanent removal of mixed hardwood and old field successional communities and agricultural fields. This loss is not significant in light of the extensive woodlands, unoccupied successional fields and actively cultivated agricultural acreage available within the Carrollton-Federalsburg corridor.

An irreversible commitment has been made to maintain the integrity of communities bordering the Airport. Last resort housing has been provided to enable lower income minority families to remain within the South Revere community; and traffic control procedures are proposed to reduce noise exposure on residence and institutions to the north.

While airport expansion is not anticipated to degrade use of Pierce State Park or Mill Creek State Mental Hospital, it does represent an irretrievable commitment to a special type of intensive land use. Cooper County's planned zoning ordinances should permit only compatible commercial-industrial development within areas influenced by airport noise. Boone County should consider up-zoning in unoccupied areas within potential NEF 30 contours. By bringing zoning into conformance with airport use, the project can stimulate a long-term commitment to logical land use planning which accommodates the future industrial-commercial growth desired to achieve a balanced local tax base.

Airport operations also result in an irretrievable demand on energy resources. However, the project is designed so as to minimize fuel and electric power consumption.

The project represents a long-term and, for practical purposes, an irreversible commitment to sustain and enhance economic development in the Carrollton-Federalsburg area. Airport expansion will directly and indirectly create new jobs, expand regional industries' sales potential in national markets, and generate increased public revenues.

SECTION VIII
A-95 REVIEW AND PUBLIC HEARING

Northeast, America
Department of Administration

September 1, 1975

Airport Manager
Bicentennial International Airport
Northeast, America

Re: A-95 Review of Environmental Assessment for Bicentennial International Airport

Dear Sir:

The subject environmental impact assessment has been reviewed by the concerned state agencies, as authorized by the Council on Environmental Quality Guidelines, prepared under Section 102(2)(c) of the National Environmental Policy Act.

Several concerns have been raised by various state agencies. We have summarized the major points below for your consideration:

	Comment
1. The State Department of Planning and Development stated that consideration should be given to the demand and location of induced airport-related service development.	1
2. The State Department of Transportation felt it would be desirable to show the 1995 NEF contours.	2
The State DOT also stated that some analysis should be made of an alternative airport access road to the south.	3
3. The State Board of Water and Air Resources has stated that a formal indirect source application will be required before full approval is given to project construction.	4
4. The Boone County Office of Housing and Community Development acknowledged the Airport Authority's commitment to relocation assistance, but is concerned about the location of any newly constructed units within noise exposure units of the crosswind runway.	5

Comments which indicated consistency with agency plans or no objection were received from the following agencies;

State Archaeologist
SHPO
State Board of Fish and Game
Boone County Planning Department
Boone County SCS
Boone County Highway Department
Boone County Health Department
Cooper County Department of Planning and Zoning
Watershed Authority

Copies of the above agency responses will be sent to you under separate cover.

We would appreciate being informed of any changes or modifications which result from these comments.

Sincerely yours,

Ray Bowman

Ray Bowman, Chief
Monitoring, Analysis, and Review Branch
Office of Intergovernmental Relations

RESPONSES TO A-95 COMMENTS

The following responses correspond to comments contained in the preceeding formal clearinghouse letter:

Response to Comment 1:

Many activities associated with support of airport operations have been provided for within the new terminal area and on immediately adjacent airport property. Additional services could be provided within the existing airport zoning district. This area would be a prime location for any commercial service to passengers and could be leased through the Airport Authority.

SR 1 would serve as a logical barrier to airport-related development to the west and thus would protect the integrity of the State Park. Any off-site auxilliary airport services which may be attracted would be subject to existing zoning and land use policies established by Boone and Cooper Counties.

Response to Comment 2:

Uncertainties currently exist as to future aircraft mixes and the status of aircraft engine noise modifications. It is thus unpractical to make speculative predictions for conditions 20 years in the future, except to state that current trends and designs are producing quieter aircraft engines.

Response to Comment 3:

An alternative access road connecting the main terminal to SR 66 to the south was considered during this environmental study. The existing access road (with extension) was found to have adequate capacity to accommodate future airport generated volumes. However, the single access route does concentrate airport traffic at the SR 1 interchange and on SR 1 itself, thereby creating a need for specific improvements.

The alternate access route would require interface improvements itself, at its intersections with SR 66, and would involve construction in the Mill Creek floodplain.

Response to Comment 4:

An application for a State Complex Source Permit will be submitted upon completion of the design plans prior to construction.

Response to Comment 5:

The crosswind runway (11-29) will remain in operation, but with limited jet aircraft traffic. The noisier B707 aircraft will utilize the parallel runway system when possible. The crosswind runway will be primarily used by general aviation aircraft.

The noise exposure contours should be used as a planning tool in locating new units in South Revere. The site of the relocated Baptist Church is outside the projected NEF 30 limits.

SUMMARY OF PUBLIC HEARING ISSUES AND RESPONSES

The draft environmental assessment report was made available to the public one month prior to the public hearing. Copies of the report were placed in the City Manager's office in Carrollton and Federalsburg, in the County Office Buildings of Cooper and Boone Counties, in area libraries and at the Airport Authority office. Both the hearing and the availability of the report were advertised in Carrollton and Federalsburg newspapers.

The public hearing was held at the Paul Revere Junior High School in North Revere. Approximately 150 persons were in attendance. The proposed project was endorsed by individuals representing the following organizations:

State Department of Transportation (DOT)
State Department of Economic Delvelopment
Airline Pilots Association
Carrollton Chamber of Commerce
Federalsburg Chamber of Commerce
League of Women Voters

Approximately thirty residents voiced some degree of opposition. The major concern which was repeatedly expressed by these residents involved implementation of the various ameliorative measures as outlined in the report.

Contract specifications for the construction of the proposed project will include a separate discussion on environmental control. The contractor can be directed to develop an Environmental Implementation Plan, calling for the periodic monitoring of construction operations and the inclusion of temporary and permanent controls as set forth in the assessment report. The construction of the expanded facilities will be accomplished in accordance with FAA construction specifications and state and county laws and ordinances.

The airport management will continue to maintain close contact with all construction operations to insure protection of the local environment. In fact, the Airport Advisory Committee, which was established early in the study, will continue to meet during and after the construction phase to protect the interests of the general public.

Modified departure procedures have been implemented at other airports for noise mitigation and can be instituted at BIA.

APPENDICES

List of Appendices

Appendix	
A	Noise
	Impact of Noise on People
	A Discussion of Aircraft Noise
	Existing and Future Operational Data
	Sample of Integrated Noise Model Output Data
B	Natural Environment
	Species Lists
	Receiving Water Quality Standards
	Water Quality Monitoring Results
C	Air Pollution from Airports
D	Socioeconomic Impacts
	Relocation Housing Supply/Demand Analysis
	Economic Analysis of Airport Development
E	Correspondence

APPENDIX A

It is Recommended That

the Report Entitled

"Impact of Noise on People"

be Referenced or Contained

in a Complex EIS.

The Report has not Been Reproduced

in This Model EIS,

but is Contained in

the Accompanying Document,

"Environmental Assessment of

Airport Development Actions

(Appendix Volume)",

Report No. FAA-AP-77-1A.

A Discussion of Aircraft Noise

Noise Exposure Forecast (NEF)

Field measurement of acoustic noise is recorded in decibels (dB) on an A-weighted scale. The A-scale is a frequency-weighted network which produces a composite value that closely approximates the response of the human ear. The A-weighted sound level is accepted as an accurate and practical measure of acoustic noise, and can be easily determined using any standard sound level meter.

A single-number measure of subjective reaction which can be computed from physical measurements--perceived noise level--is now uniformly employed in describing aircraft noise. This number results from the combination of sound pressure levels in octave or one-third-octave bands to arrive at a single number description of the sound in terms of perceived noise decibels, or PNdB. PNdB is generally specified only for the maximum value of the aircraft noise during a flyover, without corrections for duration or pure-tone effects. To correct for both the presence of discrete frequencies and time history, an effective perceived noise level in decibels, or EPNdB was established. Noise levels expressed in PNdB can generally be converted to dBA by subtracting 13-15 dB.

Discussion, heretofore, briefly centered on acoustic noise resulting from the approach or takeoff of a <u>single</u> aircraft. However, it was necessary to determine a method of combining the effects of noise from a series of aircraft flyovers, and establishing a criteria which would relate the noise exposure to subjective human response. Public objections of aircraft noise increase as the interference with sleep, speech, teaching, recreation, or other activities becomes more frequent.

As a result, a rational method for projecting the extent of aircraft noise has been available since 1962, when the concept of the CNR--Composite Noise Rating--was adopted. Refinements to this approach have resulted from studies to develop the NEF--Noise Exposure Forecast--concept. The basic difference between the two is that the NEF, in addition to utilizing all the data previously used in computing CNR's, also uses correction factors for discrete frequencies (tones) and noise duration.

Although the CNR methodology has been widely used in the past, the use of NEF contour mapping has become more prominent in recent years.

The NEF contours define land areas having different land-use compatibility with respect to aircraft noise; hence, the NEF areas may be used as a guide to land-use planning and zoning and airport development. The NEF contours are based upon the aircraft noise described in terms of effective perceived noise levels (which includes corrections for duration and presence of discrete frequencies) plus adjustments for the number of operations for daytime and nighttime periods. The following table describes suitable land uses adjacent to airports.

AD-A049 171 GREINER ENVIRONMENTAL SCIENCES INC BALTIMORE MD F/G 5/5
ENVIRONMENTAL IMPACT STATEMENT FOR BICENTENNIAL INTERNATIONAL A--ETC(U)
NOV 77 DOT-FA75WA-3703
UNCLASSIFIED FAA-AAP-78-2-1 NL

3 OF 4
AD A049171



Land Uses Adjacent to Airports (Based on NEF or CNR Noise Contours)*

NEF Values	*CNR Values*	*CNR Zone*	*Remarks*
20-30	90-100	1	Few activities will be affected by aircraft sounds, although building designs for especially sound-sensitive activities, such as auditoriums, churches, schools, hospitals, and theatres should consider sound control in areas closest to the airport. Detailed studies by qualified personnel are recommended for outdoor amphitheatres and like places of public assembly in the general vicinity of the airport.
30-40	100-115	2	Activities where uninterrupted communication is essential should consider sound exposure in design. Generally, residential development is not considered a suitable use, although multi-family developments where sound control features have been incorporated in building design might be considered. Open-air activities and outdoor living will be affected by aircraft sound. The construction of auditoriums, schools, churches, hospitals, theatres, and similar activities should be avoided within this zone where possible.
>40	>115	3	Land should be reserved for activities that can tolerate a high level of sound exposure, such as some agricultural, industrial, and commercial uses. No residential developments of any type are recommended. Sound-sensitive activities such as schools, offices, hospitals, churches, and similar activities should not be constructed in this area unless no alternative location is possible. All regularly occupied structures should consider sound control in design.

*Taken from report entitled "Airport Master Plans" prepared by the Federal Aviation Administration, February, 1971.

INTEGRATED NOISE MODEL (INM)

The Integrated Noise Model is the most recent and most comprehensive of the noise models presently available for aircraft noise impact analysis.

The output from the INM provides data in a somewhat different form than the NEF. The INM provides more detailed information on noise affected areas. Contours developed by the INM provide minutes of exposure above a threshold level of 85 dBA. Three INM noise exposure contours are normally plotted: The zero contour (or 85 dBA threshold) and the two and fifteen minute contours. For example, any noise sensitive site that lies between the two and fifteen minute contours would receive between two and fifteen minutes of noise exposure above 85 dBA per 24-hour day. In addition to contours, detailed information is also provided for noise sensitive sites within the 85 dBA threshold contour. This information includes (for each sensitive site) the minutes per day that the site would be exposed to threshold levels of 65, 75, 85, 95, 105 and 115 dBA. These minutes of exposure are also presented for the daytime (7 a.m. - 7 p.m.), evening (7 p.m. - 10 p.m.) and nighttime hours (10 p.m. - 7 a.m.). In addition to the minutes of noise exposure, L_{dn} and L_{eq} values are provided at each sensitive site. These noise identifiers are used by some reviewing agencies (particularly the Environmental Protection Agency) in assessing noise impacts. By comparing the minutes of exposure at a sensitive site for the present condition with that resulting from project development, the degree of noise impact can be clearly identified. Presentation of information in this form is normally most understandable to the non-technical reviewer.

References

Airport Master Plans, Department of Transportation, Federal Highway Administration, February, 1971.

Noise Pollution: The Unquiet Crisis, Clifford R. Bragdon, 1971.

Alleviation of Jet Aircraft Noise Near Airports, A report of the Jet Aircraft Noise Panel, Office of Science and Technology, Executive Office of the President, March, 1966.

Noise Exposure Forecast Contours for 1967, 1970, and 1975 Operations at Selected Airports, Bolt, Beranek, and Newman, Incorporated, September, 1970.

FAA Integrated Noise Model User's Guide, Report No. FAA-EQ-76-2, U. S. DOT/FAA, March, 1976.

Existing Operational Data

1975 Daily Operations

Aircraft Type	*Day*	*Night*
DC10/L1011	2	0
B707/DC8	17	3
B727	56	10
B737/DC9	56	10
Business Jet	7	1
G/A	400	61

Average Runway Utilization (Percent)

	R/W 2		*R/W 20*		*R/W 11*		*R/W 29*	
Aircraft Type	*T/O*	*L*	*T/O*	*L*	*T/O*	*L*	*T/O*	*L*
DC10/L1011	20	24	28	20	22	35	30	21
B707/DC8	20	24	28	20	22	35	30	21
B727	20	26	30	13	21	38	29	23
B737/DC9	20	26	30	13	21	38	29	23
Business Jet	20	26	30	13	21	38	29	23
G/A	20	24	31	22	21	34	28	20

Future Operational Data

1985 Daily Operations

Aircraft Type	Day	Night
DC10/L1011	9	1
B707/DC8	19	11
B727	90	10
B737/DC9	90	10
Business Jet	11	1
G/A	630	96

Average Runway Utilization (Percent)

	R/W 2L		R/W 20R		R/W 29		R/W 11		R/W 2R		R/W 20L	
Aircraft Type	T/O	L	T/O	L	T/O	L	T/O	L	T/O	L	T/O	L
DC10/L1011	15	12	9	19	8	21	34	2	25	20	9	26
B707/DC8	30	15	15	30	0	0	0	0	35	20	20	35
B727	15	12	9	19	8	21	34	2	25	20	9	26
B737/DC9	15	12	9	19	8	21	34	2	25	20	9	26
Business Jet	15	12	9	19	8	21	34	2	25	20	9	26
G/A	2	2	2	2	46	46	46	46	2	2	2	2

Sample INM Output Data

Minutes in Excess of 65, 75, 85 / 95, 105, 115 dBA

	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5
A	0, 0, 0 0, 0, 0	0, 0, 0 0, 0, 0	0, 0, 0 0, 0, 0	7, 3, 0 0, 0, 0	19, 8, 1 0, 0, 0	32, 15, 2 1, 0, 0	17, 7, 1 0, 0, 0	10, 2, 0 0, 0, 0	0, 0, 0 0, 0, 0	0, 0, 0 0, 0, 0	0, 0, 0 0, 0, 0
B	0, 0, 0 0, 0, 0	0, 0, 0 0. 0. 0	0, 0, 0 0, 0, 0	9, 4, 1 0, 0, 0	15, 7, 2 1, 0, 0	39, 19, 3 1, 0, 0	18, 9, 1 0, 0, 0	13, 2, 0 0, 0, 0	0, 0, 0 0, 0, 0	0, 0, 0 0, 0, 0	0, 0, 0 0, 0, 0
C	0, 0, 0 0, 0, 0	0, 0, 0 0, 0, 0	2, 0, 0 0, 0, 0	15, 6, 1 0, 0, 0	27, 12, 2 1, 0, 0	42, 22, 3 1, 0, 0	29, 11, 2 0, 0, 0	15, 3, 0 0, 0, 0	0, 0, 0 0, 0, 0	0, 0, 0 0, 0, 0	0, 0, 0 0, 0, 0
D	15, 5, 0 0, 0, 0	11, 3, 0 0, 0, 0	9, 4, 0 0, 0, 0	22, 9, 1 0, 0, 0	46, 17, 3 2, 0, 0	57, 27, 4 2, 0, 0	34, 15, 2 1, 0, 0	17, 5, 0 0, 0, 0	0, 0, 0 0, 0, 0	0, 0, 0 0, 0, 0	0, 0, 0 0, 0, 0
E	21, 8, 1 0, 0, 0	14, 5, 0 0, 0, 0	12, 5, 0 0, 0, 0	25, 10, 1 0, 0, 0	50, 22, 3 2, 1, 0	64, 36, 4 2, 1, 0	45, 20, 2 1, 0, 0	20, 9, 0 0, 0, 0	0, 0, 0 0, 0, 0	0, 0, 0 0, 0, 0	0, 0, 0 0, 0, 0
F	23, 11, 2 1, 0, 0	16, 6, 1 0, 0, 0	14, 6, 1 0, 0, 0	30, 13, 2 0, 0, 0	77, 48, 5 2, 1, 0	71, 43, 5 3, 1, 0	56, 26, 2 1, 0, 0	24, 11, 0 0, 0, 0	0, 0, 0 0, 0, 0	0, 0, 0 0, 0, 0	0, 0, 0 0, 0, 0
G	24, 12, 3 1, 0, 0	17, 9, 2 0, 0, 0	17, 6, 1 0, 0, 0	34, 15, 2 1, 0, 0	85, 53, 9 3, 1, 0	78, 49, 9 3, 2, 0	59, 30, 2 1, 0, 0	31, 14, 1 0, 0, 0	0, 0, 0 0, 0, 0	0, 0, 0 0, 0, 0	1, 0, 0 0, 0, 0
H	31, 19, 6 3, 1, 0	21, 12, 2 1, 0, 0	19, 8, 1 0, 0, 0	22, 11, 3 1, 0, 0	97, 61, 9 3, 2, 0	89, 54, 9 3, 2, 0	67, 33, 3 1, 0, 0	38, 18, 1 0, 0, 0	25, 6, 0 0, 0, 0	8, 2, 0 0, 0, 0	5, 1, 0 0, 0, 0
I	83, 48, 7 3, 1, 0	29, 18, 5 2, 0, 0	21, 10, 2 1, 0, 0	26, 13, 3 1, 0, 0	125, 67, 10 4, 1, 0	103, 60, 10 4, 1, 0	78, 38, 3 2, 0, 0	40, 19, 1 1, 0, 0	33, 11, 1 0, 0, 0	21, 7, 1 0, 0, 0	9, 4, 1 0, 0, 0
J	25, 14, 5 1, 0, 0	129, 61, 9 3, 1, 0	106, 53, 8 2, 1, 0	109, 54, 8 2, 1, 0	140, 79, 10 6, 2, 0	121, 68, 10 4, 2, 0	89, 47, 6 2, 1, 0	48, 25, 4 2, 0, 0	41, 20, 2 1, 0, 0	35, 16, 2 1, 0, 0	26, 10, 3 1, 0, 0
K	30, 16, 6 3, 1, 0	40, 20, 8 4, 1, 0	136, 70, 18 5, 2, 0	189, 83, 30 8, 3, 0	233, 99, 37 11, 3, 1	212, 101, 30 5, 2, 0	141, 69, 10 3, 1, 0	84, 36, 10 1, 0, 0	75, 30, 9 1, 0, 0	54, 19, 7 0, 0, 0	43, 14, 5 0, 0, 0
L	23, 12, 3 1, 0, 0	33, 15, 4 2, 0, 0	61, 30, 6 2, 1, 0	101, 44, 9 3, 0, 0	199, 94, 30 9, 3, 1	171, 70, 22 5, 2, 0	129, 64, 10 4, 2, 0	93, 58, 10 2, 1, 0	85, 47, 10 2, 0, 0	71, 24, 8 1, 0, 0	30, 11, 4 0, 0, 0
M	7, 1, 1 0, 0, 0	10, 2, 1 0, 0, 0	14, 5, 2 0, 0, 0	38, 17, 5 3, 1, 0	195, 93, 30 8, 3, 0	117, 56, 9 4, 1, 0	94, 42, 4 2, 0, 0	71, 36, 4 2, 0, 0	49, 27, 3 1, 0, 0	33, 19, 2 1, 0, 0	19, 8, 2 1, 0, 0
N	5, 1, 0 0, 0, 0	7, 1, 0 0, 0, 0	22, 6, 1 0, 0, 0	60, 29, 6 2, 0, 0	170, 81, 30 6, 2, 0	90, 44, 8 3, 1, 0	61, 28, 2 0, 0, 0	42, 11, 1 0, 0, 0	30, 16, 1 0, 0, 0	20, 8, 1 0, 0, 0	9, 4, 1 0, 0, 0
O	0, 0, 0 0, 0, 0	7, 1, 0 0, 0, 0	18, 5, 1 0, 0, 0	46, 21, 3 1, 0, 0	113, 58, 10 5, 1, 0	98, 50, 9 3, 0, 0	33, 9, 2 0, 0, 0	19, 9, 1 0, 0, 0	16, 4, 0 0, 0, 0	11, 2, 0 0, 0, 0	5, 1, 0 0, 0, 0
P	0, 0, 0 0, 0, 0	6, 1, 0 0, 0, 0	14, 4, 1 0, 0, 0	31, 16, 2 1, 0, 0	89, 49, 9 2, 0, 0	111, 57, 10 2, 1, 0	44, 14, 3 0, 0, 0	14, 7, 1 0, 0, 0	8, 3, 0 0, 0, 0	0, 0, 0 0, 0, 0	0, 0, 0 0, 0, 0
Q	0, 0. 0 0, 0, 0	5, 1, 0 0, 0, 0	17, 5, 1 0, 0, 0	29, 14, 2 1, 0, 0	38, 34, 6 2, 0, 0	65, 32, 6 2, 0, 0	51, 20, 4 1, 0, 0	22, 10, 2 1, 0, 0	18, 8, 0 0, 0, 0	17, 7, 0 0, 0, 0	0, 0, 0 0, 0, 0
R	0, 0, 0 0, 0, 0	7, 2, 0 0, 0, 0	15, 7, 1 0, 0, 0	23, 12, 3 1, 0, 0	31, 19, 3 1, 0, 0	48, 24, 4 2, 0, 0	60, 29, 5 2, 0, 0	33, 21, 3 1, 0, 0	24, 13, 2 0, 0, 0	19, 8, 0 0, 0, 0	5, 1, 0 0, 0, 0
S	2, 0, 0 0, 0, 0	12, 3, 0 0, 0, 0	16, 9, 2 0, 0, 0	18, 9, 2 0, 0, 0	21, 10, 2 0, 0, 0	33, 11, 2 1, 0, 0	49, 22, 4 1, 0, 0	45, 18, 4 2, 0, 0	42, 14, 3 2, 0, 0	23, 9, 1 0, 0, 0	8, 2, 0 0, 0, 0
T	17, 4, 0 0, 0, 0	20, 4, 0 0, 0, 0	13, 3, 0 0, 0, 0	14, 5, 1 0, 0, 0	12, 3, 0 0, 0, 0	23, 6, 0 0, 0, 0	30, 8, 1 0, 0, 0	10, 4, 2 1, 0, 0	29, 8, 3 1, 0, 0	11, 5, 2 1, 0, 0	10, 4, 1 0, 0, 0
U	9, 2, 0 0, 0, 0	23, 5, 0 0, 0, 0	28, 7, 0 0, 0, 0	12, 3, 0 0, 0, 0	8, 2, 0 0, 0, 0	11, 3, 0 0, 0, 0	17, 5, 0 0, 0, 0	24, 7, 0 0, 0, 0	27, 8, 1 0, 0, 0	25, 7, 1 0, 0, 0	18, 4, 0 0, 0, 0

Existing Conditions

APPENDIX B

Appendix Table B-1

Birds Expected to Occur in the BIA Study Area

		Relative Abundance[1]
Wood Duck	*Aix sponsa*	U-S
Belted Kingfisher	*Megaceryle alcyon*	C-S
Common Flicker	*Colaptes auratus*	C-R
Hairy Woodpecker	*Dendrocopos villosus*	C-R
Downy Woodpecker	*Dendrocopos pubescens*	C-R
Eastern Kingbird	*Tyrannus tyrannus*	U-S
Red-tailed Hawk	*Buteo jamaicensis*	U-R
Sparrow Hawk	*Falco sparverius*	C-R
Killdeer	*Charadrius vociferus*	C-S
Eastern Phoebe	*Sayornis phoebe*	U-S
Least Flycatcher	*Empidonax minimum*	U-S
Eastern Wood Powee	*Contopus virens*	U-S
Olive-sided Flycatcher	*Nuttallornis borealis*	U-S
Tree Swallow	*Iridoprocne bicolor*	U-S
Barn Swallow	*Hirundo rustica*	C-S
Blue Jay	*Cyanocitta cristata*	C-R

[1] Abundant - A
Common - C
Uncommon - U

Winter - W
Summer - S
Resident - R

Appendix Table B-1 - Cont'd.

		Relative Abundance
Common Crow	Corvus brachyrhynchos	C-R
Black-capped Chickadee	Parus atricapillus	A-R
Tufted titmouse	Parus bicolor	C-R
White-breasted Nuthatch	Sitta carolinensis	C-R
House Wren	Troglodytes aedon	C-S
Mockingbird	Mimus polyglottus	U-S
Catbird	Dumetella carolinensis	C-S
Brown Thrasher	Toxostoma rufum	U-S
Myrtle Warbler	Dendroica coronata	U-W
Yellowthroat	Geothlypis trichas	U-S
Housesparrow	Passer domesticus	C-R
Eastern Meadowlark	Sturnella magna	C-S
Redwing Blackbird	Agelaius phoeniceus	A-S
Robin	Turdus migratorius	A-S
Woodthrush	Hylocichla mustelina	U-S
Cedar Waxwing	Bombycilla cedrorum	U-S
Starling	Sturnus vulgaris	A-R
Black and White Warbler	Miniotilta varia	U-S
Common Grakle	Quiscalus quiscula	U-S
Brown-headed Cowbird	Molothrus ater	U-S

Appendix Table B-1 - Cont'd.

		Relative Abundance
Cardinal	*Richmondena cardinalis*	C-R
American Goldfinch	*Spinus tristis*	C-S
Vesper Sparrow	*Pooecetes gramineus*	U-S
Slate-colored junco	*Junco hyemalis*	C-R
Tree Sparrow	*Spizella arborea*	U-S
Field Sparrow	*Spizella pusilla*	C-S
White-throated Sparrow	*Zonotrichia albicollis*	C-S
Song Sparrow	*Melospiza melodia*	U-R
Rock Dove	*Columba livia*	C-R

Appendix Table B-2

Mammals Expected to Occur in the BIA Study Area

Opossum	Didelphis marsupialis
Masked Shrew	Sorex cinereus
Shorttail Shrew	Blarina brevicauda
Starnose Mole	Condylura cristata
Eastern Cottontail	Sylvilagus floridanus
Woodchuck	Marmota monax
Eastern Chipmunk	Tamias striatis
Eastern Gray Squirrel	Sciurus carolinensis
Flying Squirrel	Glaucomys sp.
Red Squirrel	Tamiasciurus hudsonicus
White Footed Mouse	*Peromyscus leucopus*
Meadow Vole	Microtus pennsylvanicus
Muskrat	Ondatra zibethicus
Norway Rat	Rattus norvegicus
House Mouse	Mus musculus
Meadow Jumping Mouse	Zapus hudsonicus
Red Fox	Vulpes fulva
Gray Fox	Urocyon cinereoargenteus
Raccoon	Procyon lotor
Longtail Weasel	Mustela frenata
Striped Skunk	Mephitis mephitis
Eastern White Tailed Deer	Odocoileus virginianus

Appendix Table B-3

Reptiles Expected to Occur in the BIA Study Area

Snapping Turtle	*Chelydra serpentina*
Eastern Mud Turtle	*Kinosternon suburbum suburbum*
Spotted Turtle	*Clemmys gatlata*
Wood Turtle	*Clemmys insculpta*
Eastern Box Turtle	*Terrapene carolina carolina*
Eastern Painted Turtle	*Chrysemys picta picta*
Water Snake	*Natrix sipedon*
Garter Snake	*Thamnophis sirtalis*
Eastern Ribbon Snake	*Thamnophis sauritus sauritus*
Northern Ringneck Snake	*Diadophis punctatus edwardsi*
Northern Black Racer	*Coluber constrictor constrictor*
Eastern Milk Snake	*Lampropeltis doliata triangulum*

Appendix Table B-4

Amphibians Expected to Occur in the BIA Study Area

Red-spotted Newt	*Diemictylus viridescens*
Red-backed Salamander	*Plethodon cinereus*
Northern Two-lined Salamander	*Eurycea bislineata bislineata*
Northern Dusky Salamander	*Desmognathus fuscus fuscus*
Spotted Salamander	*Ambystoma maculatum*
American Toad	*Bufo americanus*
Fowler's Toad	*Bufo woodhousei fowleri*
Crechet Frog	*Acris crepitan*
Spring Peeper	*Hyla crucifer*
Gray Treefrog	*Hyla versicoler*
Bullfrog	*Rana catesbeiana*
Green Frog	*Rana clamitans melanota*
Leopard Frog	*Rana pipens*
Wood Frog	*Rana sylvatica*

Appendix Table B-5

Fish Expected to Occur in the BIA Study Area

Pirate Perch	*Aphredoderus sayanus*
White Sucker	*Catostomus commersoni*
Brown Bullhead	*Ictalurus nebulosus*
Longnose Dace	*Rhinicthys cataractae*
Creek Chub	*Semotilus atromaculatus*
Golden Shiner	*Notemigonus crysoleucas*
Bluegill	*Lepomis macrochirus*
Johnny Darter	*Etheostoma nigrum*
Spottail Shiner	*Notropis hudsonius*

RECEIVING WATER QUALITY STANDARDS

A. GENERAL

The following receiving water quality standards are established to protect the uses indicated. Where the waters of the State are, or may be, affected by discharges from point sources, these standards shall apply outside of a mixing zone designated by the Administration.

B. STANDARDS FOR CLASS I WATERS

Water Contact Recreation and Aquatic Life

1. Bacteriological Standards

There shall be no sources of pollution which constitute a public health hazard. If the fecal coliform density exceeds a log mean of 200/100 ml, the bacterial water quality shall be considered acceptable only if a detailed sanitary survey and evaluation discloses no significant public health risk in the use of the waters.

2. Dissolved Oxygen Standard

The dissolved oxygen concentration shall be not less than 4.0 mg/liter at any time, with a minimum daily average of not less than 5.0 mg/liter, except where, and to the extent that, lower values occur naturally.

3. Temperature Standard

a. Thermal effects shall be limited and controlled so as to prevent:

(1) Temperature changes that adversely affect aquatic life;

(2) Temperature changes that adversely affect spawning success and recruitment; and

(3) Thermal barriers to the passage of fish.

b. Temperature elevations above natural shall be limited to 5°F (-21°C), and the temperature may not exceed 90°F (32°C), outside of designated mixing zones.

c. This limitation of temperature changes in Class I Waters does not preclude the discharge of warmed water. Warming of a portion of a body of water is permissible if it will not produce substantial detriment and if the volume of the new temperature is of such size and duration that the exposure of organisms or life stages thereof, is less than the time associated with deleterious biological effects at that particular temperature.

4. *pH Standard*

Normal pH values must not be less than 6.5 nor greater than 8.5, except where--and to the extent that--pH values outside this range occur naturally.

5. *Turbidity Standard*

a. Turbidity may not exceed levels detrimental to aquatic life; and

b. Within limits of Best Practicable Control Technology Currently Available, turbidity may not exceed for extended periods of time those levels normally prevailing during periods of base flow in the surface waters; and

c. Turbidity in the receiving water resulting from any discharge may not exceed 50 JTU (Jackson Turbidity Units) as a monthly average, nor exceed 150 JTU at any time.

Turbidity Values Observed During Water Quality Monitoring Conducted On Mill Creek*

Station	1	2	3
Date			
Week #1	5	4	6
Week #2	6	5	5
Week #3	1	<1	1
Week #4	4	3	4
Week #5	10	9	9
Week #6	6	6	5
Week #7	3	2	4
Week #8	2	1	1

*Values expressed in (JTU) Jackson Turbidity Units

Dissolved Oxygen Values Observed During Water Quality Monitoring Conducted On Mill Creek*

Station	1	2	3
Date			
Week #1	7.7	8.0	7.8
Week #2	7.8	9.1	8.2
Week #3	8.0	9.1	8.3
Week #4	9.1	8.7	7.9
Week #5	7.9	7.5	8.2
Week #6	8.1	7.9	8.5
Week #7	7.7	8.1	8.0
Week #8	8.3	8.5	9.0

*Values expressed in mg/l

pH Values Observed During Water Quality Monitoring Conducted On Mill Creek*

Station	1	2	3
Date			
Week #1	6.5	6.3	6.7
Week #2	6.8	7.1	6.8
Week #3	7.2	7.4	7.3
Week #4	7.1	6.9	7.2
Week #5	6.5	6.5	6.6
Week #6	6.7	6.7	6.8
Week #7	6.9	6.5	6.5
Week #8	6.9	7.0	6.7

*Values expressed in pH units

Temperature Values Observed During Water Quality Monitoring Conducted On Mill Creek*

Station	1	2	3
Date			
Week #1	18.5	18.7	18.9
Week #2	18.7	19.0	19.1
Week #3	18.9	19.1	19.3
Week #4	18.6	19.0	18.9
Week #5	19.4	19.1	19.3
Week #6	19.4	19.4	19.4
Week #7	19.6	19.7	19.9
Week #8	20.0	20.0	20.2

*Values expressed in °C

Bacteriological Values Observed During Water Quality Monitoring Conducted on Mill Creek*

Station	1	2	3
Date			
Week #1	30	180	60
Week #4	60	120	80
Week #7	165	140	100

*Values of Fecal Coliform expressed in NPM/100 ml.

APPENDIX C

Air Pollution From Airports

Airport and Aircraft Pollutants

The principal air pollutants resulting from airport and aircraft operations as well as their impact on the human body and environment are listed below:

- *Carbon Monoxide:* Carbon monoxide (CO), is a colorless, odorless, toxic gas frequently formed during the incomplete combustion of carbonaceous fuels. In both man and animals, CO is absorbed through the lungs and reacts primarily with the hemoglobin in red blood cells. The result is to decrease the oxygen carrying capacity of the blood, thus reducing the amount of oxygen transported to vital tissues by the blood. Symptoms include impaired time interval discrimination and impaired psychomotor performance.

- *Hydrocarbons:* Hydrocarbons (HC) are primarily associated with the processing and use of petroleum products. They constitute the major portion of the reactive organic substances which eventually cause photochemical smog. Hydrocarbon emissions from aircraft engines may consist of products formed during combustion as well as unburned fuel components. A distinction is made between total hydrocarbons (THC) and methane hydrocarbons, which are photochemically unreactive. Studies conducted on the effect of ambient air concentrations of gaseous hydrocarbons have not indicated any direct adverse effect from this class of pollution on human health. However, ambient levels of photochemical oxidants do have adverse effects on health and these oxidants are a direct function of gaseous hydrocarbon concentrations.

- *Nitrogen Oxides:* Nitric oxide (NO), and nitrogen dioxide (NO_2) are formed during all atmospheric combution processes in a spontaneous chemical reaction. NO has not been shown to have any adverse effects on health and welfare. However, there are several atmospheric reactions which can lead to the oxidation of NO to NO_2. NO_2 has been associated with a variety of respiratory diseases and is also essential to the production of photochemical smog. NO_2 exerts its primary toxic effect on the lungs.

- *Photochemical Oxidants:* Photochemical oxidants are produced in the atmosphere when reactive organic substances (mainly hydrocarbons) and nitrogen oxides are exposed to sunlight. Ozone is the major reaction product of these oxidants. Photochemical oxidants at certain concentrations can cause irritation of the mucous membranes, damage to vegetation, and deterioration of materials.

- *Sulfur Dioxide:* Sulfur dioxide (SO_2) is present in the exhaust gases of both aircraft piston and turbine engines; but the SO_2 concentrations are lower than those from other types of combustion equipment. This is due to the relative lack of sulfur impurities in aircraft fuel. SO_2 is emitted as a colorless gas, and can have a variety of adverse effects on health, including irritation of the respiratory system.

- *Particulate Matter:* Any matter, whether solid or liquid which is dispersed in the air and which is within a certain size range (less than 500 microns) is commonly called particulate matter. Above certain concentrations, particulate matter may have an adverse impact on human health, especially injury to the surfaces of the respiratory system.

Methods of Atmospheric Measurement of Pollutants

At existing airports, it is possible to use the measurement methods and equipment approved by the EPA to measure the concentrations of pollutants present at different locations inside and outside of the airport boundary. These locations should be selected based on prevailing climatological conditions, mobile source activities, stationary sources and the public's expected exposure time.

The actual measurement methods for each pollutant are found in the Federal Registers, (36 [84]), April 30, 1971 and (38 [197]), October 12, 1973.

Federal Ambient Air Quality Standards

The Clean Air Act of 1970 provided the authority for the Environmental Protection Agency to issue national standards to protect ambient air quality. These standards affect pollutants from all sources including aircraft. The standards were published in the Federal Register, (36 [84]), April 30, 1971, and are given in Table C-1. The term "ambient air" was defined by the EPA to mean "that portion of the atmosphere, external to buildings, to which the general public has access. Primary standards are designed to protect public health and secondary standards are to protect public welfare.

Airports are subject to provisions of the Clean Air Act of 1970. On April 18, 1973, the Administrator of the Environmental Protection Agency proposed amendments to the Clean Air Act to expand the scope of review prior to construction or modification of buildings, facilities and installations. Existing regulations covered stationary source emissions. The proposed amendments extended these controls to mobile source emissions

Table C-1

National Air Quality Standards
(Primary Standards)

Pollutant	National Standards
Carbon Monoxide	9 ppm (8 Hr. Period)
	35 ppm (1 Hr. Period)
Hydrocarbons	.24 ppm (3 Hr. Period)
Nitrogen Dioxide	0.05 ppm (Ann. Arith. Mean)
Sulfur Dioxide	0.03 ppm (Ann. Arith. Mean)
	0.14 ppm (24 Hr. Period)
Particulates	75 $\mu g/m^3$ (Ann. Geom. Mean)
	260 $\mu g/m^3$ (24 Hr. Period)

associated with or generated by such facilities. These facilities include, but are not limited to, major highways, airports, large regional shopping centers, major municipal sports complexes or stadiums, major parking facilities, and large amusement and recreational facilities. After necessary changes and improvements, the indirect sources review regulations were promulgated and published in the Federal Registers of June 18, 1973, February 25, 1974 and July, 1974. The EPA has since suspended the indirect source regulations dealing with airports, highways, and parking lots. However, several states have promulgated their own indirect source regulations.

Government of Northeast, America and the Federal Air Quality Standards

The Northeast, America Air Quality Standards are the same as Federal Air Quality Standards. Federal Air Quality Standards are given in Table C-1.

Pollutant Production by Aircraft

Pollutants from aircraft are associated with aircraft engine exhaust emissions, aircraft fuel venting and aircraft auxiliary power unit emissions.

Aircraft Engine Exhaust Emissions

Aircraft engines are of two major categories; reciprocating (piston) and gas turbine. The basic element in the aircraft piston engine is the combustion chamber, or cylinder, in which mixtures of fuel and air are burned and from which energy is extracted through a piston and crank mechanism that drives a propeller. The majority of aircraft piston engines have two or more cylinders and are generally classified according to their cylinder arrangement--either opposed or radial. Opposed engines are installed in most light or utility aircraft; radial engines are used mainly in large transport aircraft.

The gas turbine engine in general consists of a compressor, a combustion chamber, and a turbine. Air entering the forward end of the engine is compressed and then heated by burning fuel in the combustion chamber. The major portion of the energy in the heated air stream is used for aircraft propulsion. Part of the energy is expended in driving the turbine,

which in turn drives the compressor. Turbofan and turboshaft engines use energy from the turbine for propulsion; turbojet engines use only the expanding exhaust stream for propulsion.

The aircraft classification system used by EPA in "Compilation of Air Pollutant Emission Factors", AP-42, 1973, is listed in Table C-2. Both turbine aircraft and piston engine aircraft have been further divided into sub-classes depending on the size of the aircraft and the most commonly used engine for that class. Jumbo jets normally have approximately 40,000 pounds maximum thrust per engine, and medium-range jets have about 14,000 pounds maximum thrust per engine. For piston engines, this division is more pronounced. The large piston engines are in the 500 to 3,000 horsepower range, whereas the small piston engine develops less than 500 horsepower.

A typical airplane landing and takeoff cycle (LTO) can be broken down into the following operation modes.

- Taxi or idle (from start up to alignment with runway)
- Takeoff (from alignment with runway to liftoff)
- Climbout (from liftoff to 3,500 feet altitude)
- Approach (from 3,500 feet altitude to touchdown)
- Landing (from touchdown to beginning of taxi on taxiway)

Each class of aircraft has its own typical LTO cycle. Typical Time in Mode for Landing Takeoff Cycle at a metropolitan airport is presented in Table C-3. Emission factors for the complete LTO Cycle are given in Table C-4. These factors were computed using typical times as shown in Table C-3.

Federal Regulations Affecting Aircraft Emissions

Section 231 of the Clean Air Act, as amended by Public Law 91-604, directed the Administrator of the Environmental Protection Agency to conduct a study and investigation of emission of air pollutants from aircraft in order to determine:

Table C-2

Aircraft Classification

Aircraft Class	Representative Aircraft	Engines per Aircraft	Engine Commonly Used
Jumbo Jet	Boeing 747	4	Pratt & Whitney JT-9D
	Lockheed L-1011	3	
	McDonald Douglas DC-10	3	
Long Range Jet	Boeing 707	4	Pratt & Whitney JT-3D
	McDonald Douglas DC-8	4	
Medium Range Jet	Boeing 727	3	Pratt & Whitney JT-8D
	Boeing 737	2	
	McDonald Douglas DC-9	2	
Air Carrier Turboprop	Convair 580	2	Allison 501-D13
	Electra L-188	4	
	Fairchild Hiller FH-227	2	
Business Jet	Gates Learjet	2	General Electric CJ610
	Lockheed Jetstar	4	Pratt & Whitney JT-12A
General Aviation Turboprop	--	-	Pratt & Whitney PT-6A
General Aviation Piston	Cessna 210	1	Teledyne-Continental ϕ-200
	Piper 32-300	1	Lycoming ϕ-320
Piston Transport	Douglas DC-6	4	Pratt & Whitney R-2800
Helicopter	Sikorsky S-61	2	General Electric CT-58
	Vertol 107	2	
Military Transport			Allison T56A7
Military Jet			General Electric J-79
			Continental J-69
Military Piston			Curtiss-Wright R-1820

Table C-3

Typical Time in Mode for Landing Takeoff Cycle at a Metropolitan Airport

Aircraft	Time in Mode, Minutes				
	Taxi-idle	Takeoff	Climbout	Approach and Landing	Taxi-idle
Jumbo Jet	19.00	0.70	2.20	4.00	7.00
Long Range Jet	19.00	0.70	2.20	4.00	7.00
Medium Range Jet	19.00	0.70	2.20	4.00	7.00
Air Carrier Turboprop	19.00	0.50	2.50	4.50	7.00
Business Jet	6.50	0.40	0.50	1.60	6.50
General Aviation Turboprop	19.00	0.50	2.50	4.50	7.00
General Aviation Piston	12.00	0.30	4.98	6.00	4.00
Piston Transport	6.50	0.60	5.00	4.60	6.50
Helicopter	3.50	0	6.50	6.50	3.50
Military Transport	19.00	0.50	2.50	4.50	7.00
Military Jet	6.50	0.40	0.50	1.60	6.50
Military Piston	6.50	0.60	5.00	4.60	6.50

Source: AP-42

Table C-4

Emission Factors per Aircraft Landing-Takeoff Cycle (lb/engine and kg/engine)

Aircraft	Solid Particulates lb	Solid Particulates kg	Sulfur Oxides lb	Sulfur Oxides kg	Carbon Monoxide lb	Carbon Monoxide kg	Hydrocarbons lb	Hydrocarbons kg	Nitrogen Oxides (NO_x as NO_2) lb	Nitrogen Oxides (NO_x as NO_2) kg
Jumbo Jet	1.30	0.59	1.82	0.83	46.8	21.2	12.2	5.5	31.4	14.2
Long Range Jet	1.21	0.55	1.56	0.71	47.4	21.5	41.2	18.7	7.9	3.6
Medium Range Jet	0.41	0.19	1.01	0.46	17.0	7.71	4.9	2.2	10.2	4.6
Air Carrier Turboprop	1.1	0.49	0.40	0.18	6.6	3.0	2.9	1.3	2.5	1.1
Business Jet	0.11	0.05	0.37	0.17	15.8	7.17	3.6	1.6	1.6	0.73
General Aviation Turboprop	0.20	0.09	0.18	0.08	3.1	1.4	1.1	0.5	1.2	0.54
General Aviation Piston	0.02	0.01	0.014	0.006	12.2	5.5	0.40	0.18	0.047	0.021
Piston Transport	0.56	0.25	0.28	0.13	304.0	138.0	40.7	18.5	0.40	0.18
Helicopter	0.25	0.11	0.18	0.08	5.7	2.6	0.52	0.24	0.57	0.26
Military Transport	1.1	0.49	0.41	0.19	5.7	2.6	2.7	1.2	2.2	1.0
Military Jet	0.31	0.14	0.76	0.35	15.1	6.85	9.93	4.5	3.29	1.49
Military Piston	0.28	0.13	0.14	0.04	152.0	69.0	20.4	9.3	0.20	0.09

Source: AP-42

- The extent to which such emissions affect air quality control regions throughout the United States, and

- The technological feasibility of controlling such emissions.

Within 180 days after commencing this study, the Administrator was required to publish a report of the investigation. This report was published under the title "Aircraft Emissions: Impact on Air Quality and Feasibility of Control".

Subsequent to this report, a notice of proposed rule making was published in the Federal Register, (37 [239]) on December 12, 1972. This notice described standards limiting emissions from aircraft and aircraft engines. As required by Section 231 of the Act, the Administrator held public hearings with respect to the proposed aircraft emission standards. Following a detailed study of the comments, plus consultation with the National Aeronautics and Space Administration, the Air Force, and the Department of Transportation, the EPA established the Aircraft Emission Standards and Test Procedures. These regulations were published in the Federal Register, July 17, 1973. The promulgated emission standards are based on a new aircraft classification adopted by EPA. The fuel venting and smoke number requirements issued by the EPA to be effective on January 1, 1974 were extended to February 1, 1974 by the EPA in Federal Register, December 28, 1973.

EPA Aircraft Classification System

- Class T1: All aircraft turbofan or turbojet engines except engines of Class T5 of rated power less than 8,000 pounds thrust.

- Class T2: All turbofan or turbojet aircraft engines except engines of Class T3, T4, and T5 of rated power of 8,000 pounds thrust or greater.

- Class T3: All aircraft gas turbine engines of the JT-3D model family.

- Class T4: All aircraft gas turbine engines of the JT-8D model family.

- Class T5: All aircraft gas turbine engines employed for propulsion of aircraft designed to operate at supersonic flight speeds.

- Class P1: All aircraft piston engines, except radial engines.

- Class P2: All aircraft turboprop engines.

EPA Aircraft Emission Standards

The aircraft Emission Standards as announced in the Federal Register, June 17, 1973, are as follows:

- Engine Fuel Venting Emissions (New and In-Use Aircraft Gas Turbine Engines)

Applicability: The provisions of these regulations are applicable to each new aircraft gas turbine of Classes T2, T3, T4, and T5 manufactured on or after February 1, 1974, and all in-use aircraft gas turbine engines of classes T2, T3, T4, and T5 beginning February 1, 1974, and each new aircraft gas turbine engine of Classes T1 and P2 manufactured on or after January 1, 1975 and all in-use aircraft gas turbine engines of Classes T1 and P2 beginning January 1, 1975.

(1) Standards for Fuel Venting Emissions

(a) No fuel venting emissions shall be discharged into the atmosphere from any new or in-use gas turbine engine subject to the sub-part.

(b) Conformity with the standard set forth in paragraph (a) shall be determined by inspection of the method designed to eliminate these emissions.

- Exhaust Emissions (New Aircraft Gas Turbine Engines)

Applicability: The provisions of these emission controls are applicable to all aircraft gas turbine engines of the Classes specified beginning on the dates specified.

(1) Standards for Exhaust Emissions

(a) Exhaust emissions of smoke from each new aircraft gas turbine engine of Class T4 manufactured on or after February 1, 1974, shall not exceed: Smoke number of 30 (Smoke Number (SN) is the dimensionless term quantifying smoke emissions, and should be determined by smoke spot analysis made with a reflectometer).

(b) Exhaust emissions of smoke from each new aircraft gas turbine engine of Class T2 and of rated power of 29,000 pounds thrust or greater, manufactured on or after January 1, 1976, shall not exceed: Applicable smoke number from Figure C-1.

(c) Exhaust emissions from each new aircraft gas turbine engine of Class T3 manufactured on or after January 1, 1978 shall not exceed: Smoke number 25.

(d) Exhaust emissions from each aircraft gas turbine engine of the Classes specified below manufactured on or after January 1, 1979, shall not exceed:

Class T1:

Hydrocarbons	1.6 lbs/1000 lb-thrust hours/cycle
Carbon Monoxide	9.4 lbs/1000 lb-thrust hours/cycle
Oxides of Nitrogen	3.7 lbs/1000 lb-thrust hours/cycle
Smoke	Smoke number from Figure C-1

Classes T2, T3, and T4:

Hydrocarbons	0.4 lbs/1000 lb-thrust hours/cycle
Carbon Monoxide	4.3 lbs/1000 lb-thrust hours/cycle
Oxides of Nitrogen	3 lbs/1000 lb-thrust hours/cycle
Smoke	Smoke number from Figure C-1

Class P2:

Hydrocarbons	4.9 lbs/1000 horsepower-hour/cycle
Carbon Monoxide	26.8 lbs/1000 horsepower-hour/cycle
Oxides of Nitrogen	12.9 lbs/1000 horsepower-hour/cycle
Smoke	Smoke number from Figure C-2

The smoke number for each engine shall be determined by obtaining the smoke number corresponding to the engine rated power from Figure C-1 for turbofan or turbojet engines and Figures C-2 for turboprop engines.

(e) Exhaust emissions from each newly certified aircraft gas turbine engine of Classes T2, T3, or T4 manufactured on or after January 1, 1981, shall not exceed:

Hydrocarbons	0.4 lbs/1000 lb/thrust hours/cycle

- Exhaust Emissions (In-Use Aircraft Gas Turbine Engines)

Applicability: The provisions of these emission controls are applicable to all in-use aircraft gas turbine engines certified for operation within the United States of the Classes specified beginning on the dates specified.

Carbon Monoxide	3 lbs/1000 lb-thrust hours/cycle
Oxides of Nitrogen	3 lbs/1000 lb-thrust hours/cycle
Smoke	Smoke number from Figure C-1

(1) Standards for Exhaust Emissions

(a) Exhaust emissions of smoke from each in-use aircraft gas turbine engine of Class T4, beginning January 1, 1974, shall not exceed: Smoke number of 30.

(b) Exhaust emissions of smoke from each in-use aircraft gas turbine engine of Class T2 and of rated power of 29,000 pounds thrust or greater, beginning January 1, 1976, shall not exceed: Applicable smoke number from Figure C-1.

(c) Exhaust emissions of smoke from each in-use aircraft gas turbine engine of Class T3, beginning January 1, 1978, shall not exceed: Smoke number of 25.

(d) In addition to the requirements imposed by paragraphs (a), (b), and (c) of this section, each in-use aircraft gas turbine engine shall not exceed the level of the emissions applicable to such engine when it was new.

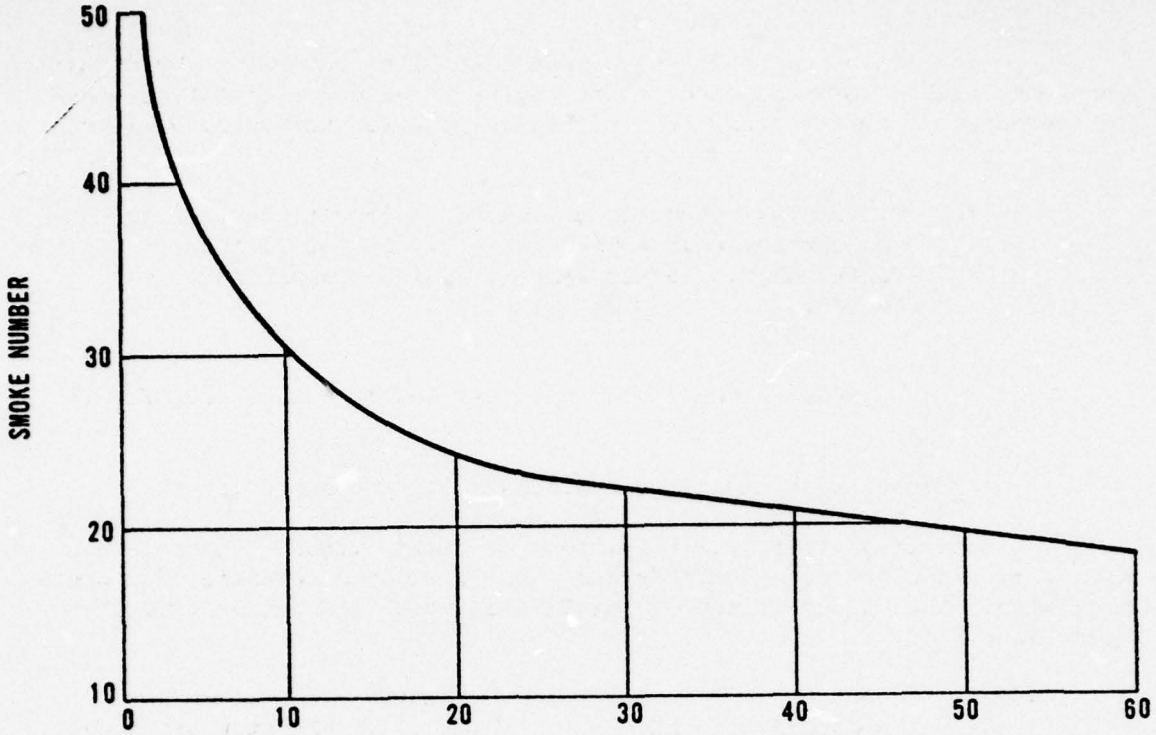


FIGURE C-1

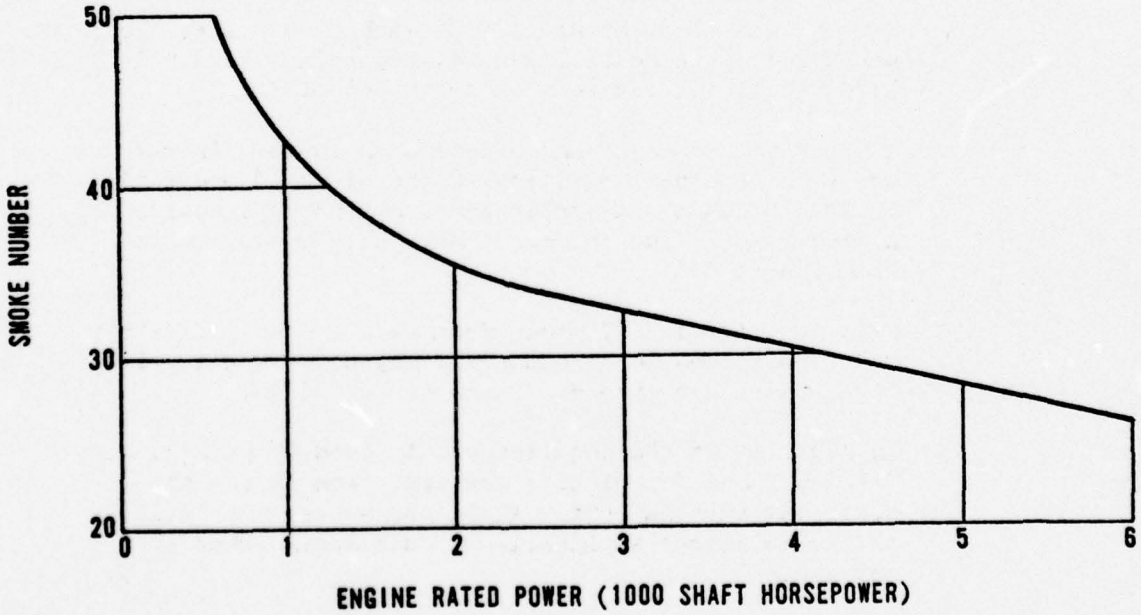


FIGURE C-2

- Exhaust Emissions (New and In-Use Aircraft Piston Engines)

Applicability: The provisions of these emission controls are applicable to all aircraft piston engines of Class P1 beginning on the date specified.

(1) Standards for Exhaust Emissions

Exhaust emissions from each new aircraft piston engine manufactured on or after December 31, 1979, shall not exceed:

Hydrocarbons	0.00190 lb/rated power/cycle
Carbon Monoxide	0.042 lb/rated power/cycle
Oxides of Nitrogen	0.0015 lb/rated power/cycle

(2) Standards for Exhaust Emissions (In-Use Aircraft Piston Engines)

Exhaust emissions from each in-use aircraft piston engine manufactured on or after January 1, 1979, shall not exceed the level applicable to such engine when it was new.

- Exhaust Emissions (All New and In-Use Aircraft)

Applicability: The provisions of these emission controls are applicable to all aircraft beginning on the date specified.

(1) Standards for Exhaust Emissions (New Aircraft)

(a) Exhaust emissions resulting from the generation of onboard power from each aircraft manufactured on or after January 1, 1970, shall not exceed:

Hydrocarbons	0.4 lb/1000 hp-hr. of power output
Carbon Monoxide	5 lb/1000 hp-hr. of power output
Oxides of Nitrogen	3 lb/1000 hp-hr. of power output

(b) The standards set forth in paragraph (a) refer to exhaust emissions from new aircraft exclusive of the exhaust, crankcase, and fuel venting emissions from the propulsion engines mounted on such aircraft.

(2) Standards for Exhaust Emissions (In-Use Aircraft)

Exhaust emissions from each in-use aircraft manufactured on or after January 1, 1979, resulting from generation of onboard power shall not exceed the level of emissions standards applicable to such aircraft when it was new.

Also in the Federal Register of July 17, 1973, the EPA stated that the 1981 standards on large engines depends on technology necessary to meet these standards. This technology is in an early development stage. EPA intends to monitor closely the development of this technology through programs sponsored both by other Federal agencies and by industry. If it should become evident that the standards as promulgated cannot be achieved by the technology approaches explored in these programs, additional rule making action will be considered to ensure that the best technology available is reflected in the standards.

Aircraft Power Setting (Propulsion Engines)

The aircraft engines are being tested in each of the following five engine operating modes which simulate aircraft operation to determine its mass emission rates and work output.

Actual power setting, that when corrected to standard day conditions, corresponds to the following percentage of rated power, reported in Federal Register, July 17, 1973.

Mode	Class T1 P2	Class T2, T3 or T4
Takeoff	100%	100%
Climbout	90%	85%
Approach	30%	30%
Taxi/Idle (In)	The Taxi/Idle operating modes shall be carried out	
Taxi/Idle (Out)	at a power setting in accordance with applicable Federal Aviation Regulations, at the manufacturer's recommended power setting for idle.	

Aircraft Fuel Venting

Turbojet aircraft are presently designed to collect residual unburned fuel in drain cans at shutdown and during start up. On takeoff, the pressure generated as the aircraft accelerates causes the drain cans to vent automatically to the atmosphere at an altitude of around 2,000 feet. Table

C-5 shows the amount of fuel vented for each of four main aircraft types under operation. The aircraft fuel venting emission controls announced by EPA in the Federal Register, dated July, 1973, were given in previous section of this Appendix.

Aircraft Auxiliary Power Unit

The emissions from aircraft auxiliary equipment have been the subject of a special study by the EPA. This study indicated that aircraft auxiliary power supplies do not emit contaminants to any significant degree.

Table C-5

Quantities of Fuel Vented by Four Aircraft Types

Aircraft Type	Example	Fuel Vented (kgms)
Jumbo Jet Transport	747, DC10	1.965
Long Range Jet Transport	707, DC8	2.430
Medium Range Jet Transport	727, 737, DC9	1.046
Turboprop Transport	Lockheed Electra FH-227	1.303

Airport Pollutant Production

In addition to aircraft emissions, a number of other pollution sources occur within any airport limits. Major potential sources are described in the following paragraphs.

- *Aircraft Fueling Systems*

An essential part of any airport operation is the fueling of aircraft, which is accomplished either by tank trucks or a central underground fueling system. The possibility of accidental spillage is substantially reduced by the underground fueling system, which has the added benefit of being more efficient as well. These fueling system emissions are the

uncontrolled combustible organic gases. The Los Angeles Air Pollution Control District has estimated that with its underground system, each hydrant at the Los Angeles International Airport (LAX), emits about 2.2 pounds of hydrocarbons per day (approximately one quart).

- *Operation of Gasoline-Fueled Ground Service Equipment*

Ground service equipment for a commercial airport generally includes light and heavy duty trucks, tractors, sweepers, vans, tow tugs and trucks, air starters, belt loaders, transports, portable air compressors, 400 cycle power generators, fork lifts, cranes, welders, fuel metering trucks, aerial ladders, steps, work platforms, etc.

The emission rates for light duty vehicles, heavy duty vehicles and various other types of ground service equipment are given in EPA "Compilation of Air Pollutant Emission Factors", AP-42, April, 1973.

- *Engine Emissions during Maintenance*

Typical maintenance and ground testing of aircraft engines involves running the engine almost entirely in idle and cruise modes. The amount of pollutants emitted during this maintenance is then calculated based on the emission rates for the particular engines, the time in each mode, and the number of maintenance checks performed daily or annually.

- *Motor Vehicles Entering and Leaving the Airport*

An estimate of the total pollutants contributed by motor vehicles entering and leaving the airport can be obtained by calculating average distance traveled by each vehicle within the airport boundary; total vehicles per day entering and leaving the airport; and distribution of the vehicular traffic movements with their average travel speed within the airport limits. The emission rates of light duty vehicles and heavy duty vehicles can be obtained from EPA "Compilation of Air Pollutant Emission Factors", AP-42, April, 1973.

- *Airport Heating Plant*

The airport heating plant can be a substantial stationary source of emissions at a major airport. Emissions from different types of power plants will vary, depending on fuel used. Emission rates of power can be obtained from EPA "Compilation of Air Pollutant Emission Factors", AP-42, April, 1973.

- *Fuel Storage Losses*

The airport fuel storage tanks represent a significant source of hydrocarbon emissions. These emissions will vary with the type of tank (fixed or floating roof), tank diameter, type of fuel, and the possible use of vapor recovery systems. The vapor emissions can be assumed to be 100 percent hydrocarbons, of which about 18.5 percent would be photochemically reactive hydrocarbons.

- *Miscellaneous Sources of Air Pollution*

In addition to the sources already mentioned, there are a number of minor airport sources, such as: abrasive blast cabinets; baghouses; boilers; chrome plating tanks; degreasers; loading racks; multiple chamber incinerators; paint bake ovens; paint spray booths; and miscellaneous equipment.

Air Pollution Resulting from Airport Construction

The construction or expansion of an airport facility may involve clearing large expanses of land, demolition of old structures, refuse burning, filling of depressions, excavation for culverts, pipes, etc., and many other operations, all of which can affect the air quality at the airport site as well as in neighboring areas. The contaminants may include dust, chemicals, smoke, and exhaust emissions, each of which can be minimized with the proper ameliorative precautions.

Assessment of the magnitude of the air pollution problem at a particular airport involves consideration of all airport and aircraft pollutant sources within the framework of that airport's specific location, layout, vehicular traffic, aircraft activity, physical size, topography and climate.

Factors Affecting Air Quality at Airports

The total volume of the atmosphere available for air contaminant dispersion is significantly influenced by local meteorological and topographical factors.

The band of atmosphere extending from ground level upward to some height is called the mixing layer, above which vertical mixing is significantly reduced. The height of this mixing layer is related to the local vertical temperature profile. The rate of change of temperature with height determines the stability of the atmosphere. For dry air, when the

temperature decreases more rapidly than the rate of 5.4°F for each 1,000 feet increase in elevation, the atmosphere is said to be unstable. When the temperature decreases less rapidly, or when it increases with height (called a temperature inversion), the atmosphere is stable and transport and dilution of pollutants is inhibited. During an inversion, there is generally little mixing above the base of the inversion. Thus, when ground level inversions occur for extended times, nearly all contaminants emitted close to ground level remain in the lowest few hundred feet of the atmosphere. The product of the mixing layer height and the horizontal wind speed gives a measure of the ventilation rate, or the "dilution capacity" of the lower atmosphere.

In addition to the transport and dilution of pollutants, precipitation (washout) also has an effect on ambient concentrations both directly (by the contact of falling rain or snow with pollutants) and indirectly (by the incorporation of suspended particulates in cloud droplets).

Other processes that influence air pollution concentrations are chemical changes (such as photochemical oxidation) and gravitational settling of the largest particulates. The formation of photochemical oxidants is a complex process involving reactive hydrocarbons, nitrogen oxides and intense sunlight. Airport emissions alone are unlikely to be an adequate source of photochemical oxidants. However, when meteorology, topography, sunlight, and community emissions are capable of producing photochemical oxidants, an airport can make the situation worse. The photochemical reaction involved takes place relatively slowly so that the contaminated air mass will have moved downwind from the airport area before substantial conversions occur.

Topography can affect the transport and dilution of air pollutants by inducing local flow patterns. Surface roughness can induce turbulence in the lower part of the atmosphere, and surface temperature differences can cause the thermal mixing to vary. Some of the topographic influences which are important for evaluating the impact of aircraft emissions include the channeling of flow through valleys, the persistence and intensification of inversions in valleys, circulations between land and water areas, urban-rural differences in surface roughness and thermal characteristics, and wind intensification on hills and ridges.

Atmospheric Dispersion of Airport Emissions

In order to evaluate the impact of pollutant emissions in airport vicinities, a model of airport emissions and atmospheric dispersion of those emissions is required.

The emission sources in the vicinity of an airport are represented by point sources, areal sources and line sources.

The dispersion of pollutants by the atmosphere occurs through four mechanisms: transport, diffusion, transformation, and loss. In this context, transport refers to mass transfer resulting from the mean motion of the wind, while diffusion refers to mass transfer resulting from turbulent mixing in the atmosphere. Transformation refers to a change of composition due to physical, chemical, or photochemical reactions.

The air pollution levels in the vicinity of an airport may be analysed for long-term or for short-term maximum conditions.

The model of atmospheric dispersion which is widely used to compute long-term average concentrations in the vicinity of an airport is known as Martin-Tekvart model and is based on a variation of the double - Gaussian equation.

The calculation of short-term maximum concentrations requires a much narrower range of meteorological conditions to be examined than the long-term analysis. In fact, the time period for such calculation has been divided into periods which are characterized by simple values of wind-speed class and atmospheric stability class, by a mean wind direction, and by a wind persistence as measured by angular variation and wind direction during the time period. The combination of meteorological conditions are designated by the Environmental Protection Agency to represent the maximum potential for pollutant concentrations.

The short-term model analysis performed for the Bicentennial International Airport, Northeast, America, was based on the double-Gaussian plume equation for point and line sources. Peak hour air pollution levels in the parking area were studied by applying a model study required by the Environmental Protection Agency. The source of this model study is "A Simple Method of Calculating Dispersion from Urban Area Aources" by S. R. Hanna, Journal of the Air Pollution Control Association, Volume 21, pp. 714, 777, 1971.

References

1. *Aircraft Emissions: Impact on Air Quality and Feasibility of Control.* U. S. Environmental Protection Agency, 1971.

2. *Airports and their Environment, A Guide to Environmental Planning,* CLM Systems, Inc., Prepared for U. S. Department of Transportation, September, 1972.

3. *Analysis of Aircraft Exhaust Emission Measurements.* Cornell Aeronautical Laboratory, Inc., Buffalo, N. Y. Prepared for the Environmental Protection Agency, Research Triangle Park, N. C., October, 1971.

4. *Assessment of Aircraft Emission Control Technology,* Northern Research and Engineering Corporation, Cambridge, Mass. Prepared for the Environmental Protection Agency, Research Triangle Park, N. C., September, 1971.

5. *Compilation of Air Pollutant Emission Factors,* U. S. Environmental Protection Agency AP-42, April, 1973. (With Supplements)

6. *Federal Register,* July 17, 1973.

7. *Federal Register,* December 12, 1972.

8. *Nature and Control of Aircraft Engine Exhaust Emissions,* Northern Research and Engineering Corporation, Cambridge, Mass. Prepared for National Air Pollution Control Administration, Durham, N. C., November, 1968.

9. *The Potential Impact of Aircraft Emissions Upon Air Quality,* Northern Research and Engineering Corporation, Cambridge, Mass. Prepared for the Environmental Protection Agency, Research Triangle Park, N. C., December, 1971.

Sample Emission Calculations

Aircraft

Daily Pollutant Loading (CO from 707 jet) =
Emission Factor (lb/eng-LTO) x Number of LTO's =
No. of engines x Adjustment Factor

$P.L._{(CO-707)}$ = (E.F.) x (LTO's) x (engines) x (A.F.)

where E.F. is derived from AP-42, utilizing appropriate times in operational mode of the aircraft's LTO;

LTO is a full landing and takeoff cycle (1/2 the number of daily operations of that aircraft);

A.F. is an adjustment factor to convert from mode times for AP-42 standard airport to present site

1975 $P.L._{(CO-707)}$ = (47.4 lb/eng-LTO) x (10 LTO's) x (4 engines) x (0.912) = 1,729 lbs/day

Daily emissions are then totalled for all other aircraft types and for other pollutants for each study year.

Autos

Daily Pollutant Loading for vehicular traffic:

$P.L._{(CO)}$ = Average Daily Traffic (ADT) x
Length of Road Segment x Emissions Factor

$P.L._{(CO)}$ = (ADT) x (L) x (EF),

where ADT is in vehicles per day,
L is the length of road in miles over which the ADT travels
EF is expressed in pounds per vehicle-mile and is found in AP-42.

1975 $P.L._{(CO)}$ = (15,123 $\frac{\text{Vehicles}}{\text{day}}$) x (1.2 miles) x

(0.0734 pounds/veh-mile) = 1,332 pounds/day.

Daily emissions are totalled for other highway segments for other pollutants and for each study year.

Service Vehicles

Daily Pollutant Loading for each type of service vehicle:

$P.L._{(CO)}$ = (Service vehicle fuel consumption) x (emission rate)

where

- fuel consumption is expressed in gallons/day and is derived from the vehicle's operating time and aircraft operations (APTD-1470);
- emission rate is expressed in pounds per gallon (also found in APTD-1470).

1975 $P.L._{(CO\text{-tractors})}$ = (375 gallons/day) x (2.20 pounds/gallon) = 825 pounds/day.

Emissions are then totalled for all service vehicle types for all pollutants and for each study year.

Working Losses (Hydrocarbon Emission)

Daily Pollutant Loading (P.L.) = (total fuel consumption) x (emission factor)

where

- fuel consumption is total daily aircraft fuel requirements - expressed gallons/day.

. emission factor is expressed in pounds/gallon of fuel and is found in APTD-1470.

1975 P.L.$_{(HC)}$ = (610,000 gals/day) x (0.55 pounds/1,000 gal) = 335 pounds/day

Emissions are then totalled for service vehicle fuel consumption and for each study year.

Air Quality Analysis Background Information

When computing emissions from aircraft, airport-generated vehicles, and vehicles operating in the parking lots, several assumptions were made for the various study conditions. These are discussed below:

For Aircraft Emissions -

- Aircraft traffic used was for a peak hour during an average day.
- Aircraft emission controls were used for 1980 and 1985 study years.
- Emissions were computed using EPA document AP-42.
- For aircraft pollutant dispersion, the "Puff Model" theory was used. This model considers the release from mobile sources as continuous interacting "puffs", each puff extending over a finite line segment and/or a duration of a time (T). Reference: "Airport Vicinity Air Pollution in Model", FAA).

For Airport-generated Vehicular Traffic -

- Auto emissions were computed using AP-42 supplement No. 2 September, 1973.
- Airport-generated traffic and through traffic was studied; traffic was distributed on major roads within a radius of three miles from the airport.
- Average speeds were assumed for each roadways.
- Methodology used to compute emissions were based on the California Line Source Model

For Parking Lots -

- Methodology used to compute emissions was based on Hanna's Areal Source Model.
- Average speed used for all study years was five mph.
- Expansion of the lot is planned for 1980 and 1985.

For Service Vehicles -

- Emissions were based on the amount of time each vehicle is in operation and the fuel consumed by each vehicle type.
- Uncontrolled emission factors were used for existing; controlled emission factors were used for 1980 and 1985.
- The methodology and source of vehicle operating times per aircraft operation are contained in APTD-1470, "An Air Pollution Impact Methodology for Airports-Phase I", EPA, January, 1973.

For Fuel Handling -

- APTD-1470 supplied hydrocarbon emissions loss rates from fuel handling.
- Fuel consumption by aircraft was based on 2,700 gal/LTO for Jumbo Jet, Long Range Jet, Medium Range Jet and Turboprop Transport and 1,700 gal/LTO for General Aviation Piston and Business Jet.

APPENDIX D

RELOCATION HOUSING SUPPLY/DEMAND ANALYSIS

Based on requirements established by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, families are guaranteed replacement housing of comparable or better quality. Interviews in South Revere Park determined the size and price of each unit to be acquired within this neighborhood. Results are shown in Table D-1.

Table D-1

South Revere Park
Housing Units To Be Acquired

Fair Market Value On Displacees Homes (In Dollars)	*Number of Bedrooms*					
	One	*Two*	*Three*	*Four*	*Five or More*	*Total*
0 - 5,000	0	0	3	0	0	3
5,000 - 10,000	2	4	12	4	0	22
10,000 - 15,000	5	7	25	8	8	53
15,000 - 20,000	3	4	10	3	2	22
Total	10	15	50	15	10	100

It was determined that due to the community's unique nature, replacement housing to be considered intrinsically as well as monetarily and structurally "comparable" had to be located in South Revere.

Available housing in South Revere was determined from multiple listings provided by the Boone County and Greater Carrollton Boards of Realtors and classified advertisements in the real estate section of the daily Carrollton Clarion and weekly Boone County Times. Table D-2 shows the total supply of available replacement housing units in the South Revere Park area circa June-August 1975, irrespective of specific demand.

Table D-2

South Revere Park
Available Replacement Housing Units

Dollar Cost of Comparable Replacement Homes	Number of Bedrooms					
	One	Two	Three	Four	Five or More	Total
0 - 5,000	0	0	2	0	0	2
5,000 - 10,000	2	4	4	0	0	10
10,000 - 15,000	3	10	18	12	7	50
15,000 - 20,000	3	5	15	0	0	23
Total	8	19	39	12	7	85

It is noted that the Uniform Relocation Act places specific restrictions upon replacement housing. Units not only must be "comparable" but safe, sanitary and in full compliance with local housing codes and regulations. The 85 units indicated above fully met these standards.

The overall comparison of supply and demand showed a deficiency of 15 units. However, when consideration was given to individual requirements for cost and size, there was found to be a net deficiency of 28 units. (See Table D-3).

Provisions of the Uniform Relocation Act permit the grant of up to $15,000 to compensate for the difference between the fair market value of the displaced unit and the purchase price of the most comparable replacement dwelling. Under this provision, for example, the deficit of seven, $10,000 to $15,000 units of three rooms each may be partially negated by the availability of five surplus units valued at $15,000 to $20,000 and containing the same required number of bedrooms. The net difference between the cost of the available units and the required value of the desired units is less than the allowed $15,000. Therefore, by placing five of the seven households in the higher cost units, the deficiency of seven units is reduced to two units. By adjusting the entire matrix in a similar manner, the final unfilled demand is shown in Table D-4.

Table D-3

South Revere Park
Supply/Demand Interaction

Dollar Cost of Comparable Replacement Homes	Number of Bedrooms					
	One	Two	Three	Four	Five or More	Total
0 - 5,000	0	0	- 1	0	0	- 1
5,000 - 10,000	0	0	- 8	-4	0	-12
10,000 - 15,000	-2	(+3)	- 7	(+4)	-1	-10
15,000 - 20,000	0	(+1)	(+ 5)	-3	-2	- 5
Total	-2	(+4)	-16	-7	-3	-28

Table D-4

South Revere Park
Net Deficiency of Replacement Housing Supply

Dollar Cost of Comparable Replacement Homes	Number of Bedrooms				
	One	Two	Three	Four	Five or More
0 - 5,000			- 1		
5,000 - 10,000			- 8		
10,000 - 15,000	-2		- 2		-1
15,000 - 20,000				-3	-2

The final excess demand of 19 units can only be filled by Last Resort Housing. The Airport Authority has agreed to provide this as follows:

New Construction	11 three-bedroom units
Significant Renovations	3 four-bedroom units
of Existing Structures:	3 five-bedroom units
	2 one-bedroom unit
Total Last Resort Housing	19 units

The same procedures were followed for the 30 displaced families in the Nathan Hills community. In this case the only intrinsic restriction was housing within a 15 minute driving distance of Nathan Hills. Table D-5 shows the housing requirements for Nathan Hills families.

Table D-5

Nathan Hills
Characteristics of Housing to be Acquired

Fair Market Value Of Displacee's Homes (In Dollars)	Number of Bedrooms					
	One	Two	Three	Four	Five or More	Total
15,000 - 20,000						
20,000 - 25,000		1	4			5
25,000 - 30,000			3			3
30,000 - 35,000			8			8
35,000 - 40,000						
40,000 - 45,000				2		2
45,000 - 50,000						
50,000 - 55,000				10		10
55,000 - 60,000						
60,000 - 65,000		—	—	2		2
Total		1	15	14		30

ECONOMIC ANALYSIS OF AIRPORT DEVELOPMENT

Table D6 is intended to serve as a comprehensive outline of operating and non-operating revenues and expenses. The outline was developed for the Division of Aeronautics/State of California by the Aerospace Corporation in 1973. The table was developed from an analysis of income and expense statements from nearly 100 airports from around the United States.

The definitions which follow the table are provided to explain the component costs and revenues.

Table D7 illustrates the various relationships which relate airport operating revenues and expenses to the total annual number of passengers handled and to the total annual number of general aviation operations. The variables in the estimating relationships are explained at the bottom of Table D7. Note that each equation which uses passengers and/or total general aviation movements as input variables represents a component cost or expense for an air carrier type airport. Relationships for general aviation airports are explained by the following set of independent variables:

- Total Number of Based Aircraft
- Total Number of Annual Operations
- Length (uncorrected) of the Longest Runway

Input forms for these variables are also included at the bottom of Table D7. The estimating relationships were developed by the Aerospace Corporation, and are included in the report entitled, Financial and Statistical Data and Estimating Relationships for Airport Planning.

Table D6 . Income and Expense Sources

- OPERATING REVENUES
  - AIRFIELD AREA
    - AIR CARRIER LANDING FEES $ _____
    - OTHER LANDING FEES _____
    - FUEL AND OIL FEES _____
    - AIRLINE CATERING FEES _____
    - AIRCRAFT PARKING _____
    - AIR NATIONAL GUARD _____
    - TOTAL AIRFIELD AREA $ _____
  - HANGAR AND BUILDING AREA
    - HANGAR RENTAL $ _____
    - COMMERCIAL/INDUSTRIAL _____
    - GROUND SITE LEASES _____
    - GOVERNMENT _____
    - FIXED BASE OPERATION _____
    - TOTAL HANGAR AND BUILDING AREA $ _____
  - TERMINAL AREA
    - AIRLINE RENTAL $ _____
    - GOVERNMENT _____
    - MISCELLANEOUS RENTALS _____
    - TOTAL TERMINAL AREA $ _____
  - SYSTEMS AND SERVICES
    - UTILITIES $ _____
    - MISCELLANEOUS SERVICE FEES _____
    - TOTAL SYSTEMS AND SERVICES $ _____
  - CONCESSIONS
    - AIRPORT PARKING $ _____
    - AUTO RENTAL _____
    - RESTAURANT AND LOUNGE _____
    - SHOPS _____
    - ADVERTISING _____
    - GROUND TRANSPORTATION _____
    - FLIGHT INSURANCE _____
    - HOTEL/MOTEL _____
    - MISCELLANEOUS _____
    - TOTAL CONCESSION $ _____
  - TOTAL OPERATING REVENUES $ _____
- OPERATING EXPENSES
  - AIRFIELD AREA $ _____
  - HANGAR AND BUILDING AREA _____
  - TERMINAL AREA _____
  - GENERAL AND ADMINISTRATIVE _____
  - TOTAL OPERATING EXPENSES $ _____
- OPERATING PROFIT $ _____
- NON-OPERATING REVENUES
  - INTEREST ON INVESTMENTS $ _____
  - LOCAL TAXES _____
  - CONTRIBUTIONS FROM GOVERNMENT _____
  - MISCELLANEOUS _____
  - TOTAL NON-OPERATING REVENUES $ _____
- NON-OPERATING EXPENSES
  - INTEREST $ _____
  - CONTRIBUTIONS TO GOVERNMENT _____
  - MISCELLANEOUS _____
  - TOTAL NON-OPERATING EXPENSES $ _____
- OPERATING INCOME $ _____
- DEPRECIATION $ _____
- NET INCOME $ _____

Table D7

OPERATING REVENUE AND EXPENSE ESTIMATING EQUATIONS

Parameter	Airport Category	Equation
Air Carrier Airports		
Total Operating Revenues	Large Air Carrier	$\text{Log REV} = -.417 + 1.364\ (\text{Log PAX}) - .0575\ (\text{Log PAX})^2$
	Small Air Carrier	$\text{REV} = -8.334 + 1.127\ (\text{PAX}) + 1.208\ (\text{GA})$
Total Operating Expenses	Large Air Carrier	$\text{Log EXP} = -2.173 + 2.355\ (\text{Log PAX}) - .223\ (\text{Log PAX})^2$
	Small Air Carrier	$\text{EXP} = 3.645 + .767\ (\text{PAX}) + .731\ (\text{GA})$
Airfield Area Revenue	All Air Carrier	$\text{Log REV} = -.199 + .899\ (\text{Log PAX})$
Hangar and Building Area Revenue	All Air Carrier	$\text{REV} = 74.153 + .135\ (\text{PAX}) + 9.872E^{-8}(\text{PAX})^2 + .356\ (\text{GA})$
Terminal Area Revenue	All Air Carrier	$\text{Log REV} = .621 + .971\ (\text{Log PAX})$
Systems and Services Revenue	All Air Carrier	$\text{Log REV} = -.674 + .731\ (\text{Log PAX})$
Concessions	All Air Carrier	$\text{Log REV} = -2.658 + 2.306\ (\text{Log PAX}) - .175\ (\text{Log PAX})^2$
Air Carrier Landing Fees	All Air Carrier	$\text{Log REV} = -.388 + .785\ (\text{Log PAX}) + .049\ (\text{Log PAX})^2$
Auto Parking Revenue	All Air Carrier	$\text{Log REV} = -1.594 + 1.2667\ (\text{Log PAX})$
Auto Rental Revenue	All Air Carrier	$\text{Log REV} = -.884 + 1.008\ (\text{Log PAX})$
Restaurant and Lounge Revenue	All Air Carrier	$\text{Log REV} = -1.133 + 1.002\ (\text{Log PAX})$
Shops	All Air Carrier	$\text{Log REV} = -2.166 + 1.196\ (\text{Log PAX})$
General Aviation Airports		
Total Operating Revenues	Commercial/Industrial	$\text{Log REV} = -1.135 + .131\ (\text{Log A/C}) + .845\ (\text{Log OPS}) + .655\ (\text{Log RUNWAY})$
	Service/Training	$\text{Log REV} = -2.127 + .597\ (\text{Log A/C}) + .322\ (\text{Log OPS}) + .889\ (\text{Log RUNWAY})$
Total Operating Expenses	Commercial/Industrial	$\text{Log EXP} = -1.284 + .533\ (\text{Log A/C}) + .464\ (\text{Log OPS}) + .591\ (\text{Log RUNWAY})$
	Service/Training	$\text{Log EXP} = -2.480 - .077\ (\text{Log A/C}) + .967\ (\text{Log OPS}) + 1.224\ (\text{Log RUNWAY})$

Log = Common Logarithm

PAX = Total annual number of passengers handled, in thousands.
GA = Total annual number of general aviation operations, in thousands.
REV = Annual revenue, in thousands of dollars.
EXP = Annual expenses, in thousands of dollars.
A/C = Number of based aircraft.
OPS = Number of annual movements, in thousands.
RUNWAY = Length (uncorrected) of longest runway, in hundreds of feet.

DEFINITIONS

The definitions included in this section correspond to the elements shown in Table D6. Additional definitions are included to explain both the Operating Statistics and the Physical and Financial Statistics which were used in the estimating relationships for Operating Revenues and Operating Expenses. These definitions are unique to airport economic analysis and are intended to ensure understanding and uniformity by those who prepare and use the data.

- Operating revenues

Airfield area

Air carrier landing fees	Landing fees paid by air carrier and commuter aircraft in scheduled and unscheduled service.
Other landing fees	Landing fees paid by general aviation and military aircraft. Includes fees paid by scheduled air carriers for training flights.
Fuel and oil fees	Fuel flowage fees or revenues from fuel concession. Fees are net (sales less cost of sales).
Airline catering fees	Fees received from operation of airline catering services.
Aircraft parking	Revenues from aircraft tie-down and use of service areas.
Air National Guard	Annual lease or fee for airfield use.

Hangar and Building area

Hangar rental	Rental or lease specifically for aircraft storage by airlines, aircraft service operations, private owners--except government agencies.
Commercial/industrial	Rental or lease of hangars, buildings, or ground sites for aviation and non-aviation related services or enterprises. Includes aircraft maintenance facilities,

	cargo and freight forwarding, aircraft and aircraft equipment manufacturing, aviation sales and services, industrial parks, and manufacturing facilities.
Ground site leases	Lease of airport land for farming, trailer parks, or industrial use.
Government	Rental or lease of hangars and buildings by federal, state, or local governments.
Fixed base operation	Revenue received from a private enterprise from operation of the airport for the local municipality. Revenues are from services related to general aviation such as fuel sales, aircraft maintenance, hangar and apron parking, aircraft rental and sales, and flight instruction.
Terminal area	
Airline rental	Rental or lease of ticket counter, baggage facilities, and boarding gates by airlines.
Government	Rental for building and office space at the terminal.
Miscellaneous rentals	Other terminal rentals by various aviation and non-aviation business enterprises not engaged in airline passenger-related services.
System and services	
Utilities	Resale of electricity, gas, and water to airport tenants based on bulk purchases by the airport.
Miscellaneous service fees	Other miscellaneous service fees for use of airport property such as license and permit fees, and washing of aircraft.
Concessions	Revenue to airport from all passenger-related services provided directly by the airport or by concessionaires.
Airport parking	Revenues from public parking areas and structures for parking of automobiles.

Auto rental	Revenues from lease of terminal facilities by auto rental firms.
Restaurant and lounge	Revenue from concessionaire operating terminal restaurants and lounges.
Shops	Revenue from concessionairs offering merchandise or services to airline passengers. Includes gift, barber, clothing, and specialty shops.
Advertising	Revenue from use of airport space for advertising purposes.
Ground transportation	Revenues from all public ground transportation modes including taxicabs, bus, and limousine services.
Flight insurance	Revenue from sale of flight insurance to airline passengers.
Hotel/motel	Revenue from on-site use of airport property for hotel/motel operations.
Miscellaneous	Revenues from vending machines, pay telephones, toilets, observation decks, auto service, and other miscellaneous services.
Operating expenses	Total expenses* incurred in operating and maintaining the airport.
Airfield area	Maintenance of runways, taxiways, aprons, and areas for servicing aircraft, and general airfield area covering drainage, grass areas, and fencing.
Hangar and building area	Maintenance of aircraft storage and service facilities, and airport property rented or leased to aviation and non-aviation users.
Terminal area	Maintenance of airport terminal building, facilities, and equipment. Includes concession area and parking terminal, roads, streets, and walks.

*Includes costs of utilities, fire, crash rescue, police, sanitation, landscaping, snow removal and maintenance of shop area and equipment. Such costs are to be allocated to individual areas. Includes disbursement to local government for such services provided.

General and administrative	Costs of airport management and planning, general office expenses, employee benefits, insurance, and accounting.
• Operating profit	Operating profit from airport operations (operating revenues less expenses).
• Non-operating revenues	Income received not attributable to airport operations.
Interest on investments	Interest earned on airport capital funds. Includes interest on cash and securities invested and from bonds sold but not yet expended for airport development.
Local taxes	Property tax revenues received from taxes levied by special districts used for airport operations. Revenues used for airport development should be shown in sources of funds.
Contributions from government	Contribution of general funds by the state, cities, and counties for airport operation. Does not include funds specifically for capital improvements.
Miscellaneous	Includes funds obtained from capital gains and sale of property or equipment.
• *Non-operating expenses*	Expenses incurred not attributable to airport operations.
Interest	Interest on revenue bonds and general obligation bonds provided that restrictions do not require that interest be paid out of taxes. Includes amortization of bond expenses.
	Includes interest paid by local governments on capital funds provided for airport development provided such costs are allocated to all agencies.
Contributions to government	Transfer of funds to the general fund of local government. Represents contribution in lieu of taxes or return on investment.

Miscellaneous	Any extraordinary expenses or losses from sales or disposition of property.
• Operating income	Total cash flow indicating gain or loss from operating and non-operating revenues and expenses before depreciation.
• Depreciation	Allowance of wear and obsolescence of airport buildings, fixtures, equipment and improvements. Does not include fixed assets provided by federal grants or leasehold improvements by tenants.
• Net income	Net income from operations including depreciation.

- **Operating statistics**

Aircraft operations	**Total aircraft arrivals and departures from an airport.**
Air carriers	**Aircraft operating under certificates of public convenience and necessity issued by the CAB. Includes the supplemental and major intrastate air carriers--PSA and Air California**
Commuter	**Aircraft operations of scheduled commuter air carriers.**
General aviation	**All civil aircraft operations including those of air taxi operators.**
Military	**Operations by Army, Navy, Marine, Coast Guard, Air Force, or Air National Guard aircraft.**
Passengers handled	**The total number of revenue passengers enplaning and deplaning aircraft including originating, stopover, transfer, and terminating passengers in scheduled and non-scheduled service.**
Air Carrier	**Applies to air carrier operations.**
Commuter	**Applies to commuter air carriers.**
Air cargo (tons)	**Total of air freight, express, and mail handled (enplaned plus deplaned).**

- **Physical and financial statistics**

Number of based aircraft	**Total general aviation aircraft based at an airport.**
Total acreage	**Total airport property including clear zones.**
Total debt outstanding	**Total value of revenue and general obligation bonds outstanding.**
Total assets	**Original acquisition cost of land; land improvements; buildings, furniture and fixtures; and equipment. utilities, and construction in progress.**

APPENDIX E

COOPER COUNTY DEPARTMENT OF PLANNING AND ZONING

Cooper County Office Building
Federalsburg

March 17, 1975

FAA District Office
Bicentennial International Airport

Gentlemen:

The Board of Supervisors of Cooper County at their bimonthly meeting on March 12, 1975, formally agreed and resolved to authorize a special zoning category (Airport Use) and designate properties in Cooper County south of SR 66, east of SR 1, and west of SR 102 within this classification.

Specific metes, bounds and plat details will be provided by this office, and upon their receipt the Supervisors will take official action. It is acknowledged that this zoning will be authorized as part of the enactment of county-wide zoning ordinances scheduled for the spring of 1976.

The Department of Planning and Zoning joins the Board of County Supervisors in supporting this expansion as critical to the growth and development of Cooper County.

Sincerely,

Donald R. Dwight Jr.

Donald R. Dwight, Jr.
Director

DRD/rd

cc: Northeast Airport Authority

STATE DEPARTMENT OF TRANSPORTATION

State Highway Administration
Capitol Center, Carrollton

April 4, 1975

Northeast Airport Authority
Bicentennial International Airport

Gentlemen:

As a result of our series of meetings regarding the airport expansion, the State Highway Administration is considering the advancement of the programmed widening of SR 1 from Interstate 40 to the Bicentennial Airport access road from its 1985-1990 capital program to its 1980-1985 program. In addition, the 1980-1985 program will include funds to modify the SR 1-Airport-State Park access road interchange as required.

It is noted that such an agreement would be contingent upon the provision of partial funding from the Boone County 1980-1985 primary road budget. Furthermore, it will be incumbent upon the Airport Authority to defray costs for signing and lighting on the airport property.

It is our belief that these actions would be sufficient to permit the safe movement of anticipated airport and through traffic volumes at a satisfactory level of service.

Sincerely,

STATE HIGHWAY ADMINISTRATION

Larsen V. Groves
Administrator

LVG/re

STATE DEPARTMENT OF PLANNING AND DEVELOPMENT

Division of Historic and Archaeological Landmarks
Office of the State Archaeologist
Carrollton Capitol Plaza

April 7, 1975

Northeast Airport Authority
Bicentennial International Airport

Gentlemen:

In response to your inquiries regarding potentially valuable archaeological sites within the Bicentennial Airport expansion area as indicated in your exhibits entitled "Alternate 1," "Alternate 2," and "Alternate 3," I am able to advise you that no archaeological sites are known or believed to exist within these locations.

However, a mild caveat modifies this statement. While we have no evidence of aboriginal activity in this particular area, construction operations are occasionally the source of potentially valuable finds. Therefore, I would request that any relics uncovered during excavation be immediately reported to this office.

Sincerely,

Allison S. Krebs

Allison S. Krebs, Ph.D.
State Archaeologist

ASK/rf

AIRPORT AUTHORITY

Bicentennial International Airport
Office of the Airport Manager

April 15, 1975

Dr. Allison S. Krebs
State Archaeologist
State Department of Planning
and Development
Carrollton Capitol Plaza

Dear Dr. Krebs:

This is to acknowledge your letter of April 7, 1975. We are most appreciative of your review of the Bicentennial Airport expansion area. Please be assured that should any relic of potential archaeological value be uncovered during the project excavation, you will be immediately notified, and all operations will cease pending your investigation.

Sincerely,

Michael D. Reets

Michael D. Reets
BIA Airport Manager

MDR/rg

BOONE COUNTY HISTORICAL SOCIETY

8205 Evergreen Road
Carrollton

April 17, 1975

Northeast Airport Authority
Bicentennial International Airport

Gentlemen:

Your interest in the archaeological significance of the area surrounding Bicentennial Airport has been brought to my attention by our Director.

We have no evidence of Indian activity or historic events in this area. All research known of and supported by the Society shows activity concentrated in the western perimeter of the County or along passes in the Jefferson foothills. Even Revolutionary War activity was focused north of the airport in the colonial nucleus community of Carrollton.

Consequently, from an archaeological point of view, we see no reason to impede construction of an expanded airport.

Sincerely,

Sylvia Catherine Fell

Sylvia Catherine Fell, Ph.D.
Associate Professor of Archaeology,
Carrollton Community College and
Volunteer Advisor on Archaeology to the
Boone County Historical Society

SCF/ri

MILL CREEK STATE MENTAL HOSPITAL
Office of the Director

Lawrence J. Weisshoff, M.D.
Director

May 7, 1975

The Northeast Airport Authority
Bicentennial Airport

Gentlemen:

This is to advise you that our house staff has reviewed your proposed expansion plans. Speaking on behalf of our professional staff, I offer the strongest possible objection to Alternatives 1 and 2, which we feel would introduce highly disturbing noise or distracting activity to our patient population.

Conversely, we can willingly support Alternate 3, which we believe will not have any effect on our therapeutic programs. In fact, we believe this alternate will considerably reduce present activity by diverting planes from the present runway to one further removed from our clinics. We therefore would support the Alternate 3 action.

Sincerely,

Lawrence J. Weisshoff

Lawrence J. Weisshoff, M.D.
Director

LJW/rb

DEPARTMENT OF RECREATION AND PARKS
Boone County

May 21, 1975

Northeast Airport Authority
Bicentennial International Airport

Gentlemen:

In response to inquiries regarding the significance of parks in the Bicentennial International Airport area, I offer the following information:

1. Pierce State Park is the region's most important comprehensive recreational resource and provides a full range of active and passive opportunities.

2. The developed active sports area attached to Ethan Allen High School (located in the northwest corner of the Jasper Boulevard-SR 102 intersection) represents the second most important recreational resource to the greater South Carrollton community.

3. Recreation areas adjacent to Paul Revere Junior High and Jefferson Elementary School in North Revere and Nathan Hale Elementary School in Nathan Hills represent solid neighborhood recreational resources. These developed sports areas not only serve school students but adult residents, and the fields are used for organized interscholastic and intercommunity programs, i.e., Little League competition, county-sponsored adult tennis instruction, summer scout day camp activities, etc.

4. The South Revere playground is strictly a neighborhood facility with use dominated by preschool children attending the nearby Baptist Church Day Care Center. It is our understanding that the church plans to move to a new facility within the next five years. At that time the Department may decide to abandon the playground so as to maintain a new recreational support facility adjacent to the new church.

In closing, I express the Department's view that any future expansion plans be formulated to minimize impact on Pierce State Park and to orient air traffic away from our school-connected recreational facilities.

Sincerely,

Jonathan G. Bethune

Jonathan G. Bethune
Director

JGB/rj

CYRUS PIERCE STATE PARK
State Department of Recreation and Parks

Thomas H. Bauer
Director, Cyrus Pierce State Park

May 26, 1975

The Northeast Airport Authority
Bicentennial International Airport

Gentlemen:

On behalf of the State Department of Recreation and Parks, this letter is an endorsement of Alternate 3 for the proposed Bicentennial Airport expansion.

We feel that this action would have the least effect on park activity or wildlife habitat.

At the same time, we strongly oppose Alternate 1, which we believe brings aircraft activity within disruptive proximity of the park. We also oppose Alternate 2, which would increase noise levels in park wildlife and recreation areas. Furthermore, construction of Alternate 1 has the potential for severe siltation of Pierce Lake.

In conformance with Section 4(f) of the Transportation Act, we recommend your selection of Alternate 3 as the only feasible and prudent alternative to protect this important public parkland.

Sincerely,

Thomas H. Bauer

Thomas H. Bauer
Director, Cyrus Pierce State Park

THB/rc

BOONE COUNTY HISTORICAL SOCIETY

8205 Evergreen Road
Carrollton

June 21, 1975

Northeast Airport Authority
Bicentennial Airport

Gentlemen:

This is to advise you that your presentation of airport expansion impact on the General Boone House was taken under consideration at our bi-monthly meeting of June 18, 1975. We were most appreciative that Mr. Michael Reets, Bicentennial International Airport Manager and a representative of your environmental consulting firm, provided exhibits and explanations of the Noise Exposure Forecast procedures and implications of analysis results.

Subsequent to their presentation, the Trustees formally voted to support the project. We believe that expansion of Bicentennial International Airport is important to the County's future history.

Furthermore, we believe that the adjusted takeoff procedures proposed for the new runway will minimize impact on the Boone House Museum. We do not foresee expanded airport activity in any way restricting tours of the house or its gardens.

Sincerely,

Nathan J. Bradshaw

Nathan J. Bradshaw
President of the Board of Trustees

NJB/rh

STATE DEPARTMENT OF HEALTH AND MENTAL HYGIENE
Carrollton Capitol Center

Andrew F. Miller, M.D.
Administrative Deputy

August 9, 1975

The Northeast Airport Authority
Bicentennial International Airport

Gentlemen:

In response to your concern as to the proposed airport expansion's impact on Mill Creek State Mental Hospital, I would like to offer the following comments:

We recognize the importance of this project and, after consultation with Dr. Weisshoff, Mill Creek's Director, see no conflict with our therapeutic procedures.

Further, this Department has advised the Boone County planning officials that we understand their views as to the desirability of relocating Mill Creek Mental Hospital to permit compatible industrial-commercial zoning abutting the airport. Unfortunately, the State cannot afford to replace or relocate these highly specialized facilities in the foreseeable future. However, we have pledged not to build any additional facilities at Mill Creek and have included land acquisition for a new mental hygiene complex northeast of Carrollton in our ten-year plan. This new facility will not necessarily relieve Mill Creek, but it will assure that no additional buildings need be constructed on the Mill Creek campus to handle our projected 1990-2020 increased caseload.

Sincerely,

Andrew F. Miller

Andrew F. Miller, M.D.
Administrative Deputy

AFM/ra

DEPARTMENT OF PLANNING
Boone County

March 1, 1977

The Northeast Airport Authority
Bicentennial International Airport

Gentlemen:

This transmittal is intended to provide additional information concerning this department's policy with respect to airport expansion and compatible land use. In our A-95 review, we indicated no objection to the proposal. We were represented on the advisory committee for expansion and were involved in discussions on noise abatement.

Our main concerns are directed toward the areas to the north and east of the airport. Some of this land is presently zoned for manufacturing and commercial uses and is expected to retain those designations. Development on the remaining land will be accomplished with the objective of achieving compatible land use with the airport and other adjacent activities.

We hope this information can be of some assistance to you.

Very truly yours,

Christopher S. Mitchell

Christopher S. Mitchell
Director

ADVISORY COUNCIL ON HISTORIC PRESERVATION

March 1, 1977

FAA Airports District Office
Northeast, America

Gentlemen:

Subsequent to your request for consultation, we have reviewed the results of the noise assessment for the proposed improvements at Bicentennial International Airport.

Based on the degree of noise exposure resulting from modified air traffic control procedures, we would concur in the establishment of this operational alternative. A Memorandum of Agreement to this effect is forthcoming for your review.

Thank you for your cooperation.

Sincerely,

The Advisory Council on
Historic Preservation

DEPARTMENT OF PLANNING
Boone County

April 2, 1977

Mr. John Parks, Director
Northeast Game and Parks Commission
2001 West Recreation Road
Northeast, America

Dear Mr. Parks:

The proposed expansion of Bicentennial International Airport would require the removal of the South Revere Playlot.

In accordance with the provisions of the Land and Water Conservation Fund Act, we are hereby requesting approval of the Department of Interior for a change in the use of that portion of land.

A Section 4(f) Statement was prepared for the lot and is contained in the FAA's Draft EIS for airport expansion. A replacement site has been proposed and has been surveyed by our Department of Recreation and Parks (See attached letter).

Thank you for your assistance in processing this request. Please contact us if you have any further questions.

Very truly yours,

Raymond O. Egleston

Raymond O. Egleston
Acting Director

DEPARTMENT OF RECREATION AND PARKS
Boone County

April 1, 1977

FAA Airports District Office
Northeast, America

Gentlemen:

In response to your request, we have surveyed the proposed replacement site for the South Revere Playlot.

As you know, the proposed site is planned to be adjacent to the relocated church. The site is relatively flat and dry, and appears to possess the same degree of usefulness as the former site. Its location is within the same community and is easily accessible.

We believe that this proposed site is a satisfactory replacement for the playlot which would be removed by airport expansion.

Sincerely,

Jonathan G. Bethune

Jonathan G. Bethune
Director

DEPARTMENT OF THE INTERIOR

June 1, 1977

Planning Department
Boone County
Northeast, America

Gentlemen:

In response to your request for a change in the use of land under the Land and Water Conservation Fund Act, we hereby provide our approval of the conversion of the South Revere Playlot land to airport use. This approval is subject to the provision that the replacement site as surveyed by the Boone County Department of Recreation and Parks is developed as proposed.

Sincerely,

Irving R. Sixeff

Irving R. Sixeff

STATE DEPARTMENT OF PLANNING AND DEVELOPMENT
Division of Historic and Archaeological Landmarks
Office of the State Archaeologist
Carrollton Capitol Plaza

March 21, 1977

FAA Airports District Office
Northeast, America

Gentlemen:

This is to inform you of the fact that, in response to your request, we have undertaken a preliminary archaeology survey of the area that would be affected by the expansion of the Airport.

Members of my staff have been searching the area intensively, but thus far they have failed to discover a single archaeological site that would be affected by the proposed construction.

A detailed report is being prepared and should be ready soon. If there is any change from our original survey, we will advise you accordingly. In the meantime, however, you can proceed under the assumption that no archaeological sites are likely to be damaged in the course of the development.

Sincerely,

Allison S. Krebs

Allison S. Krebs, Ph.D.
State Archaeologist

DRAFT EIS COORDINATION
COMMENTS AND FAA RESPONSES

Form DOT F 1320.1 (1-67)

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

DATE: JAN 14 1976

SUBJECT: Model EISs Prepared as Part of Airports Service Environmental Guidance Contract

In reply refer to: TES-72

FROM : Director, Office of Environmental Affairs

TO : Chief, Environmental Planning Branch
Airports Service (FAA/AAS-410)

Comment No

This office has reviewed the model draft environmental impact statement for expansion of an air carrier airport ("Bicentennial International Airport, Northeast, America"). We offer the following comments:

Justification. The EIS should provide additional information on the need for the proposed runway. There is no discussion of existing facilities and existing capacity at the airport, and the statement that "the saturation point is rapidly being approached" is not supported. How would the forecast airport activity compare with hypothetical FAA terminal area forecasts? We suggest that the final EIS supplement prepared for Detroit Metropolitan Airport be consulted as an example of the kind of discussion of project justification which is required in a statement for a proposal such as this. (1)

We note that general aviation activity is expected to comprise over 70% of forecast operations. We suggest that the EIS discuss methods of diverting general aviation operations, including a possible variable landing fee system, as an alternative to the project. (2)

Air Quality. The hypothetical metropolitan areas served by the airport have a combined population of 1.8 million. It does not seem realistic that such an area would presently meet Federal air quality standards and be classified Priority III. We suggest that air quality impacts of both air traffic and ground access be evaluated with the assumption that air quality standards are presently being violated. (3)

Comment No

Noise. The noise analysis should include projections of aircraft noise for the projected peak operations or design year (1990 or 1995). The EIS should specify the assumptions concerning retrofit used for the analysis, and should indicate the sensitivity of the analysis to these assumptions. (4)

Section 4(f) Lands. The title of this section of the EIS (page III-76) should be changed to "Recreation Lands" or a similar title, since this section discusses impacts of the project on all public park and recreation lands in the airport vicinity, and not just those to which section 4(f) applies. (5)

The location of the Paul Revere Junion High School recreation area is such that it is at the edge of the 30 NEF contour. It is not clear that such noise impacts would necessarily constitute a "taking". We suggest that the hypothetical location for the recreation area be such that severe noise impacts are projected (e.g. within the 40 NEF contour), in order to make it clearer that section 4(f) would apply. (6)

Specific Comments. On page III-16, the statement that the ADAP Act requires land use controls within the 30 NEF contour should be clarified. The ADAP Act requires sponsor assurances of compatible land use, but does not specify the area which should be controlled. As a matter of practice, we believe that controls should generally be implemented for areas within the 30 NEF contour. (7)

On page III-33, the EIS should discuss the impacts of the project on Corps of Engineers Dam No. 6. (8)

Under Induced Socio-Economic Impacts (page III-56), the EIS should discuss whether existing public facilities and services are adequate to accommodate growth induced by the airport project. The EIS should also discuss any adverse effects of the induced growth. (9)

An alternate site in Cooper County was rejected because it was too far from Carrollton; the EIS should indicate the distance between Carrollton and this site. (10)

We suggest elimination of Table A-II, Tabulation of EPNL Values for Different Aircraft, since the table is lengthy and does not appear to provide critical information. A (11)

Comment No

table specifying for representative aircraft types the noise levels at the three FAR 36 measuring points - takeoff, approach, and sideline - may be appropriate.

On page C-4, it is indicated that EPA indirect source regulations will be in effect in July 1975; implementation of indirect source regulations has been deferred indefinitely. Unfortunately, clear guidance in this area cannot be given at this time. (12)

We appreciate the opportunity to review this model EIS, and would be happy to discuss any of these comments with you.

Martin

Martin Convisser

RESPONSES TO COMMENTS BY
THE U. S. DEPARTMENT OF TRANSPORTATION
OFFICE OF ENVIRONMENTAL AFFAIRS

Response to Comment No. 1:

Additional information on existing airfield capacity has been provided in the Final EIS. The forecasts compare favorably with FAA Terminal Area Forecasts.

Response to Comment No. 2:

The diversion of general aviation aircraft was investigated. No adequate general aviation airports presently exist in the area. Planning and construction of a new general aviation airport in the region would take 5-8 years to complete.

Landing fees are not normally charged for general aviation aircraft. This is the case at BIA. Long-term agreements with fixed based operators involve fuel flowage fees and tie-down fees.

Response to Comment No. 3:

Generally, the extent of an air quality analysis in an airport impact assessment depends on the scope (or type) of project and the environmental/community setting. The level of air quality impact analysis included in this statement is felt to be consistent with the type and size of the airport and its location near two metropolitan areas. The approach to this analysis (emission inventory and pollutant dispersion) would have been the same had agency consultation revealed that standards were presently being violated. The major difference in the approach would involve the evaluation of impact results. Where airports are located where violations exist, the impact statement should specifically address which pollutant standards are being exceeded, the major sources of that pollutant in the region, strategies planned to control those emissions, and the components of the proposed airport action which contribute those particular emissions. Consistency with State Implementation Plan strategies and further consultation/coordination with agencies should be documented where airport development would directly affect pollutant levels currently in violation of standards. A discussion of measures to minimize further harm to air quality would be appropriate.

Response to Comment No. 4:

The noise analysis for 1985 assumed that 90 percent of the aircraft complied with Part 36 and the retrofit schedule. Noise analysis for 1990 or 1995 would assume the retrofit program to be fully effective. A general rule-of-thumb for sensitivity assumes that the NEF value at a given point would increase approximately three (3) units with a doubling of the number of operations. Projections show that annual operations would increase from 378,000 in 1985 to 473,000 in 1990, an increase of only 25 percent.

Response to Comment No. 5:

The referenced section title has been retained since the section's content has been changed in the Final EIS as a result of agency comment. The section contains a Section 4(f) evaluation for the South Revere Playlot.

Response to Comment No. 6:

The degree of noise impact on the Paul Revere Junior High School recreation area is not considered to be severe and consequently is not considered to be a "taking" of the land. This determination is now reflected in the text of the Final EIS.

Response to Comment No. 7:

The referenced statement concerning the Airport and Airway Development Act has been clarified in the Final EIS.

Response to Comment No. 8:

See Response to EPA Comment No. 13.

Response to Comment No. 9:

Within the section of the EIS on Public Utilities and Services, reference is made to proposed regional/county improvements in water supply, sanitary sewerage, and solid waste. These improvements will provide services required by regional growth as well as the immediate needs of an expanded airport.

The Airport Authority has control over the lands which it owns. Beyond this limit, the ultimate control of land use and development lies with the planning and zoning departments of the local political subdivisions and their elected officials. Available controls on development include zoning approvals and hearings, site plan approval, and local permit requirements regarding access, parking, wetlands, and floodplains. Individual development will have localized impacts due to siting and operation. The existing control system will serve to identify these impacts prior to local approvals.

Response to Comment No. 10:

The alternate site was located approximately 18 miles from the City of Carrollton.

Response to Comment No. 11:

The referenced EPNL Tables have been deleted from Appendix A of the Final EIS. Information has been added to the EIS concerning the Integrated Noise Model.

Response to Comment No. 12:

The text of Appendix C has been revised in the Final EIS to reflect this comment.

Advisory Council
On Historic Preservation
1522 K Street N.W.
Washington, D.C. 20005

January 25, 1977

Mr. Elliott B. Perrett
Contract Technical Representative
Environmental Planning Branch, AAP-410
Airports Planning Division
Office of Airports Programs
Department of Transportation
Federal Aviation Administration
Washington, D.C. 20591

Dear Mr. Perrett:

Comment No

The Advisory Council on Historic Preservation has reviewed Model Environmental Impact Statement No. 1 for the expansion of the Bicentennial International Airport serving Carrollton and Federalsburg, Northeast, America, prepared by Greiner Environmental Sciences, Inc., for the Federal Aviation Administration dated January 11, 1977. We have paid particular attention to Section III, Probable Impact on the Environment, Historical and Archeological Sites beginning on p. III-82 and related correspondence in Appendix E.

We have several comments to make regarding treatment of historic and cultural resources in the Model EIS.

1. For purposes of the Model, we believe that the treatement of archeological resources should have been dealt with in a substantial manner rather than the cursory manner of stating that no known sites were located. The treatment of archeological resources is a subject of considerable interest which can be expected to develop still further. For specific guidance in dealing with archeological resources we would suggest that you contact Mr. Larry Aten, Chief, Interagency Archeological Services, Office of Archeology and Historic Preservation, National Park Service, Department of the Interior, Washington, D.C. 20240. In addition, we would also suggest that you examine the expedited method of compliance for Section 106 of the National Historic Preservation Act developed by the Council when salvage of archeological resources is an acceptable alternative. A copy of these procedures is attached for your convenience. Further, we suggest that the provisions of the Preservation of Historical and Archeological Data Act of 1974 (P.L. 93-291) should be explored in the Model EIS. (1)

The Council is an independent unit of the Executive Branch of the Federal Government charged by the Act of October 15, 1966 to advise the President and Congress in the field of Historic Preservation.

Comment No

2. The case chosen for the Model EIS, that of the Boone House, does not reflect compliance with the provisions of Section 106 of the National Historic Preservation Act, as amended. In cases which the Boone House is supposed to represent, compliance with the procedures of the Council must be demonstrated before the Environmental Impact Statement can be considered to be complete. In this particular instance, the Model EIS should indicate that a Memorandum of Agreement developed pursuant to the Council's procedures, "Procedures for the Protection of Historic and Cultural Resources" (36 C.F.R. Part 800) has been executed or is being developed which will satisfactorily mitigate the adverse impact of the project on the Boone House, or that a meeting of the full Council has been scheduled to consider the matter. (2)

Concurrence in the views of the Boone County Historical Society by the State Liaison Officer for Historic Sites as noted on p.III-84 does not satisfy compliance with Federal preservation requirements. These can only be satisfied by compliance with the Council's procedures noted above. (3)

3. While the Boone House example portrays a realistic case, it does not fully represent preservation concerns. The majority of Federal undertakings that affect properties included in or eligible for inclusion in the National Register of Historic Places do not deal with historic house museums, but rather with properties that are a more integral part of a community. For example, office buildings in downtown centers and entire residential districts are included in or eligible for inclusion in the National Register and are more commonly the subject of preservation interests and concerns. Historic house museums thus do not represent the full range of properties afforded protection under the provisions of Section 106. We believe that the section beginning on p.III-82 should be expanded to be more fully representative of historic and cultural resources afforded protection under Section 106. (4)

4. The provisions of Executive Order 11593 "Protection and Enhancement of the Cultural Environment" (May 13, 1971, 16 U.S.C. §470) should be dealt with in the section beginning on p.III-82. The Executive Order requires Federal agencies to survey and afford special protections to properties under their jurisdiction or control that may be eligible for inclusion in the National Register. (5)

5. The section should also be expanded to discuss treatment of properties that are eligible for inclusion in the National Register. Procedures for determinations of eligibility have been published in (6)

Comment No

draft form at 41 FR 17688, April 27, 1976 and should be incorporated into the discussion in this section. Additional information on determination of eligibility may be obtained from Dr. William Murtagh, Keeper of the National Register, Office of Archeology and Historic Preservation, National Park Service, Department of the Interior, Washington, D.C. 20240.

6. In addition to the above general points there are a number of clarifications that should be made in the Model EIS in the section dealing with historic and cultural resources. (7)

a. p.III-82, paragraph 1. The correct title is the Advisory Council on Historic Preservation, not the Federal Advisory Council on Historic Preservation.

b. p.III-82, paragraph 1. There is no such designation as State Liaison Officer for Historic Sites. The correct title is State Historic Preservation Officer (SHPO).

c. p.III-82, paragraph 2. Advisory Council on Historic Preservation procedures should be referenced as "Procedures for the Protection of Historic and Cultural Resources" 36 C.F.R. Part 800.

d. p.III-83, paragraph 2. The correct name of the National Register is the National Register of Historic Places, not Historic Sites.

If you have any questions or wish to discuss any aspect of our comments please contact Mr. John Fowler, Director, Office of Intergovernmental Programs and Planning at 254-7788. Thank you for affording the Council the opportunity to comment on the Model EIS.

Sincerely yours,

Robert Garvey

Robert R. Garvey, Jr.
Executive Director

Enclosures

Guidelines for Making "Adverse Effect" and "No Adverse Effect" Determinations for Archeological Resources in Accordance with 36 C.F.R. Part 800

Archeological properties included in or eligible for inclusion in the National Register of Historic Places are generally nominated under National Register Criterion "d" (36 C.F.R. Part 60.6) which states that a property may qualify if it has "yielded, or may be likely to yield, information important in prehistory or history." While disturbance of archeological properties should be avoided, under certain circumstances, properties primarily significant for the data they contain can be said to realize their significance when this data is retrieved in an appropriate manner.

In such cases where a Federal undertaking (36 C.F.R. Part 800.3(c)) can result in the recovery of data from an archeological property on or eligible for inclusion in the National Register of Historic Places, the Agency Official should take the following steps to decide whether a "no adverse effect" determination can be made:

> The Agency Official shall, in consultation with the State Historic Preservation Officer (SHPO), apply the criteria set forth in Part I below. If these criteria are not met, the Agency Official shall comply with the procedures set forth at 36 C.F.R. Part 800.4(e) et seq. If the criteria are met, the Agency Official may issue a determination of no adverse effect for any data recovery program conducted in accordance with the requirements set forth in Part II below. Documentation that the criteria and requirements set forth in Parts I and II below have been met, along with the comments of the SHPO, shall be forwarded to the Council for review in accordance with 36 C.F.R. Part 800.4(d).

Part I: Criteria

1. The property is not a National Historic Landmark, a National Historic Site in non-federal ownership, or a property of national historical significance so designated within the National Park System.

2. The SHPO has determined that in-place preservation of the property is not necessary to fulfill purposes set forth in the State Historic Preservation Plan.

3. The SHPO and the Agency Official agree that:

   a. The property (including properties that are subsidiary elements in a larger property defined in Criterion 1) has minimal value as an exhibit in place for public understanding and enjoyment;

b. Above and beyond its scientific value, the property is not known to have historic or cultural significance to a community, ethnic, or social group that would be impaired by the retrieval of data;

c. Currently available technology is such that the significant information contained in the property can be retrieved.

4. Funds and time have been committed to adequately retrieve the data.

Part II: Data Recovery Requirements

1. The data recovery will be conducted under the supervision of an archeologist who meets the "Proposed Department of the Interior Qualifications for the Supervisory Archeologist (Field Work Projects)." (See Attachment #1.)

2. The data recovery will be conducted in accordance with "Professional Standards for Data Recovery Programs." (See Attachment #2)

3. A specified date has been set for completion and submission of the final report to the Agency Official.

4. Plans have been made for disposition of the material recovered after they have been analyzed for the final report. (See Attachment #3.)

5. Regarding the status of the affected property, documentation of the condition and significance of the property after data recovery will be provided the Agency Official and SHPO for forwarding to the National Register of Historic Places for action to include nominations, boundary changes or removal of National Register or eligiblility status, in accordance with National Register procedures (36 C.F.R. Part 60.16 and 60.17).

Attachment #1 Proposed Department of the Interior Qualifications for the Supervisory Archeologist (Field Work Projects)

The minimum professional qualifications for the Supervisory Archeologist are a graduate degree in archeology, anthropology, or a closely related field, or equivalent training accepted for accreditation purposes by the Society of Professional Archeologists, plus: (1) at least sixteen months of professional experience or specialized training in archeology field, laboratory, or library research, including (a) at least four months of experience in general North American archeology, and (b) at least six months of field experience in a supervisory role; (2) a demonstrated ability to carry research to completion, usually evidenced by timely completion of thesis, research reports, or similar documents.

For work involving prehistoric archeology, the Supervisory Archeologist should have had at least one year of experience in research concerning archeological resources of the prehistoric period.

For work involving historic archeology, the Supervisory Archeologist should have had at least one year of experience in research concerning archeological resources of the historic period.

Attachment #2 Professional Standards for Data Recovery Programs

1. The data recovery program should be conducted in accordance with a professionally adequate recovery plan (research design):

   a. The plan shall be prepared or approved by the Supervisory Archeologist and shall reflect a familiarity with previous relevant research;

   b. The plan shall include a definite set of research objectives, taking into account previous relevant research, to be answered in analysis of the data to be recovered;

   c. The plan shall provide for recovery of a usable sample of data on all significant research topics that can reasonably be addressed using the property or a justification for collecting data on a smaller range of topics at the expense of others;

   d. The plan shall specify and justify the methods and techniques to be used for recovery of the data contained in the property. (Methods destructive of data or injurious to the natural features of the property should not be employed if non-destructive methods are feasible.)

2. The data recovery program should provide for adequate personnel, facilities, and equipment to fully implement the recovery plan.

3. The data recovery program should insure that full, accurate and intelligible records will be made and maintained of all field observations and operations, including but not limited to excavation and recording techniques, stratigraphic and/or associational relationships where appropriate, and significant environmental relationships.

4. Particularly when a data recovery program is conducted upon a potentially complex historic or prehistoric property (e.g., an historic town site; a prehistoric site that may contain many occupation layers, cemeteries, or architectural remains), situations may arise or data be encountered that were not anticipated in designing the program. Adequate provision should be made for modification of the data recovery plan to cope with unforeseen discoveries or other unexpected circumstances.

5. The data recovery program should include provisions for dissemination of the results of the program. Generally, the final report should be made available to the SHPO, the State archivist, the State archeologist, the Departmental Consulting Archeologist of the Department of the Interior, and the Chairman, Department of Anthropology, Smithsonian Institution.

Attachment #3 Treatment of Recovered Materials

The recommended professional treatment of recovered materials is curation and storage of the artifacts at an institution that can properly insure their preservation and that will make them available for reserach and public view. If such materials are not in Federal ownership, the consent of the owner must be obtained, in accordance with applicable law, concerning the disposition of the materials after completion of the report.

RESPONSES TO COMMENTS BY
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION

Response to Comment No. 1:

This model statement (No. 1) is one of four such statements for airport development actions. Each statement dealt with specific impacts in varying degrees. Model EIS No. 3 dealt with archaeological resources in more detail than any of the other statements. Use of Model EIS No. 3 along with the references cited in the ACHP's comment will provide assistance in assessing impacts on archaeological resources.

Response to Comment No. 2:

In consultation with the State Historic Preservation Officer, the Advisory Council's Criteria of Effect and Criteria of Adverse Effect were applied to the Boone House, an historic site listed in the National Register of Historic Places. Since potential aircraft noise at the site may have been considered adverse, comment was requested from the Advisory Council by the FAA. The consultation which followed included discussion of the noise exposure resulting from an expanded facility and alternative measures, including modified air traffic control procedures. Based on the results of modified noise analyses, the Advisory Council agreed to an operational alternative, which is referenced in a Memorandum of Agreement soon to be executed. Correspondence from the Advisory Council is contained in Appendix E, page E-12, of the Final EIS.

Response to Comment No. 3:

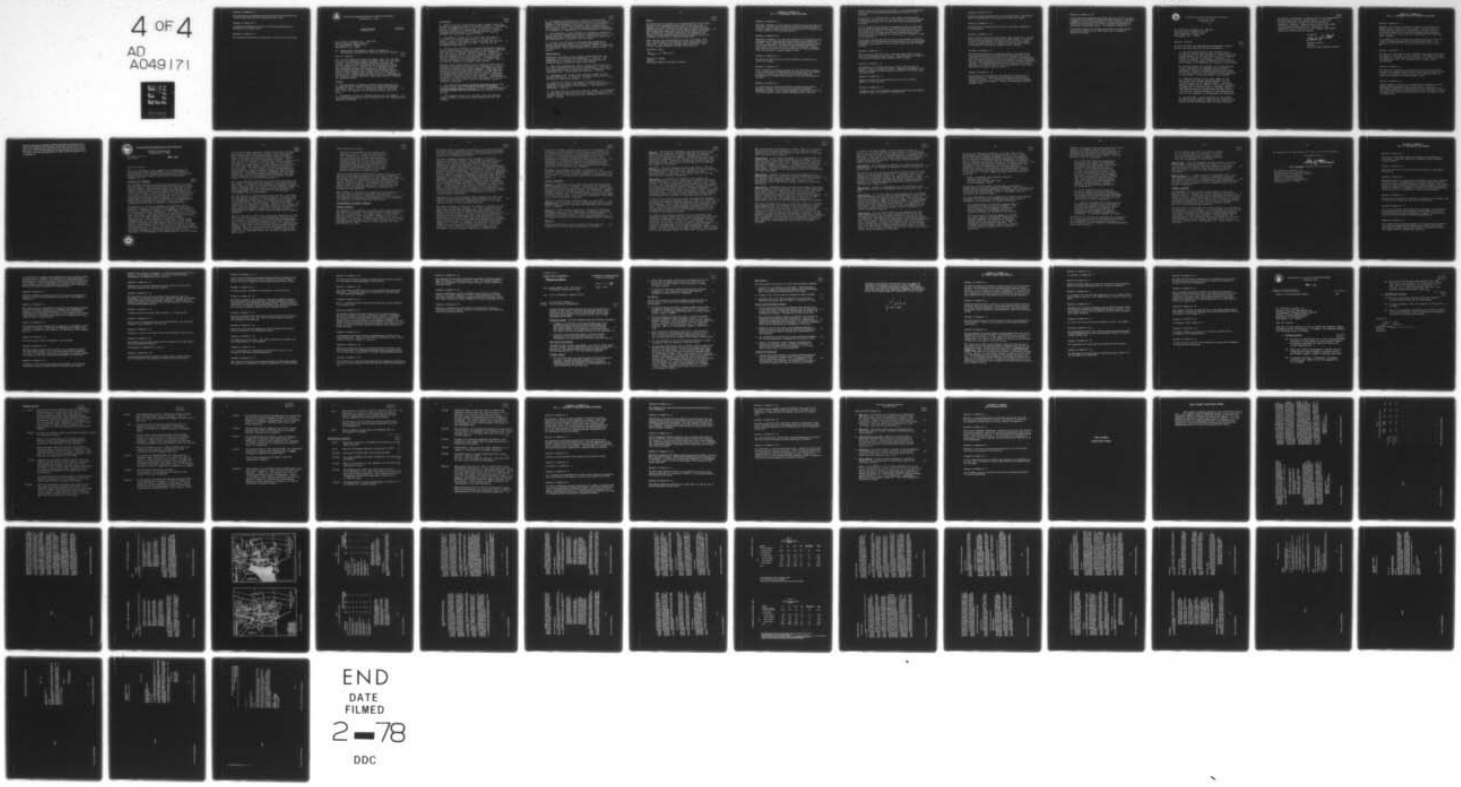
Compliance with the Council's procedures is documented in the Final EIS. See Response to Comment No. 2 above.

Response to Comment No. 4:

The point is well made within the comment itself. The specific situation created in Model EIS No. 1 is not applicable to the suggested expanded treatment.

AD-A049 171 GREINER ENVIRONMENTAL SCIENCES INC BALTIMORE MD F/G 5/5
ENVIRONMENTAL IMPACT STATEMENT FOR BICENTENNIAL INTERNATIONAL A--ETC(U)
NOV 77 DOT-FA75WA-3703
UNCLASSIFIED FAA-AAP-78-2-1 NL

4 OF 4
AD
A049171



END
DATE
FILMED
2-78
DDC

Response to Comment No. 5:

The consultation and assessment carried out within this EIS process has indicated compliance with the referenced Executive Order.

Response to Comment No. 6:

No properties eligible for inclusion in the National Register were identified in the project area.

Response to Comment No. 7:

The referenced clarification has been made to the text of the Final EIS.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB 28 1977

OFFICE OF THE
ADMINISTRATOR

Mr. Elliott B. Perrett, Jr., (AAP-410)
Federal Aviation Administration
800 Independence Avenue, S.W.
Washington, D.C. 20591

RE: Model Draft Environmental Impact Statement #1
Bicentennial International Airport, Northeast America

Comment
No

Dear Mr. Perrett:

The U.S. Environmental Protection Agency (EPA) has reviewed the draft environmental impact statement (EIS) for the above project. We find the document adequately presents the various impacts on the environment of the proposed project and its alternatives. However, we find generally lacking the background information necessary to validate these impact quantifications, and a sensitivity analysis showing how much these impacts might change given an incremental change in the forecast activity (due to error in forecasting). Our concerns in these areas plus some other specific comments are presented below.

General

1. The forecasting technique and data source used for the projections of air carrier activity and enplaned passengers provided in Table I (p. 1-4) should be given in the final EIS. Also, the capacity of the present airport should be given. (1)

2. Information on the air freight activity at the airport and possible alternatives (rail, pipeline) for its transportation should be addressed. (2)

Air Quality

Comment No

1. Table 15 on page III-60 should state whether or not the numbers are annual arithmetic or geometric means. Furthermore the text on page III-57 is in error in stating that only Station A exceeds the standard for particulates. Table 15 indicates both Stations A & B exceeded the air quality standard for particulate matter in 1974. (3)

2. Paragraph 4 on page III-61 states that the aviation operations contribute comparatively little pollution; however, Table 17 indicates a total of 13,296 lbs. per day or approximately 2000 tons per year. This can not be considered insignificant. (4)

3. It may be too optimistic to assume that Federal emission controls applicable to both aircraft and automotive emissions will achieve a 90 percent reduction by 1985. Hopefully, this will occur; however, for one reason or another in the past the deadline for a 90 percent reduction in emissions for new automobiles has been extended. It appears that further extensions of the deadline will be a major issue in the current sessions of Congress (page III-68). (5)

Because of the uncertainty of future emission reductions in aircraft and automotive engines it is reasonable to require additional estimates for airport emission inventories and ensuing air quality dispersion estimates. These additional estimates should consider the projected 1980 and 1985 air and automotive traffic volumes with no further improvement in emission characteristics of the enginees. A subsequent discussion of these estimates would then deal with alternative reduction strategies which could be implemented should an indicated need exist.

4. The heading Non-Airport Related: Vehicular Traffic used on pages III-65, 69, 70 should be changed to Off-Site Airport Related Vehicular Traffic to more adequately describe the relationship which exists between this traffic and the airport. (6)

5. The appendix should list the type, size and expected number of each air pollution source associated with the airport. (7)

Comment No

6. The appendix dealing with air quality should provide sample calculations showing the method used to calculate an example of the emissions from one of each of the principal sources of air pollution, (aircraft, auto, heating plant, fuel transfer, etc.). This would simplify problems arising in attempting to independently verify calculation of emissions. (8)

7. The discussion in the Appendix of atmospheric dispersion models should be expanded to include a description of all assumptions used in the model and the actual input data that was used should be provided if not too bulky. (9)

8. On page C-2, the next to last paragraph incorrectly states that primary ambient air quality standards are to protect against plant and material damage, odors, or reduction in visibility. The primary standard is to protect human health. (10)

Water Quality

Generally, the water quality impacts associated with the expansion of the airport are addressed in the EIS. The presentation is concise and the mitigative measures are directed toward prevention rather than removal.

1. The State standards for Class I waters, which apply for this EIS, include the fecal coliform parameter. This was not monitored during the sampling period, although the other parameters were. This should be corrected. (III-24) (11)

2. Included in the wastes to be contained should be fire fighting chemicals. A clarifier to remove these should be a part of the storm drain design. (III-26) (12)

3. A dam to be built by the Corps of Engineers will be affected by the airport improvements, but the EIS does not elaborate on the nature of the effects. This should be explained. (III-33) (13)

4. In evaluating the impact on sanitary sewage, the assumption is made that 90 percent of the water used is returned to the sanitary system. The basis for this assumption should be given. (III-88) (14)

Comment No

Noise

The draft EIS is thorough in its presentation of the noise impacts of the proposed project and its alternatives. However, the final EIS should indicate the source of the operational data (for both current and forecast conditions), the forecasting techniques used and their margin of error, and a sensitivity analysis indicating the magnitude of change in noise exposure which could be expected given an increase or decrease in projected operations. (15)

Thank you for the opportunity to review this Model draft EIS. Please send us five copies of the final when it is available. You may call Ms. Meri Bond (245-3006) of my office if these comments require clarification.

Sincerely yours,

Rebecca W. Hanmer

Rebecca W. Hanmer
Director
Office of Federal Activities (A-104)

RESPONSES TO COMMENTS BY
THE U. S. ENVIRONMENTAL PROTECTION AGENCY

Response to Comment No. 1:

Additional information on the airfield's capacity has been provided in the Final EIS. Forecasts were developed using multiple regression analysis techniques based on historical activity and projections of population and economic activity by local planning agencies.

Response to Comment No. 2:

Substantial increases in air cargo are forecasted for the planning period. Information on air cargo and mail projections have been added to the Final EIS. These projections were based on past trends, national trends, and ATA cargo forecasts. The materials and equipment shipped by air cargo through BIA are not suited for transport in pipeline. These air cargo items are generally of a high priority nature, requiring shipment over long distances in a minimum amount of time

Response to Comment No. 3:

The referenced table and text have been modified in the Final EIS to reflect this comment.

Response to Comment No. 4:

Table 13 presented an emission inventory for the county which indicated a total annual loading of approximately 164 thousand tons. The results in Table 17 indicate that aircraft at BIA presently contribute approximately two thousands tons per year, or less than two percent of the total.

Response to Comment No. 5:

It is felt that the latest state-of-the-art techniques and existing applicable standards for autos should be utilized in assessing environmental impact. Since the new supplement to AP-42 does reflect the latest auto emission control schedule and does provide a means for

obtaining emission factors for future years, it is considered appropriate at this time to utilize estimated auto emission factors for future conditions.

In this case, it is estimated that if 1975 emission rates were used throughout the analysis, the auto emissions shown for 1980 would increase by 35 percent and those given for 1985 would increase by approximately 80 percent.

If it is assumed that no aircraft have emission controls in 1980, daily aircraft emissions would increase by approximately 30 percent over the total shown in the Draft EIS. By 1985, it is assumed that a portion of the aircraft fleet will have engine emission controls and that this action would begin to compensate (in calculations) for increases in total aircraft operations.

If pollutant concentrations for future years were assumed to increase by approximately the same percentage as daily emissions, the resultant levels at sensitive areas adjacent to the site would remain less than allowable standards.

Response to Comment No. 6:

The "non-airport vehicular traffic" represents other traffic on major roads in the immediate airport vicinity. These emissions are included in the inventory to identify major adjacent off-site sources.

Response to Comment No. 7:

The appendix on air quality discusses in detail each major type of pollution source at a commercial airport. Additional information on the numbers of aircraft and autos used has been added to the emission tables in the Final EIS.

Response to Comment No. 8:

Sample calculations for determining emissions have been added to Appendix C of the Final EIS.

Response to Comment No. 9:

Assumptions used in the atmospheric dispersion models have been added to Appendix C, pages C-24 and C-25, of the Final EIS.

Response to Comment No. 10:

Primary air quality standards are to protect human health. The appendix text has been modified in the Final EIS to reflect this comment.

Response to Comment No. 11:

The tabulation of bacteriological values has been added to Appendix B of the Final EIS.

Response to Comment No. 12:

Wastes resulting from fire fighting and/or runway foaming has a very high organic content as measured by biochemical oxygen demand. In the event of a spill or foam flushing, the control gate at the closest storge/ holding pond downstream will be operated to permit the spill residual to be retained at the pond for treatment prior to disposal.

Response to Comment No. 13:

The Draft EIS referenced the Floodplain Evaluation Study and Tonytank Creek Watershed Work Plan, and described the potential effect of the proposed project without the controls of the 19 acres of storage/holding pond. The storage and depth of the on-site ponding have been coordinated with the Corps of Engineers and the Niomi River Soil and Water Conservation Authority. The proposed ponds provide excess storage over the actual requirement for retention and will delay the flood peak of storm runoff. There will be no adverse effect on Dam No. 6.

Response to Comment No. 14:

The assumption that 90 percent of the water used is returned to the sanitary system is a widely-used rule-of-thumb estimate employed in engineering practice. It is discussed in Chapter VI of the reference, "Airports and Their Environment - A Guide to Environmental Planning", September, 1972.

Response to Comment No. 15:

A daily operational breakdown of aircraft activity at the site is given in Appendix A of the EIS for existing and future conditions. This daily breakdown is derived from planning data on annual forecasts and from consultation with planning, air traffic, and operations personnel at Bicentennial International Airport. See Response to Comment No. 1.

A sensitivity analysis for the NEF criteria shows that noise exposure would increase three (3) units (NEF values) when the number of operations is doubled.

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20201

377

Mr. Elliott B. Perrett, Jr., AAP-410
Federal Aviation Administration
800 Independence Avenue, SW.
Washington, D.C. 20591

Dear Mr. Perrett:

Comment No

We have reviewed the hypothetical Bicentennial Airport Project EIS and offer the following comments:

1. The EIS presentation of two different noise evaluation systems (dBA and NEF) is confusing for the average person, or for that matter, even a technical person not skilled in acoustics. Therefore, the average individual cannot determine from the EIS the noise impact to be expected as a result of the project. (1)

We therefore doubt the validity of the hypothetical letter included in the appendix from the State Department of Health and Mental Hygiene which makes no specific mention of the effects of noise generated by the airport on the well-being of the patient. (2)

2. Relating further to the noise impact of the Mill Creek State Mental Health Hospital, we see inconsistencies in the reported facts. Projected Exterior Noise Levels, table 5, Page III-9 indicate the NEF level to be less than 30, whereas exhibit 11 1985 NEF and Sensitive areas shows the NEF contour to be about 40 which according to the standards set forth in the appendix is unacceptable for hospitals. (3)

3. We find that in the evaluation of the Induced Secondary Social Impacts, Page III-54, education and health related facilities have not been evaluated.

Comment No

Estimates of population increases due to the expansion of the airport and its related effects on existing schools and health related facilities should be addressed in detail. Medical facilities and the types of services provided should be identified. The capacities and utilization for both schools and health facilities should also be stated. (4)

Sincerely,

Charles Custard

Charles Custard
Director
Office of Environmental Affairs

RESPONSES TO COMMENTS BY
THE U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Response to Comment No. 1:

Appendix A of the Draft and Final EIS's contains a publication by the DOT/FAA entitled, "Impact of Noise on People". This is included to provide additional assistance in understanding the effects of noise. It contains information on aircraft noise indices, human response to noise, criteria for land use controls, hearing damage, and occupational health standards.

In an additional effort to present more useful noise data, the Final EIS contains information generated by the Integrated Noise Model. The discussion of the peak level criteria has been deleted from the Final EIS.

Response to Comment No. 2:

The text of the EIS points out that the hospital and airport have existed in proximity to each other for quite some time. The document also states that impact on the hospital was a consideration in evaluating alternatives for development at BIA. The referenced letter is based on these considerations.

Response to Comment No. 3:

The suggested inconsistency was clarified in the Final EIS with proper notation on all graphic exhibits to more clearly show the location of the hospital on the property. The NEF values in the referenced table are correct with respect to the exact location as shown.

Response to Comment No. 4:

Airport expansion at this site is proposed more in response to a growth pattern already established than to create growth. As such the development of adequate air transportation is one of many areas of the social infrastructure which are actively pursued by a community. Planning and public policy must be utilized to channel growth into desirable areas at a desired rate.

Detailed estimates of effects on schools and health facilities by BIA expansion are difficult to quantify. Many other forces/factors are at work in the community which also affect the need and location of these facilities. One such facility which is being planned was referenced in the letter from the State Department of Health and Mental Hygiene found in Appendix E.

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

In reply refer to:
(ER-77/48)

MAR 11 1977

Dear Mr. Perrett:

This is in response to your request for the Department of the Interior's review and comments on the draft environmental/Section 4(f) statement for Bicentennial International Airport, Northeast, America (Model Draft Environmental Statement No. 1).

SECTION 4(f) COMMENTS

Comment No

The statement includes a Section 4(f) analysis which locates and describes the affected parklands and evaluates the project impacts thereon. This analysis, along with information contained in other portions of the draft, provides most of the elements necessary to support a Section 4(f) determination; (1)
i.e., that (1) there are no feasible and prudent alternatives to the use of Section 4(f) lands and that (2) all measures to minimize harm have been taken. However, the draft has not consolidated or arrayed this information in an organizational format which considers the pertinent points set forth in proposed FAA Order 1050.1B (Section 4, paragraph 329).

Alternatives to the use of parkland are discussed briefly (page 80); however, quantification of impacts of these alternatives is necessary to support a determination that there is no feasible and prudent alternative. For example, it is stated that Alternative 1 would increase noise exposure at Pierce State Park, Mill Creek State Mental Hospital, and residential areas west of S.R. #1, while Alternative 2 would increase (2)
"significantly" noise exposure in Pierce Park. While these statements may be true, they do not give the reviewer enough detail to determine the magnitude of the noise impact on the various areas involved nor do they provide an idea of the trade-offs which must occur (i.e., acres of land at each area subject to increased noise, or numbers of people and activities affected). The final statement should include more specifics in the discussion of the impacts of the alternatives to the 4(f) taking.

Comment No

You should be aware that the 1.5-acre South Revere playlot was developed with financial assistance from the Land and Water Conservation Fund administered by this Department. Lands so assisted are subject in their entirety to Section 6(f) of the Land and Water Conservation Fund Act. Such lands may not be converted to other than outdoor recreation use without the approval of the Secretary of the Interior and only upon substitution of other lands and facilities of at least equal fair market value and equivalent location and usefulness. For this reason, it will be necessary for Boone County to submit a request through the State Liaison Officer (Mr. John Parks, Director, Northeast Game and Parks Commission, 2001 West Recreation Road, Northeast, America) for the approval of the Secretary of the Interior for the change in land use of South Revere playlot. (3)

Due to the unresolved problem of Section 6(f) conversion, we are unable to concur that all measures to minimize harm have been taken. In addition to fulfilling the statutory requirements of Section 6(f), we believe that the statement should contain documentation from the Boone County Recreation and Parks Department that will indicate that the proposed replacement land is satisfactory. (4)

The Paul Revere Jr. High recreation area has been identified as 4(f) land by virtue of a "noise taking." We believe that the information contained in the document does not support a 4(f) determination that there is no feasible and prudent alternative to the proposed taking. Before we are able to concur that all measures to minimize harm have been taken, the draft should be revised to include a letter of concurrence in the proposed mitigating measures from the agency which administers the lands, in this case, the Boone County Board of Education. (5)

North of the South Revere Park residential subdivision on the east side of SR-102 lies an open undeveloped 100-acre tract of land which was dedicated by the Boone County government in April 1961 as a regional recreational park site. This 100-acre site was given to Boone County by the U.S. Department of Defense under Public Law 91-485, the Federal Surplus Property Program. Since the site lies within the boundaries of the necessary 700-acre acquisition for the airport, the requirements for the mentioned Public Law, as well as Section 4(f), must be met.

Comment No

Public Law 91-485 states:

> The deed of conveyance of any surplus real property disposed of under the provisions of this subsection --- shall provide that all such property shall be used and maintained for the purpose for which it was conveyed in perpetuity, and that in the event that such property ceases to be used or maintained for such purpose during such period, all or any portion of such property shall in its then existing condition, at option of the United States, revert to the United States...

Since the Bicentennial International Airport Authority finds the use of this land necessary for the airport expansion, the Federal Aviation Administration must request the approval of the Secretary of the Interior and the Administrator of General Services to revert the property for redisposal by GSA for airport purposes. The Secretary may approve such reversion only if other properties of at least equal fair market value and equivalent recreation usefulness are provided by the authority. (6)

When evidence of satisfactory commitments for completion of 6(f) and surplus property conversion requirements is presented and letters of concurrence from the local recreation agencies are obtained, this Department would concur that all measures to minimize harm have been taken. (7)

ENVIRONMENTAL STATEMENT COMMENTS

General Comments

As mentioned in our reviews of previous model draft statements, the need for and extent of a Section 16(c)(4) determination has yet to be resolved. This model draft, like the others, does not contain a Section 16(c)(4) finding or even any mention of the process. Therefore, we wish to call attention, once again, to our views on this subject (please refer to our previous letters dated October 6, 1975, February 20, 1976, and February 23, 1976. (8)

Comment No

We believe that the concerns expressed in our previous reviews are still valid, especially since a Section 16(c)(4) determination is not reflected in the draft environmental/Section 4(f) statement for Bicentennial Airport.

The draft statement exhibits fair treatment of cultural resource protection concerns. The project proposes no direct taking of an historic site, and noise impacts on cultural resources are satisfactorily dealt with. However, since these noise impacts will affect a site on the National Register of Historic Places page III-82 states that the Advisory Council on Historic Preservation has been consulted as well as the State Historic Preservation Officer. Usually this evokes a commentary from the Council. Such a commentary should have been exhibited in this draft environmental statement along with more specific reference to or inclusion of the "more detailed study" which was apparently completed prior to finishing the draft statement. The final environmental statement should include the comments of the Advisory Council on Historic Preservation. However, we find no indication that that body is reviewing the draft statement. In the absence of the Advisory Council's and State Historic Preservation Officer's comments, the comments,of the local Historical Societies as displayed and discussed in support of the project raise questions of imbalance in cultural resource impact evaluation. (9)

Incidently, the correct Federal title reference for the State official responsible under the Historic Preservation Act of 1966 is the State Historic Preservation Officer -- the name liaison as used in this statement is passe. (10)

The draft statement is deficient in failing to account for the possibility of geologic hazards. The final statement should make clear whether natural foundations are adequate for the safety of the proposed structures and whether hazards such as seismic risk are present. The fact that such an evaluation is pertinent has been recognized only in the description of an alternative site, which states that "sub-surface soil exploration indicated large areas of deep muck indicating poor bearing capacity over an area of one-half to two-thirds of the site" (page V-3). However, no evidence was found that sub-surface conditions were evaluated at the proposed site. The final statement should include a description and engineering evaluation of local geologic conditions, including soils. (11)

Comment No

The draft statement contains practically no information on topography or physiography of the proposed site, except for a brief mention of hills to the east (page I-6) and a statement that "the meterology and topography of the area are conducive to pollutant dispersion" (page III-68). The physiographic province in which the site occurs should be identified. A topographic map and/or a description of the topography along with an estimate of earthwork, potential site-construction problems, and likely environmental impacts should also be included in the statement. (12)

Throughout the document the reader is referred to "the Appendix" without being told which appendix (A, B, C, D, or E). It would be desirable to number the pages of each appendix and to refer to the appendices specifically by letter and page number. (13)

SPECIFIC COMMENTS

Page I-1. Beginning on this page a more detailed description of the proposed action is needed. Presently, the reader must piece together many of the details of the proposal which are gradually filled in throughout Section III (Impacts). Factual information should also be summarized here on the size of the proposed terminal, the size of the parking facility, and length of the new access roads. Also, specific ownership of all lands to be acquired should be indicated. (14)

Exhibit 1, Location Map, following page I-1, could be a regional map or at least contain a regional map insert, rather than the same localized base map used throughout this environmental statement. (15)

Page I-2. Several phrases used (e.g., "rejected alternative configurations," and "was immediately eliminated") give the unwarranted impression that the choice of the preferred alternative was predetermined. Since all alternatives are discussed in Section V, this kind of language should be avoided. (16)

Page I-4.

Several abbreviations and the classes on this page are unfamiliar to the lay reader and should be defined. (17)

Comment No

Page I-6. Maps showing topography, geology and soils on the proposed site should be included, along with discussions of these factors sufficient to permit analysis of potential construction problems and impacts. Information on soils is particularly important in the vicinity of the sanitary sewer collection system. Excessive infiltration problems have been experienced in the past and the system may have to expanded (see pages III-85 and 86). (18)

Page II-1. The last sentence on this page states, "Initial findings by Skyways indicated that extension of the boundaries were imperative." This conclusion should not remain unsubstantiated in the text -- the reader wants to know why extension was considered imperative. (19)

Page III-1. In Section III (Impacts), the authors have included measures to minimize harm right alongside the identification of impacts (e.g., pages III-16, III-24, III-26, and III-53). All these measures to minimize harm are then repeated in Section IV, leaving the reader with the overall impression that "everything is taken care of." Potential impacts (beneficial and adverse) should stand alone, clearly identified, in Section III. It would also be desirable to have a section, following Section IV, which clearly identifies adverse impacts remaining after all measures to minimize harm are applied. (20)

As has been the case with most draft environmental statements reviewed, the authors apparently are not aware that existing and potential National Natural Landmarks need to be taken into consideration. Such is the case with this environmental statement. An additional heading, Natural Landmarks, should be incorporated into the final statement under Section III with an appropriate evaluation of this resource category in the vicinity of the proposed airport. (21)

In addition, the authors seem not to have recognized that cumulative impacts resulting from other projects and activities occurring in the region, now and in the foreseeable future, should be considered. On page VII-1, for example, it is not sufficient to say that the loss of habitat and agricultural fields is insignificant until potential impacts of other projects and activities in the region which might impact the region's natural resources have been considered. Also, on page III-26, the document should not imply that as long as sanitary (22)

Comment No

and solid wastes are disposed of offsite, there is no concern. There should be enough description of the offsite disposal locations to indicate the impacts of disposal and to show why these locations are suitable.

Page III-18. In the first paragraph, it is inappropriate to exclude Cyrus Pierce State Park from the study area. Air or water pollution could affect Park vegetation, which could in turn affect animals in the Park. Increased noise levels and reduction of habitat adjacent to the Park could also affect Park fauna. The final statement should evaluate potential environmental impacts on and possible Section 4(f) involvements with this State Park. (23)

Page III-19. Exhibit 14 should include the water-quality monitoring station on Pierce Lake located immediately north of the Gordon's Run confluence (page III-23). It is noted that map exhibits only identify Mill Creek. Gordon's Run, a significant stream draining the project area, also should be identified. (24)

Page III-21. Whitetail deer, and many other mammals and birds as well, possess strong instincts to return to their home range after being moved and released as much as 50 miles away from their home territory. The statement as written presents wishful thinking in assuming that deer moved from the airport site to Pierce State Park (a distance of from one to eight miles) will stay put. We suggest that a release site approximately 100 miles from the proposed airport be utilized. (25)

The draft statement says that a "very small number of resident small mammals" will be "displaced" most of which are "hardy individuals" which "will be able to relocate successfully." This is an inaccurate description of what will occur when construction takes place. In the absence of evidence to the contrary, it must be assumed that adjacent lands have already reached carrying capacity and cannot absorb additional residents. Thus, relocation is not likely to be successfull and the area will experience a net reduction in its wildlife populations. This should be acknowledged and quantified in the final statement. (26)

Comment No

In view of the lake southwest of the runway and plans to construct a settling pond for airport runoff, it is surprising that no mention was made of the potential for collisions with waterfowl. Also, since the Appendix describes blackbirds and starlings as abundant in the area, these species may present a hazard to aircraft operations. The final statement should address these concerns. (27)

Page III-28. The Drainage Map (Exhibit 15) should include an explanation for the stippled areas along streams draining the project area. (28)

The Section on Water Resources-Hydrology should include a brief summary on ground-water conditions -- including depth and configuration of the water table -- in the project area. Such information is needed to assess any adverse effects on water quality of Pierce Park Lake that may result from ground-water migration of hazardous substances from the proposed onsite holding ponds (page III-26). (29)

Page III-29. Sources of information for the hydrologic study should also include U.S. Geological Survey Flood Prone Area maps. (30)

Page III-68. It is noted that the development will not degrade long-term ambient air conditions because emission controls will reduce pollutional loading by 1980 and 1985. This seems an over simplification. Many areas will continue to have problems because an increased number of vehicles tends to compensate for reduced emissions from individual vehicles. In any case, the corollary to this statement is that if the development did not take place, then ambient air quality would be improved as a result of emission controls. (31)

Page III-82. We note from letters in the Appendix that the State Archeologist and the County Historical Society do not recommend that cultural resource surveys of the project site be conducted. We suggest that you obtain a more recent opinion from these sources. Recent information in our files indicates that a seventeenth century Dutch farmstead and a prehistoric Indian village may be within the project area, and we strongly urge that the Federal Aviation Administration conduct a field survey to verify their existence and evaluate their significance before further planning is undertaken. (32)

Comment No

We would also draw your attention to Section 3(a) of the Archeological and Historic Preservation Act of 1974 (Public Law 93-291) which requires an agency to notify the Secretary of the Interior and provide him with appropriate information when it finds or is notified that its activities in connection with any Federal construction project or Federally assisted, licensed or permitted project, activity, or program may cause irreparable loss or destruction of cultural resources. Section 5(c) directs the Secretary to coordinate all Federal survey and recovery activities and report annually to Congress on the results. In this regard the following office must be contacted: (33)

Chief, Interagency Archeological Services
National Park Service
703 Peachtree Street, ROOM 1010
Atlanta, Georgia 30308

During any operations which disturb land, professional archeological observation should be provided. Work contracts should contain clauses permitting work stoppage or re-scheduling to salvage cultural resource values in the event such are located in the course of work. (34)

For your information in the preparation of future environmental statements we include the following steps which should be followed in any discussion of cultural resources:

The identification of cultural resources may be considered in three levels of treatment. The first level is for the agency to check the National Register of Historic Places for properties within the vicinity of the project.

The second level is for the agency to contact the State Historic Preservation Officer at the earliest stages of the project to determine whether there are any sites in the process of nomination to the National Register. The statement should include a copy of his comments in this regard in relation to all cultural resources.

Thirdly, the agency should make appropriate field studies to determine whether there are any unknown sites that have not been recognized and evaluated for eligibility for listing in the National Register of Historic Places. This can be done in one of three ways:

1. If the State Historic Preservation Officer or your agency can ascertain and comment that there have been recent historical and archeological field studies to determine the presence of cultural values within the area, then it need only append the results of the studies to the environmental statement. The agency should keep in mind, however, that the independent study should be of such scope and professional accuracy that it provides the data required for adequate consideration of cultural resources in the planning process for all alternatives.

2. If an adequate onsite survey for presently unrecorded cultural resources is not performed during the planning stage, the Federal Agency should provide sufficient information to support the conclusion that such a survey was not necessary.

3. Cultural resources thus located must be evaluated for eligibility for inclusion in the National Register of Historic Places. Criteria have been established by the Secretary of the Interior for use in evaluating and determining eligibility (Reference: 36 CFR 800, January 25, 1974.)

The effects of the various alternatives considered in the proposed project on the values found should be incorporated in the appropriate section of the statement discussing impacts, mitigating measures and adverse effects.

Comment No

If the project may affect a property eligible for, in the process of nomination, or listed on the National Register of Historic Places, then the statement should evidence compliance with the requirements of 36 CFR 800.

Page III-88. Since the estimated average effluent discharge of the onsite sewage-treatment plant would be as much as 318,100 gallons per day by 1985, the effects on streamflow characteristics of Tonytank Creek below Pierce Park Lake that may result from the increased discharge should be considered. (35)

Pages V-18, 19. It seems necessary to determine exactly how much increased air traffic would be accommodated under the "no project" alternative in comparison to the development alternative before one can calculate that gross daily pollution and daily energy consumption would be greatest under the "no project" alternative. (36)

SUMMARY COMMENTS

The Department of the Interior cannot concur at this time with Section 4(f) approval of the Bicentennial International Airport project. As mentioned above, additional specific information is needed in the discussion of alternatives, and evidence of satisfactory completion of Section 6(f) and surplus property conversion requirements, along with letters of concurrence from the local recreation agencies, must be presented before Section 4(f) procedures are completed. (37)

We stand ready to reconsider this position when such information is presented to us for review. In the meantime, we would be glad to provide technical assistance for any supplemental material that might be prepared by the Federal Aviation Administration for inclusion in the final statement. Responsibility for coordination of this assistance has been assigned to the Office of Environmental Project Review, Department of the Interior, 18th and C Streets, N.W., Washington, D.C. 20240 (Phone: FTS-343-7564).

We appreciate the opportunity to review this draft statement.

Sincerely yours,

Stanley D. Doremus

Deputy Assistant Secretary of the Interior

Mr. Elliott B. Perrett, Jr.
Contract Technical Representative
Environmental Planning Branch AAP-410
Airports Planning Division
Office of Airports Programs
Federal Aviation Administration
Washington, D. C. 20591

RESPONSES TO COMMENTS BY
THE U. S. DEPARTMENT OF THE INTERIOR

Response to Comment No. 1:

The Section 4(f) Statement within this document has been modified and restructured. Additional information is provided in these responses to agency comments.

Response to Comment No. 2:

Additional discussion of specific alternative impacts has been added to the Final EIS.

Response to Comment No. 3:

Replacement land for the Playlot will be provided in kind and is addressed in this Final EIS. The replacement site is larger, functional, and is within the existing community, adjacent to other facilities. The referenced request for approval of conversion of this land was submitted through the appropriate channels in accordance with Section 6(f) of the Land and Water Conservation Fund Act (see Appendix E, page E-13--Correspondence).

Response to Comment No. 4:

Documentation from the County regarding the suitability of replacement land has been added to Appendix E, page E-14, of the Final EIS.

Response to Comment No. 5:

As a result of internal review and agency coordination, the determination has been made that the noise exposure at the Paul Revere Junior High School recreation area does not constitute a "taking." The text of the Final EIS has been revised to reflect that determination.

Response to Comment No. 6:

This comment clearly identifies another area of coordination/consultation to be undertaken during the environmental process when certain lands administered by federal agencies are involved. The process outlined in this comment should be followed where applicable.

It is difficult to introduce this consideration into the situation created for Model EIS No. 1, however. The location of the undeveloped land is inconsistent with planning and zoning information which was developed (see Zoning Exhibit). Also, the development of a regional park on that site was not identified during consultation with the Boone County Department of Recreation and Parks (see Appendix E--Correspondence).

Response to Comment No. 7:

Additional information regarding Section 6(f) of the Land and Water Conservation Fund Act has been provided in the Final EIS. See Response to Comment No. 3.

Response to Comment No. 8:

When Section 16(c)(4) consultation is required and FAA guidelines indicate that Section 102(2)(c) coordination is involved, only one document is prepared. The coordination with respect to 102(2)(c) satisfies the requirements for consultation under 16(c)(4). The finding is not included in the Draft EIS. Conclusions are reached after consultation and are included as part of a final decision.

Response to Comment No. 9:

The Final EIS includes comments from and responses to the Advisory Council on Historic Preservation. Additional information has been added to the Final EIS in response to their comments. See Responses to ACHP's Comments Nos. 1-7.

Response to Comment No. 10:

The correct title has been incorporated in the Final EIS.

Response to Comment No. 11:

The Master Planning Study for BIA included a full geotechnical exploration and analysis program. Sixty (60) borings were taken to depths of 10-20 feet. The project is not within an area subject to seismic hazards. A description of the area's geology has been added to the Final EIS.

Response to Comment No. 12:

Information on the area's physiography has been added to the Final EIS. Preliminary earthwork estimates indicate that 680,000 cubic yards of

material will be placed in embankment. No off-site borrow material will be required. The drainage map (Exhibit 13) shows the drainage divides, drainageways, and predominant slope of the site.

Response to Comment No. 13:

References to the specific Appendices have been added to the Final EIS. Individual Appendices have been page numbered.

Response to Comment No. 14:

The description of the project identifies those component items to be constructed. Construction, siting, and/or operational impacts are presented in the discussions of the various impact categories. Detailed design information on the various facilities has not been generated at this point in the planning/development process.

Response to Comment No. 15:

A regional map insert has been added to Exhibit 1 in the Final EIS.

Response to Comment No. 16:

The choice of the proposed project was not predetermined. The referenced language has been modified in the Final EIS.

Response to Comment No. 17:

Explanation of some of the aviation terms has been added to the Final EIS.

Response to Comment No. 18:

The expanded sanitary sewer system would be constructed with rubber gasket joints to preclude infiltration.

See Responses to Comments Nos. 11 and 12.

Response to Comment No. 19:

The referenced conclusion was based on airport master planning criteria and on an analysis of area growth and aircraft activity projections.

Response to Comment No. 20:

Actions taken to minimize environmental effects should be included in the impact evaluation and presented in the discussion of potential impacts. Section IV has been modified to address those remaining adverse effects.

Response to Comment No. 21:

No National Natural Landmarks were identified in the project area.

Response to Comment No. 22:

The agency is aware of the importance of considering cumulative impacts, where the impacts are clearly definable. The EIS identified the project's relationship to Corps of Engineers and FHWA projects. The EIS presents an evaluation of the impacts of a proposed federal action and does not extend into the area of potential impacts of other unrelated activities.

Response to Comment No. 23:

The biotic inventory of the State Park was excluded from field survey and impact quantification only. Air, water, and noise impacts on the park were evaluated in the Draft EIS.

Response to Comment No. 24:

Gordon's Run, the 100-year floodplains, and the proposed holding ponds have been identified in the appropriate exhibit.

Response to Comment No. 25:

The suggestion has been noted. The Airport Authority will cooperate with State Game personnel in this operation.

Response to Comment No. 26:

It is acknowledged that displacement of wildlife will result in a net reduction in the area's wildlife populations.

Response to Comment No. 27:

This concern was discussed with airport personnel and State Game personnel. The ponds will be maintained to eliminate accumulation of suitable habitat.

Response to Comment No. 28:

The Units of the 100-year floodplain for Mill Creek and Gordon's Run have been identified on the Drainage Map in the Final EIS.

Response to Comment No. 29:

The water within the ponds will be at a level slightly below the groundwater level. The holding ponds will be maintained on a periodic basis to remove undesirable materials.

Response to Comment No. 30:

The U. S. Geological Survey Flood Prone Area maps have not been completed for the project area.

Response to Comment No. 31:

This comment identifies two basic factors in an air quality analysis--operations (or number of vehicles) and emission controls (or standards). The use and application of these factors must be made on a project-by-project basis. It is agreed that with a no-project alternative, the emission controls would contribute to lower emissions. However, it must be noted that with many projects, including the present case, taking no action results in aircraft and vehicle delay and congestion which contribute to higher emissions.

Response to Comment No. 32:

A preliminary archaeological survey was performed by the Office of the State Archaeologist. Results of the survey are summarized in their correspondence contained in Appendix E, page E-16.

Response to Comment No. 33:

Based on the preliminary survey and consultation with the Office of the State Archaeologist, the determination was made that the proposed project will not cause loss or destruction of the area's archaeological resources.

Response to Comment No. 34:

Work contracts will contain clauses permitting work stoppage or rescheduling to salvage cultural resources in the event they are located during construction.

Response to Comment No. 35:

Upon completion of the City of Carrollton's wastewater collection system in 1980, all disposal to Tonytank Creek will cease. The existing treatment plant will be upgraded to provide tertiary treatment, thereby reducing the creek BOD loading.

Response to Comment No. 36:

Though no improvements would be implemented, operations will continue to increase in the manner forecasted. With a capacity deficiency, aircraft and surface vehicles will begin to experience congestion and delay, resulting in more pollution and energy consumption than with an expanded facility.

Response to Comment No. 37:

Additional information has been provided in the Final EIS concerning alternatives and their impacts, Section 6(f) consultation, and concurrence from local recreation officials.

Form rHWA 121 (Rev. 5-73)

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

DATE: MAR 11 1977

SUBJECT: Review Comments, FAA - Model EIS No. 1, Bicentennial International Airport

In reply refer to: HEV-11

FROM : Chief, Environmental Programs Division

TO : Mr. Elliott B. Perrett, Jr.
AAP-410 Contract Technical Representative

Comment No

We have reviewed the above-captioned model EIS as requested by your January 11, 1977, letter. The review was performed by our interdisciplinary staff of specialists in the different interest areas, and the following comments are presented to assist you in further development of the model.

Relocation Impacts: We would recommend adding the following information:

1. A summary of the Relocation Assistance Program based on the benefits provided by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (PL-91-646), with special emphasis on the explanation of relocation assistance advisory services and payments available to the displacees, and (1)

2. The ability of the acquiring agency to provide relocation advisory services for special problem cases such as the handicapped, low-income families, minorities, large families, etc. (2)

Water Quality and Ecology:

The model EIS does not make clear whether or not the Mill Creek Channel will be relocated. Such a channelization could require coordination with the U.S. Fish and Wildlife Service under the 1958 Fish and Wildlife Coordination Act. This issue should be addressed. (3)

Economic Impacts:

1. The text reads easily and leads the reader into this impact area very well. We would encourage a greater use of tables in presenting economic data and detail because so much more information can be made available in an understandable way than can be accomplished in narrative form.

Comment No

2. We feel that the impacts, both direct and induced, upon the tax base of the two counties should receive more attention and explanation. The base impact is only discussed as it relates to airport revenues. (4)

3. The model does show good estimation and projection techniques in Appendix D. We do feel that including some numerical employment estimates would be an improvement. (5)

Air Quality:

We feel that the model EIS could be improved in addressing the air quality impacts, and we offer the following comments for your consideration.

1. The National Ambient Air Quality Standards (NAAQS) should either be added for informational purposes near Table 15 "Monitoring Stations in the Carrollton-Federalsburg Area" or reference should be made to page C-3 (NAAQS). (6)

2. The first paragraph on page III-62 makes it sound like surface atmospheric temperature alone determines stability. This is an erroneous impression. Stability depends on the verticle temperature profile, wind speed, solar insulation or amount of cloud cover, presence of high or low pressure areas, etc. This should be corrected. Page C-17, last paragraph, attempts to address this issue. (7)

3. There should be an indication on page III-64 if monitoring was done to arrive at the concentrations shown in Tables 18 and 19. Also, it should be stated if these concentrations are worst case concentrations or just average or most probable concentrations. (8)

4. The third paragraph on page III-68 should be corrected to include construction activities causing air pollution (dust). (9)

5. The predicted concentrations shown in Tables 23 and 24 (pages III-73 and 74) do not look realistic in light of the highway and airport sources of pollutants nearby. The CO concentrations shown appear to be much less than what would be expected for background alone. This observation is made in light of the widening of SR 1 required because of induced traffic and generated traffic from the expansion of the airport (keeping in mind that the total concentration a receptor sees is the background concentration plus the concentration from the project). SR 1 requires widening from four lanes to six lanes because four lanes cannot accommodate the projected traffic volumes. For example, concentrations of 3 or 4 PPM for 1 hour at recepter number 3 would be more realistic than the 0.61 PPM shown in Table 23. (10)

Comment No

Noise Impacts:

The noise portion of the draft EIS is well done and appears adequate.

1. On page III-1, the reference to the report, "Human Response to Noise," is a good way to aquaint the reader with the terminology, data, and evaluation methods presented in the report.

2. On page III-10, the two values are reversed (75 dBA to 50 dBA). (11)

3. The design noise level table on page III-11 is out of date. Substitute the current chart for FHPM 7-7-3 dated May 14, 1976. (12)

Historic and Archeological Impacts:

1. The EIS should show more early coordination with entities (such as the State Historic Preservation Officer) that are charged with or have an interest in protecting and preserving the historic and archeological resources. The draft EIS is weak in this area. (13)

2. The EIS should include an inventory of historic sites that may be affected by each alternate under consideration. The way the inventory was developed along with sources of information used in making the inventory should be discussed. This type of information should also be included for an archeological field survey. (14)

3. Should any sites on or eligible for the National Register of Historic Places be involved, then the Section 106 procedures of the Advisory Council must be followed and a determination of effect pursued. (15)

4. Any consultation with the Advisory Council should be documented or, if such consultation is underway, the EIS should so state. (16)

5. Should it be necessary to make a physical taking from any historic site of local, State, or national significance, a Section 4(f) determination will be necessary. This is true even if such a site is in private ownership. (17)

Section 4(f) Discussion:

1. On page III-80 the discussion of alternates should include the null or "do-nothing" alternate which is always a possibility with any public works project. The last paragraph in this discussion does not agree with the wording in the law; that is, Section 4(f) requires that there be no feasible and prudent (18)

alternate to the taking of Section 4(f) land. We suggest the discussion of alternatives be revised to clearly demonstrate that there is no feasible and prudent alternate to the proposed action and leave the "least impact" and "conducive to amelioration" points to be discussed under the "Minimization of Harm" section.

Rex I. Wells

RESPONSES TO COMMENTS BY THE FEDERAL HIGHWAY ADMINISTRATION

Response to Comment No. 1:

The FAA has prepared and published a brochure entitled, "Sites for Public Airports - How and Why Your Local Government Acquires Land for Public Airports." It is intended as a general information guide for persons who own or rent property required for airport development. It contains relevant information on relocation assistance payments and advisory services. These booklets have been distributed locally by the Airport Authority.

Response to Comment No. 2:

The EIS process identified in detail the relocation requirements and the individual families to be moved. The Airport Authority will be assisted by the Boone County Department of Social Services in providing advisory services for special situations at the appropriate time in the development process.

Response to Comment No. 3:

The Mill Creek Channel will not be relocated as part of the proposed project development. (Refer to the discussion on Flood Hazard Evaluation in the EIS.)

Response to Comment No. 4:

The land required for airport expansion (approximately 700 acres) will be removed from the county's tax rolls. This would result in an annual tax revenue loss to the county. At the present tax rate of $4 per $100 of assessed value, the loss due to the removal of 700 acres of land assessed at $5000/acre would amount to $140,000 annually.

This effect may be offset by the increase in the local tax base due to the creation of new jobs resulting from an expanded airport facility and supporting services. Studies have indicated (Netzer: Economics of the Property Tax, 1966) that the elasticity between an increase in personal income or new payroll in an area and the increase in the property tax base is "one." That is, for every dollar increase in income in an area, there is a corresponding one dollar increase in the property tax base of the area. It is estimated that approximately 100 new permanent jobs would be created by the expanded facility. Assuming the average new salary to be approximately $12,000 per year, the payroll and tax base would be increased by $1.2 million annually.

Response to Comment No. 5:

See Response to Comment No. 4.

Response to Comment No. 6:

Reference has been added in the text of the Final EIS to the National Ambient Air Quality Standards, which are contained in Appendix C.

Response to Comment No. 7:

It is noted in the Final EIS that temperature is one of several factors which determine stability. This comment points out several others to be noted.

Response to Comment No. 8:

Monitoring was not used to determine existing pollution levels; rather, the results were obtained using dispersion modeling techniques. The concentrations shown are for the peak hour of daily airport operations under normal conditions.

Response to Comment No. 9:

The text of the Final EIS has been modified to reflect this comment.

Response to Comment No. 10:

The concentrations shown in the referenced tables were obtained using accepted methodologies and show the contribution (impact) of airport-related activity only.

Response to Comment No. 11:

The referenced noise values have been clarified in the Final EIS.

Response to Comment No. 12:

The referenced noise level/activity relationship chart in FHPM 7-7-3 has been added to the Final EIS.

Response to Comment No. 13:

The Draft EIS specifically referenced early consultation with the ACHP, the State Historic Preservation Officer, the Boone County Historical Society, and the State Archaeologist.

Response to Comment No. 14:

One of the first steps in the inventory of sites was to consult the National Register of Historic Places. This action resulted in the identification of one site in the project vicinity which was of national significance--the Boone House. Consultation revealed no other sites eligible for nomination to the National Register nor any local historic sites in the project area.

Response to Comment No. 15:

This comment identifies an important step in the historic impact assessment process, one which was undertaken during the development of this EIS. See Response to ACHP Comment No. 2.

Response to Comment No. 16:

See Response to ACHP Comment No. 2.

Response to Comment No. 17:

No physical taking of any historic site would be required with the development of the proposed project.

Response to Comment No. 18:

The 4(f) section of the EIS has been modified to provide more information on impacts of the alternatives.

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
WASHINGTON, D.C. 20410

APR 6 1977

OFFICE OF THE ASSISTANT SECRETARY
FOR COMMUNITY PLANNING AND DEVELOPMENT

IN REPLY REFER TO:

Office of Environmental Quality

CSP

Mr. Elliott B. Perrett, Jr.
Contract Technical Representative
Environmental Planning Branch, AAP-410
Federal Aviation Administration
Department of Transportation
Washington, D.C. 20591

Dear Mr. Perrett:

Enclosed are our comments on the two Model Environmental Impact Statements (EIS) for airports. In summary, the comments address the following areas of concern:

1. Freedom Airport

See Model EIS No. 2

(1) The EIS is characterized by a lack of documentation, especially in the areas of socio-economic impact, air quality analysis and land use controls to insure compatibility.

(2) There are several environmental factors that are conspicuous by their absence, including access and traffic impacts, aquifer recharge, and soils.

(3) In several sections, a discussion of impacts resulting from Phase II and III expansion is not included.

See Model
EIS No. 2

(4) The use of multiple noise descriptors (NEF, ASDS, peak levels) as presented is confusing and unless they add to the analysis, the EIS should, we believe, use a single descriptor that takes into account cumulative exposure (NEF, L_{d_n}).

2. Bicentennial Airport

Comment No

(1) The EIS is much more complete (and with documentation) than the EIS for Freedom Airport.

(2) A major problem is that the analysis is restricted to 1985. (1)

(3) There is insufficent discussion of a critical issue in airport planning, that of planning for compatible land use in noise affected areas. (2)

Sincerely,

Richard H. Broun
Director
Enclosure

FREEDOM AIRPORT

See Model
EIS No. 2

p. III-7 No documentation of whether plans for residential development in the area within the NEF 30 contour will be changed - Might have included some correspondence with the County Planning Agency. How will restrictions on this land for residential development affect the provision of housing in the surrounding area? (Should be noted that sites lying within the NEF 30 and 40 contour are Unacceptable to HUD for granting of any HUD assistance).

III-37 No facts or figures used to give socio-economic picture of residents of area.

There is no documentation of economic impact. Why are revenue and expenditure forecasts not included as documentation in the appendix?

About how many jobs for skilled, semi-skilled, unskilled labor would there be? Comparison with similar projects would be helpful. How many of the new jobs can use local unemployed residents. How many are too specialized to use them?

III-39 Induced socio-economic impacts section does not address the attraction to the area of commercial and industrial concerns that need the access provided by the airport, and the impact especially in terms of noise and traffic, this will have on surrounding development, both residential and recreational.

No discussion of the induced impact of development pressure resulting from the laying of water and sewer lines needed to service the airport.

III-39 How will development pressure around the airport for industrial and commercial uses affect the planned residential subdivisions and the park that is to be built. What landuse controls does the County employ to deal with this type of problem? Have they been effective in the past?

See Model
EIS No. 2

III-45 No documentation of how, because of emission standards, airport impact will be reduced. Need to show how emission standards are being complied with in the area.

49 Concentrations for SO_2 and particulates are not computed so they are comparable to standards. There are methods for computing 24 hour averaging times.

Cannot assume that concentrations will decrease enough in 5 and 10 years to comply with standards because of reductions due to national emissions standards. Need to show computations and show how emission standards have been complied with in the past.

Would be helpful to see a table showing peak hour concentration compared to standards, with an indication of the averaging time used.

III-56 It seems as if ultimate NEF will cause part of Thompson Beach Shoreline to lie within the NEF 30 contour. Peak aircraft noise levels, of 85dBA will impact more than half the shore - No discussion of how often this peak noise would occur or how airport operations could be regulated to minimize its impact.

III-60 No discussion of Geology or Soils -
No discussion of how pumping the aquifer would affect salt water intrusion.

General In the public utilities and services section there is no discussion of Phase I, II and III impact on community service provision to the airport itself, and potential for decreasing services to existing residents and establishments - (e.g. police, fire).

See Model
EIS No. 2

III-61 No discussion of future alternatives for addressing the problem of water supply in Phase II and III - Mention of aquifer - No discussion of its recharge potential or whether pumping could create salt water intrusion.

III-61 What provisions for expansion of on-site septic systems past 1980 if Lee City does not extend sanitary facilities as planned?

III-65 No documentation that energy saved by reducing congestion is greater than energy spent in additional vehicle miles travelled - No estimates of traffic projection or vehicle miles travelled (vmt) are documented.

III-67 No documentation of how much distance will attenuate noise from construction "causing only a slight increase in ambient concentrations."

Very little discussion of Phase II and III construction impacts.

General There should be a separate section addressing access and traffic impacts. Should include traffic projections. Impact of this traffic on access to recreational areas should be addressed. Impact of increased truck traffic should be looked at in terms of impact on residential neighborhoods. Should include statement on adequacy of roads to accomodate increased traffic.

See Model
EIS No. 2

IV-1 Minimization of adverse effects regarding land use: No discussion of impact of redesignating residential area in comprehensive plan. Should ensure the new use is compatible with coastal environment.

No discussion of the land use control process that would ensure that areas planned residential would be redesignated.

IV-5 Under emphasis of the amount of Thompson Bay to be exposed to >30 NEF.

BICENTENNIAL AIRPORT

		Comment No
III-1	Residences should be included in the listing of noise sensitive uses.	(3)
III-7	Why was the impact analysis restricted to 1985?	(4)
III-10	How much of Pierce Park will exceed 70 dBA?	(5)
III-16	Are there adequate housing alternatives for displaced residents?	(6)
III-34	What is the status of the community in the HUD Flood Insurance Program?	(7)
III-40	No discussion of where new units will be built - If in NEF 30-40, will they be required to incorporate noise attenuation measures? Will renovated units incorporate attenuation measures if they are in a >NEF 30 zone?	(8)
III-44	No documentation of how unemployment in area will be reduced by a sizable amount.	(9)

Comment No

III-62 Clarifications in the text and the tables are needed to allow relatively rapid review of the document by a non-air pollution specialist. (10) The most needed improvement would be comparison of the product of calculations with the National Standards. In several places the concentrations are indicated in the tables without indication of the averaging time.

III-79 No discussion of attenuation necessary at Paul Revere Junior High to accommodate the increased noise levels. The same goes for 80 homes that will be within the 30 NEF contour- (11)

III-81 Unclear how proposed departure procedures could eliminate noise impact when it puts the school within the 30 contour. (12)

III-90 Solid waste: How close are these landfills to capacity .- Any plans for resource recovery? (13)

III-88 Contradiction as to when Carrollton will extend service - 1980 or 1985? (14)
How will the new plant be paid for - How much will it cost to go to tertiary treatment?

General What provisions will be made to insure that future residential development in existing residential areas will be discouraged within the 30 NEF Contour? Should be noted that sites within the 30 to 40 NEF Contour will not be eligible for HUD assistance except in (15) special circumstances in which case noise attenuation measures and an environmental impact statement would be required. Sites within the NEF 40 Contour are "Unacceptable" for HUD assistance.

What provisions will be made to bring about compatibility of existing noise sensitive uses in terms of implementation of noise attenuation measures? (16)

RESPONSES TO COMMENTS BY
THE U. S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Response to Comment No. 1:

The analysis to 1985 is certainly adequate to evaluate the physical impacts due to "siting" of the proposed new facilities. These impact categories include vegetation and wildlife, water resources, flood hazard, direct social effects, Section 4(f) lands, and historical/ archaeological sites. The economic analysis was extended beyond 1985. The air and noise analyses are presented for 1985 which represents a time frame consistent with the various prediction methodologies and the introduction of emission standards.

Response to Comment No. 2:

The responsible local planning agencies have been involved with the planning for the airport for several years. They were represented on an advisory committee for airport expansion which met throughout the environmental assessment stage of the program. Correspondence is contained in the EIS which outlines their commitments to compatible land use planning.

Response to Comment No. 3:

Residences have been added to the listing of noise sensitive areas.

Response to Comment No. 4:

See Response to Comment No. 1.

Response to Comment No. 5:

It is estimated that approximately the first 100 to 200 feet of the eastern side of the park would be exposed to traffic noise greater than 70 dBA.

Response to Comment No. 6:

The EIS has documented a detailed inventory of the number of relocated families and the availability of relocation housing. The latter included evaluation of resident characteristics and desires, and an evaluation of the present housing market in the area. The assessment has indicated that there are adequate housing alternatives for displaced residents.

Response to Comment No. 7:

The communities are awaiting the final determination and publication of flood evaluations.

Response to Comment No. 8:

Construction of new units will be subject to the policies of the local planning agencies which have expressed intentions to develop land uses compatible with airport operations. The noise exposure criteria will be a consideration in the location of new units as well as noise attenuation measures. Renovated units within the NEF 30 contour will incorporate attenuation measures.

Response to Comment No. 9:

Recent unemployment figures released by the state have shown levels as high as 12 percent, with a significant portion related to the construction industry. A major public works project such as an airport expansion will create opportunities during the construction period. It is estimated that construction manpower requirements would range from 100 to 550 persons during this period.

Response to Comment No. 10:

Additional information and sample calculations have been added to the Final EIS to facilitate review. The National Standards have been referenced in EIS Appendix C. All pollutant concentrations developed in the assessment of air quality impact were for the peak hour of daily operations under normal conditions.

Response to Comment No. 11:

The daily 1985 cumulative exterior noise exposure for the junior high school is estimated to be equivalent to NEF 30. No attenuation measures are planned for the school.

Response to Comment No. 12:

The proposed departure procedures will reduce (NEF 35 to NEF 30) but not entirely eliminate aircraft noise.

Response to Comment No. 13:

The existing county landfills have approximately three years of life remaining. The two proposed landfills both have a projected life of twenty years. There are plans for resource recovery at the proposed sites.

Response to Comment No. 14:

The City of Carrollton will extend sewer service to the airport in 1980. The new regional plant will be financed by City and County public works funds. Tertiary treatment will be accomplished at a cost of approximately $250,000.

Response to Comment No. 15:

The local jurisdictions, through their planning departments, will determine the location and extent of future residential development.

Response to Comment No. 16:

Noise abatement is a multi-jurisdictional area. Measures are being taken to reduce aircraft noise at its source. Traffic control procedures have been discussed and presented within this EIS. The planning agencies have responsibilities in the area of compatible land use. There are no current plans to further provide for noise reduction through the implementation of attenuation measures at individual residences.

Additional Comments Resulting
From FAA Review

Comments of Model EIS No. 1.

Comment No.

1. Page III-1. On this page and elsewhere, delete reference to ASDS and instead refer to the Integrated Noise Model (INM). The exhibits which refer to ASDS should be changed to refer to 85 dB(A). Changes in data and analyses should be made accordingly as noted in the marked-up copy of the text provided separately. (This also applies to the discussion on noise in Section V, Alternatives, and Appendix A.) (1)

2. Page III-3. The length, time of day, and date when noise levels were measured should be included or referenced in the second sentence. (2)

3. Page III-16, 42, 47, IV-5. References on these pages to relocation assistance funds relative to the First Baptist Church are incorrect. Funds received from acquisition of the property may be used toward the construction of the new facility, but funds are not provided for relocation of the Church, per se. (3)

4. Appendices. It would be helpful to include a list of appendices at the beginning of this section as well as in the Table of Contents in the front. A letter and number system for the pages would also be helpful (e.g., A-1). (4)

5. Other Comments. A number of other comments are included by notation on the following pages of the marked-up copy of the draft EIS, enclosed: (5)

   Cover; i; I-4; Exhibit 4; II-3, 4; III-1; Exhibits 5, 8, 9, 12; III-4, 6 through 12, 16, 17, 20, 35, 36, 40, 43, 49, 64, 67, 76, 77, 78, 86, 89, 90, 93, 96; IV-3, 4, 6; V-4, 6, 11, 12, 17; VII-1, 2; VIII-5; Appendix A: first page, ASDS, References, Tables A-11-1 through 12; Appendix B: Receiving Water Quality Standards (second page); Appendix C: C-4, 7, 8, 9; Appendix D: second page, Definitions (second page); Appendix E: letter from Department of Recreation and Parks.

RESPONSES TO COMMENTS
RESULTING FROM FAA REVIEW

Response to Comment No. 1:

Reference to the ASDS methodology has been deleted from the Final EIS. The Integrated Noise Model and its results were added to the Final EIS and appropriate changes made in the text, exhibits, and Appendix A.

Response to Comment No. 2:

Where noise measurement programs are included as part of the noise analysis, the location, duration, time of day, and date of measurements should be included or referenced in the EIS. Noise measurements were included in Model EIS No. 2 for a new reliever site. In the present case, accepted noise methodologies were used to describe existing aircraft noise exposure in adjacent communities.

Response to Comment No. 3:

References to relocation assistance funds relative to the First Baptist Church have been corrected in the Final EIS.

Response to Comment No. 4:

A List of Appendices has been placed at the beginning of the Appendices in the Final EIS. In addition, a letter-number system for the Appendix pages has been added.

Response to Comment No. 5:

Other comments resulting from FAA review have been addressed throughout the text and appendices.

MODEL STATEMENT

INSTRUCTIONAL GUIDANCE

MODEL STATEMENT INSTRUCTIONAL GUIDANCE

This section of the Model Statement is for instructional purposes only. It is intended to show by comparison the FAA's initial evaluation of a particular impact or other section of the document and the FAA's final evaluation in response to Federal coordination and comments. To do this, selected sections of the impact document prior to coordination are shown side-by-side with the corresponding sections of the documents after coordination. The sections selected for this purpose are those which changed significantly as a result of coordination and comment.

Table 1 shows forecasts of BIA air carrier and enplaned passenger expansion from 1970 to 1990 as well as projected operations by aircraft and instrument class. By 1990, it can be seen that commercial carrier service is anticipated to increase by 86 percent, enplaned passengers by almost 200 percent, and general aviation activity is forecast to more than triple. Instrument operations will more than double their 1975 level.

Given the projected air carrier demand, the purpose of the project is summarized below:

- Expansion of BIA is necessary to accommodate increased traffic and passenger demand.
- Construction of an additional runway is essential to accommodate the projected number of daily flight operations.
- Improvements in surface access and terminal facilities are needed to support increased cargo and passenger operations.

The proposed project provides the comprehensive improvements required to handle forecast growth in operations. Construction of the parallel runway allows simultaneous Instrument Flight Rule (IFR) landings during low ceiling and visibility conditions. The improved terminal facilities and access will provide better service to the travelling public. Demand projections indicate that passenger traffic will double between 1970 and 1980 alone. The new terminal complex will offer convenient parking, curb frontage pick-up and check-in, and passenger handling facilities designed to minimize walking distances. Improved cargo facilities will expedite handling and enhance security.

The project is needed to permit BIA to accommodate forecast air carrier growth efficiently and safely. Failure to expand the airport will result in increasing congestion, delay and ultimate saturation of the facility. Briefly, increased congestion means more flights waiting to take off and land are stacked in the air or in line on the ground. Delay is undesirable for four basic reasons. These are:

- Passenger inconvenience.
- Safety hazards.
- Increase in energy consumption.
- Increase in air and noise pollution.

Prior to Coordination

Tables 1 and 2 show forecasts of BIA air carrier and enplaned passenger expansion from 1970 to 1990 and projected air cargo activity. By 1990, it can be seen that commercial carrier service is anticipated to increase by 86 percent, enplaned passengers by almost 200 percent, and general aviation activity is forecast to more than triple. Instrument operations will more than double their 1975 level. The forecasts shown correlate well with the terminal area forecasts developed by the FAA.

The practical annual capacity (PANCAP) of the existing runways is 200,000 operations per year. This capacity was exceeded in 1975 when 232,500 total operations took place. Also of importance are the airfield's hourly capacities under visual and instrument flight rules (VFR and IFR). The airfield's hourly capacity under VFR is 91 operations per hour, while its capacity under IFR is 52 operations per hour. The airfields's hourly VFR capacity was exceeded in 1975 when busy hour activity reached 109 operations. By 1980, the airfield's hourly IFR capacity will virtually be reached.

Construction of an additional runway is essential to accommodate the projected number of flight operations. Improvements in surface access and terminal facilities are needed to support increased cargo and passenger operations. The proposed project provides the comprehensive improvements required to handle forecast growth in operations. Construction of the parallel runway allows simultaneous Instrument Flight Rule (IFR) landings during low ceiling and visibility conditions. The improved terminal facilities and access will provide better service to the travelling public. Demand projections indicate that passenger traffic will double between 1970 and 1980 alone. The new terminal complex will offer convenient parking, curb frontage pick-up and check-in, and passenger handling facilities designed to minimize walking distances. Improved cargo facilities will expedite handling and enhance security.

The project is needed to permit BIA to accommodate forecast air carrier growth efficiently and safely. Failure to expand the airport will result in increasing congestion, delay and ultimate saturation of the facility. Briefly, increased congestion means more flights waiting to take off and land are stacked in the air or in line on the ground. Delay is undesirable for four basic reasons. These are:

- Passenger inconvenience.
- Safety hazards.
- Increase in energy consumption.
- Increase in air and noise pollution.

After Coordination and Response

None

Prior to Coordination

Table 2

Annual Enplaned Cargo and Mail Activity at BIA

	(Actual) 1970	*(Actual) 1975*	*1980*	*1985*	*1990*
Annual Enplaned Cargo (Tons)	3,870	5,500	8,000	11,500	16,500
Annual Enplaned Mail (Tons)	2,285	3,100	4,200	5,300	6,800

After Coordination and Response

None

Prior to Coordination

constructed in the 1960's and is predominantly a middle to upper-middle income neighborhood. South Revere Park, located northeast of the site, was constructed in the 1940's to serve as off-base housing for non-commissioned officers in the Army Air Corps. Today, this neighborhood remains fairly stable and is occupied by lower income black and Spanish-speaking families.

The more recent, higher cost subdivision of North Revere Park, is located north of I-40, approximately four miles north of proposed runway 2R-20L. Paul Revere Junior High School and the General Boone House, a registered historic landmark, are located in the North Revere community.

With the exception of these residential and commercial enclaves, land surrounding the project site is predominantly unoccupied overgrown areas or agricultural fields. A power transmission line and the Northeast Railroad follow a parallel north-south alignment east of the site. Exhibit 4 indicates present zoning in the airport vicinity.

Carrollton, the state capitol, is also the home of the State University with a student population of 15,000, Carrollton Community College and several smaller private colleges with a collective enrollment approaching 8,000. While state government is the principal employer, Carrollton also has thriving textile and hardware manufacturing industries.

Federalsburg to the south is the national home office for ABC Computers with personnel exceeding 5,000. The city is also the center for numerous research and development (R & D) industries in the fields of electronics, aeronautics and communication. Further, the nationally renown Hopkins Medical Research Center along with three affiliated hospitals are located in Federalsburg.

The natural topography of the project area is dominated by the foothills of the Jefferson Mountains which begin to rise east of the site. Mill Creek flows through the southern perimeter of the airport property to the lake in Cyrus Pierce State Park, and Gordon's Run flows through the airport's western perimeter, also terminating in the Park's lake. With the exception of the Park's woodlands, there are no significant or valuable expanses of vegetation in the airport area.

The counties are located in the Middle Western Upland Plain physical subdivision of the Appalachian Highlands physiographic division. Glaciers covered the greater part of the area in the ancient past. They modified hills, filled in valleys, left masses of glacial debris, and produced soil types which have an identifiable effect on ground water supplies and rates of surface runoff.

After Coordination and Response

NOISE

Introduction

The noise portion of the environmental investigation included the following elements:

- Measurement of ambient (existing) noise levels in relation to land use in the project study area.
- Identification of particularly noise sensitive areas such as parks, hospitals, schools and churches.
- Development of Noise Exposure Forecast (NEF) and Aircraft Sound Description System (ASDS) contour to indicate areas of various levels of noise exposure.
- Consideration of non-aircraft noise impact induced by the project i.e., noise generated by construction operations and noise resulting from increased surface traffic on main access and bordering roads.

Prior to reviewing this section, it may be helpful to read a brief report entitled Human Response to Noise provided in the Appendix of this document. The report includes an explanation of noise and its measurement and discusses public reaction to various levels of aircraft generated acoustic noise.

Noise Exposure Forecast and ASDS methods of analyses were developed by the U. S. Department of Transportation. The NEF methodology has undergone continuous improvement with revisions in input parameters published as recently as 1975. A discussion of the noise methodologies is contained in the Appendix.

Prior to Coordination

SECTION III: PROBABLE IMPACT ON THE ENVIRONMENT

NOISE

Introduction

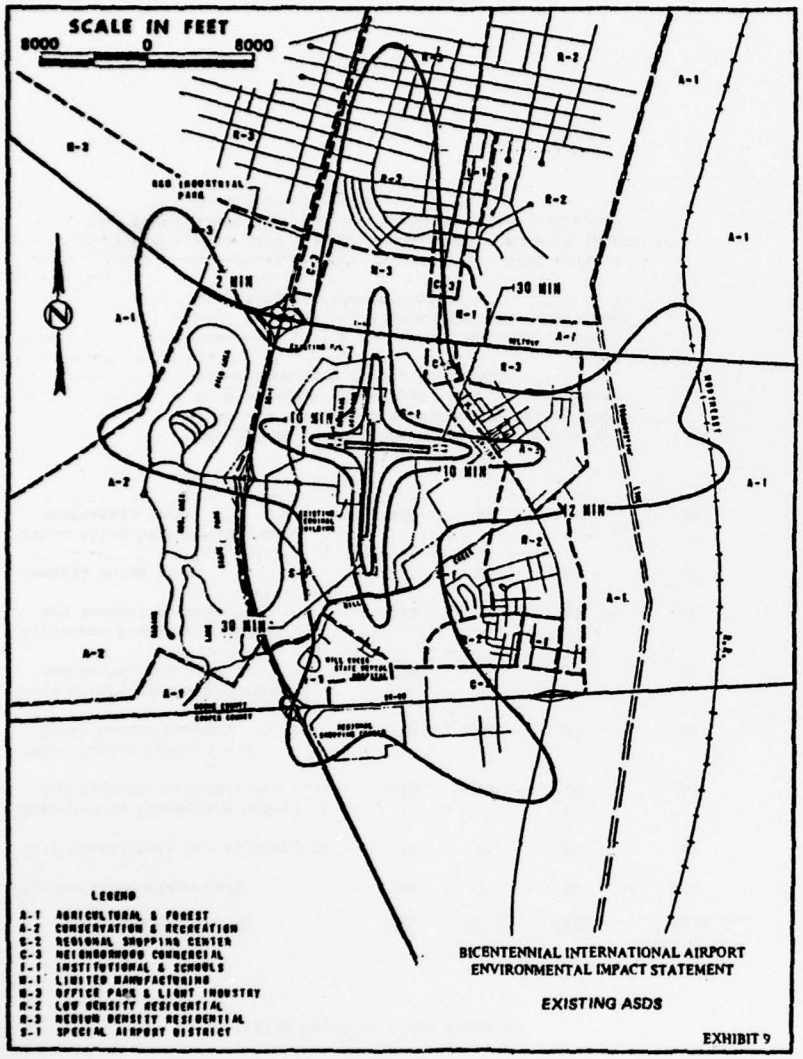
The noise portion of the environmental investigation included the following elements:

- Identification of particularly noise sensitive areas such as parks, hospitals, schools, churches, and residences.
- Development of Noise Exposure Forecast (NEF) and Integrated Noise Model (INM) values to indicate areas of various levels of noise exposure.
- Consideration of non-aircraft noise impact induced by the project i.e., noise generated by construction operations and noise resulting from increased surface traffic on main access and bordering roads.

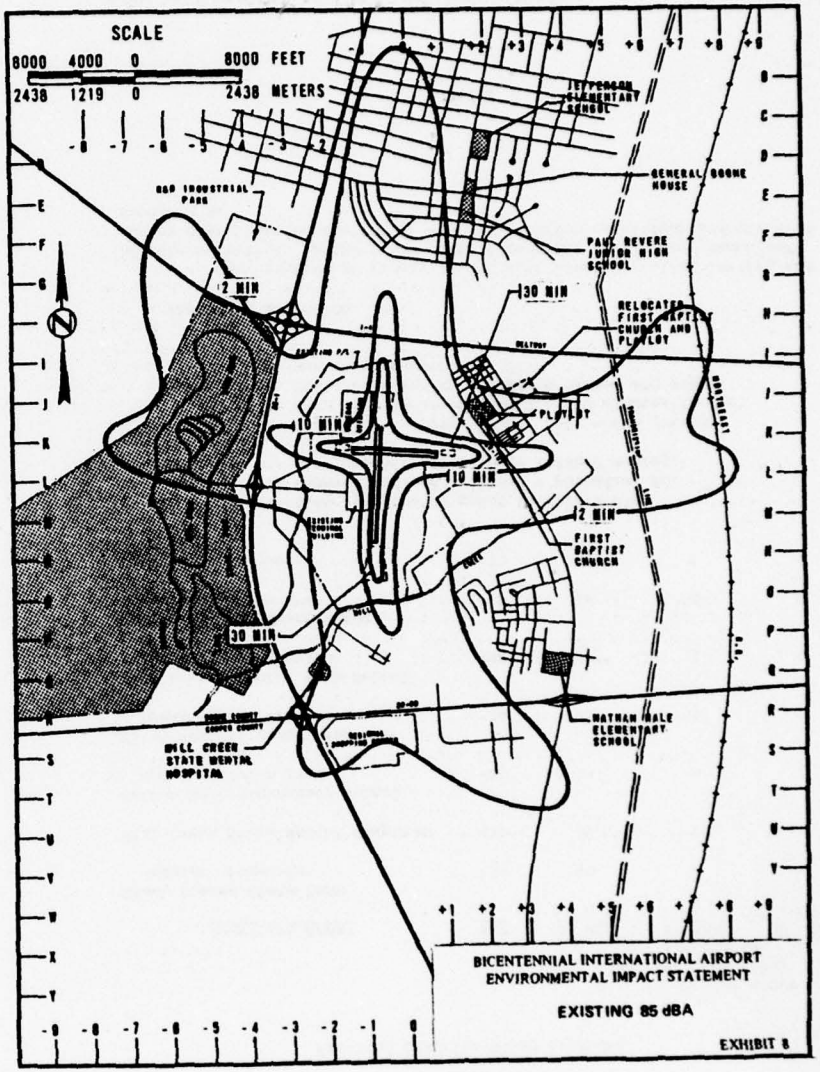
Prior to reviewing this section, it may be helpful to read a brief report entitled Impact of Noise on People provided in Appendix A of this document. The report includes an explanation of noise and its measurement and discusses public reaction to various levels of aircraft generated noise.

The NEF method used was the Airport Noise Prediction Model - MOD 7 developed by the U. S. Department of Transportation, Transportation System Center. The NEF methodology has undergone continuous improvement with revisions in input parameters published as recently as 1975. The INM method was accomplished using the FAA Integrated Noise Model User's Guide, FAA Report No. FAA-EQ-76-2, March, 1976. A discussion of the noise methodologies is contained in Appendix A.

After Coordination and Response



Prior to Coordination



After Coordination and Response

Table 4

Existing Exterior Noise Exposure

Sensitive Areas	NEF	Maximum Flyover Levels (dBA) B707	B727	Twin Engine Prop
Cyrus Pierce State Park	35	95	90	74
Mill Creek State Mental Hospital	<30	86	83	65
Nathan Hale Elementary School and Recreation Area	<30	82	79	60
First Baptist Church and South Revere Playlot	30	90	87	66
Paul Revere Junior High School and Recreation Area	<30	86	83	60
Jefferson Elementary School and Recreation Area	<30	86	83	60
General Boone House	<30	86	83	60
Ethan Allen High School and Recreation Area	<30	84	80	55

- The NEF 30 contour for operations on runway 2-20 and influenced considerably by the B707/DC 8 aircraft and extend approximately four miles from each runway threshold.
- Land area to the south is relatively undeveloped and provides a potential for development with airport related zoning.
- The daily exposure to aircraft noise greater than 85 dBA ranges from 2 to 10 minutes in the State Park and in the North Revere and South Revere communities.

Prior to Coordination

Table 4

Existing Exterior Noise Exposure

Sensitive Areas	NEF	Time in Minutes Above Indicated dBA Level For 24-Hour Day 65 dBA	85 dBA	105 dBA
Cyrus Pierce State Park (eastern boundary)	35	40	8	0
Mill Creek State Mental Hospital	<30	29	2	0
Nathan Hale Elementary School and Recreation Area	<30	17	0	0
First Baptist Church and South Revere Playlot	30	31	5	0
Paul Revere Junior High School and Recreation Area	<30	23	1	0
Jefferson Elementary School and Recreation Area	<30	18	0	0
General Boone House	<30	23	1	0

- Land area to the south is relatively undeveloped and provides a potential for development with airport related zoning.
- The daily exposure to aircraft noise greater than 85 dBA ranges from 2 to 10 minutes in the State Park and in the North Revere and South Revere communities.

Impact of Expansion

Construction of runway 2R-20L will permit parallel landing and takeoff operations in the north-south direction. Daily operations and runway distributions for future (1985) expansion conditions are given in Appendix A.

After Coordination and Response

- Institute modified departure procedures for flights taking off to the north on new runway 2R-20L.

The departure procedures would require that a right turn be made for all jet traffic using runway 2R for takeoff. This control would minimize noise exposure within the suburban residential neighborhood north of runway 2R and direct traffic on an easterly course after takeoff. Meetings with the airport's traffic control personnel indicated that the procedures recommended could be safely instituted.

Further, the procedure has received a favorable response from an informal FAA airspace review. Formal proceedings to institute the control procedures would be initiated during the construction of the new runway. The results of this noise abatement control procedure, as seen in the noise exposure forecast on Exhibit 11, would be to reduce the noise exposure on schools and recreational fields and the General Boone House north of the airport.

The project will increase noise exposure in neighborhoods within the Airport study area. The estimated total of units which will be exposed to greater than NEF 30 is 280.

Table 5 gives NEF values at noise sensitive areas for existing and 1985 conditions. Existing NEF values are included in the table for comparative purposes. Maximum noise levels expected to occur during a single operation are also provided for the various aircraft types and are shown in Exhibit 12.

Using the ASDS approach, Exhibit 13 indicates future noise impact in terms of daily exposure to greater than 85 dBA from future airport operations. Compared to existing conditions, daily exposure in the communities of South Revere and Nathan Hills, east of the expanded airport, would increase from less than two minutes per day to a level in the range of 2-10 minutes per day. Total exposure in the State Park would remain approximately the same as the present condition.

Much of North Revere would experience between 2 and 10 minutes of aircraft noise greater than 85 dBA with project development.

Prior to Coordination

The departure procedures would require that a right turn be made for all jet traffic using runway 2R for takeoff. This control would minimize noise exposure within the suburban residential neighborhood north of runway 2R and direct traffic on an easterly course after takeoff. Meetings with the airport's traffic control personnel indicated that the procedures recommended could be safely instituted.

Further, the procedure has received a favorable response from an informal FAA airspace review. Formal proceedings to institute the control procedures would be initiated during the construction of the new runway. The results of this noise abatement control procedure, as seen in the noise exposure forecast on Exhibit 10, would be to reduce the noise exposure on schools and recreational fields and the General Boone House north of the airport.

The project will increase noise exposure in neighborhoods within the Airport study area. The estimated total of units which will be exposed to greater than NEF 30 is 280.

Table 5 gives NEF values at noise sensitive areas for existing and 1985 conditions. Existing NEF values are included in the table for comparative purposes.

Using the INM approach, Exhibit 11 indicates future noise impact in terms of daily exposure to greater than 85 dBA from future airport operations. Compared to existing conditions, daily exposure in the communities of South Revere and Nathan Hills, east of the expanded airport, would increase from less than two minutes per day to a level in the range of 2-10 minutes per day. Total exposure in the State Park would remain approximately the same as the present condition. Much of North Revere would experience between 2 and 10 minutes of aircraft noise greater than 85 dBA with project development. Table 5 also contains results from the INM analysis, showing the level of aircraft noise impact at sensitive areas for existing and 1985 conditions.

Impact of Construction Operations

In addition to aircraft noise, project construction will result in a temporary increase in noise levels bordering the site.

Construction noise impact will be short-term and most discernible in immediate proximity to the active work area. On-site grading for the runway and terminal facilities will constitute the most significant construction noise sources. These operations generate noise levels in the

After Coordination and Response

Residential development is gradually spreading north and east from the Federalsburg CBD. A 1,000 unit garden apartment and high-rise subdivision, in the southwest quadrant of the Evergreen Road/S. R. 102 intersection, eight miles southwest of the Airport site represents the closest residential development in Cooper County.

IMPACT OF THE PROPOSED PROJECT

The project will require the acquisition of housing from the South Revere Park and Nathan Hills communities and bring new areas of North Revere Park within the 30 NEF contour.

Community involvement has resulted in ameliorative provisions which could reinforce neighborhood stability. These include:

- Traffic control procedures which will establish a flightpath from the proposed runway over a largely unoccupied area between North and South Revere, thereby diminishing noise impact on residences.
- Relocation of all displaced South Revere families within the South Revere community through the provision of Last Resort Housing.
- Relocation assistance funds will accelerate anticipated construction of a new First Baptist church and community center complex in South Revere well ahead of schedule. This institution is the focal point of South Revere's social as well as spiritual life and the new facility will reinforce community stability.

Zoning ordinances and existing land use will govern future development patterns bordering the site. Correspondence from the Directors of Pierce State Park and Mill Creek Hospital document their support of the project.

In conformance with provisions of the 1970 Airport Development Act, land use controls or airport zoning must be provided by Cooper County for county areas within the 30 NEF contour. The county has pledged to enact zoning and correspondence to this effect is provided in the Appendix.

Prior to Coordination

Residential development is gradually spreading north and east from the Federalsburg CBD. A 1,000 unit garden apartment and high-rise subdivision, in the southwest quadrant of the Evergreen Road/S. R. 102 intersection, eight miles southwest of the Airport site represents the closest residential development in Cooper County.

IMPACT OF THE PROPOSED PROJECT

The project will require the acquisition of housing from the South Revere Park and Nathan Hills communities and bring new areas of North Revere Park within the 30 NEF contour.

Community involvement has resulted in ameliorative provisions which should reinforce neighborhood stability. These include:

- Traffic control procedures which will establish a flightpath from the proposed runway over a largely unoccupied area between North and South Revere, thereby diminishing noise impact on residences.
- Relocation of all displaced South Revere families within the South Revere community through the provision of Last Resort Housing.
- Funds received from property acquisition may be used toward the construction of a new First Baptist church and community center complex in South Revere. This institution is the focal point of South Revere's social as well as spiritual life and the new facility will reinforce community stability.

Zoning ordinances and existing land use will govern future development patterns bordering the site. Correspondence from the Directors of Pierce State Park and Mill Creek Hospital document their support of the project.

In conformance with provisions of the 1970 Airport and Airway Development Act (as amended), land use control assurances or airport zoning should be enacted, to the extent reasonable, to restrict land uses in the

After Coordination and Response

The approximately 3,200 acres of maintained area within the study area include airport clear zones, the power line corridor, lawns and landscaped areas surrounding private residences and other building sites, roadway easements, paved highways, runways, taxiways, aprons, etc.

Residential properties, roadsides and most of the existing airport property are controlled by mechanical mowing and pruning. Shrubs and trees in the residential areas were either planted, or, in the case of mature specimens, left when the original community was developed. Herbaceous vegetation includes cultivated grasses, tolerant invasion species and ornamental species used to enhance landscaping.

Maintained communities are the dominant cover type in the study area. Yet this community provides little or no suitable breeding, feeding or cover habitat for wildlife.

Agricultural Communities

A total of 558 acres of periodically cultivated fields or pasture primarily occur within the eastern section of the study area. Most tilled fields contain homogeneous populations of cultigens during the growing season. These cultigens may vary from year to year depending on agricultural practices.

The fairly intense level of agricultural practices minimizes this area's value as habitat. No hedgerow exist within the study area and annual cutting or cropping eliminates cover during the winter months.

Stream Communities

Mill Creek and Gordon's Run flow through the project area. According to State Department of Natural Resources records, the stream does support populations of fish species common to the area. During field reconnaissance, it was observed that the water was clear and generally fit for aquatic invertebrates although no survey or sampling of aquatic invertebrates was conducted. Green frogs (Rana clamitans), leopard frogs (Rana pipens) and raccoon tracts were observed along the stream.

A listing of fish sampled by the state from Cyrus Pierce State Park and site streams prior to entry to the Park's lake is provided in the Appendix.

Prior to Coordination

The approximately 3,200 acres of maintained area within the study area include airport clear zones, the power line corridor, lawns and landscaped areas surrounding private residences and other building sites, roadway easements, paved highways, runways, taxiways, aprons, etc.

Residential properties, roadsides and most of the existing airport property are controlled by mechanical mowing and pruning. Shrubs and trees in the residential areas were either planted, or, in the case of mature specimens, left when the original community was developed. Herbaceous vegetation includes cultivated grasses, tolerant invasion species and ornamental species used to enhance landscaping.

Maintained communities are the dominant cover type in the study area. Yet this community provides little or no suitable breeding, feeding or cover habitat for wildlife.

Agricultural Communities

A total of 558 acres of periodically cultivated fields or pasture primarily occur within the eastern section of the study area. Most tilled fields contain homogeneous populations of cultigens during the growing season. These cultigens may vary from year to year depending on agricultural practices.

The fairly intense level of agricultural practices minimizes this area's value as habitat. No hedgerow exist within the study area and annual cutting or cropping eliminates cover during the winter months. The agricultural lands in the study area represent less than five percent of the two counties' total farmland. None of the farmland in the study is classified as prime or unique farmland.

Stream Communities

Mill Creek and Gordon's Run flow through the project area. According to State Department of Natural Resources records, the stream does support populations of fish species common to the area. During field reconnaissance, it was observed that the water was clear and generally fit for aquatic invertebrates although no survey or sampling of aquatic invertebrates war conducted. Green frogs (Rana clamitans), leopard frogs (Rana pipens) and raccoon tracts were observed along the stream.

A listing of fish sampled by the state from Cyrus Pierce State Park and site streams prior to entry to the Park's lake is provided in Appendix B.

After Coordination and Response

Prior to Coordination

Table 17

BIA 1975 Emission Inventory
(lbs/Day)

Sources	CO	HC	NO_x	SO_2	Particulates	Total
Non Airport Related:						
Vehicular Traffic	28,043	2,754	5,225	134	175	36,331
Airport Related:						
Aircraft Traffic	8,449	2,605	1,908	219	115	13,296
Vehicular Traffic[1]	5,265	506	827	23	31	6,652
Service Vehicles[2]	2,200	490	128	2	4	2,824
Working Losses[3]	-----	339	-----	---	---	339
Total	43,957	6,694	8,088	378	325	59,442

[1]Includes passenger, visitor and employee traffic.

[2]Gasoline-fueled ground service equipment.

[3]Losses that occur during aircraft and ground service vehicle refueling.

After Coordination and Response

Table 17

BIA 1975 Emission Inventory
(lbs/Day)

Sources	CO	HC	NO_x	SO_2	Particulates	Total
Non-Airport Vehicular Traffic in Vicinity[1]	28,043	2,754	5,225	134	175	36,331
Airport Related:						
Aircraft Traffic[2]	8,449	2,605	1,908	219	115	13,296
Vehicular Traffic[3]	5,265	506	827	23	31	6,652
Service Vehicles[4]	2,200	490	128	2	4	2,824
Working Losses[5]	-----	339	-----	---	---	339
Total	43,957	6,694	8,088	378	325	59,442

[1]The emission rates for autos and aircraft were computed using EPA publication AP-42.
[2]Daily aircraft operations are given in Appendix A.
[3]Includes passenger, visitor and employee traffic, total site-generated vehicle traffic = 15,123 vehicles/day.
[4]Gasoline-fueled ground service equipment, emission rates computed from APTD-1470.
[5]Losses that occur during aircraft and ground service vehicle refueling.

SECTION 4(f) PUBLIC LANDS

Existing Conditions

Exhibit 5 showed parks, recreation areas and public lands within the study area.

Cyrus Pierce State Park is the major recreational area in proximity to the project. This 6,000-acre facility includes natural forest areas, streams, campsites, picnic areas, an active recreation area, a boating lake and beach. Pierce Park, the largest State Park in the twelve county area, recorded 50,000 visitors in 1974.

Expansion of BIA will have little impact on the Park. Aircraft will continue to use the expanded airport's crosswind runway. This runway will continue to be primarily used by general aviation aircraft which generate less noise than the commercial air carriers.

A comparison of the noise exposure under existing and future conditions indicates slightly less exposure in the Park with expansion during an average day. The contours reflect operating procedures which would have the aircraft turning away from the campsite area of the Park.

Airport activity will also increase traffic on S. R. 1, the primary access road to the Park. Dispersion analysis indicated that pollutant levels in the Park would remain within criteria. Increased vehicular activity on S. R. 1 will result in a 2 dBA increase in acoustic levels on the Park's eastern border. However, within 200 feet of the highway, noise levels will drop to 69 dBA. This is within DOT design criteria for recreation areas. Given the extent of acreage available for recreation, few persons will use the Park's western fringe bordering S. R. 1 which is devoid of nature trails or other attractions.

Mr. Jonas Trilling, Director of Pierce State Park served on the Airport Advisory Committee. He noted that increased traffic on S. R. 1 and population growth to the south have resulted in plans to open a second access road from S. R. 66. This action, totally unrelated to BIA expansion, will divert some user traffic from S. R. 1. Park officials supported the project at the public hearing as the only alternative which would not adversely impact Pierce Park.

Neighborhood recreation areas in North Revere and Nathan Hills border school sites simultaneously serving physical education and community purposes. The Revere Junior High playing fields are located north of the

Prior to Coordination

SECTION 4(f) PUBLIC LANDS

Section 4(f) of the DOT Act of 1966, as Amended, states that approval will not be given for projects requiring use of publicly owned land from a public park, recreation area, or wildlife or waterfowl refuge, or any land from an historic site unless (1) there is no feasible and prudent alternative to the use of such land, and (2) such program includes all possible planning to minimize harm to such area.

Existing Conditions

Exhibit 5 showed parks, recreation areas and public lands within the study area. Correspondence concerning the significance of the recreation areas and the necessary coordination is provided in Appendix E.

A 1.5-acre playground is located in South Revere Park adjacent to the First Baptist Church. This Park will be acquired for project construction. The 4(f) statement for the South Revere Playlot has been prepared as part of this environmental statement and is included in this section of the report.

The effects of proposed airport development on the other public recreation lands in the area as discussed below are not sufficient to constitute a "use" of the lands within the meaning of Section 4(f). The lands are active parks and the level of noise increase will not affect their normal activities.

Cyrus Pierce State Park is the major recreational area in proximity to the project. This 6,000-acre facility includes natural forest areas, streams, campsites, picnic areas, an active recreation area, a boating lake and beach. Pierce Park, the largest State Park in the twelve county area, recorded 50,000 visitors in 1974.

Mr. Jonas Trilling, Director of Pierce State Park served on the Airport Advisory Committee. He noted that increased traffic on S. R. 1 and population growth to the south have resulted in plans to open a second access road from S. R. 66. This action, totally unrelated to BIA expansion, will divert some user traffic from S. R. 1. Park officials supported the proposed project at the public hearing as the only alternative which would not adversely impact Pierce Park.

Neighborhood recreation areas in North Revere and Nathan Hills border school sites simultaneously serving physical education and community purposes. The Revere Junior High playing fields are located north of the school structure on land once part of the General Boone Estate.

After Coordination and Response

school structure on land once part of the General Boone Estate. This area will experience an increase in noise exposure due to expansion, and as a result, a 4(f) section is included in this report. Nathan Hale Elementary in Nathan Hills and Jefferson Elementary School playfields in North Revere are outside the projected NEF 30 contour associated with airport expansion.

A 1.5-acre playground is located in South Revere Park adjacent to the First Baptist Church. This Park will be acquired for project construction and replacement land provided adjacent to the relocated new First Baptist Church in South Revere. The following 4(f) section addresses this playground as well as Revere Junior High playfields.

Section 4(f) Statement for Impacted Public Lands

Project Description

Expansion of BIA will result in the acquisition of the South Revere playlot to construct the new 2R-20L runway. Aircraft operations on this new runway will bring community recreation areas adjacent to Revere Junior High School within the NEF 30 contour.

Description of Impacted Facilities

South Revere Playlot

This 1.5-acre playground, owned and maintained by the Boone County Department of Recreation and Parks, is located northeast of the First Baptist Church. Access is available by Military Road and Lindbergh Lane. Facilities are limited to playground equipment and two unlighted multi-purpose courts. There are also several benches and the playlot borders are maintained in flowering shrubs.

The facility is primarily used by children attending the Church's Day Care Center and older neighborhood children after school. The Church Brotherhood sponsors a Saturday teen sports club which uses the multi-purpose courts for organized basketball games.

Playground equipment includes a jungle gym, eight swings, two slides, parallel bars and large sand box. It is estimated that daily usage averages 50-60 persons.

Prior to Coordination

Section 4(f) Statement for South Revere Playlot

Project Description

Expansion of BIA as proposed will result in the acquisition of the South Revere playlot to construct the new 2R-20L runway. New terminal facilities are planned between the parallel runways and a new access road would be constructed.

Description of South Revere Playlot

This 1.5-acre playground, owned and maintained by the Boone County Department of Recreation and Parks, is located northeast of the First Baptist Church. Access is available by Military Road and Lindbergh Lane. Facilities are limited to playground equipment and two unlighted multi-purpose courts. There are also several benches and the playlot borders are maintained in flowering shrubs.

The facility is primarily used by children attending the Church's Day Care Center and older neighborhood children after school. The Church Brotherhood sponsors a Saturday teen sports club which uses the multi-purpose courts for organized basketball games.

Playground equipment includes a jungle gym, eight swings, two slides, parallel bars and large sand box. It is estimated that daily usage averages 50-60 persons.

Relationship to Other Local, State or National Parks

Numerous local recreational facilities are in close proximity to the airport. A seven acre developed sports area abuts Nathan Hale Elementary School, 3.5 miles south of South Revere playlot. The Nathan Hale facility primarily serves the Nathan Hills Community and includes two baseball fields, a soccer/football field, two lighted multi-purpose courts and playground equipment. It is estimated that approximately 10,000 persons use the facilities annually.

A similar six-acre facility is located adjacent to Jefferson Elementary School, 1.5 miles north of Revere Junior High in North Revere.

After Coordination and Response

There are no watercourses within the South Revere playlot nor the Paul Revere Junior High recreation area.

Streams and the lake in Cyrus Pierce State Park are important recreational waters. Extensive erosion and water quality controls, planned for the project, should protect these watercourses. The maximum impact anticipated to occur is a transient impact in Mill Creek turbidities during the construction period. This is not expected to reach levels detrimental to aquatic life or recreational use of park streams or lake.

Alternatives

Two alternative configurations were considered for the project. These are illustrated in Exhibits 18 and 19 in Section V of this report.

Alternate 1 would place the parallel runway to the west of the existing runway. While this would save the South Revere playlot and eliminate noise impact at Revere Junior High's recreation area, Alternate 1 would increase noise exposure on Pierce State Park, Mill Creek State Mental Hospital and residential areas to the west of U. S. 1, north of the industrial park. Further, this alternate requires relocation of Gordon's Run.

Alternate 2 involves construction of the new 10,000-foot runway on an east-west alignment along the southern perimeter of the Airport site. Flight operations for this configuration would significantly increase noise exposure in Pierce Park.

The proposed project, originally Alternate 3, represents the most feasible and prudent alternative since it has the least impact on the most significant parkland in the study area and is conducive to amelioration with respective to other public lands.

Steps to Minimize Harm

The following actions are planned to mitigate impact on public parks and recreation areas:

- South Revere playlot will be replaced in kind. A 2.65-acre relocation site has been selected adjacent to the relocated First Baptist Church site.

Prior to Coordination

Impact of the Project on South Revere Playlot

The project will completely take the South Revere playlot. A relocation site has been selected adjacent to the proposed site of the relocated First Baptist Church in South Revere, which will permit the playlot to continue to function as a neighborhood playground and recreation area for children attending the church's day care center.

Alternatives

The consideration of alternatives to the proposed action included other sites and other on-site configurations. The initial feasibility study begun in 1972 explored the development of a totally new site for air carrier operations. All available contiguous tracts of land between Carrollton and Federalsburg were identified and evaluated in detail. None of the sites were found to be suitable for development based on the evaluation criteria that included location, access, topography, soil characteristics, navigation constraints, compatible land use, and noise exposure.

Three on-site alternative configurations were evaluated as part of the continuing feasibility study. Alternative 1 and 2 to the proposed project are shown on exhibits in Section V. Alternative 1 would place the parallel runway to the west of the existing runway. Noise exposure in some parts of Pierce State Park would increase to NEF 39 and that for the Mental Hospital to the south would increase from a level less than 30 under existing conditions to a level of NEF 39 with Alternative 1. The noise analysis also indicated that more residences would be exposed to NEF values greater than 30 with Alternative 1 than with the proposed action.

Alternative 2 provides for a parallel runway system in an orientation perpendicular to the existing major runway. This alternative's most severe noise impact is on Pierce State Park where the noise exposure at a level of NEF 40 extends well into the park boundaries. Aircraft on final approach would be flying directly over the park's interior.

Under the No Project Alternative, noise exposure will continue along the axis of the existing major runway. The level of exposure will increase in adjacent areas due to the increase in total operations.

The No Project Alternative would result in more gross daily pollution than the other alternates since no improvements are made while operations continue to increase. The relatively greater pollutant loading would result from increased periods of aircraft idling in the aprons and from congestion of surface traffic in the terminal area.

After Coordination and Response

WATER QUALITY

With the exception of a temporary increase in stream turbidities, the project is not anticipated to affect on-site or off-site water quality due to the following measures:

- Permanent erosion controls are incorporated into the project design. All excavated areas will either be paved or planted with cover so that a minimum amount of soil is exposed.
- Petroleum wastes will be contained at the source. Removal will be achieved by absorbent chemicals or mechanical means.
- Storm water will be transmitted by a closed system. Oil separators will be installed in drains to trap residue oils and fuels not eliminated by petroleum absorbents.
- Two retention ponds are provided to permit further opportunity for suspended material to settle. A skimmer will be located at the weir of each pond as a final safeguard.
- Site-generated sanitary sewerage will be treated by the Airport's expanded advanced wastewater treatment plant and piped via gravity sewers to the Tomytank Creek so as not to discharge treated effluent into on-site Class I watercourses. As soon as connection with the municipal system is possible, the on-site interim plant will be abandoned.
- Solid waste will be collected daily and transported to a County landfill off-site.

HYDROLOGY AND FLOOD HAZARDS

Clearing vegetated areas for the paved project will result in an increase in runoff. The weighted runoff coefficient for the composite area will change from 0.35 to 0.40. Major modifications to the on-site drainage system are planned to minimize impact on on-site and off-site hyrology:

Prior to Coordination

WATER QUALITY

With the exception of a temporary increase in stream turbidities, the project is not anticipated to adversely affect on-site or off-site water quality.

HYDROLOGY AND FLOOD HAZARDS

Clearing vegetated areas for the paved project will result in an increase in runoff. The weighted runoff coefficient for the composite area will change from 0.35 to 0.40. Major modifications to the on-site drainage system are planned to minimize impact on on-site and off-site hydrology.

AIR QUALITY

When necessary during the construction period, exposed areas will be sprayed with water to minimize dispersal of dust. Any open burning of cleared materials will be done during periods of most favorable atmospheric conditions and in conformance with State and local standards and ordinances.

Federal emission controls for airport engines will have a positive effect on the reduction of the future emission inventory of the airport. Improvements in the airport's immediate access road system will reduce congestion and delays associated with increased airport-generated traffic.

DIRECT SOCIAL IMPACTS

The project will require the acquisition of 130 homes--100 residences from the South Revere Park and 30 from Nathan Hills. The First Baptist Church and South Revere Playlot will also have to be relocated. Noise exposure will increase in the North and South Revere communities. The following steps have been taken to minimize these impacts:

- Detailed analysis indicated that the supportive infrastructure of the South Revere community mandated relocation of all residents within this same neighborhood. By applying the

After Coordination and Response

None

Prior to Coordination

Sample Emission Calculations

Aircraft

Daily Pollutant Loading (CO from 707 jet) =
Emission Factor (lb/eng-LTO) x Number of LTO's =
No. of engines x Adjustment Factor

$P.L._{(CO-707)}$ = (E.F.) x (LTO's) x (engines) x (A.F.)

where E.F. is derived from AP-42, utilizing appropriate times in operational mode of the aircraft's LTO;

LTO is a full landing and takeoff cycle (1/2 the number of daily operations of that aircraft);

A.F. is an adjustment factor to convert from mode times for AP-42 standard airport to present site

1975 $P.L._{(CO-707)}$ = (47.4 lb/eng-LTO) x (10 LTO's) x (4 engines) x (0.912) = 1,729 lbs/day

Daily emissions are then totalled for all other aircraft types and for other pollutants for each study year.

Autos

Daily Pollutant Loading for vehicular traffic:

$P.L._{(CO)}$ = Average Daily Traffic (ADT) x
Length of Road Segment x Emissions Factor

$P.L._{(CO)}$ = (ADT) x (L) x (EF),

where ADT is in vehicles per day,
L is the length of road in miles over which the ADT travels
EF is expressed in pounds per vehicle-mile and is found in AP-42.

After Coordination and Response

None

Prior to Coordination

DEPARTMENT OF PLANNING
Boone County

March 1, 1977

The Northeast Airport Authority
Bicentennial International Airport

Gentlemen:

This transmittal is intended to provide additional information concerning this department's policy with respect to airport expansion and compatible land use. In our A-95 review, we indicated no objection to the proposal. We were represented on the advisory committee for expansion and were involved in discussions on noise abatement.

Our main concerns are directed toward the areas to the north and east of the airport. Some of this land is presently zoned for manufacturing and commercial uses and is expected to retain those designations. Development on the remaining land will be accomplished with the objective of achieving compatible land use with the airport and other adjacent activities.

We hope this information can be of some assistance to you.

Very truly yours,

Christopher S. Mitchell

Christopher S. Mitchell
Director

E-11

After Coordination and Response

None

Prior to Coordination

ADVISORY COUNCIL ON HISTORIC PRESERVATION

March 1, 1977

FAA Airports District Office
Northeast, America

Gentlemen:

Subsequent to your request for consultation, we have reviewed the results of the noise assessment for the proposed improvements at Bicentennial International Airport.

Based on the degree of noise exposure resulting from modified air traffic control procedures, we would concur in the establishment of this operational alternative. A Memorandum of Agreement to this effect is forthcoming for your review.

Thank you for your cooperation.

Sincerely,

The Advisory Council on
Historic Preservation

After Coordination and Response

None

Prior to Coordination

DEPARTMENT OF PLANNING
Boone County

April 2, 1977

Mr. John Parks, Director
Northeast Game and Parks Commission
2001 West Recreation Road
Northeast, America

Dear Mr. Parks:

The proposed expansion of Bicentennial International Airport would require the removal of the South Revere Playlot.

In accordance with the provisions of the Land and Water Conservation Fund Act, we are hereby requesting approval of the Department of Interior for a change in the use of that portion of land.

A Section 4(f) Statement was prepared for the lot and is contained in the FAA's Draft EIS for airport expansion. A replacement site has been proposed and has been surveyed by our Department of Recreation and Parks (See attached letter).

Thank you for your assistance in processing this request. Please contact us if you have any further questions.

Very truly yours,

Raymond D Egleston

Raymond O. Egleston
Acting Director

E-13

After Coordination and Response

U.S. GOVERNMENT PRINTING OFFICE: 1977732-929/339 1-3

None

Prior to Coordination

STATE DEPARTMENT OF PLANNING AND DEVELOPMENT
Division of Historic and Archaeological Landmarks
Office of the State Archaeologist
Carrollton Capitol Plaza

March 21, 1977

FAA Airports District Office
Northeast, America

Gentlemen:

This is to inform you of the fact that, in response to your request, we have undertaken a preliminary archaeology survey of the area that would be affected by the expansion of the Airport.

Members of my staff have been searching the area intensively, but thus far they have failed to discover a single archaeological site that would be affected by the proposed construction.

A detailed report is being prepared and should be ready soon. If there is any change from our original survey, we will advise you accordingly. In the meantime, however, you can proceed under the assumption that no archaeological sites are likely to be damaged in the course of the development.

Sincerely,

Allison S. Krebs

Allison S. Krebs, Ph.D.
State Archaeologist

After Coordination and Response