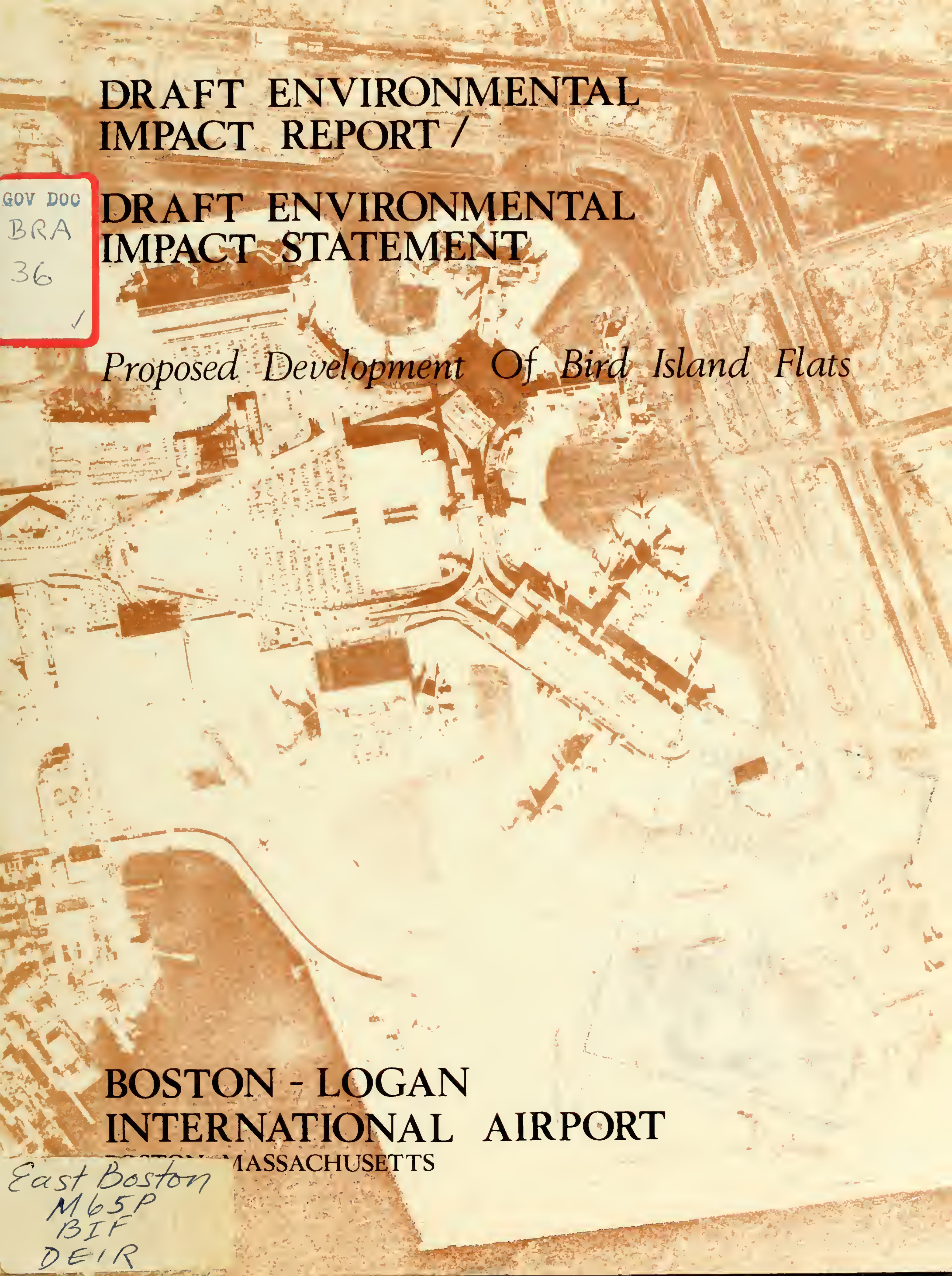

DRAFT ENVIRONMENTAL IMPACT REPORT / DRAFT ENVIRONMENTAL IMPACT STATEMENT

Proposed Development Of Bird Island Flats

BOSTON - LOGAN INTERNATIONAL AIRPORT

MASSACHUSETTS

DRAFT

ENVIRONMENTAL IMPACT REPORT

DRAFT

ENVIRONMENTAL IMPACT STATEMENT

PROPOSED DEVELOPMENT
OF
BIRD ISLAND FLATS

PREPARED FOR

MASSACHUSETTS PORT AUTHORITY
U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

BOSTON-LOGAN INTERNATIONAL
AIRPORT
BOSTON, MASSACHUSETTS

April 7, 1980

Volume 1 of 2 Volumes:

  Volume 1 - Draft EIR/EIS
  Volume 2 - Appendix Volume

DRAFT EIR/EIS

PROPOSED DEVELOPMENT OF BIRD ISLAND FLATS

ABSTRACT

This is an action to assess the environmental effects of a range of alternative land use and facility development intensities which would be accommodated on a 65 acre tract of reclaimed land at the southwest corner of Logan International Airport known as Bird Island Flats and to assess all feasible mitigating measures.

Responsible Agencies:
Massachusetts Port Authority
Federal Aviation Administration

Prepared By:
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In Conjunction With:
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Public Comment Deadline:

State - May 22, 1980 (if it appears in the April 22, 1980 Environmental Monitor, as expected)

Federal - June 2, 1980 (if it appears in the Federal Register, April 18, 1980)

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CHAPTER 5: POTENTIAL IMPACTS

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SUMMARY

Project Description

This Draft EIR/EIS document has been prepared to evaluate the environmental impacts of three land development options for Bird Island Flats at Boston-Logan International Airport (Logan).

The Bird Island Flats (BIF) development parcel is approximately 65 acres in size and is the western portion of a 234 acre landfill located along the southern perimeter of the Airport. The landfill was completed in 1974 after several years of planning, feasibility studies, engineering and construction work (See Figure S-1).

Strong upward trends in air cargo activity at Logan prompted Massport to devote considerable attention to the question of cargo facility expansion. One result of this was the strong emphasis placed upon air cargo during Year I of the Land Use Master Plan (currently in its second year).[1] That Plan concluded with a Massport policy decision to pursue a variety of land uses at BIF, but with a substantial proportion of the site devoted to air cargo facilities.

The alternatives evaluated in this EIR were based on a further study conducted in response to the current and future development needs of Logan and modified by Massport.[2] The development options for BIF reflect these needs for increased cargo and cargo-related facilities, increased operational efficiency at Logan, and the desire for the relocation of some airport related uses from the East Boston community onto the Airport. In addition, the proposed alternatives allow for the relocation of general aviation (GA) activities which are currently located near the Jeffries Point section of East Boston.

The alternatives studied are made up of the following land uses in varying proportions:

- Air Cargo Apron
- Air Cargo Terminal (with freighter apron)

- Air Cargo Terminal (without freighter apron)
- Air Freighter Forwarder Facilities
- General Aviation
- Aircraft Maintenance Facilities
- Auto Rental Facilities
- Noise Barrier Buffer Zone
- Commercial/Residential/Hotel/Conference Center
- Food Preparation

Each alternative includes some cargo facilities (with and without freighter aprons), freight forwarders, and a noise buffer zone. The development alternatives for Bird Island Flats considered in the EIR are:

- Low Intensity Cargo (with and without GA)
- High Intensity Cargo (with and without GA)
- Mixed Use (with and without GA)
- No-Build

Regarding the physical scope of this project, it should be noted that, while BIF is the proposed project area, the environmental consequences of BIF development extend beyond BIF. Because of the obvious need for Logan to accommodate a significant amount of projected demand increases in cargo and other airport functions, the level of development at BIF will have repercussions elsewhere at Logan.

To the extent that development does not occur at BIF, it is likely to take place elsewhere, as required to accommodate future needs (such as air cargo). The North Apron area (the general area between the outbound terminal loop roadway and Prescott Street) is the logical recipient of most of the development, but cannot accommodate projected needs for all essential airport related activities, such as aircraft maintenance, forwarders, etc.

The environmental impacts consider the activities at both BIF and the North Apron, based upon the projected

Year 2000 requirements. Greater activity at one site means less activity at the other, but both impacts are included.

It should be noted that the development alternatives all reflect full utilization of BIF as may be seen in the Year 2000. From the standpoint of environmental impacts, they present a "worst case" analysis. For locus of BIF development area and project boundary, see accompanying maps, Figures S-1 and S-2, on the following pages.

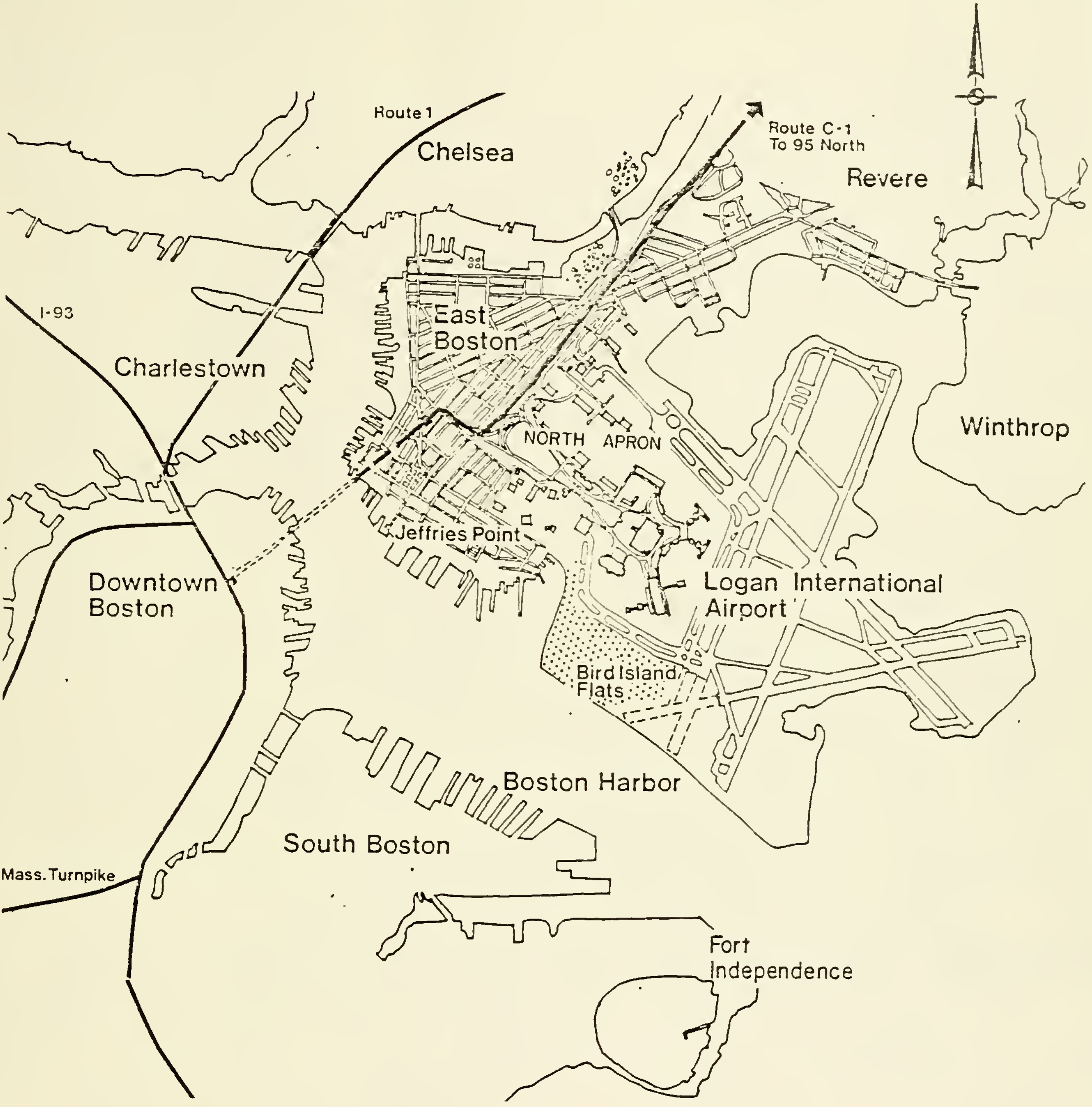
Noise Impacts

All of the Build alternatives would increase the number of airport related noise sources near Jeffries Point relative to existing conditions. Currently, taxiing Eastern Airlines and US Air aircraft, and helicopter operations at BIF, are the most intrusive airport related noise sources. The impact of the Eastern and US Air operations should be reduced 2-3 dB from current levels through introduction of quieter aircraft. Shielding by the buildings included in the Build alternatives, particularly the 40 foot buffer zone along the westerly edge of BIF (included in all the Build alternatives), are expected to further reduce the impact of these operations by approximately 7 dB, most of the time. The cumulative reduction should result in noise levels below the threshold of day or night activity interference.

However, two new noise-producing activities, taxiing cargo aircraft at BIF and truck traffic along a proposed internal Logan road parallel to Maverick Street, will be introduced with any of the Build alternatives.

The existing noise impact of reciprocating general aviation operations will be eliminated in Jeffries Point under all alternatives including No-Build, because the general aviation facility will be moved to either BIF or the North Apron.

Noise generation would be likely to interfere with nighttime activity (sleep interference) at Jeffries Point under the higher activity assumptions of the High Intensity and Mixed Use alternatives. The location of all-cargo aircraft aprons on the Easterly half of the BIF site should insure that noise levels will not interfere with daytime activity (speech interference).

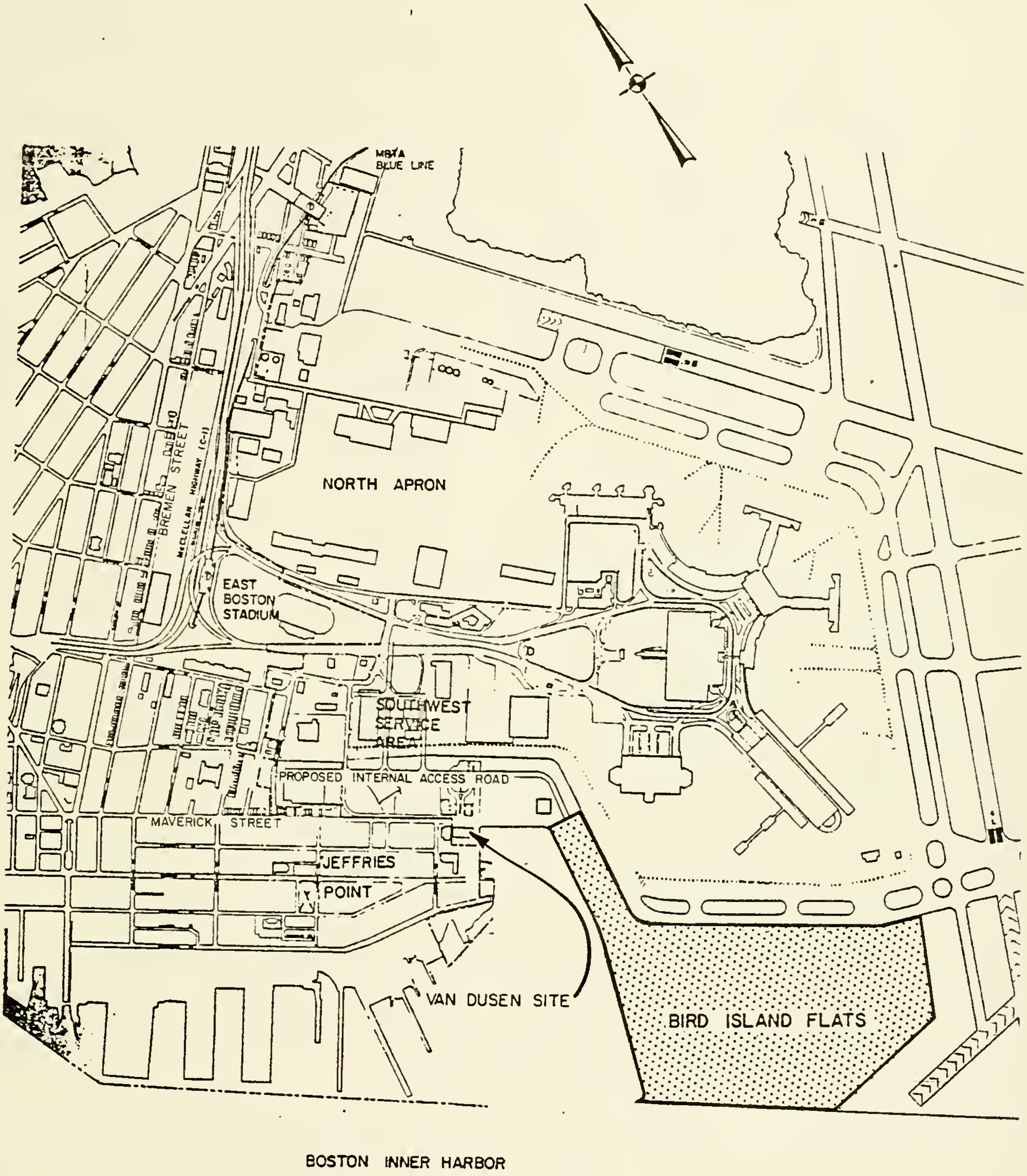


Source: Wallace, Floyd, Ellenzweig, Moore Inc. / Griffith Associates

BOSTON-LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

PROJECT LOCATION

FIGURE
S-1



▨ PROJECT BOUNDARY

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS
PROJECT BOUNDARY

FIGURE
S-2

Projected truck traffic serving BIF (on the road parallel to Maverick Street) would cause day and night activity interference in Jeffries Point, unless a continuous barrier, at least 20 feet high, is constructed.

The only new noise source that will be introduced to the North Apron under the Build alternatives will be taxiing general aviation aircraft under those alternatives that include GA on the North. This noise source would probably not cause activity interference during the day or night.

The introduction of quieter cargo aircraft is expected to result in reductions of the noise levels from taxiing operations, as heard on Bremen Street. Any Build alternative on BIF would cause a further reduction in noise levels on Bremen Street relative to the No-Build alternative.

Air Quality Impacts

A field monitoring program was conducted to estimate the total emissions of carbon monoxide (CO), oxides of nitrogen (NO_x), and hydrocarbons (HC) at the Van Dusen site at the end of Maverick Street and at other measurement sites in East Boston. At the Van Dusen site, Federal and State ambient air quality standards (or proposed standards) for CO, and NO_x were not exceeded in the three month monitoring period.

Diffusion modeling (assuming the No-Build alternative for BIF) indicated that there would be an improvement in CO concentrations and an increase of NO_x concentrations by the Year 2000.

Increased NO_x emissions are attributed to an increase in activity - a shift in the aircraft fleet mix toward wide-bodied jets with more efficient engines, but which have higher NO_x emissions potential - and an anticipated relaxation and/or delay of NO_x emission regulations by the Federal government for gas turbine engines. Maximum 1-hour HC concentrations under the No-Build alternative are also estimated to increase when compared with existing conditions.

All Build alternatives have greater air quality impacts than the No-Build alternative. Projected increases in total emissions as compared to the No-Build alternative are as follows:

NO_x + 1% for All Build Alternatives

HC + 1% for All Build Alternatives

CO + 4% High Intensity Cargo (with GA)

+ 3% Low Intensity Cargo (with GA)

+ 5% Mixed Use (with GA)

The relatively higher increase in CO emissions associated with the Mixed Use alternative is a direct result of the projected addition of approximately 7,500 automobile (round trips) per day under this alternative. Vehicle emissions are also slightly higher than the High Intensity Cargo alternative as compared to the Low Intensity Cargo alternative.

A slight increase in the frequency of odor impacts experienced at Jeffries Point is projected to occur as a result of any of the Build alternatives. Concentration of odor is not expected to change at Jeffries Point. Odor impacts will be reduced at Chelsea/Putnam Streets as a result of any of the Build alternatives.

Water Quality Impacts

Water quality impacts are expected to be minimal, and are related to the volume of run-off.

Low, High Intensity and Mixed Use development will increase the amount of run-off compared to existing conditions. This is not expected, however, to have any appreciable effect on the water quality of Boston Harbor.

Overall, water quality impact differences among the development options are not significant.

Hydrology/Flood Impacts

Earth moving during construction could produce ponding during wet weather. Nevertheless, flooding is not anticipated to be a significant hazard. Implementation of the marina and ferry terminal under the Mixed Use alternative would require Federal and State permits.

Wetlands and Coastal Zones

BIF does not contain any vegetated wetlands. The retaining wall qualifies, however, under Massachusetts law as a coastal bank extending beneath the ocean surface. If construction for either the high or low intensity options is kept away from the wall, then no problem would occur. Marina development or ferry usage under the Mixed Use alternative would require State and Federal permits beyond this EIR/EIS.

Flora and Fauna

BIF is the result of a recent landfill and the North Apron is a paved area. Therefore, implementation of any of the alternatives would not result in negative environmental impacts to flora and fauna. The High and Low Intensity Cargo alternatives would not have any impact on aquatic life. Construction of the marine and ferry terminal under the Mixed Use alternative would have a negligible short-term impact on aquatic life, such as lobsters and crabs.

Social and Economic Impacts

None of the BIF development alternatives result in the displacement of residences or businesses. The relocation of some existing airport-related businesses from the East Boston community to Logan is encouraged in accordance with Massport policy set forth in the 1976 Logan Master Plan.

The BIF Build alternatives assume a north/south service road which will cross the terminal roadway loop and link the northern part of the airport to BIF. This new road would limit access from Logan to the local roads in East Boston.

None of the proposed alternatives would cause the loss or major degradation of parks, recreation areas, schools, or other facilities or amenities contributing to the quality of life in East Boston. Rather, the open space improvements discussed in the visual impacts section should slightly improve the quality of life in East Boston.

Development at BIF can be expected to result in some increase of jobs at the airport. There will be no impacts to population movement and growth, nor public service demands due to implementation of any of the alternatives.

Traffic Impacts

The airport roadway system becomes heavily congested during the morning and evening peak hours (approximately 7 A.M. - 9 A.M. and 4 P.M. - 6 P.M.). Inadequate capacity and operation of the traffic signals at the crossroad of the terminal roadway is one of the major reasons for the congestion. Vehicular traffic and truck movements associated with Logan Airport in the Year 2000 are projected to be between 150%-250% of the present volume. The proposed increase in freight movement will have a major impact on the traffic operation at the airport as a whole and, most particularly, at BIF (under all the Build alternatives) and the North Apron. Under the Mixed Use alternative, the projected number of automobiles would further increase. To alleviate traffic congestion, internal access roads (within the airport) will be improved and a new north/south connection, ultimately developed.

Department of Transportation 4(f) Lands

The implementation of any of the proposed development alternatives on BIF will not affect any Department of Transportation Section 4(f) Land.

Impact on Historic and Archaeologic Sites

No registered historic sites or areas of archaeological significance exist on BIF. Further, there are no such sites close enough to BIF to be affected by BIF development.

Visual Impacts

All BIF Build alternatives include landscape improvements on the southwestern edge of BIF. These improvements include a waterfront pedestrian promenade and landscaped open space between the airport and Jeffries Point Cove.

Light Emission Impacts

Lighting associated with the alternatives is limited to roadway and security lighting in the Low and High Intensity alternatives. The Mixed Use alternative would entail roadway and security lighting as well as lighting for housing, office, hotel and manufacturing. Due to similarities in lighting on Logan and in the City of Boston, there should be no significant light emissions impacts.

Energy Supply and Natural Resources

Impact to proposed energy sources would be insignificant when comparing the Low and High Intensity options with Logan's existing demands. The Mixed Use alternative could require a significant energy increase over Logan's existing demands for energy if current building design standards are used. This demand could be reduced substantially if the proposed Building Energy Performance Standards were applied to the design of the facilities.

Solid Waste

There will be an estimated increase of approximately 36% in the amount of solid waste produced by all facilities at Logan in the Year 2000. The differences between the BIF development options and the No-Build are not significant. The landfill and incinerator sites to which the waste is hauled presently will be able to handle this increase.

Construction Impacts

There would be no significant impacts associated with the construction period of the BIF alternatives. The site preparation work at BIF is expected to take approximately 10 months, while the building construction period is expected to last up to five years or more as determined by demand.

Noise levels associated with construction of facilities not accommodated at BIF may exceed the residential standards along Bremen Street during this period. Analysis of the construction noise levels that would be produced by building the North Apron facilities required by the No-Build option suggests that resultant hourly equivalent levels along Bremen Street may be in the range of 70-74 dB.

All construction operations will occur during the contractor's normal workday; thus, normal nighttime sleeping hours would not be disturbed.

Dust generation can be expected during the site preparation period. Precautions will be taken to reduce the impacts.

Water quality could be marginally affected adversely by siltation if heavy precipitation accompanies earthworking activities while preparing the BIF site. Building construction is expected to produce even less disruption of water quality conditions than site preparation activity.

NOTES

SUMMARY

[1] Wallace, Floyd, Ellenzweig, Moore, Inc./Griffith Associates, Land Use Master Plan Study, Logan International Airport: Year One Report, Cambridge, Massachusetts, June 1979.

[2] Wallace, Floyd, Ellenzweig, Moore, Inc./Griffith Associates, Summer Work Report, Cambridge, Massachusetts, October 1979.

CHAPTER 1: ENVIRONMENTAL ASSESSMENT: REQUIREMENTS, DOCUMENTS AND PROCEDURES

1.1 INTRODUCTION

This Environmental Impact Report (EIR) assesses the environmental impact of proposed alternatives for the development of the Bird Island Flats (BIF) site at Boston-Logan International Airport (Logan). It was prepared for the Massachusetts Port Authority (Massport), which is the owner and operator of Logan, and the Department of Transportation (DOT), Federal Aviation Administration (FAA). The format of this document meets both state requirements mandated by the Massachusetts Environmental Policy Act (MEPA) and the Federal Environmental Impact Statement (EIS) requirements promulgated by the Council of Environmental Quality (CEQ). Although this document serves as a joint EIR/EIS, it will be referred to as an EIR throughout.

The EIR has been prepared for the proposed landside/airside development of BIF, which is a land fill site in the southern part of Logan. Therefore, the development considered in this EIR would take place within the existing airport boundaries. Implementation of any of the alternatives would directly impact East Boston (specifically Jeffries Point), and indirectly other nearby areas, and has economic benefits for much of the New England Region.

1.2 LEGAL REQUIREMENTS

The National Environmental Policy Act of 1969 (NEPA) established environmental protection as a national policy. The Council on Environmental Quality's (CEQ) Regulations for Implementing the Procedure Provisions of the NEPA set guidelines to be followed by federal agencies in implementing NEPA for projects subject to the Act's requirements. FAA Order 1050.1C defines the procedures and guidelines that must be followed in evaluating the potential impacts on the environment that might result from the construction of a major FAA funded project or FAA approval of an airport layout plan. Other Federal legislation, including the statutes and directives listed in Appendix A.1, (page A.1-2) is pertinent to airport projects.

This EIR complies with Massachusetts laws (MGL Ch. 30, § 61-62) and its accompanying Rules and Regulations (301 CMR 10.00). The EIR is an evaluative planning tool for use within the framework of Massport's on-going master land use planning process for Logan. The relationship between this EIR and the Logan Land Use Master Plan is discussed in Chapter Four.

In addition to EIR requirements, all BIF Build alternatives will require an Order of Conditions from the Boston Conservation Commission (MGL Ch. 131, § 40) and an approval from the Massachusetts Department of Environmental Quality and Engineering (MA DEQE), Division of Water Pollution Control. For one of the alternatives (Mixed Use), further permits might be required from the U. S. Army Corps of Engineers, and MA Division of Waterways (CH. 91).

1.3 DOCUMENTS

In the preliminary environmental assessments the following public documents resulted:

on State level:

(A) Environmental Notification Form (notice appeared in Environmental Monitor October 9, 1979).

(B) The Scope of the EIR as mandated by the Secretary of Environmental Affairs (November 8, 1979).

on Federal level:

(C) Environmental Assessment (notice appeared in Federal Register, Thursday, December 6, 1979).

(D) The Scope of the EIS as mandated by the FAA (January 9, 1980). The FAA concurred that the Scope mandated on the State level would satisfy the Federal requirements.

The above referenced documents (A) through (D), are included at the end of this Chapter.

1.4 PUBLIC PARTICIPATION AND COORDINATION

Prior to the State and Federal Scoping sessions, seven meetings were held with the environmental consultants and the joint lead agencies (Massport and the FAA), to develop the program for the study. In accordance with the guidelines set by MEPA and FAA Order 1050.1C, the State Scoping session was held on October 22, 1979, and the Federal Scoping session was held on December 13, 1979. Interested agencies and groups were invited to attend, for the purposes of identifying the areas of concern as well as determining the level of effort required in the preparation of various work elements. Minutes of both Scoping sessions and the list of attendees are included in Appendix I of this report.

Massport has sought input from many community and user groups on many projects, such as the Logan Land Use Master Plan. The program includes working with the existing Airport Users Committee, related subcommittees, and the East Boston Land Use Council, through various meetings, presentations, and discussions. With regard to BIF and the Land Use Master Plan, six public meetings were held from March, 1979 through the fall of 1979 in East Boston. The East Boston community desired more involvement and technical assistance for review and critique of the EIR material. Massport agreed, and at the suggestion of the community, Justin Gray (urban planner), was selected to work as liaison between the community and Massport in order to evaluate the planning material related to community impacts. In addition, two more specialists suggested by the community were made available by Massport: Ilene Busch-Vishniac, an acoustical specialist (MIT), for review of the noise impact analysis; and John D. Spengler, an air quality specialist (Harvard), for review of air pollution impact analysis.

The Scope of work used as the basis of this EIR evolved through interactions between Massport, the community consultants, the FAA, the consultant team, plus significant input from community groups and agencies at the Scoping sessions. As seen in the Scoping document, the Scope mandated by the Massachusetts Secretary of Environmental Affairs reflects major inputs from community groups, community consultants, users as well as many state agencies.

1.5 NOTICE OF REVIEW OF DRAFT EIR

The notice of this Draft EIR is expected to appear in the State Environmental Monitor on April 22, 1980, and the Federal Register on April 18, 1980. The State comment period is 30 days, and the Federal comment period is 45 days. Should the Draft EIR not appear in the Federal Register on April 18, 1980, the Federal review period will commence from the date of publication in the Federal Register for 45 days.

The public comment period on the Draft EIR extends on a State level from April 22, 1980 to May 22, 1980, and on the Federal level from April 18 to June 2, 1980.

A public hearing (sponsored jointly by Massport and the FAA) is scheduled to be held on May 12.

Comments on this Draft EIR should be submitted to John Silva, Federal Aviation Administration, 12 New England Executive Park, Burlington, Massachusetts 01803 and Sam Mygatt, MEPA (Massachusetts Executive Office of Environmental Affairs), 100 Cambridge Street, Boston, Massachusetts 02202.

1.6 PREPARATION OF FINAL EIR

At the conclusion of the public comment period, the comments will be addressed (including comments by the Massachusetts Secretary of Environmental Affairs), and incorporated into the Final EIR.

Massport in consultation with FAA will select a "preferred alternative" for development at BIF. That preferred alternative will be treated in greater detail in the Final EIR. The preferred alternative will also be incorporated into the Logan Land Use Master Plan as discussed in Chapter Four.

(A)

APPENDIX A
COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS

ENVIRONMENTAL NOTIFICATION FORM

03587

I. SUMMARY

A. Project Identification
1. Project Name Development of Bird Island Flats
2. Project Proponent Massachusetts Port Authority
Address 99 High St., Boston, Mass.

B. Project Description: (City/Town(s) East Boston
1. Location within city/town or street address Logan Airport, East Boston, Mass.
2. Est. Commencement Date: August 1980 Est. Completion Date: ______
Approx. Cost $ Not available at this time Current Status of Project Design: ______% Complete

C. Narrative Summary of Project
Describe project and give a description of the general project boundaries and the present use of the project area. (If necessary, use back of this page to complete summary).

Massport is exploring development alternatives at Bird Island Flats. Possible development will include air cargo facilities, general aviation relocation, and airport support systems. There will be a look at construction patterns that will reduce noise impacts from airfield capacity in the nearby areas. Also, there will be a study of the impacts of existing and proposed runways on development configurations.

Massport's land use consultant is developing three alternatives, in addition to a no build, which will receive an extensive environmental analysis.

After environmental reviews are completed and the desired alternative is selected by Massport, construction of first phase will commence in mid-to-late 1980.

Copies of this may be obtained from:
Name: Norman J. Faramelli Firm/Agency: Massport Authority
Address: 99 High St., Boston, MA 02110 Phone No. 482-2950

1979 **THIS IS AN IMPORTANT NOTICE. COMMENT PERIOD IS LIMITED.**
For Information, call (617) 727-5830

Use This Page to Complete Narrative, if necessary.

This project is one which is categorically included and therefore automatically required preparation of an Environmental Impact Report: YES________ NO__X______

D. Scoping (Complete Sections II and III first, before completing this section.)

1. Check those areas which would be important to examine in the event that an EIR is required for this project. This information is important so that significant areas of concern can be identified as early as possible, in order to expedite analysis and review.

	Construction Impacts	Long Term Impacts		Construction Impacts	Long Term Impacts
Open Space & Recreation	X	X	Mineral Resources		
Historical			Energy Use	X	X
Archaeological			Water Supply & Use		X
Fisheries & Wildlife		X	Water Pollution		X
Vegetation, Trees	X	X	Air Pollution	X	X
Other Biological Systems			Noise	X	X
Inland Wetlands			Traffic	X	X
Coastal Wetlands or Beaches			Solid Waste		X
Flood Hazard Areas			Aesthetics		X
Chemicals, Hazardous Substances,			Wind and Shadow		
High Risk Operations		X	Growth Impacts		X
Geologically Unstable Areas			Community/Housing and the Built		
Agricultural Land			Environment		X
Other (Specify)					

2. List the alternatives which you would consider to be feasible in the event an EIR is required.

The no build alternative will be looked at, in addition to 3 types of development patterns with different road way designs at Bird Island Flats, including air cargo, relocated general aviation, and air support services.

E. Has this project been filed with EOEA before? Yes ____ No X
If Yes, EOEA No. ________ EOEA Action? ____________________

F. Does this project fall under the jurisdiction of NEPA? Yes X No ____
If Yes, which Federal Agency? ________________ NEPA Status? ____________

G. List the State or Federal agencies from which permits will be sought:

Agency Name	Type of Permit
DEQE - A&H Materials	Notification & approval
Water Pollution Control	Certificate of approval
CZM	Consistency finding
EPA	NPDES permit, if analysis shows that one is necessary

H. Will an Order of Conditions be required under the provisions of the Wetlands Protection Act (Chap. 131, Section 40)?
Yes X No ____
DEQE File No., if applicable: ________

I. List the agencies from which the proponent will seek financial assistance for this project:

Agency Name	Funding Amount
FAA	Not known at this time

II. PROJECT DESCRIPTION

A. Include an original 8½ x 11 inch or larger section of the most recent U.S.G.S. 1:24,000 scale topographic map with the project area location and boundaries clearly shown. Include multiple maps if necessary for large projects. Include other maps, diagrams or aerial photos if the project cannot be clearly shown at U.S.G.S. scale. If available, attach a plan sketch of the proposed project.

B. State total area of project: ____________________
Estimate the number of acres (to the nearest 1/10 acre) directly affected that are currently:

1. Developed .... ____ acres
2. Open Space/Woodlands/Recreation 80 acres
3. Wetlands .... ____ acres
4. Floodplain .... ____ acres
5. Coastal Area .... ____ acres
6. Productive Resources
   Agriculture .... ____ acres
   Forestry .... ____ acres
   Mineral Products .... ____ acres

C. Provide the following dimensions, if applicable:
Length in miles ____ Number of Housing Units ____ Number of Stories ____

	Existing	Immediate Increase Due to Project
Number of Parking Spaces	____	____
Vehicle Trips to Project Site (average daily traffic)	*	____
Estimated Vehicle Trips past project site	____	____

D. If the proposed project will require any permit for access to local or state highways, please attach a sketch showing the location of the proposed driveway(s) in relation to the highway and to the general development plan; identifying all local and state highways abutting the development site; and indicating the number of lanes, pavement width, median strips and adjacent driveways on each abutting highway; and indicating the distance to the nearest intersection. *This will be determined in forthcoming environmental assessment.

III. ASSESSMENT OF POTENTIAL ADVERSE ENVIRONMENTAL IMPACTS

Instructions: Consider direct and indirect adverse impacts, including those arising from general construction and operations. For every answer explain why significant adverse impact is considered likely or unlikely to result.

Also, state the *source* of information or other basis for the answers supplied. If the source of the information, in part or in full, is not listed in the ENF, the preparing officer will be assumed to be the source of the information. Such environmental information should be acquired at least in part by field inspection.

A. Open Space and Recreation

1. Might the project affect the condition, use or access to any open space and/or recreation area?
Yes __X__ No _____

Explanation and Source:

BIF is now inaccessible open space

B. Historic Resources

1. Might any site or structure of historic significance be affected by the project? Yes _____ No __X__

Explanation and Source:

2. Might any archaeological site be affected by the project? Yes _____ No __X__

Explanation and Source:

C. Ecological Effects

1. Might the project significantly affect fisheries or wildlife, especially any rare or endangered species?
Yes _____ No __X__

Explanation and Source: Impact on fish/wildlife is expected to be minimal or non-existent. The issues will be reviewed in environmental assessment.

2. Might the project significantly affect vegetation, especially any rare or endangered species of plant?
Yes ______ No __X__
(Estimate approximate number of mature trees to be removed: __________)

Explanation and Source:

3. Might the project alter or affect flood hazard areas, inland or coastal wetlands (e.g., estuaries, marshes, sand dunes and beaches, ponds, streams, rivers, fish runs, or shellfish beds)? Yes ______ No __X__

Explanation and Source:

4. Might the project affect shoreline erosion or accretion at the project site, downstream or in nearby coastal areas? Yes ______ No __X__

Explanation and Source:

5. Might the project involve other geologically unstable areas? Yes ______ No __X__

Explanation and Source:

D. Hazardous Substances

1. **Might the project involve the use, transportation, storage, release, or disposal of potentially hazardous substances?**
Yes __X__ No ______

Explanation and Source: If hazardous materials are transported (via air cargo) the shipment will comply with U.S. D.O.T. regulations.

E. Resource Conservation and Use

1. Might the project affect or eliminate land suitable for agricultural or forestry production?
Yes ______ No __X__
(Describe any present agricultural land use and farm units affected.)

Explanation and Source:

2. Might the project directly affect the potential use or extraction of mineral or energy resources (e.g., oil, coal, sand & gravel, ores)? Yes ______ No __X__

Explanation and Source:

3. Might the operation of the project result in any increased consumption of energy? Yes __X__ No ______

Explanation and Source:
(If applicable, describe plans for conserving energy resources.)

F. Water Quality and Quantity

1. Might the project result in significant changes in drainage patterns? Yes __X__ No ______

Explanation and Source:

Depending upon the alternatives selected the drainage could vary.

2. Might the project result in the introduction of pollutants into any of the following:

(a) Marine Waters	Yes __X__	No ______
(b) Surface Fresh Water Body	Yes ______	No ______
(c) Ground Water	Yes ______	No ______

Explain types and quantities of pollutants.

There is a small chance of this, but it will be looked at in environmental assessment.

3. Will the project generate sanitary sewage? Yes X No ____
   If Yes, Quantity: ____ gallons per day (Unknown at present time)
   Disposal by: (a) Onsite septic systems .... Yes ____ No ____
   (b) Public sewerage systems .... Yes ____ No ____
   (c) Other means (describe) ____

4. Might the project result in an increase in paved or impervious surface over an aquifer recognized as an important present or future source of water supply? Yes ____ No X

   Explanation and Source:

5. Is the project in the watershed of any surface water body used as a drinking water supply?
   Yes ____ No X
   Are there any public or private drinking water wells within a 1/2-mile radius of the proposed project?
   Yes ____ No X

   Explanation and Source:

6. Might the operation of the project result in any increased consumption of water? Yes X No ____
   Approximate consumption ____ gallons per day. Likely water source(s) ____

   Explanation and Source:

7. Does the project involve any dredging? Yes ____ No X
   If Yes, indicate:
   Quantity of material to be dredged ____
   Quality of material to be dredged ____
   Proposed method of dredging ____
   Proposed disposal sites ____
   Proposed season of year for dredging ____

   Explanation and Source:

G. Air Quality All of these (G thru J) will be analyzed and quantified during environmental assessment.

1. Might the project affect the air quality in the project area or the immediately adjacent area?
   Yes X No ____
   Describe type and source of any pollution emission from the project site. ____

2. Are there any sensitive receptors (e.g., hospitals, schools, residential areas) which would be affected by any pollution emissions caused by the project, including construction dust? Yes X No ____

   Explanation and Source:

3. Will access to the project area be primarily by automobile? Yes X No ____
   Describe any special provisions now planned for pedestrian access, carpooling, buses and other mass transit.

H. Noise

1. Might the project result in the generation of noise? Yes X No ____

   Explanation and Source:
   (Include any source of noise during construction or operation, e.g., engine exhaust, pile driving, traffic.)
   Usual construction drilling and new aircraft activity adjacent to Jeffries Pt.

2. Are there any sensitive receptors (e.g., hospitals, schools, residential areas) which would be affected by any noise caused by the project? Yes X No ____

   Explanation and Source:

Noise would be heard in Jeffries Pt. Noise barrier designs, however, should reduce noise impacts.

I. Solid Waste

1. Might the project generate solid waste? Yes __X__ No _____

Explanation and Source:
(Estimate types and approximate amounts of waste materials generated, e.g., industrial, domestic, hospital, sewage sludge, construction debris from demolished structures.)

J. Aesthetics

1. Might the project cause a change in the visual character of the project area or its environs?
Yes __X__ No _____

Explanation and Source:

This, too, will be looked at in environmental review.

2. Are there any proposed structures which might be considered incompatible with existing adjacent structures in the vicinity in terms of size, physical proportion and scale, or significant differences in land use?
Yes _____ No __X__

Explanation and Source:

This issue will need to be explored as different alternatives are set forth

3. Might the project impair visual access to waterfront or other scenic areas? Yes __X__ No _____

Explanation and Source:

K. Wind and Shadow

1. Might the project cause wind and shadow impacts on adjacent properties? Yes _____ No __X__

Explanation and Source:

IV. CONSISTENCY WITH PRESENT PLANNING

A. Describe any known conflicts or inconsistencies with current federal, state and local land use, transportation, open space, recreation and environmental plans and policies. Consult with local or regional planning authorities where appropriate.

NONE

V. FINDINGS AND CERTIFICATION

A. The notice of intent to file this form has been will be published in the following newspaper(s).

(Name) Boston Globe	(Date) September 11, 1979
East Boston Community News	September 11, 1979
East Boston Times Reg. World Review-Bremen St. E.B.	

B. This form has been circulated to all agencies and persons as required by Appendix B.

September 11, 1979
Date

Signature of Responsible Officer
or Project Proponent

Norman J. Faramelli
Name (print or type)

Address Massport Authority
99 High St., Boston, MA
Telephone Number 482-2950

September 11, 1979
Date

Signature of person preparing
ENF (if different from above)

Jean F. LeClair
Name (print or type)

Address Massport Authority
99 High St., Boston, MA
Telephone Number 482-2950

The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
100 Cambridge Street
Boston, Massachusetts 02202

EDWARD J. KING
GOVERNOR
JOHN A. BEWICK
SECRETARY

CERTIFICATE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS

ON

ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME: Development of Bird Island Flats

EOEA NUMBER: 03587

PROJECT PROPONENT: Massachusetts Port Authority

DATE NOTICED IN MONITOR: October 9, 1979

Pursuant to M.G.L., Chapter 30, Section 62A, and Section 10.04(9) of the Regulations Governing the Implementation of the Massachusetts Environmental Policy Act, I hereby determine that the above referenced project does require an Environmental Impact Report.

11/8/79
DATE

Samuel G. Mygatt for
JOHN A. BEWICK, SECRETARY

FORM A

The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
100 Cambridge Street
Boston, Massachusetts 02202

EDWARD J KING
GOVERNOR
JOHN A BEWICK
SECRETARY

(B)

DETERMINATION OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS OF SCOPE AND ALTERNATIVES FOR ENVIRONMENTAL IMPACT REPORT

PROJECT NAME: Development of Bird Island Flats

EOEA NUMBER: 03587

PROJECT PROPONENT: Massachusetts Port Authority

DATE NOTICED IN MONITOR: October 9, 1979

Pursuant to Massachusetts General Laws, Chapter 30, Section 62A, and Section 10.05(1) of the Regulations Governing the Implementation of the Massachusetts Environmental Policy Act, I hereby issue the following determination of scope and alternatives for the Environmental Impact Report on the above-referenced project:

11/8/79
DATE

Samuel C. Mygatt for
JOHN A. BEWICK, SECRETARY

FORM C

The Commonwealth of Massachusetts
Executive Office of Environmental Affairs
100 Cambridge Street
Boston, Massachusetts 02202

EDWARD J KING
GOVERNOR
JOHN A. BEWICK
SECRETARY

SCOPE

EOEA 03587, BIRD ISLAND FLATS DEVELOPMENT

As discussed at the October 22 Consultation Session, Massport desires to structure the state EIR so that it may be processed as a federal EIS if the Federal Aviation Administration should call for one. Although all subjects called for by MEPA regulations (301 CMR 10.05) must be addressed, the format of the report may conform to that required to meet FAA NEPA and CEQ NEPA regulations. A clear, orderly and comprehensive EIR evaluating both construction and operational impacts is the goal.

The EIR should devote extensive attention to the noise and air quality analysis and should include discussion of psychological and stress effects as well as the ability to meet promulgated standards. The noise analysis should include time of day, pure tone effects and peak noise levels. Air quality should include a map of sensitive receptors, an analysis for CO, HC and NO and must include ambient monitoring for at least 3 to 6 months at Jeffries Point. Location of monitors and selection of receptors for modeling should be done in consultation with DAHM.To the extent possible, the question of the potential health effects due to particulate size and composition should be addressed. Potential odor problems should be identified and evaluated to the extent possible. As mitigation measures, management techniques such as time of operation, changes dictated by atmospheric conditions and tow options should be included. The greater base monitoring is needed to determine current conditions under differing atmospheric conditions.

Traffic impacts for the various levels of development should be analyzed for on-site, general airport and community area impacts.

Of lesser potential magnitude and therefore requiring more general treatment in the EIR are Water Quality, Visual, Hydrologic/Wetland, solid waste, water supply and waste water treatment impacts. Included in these areas should be a discussion of the existing excess storm water treatment capacity on site, the impact of an increased volume of discharge at the outfall, erosion control during construction, and public access and recreational potential for the developed site, including access to the water's edge. The visual impacts should be evaluated from neighborhoods and from the water. Solid waste generation and disposal for both construction and operation should be addressed. Estimate water usage and sewage generation, and evaluate Boston's ability to handle the new demand.

Additionally, any impacts on Section 4(f) land and historical/archaeological sites identified during the study should be discussed. The impact on animal and bird populations of changing the terrestrial habitat, and the impacts of the outfall volume and contaminant content on fisheries should be included. The report should evaluate compatibility of each alternative with existing or proposed plans including the Master Plan, potential runway expansion and the third harbor tunnel possibilities.

Along with the no build and the various build configurations to be evaluated should be an evaluation of the displaced development impacts. Will the overall land use patterns dictated by the adoption of plan C change the identified impacts in areas other than Bird Island Flats, and to what extent?

Finally, Massport should evaluate its ability to ensure implementation of the identified mitigation measures.

The annexed comments1/ of the Division of Air & Hazardous Materials, Mass. Aeronautics Commission, Boston Redevelopment Authority, Mr. John D. Spengler and Ms. Ilene Busch-Vishniac should be responded to in the Draft EIR. With regard to the BRA comment, the requested analysis of airport-related commercial development within the East Boston residential community may be limited to a generalized qualitative appraisal. The substance of paragraphs 2, 3, and 4 of the October 26 M.A.C. comment may be discussed by Massport and M.A.C. outside of the EIR process.

1/ See Appendix I

(C)

ENVIRONMENTAL ASSESSMENT
ON DEVELOPMENT AT
BIRD ISLAND FLATS
LOGAN INTERNATIONAL AIRPORT

BOSTON, MASS

This environmental assessment becomes a federal document when evaluated and signed by a responsible FAA official.

John C. Silva
Responsible FAA Official

DATE January 25, 1980

Environmental Assessment on Development
at Bird Island Flats
Logan International Airport Boston, MA

Project Description

The project consists of the development of 65 acres at Bird Island Flats at Logan Airport. The development options Massport is considering are designed to deal primarily with the accommodation of air cargo facilities for freighters, air cargo facilities for air carriers, maintenance areas, and buildings for freight forwarders and food preparation, and possible commercial parking lots. In addition, one of the alternatives will consider various types of commercial developments. Two of the alternatives will be looked at with and without General Aviation located at Bird Island Flats. All of the land use alternatives have kept open the area necessary to recapture the full length of Runway 9, which is now designated as an extended safety area.

The project will include the construction of the infrastructure - roadways and utilities, the buildings, (with parking and loading areas), in addition to apron space and taxiways for air freighter operations, and possible for general aviation.

Possible Environmental Impacts

The major adverse environmental impacts will be in the area of air quality and noise levels resulting from the operation of air freighters and ground transportation vehicles. Extensive studies are being planned to assess noise and air quality impacts. Water quality impacts are expected to be minimal. Since the area is a land fill, it does not have archaeological or historical significance.

Traffic to Logan will be increased, but since most air cargo vehicles travel to Logan during the off peak hours, we do not contemplate serious traffic flow problems resulting from most Bird Island Flats alternatives.

Mitigating Measures

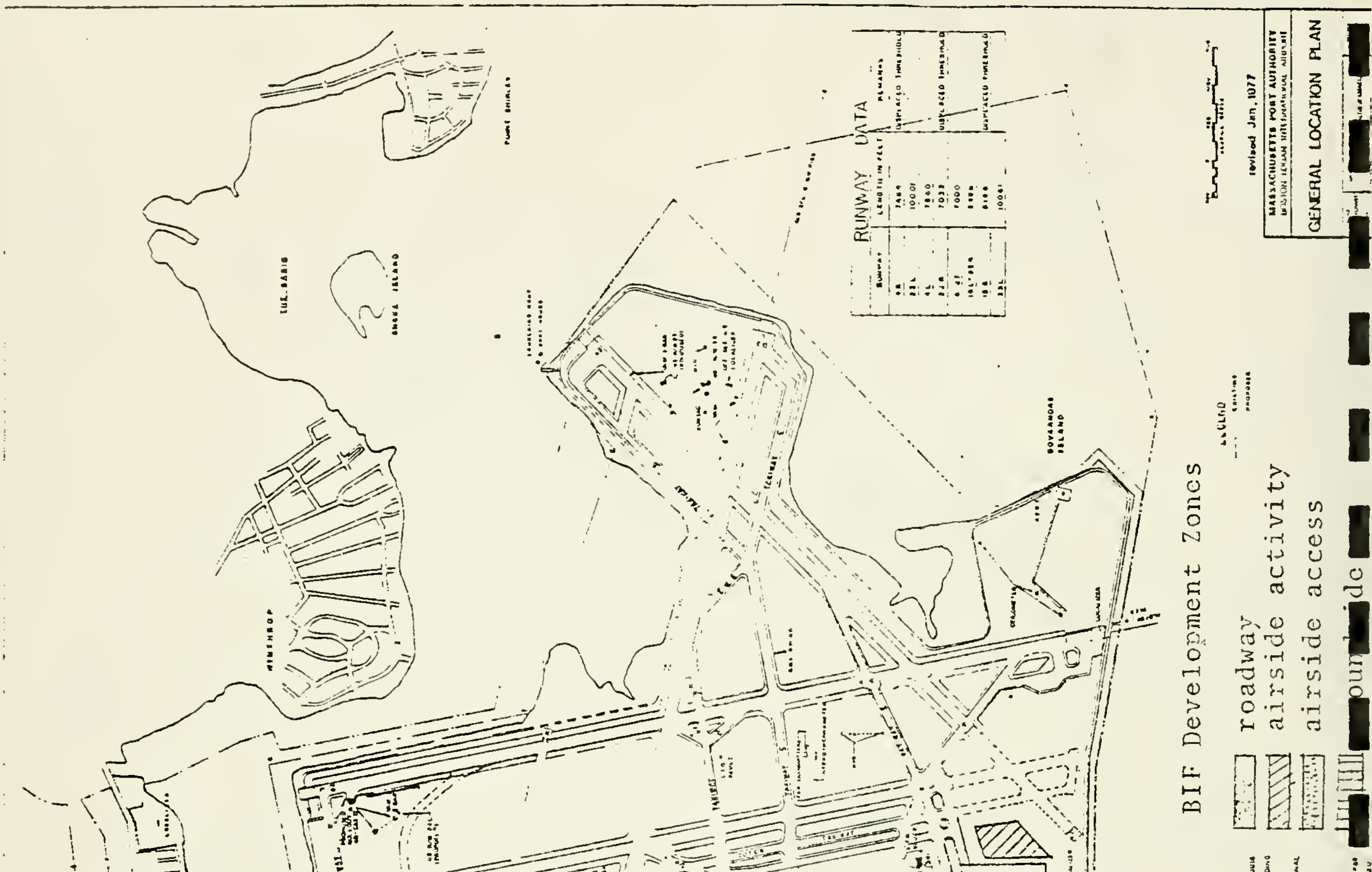
All the land use alternatives have been designed to include a buffer zone to reduce noise levels and air quality impacts. The alternatives have also given serious consideration to the location and orientation of buildings in a manner that will reduce adverse environmental impacts.

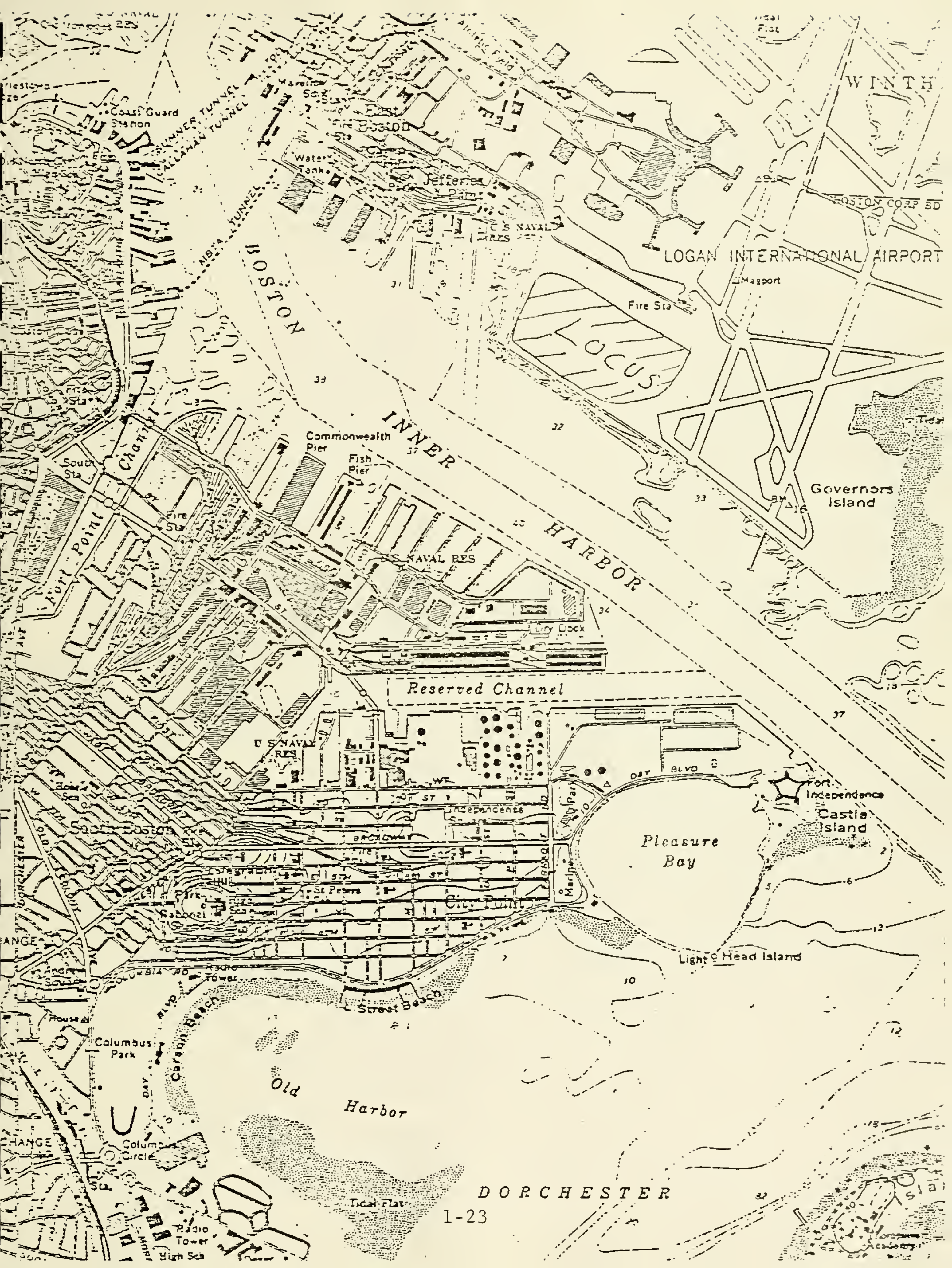
Public Response

Several meetings on the project have been held with community groups (including the E. Boston Land Use Council), agencies and officials in the City of Boston, and potential users who would like to locate at Bird Island Flats. Based on the feedback we have received thus far, it appears that this project has the potential of being highly controversial. The community groups, in particular, are concerned that the noise and air quality impacts, traffic flows and land use options be thoroughly assessed.

Attachments

The attached maps depict the location of the Bird Island Flats project and the possible roadway design being considered. Note that there will be an effort to locate air freighters activity as far away from the community as possible.


RUNWAY DATA
revised Jan, 1977
MASSACHUSETTS PORT AUTHORITY
GENERAL LOCATION PLAN
BIF Development Zones
roadway
airside activity
airside access
INDEX
WINTHROP
SNAKE ISLAND
GOVERNORS ISLAND
MAVERICK SQUARE
BOSTON HARBOR



WINTH
Coast Guard Station
SUMNER TUNNEL
CALLAHAN TUNNEL
MBTA TUNNEL
East Boston
Water Tank
Jefferies Point
U S NAVAL RES
BOSTON CORP BD
LOGAN INTERNATIONAL AIRPORT
Magport
Fire Sta
LOCUS
BOSTON INNER HARBOR
Governors Island
Commonwealth Pier
Fish Pier
Fort Point Channel
South Sta
Fire Sta
U S NAVAL RES
Dry Dock
Reserved Channel
U S NAVAL RES
DAY BLVD
Fort Independence
Castle Island
Pleasure Bay
Marine Park
South Boston
Telegraph Hill
St Peters
City Point
Light
Head Island
L Street Beach
Carson Beach
Radio Tower
Columbus Park
Old Harbor
Columbus Circle
Radio Tower
High Sch
Tidal Flat
DORCHESTER

(D)

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

NEW ENGLAND REGION
12 NEW ENGLAND EXECUTIVE PARK
BURLINGTON, MASS 01803
Tel: (617) 273-7233

9 JAN 1980

Ref: BOS-EIS No. 3

Mr. Norm Faramelli
Massachusetts Port Authority
99 High Street
Boston, MA 02110

Dear Norm:

Attached is a meeting record for the BIF federal scoping meeting.

Generally we believe that the scope of work now proposed by the consultant team can accommodate the interests of the federal agencies as expressed at the meeting. In the air quality area, EPA and BBN have been coordinating a mutually acceptable study approach, especially in the PSD area.

Sincerely,

VINCENT A. SCARANO
Chief, Planning & Programs Branch

Enclosure

cc: Ashraf Jan, Hoyle, Tanner & Assoc.
Meng Chng, Bolt, Beranek & Newman
Stan Reich, Bryant Assoc.

CHAPTER 2: PURPOSE AND NEED OF PROPOSED ACTION

In this chapter, the overview of the proposed action, potential benefits and need for the project are considered.

2.1 OVERVIEW OF BIF DEVELOPMENT

During the period between 1967 and 1974,. Massport undertook surveying, engineering and construction work which resulted in the filling of 234 acres of Boston Harbor along the southern perimeter of Logan Airport to create an area referred to as Bird Island Flats. Much of this original 234 acre parcel was subsequently utilized by the completion of a 1789-foot safety overrun for Runway 9 and a 1896-foot safety overrun on Runway 4L. Airspace clearance requirements further reduced the size of the developable BIF parcel to about 65 acres.

Due partly to steady increases in air cargo tonnage handled at Logan over the last few years, Massport began to receive, in late 1978 and early 1979, inquiries from air cargo carriers regarding facility improvement possibilities. In particular, these carriers expressed strong interest in constructing new cargo handling buildings at BIF. These early expressions of interest, together with Massport's policy to accommodate cargo demand, were influential in shaping the basic approach to the Year I Report of the Logan Land Use Master Plan, which was just getting underway during early 1979.

Consequently, the Logan Land Use Master Plan Year I effort was structured to devote considerable attention to the need for air cargo facilities, including the level, distribution and placement of such facilities at Logan. The study activities were set up so that findings would yield useful information with which to address this pressing near-term problem.

In this regard, a major product of the Year I Report was an indication of the range of possible roles which BIF might play in responding to demands for air cargo facility expansion. This was apparent to the overall development options for Logan as formulated during Year I, which proposed three major cargo activity locational options. These "Concept Plans" which serve to define the basic internal organization of the airport, are as follows:

- Concept Plan A: Cargo activity concentrated on North Apron
- Concept Plan B: Cargo activity concentrated on Bird Island Flats
- Concept Plan C: Cargo activity distributed between North Apron and BIF in such a manner that proximity of cargo and passenger operations for each carrier is maximized.

Concept Plan C was subsequently selected by Massport as the fundamental future development theme for Logan Airport, with the result that BIF development will generally follow a split use pattern. Accordingly, more recent land use planning efforts for BIF have identified specific infrastructure and land use locational configurations with the following categories of land uses in varying proportions.

- Air cargo apron
- Air cargo terminal (with freighter apron)
- Air cargo terminal (without freighter apron)
- Air freight forwarder facilities
- Food preparation facilities
- General Aviation
- Aircraft Maintenance
- Car Rentals
- Noise barrier - buffer zone
- Commercial/Residential/Hotel/Conference Center

These land use categories have been arranged into three main development alternatives with a "sub-alternative" to each depending upon whether or not General Aviation is located on BIF. Together with the No-Build alternative, this has resulted in a total of seven distinct land use combinations which serve as the basis of the environmental investigations presented in this document. These alternatives are described in detail in Chapter Three. Also, further discussion on how BIF development is related to other aspects of Logan planning can be found in Chapter Four.

A preferred alternative will be identified after evaluation of the comments received in response to this Draft, and will be designated as the proposed action in a Final EIR. The preferred alternative will be comprised of development options chosen from elements of the three Build alternatives.

The Massport proposed action is the construction of the infrastructure, roadways, utilities, buildings, (with parking and loading areas), apron space, and taxiways for the project. The proposed Federal Action is the approval of a revision to the Boston-Logan International Airport layout plan by the FAA which incorporates the preferred alternative, and funding of those portions of the development which are eligible for participation under ADAP or other programs.

2.2 POTENTIAL BENEFITS

The positive effects of air cargo development at BIF with any of the Build alternatives are:

- increased operating efficiency of Logan by minimizing distances between air passenger/air cargo operations
- improved airport functional relationships between airside/landside, and airport/community
- improved airside security
- maximization of existing airport land to allow for airport related uses
- attraction of airport-related businesses away from East Boston to Logan
- increased compatibility with adjacent land uses
- ability to meet projected air cargo demands with ease
- consolidation of general aviation at either BIF or the North Apron
- generation of short-term and long-term employment both in the airport and throughout the region
- stimulus to local and regional economy
- improved visual environment

2.3 PURPOSE AND NEED

The master plan adopted by the Massachusetts Port Authority in April 1976 established a policy that:

> "Logan Airport facilities are essentially complete and projected traffic growth can be accommodated by existing facilities within the existing land area.... New Development within the airport boundaries will be limited primarily to air cargo, rent-a-car, and other airport related facilities." 1/

That policy, which specifically identified Bird Island Flats as an "On Airport Development Area",2/ called for a development program conducted under strict environmental controls in order to provide additional cargo facilities, and encouraged the relocation of off-airport activities to within the airport boundaries in order to minimize the undesirable impacts of airport related activities on neighboring communities.

2.3.1 Growth Trends

Projections of future demand for air cargo, and passenger services, as well as the associated level of aircraft flight activity, indicate that the demand for these services will continue to grow at least through the turn of the century. Although there are substantial differences among the various forecasts concerning the rate of growth in cargo tonnage and passenger trips which can be expected, there is basic agreement that the operating economics of wide-bodied aircraft coupled with increasing fuel and labor costs indicate that these aircraft types will satisfy the increased demand for service without a corresponding increase in flight activity.

The baseline growth assumptions contained in this EIR are described in Table 2.3-1. They are developed from baseline projections performed in 1979 by Charles River Associates under contract to Massport. These projections are somewhat lower in the area of cargo growth than other industry estimates but, nonetheless, indicate that substantial growth in cargo tonnage and passenger trips, (along with the associated demand for airport facilities), can be expected over the next twenty years. The aircraft flight activity levels and fleet composition used in this EIR were produced by

TABLE 2.3-1

AIR CARGO PROJECTIONS FOR LOGAN AIRPORT, 1978-2000; ALTERNATIVE SCENARIOS (TONS)

Type of Service	1978 Actual	1980	1985	1990	1995	2000
Domestic Freight and Express						
Certificated Carrier Baseline	136,554	153,066	200,876	236,574	276,810	320,230
TOTAL BASELINE (including other)	141,613	159,796	212,592	254,260	302,222	354,304
International Freight and Express						
Baseline	47,756	55,078	72,767	86,727	102,864	118,900
TOTAL FREIGHT BASELINE	189,369	214,874	285,359	340,987	405,086	473,024
Domestic Mail						
Baseline	41,206	42,883	45,290	46,376	46,938	47,289
International Mail						
Baseline	3,780	4,660	6,540	8,798	11,919	15,518
TOTAL MAIL BASELINE	44,986	47,543	51,830	55,174	58,857	62,807
TOTAL BASELINE	234,355	262,417	337,189	396,161	463,943	536,011

SOURCE: 1978 Data came from "Green Sheets" supplied by Massport Aviation Department. Data for other years are based on simulations calculated by Charles River Associates Incorporated, March, 1979.

Flight Transportation Associates, Inc., and indicate a continuation of the shift to widebody aircraft utilization which has been occurring in recent years. This results in lower projections in the growth of aircraft flight activity though the projected cargo and passenger capacities of this fleet are expected to more than adequately meet the anticipated demand.

The growth assumptions used in developing BIF development alternatives, like all forecasting exercises, are subject to considerable uncertainty as to when the projected activity levels will be attained or exceeded. The environmental analysis, however, has been conducted on the basis of the expected activity levels in the year 2000 in order to insure that conservative or worst-case impacts are described.

- Timetable

Development at BIF will be phased over a number of years in accordance with the infrastructure, site plan, and environmental controls selected as the preferred alternative in this EIR and in response to the developing demand. The first phase is expected to begin in 1980/1981 and will include general site preparation, installation of roadways and utilities, and construction of cargo facilities and apron for approximately four to six initial tenants.

2.3.2 Needs Met by the Project

The following are seen as the major needs to be addressed by the project:

- On-Airport Land Use

Today, facilities at Logan Airport tend to be grouped by airline rather than by function, there is very little consolidation of similar industries. Development of BIF will be conducted in accordance with Land Use Concept Plan "C" recommended by WFEM/GA (see Sections 2.1 and 4.2).

Adherence to this Concept in the development of BIF will provide the opportunity to improve airport functional relationships and therefore, the operating efficiency of many Logan industries. In addition, internal access will be improved, and traffic congestion reduced. Furthermore, airside/landside interface will be enhanced, as will airside security.

- Cargo Demand

Presently, cargo facilities are fast approaching their space limitations. Formal and informal requests for additional cargo space, preferably on BIF, have been received by Massport from Northwest Orient, Lufthansa, Tigers International, Federal Express, and other airlines. Development of BIF will afford the space needed by the industry to fulfill their expressed current and additional future demands. Further, the interface between the landside and airside components of cargo operations is in need of improvement. Relocation of related industries (e.g. forwarders) will allow for the increased efficiency of cargo and cargo-related operations.

- Off-Airport Land Use

Land uses in the East Boston community, which would be more appropriate if located on airport property, currently contribute to environmental impacts due to traffic noise, air quality effects, and nighttime activity in that residential neighborhood. These land uses result in degradation of traffic flow on the airport by mixing neighborhood-bound cross flow traffic with the primary traffic flows on the main entrance and exit roadways. Development of BIF will provide incentives for relocation by these firms to within the airport boundary and will allow consolidation of traffic to fewer airport access points having lower community impacts.

- Airline Support Activities

Airline support activities include aircraft maintenance, food preparation facilities, reservation centers, etc. The land use relationships between some of those facilities at their current locations are less than optimum and a need exists to rationalize relationships between the operational needs of these various functions. There is also a desire to increase the space allocated to these functions in order to allow for anticipated future demand related to growth in passenger volumes, encourage the generation of higher income employment opportunities in the maintenance areas, and assure that any additional facilities in the future can be accommodated on airport property rather than in the adjacent community.

- General Aviation Relocation

It has been Massport's intention to relocate the General Aviation terminal and the reciprocating aircraft parking apron from its current site adjacent to Maverick Street to a more remote location in order to reduce the noise and air quality impacts on that neighborhood. The initial phase of this relocation was undertaken in 1977-78 with the construction of a remote parking apron for turbine-powered aircraft adjacent to Bravo taxiway on the far easterly edge of the proposed BIF development site. The ultimate relocation of General Aviation cannot occur either on BIF or on the North side of the airport until BIF development commences. The proposed development would either include a new General Aviation Terminal on BIF or would allow for development of a North apron site by relocating a current North Apron tenant to BIF. Under the No-Build alternative, the relocation of general aviation to the north side of the airport would be complicated by the need to displace any existing land use to provide the space required.

NOTES

CHAPTER 2

1/ Logan Airport Master Plan, Massport, 1976, p.2.

2/ Ibid, p. 4.

CHAPTER 3: DESCRIPTION OF ALTERNATIVES

This Chapter describes the alternatives which are analyzed in this EIR. Section 3.1 describes the characteristics which are common to all alternatives, thus providing a framework in which the alternatives are developed. The three Build and the No-Build alternatives are then defined in Sections 3.2 and 3.3, respectively.

Neither a preferred alternative nor a specific proposed action has been identified in this Draft EIR. Rather, three build alternatives, each having a somewhat different development emphasis on BIF, have been analyzed, as well as a No-Build alternative which examines the effect of accommodating projected demand levels elsewhere on the airport. The expected environmental impacts of each alternative are being evaluated concurrently with other planning studies such as marketing, traffic, financial, and site engineering analyses. All of these activities will contribute to the selection of a preferred alternative which will become the proposed action in the Final EIR. The kinds of activities which will be included in the Final EIR are not expected to be substantially different from those activities described in the Draft, nor are they expected to introduce any environmental impacts which have not been analyzed at the Draft stage. The level or amount of individual activities which will be included in the preferred alternative, will not exceed the activity levels described in the Draft. Hence, the description of the environmental consequences and the public comments received in response to the alternatives described in this draft will fulfill the requirements for a Draft EIR of the preferred alternative which is selected. As noted, each of the alternatives reflects full utilization of BIF, and hence, shows worst-case impacts.

3.1 CHARACTERISTICS WHICH ARE COMMON TO ALL ALTERNATIVES

- Growth

Each alternative studied, including the No-Build alternative, will provide sufficient all-cargo aircraft parking apron and associated terminal facilities to accommodate the baseline demand for all-cargo aircraft activity which is projected to occur over the twenty year planning period. However, not all alternatives will provide all of the facilities required to meet the needs for airline support activities such as food preparation, auto rental, etc., nor will all alternatives provide sufficient area to accommodate relocation of airport oriented activities from the adjacent residential areas. In addition, the No-Build alternative would require the elimination of all North Apron aircraft maintenance facility and a reduction in the size of the fuel farm.

- General Aviation Relocation

Each alternative studied, including the No-Build alternative, provides sufficient area to relocate General Aviation to an integrated terminal and aircraft apron facility which is located away from residential areas. All alternatives except the No-Build allow a choice of two locations (North apron or BIF) for such a relocated general aviation facility.

If the No-Build alternative were selected, and the relocation of General Aviation did not occur on the North Apron as assumed in that alternative, a separate environmental process would be undertaken for that relocation to some other site.

- Access Roadway Configuration

All Build alternatives assume a common access road alignment from the vicinity of the terminal roadway near the current Budget Rent-A-Car site to the BIF development area. This road would pass approximately 500 feet north of the existing airport service road adjacent to Maverick Street and create a series of parcels which could be developed to provide a visual and acoustic buffer between BIF vehicular traffic and Maverick Street.

- Buffer Zones

In addition to the buffer possibilities created by the roadway alignment discussed above, all Build alternatives incorporate a buffer zone along the westerly shore of the BIF development site, which will consist of buildings between the access roadway and a landscaped community access strip at the water's edge. This buffer zone is intended to provide visual and acoustic separation between the Jeffries Point community and activities which either currently occur on the airport or are expected to occur if BIF development is undertaken. The environmental effects of this buffer zone are described in Chapters Five and Six.

- Helipad

The helipad was assigned to BIF under each of the alternatives. This location allows the continued use of the inner harbor helicopter routes which the FAA has developed to separate rotary and fixed winged aircraft. In the No-Build alternative, the helipad remains in its current location. In this case, helicopters would have to hover taxi to the General Aviation facilities in the North Apron.

In the Build alternatives, the helipad is located on the southern edge of BIF at a point farthest from the Jeffries Point community. (See Figures 3.2-1 through 3.2-6.) This location was chosen to minimize environmental impacts in Jeffries Point and approaches that potentially conflict with BIF development. A small space in the adjacent buildings could be used in these alternatives to service helicopter patrons and eliminate the need for extended taxiing.

- General Aviation Runway and a Third Harbor Crossing

The compatibility between the BIF development alternatives and a proposed GA runway, as well as the proposed Third Harbor Crossing, will be considered since they are common to all alternatives.

  - General Aviation Runway

The "Determination of the Massachusetts Secretary of Environmental Affairs of Scope and Alternatives..." 1/ for this EIR specifies that the following comments of the Massachusetts Aeronautics Commission should be addressed; specifically as regards any development on BIF which would preclude future development on Runway 14-32:

> "Our most crucial concern is that the selected development plan for Bird Island Flats leave a full clear zone for the proposed 14-32 reliever runway which is our (and the Administration's) policy to complete, as one of the few remaining means to relieve congestion at Logan. FAA recently provided all the setback specifications to Massport, but we would like a written assurance that they will, in fact, be adhered to. We are convinced that this small amount of additional asphalt will go a long way toward relieving congestion and improving safety at Logan without increasing the noise impact. As this site offers what is perhaps the only reasonable remaining opportunity to accommodate increasing demand through improvements, it is extremely important that it not be precluded by other developments." 2/

Massport Staff evaluation indicates that none of the facility development alternatives under evaluation for BIF either foreclose the possibility of future airfield improvements nor are they prerequisites to such improvements.

Three specific airfield improvements which were under construction in 1974 on the easterly portion of the landfill of Bird Island Flats were enjoined in Superior Court prior to completion. These improvements were: the extension of Runway 9 toward the west by 1,789 feet, the extension of Runway 4 Left toward the southwest by 1,896 feet, and the construction of a 3,830 foot long General Aviation runway designated 14-32. In accordance with the terms under which this litigation was resolved, the largely completed runway extensions were paved and designated as runway safety areas and construction of the 14-32 Runway was terminated.

Further agreement on these projects is contained in a Memorandum of Understanding executed on May 21, 1974 by Edward J. King, for the Massachusetts Port Authority and Alan Altshuler for the Executive Office of Transportation and Construction of the Commonwealth which limited any further consideration of Runway 14-32 to unidirectional use over the waters of Boston Harbor.

In correspondence dated May 21, 1974, the Director of the FAA New England Region concurred, and agreed that Massport as airport proprietor had the authority to establish specific operating conditions as contained in the Memorandum of Understanding and further agreed that FAA would control air traffic at Logan in accordance with those specific operating conditions.

In planning alternatives for BIF development, Massport has reviewed the applicable agreements and policies and has considered the concerns expressed by the Massachusetts Aeronautics Commission. All alternatives being considered are consistent with future re-assessment of those airfield improvements projects as described in those agreements. Massport's review indicates that the site plans being proposed in all alternatives, which have been developed in accordance with clearance criteria for existing runways, are consistent with both the missed approach criteria and the clear zone which is required at both ends of that previously proposed visual runway.

FAA staff evaluation noted that if the Logan Land Use and Airfield Capacity Study indicated a need for a new bidirectional 14-32 GA runway, there would be no clearzone or approach zone conflicts with the visual approach (20:1 slope) on the 14 end of the runway, as long as the building heights were kept under 150 feet.

For an instrument approach on the 14 end, there are already height conflicts with the cranes at Bethlehem Shipyard, which would limit the instrument minimums of a 34:1 approach slope. With an instrument approach, the location of buildings on BIF could potentially conflict with clearzone and instrument approach criteria. In addition, air traffic patterns for light aircraft on south westerly departures, which could potentially conflict with some of the buildings on BIF, will require further examination, as well the potential conflict in clearzone and instrument approach criteria.

- A Third Harbor Crossing

Each BIF alternative assumes maximum utilization of land for air cargo and other development projects. Therefore, none of the BIF alternatives reserve land for a tunnel portal at BIF. The reasons are as follows according to Massport's staff evaluation:

(1) The alignment of the Third Harbor Crossing is not yet determined. The proposed alignment through BIF is simply one route among others now being considered. It is premature to draw conclusions about alignments at this time.

(2) The phasing of construction at BIF and the building of third harbor crossing would most likely be different. For example, if a tunnel were ever built, the construction impacts at Logan would probably not be experienced until the late 1980's. Hence, it would be possible to construct relatively low investment structure at BIF without posing serious obstacles to future tunnel designs. If a heavy investment were made in the area that would eventually be desirable for a tunnel portal, conflicts emerge. In such a case, the location of the tunnel portals could be relocated.

(3) For the purposes of an EIR, it is not desirable to allocate several acres for a tunnel portal, without evaluating the effects of the vehicular activity that would occur at the portals. That is, if a third tunnel were ever routed through BIF, a new EIR/EIS would be required before it could be constructed. For instance, the BIF truck and aircraft-related impacts slated to occur at the BIF parcels would have to be deducted from the impacts of the proposed alternatives being studied in this EIR, and the environmental impacts resulting from vehicular traffic at the tunnel portals would have to be added. It is impossible to estimate the environmental impacts of allowing for a tunnel portal at BIF until the total environmental impact of the third harbor crossing is considered. This EIR is not the appropriate document for that to occur.

When the preferred alternative is selected, however, the compatibility of the configuration with a third harbor crossing through BIF will be explored. Staging of the BIF "preferred alternative" and the routing of a third harbor crossing through BIF will be considered in the Final EIR.

3.2 BUILD ALTERNATIVES

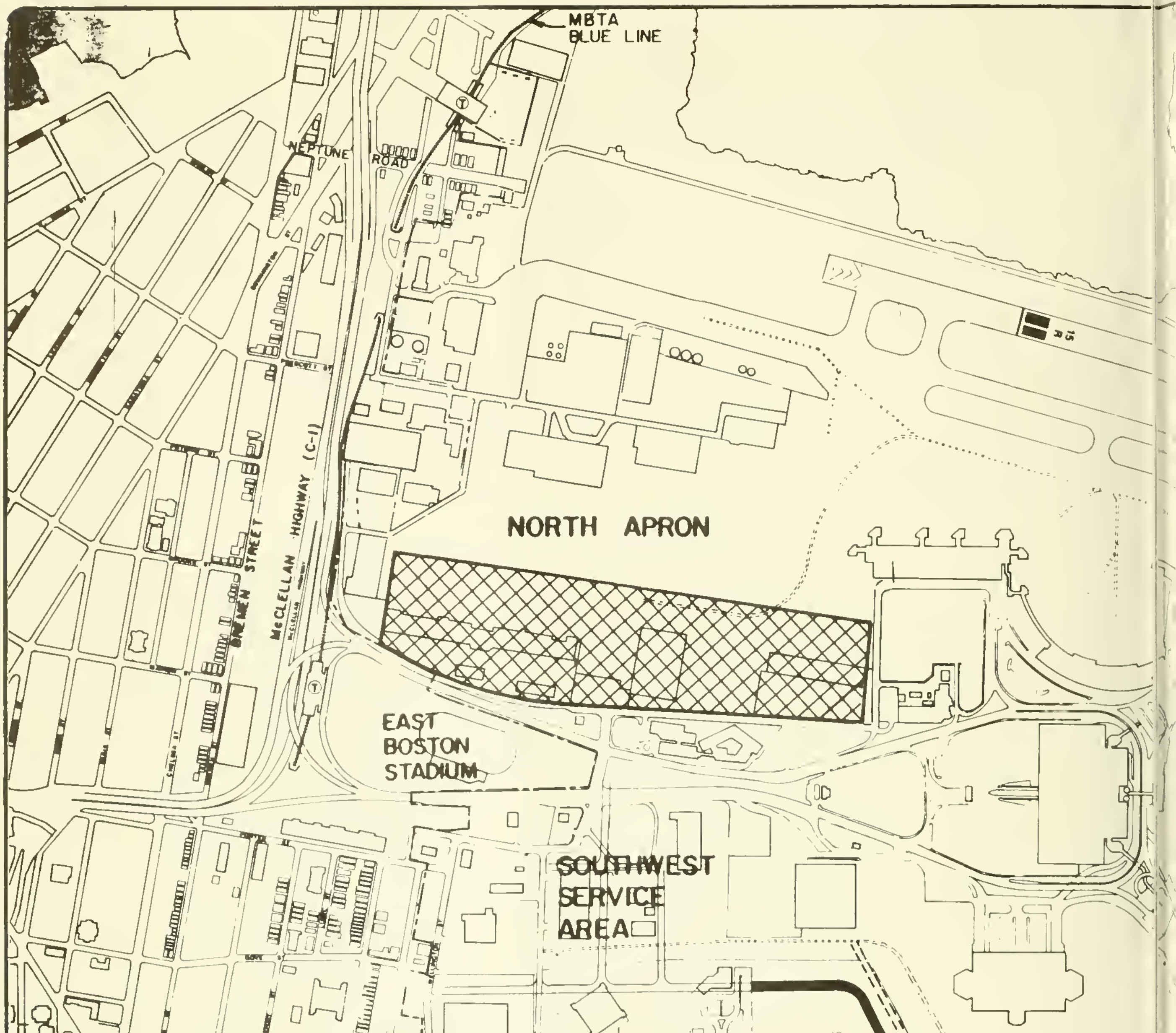
Three alternatives involving development of BIF were established. They are designated "Low Intensity Cargo," "High Intensity Cargo" and "Mixed Use."

The layout of each alternative at BIF, along with its effects on the North Apron area, can be seen in Figures 3.2-1 through 3.2-7. The No-Build alternative can be seen in Figure 3.3-1 and is discussed individually in the following section.

The High Intensity Alternative is based on maximum assignment of all-cargo aircraft operations to BIF consistent with Concept Plan "C". The only all-cargo operations assigned to the North Apron are those projected for airlines whose passenger operations are also on the North side of the airport (AerLingus, Air France and Lufthansa). No other airlines using passenger terminals on the North side of the airport are expected to operate all-cargo flights through the Year 2000.

The Low Intensity Alternative is based on minimum compliance with Concept Plan "C". All-cargo operations on BIF are limited to those projected for carriers with passenger gates on the south side of the airport, with one exception--Federal Express. Federal Express is assigned to BIF in this alternative even though it has no passenger operations because it has indicated an interest in a BIF location. In addition, Federal's aircraft loading practices do not require an adjacent cargo-handling building. Assignment of its three projected daily operations to BIF makes efficient use of an apron area that may be isolated from cargo buildings by a taxiway.

In both the High-and Low-Intensity Alternatives, unused land on BIF is assigned to cargo-handling facilities for "belly-cargo" carried on passenger flights, air freight forwarders, food preparation, parking facilities and roadways. When space is available, apron is also allocated to aircraft maintenance for carrier on the south side of the airport. Maintenance facilities require apron space that is adjacent to taxiways, buildings and land-side roadway. Unused apron that does not meet these requirements is designated "Public Use". Public Use apron provides parking space primarily for itinerant aircraft not requiring direct access to passenger or freight handling facilities or other land-side services.


MBTA BLUE LINE
NEPTUNE ROAD
15 R
BREMEN STREET
McCLELLAN HIGHWAY (C-1)
NORTH APRON
EAST BOSTON STADIUM
SOUTHWEST SERVICE AREA
JEFFRIES POINT
G
D
C
H
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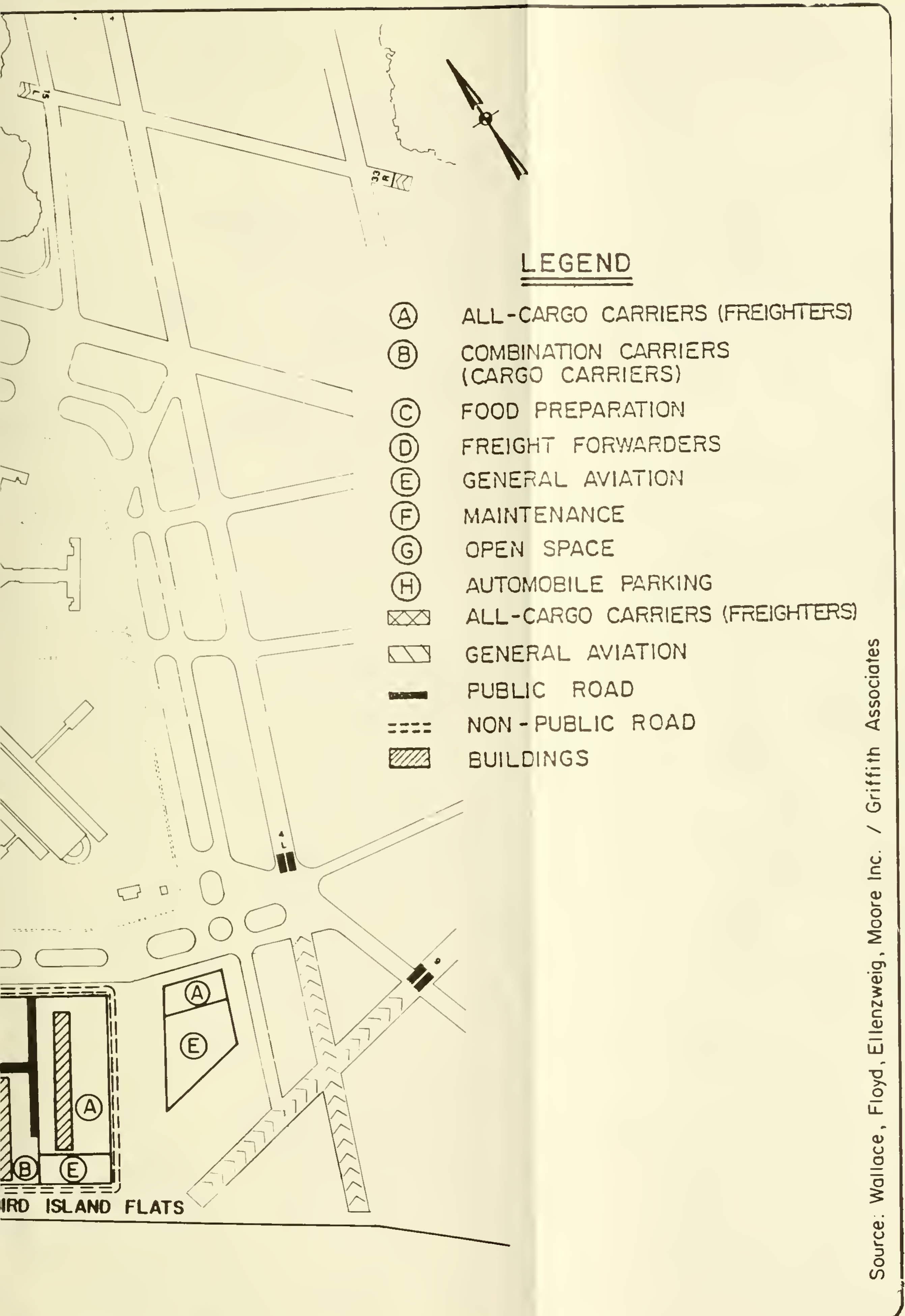
H
BOSTON INNER HARBOR



LEGEND

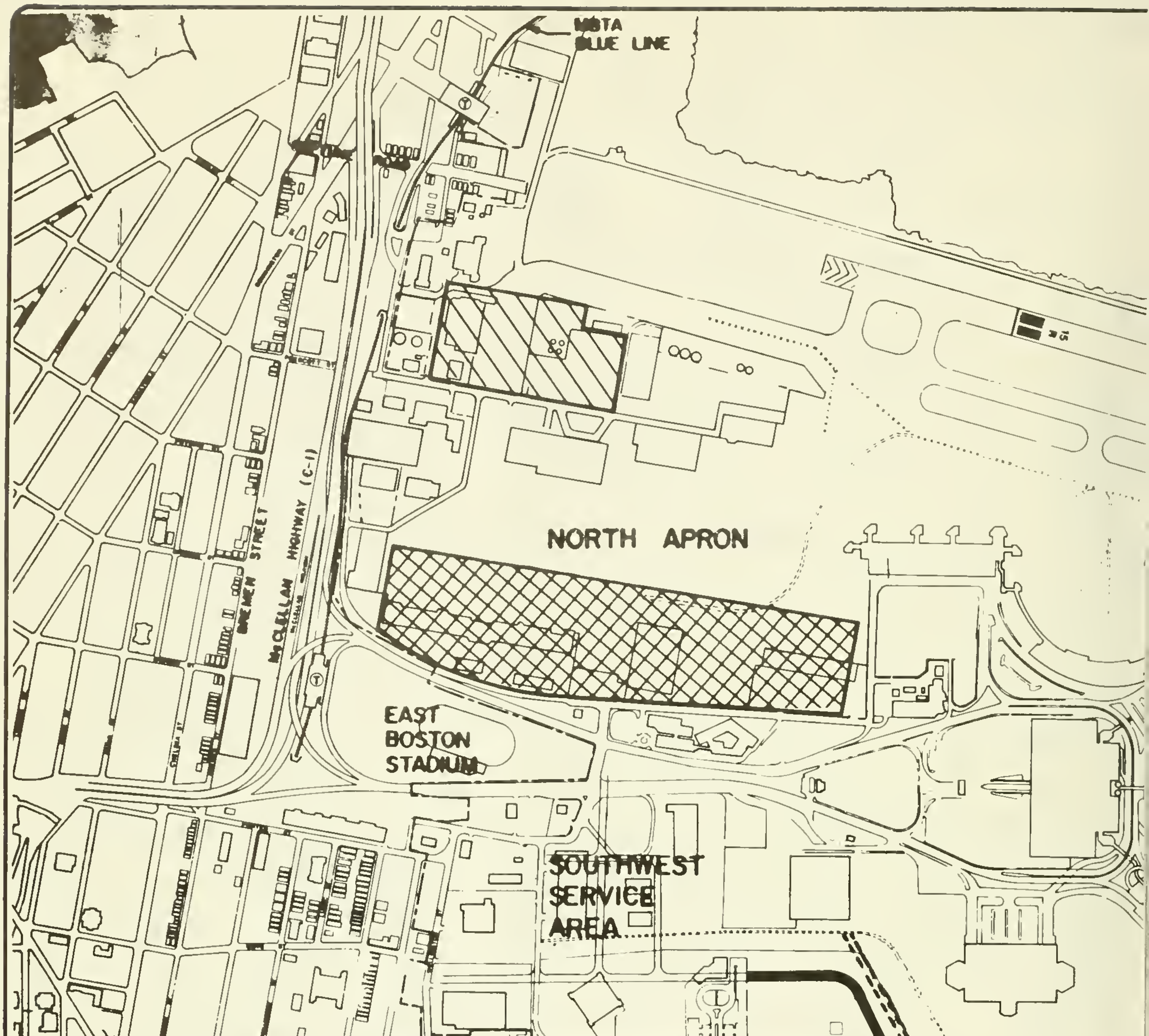
Ⓐ ALL-CARGO CARRIERS (FREIGHTERS)
Ⓑ COMBINATION CARRIERS (CARGO CARRIERS)
Ⓒ FOOD PREPARATION
Ⓓ FREIGHT FORWARDERS
Ⓔ GENERAL AVIATION
Ⓕ MAINTENANCE
Ⓖ OPEN SPACE
Ⓗ AUTOMOBILE PARKING
⊠ ALL-CARGO CARRIERS (FREIGHTERS)
▧ GENERAL AVIATION
▬ PUBLIC ROAD
==== NON-PUBLIC ROAD
▨ BUILDINGS

Source: Wallace, Floyd, Ellenzweig, Moore Inc. / Griffith Associates

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

LOW INTENSITY CARGO WITH GENERAL AVIATION

FIGURE 3.2-1


MBTA BLUE LINE
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NORTH APRON
BREMEN STREET
McCLELLAN HIGHWAY (C-1)
EAST BOSTON STADIUM
SOUTHWEST SERVICE AREA
JEFFRIES POINT
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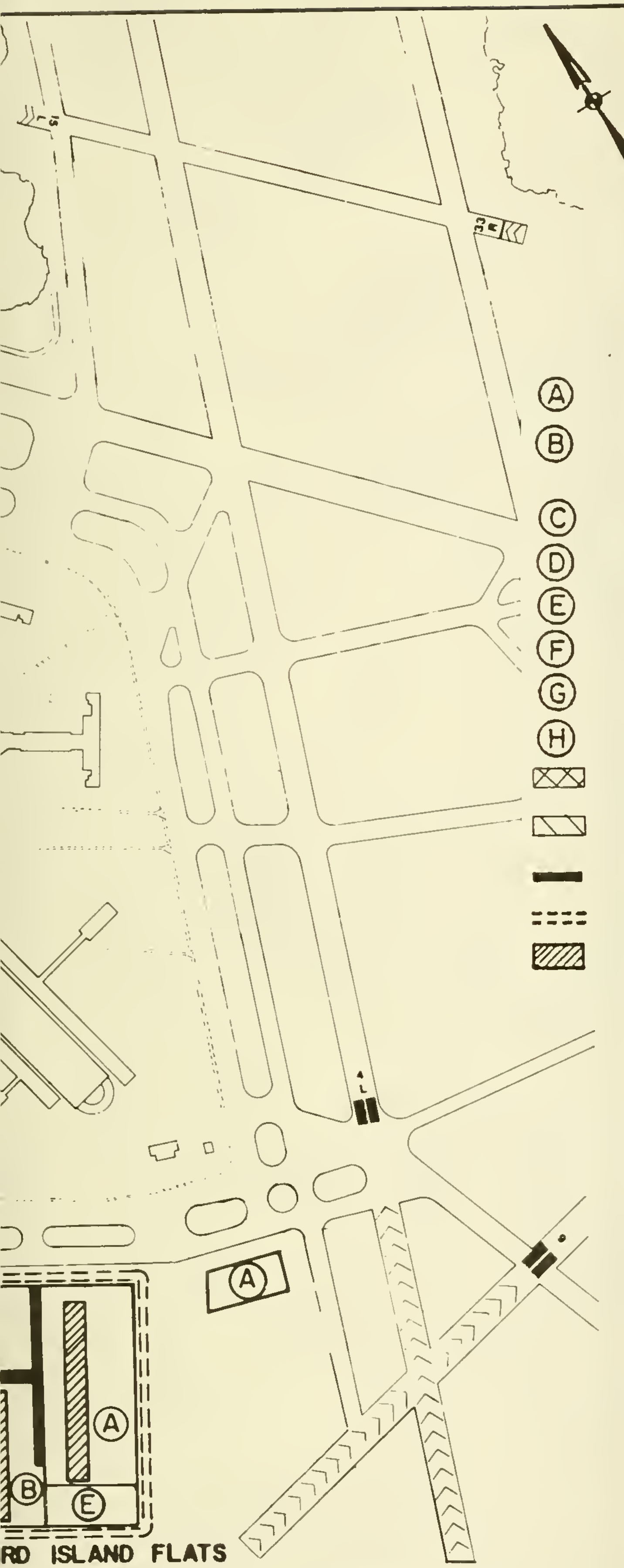
BOSTON INNER HARBOR



LEGEND

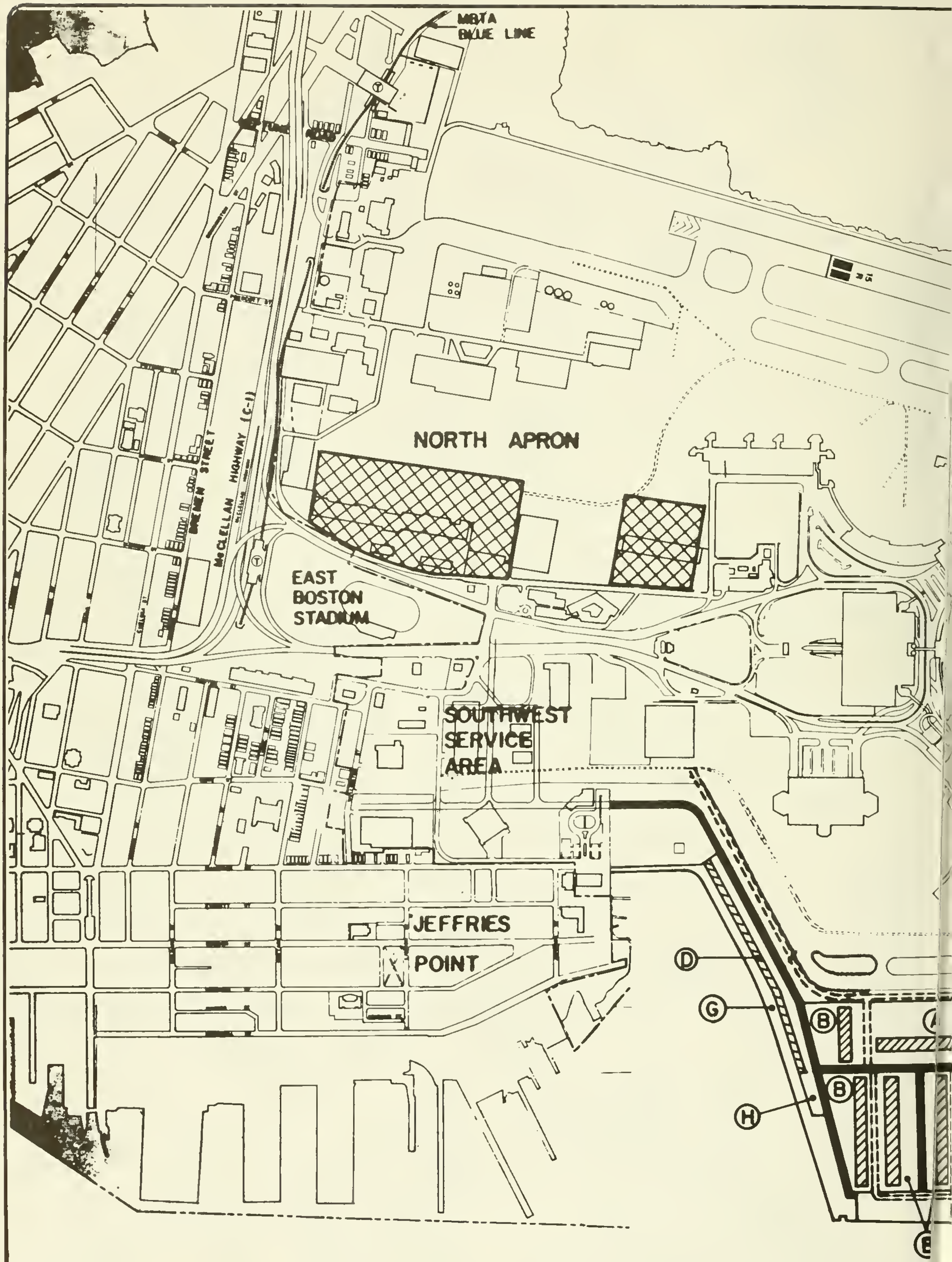
Ⓐ	ALL-CARGO CARRIERS (FREIGHTERS)
Ⓑ	COMBINATION CARRIERS (CARGO CARRIERS)
Ⓒ	FOOD PREPARATION
Ⓓ	FREIGHT FORWARDERS
Ⓔ	GENERAL AVIATION
Ⓕ	MAINTENANCE
Ⓖ	OPEN SPACE
Ⓗ	AUTOMOBILE PARKING
⊠	ALL-CARGO CARRIERS (FREIGHTERS)
⧅	GENERAL AVIATION
▬	PUBLIC ROAD
----	NON-PUBLIC ROAD
▨	BUILDINGS

Source: Wallace, Floyd, Ellenzweig, Moore Inc. / Griffith Associates

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

LOW INTENSITY CARGO WITHOUT GENERAL AVIATION

FIGURE 3.2-2


MBTA BLUE LINE
BREMEN STREET
McCLELLAN HIGHWAY (C-1)
NORTH APRON
EAST BOSTON STADIUM
SOUTHWEST SERVICE AREA
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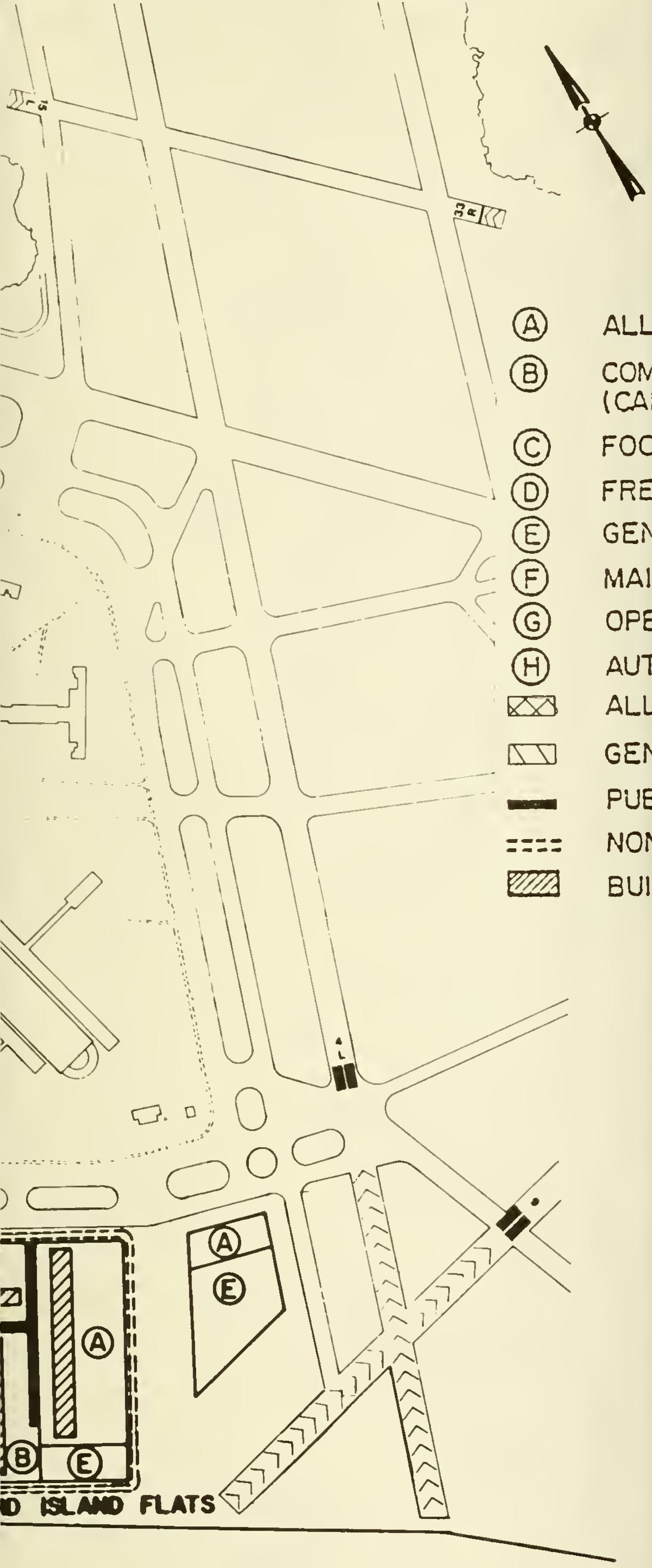
BOSTON INNER HARBOR



LEGEND

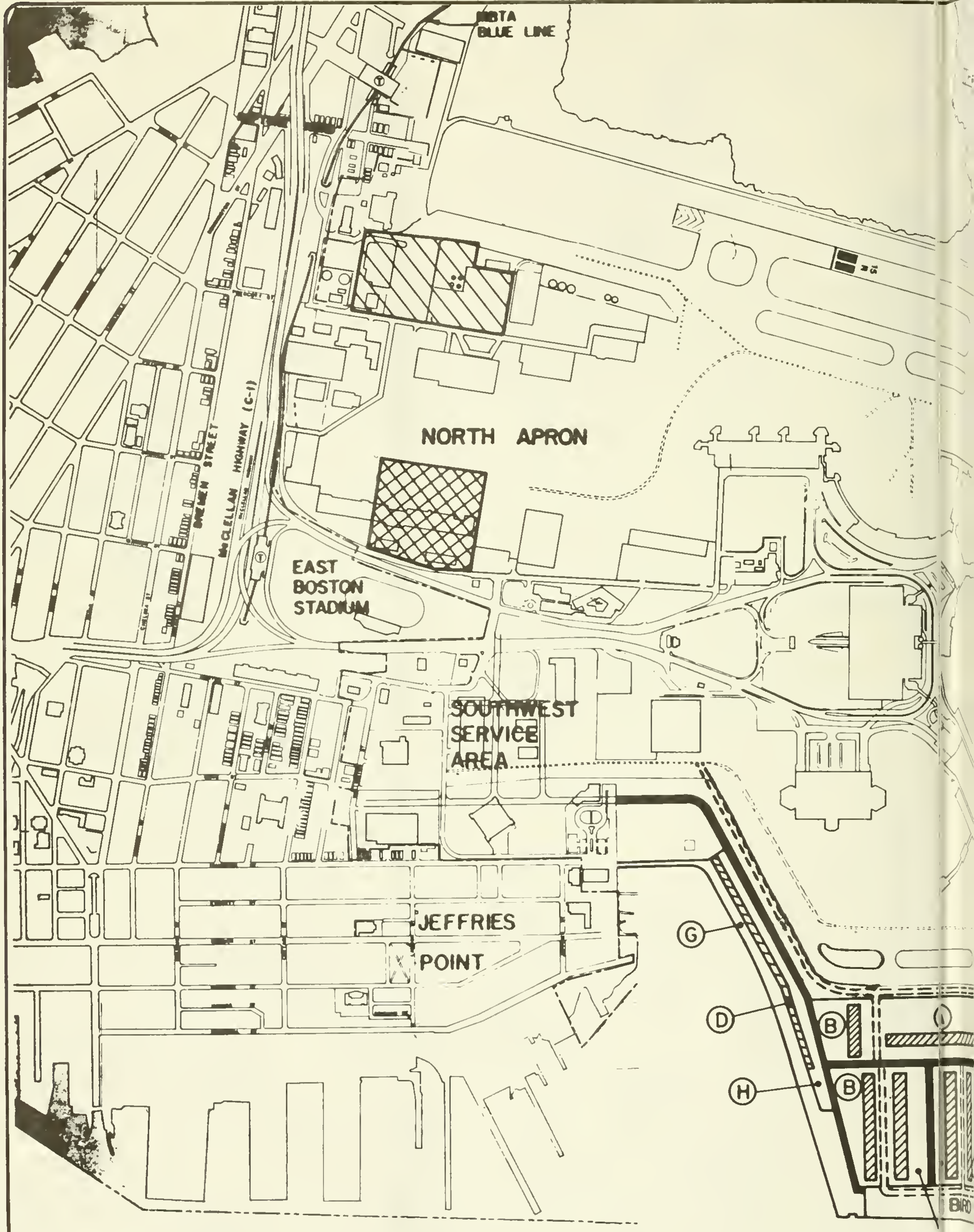
Ⓐ	ALL-CARGO CARRIERS (FREIGHTERS)
Ⓑ	COMBINATION CARRIERS (CARGO CARRIERS)
Ⓒ	FOOD PREPARATION
Ⓓ	FREIGHT FORWARDERS
Ⓔ	GENERAL AVIATION
Ⓕ	MAINTENANCE
Ⓖ	OPEN SPACE
Ⓗ	AUTOMOBILE PARKING
☒	ALL-CARGO CARRIERS (FREIGHTERS)
⧅	GENERAL AVIATION
▬	PUBLIC ROAD
====	NON-PUBLIC ROAD
▨	BUILDINGS

Source: Wallace, Floyd, Ellenzweig, Moore Inc. / Griffith Associates

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

HIGH INTENSITY CARGO WITH GENERAL AVIATION

FIGURE
3.2-3


MBTA
BLUE LINE
NORTH APRON
BREMEN STREET
McCLELLAN HIGHWAY (C-1)
CHELSEA ST
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STADIUM
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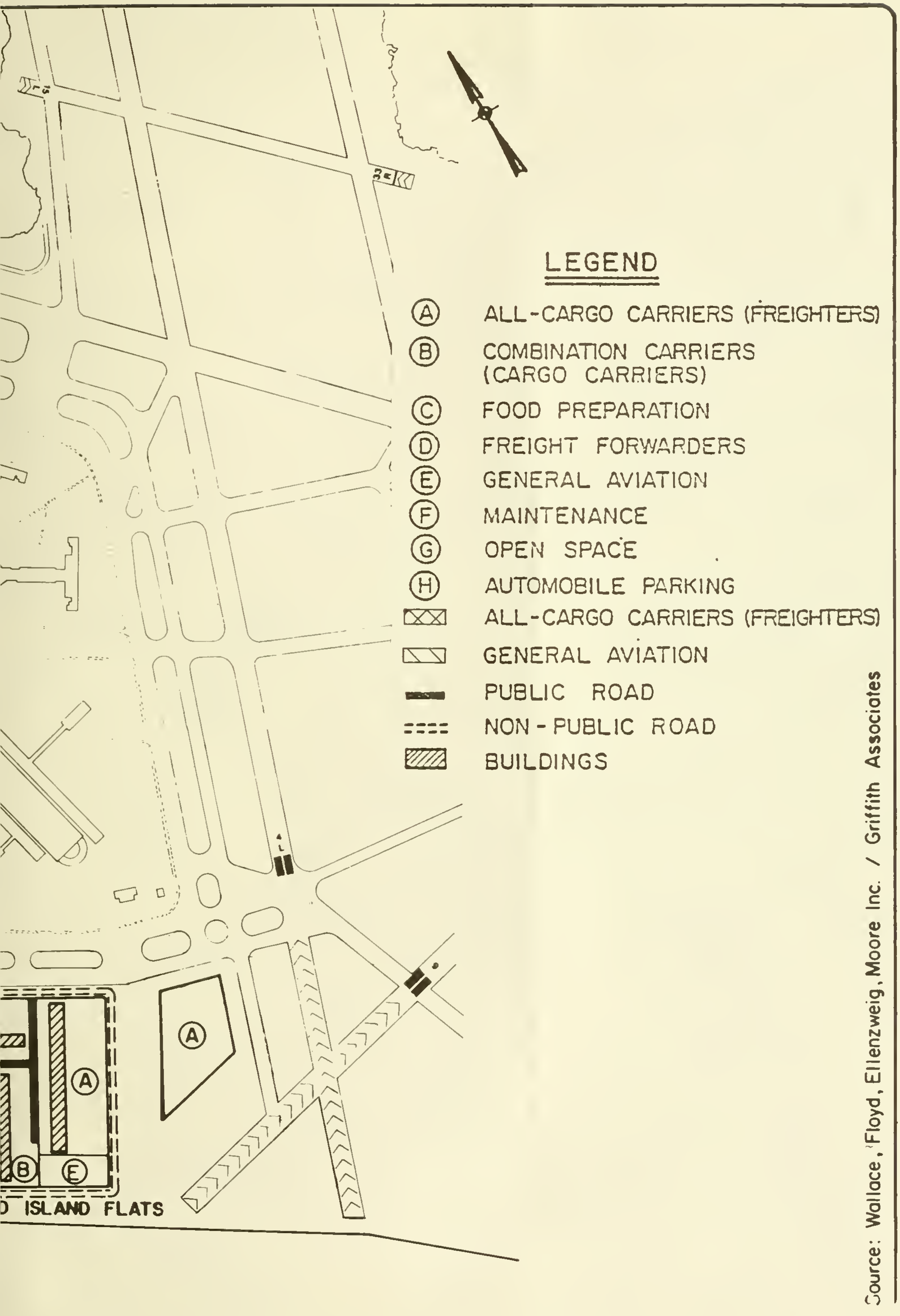
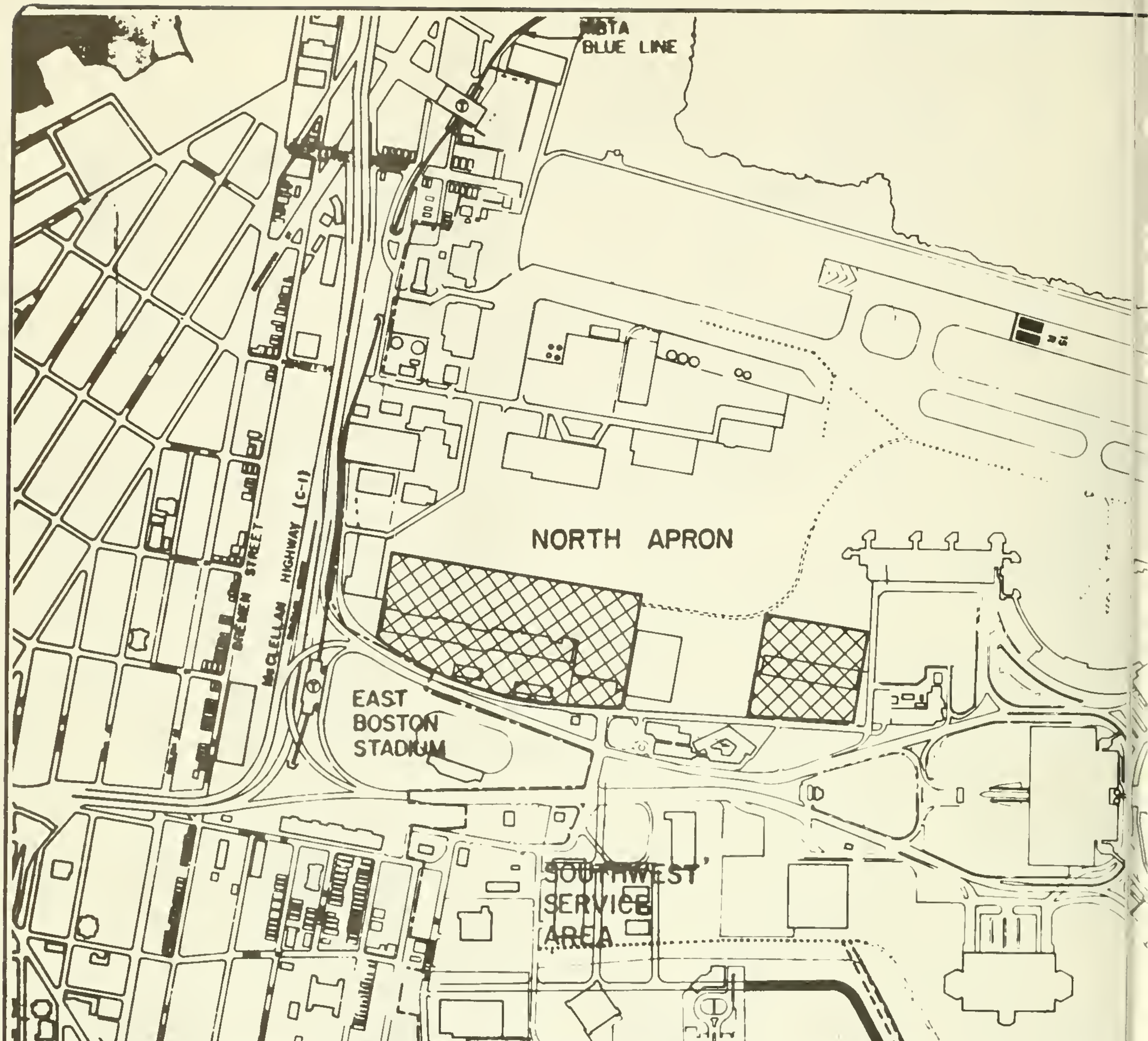


Source: Wallace, Floyd, Ellenzweig, Moore Inc. / Griffith Associates

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

FIGURE
3.2-4

HIGH INTENSITY CARGO WITHOUT GENERAL AVIATION


MBTA BLUE LINE
NORTH APRON
BREMEN STREET
McCLELLAN HIGHWAY (C-1)
EAST BOSTON STADIUM
SOUTHWEST SERVICE AREA
JEFFRIES POINT
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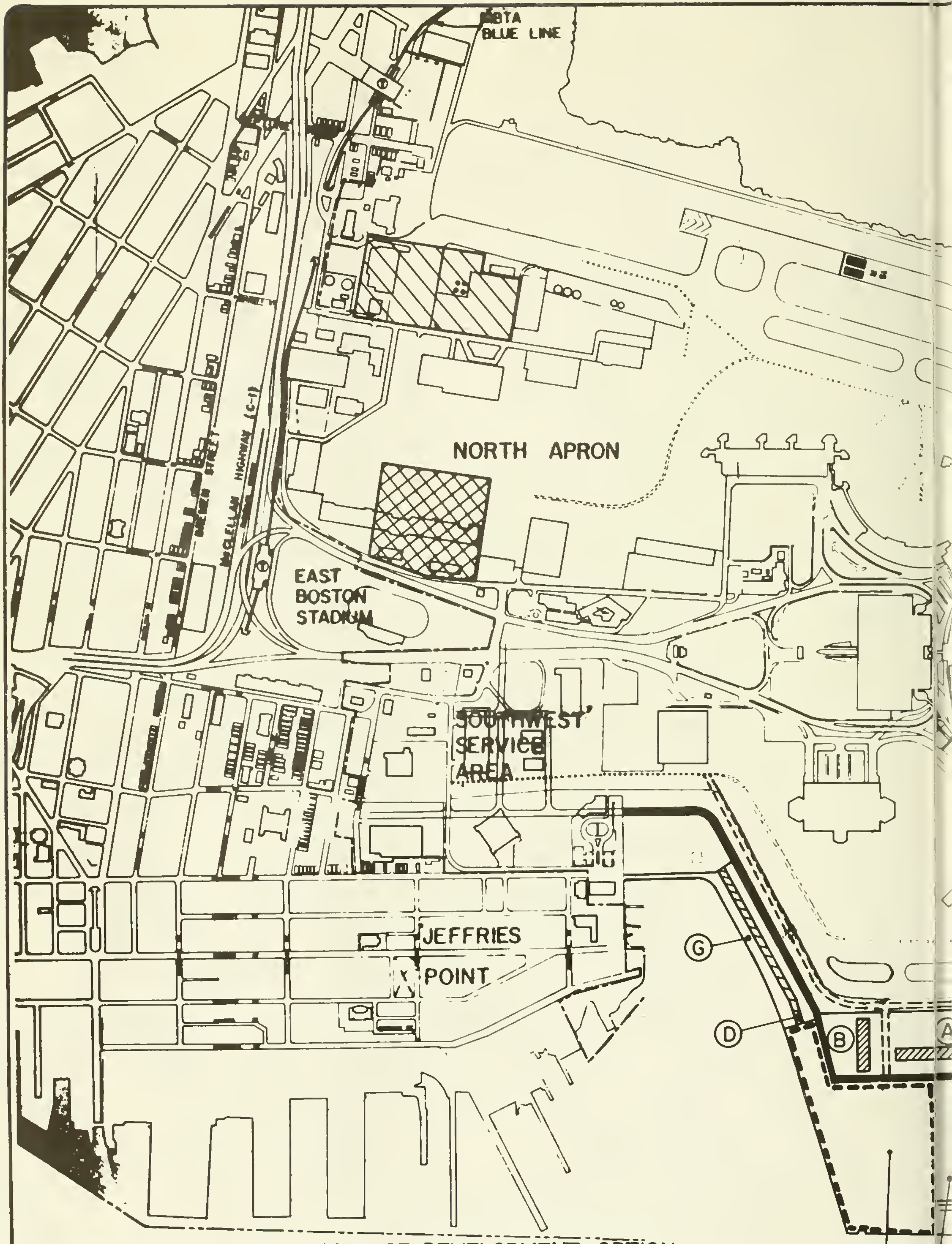
MIXED USE DEVELOPMENT OPTION
FOR DETAILS SEE FIGURE 3.3-7
BOSTON INNER HARBOR

Source: Walloce, Floyd, Ellenzweig, Moore Inc. / Griffith Associates

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

MIXED USE WITH GENERAL AVIATION

FIGURE
32-5


MBTA
BLUE LINE
BREMEN STREET
McCLELLAN HIGHWAY (C-1)
NORTH APRON
EAST
BOSTON
STADIUM
SOUTHWEST
SERVICE
AREA
JEFFRIES
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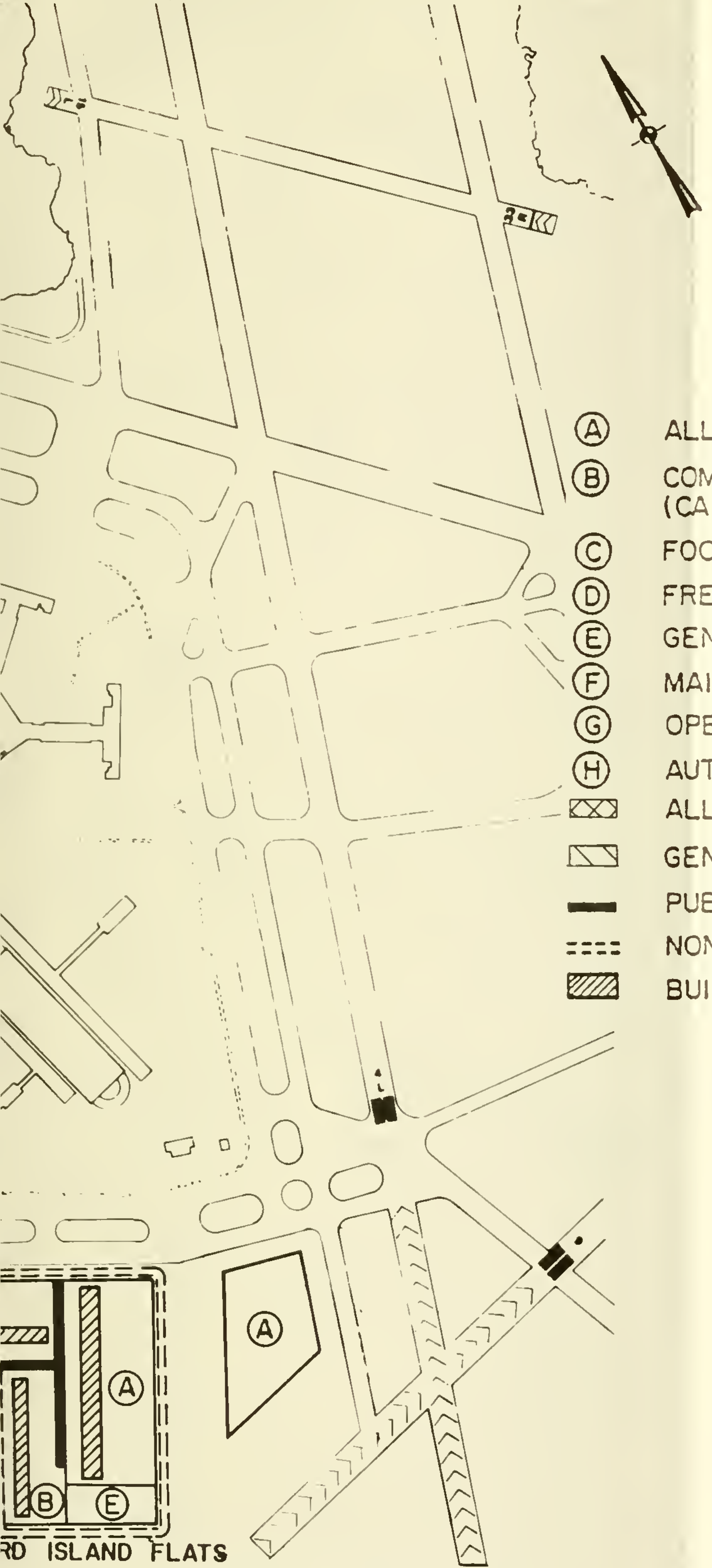
MIXED USE DEVELOPMENT OPTION
FOR DETAILS SEE FIGURE 3.3-7
BOSTON INNER HARBOR



LEGEND

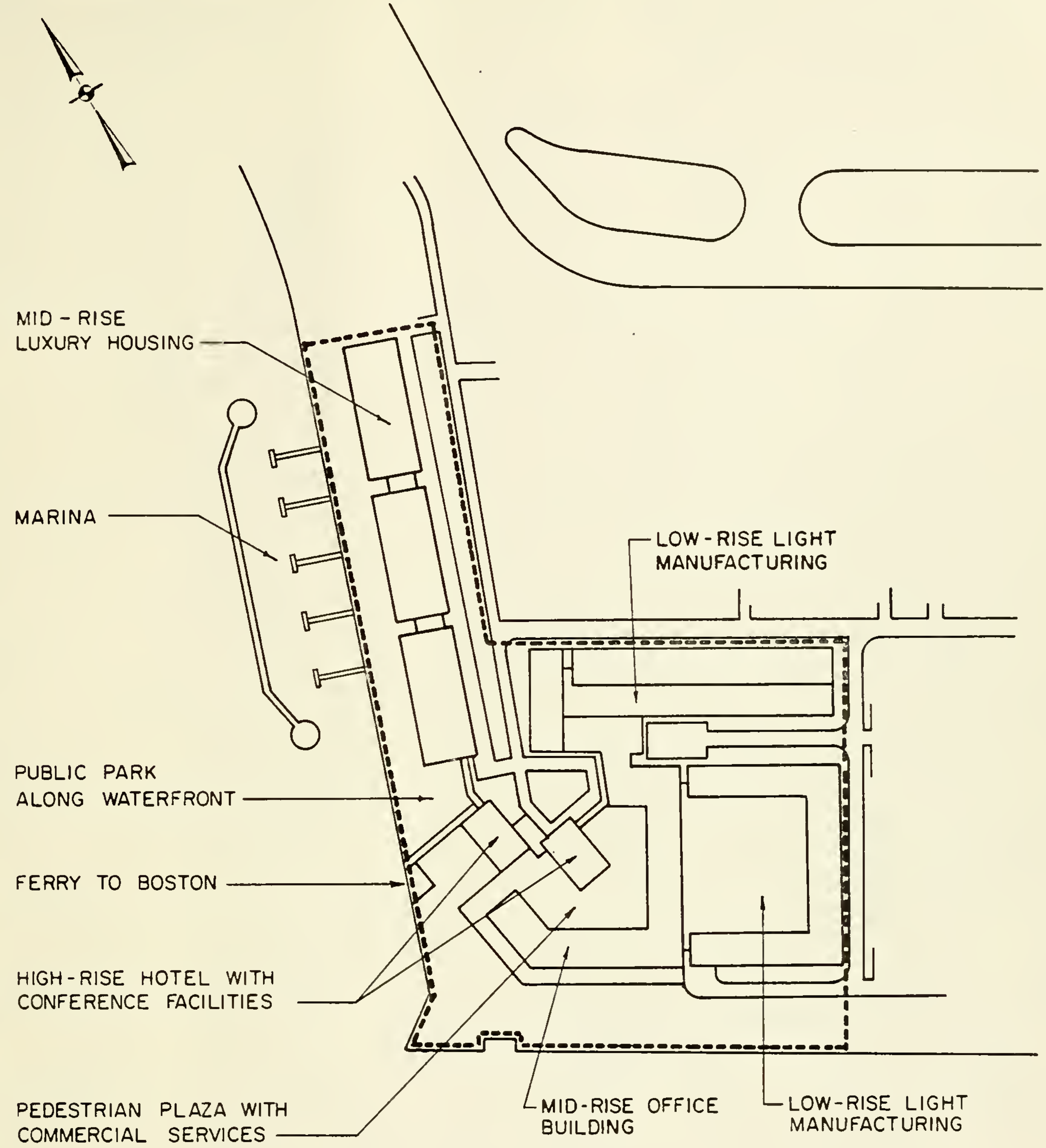
Ⓐ	ALL-CARGO CARRIERS (FREIGHTERS)
Ⓑ	COMBINATION CARRIERS (CARGO CARRIERS)
Ⓒ	FOOD PREPARATION
Ⓓ	FREIGHT FORWARDERS
Ⓔ	GENERAL AVIATION
Ⓕ	MAINTENANCE
Ⓖ	OPEN SPACE
Ⓗ	AUTOMOBILE PARKING
⊠	ALL-CARGO CARRIERS (FREIGHTERS)
⧄	GENERAL AVIATION
▬	PUBLIC ROAD
====	NON-PUBLIC ROAD
▨	BUILDINGS

Source: Wallace, Floyd, Ellenzweig, Moore Inc. / Griffith Associates

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

MIXED USE WITHOUT GENERAL AVIATION

FIGURE 3.2-6



BUILDING HEIGHTS

LOW - RISE	25' - 35'
MID - RISE	50' - 70'
HIGH - RISE	135' - 150'

Source: Wallace, Floyd, Ellenzweig, Moore Inc. / Griffith Associates

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

MIXED USE DEVELOPMENT OPTION

HTA

SCALE: 1" = 300'

FIGURE
3.2-7

The Mixed Use Alternative incorporates the same cargo apron assignments as the High-Intensity Alternative and hence, has comparable cargo-related environmental impacts.

However, approximately 23 acres of the remaining land is allocated for commercial development, including hotel with conference facilities, retail space, a pedestrian mall, private housing, offices, light manufacturing facilities and a marina.[3] These uses require the relocation onto the North Apron of some activities planned for BIF under the High Intensity Alternative.

Table 3.2-1 summarizes the levels of primary activity and land or building area associated with different uses on both BIF and the North Apron in each alternative. The activity levels and areas were the bases of the environmental assessments described in the following sections. The common denomination for most land uses is based upon a modular concept, examples of which are given in Figure 3.2-8.

These activities and areas were used to derive levels of associated activities, such as ground vehicle movements, which also had environmental impacts. These associated activities and the assumptions used in deriving their levels are discussed in detail in the relevant sections.

(Table 3.2-1 shows numbers of cargo operations assigned north/south; cargo apron positions; cargo handling building area for all-cargo operators with adjacent apron space and for combination carriers without; forwarder building space; GA, Public Use and maintenance apron area; food preparation area; and mixed use areas, units and activity levels).

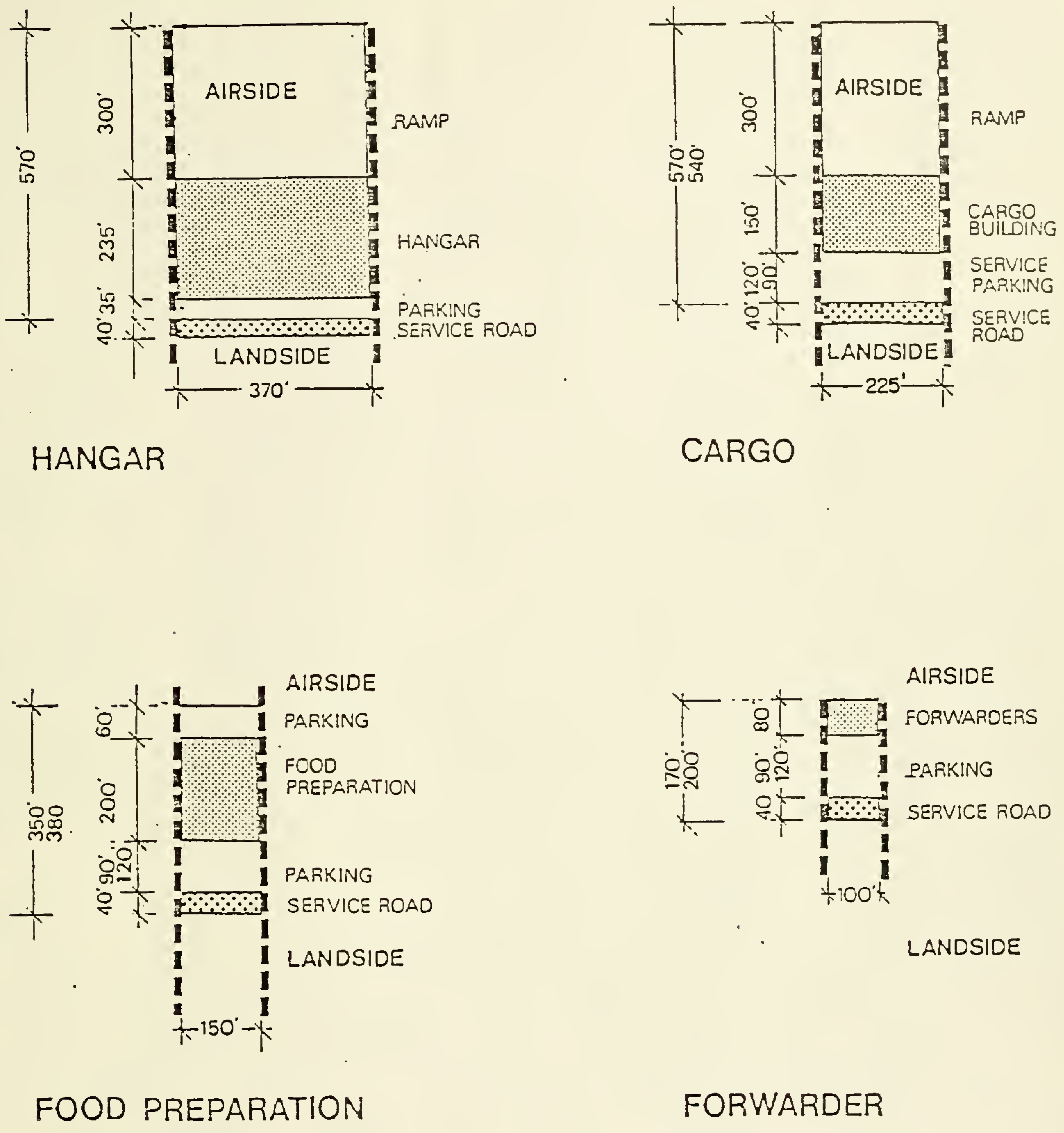
3.3 NO-BUILD ALTERNATIVE

The No-Build alternative (Figure 3.3-1) examined in this EIR assumes that no further development (the existing helipad and Bravo Apron would remain), will occur on BIF and that priority would be given on the North Apron to accommodating the growth expected to occur in cargo-related activities requiring apron access. This alternative can accommodate 23.5 of the projected 24.5 operations per day on 18 apron positions in the existing North Apron area and could accommodate a relocation of General Aviation to the North Apron area. This alternative would require elimination of the maintenance facilities currently operated by U.S. Air, Delta, American and TWA as well as a reduction in the

Table 3.2-1

DEFINITION OF ALTERNATIVES

		Daily All-Cargo Departures	Freighter Apron Positions	Cargo Handling Bldg. (Sq. Ft.)	Forwarder Bldg. (Sq. Ft.)	Food Preparation (Sq. Ft.)	Maintenance Apron Positions	G.A. (Sq. Ft.)	Auto Parking (Sq. Ft.)
Low-Intensity Cargo With G.A.	BIF	10	8	371,000	144,000	60,000	5	500,000	316,000
	North Apron	14.5	11	371,000	54,000	60,000	0	0	0
Low-Intensity Cargo Without G.A.	BIF	10	8	371,000	144,000	60,000	5	0	316,000
	North	14.5	11	338,000	0	60,000	0	500,000	0
High-Intensity Cargo With G.A.	BIF	15.5	11	776,000	144,000	0	0	500,000	60,000
	North	9	8	135,000	48,000	120,000	5	0	0
High-Intensity Cargo Without G.A.	BIF	21.5	16	641,000	144,000	0	0	0	60,000
	North	3	3	135,000	48,000	120,000	0	400,000	60,000
Mixed Use With G.A.	BIF	15.5	11	573,500	96,000	0	0	500,000	1,800 space garage
	North	9	8	337,500	0	120,000	5	0	0
Mixed Use Without G.A.	BIF	21.5	16	438,500	96,000	0	0	0	1,800 space garage
	North	3	3	337,500	0	120,000	0	400,000	0
No-Build	BIF	1	1	0	0	0	0	0	0
	North	23.5	18	743,000	100,000	120,000	2	400,000	0

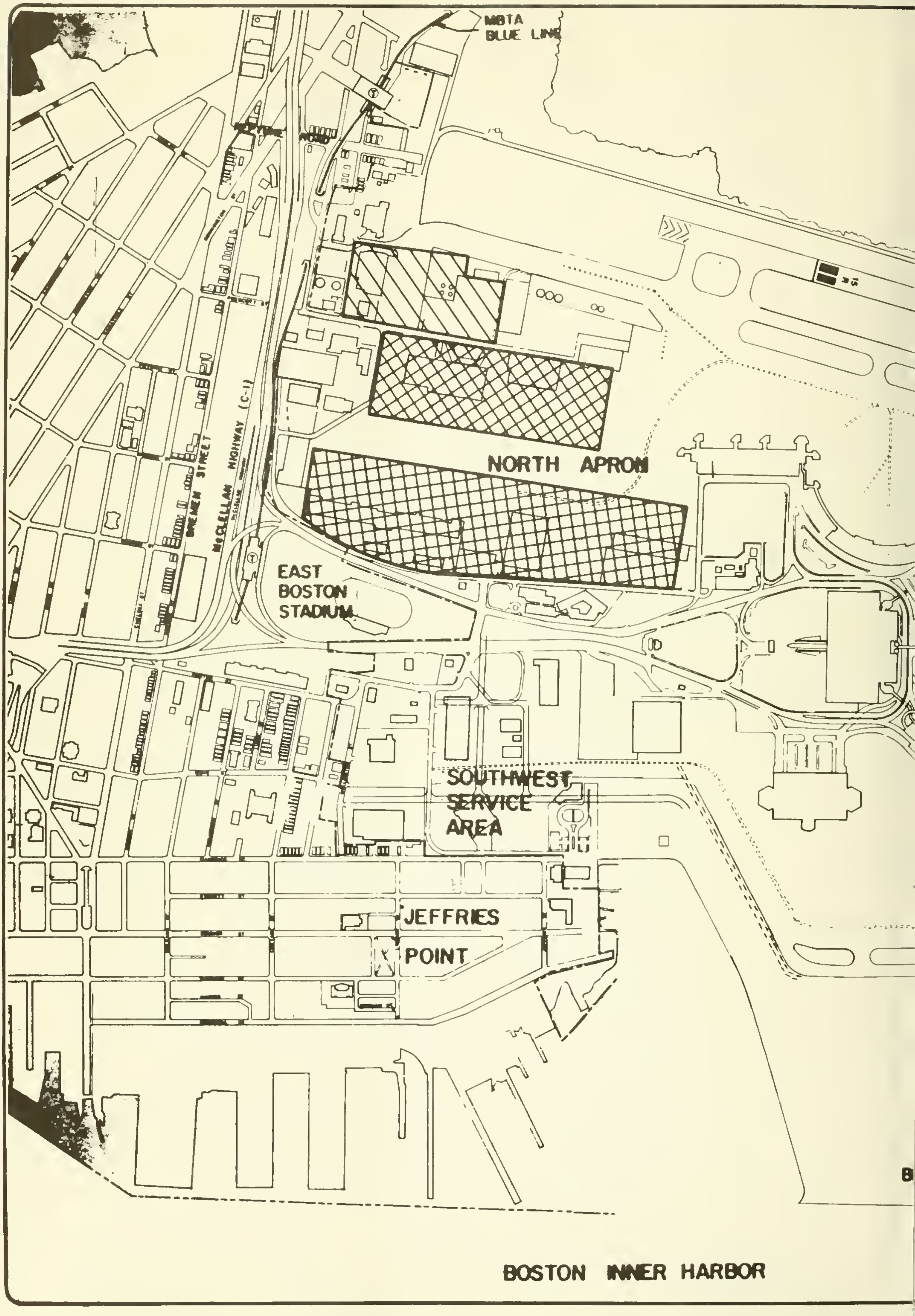


Source: Wallace, Floyd, Ellenzweig, Moore Inc. / Griffith Associates

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS
MODULES FOR AIRPORT
RELATED ACTIVITIES

HTA

FIGURE
3.2-8


MBTA
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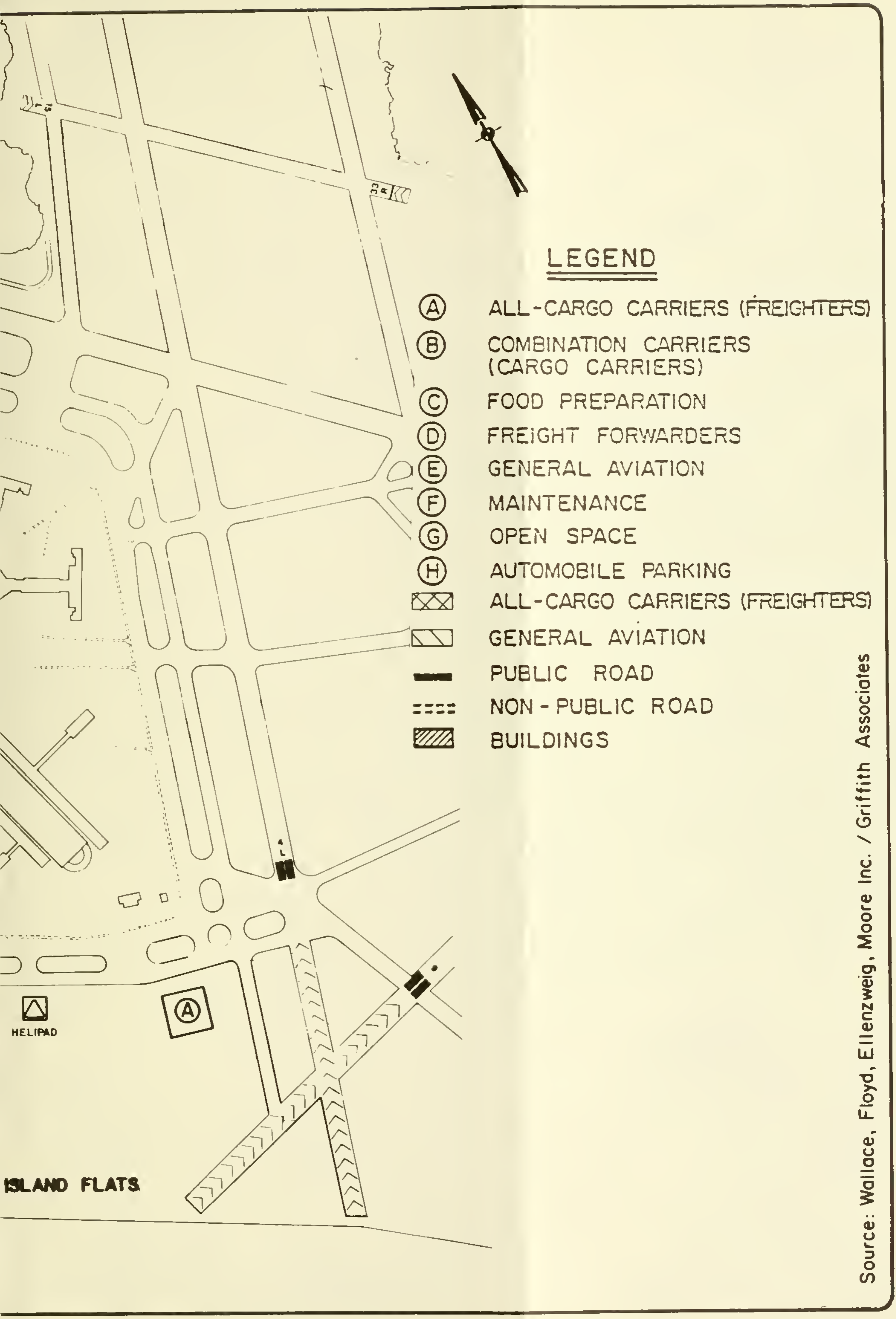
McCLELLAN HIGHWAY (C-1)
EAST
BOSTON
STADIUM
SOUTHWEST
SERVICE
AREA
JEFFRIES
POINT
15
BOSTON INNER HARBOR



Source: Wallace, Floyd, Ellenzweig, Moore Inc. / Griffith Associates

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

NO-BUILD ALTERNATIVE

FIGURE
3.3-1

North fuel farm tank capacity. This alternative would not allow any additional area for possible relocation of freight forwarder, auto rental or flight kitchen activities onto Airport property. See Table 3.2-1.

NOTES

CHAPTER 3

1/ EOEA 30587

2/ MAC letter of 26 October 79, appended to scope. (Appendix, I-30)

3/ The program of development for the Mixed Use Alternative includes (in addition to the cargo related uses shown in Table 3.2.1) the following uses:

Hotel/Conference Center	500 Rooms
Residential	180 Units
Office	400,000 SF
Retail and Services	30,000 SF
Light Manufacturing	300,000 SF
Parking Garage	1800 Spaces
Marina	1
Ferry Terminal	1

CHAPTER 4: AFFECTED ENVIRONMENT

This chapter presents a discussion of existing airport facilities, local and regional characteristics, and related land use and aviation plans.

4.1 PROJECT SETTING

4.1.1 Site Description

Logan has a total land area of some 2,400 acres.[1/] This land resulted primarily from filling tidal marshes and levelling islands. It is physically contiguous to the waters of Boston Harbor on three sides, and to the community of East Boston on the fourth. As shown in Figure 4.1.-1 (Existing Facilities), BIF is mostly vacant land, surrounded primarily by the waters of Boston Harbor and by various airport uses. It has an elevation above mean sea level of approximately 18 feet. Existing facilities on BIF include Bravo Apron, a helipad, and a dock with a crash/fire/rescue boat. Additionally, a twin drainage culvert runs underneath BIF. The culvert discharges into Boston Harbor near the southwestern end of the rock dike which surrounds BIF. The BIF site was part of a 234 acre landfill that also accommodated runway extensions on 9 and 4L. About 80 acres are potentially available for BIF development, but the runway clear zone requirements reduced the developable land to 65 acres.

Land use immediately bordering the airport is a mixture of open space (including abandoned railroad), the Airport "Park-and-Ride" lot, the Robie Industrial Park, and residential areas beyond Wellington and Porter Streets, and on Maverick and Bremen Streets. There is also some residential use remaining on Neptune Road. The MBTA Blue Line runs north/south between the McClellan Highway and Logan's western boundary. In addition, the McClellan Highway (Route C-1) runs parallel to the western boundary of the airport: it provides access to the airport from the north as well as from the Callahan and Sumner Tunnels. These tunnels in turn are the primary connectors to Boston's central business district and points south/west from East Boston and portions of the North Shore.

4.1.2 Local Characteristics [2]

Logan is surrounded by the communities of Winthrop to the northeast, Revere to the north, Chelsea to the northwest and East Boston to the west, as shown in Figure 4.1-2, Urban Setting. Additionally, Charlestown, Downtown Boston and South Boston are within a three mile radius of the airport. [3]

The city of Chelsea covers approximately 2.17 square miles of land and had a 1970 population of 30,625. Two and three family housing on small lots along with light to heavy industry are the dominant land uses.

Revere comprises 6.32 square miles of land, much of which is marsh and tidal land. Petroleum products storage and distribution is the dominant industry, while Revere Beach is a popular recreational area. Revere had a 1970 population of 43,159.

Winthrop, with a population of 20,335 (1970), is a primarily residential community with a small businesss district and marine recreation facilities.

South Boston with a population of 38,488 (1970). is separated from Logan by Boston Inner Harbor. It is a dense residential community with much industry and major port facilities.

East Boston is the community closest to, and most affected by activities at, Logan. It is a densely populated, primarily residential community covering approximately five square miles. Aside from residential land, other uses include light to heavy industry and commercial enterprises. The community had a 1975 population of approximately 38,300, and a labor force of about 17,800. Approximately 5% of the labor force is employed at Logan.

East Boston is comprised of six neighborhoods: Jeffries Point; Central/Maverick Square; Paris Street Flats; Eagle Hill; Harbor View; and Orient Heights as shown in Figure 4.1-3. Of these neighborhoods, Jeffries Point is closest to BIF. Improvements at BIF could have definitive potential impacts upon East Boston, and especially upon Jeffries Point. Special attention, therefore, is given to this neighborhood in the appropriate impact sections.

1. Marriott-In-Flite Caterers
2. Wood Island Power Substation
3. M.P.A. Field Maintenance Center
4. Daves Airfreight
5. U. S. Air Hangar
6. M.P.A. Pumping Station
7. Delta Airlines Reservations
8. Pan American Airlines Airfreight
9. Airport M.B.T.A. Station (Off-Airport)
10. Dollar Rent-A-Car Service Center
11. Avis Rent-A-Car Service Center
12. Hertz Rent-A-Car Check In Center
13. Porter St. Power Substation
14. Hertz Rent-A-Car Service Center
15. Sky Chef Caterers
16. U.S. Post Office
17. Butler Aviation Hangar
18. General Aviation Administration
19. Van Dusen Building
20. Williams Airfreight
21. Delta Airlines Hangar
22. T.W.A. Hangar
23. T.W.A. Airfreight
24. American Airlines Hangar
25. Hilton Hotel
26. American Airlines Airfreight
27. Exxon Service Station
28. M.P.A. Heating Plant
29. International Terminal
30. Pier - A
31. Pier - B
32. North Terminal
33. Pier - C
34. Old Control Tower
35. New Control Tower
36. South Terminal/Garage
37. Southwest Terminal/Garage
38. Eastern Airlines Hangar
39. Fire And Crash Station
40. Fire Boat Mooring
41. Central Parking Garage
42. Budget-Rent-A-Car (Off-Airport)
43. Emery Airfreight (Lang)
44. Eastern Airlines Airfreight
45. National Car Rental
46. Airways Inc. Maintenance Building
47. Eastern Airlines Reservations

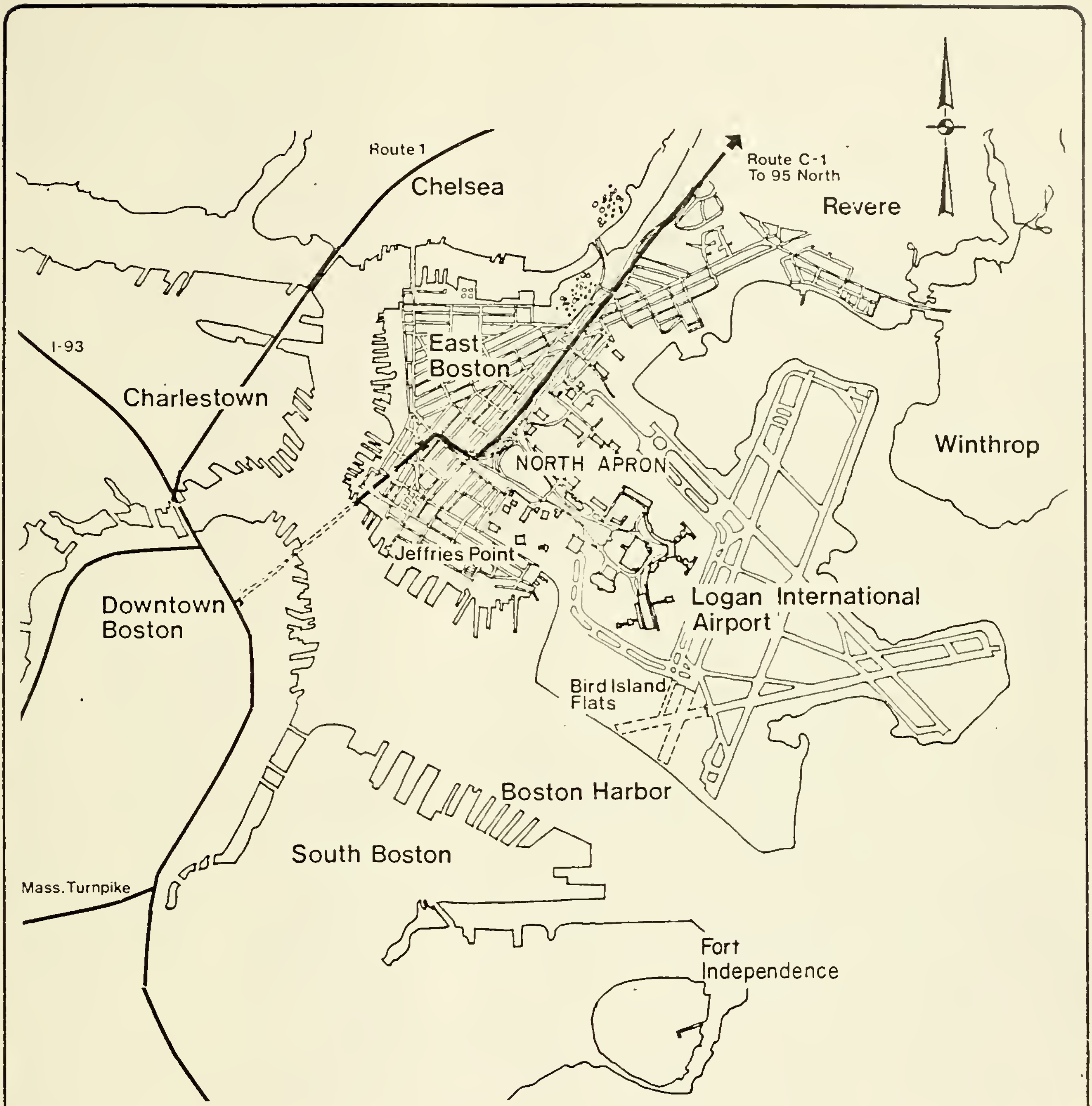
Source: Wallace, Floyd, Ellenzweig, Moore Inc. / Griffith Associates

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR/ EIS

EXISTING AIRPORT FACILITIES

HTA

FIGURE
4.1-1



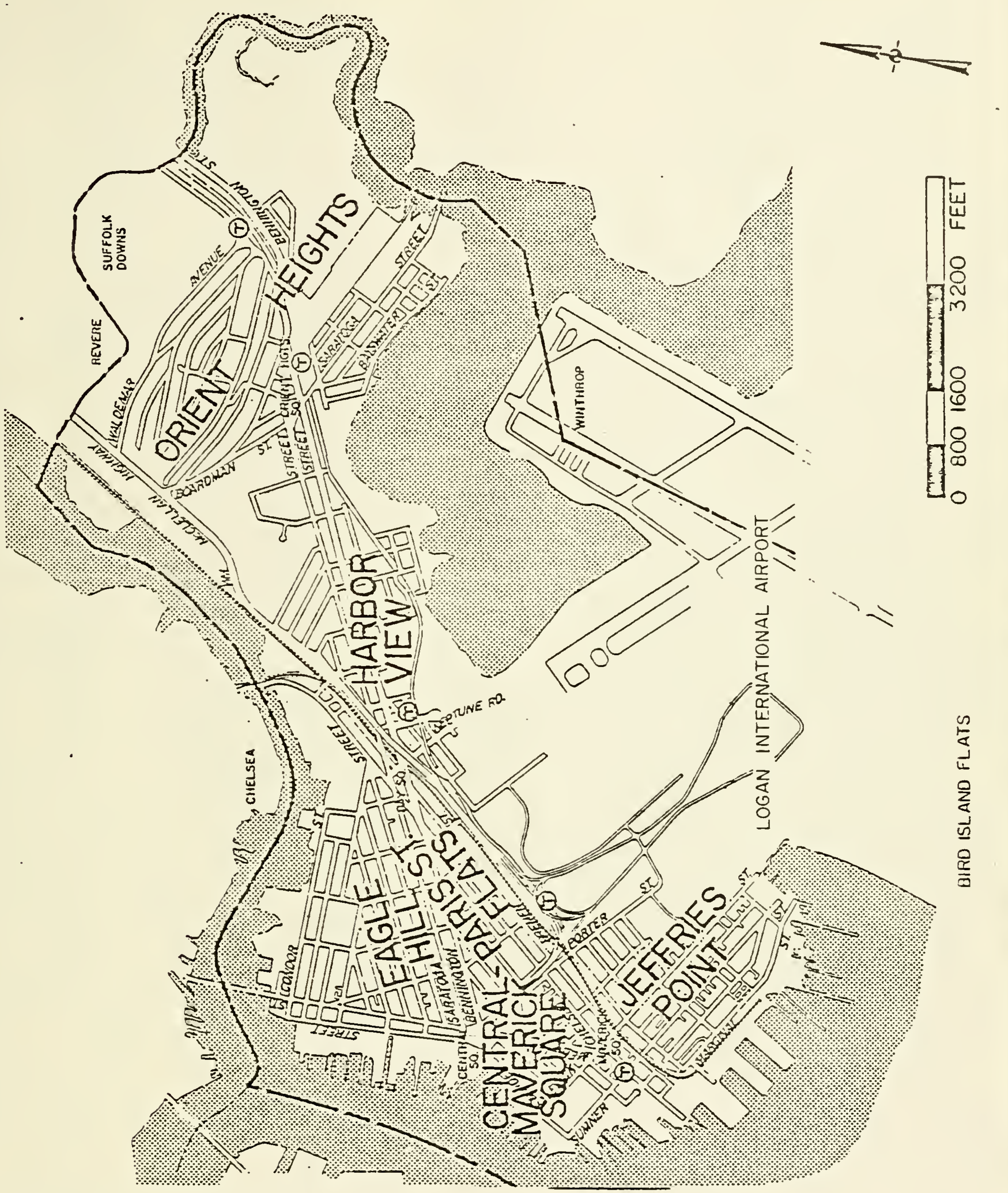
Source. Wallace, Floyd, Ellenzweig, Moore Inc. / Griffith Associates

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

URBAN SETTING

HTA

FIGURE 4.1 -2



Source: Boston Redevelopment Authority

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

EAST BOSTON NEIGHBORHOODS

HTA

FIGURE 4.1-3

4.1.3 Regional Characteristics

In terms of passengers and total operations, Logan is the busiest airport in New England, and provides the primary regional air link with the National Air Transportation System. As the only major air carrier/air cargo airport in New England, it serves an essential regional need, not met by any other facility.

Logan's major impact is on the metropolitan Boston Region. The Metropolitan Area Planning Council (MAPC), which is comprised of 101 cities and towns, is typically considered Boston's "region". The MAPC region is comprised of all of Suffolk County, and parts of Essex, Middlesex, Norfolk, Plymouth and Worcester Counties. The 1970 population of the MAPC was approximately 3 million, which was 53 percent of the total 1970 Massachusetts state population of around 5.7 million. The 1970 population of Boston proper was approximately 641,000.

Another important feature in the metropolitan Boston setting is the Boston Harbor, which encompasses an area of approximately 50 square miles and has 180 miles of tidal shoreline. Thirty islands covering a total land area of 1,200 acres lie within the harbor. It is divided into the inner harbor and the outer harbor which includes Dorchester Bay, Quincy Bay, and Hingham Bay.

4.2 LOGAN PLANNING: PREVIOUS, CURRENT & RELATED

In 1976, Massport adopted a policy statement entitled Logan International Airport Master Plan which incorporated important policies for future planning of Logan. It stated that no additional runways were necessary at that time and that the existing boundaries of Logan were not to be expanded. In addition, land use priorities were determined. Subsequently, in 1978, the consulting firms of Wallace, Floyd, Ellenzweig, Moore, Inc., and Griffth Associates, (WFEM/GA) were chosen by Massport to develop a Land Use Master Plan for Logan. The Year One Report was completed in June 1979. Its major findings centered around the options for location of cargo facilities at Logan and overall land use concepts for further development. Concept "A" consolidated all cargo in the North area, Concept "B" consolidated all cargo on BIF, and Concept "C" split the cargo between the two areas (See Section 2.1).

After extensive review of the three concepts, Massport selected Concept "C", because it seemed to provide the operating flexibility needed at Logan. That is, those airlines with gates on the south side would have their air cargo facilities located at BIF, while those with gates on the north side would have air cargo facilities located on the North Apron.

The WFEM/GA Summer Work Report, October 1979, further refined Concept "C" into a series of infrastructure alternatives and land use zones. All of the Build alternatives for this EIR are based on Concept "C".

Utilizing criteria that considered preliminary environmental assessment, financial constraints and operating flexibility, Massport evaluated a variety of road alignments and building/ apron configurations and selected the road scheme and basic layout that is shown on all the BIF development alternatives. This configuration was subsequently revised to reflect different levels of air cargo intensity at BIF, and also to accommodate a Mixed Use alternative, while still meeting air cargo projections.

After the public comments on this Draft EIR are reviewed and addressed, and each alternative is assessed in light of engineering feasibility, operational flexibility, financial factors as well as environmental impacts, Massport in consultation with FAA will select a preferred alternative.

The preferred alternative will be incorporated into the WFEM/GA Logan Land Use Master Plan (Year Two Report) which is now being prepared. This document will include detailed analysis of other sites at Logan as well as vehicular and aircraft parking, financial and implementation studies.

From a planning perspective, it is essential that the environmental impacts of each alternative be evaluated and understood before a preferred alternative is selected. That is why the BIF land use and environmental impact studies were performed before the completion of the Logan Land Use Master Plan. It would have made little sense to select a BIF alternative for purposes of the Logan Land Use Master Plan without the benefit of a detailed environmental impact analysis.

In addition to relying on the 1976 Logan Master Plan, Logan Land Use Master Plan Studies, "Summer Work", etc. this EIR has to be understood in the context of other studies as well. These include, but are not limited to, the following:

- Logan Airport Master Plan Study, September 1975. This study provided much of the background work used in the 1976 Logan Master Plan.

- FAA New England Aviation System Ten-Year Plan, Fiscal 1977-1987. This study identified the long-range needs of the aviation system in the six state New England Region. It identified the system's needs for enroute control services, navigation aids, landing aids, flight and terminal area services. Items proposed in this plan are implemented only when they qualify, are programmed, funded and approved by the FAA's Airways Facilities Division.

- Massachusetts Airport System Plan (MASP). The MASP was prepared by the Massachusetts Aeronautics Commission and the Massachusetts Department of Public Works in 1973.

- National Airport System Plan 1980-89 (NASP). The NASP is prepared periodically in published form and updated continuously. It contains information on the current and forecasted role of Logan as well as projected capital development costs for the ten year planning period. Out of six air carrier airports in Massachusetts, Logan is the only one designated presently as a hub airport. This is not expected to change over the NASP planning period.

- East Boston. District Profile and Proposed 1979-1981 Neighborhood Improvement Program, Boston Redevelopment Authority, 1979.

There are many other plans which relate to the development of Logan. As appropriate, background reports and plans specific to individual impact area are cited in the respective sections of this EIR.

NOTES

CHAPTER 4

[1] Wallace, Floyd, Ellenzweig, Moore, Inc./Griffith Associates, Land Use Master Plan Study, Logan International Airport: Year One Report, Cambridge, Massachusetts, June 1979, p. 1.

[2] Demographic and descriptive data on East Boston is primarily from the Boston Redevelopment Authority's East Boston District Profile and Proposed 1979 - 1981 Neighborhood Improvement Program, Boston, Massachusetts, 1979.

[3] For further information on communities near Logan, please consult: Massachusetts Port Authority, Draft Generic Environmental Impact Report, Boston, Massachusetts, December, 1979.

CHAPTER 5: POTENTIAL IMPACTS

In this chapter the potential environmental impacts of each BIF alternative are evaluated. Both temporary and long-term impacts are discussed and measures to mitigate the adverse impacts are identified. The potential areas covered are:

- Noise Impacts
- Air Quality Impacts
- Water Quality Impacts
- Hydrology/Flood Hazards
- Wetlands and Coastal Zones
- Flora and Fauna
- Social and Economic Impacts
- Transporation Impacts
- Impacts on Department of Transporation Section 4(f) Lands
- Impacts on Historic and Archaeologic Sites
- Visual Impacts
- Light Emission Impacts
- Energy Supply and Natural Resources
- Solid Waste
- Construction Impacts
- Relationship Between Short Term Uses of the Human Environment and the Maintenance and Enhancement of Long-Term Productivity
- Irreversible and Irretrievable Commitments of Resources

The analysis was based on full activity at BIF for each alternative, comparable to what would be expected in the Year 2000. In each instance the numbers analyzed, emission factors, transportation flows, etc. were clearly on the conservative side, i.e., a deliberate overstatement of the effects. Hence, what follows, is a worst case analysis for each BIF alternative. The major potential environmental impacts resulting from BIF development are unquestionably noise generation and air quality deterioration. It is for this reason that both of these receive much more extensive treatment than the others. The public facilities in East Boston, including sensitive receptors, are shown in Figure 5-1. These receptors will be kept in mind during the impact analyses. In all cases, the environmental impacts of both BIF and North Apron activities will be assessed.

5.1 NOISE IMPACTS

5.1.1 Introduction

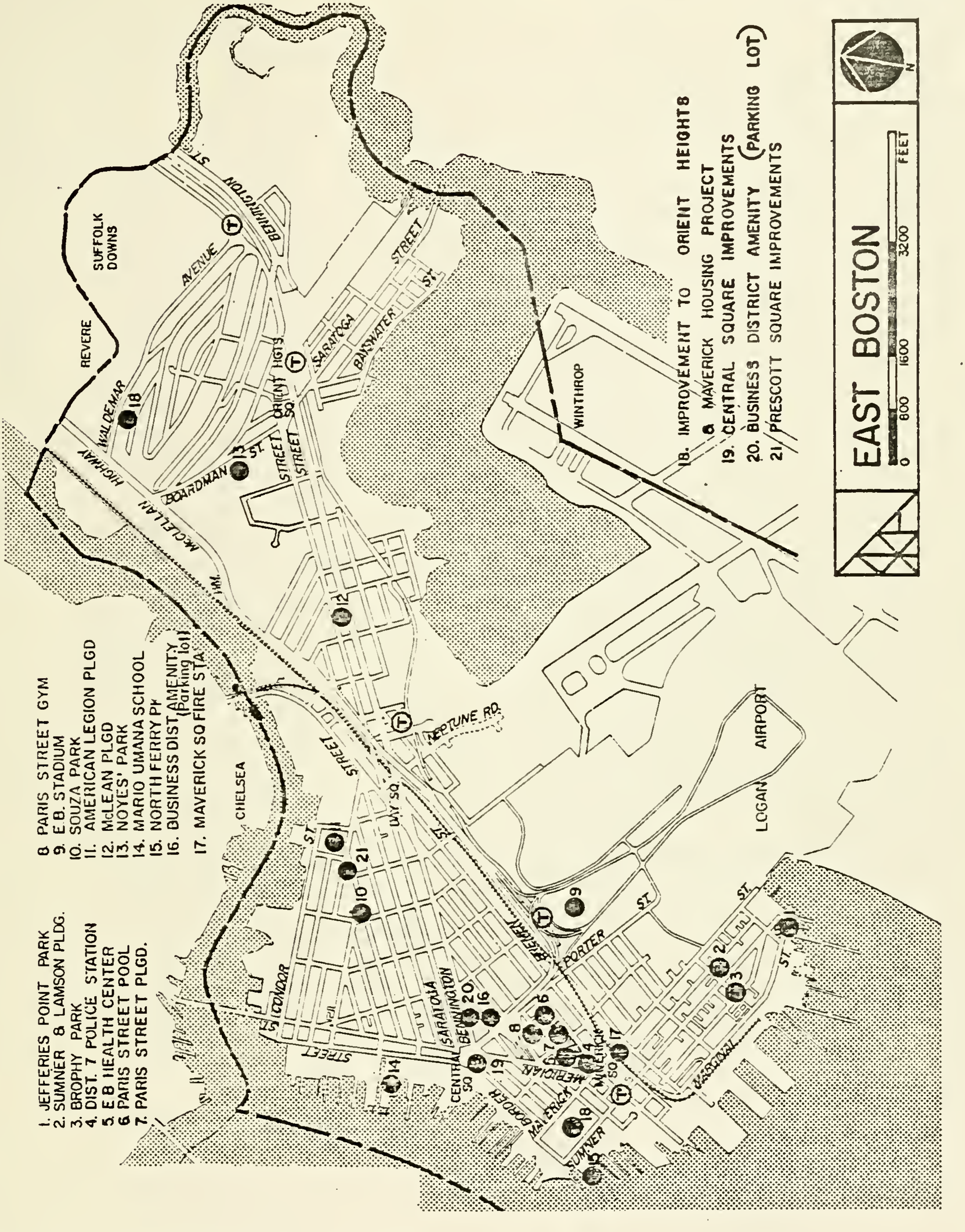
Many of the day-to-day activities at Logan produce noise. The development of BIF will affect some of these activities and may, consequently, affect the amount of noise they produce. Section 5.1 examines the noise-related effects of BIF development and attmepts to determine whether the noise environments in the surrounding communities will be altered by the proposed changes, whether the alterations will be significant, and whether the alterations will improve or degrade the existing and the future noise environments.

The approach taken here to examine the noise effects of BIF development has eight general steps:

- Identification of noise sources (noise-producing activities) likely to be affected.
- Identification of the communities likely to experience altered noise environments.
- Description of how noise affects people.
- Selection of a method for quantifying these effects.
- Demonstration of how noises are quantified.
- Quantification of existing and future noise environments and the alterations in these environments that will result from BIF development.
- Assessment of the noise environment alterations.
- Examination of possible mitigating measures.

5.1.2 Activities and Communities Affected

As discussed in previous sections of the EIR, BIF development primarily affects the type and number of cargo-related activities that are conducted either on BIF or the North Apron. But BIF development may affect the noise produced by several other types of activities at Logan as well. First, BIF development means facility (building) construction, and relocation of some activities. Thus construction activity noise and the noise effects of relocating



Source: Boston Redevelopment Authority

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS · EIR / EIS
PUBLIC FACILITIES AND SENSITIVE RECEPTORS

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FIGURE
5 - 1

general aviation gates and helicopter gates should be examined. Second, there are some activities that exist today, and that will exist in the future, but may be acoustically shielded by proposed BIF buildings (start of takeoff roll on Runway 9, Eastern Airlines and USAir ground operations). Finally, though not affected directly by any development alternative, flight operations are generally the predominant noise generating activity at Logan, and noise levels from these operations should be examined for purposes of comparison with other activity noise.

The selected activities may be categorized as follows:

- Cargo-Related
  - Cargo aircraft ground operations (taxi)
  - Trucking activities serving BIF/North Apron
- General BIF Development-Related
  - Construction activities
  - General aviation ground operations
  - Helicopter operations (landing on BIF)
- Acoustically Sheilded
  - Start of takeoff roll on Runway 9
  - Eastern Airlines/USAir ground operations
- General Logan Flight Operations

The communities most likely to be affected are those residential neighborhoods near either BIF or the North Apron:

- Jeffries Point
- Bremen Street residences
- Neptune Road residences

Additionally, so that all potentially affected noise-sensitive areas will be examined, noise levels are briefly examined for:

- Boston (Harbor Tower Apartments)
- South Boston (Fort Independence)

5.1.3 Quantification of Noise Effects

Ideally, the goal of any noise impact study should be to determine the noise-related psychological effects of implementing the proposed project. That is, the study should determine whether the noise environment, after the proposed changes are implemented, will be more annoying or less annoying than the environment is now, or than the environment will be if the proposed changes are not implemented. In making such a determination; present and future noise environments, and hence the noise sources that contribute to those environments, must be quantified, and those quantities must be related to annoyance.

- Annoyance Due to Noise[1/]

When is a noise annoying? Predicting whether or not a specific noise will be annoying to any given individual is extremely difficult. An individual's reaction to noise depends not merely on the level, frequency content, time history, or other quantifiable physical parameters of the noise, but also on many not easily quantified subjective factors. Does the individual like or dislike the source of the noise? Does the noise source represent some threat (e.g., in terms of safety) to the individual?

Studies have shown, however, that when judgments of annoyance are averaged over many individuals, a somewaht predictable relationship exists between the quantifiable physical parameters of the noise and the average annoyance reaction. Furthermore, the average annoyance reaction is closely related to the amount of activity intereference prouced by the noise. In other words, on the average, the amount and/or degree of annoyance produced by a noise is a result of the degree to which that noise interferes with human activity. In this study, therefore, the psychological effects produced by the various noise sources will be judged by determining the likelihood that their noise will interfere with the human activities of speech communication or sleep.

When a judgment is being made on when activity interference will occur, the noise must be quantified with one or more descriptors, and these descriptors must be related to activity interference. Thus, a quantitative descriptor is selected, and then a value of that descriptor is identified as the threshold at which activity interference can be expected to occur.

- Selection of Descriptors

To select from among commonly used descriptors, one must understand, first, what sound is, and, second, how the various descriptors "describe" or quantify sound.

All commonly used descriptors account for one or more of the three basic characteristics of sound:

- The frequency of the sound (pitch).
- The level of the sound (loudness).
- The time varying nature of the sound.

- Pitch

Airborne sound is a disturbance that passes through the air, causing rapid fluctuations of air pressure above and below the existing atmospheric pressure. Each time the pressure fluctuates above, below, and back above atmospheric pressure, it is said to go through one cycle. The greater the number of cycles per second, the greater the frequency and the higher the pitch. The unit of frequency is the cycle per second, called hertz (Hz), after the man who first studied electromagnetic waves. Normal speech occurs in the mid-frequency range from roughly 500 Hz to 3000 Hz.

- Loudness

The loudness of a sound is determined by how greatly the sound pressure fluctuates above and below atmospheric pressure. Because a very loud sound can have pressure fluctuations that are 1,000,000 times greater than those of a just audible sound, a "compressed" scale has been devised to describe the loudness of sounds. The unit of this scale is the decibel (dB), and sounds described in terms of decibels are called "levels".

- Time Variation

In any community, the noises heard vary from second to second. Both the frequency content (or pitches that are present in the noise) and the loudness (or level) of the noise change from second to second.

What are the commonly used descriptors? How do they account for pitch, loudness, and time variation? Which descriptor or descriptors would be most useful in this study? Almost all descriptors are based on the concept of frequency-weighting. It would be extremely difficult and confusing to describe all community noise levels frequency-by-frequency - that is, to analyze all community noise by examining the time-varying levels at each frequency. Scientists have therefore devised a number of different methods for adding together the levels at all frequencies and producing a single number to describe a sound.

The most commonly used method is one that first "weights" the levels at each frequency and then adds all the "weighted" levels together. "Weighting" means that certain frequencies are deemphasized, or considered less important than others. This weighting is generally done with an electronic network or circuit of a sound level meter, and the most widely used electronic circuit is one called the "A-weighting" network. Sound levels measured with this network are called A-weighted sound levels, abbreviated dB(A) or dBA. Throughout this study, all sounds are discussed in terms of their A-weighted levels.2/

Thus, A-weighting accounts for pitch. What about loudness and time variation? Commonly used (A-weighted) descriptors that quantify loudness and/or time variation generally fall into one of three categories:

- Single Levels - e.g., sound level maximum, minimum;
- Percentage Levels - sound levels that are exceeded for some stated percentage of time;
- Equivalent Levels - the steady sound level that, during a stated time period, has the same sound energy as does the sum of all the individual sounds during the period.

Each of these three types of descriptors is useful in certain situations, and each has certain shortcomings.

- Single Levels

Single levels are probably the easiest to understand. If a noise source (e.g., an aircraft taking off) produces a maximum noise level of 90 dB(A) at a specified community location, it is relatively easy to imagine how loud that is once one has been given (or heard) a few examples of noises and knows their associated maximum noise levels.

Also, it is an easy matter to decide what of several different noise sources will produce the loudest maximum sound level. Finally, for steady noise sources, such as a fan, an air conditioner, or the auxiliary power unit (APU) of an airport, a single level completely describes the noise that source makes when it is in operation.

Unfortunately, the single level tells nothing about the time-varying nature of the noise source: how long it produces the maximum noise level; how often it produces the maximum level; what the noise level is like when it is less than the maximum level - does the level rise quickly or slowly to the maximum and does it drop quickly or slowly after it reaches the maximum? Furthermore, there is no doubt that interference with human activity is highly dependent upon the time-varying nature of sound.

- Percentage Levels

These are descriptors that identify A-weighted levels that are exceeded for a specified percentage of the time during a staged period. Commonly encountered percentage levels are the 10% (abbreviated L_{10}) and 50% (abbreviated L_{50}) levels for a specified hour. The L_{10} is the level exceeded for 10% of the time period (usually an hour) and the L_{50} is the level exceeded for 50% of the time period.

Percentage levels are an attempt to account for the time-varying nature of noise, and for certain types of noise sources, they are somewhat useful. In particular, for very regular, predictable sources, such as a heavily travelled highway, they have meaning. The L_{10} is a measure of the average maximum noise levels, and the L_{50} and L_{10} together suggest how much the maximum noise levels differ from the average noise level. Thus, if L_{10} and L_{50} are nearly the same or differ by only a few decibels, one knows that the highway produced very constant noise levels. On the other hand, if L_{10} and L_{50} differ greatly, one knows that the highway produced relatively loud, somewhat infrequent maximum noise levels.

For noise sources that are less regular, less easily defined than heavily travelled highways, however, percentage levels are not useful, unless many percentage levels (e.g. L_1, L_{10}, L_{50}, L_{90}, L_{99}) are known. Determining simply L_{10} (and/or L_{50}), for example, still tells nothing about what the noise levels are like when they exceed L_{10} or L_{50}. Do they exceed L_{10} by many decibels or by only a few? Again, interference with human activity is certainly dependent upon how loud noise levels are and how often they occur.

Another type of percentage-related descriptor is the "time-above" or TA. This descriptor is either a time, in minutes of hours, or a percentage of time, during which noise levels exceed some identified level. If, for example, the identified level is chosen to be the one at which activity interference (e.g., speech interference) begins, then TA gives an indication of how much time the noise from a source will interfere with speech. As with other percentage levels, TA does not tell by how much a level is exceeded.

- Equivalent Levels

This type of descriptor is probably the most difficult to understand. In essence, it is a number that accounts for all the sound energy produced by a noise source. The equivalent sound level during a stated time period for a given noise source is the level of a steady sound that has the same sound energy as does the actual time-varying sound produced by that noise source. Put another way, it is a measure of the dose of noise from a given noise source that takes into account how loud each sound produced by the noise source is and how often the sounds occur. Thus, equivalent level measures the average cumulative noise during the time period and accounts for all time variations of the noise.

One shortcoming of the equivalent level descriptor is that it may not account for very short-duration, relatively loud noise events. If the noise sources examined in this study produced such noises (i.e., were sources of "impulse" or explosive-type noise), this shortcoming might be of concern. However, with the exception of construction-related pile driving, there are no such sources of concern here. Further, numerous social surveys made in the vicinity of airports show reasonably good correlation between equivalent level descriptors and annoyance reactions to the noise.[3]

Accordingly, because single (maximum) levels fail to account for number of occurrences and duration of each occurrence, because percentage levels fail to account for maximum levels, and because equivalent levels account for all factors - number of occurrences, duration, and maximum level - the hourly equivalent sound level, L_{eq}, is the primary descriptor used in this report. It is determined for an average daytime hour and an average nighttime hour. This separation of daytime and nighttime permits separate assessments of speech interference and sleep interference.

It should be noted that while daytime includes the usual period between 7 A.M. and 10 P.M., nighttime is not defined as the remaining hours between 10 P.M. and 7 A.M. Rather, nightime includes only the hours between 10 P.M. and midnight. Why such a short period for nighttime? BIF development affects primarily cargo operation. Cargo aircraft depart throughout the daytime hours, but most nighttime activity occurs between 10 P.M. and midnight. Thus, it would be inappropriate to average the nighttime activity over the entire nine nighttime hours of 10 P.M. to 7 A.M. For example, if nine cargo aircraft depart after 10 P.M. and before 7 A.M., then on the average, one plane departs per hour, and L_{eq} for an average nighttime hour would be based on one departure. If, however, the nine aircraft actually depart between 10 P.M. and midnight, L_{eq} for these two hours should be based on 4.5 departures, and the more realistic assessment of the Noise-related psychological effects should also be based on 4.5 departure L_{eq}. Thus, "nighttime" in this study refers to the hours between 10 P.M. and midnight.[*]

In addition to daytime and nighttime L_{eq}, this study also provides information on resultant maximum A-weighted sound levels, L_{max}, and on "time-above". These two additional descriptors are provided to give readers an alternative, if somewhat limited, method of assessment.

- <u>Noise Descriptors and Activity Interference</u>

The relationships between activity interference and the selected descriptor are given in Table 5.1-1.

---

[*] Note also, that use of daytime and nighttime hourly equivalent sound levels permits computation of either the day-night average sound level, L_{dn}, or the 24-hour equivalent sound level.

If daytime L_{eq} is denoted $L_{eq}(d)$ and nighttime L_{eq} is denoted $L_{eq}(n)$ then:

$$L_{dn} = 10 \log \left[\frac{15}{24} \cdot 10^{\left(\frac{Leq(d)}{10}\right)} + \frac{2}{24} \cdot 10^{\left(\frac{Leq(n) + 10}{10}\right)} \right]$$

if nighttime noise occurs only between 10 P.M. and midnight.

If nighttime noise occurs equally throughout the hours of 10 P.M. to 7 A.M. then:

$$Ldn = 10 \log \left[\frac{15}{24} \cdot 10^{\left(\frac{Leq(d)}{10}\right)} + \frac{9}{24} \cdot 10^{\left(\frac{Leq(n) + 10}{10}\right)} \right]$$

TABLE 5.1-1. ACTIVITY INTERFERENCE AND NOISE DESCRIPTORS.[1]

Activity	Outdoor A-weighted Hourly Equivalent Sound Levels at which Activity Interference is Assumed to Occur
Speech	60 to 65 dB(A)
Sleep	50 dB(A)

---

[1] The relationships of this table are based on information presented in U.S. EPA Report 550/9-74-004, Appendix D.

Speech Interference

Both outdoor and indoor speech communication have been considered. Outdoors, satisfactory conversation (95% sentence intelligibility) is possible using "normal voice" at a talker-listener distance of 2 m (1-1/2 foot) in the presence of urban community noise equivalent sound levels not greater than approximately 60 dB(A).[4]

Indoors, 100% sentence intelligibility is possible using normal voice at talker-listener distances greater than 1 m in typical living rooms and bedrooms in the presence of steady A-weighted levels of, at most, 45 dB(A) to 50 dB(A). Outdoor noise intruding into a living room or a bedroom through a partially open window will be reduced, within the room and away from the window, by 10 dB to 15 dB. Consequently, a steady outdoor sound level of, at most, 55 dB(A) to 60 dB(A) should permit 100% sentence intelligibility indoors. However, since outdoor sound levels are not steady but fluctuating, an equivalent level somewhat higher than 60 dB(A) should also permit 100% indoor speech intelligibility. That is, it has been found that "...almost all time-varying environmental noises with the same Leq would lead, averaged over long time periods, to better intelligibility than the intelligibility for the same Leq values of continuous noise".[5]

Thus, an outdoor equivalent sound level of at most 60 to 65 dB(A) should permit 100% sentence intelligibility indoors and 95% sentence intelligibility outdoors. Outdoor equivalent sound levels exceeding 60 to 65 dB(A) will be judged in this study as producing adverse psychological effects; that is, speech interference.

Sleep Interference

Many authors have developed recommended acceptable noise levels for various architectural spaces. These recommendations are summarized in the U. S. EPA Levels Document* and include levels recommended for residential bedrooms. The limits of acceptability range from 25 dB(A) to 47 dB(A). If the average of these limits - about 35 dB(A) - is judged to be the upper limit of acceptability for the equivalent sound level of intruding noise (indoors), then outdoors, equivalent noise levels that exceed approximately 50 dB(A) (35 dB(A) + 15 dB outdoor-to-indoor attenuation) can be judged as causing unacceptable levels inside bedrooms. Accordingly, outdoor hourly equivalent noise levels that exceed 50 dB(A) will be considered as potentially disruptive to sleep.

---

* "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety", EPA/ONAC 550/9-74-004, March, 1974.

5.1.4 Existing Noise Levels

As discussed in Section 5.1.3, community noise levels vary with time. A-weighted levels vary from second to second, and even average daytime or average nighttime hourly equivalent levels vary from day to day and from night to night. Thus, the present examination of existing noise levels is an examination of ranges of existing noise levels.[6]

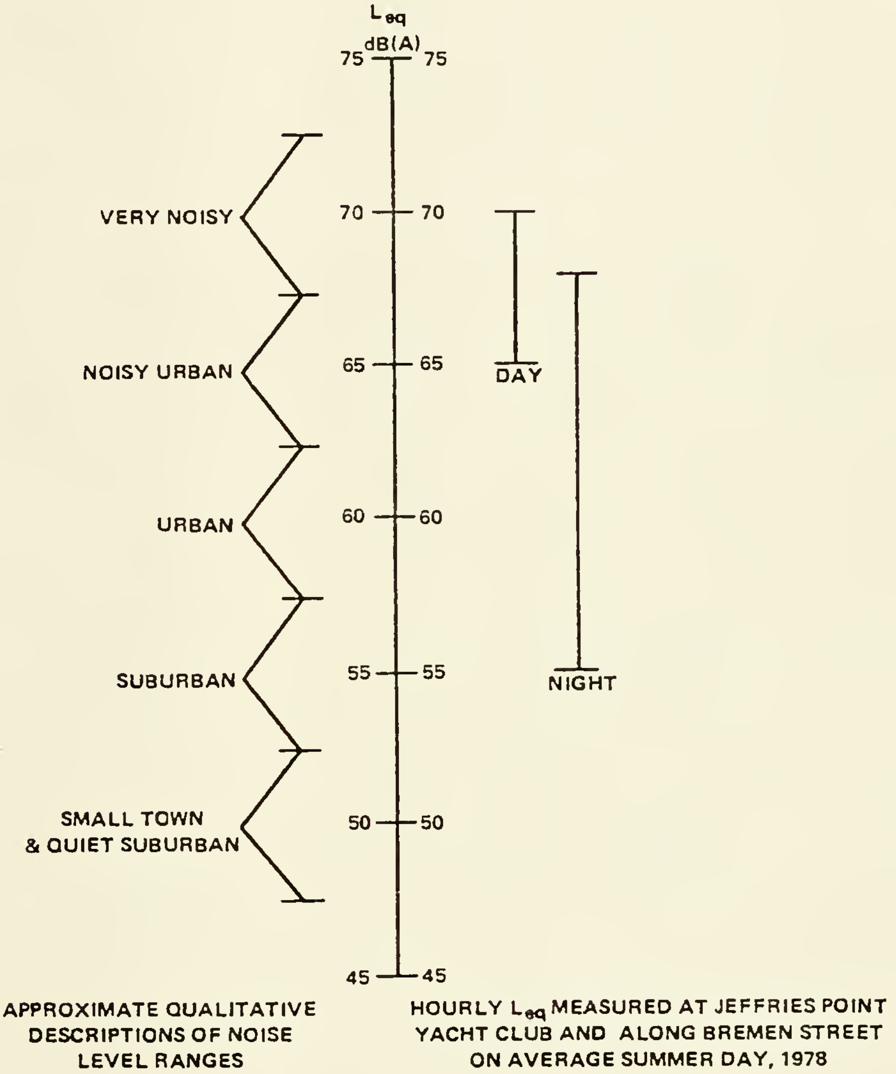
Figures 5.1-1 through 5.1-4 present some examples of existing noise level ranges. Figure 5.1-1 shows the general values of average summer daytime and nighttime (10 P.M. to midnight) hourly equivalent levels that exist in Jeffries Point near the airport and along Bremen Street. These hourly equivalent levels are based on summertime (August 1978) Massport noise monitoring site measurements and are for an average day (neither the noisiest nor the quietest day, but approximately halfway in between).

Figure 5.1-1 also provides a comparison of these average hourly equivalent levels with qualitative descriptions of residential community noise levels. Two conclusions are apparent.

First, measured existing levels fall in the noisier, top portion of the scale. Second, by comparison with the values in Table 5.1-1, it can be concluded that measured existing levels may produce both speech and sleep interference.

Figure 5.1-2 presents estimated ranges of daytime hourly L_{eq} for Boston (Harbor Tower Apartments) and South Boston (Fort Independence). These ranges are based on measurements made at the top of the parking garage adjacent to the Harbor Towers Apartments and at Fort Independence, and are intended to show how loud existing noise levels are at these two locations when no aircraft are flying nearby. The 20 dB difference between these two locations is due to the high noise levels produced by traffic passing the Harbor Tower Apartments on the Central Artery and to the lack of any substantial traffic in the vicinity of Fort Independence.

Aircraft taking off from Logan generally produce the highest noise levels that surrounding communities experience. Figure 5.1-3 shows ranges of maximum A-weighted levels, L_{max}, as measured in Jeffries Point and at Bremen Street. The ranges include approximately 90% of all maximums measured during December 1979.



Source: Bolt, Beranek and Newman Inc.

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

COMPARISON OF MEASURED RANGES OF HOURLY Leq IN JEFFERIES POINT AND ALONG BREMEN STREET WITH QUALITATIVE DESCRIPTIONS OF NOISE LEVELS.

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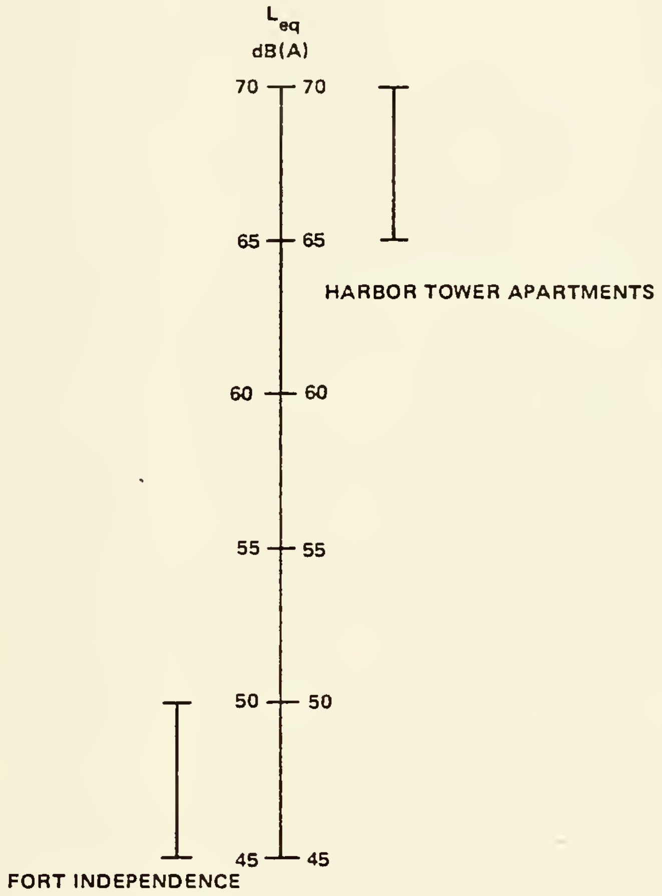
FIGURE 5.1-1



Source: Bolt Beranek and Newman Inc.

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

APPROXIMATE EXISTING DAYTIME RANGES OF HOURLY L_{eq} IN BOSTON (HARBOR TOWER APARTMENTS) AND IN SOUTH BOSTON (FORT INDEPENDENCE), WHEN NO AIRCRAFT ARE FLYING NEARBY.

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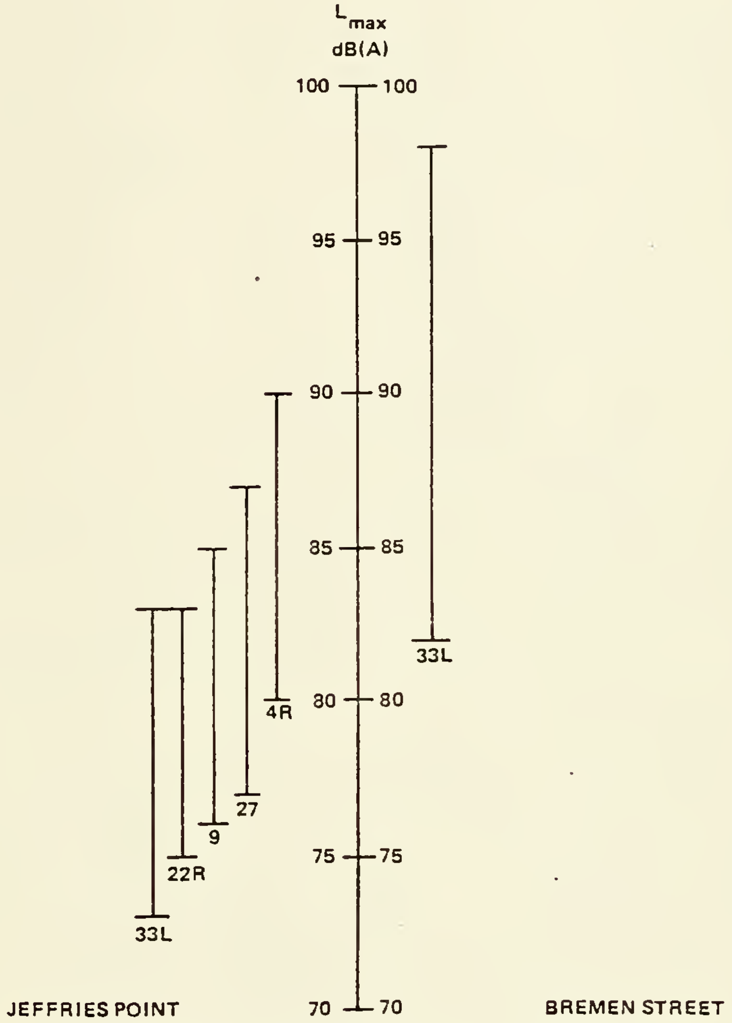
FIGURE
5.1-2



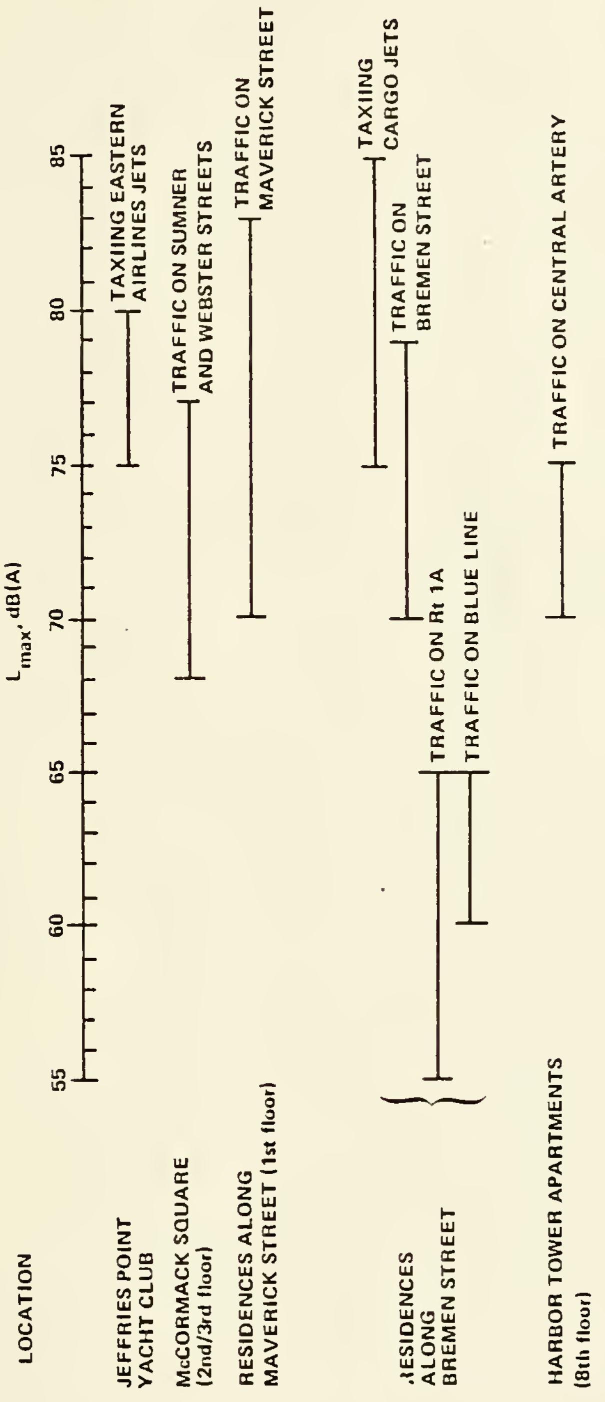
BASED ON MASSPORT NOISE MONITORING DATA FROM MICROPHONES 12 AND 4 MADE DEC. 1979, AND ON GRAPHIC LEVEL RECORDINGS MADE AT THE JEFFRIES POINT YACHT CLUB, WINTER, 1978.

Source: Bolt Beranek and Newman Inc.

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS
RANGES OF MAXIMUM A-WEIGHTED SOUND LEVELS FROM TAKEOFFS ON DIFFERENT RUNWAYS AS HEARD IN JEFFRIES POINT AND AT RESIDENCES ALONG BREMEN ST.

HTA

FIGURE
5.1 - 3



Source: Bolt Beranek and Newman Inc.

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS
EXAMPLES OF MAXIMUM A-WEIGHTED LEVELS
AT VARIOUS COMMUNITY LOCATIONS.

HTA

FIGURE
5.1-4

Figure 5.1-4 presents examples of the maximum A-weighted levels produced by other common noise sources at specific community locations.

The ranges presented in Figures 5.1-1 through 5.1-4 may not fully convey the relative aspects of the different types of noise sources. Figure 5.1-5 presents the A-weighted time histories of several different noise events. The events are presented on identical time scales and sound level scales so that they may be directly compared.

These time histories may be used to compare the different A-weighted descriptors discussed earlier (see Selection of Descriptors): maximum levels, L_{max}; percentage levels, L_{10} and TA; and equivalent levels L_{eq}. First, L_{max}, L_{10}, and L_{eq} are shown for the two events of Figures 5.1-5 A and B. Second, the values of Tables 5.1-2 and 5.1-3 permit quantitative comparisons of L_{max}, L_{eq}, and TA. Table 5.1-2 presents, for specific events, the maximum A-weighted level, the duration for a single event of the time-varying level about 65 dB(A) (time-above, TA, 65 dB(A)), and the number of events per hour needed to result in hourly L_{eq}s of 60, 56 and 70 dB(A). Table 5.1-3 presents corresponding time-above (TA) percentages for each type of event and each value of hourly L_{eq}. In other words, Table 5.1-2 shows how many events are needed to produce hourly equivalent levels of 60, 65 and 70 dB(A), and Table 5.1-3 shows the corresponding percentages of an hour during which the level of 65 dB(A) will be exceeded. For example, Table 5.1-2 shows that fifteen 727 arrivals in an hour will create an hourly L_{eq} of 70 dB(A), and Table 5.1-3 shows that this many arrivals will result in noise levels that exceed 65 dB(A) for 37% of the hour.

5.1.5 Results

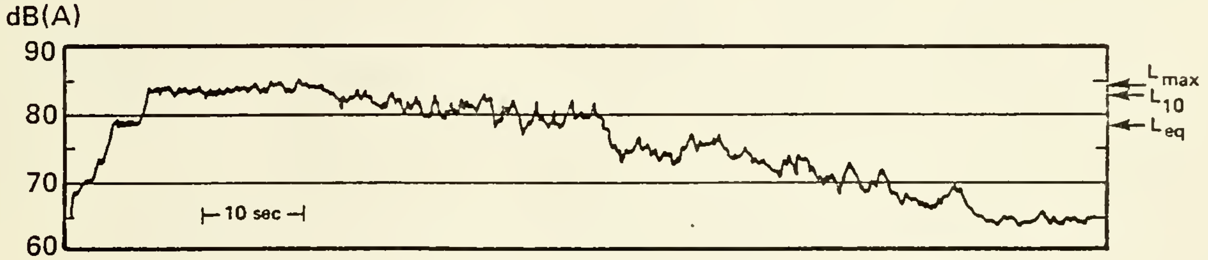
- Methods

Predictions of noise levels were made, in general, for worst case (loudest) conditions at typical community locations. Worst case conditions are those propagation conditions that have been shown to result in the loudest community noise levels resulting from Logan operations. Specifically, Logan activities are most easily heard in nearby communities when the wind blows from the airport toward the community. During these wind conditions, sound propagates easily from the noise source to the community, and the sound experiences little or no excess attentuation.7/

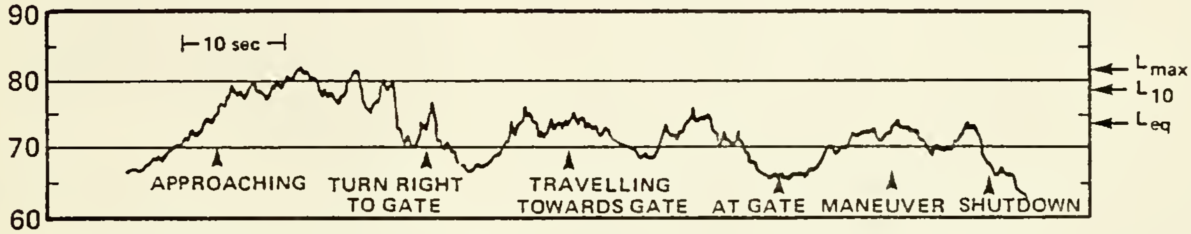
TABLE 5.1-2. QUANTITATIVE COMPARISONS OF SOME OF THE NOISE EVENTS SHOWN GRAPHICALLY IN FIG. 5.1-5.

Event	Maximum A-Weighted Level	Duration [Seconds Above 65 dB(A)]	Number of Events Per Hour Needed to Produce an Hourly L_{eq} of:		
			60 dB(A)[1]	65 dB(A)[1]	70 dB(A)[1]
Takeoff on 4L/R	84	95	~1	~2	5-6
Arriving 727	82	88	1-2	5	15
Van passing by at McCormack Square	76	7	43	135	428
Bus passing by on Maverick Street	83	8 1/3	5	16	51

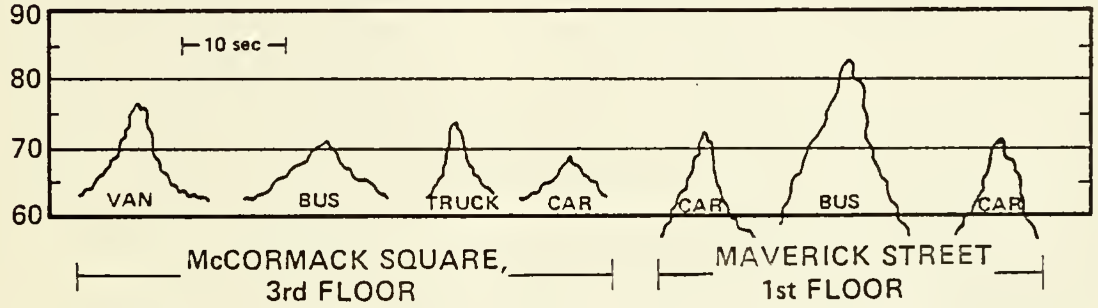
[1] For the numbers of events given in these columns, Table 5.1-3 gives percent of 1 hour that the events will result in levels exceeding 65 dB(A). For example, if 5 Eastern Airlines 727s arrive during an hour, they will produce noise levels at the Jeffries Point Yacht Club that exceed 65 dB(A) 12% of that hour (Table 5.1-3). Similarly, 43 vans passing by at McCormack Square would cause noise levels at a McCormack Square third-floor window to exceed 65 dB(A) 8.4% of that hour.



A. TAKEOFF ON 4R/L, AS HEARD AT JEFFRIES POINT YACHT CLUB



B. EASTERN AIRLINES 727 ARRIVING ON INNER TAXIWAY AS HEARD AT JEFFRIES POINT YACHT CLUB



C. VEHICLE PASSBYS AS HEARD IN McCORMACK SQUARE AND ON MAVERICK STREET

Source: Bolt Beranek and Newman Inc.

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

A-WEIGHTED TIME HISTORIES OF SOME COMMON EAST BOSTON NOISE EVENTS.

HTA

FIGURE
5.1 - 5

TABLE 5.1-3. PERCENTAGE OF 1 HR THAT SOUND LEVEL EXCEEDS 65 dB(A) FOR NUMBERS OF EVENTS SHOWN IN TABLE 5.1-2.

Event	Percent of 1 Hr for Hourly L_{eq} of:		
	60 dB(A)	65 dB(A)	70 dB(A)
Takeoffs on 4L/R	1.4	5.2	14.
Arriving 727s	3.7	12.	37.
Vans passing by at McCormack Square	8.4	26.	83.
Buses passing by on Maverick Street	1.2	3.9	12.

It should be noted, however, that for Jeffries Point, these worst case conditions exist, on average, only 14% of the year. For the rest of the year, wind conditions either reduce taxiing/ground operation noise 10 to 15 dB below worst case conditions (35% of the time) or reduce this noise by 15 to 30 dB below worst case conditions (48% of the time).[8/] Thus, in what follows, it must be recalled that for more than 80% of the year noise levels produced by ground operations, as heard in Jeffries Point, will be at least 10 dB lower than the predicted levels.

The majority of the predictions discussed here have been made at two typical community locations: one in McCormack Square at a third-floor window facing the airport; the other at a third-floor window facing the airport; the other at a third-floor window of a Bremen Street residence facing the airport. These two locations were chosen for several reasons. Numerous predictions had been made at a number of community locations, and these two were found to represent reasonably the respective East Boston communities. Noise levels at the McCormack Square residence are generally within 2 dB or 3 dB of levels predicted at any other location in the Jeffries Point community.[9/] The Bremen Street residence is the one closest to North Apron activity and represents all those Bremen Street residences that are likely to experience the loudest noise levels produced at the North Apron. Predictions have also been made for the third floor window of residences on Neptune Road nearest the North Apron taxiways.

All predictions were based on specific assumptions about numbers and types of aircraft, types of buildings/barriers constructed, numbers of trucks serving BIF, etc. Though the specific assumptions are detailed in Appendix B, a few that are critical to noise predictions, should be stated here.

- Noise predictions for the future (year 2000) assume that aircraft are generally quieter (because of Federal regulations) than they are today, see below, Ground Operations Noise Predictions.

- Buildings or barriers 40 feet high are constructed along the western edge of BIF, along Jeffries Point Cove, for all build alternatives.

- The "Mixed Use" build alternative includes buildings 70 feet high along part of the Jeffries Point Cove boundary, and the exact location of these buildings is somewhat flexible so that they can be located to achieve maximum reduction of community noise levels.

Ground Operations Noise Predictions

Predictions for all ground operations, including taxiing aircraft, truck traffic, and construction equipment activity, were made using the basic calculation procedure described in Users Manual: TSC Highway Noise Prediction Code: MOD-04.[10] This method is a computerized procedure that allows prediction of the equivalent noise levels produced by any type of noise source, moving or stationary, so long as the noise "emission level", speed and location of movement, and number of operations per day are known for each noise source. A complete description of the method is given in a previous report done for Massport.[11] Numbers of noise sources (operations data) and emission levels used are given in Appendix B.

The "emission level" for a noise source is the sound level produced by the noise source as measured at a location 50 feet from the source. Emission levels for most existing aircraft have been previously measured,[12] while emission levels for aircraft that will be used in the future (year 2000) were derived from engine type and thrust information. These future aircraft emission levels had to be derived because either they could not be measured, or manufacturers could not yet provide test data since the engines were still in design. In general, these future aircraft emission levels are lower than the levels of existing aircfaft, because by the year 2000 all new aircraft will have to comply with the stricter "Stage 3" noise level requirements of FAR Part 36 (14CFR Part 36), and older aircraft will have to be retrofitted/reengined to comply with "Stage 2" requirements. Derivation of these future emission levels is described in Appendix B.

- Flight Operations Noise Predictions

Helicopter flight operations noise was also predicted using the MOD-04 computer model. Jet takeoff noise, however, was predicted with multi-step hand computations. Takeoff noise was predicted for each runway by determining the sound exposure level (SEL) for each aircraft type to use the runway now and in the future.[13] The proper SEL was selected not only on the basis of aircraft type, but also on the basis of its takeoff weight, distance from the community location to the flight track point of closest approach, and distance from the closest approach point to start of takeoff roll. Existing and future fleet mixes were based on data provided by Massport. A more detailed description of the prediction procedures is given in Appendix B.

Takeoff noise predictions were made by assuming 100% utilization of the identified runway. In other words, the predicted values of average hourly L_{eq} for each runway assume all takeoffs for that average daytime or nighttime hour use only the one identified runway. Such an approach should yield values of average hourly L_{eq} that can be related directly to personal experience. For example, when aircraft take off from Runway 9, they take off from it for 100% of the time, even if it is used for only 2 hours before the wind shifts and another runway comes into use. The predicted hourly L_{eq} is the value that would result for each of these 2 hours. This approach is different from the more common method of computing aircraft flight operation noise on the basis of average annual runway usage.

Flight operations noise levels are predicted for single runways for another reason. The periods during which East Boston communities are most likely to hear the noise of ground operations are the periods when specific runways are likely to be in use. As discussed earlier, worst case noise conditions generally occur when the wind blows from the airport toward the community. For Jeffries Point and Bremen Street residences, worst case wind conditions are easterly to southeasterly winds. During such winds, takeoffs are likely to use Runway 9 or 15R. Predictions of takeoff noise were, therefore, made for these two runways.14/ Additionally, for comparison, average hourly L_{eq} values were also predicted for takeoffs on 27 and 33L since these operations produce some the highest noise levels experienced by Jeffries Point and the Bremen Street residences, respectively.

- Comparisons and Conclusion

Tables 5.1-4 through 5.1-8 present the resultant predicted noise levels for all identified activities (except construction noise, which is discussed separately below). These presentations of noise level descriptors at community locations may be summarized as follows:

Table Number	Descriptor Presented	Community Location
5.1-4	Average Hourly Leq	Jeffries Point
5.1-5	Maximum A-Weighted Sound Level	Jeffries Point
5.1-6	Average Houly Leq	Bremen Street & Neptune Road
5.1-7	Maximum A-Weighted Sound Level	Bremen Street
5.1-8	Time Above 65 dB(A)	Jeffries Point & Bremen Street

Before presentation of the comparisons and conclusions suggested by the numbers, the general accuracy of the numbers should be discussed. Two major, but unavoidable, shortcomings affect the accuracy of the calculated numbers. First, in almost all cases, the communities are at considerable distances from the noise sources - at least 1000 feet or more. Thus, all noise must propagate a long distance before reaching the community. The greater the propagation distance, the greater will be the effects of meteorological conditions: wind and temperature variations. These conditions produce fluctuations in the sound levels heard in the communities. Hence, since all predictions have been made for worst case (loudest) conditions, the numbers presented are the loudest likely to result from the identified activities and will occur only occasionally. Actual levels will fluctuate, and they will generally fluctuate below the presented levels. (A previous study of a proposed commuter pier reported that the worst case wind conditions occur for Jeffries Point about 14% of the time.)

Second, predictions of future noise levels are based in part on the noise levels of aircraft that do not yet exist. Thus, the predicted levels cannot be entirely correct. It must also be noted, however, that errors of more than 5 dB in emission levels are highly unlikely.

TABLE 5.1-4. EXISTING AND FUTURE (YEAR 2000) AVERAGE HOURLY EQUIVALENT SOUND LEVELS AS HEARD IN TYPICAL JEFFRIES POINT LOCATION (3rd FLOOR WINDOW ON McCORMACK SQUARE).

	Average Hourly Equivalent Sound Levels, dB(A) L_{eq}							
		BIF Development Alternative (Year 2000)						
			High Intensity Cargo		Low Intensity Cargo		Mixed Use	
Activity	Existing Conditions	No Build	With GA	Without GA	With GA	Without GA	With GA	Without GA
GROUND OPERATIONS								
EA/USAir Jets								
Day	65	63	56	56	56	56	56	56
Night	58	55	48	48	48	48	48	48
Cargo Aircraft								
Day	37	--	53	53	47	47	53	53
Night	46	--	59	59	54	54	59	59
General Aviation								
Day	56	--	42	--	42	--	42	--
Night	44	--	32	--	32	--	32	--
Truck Traffic (as heard in McCormack Square)								
Day	--	--	50	49	47	47	48	47
Night	--	--	43	43	41	41	42	41
Truck Traffic (as heard at Maverick St. residences)								
Day	--	--	62	61	59	59	61	60
Night	--	--	56	55	53	53	54	53
FLIGHT OPERATIONS								
Helicopter								
Day	55	59	56	56	56	56	56	56
Takeoffs on 9								
Day	67	65	65	65	65	65	65	65
Night	60	61	61	61	61	61	61	61
Takeoffs on 15R								
Day	66	65	65	65	65	65	65	65
Night	59	60	60	60	60	60	60	60
Takeoffs on 27								
Day	68	67	67	67	67	67	67	67
Night	61	62	62	62	62	62	62	62

TABLE 5.1-5. EXISTING AND FUTURE (YEAR 2000) MAXIMUM A-WEIGHTED SOUND LEVELS AND NUMBER OF OCCURRENCES EACH DAY, AS HEARD IN TYPICAL JEFFRIES POINT LOCATION (3RD FLOOR WINDOW ON MCCORMACK SQUARE).

	Maximum A-Weighted Level/Number of Occurrences as Heard in Jeffries Point																				
				BIF Development Alternative (Year 2000)																	
	Existing Conditions			No Build			High Intensity Cargo						Low Intensity Cargo						Mixed Use		
							With GA			Without GA			With GA			Without GA			With GA			Without GA		
		Number			Number			Number			Number			Number			Number			Number			Number	
Activity	L_{max}	Day	Night	L_{max}	Day	Night	L_{max}	Day	Night	L_{max}	Day	Night	L_{max}	Day	Night	L_{max}	Day	Night	L_{max}	Day	Night	L_{max}	Day	Night
GROUND OPERATIONS																								
EA Jets	75-80	110	9	65-70	140	10	55-60	140	10	55-60	140	10	55-60	140	10	55-60	140	10	55-60	140	10	55-60	140	10
USAir Jets	65-70	71	6	60-65	50	4	50-55	50	4	50-55	50	4	50-55	50	4	50-55	50	4	50-55	50	4	50-55	50	4
Cargo Aircraft	55-60	4	2	---	---	--	65-70 55-60	7 13	4 7	65-70 55-60	7 15	4 7	55-60	13	7	55-60	13	7	65-70 55-60	7 13	4 7	65-70 55-60	7 15	4 7
General Aviation Jets	50-60	34	2	50-60	26	2	50-60	26	2	---	---	---	50-60	26	2	---	---	---	50-60	26	2	---	---	---
General Aviation Props	55-60	123	7	45-50	170	12	45-50	170	12	---	---	---	45-50	170	12	---	---	---	45-50	170	12	---	---	---
Trucks (as heard at Maverick St. residences)	---	---	-	---	---	--	60-65	1300	800	60-65	1300	600	60-65	1100	700	60-65	1100	700	60-65	1200	800	60-65	1200	700
FLIGHT OPERATIONS																								
Helicopters	70-75	30	-	70-75	75	--	65-70	75	---	65-70	75	---	65-70	75	---	65-70	75	---	65-70	75	---	65-70	75	---
Takeoffs on 9	66-86	---	-	66-86	---	--	66-86	---	---	66-86	---	---	66-86	---	---	66-86	---	---	66-86	---	---	66-86	---	---

TABLE 5.1-6. EXISTING AND FUTURE (YEAR 2000) AVERAGE HOURLY EQUIVALENT SOUND LEVELS AS HEARD AT BREMEN STREET RESIDENCES BETWEEN PUTNAM AND BROOKS STREETS.

	Average Hourly Equivalent Sound Levels, dB(A) L_{eq}							
		BIF Development Alternative (Year 2000)						
			High Intensity Cargo		Low Intensity Cargo		Mixed Use	
Activity	Existing Conditions	No Build	With GA	Without GA	With GA	Without GA	With GA	Without GA
GROUND OPERATIONS								
Cargo Aircraft								
Day	64	59[1]	56	55	57	57	56	55
Night	71	66	62	60	64	64	62	60
General Aviation								
Day	--	52	--	52	--	52	--	52
Night	--	41	--	41	--	41	--	41
FLIGHT OPERATIONS								
Takeoffs on 9								
Day	58	56	56	56	56	56	56	56
Night	51	52	52	52	52	52	52	52
Takeoffs on 15R								
Day	68	66	66	66	66	66	66	66
Night	61	62	62	62	62	62	62	62
Takeoffs on 33L								
Day	77	74	74	74	74	74	74	74
Night	70	71	71	71	71	71	71	71

[1] New, quieter aircraft, are a primary reason for future noise levels being lower than existing noise levels.

TABLE 5.1-7. EXISTING AND FUTURE (YEAR 2000) MAXIMUM A-WEIGHTED SOUND LEVELS AND NUMBER OF OCCURRENCES EACH DAY, AS HEARD AT BREMEN STREET RESIDENCES BETWEEN PUTNAM AND BROOKS STREETS.

	Maximum A-weighted Level/Number of Occurrences as Heard Along Bremen Street																							
	Existing Conditions			BIF Development Alternative (year 2000)																				
				No Build			High Intensity Cargo						Low Intensity Cargo						Mixed Use					
							With GA			Without GA			With GA			Without GA			With GA			Without GA		
		Number			Number			Number			Number			Number			Number			Number			Number	
Activity	L_{max}	Day	Night	L_{max}	Day	Night	L_{max}	Day	Night	L_{max}	Day	Night	L_{max}	Day	Night	L_{max}	Day	Night	L_{max}	Day	Night	L_{max}	Day	Night
GROUND OPERATIONS																								
Cargo Aircraft	80-85 70-80	11 8	5 4	75-80 70-75	16 16	8 8	75-80 60-65	8 4	4 2	75-80	4	2	75-80 70-75	11 11	5 5	75-80 70-75	11 11	5 5	75-80 60-65	8 4	4 2	75-80	4	2
General Aviation Jets	---	--	--	60-65	26	2	---	--	--	60-65	26	2	---	--	--	60-65	26	2	---	---	---	---	26	2
General Aviation Props	---	--	--	50-55	170	12	---	--	--	50-55	170	12	---	--	--	50-55	170	12	---	---	---	50-55	170	12
FLIGHT OPERATIONS																								
Takeoffs on 15R	71-91	--	--	67-89	---	--	67-89	--	--	67-89	---	--	67-89	--	--	67-89	---	--	67-89	---	---	67-89	---	---

TABLE 5.1-8. PERCENT OF TIME ABOVE 65 dB(A) IN JEFFRIES POINT (AT THE YACHT CLUB) AND AT RESIDENCES ON BREMEN STREET FOR GROUND OPERATION ACTIVITIES.

Activity	Percent of Day[1] or Night[2] During Which 65 dB(A) is Exceeded By Noise of Different Ground Operation Activities						
		BIF Development Alternative (year 2000)					
		High Intensity Cargo		Low Intensity Cargo		Mixed Use	
	No Build (%)	With GA (%)	Without GA (%)	With GA (%)	Without GA (%)	With GA (%)	Without GA (%)
Jeffries Point							
EA Jets							
Day	36	~0	~0	~0	~0	~0	~0
Night	4	~0	~0	~0	~0	~0	~0
Cargo Aircraft							
Day	--	4	5	2	2	4	5
Night	--	17	20	18	8	17	20
Bremen Street							
Cargo Aircraft							
Day	5	2	1	4	4	2	1
Night	14	7	3	16	16	7	3

[1] Day = 7 a.m. to 10 p.m. = 15 hr.

[2] Night = 10 p.m. to midnight = 2 hours; see text for explanation of use of these nighttime hours.

Numerous comparisons can be made within the vast array of numbers presented in Tables 5.1-4 through 5.1-8, and readers will certainly wish to draw their own conclusions. The following paragraphs, however, attempt to identify the points that are most significant for this study. The remarks and conclusions are presented by community.

Jeffries Point (Tables 5.1-4 and 5.1-5)

Remarks: These two tables present by activity the computed existing and future values of hourly equivalent sound levels and maximum sound levels that are/will be experienced in the Jeffries Point Community. For the future build alternatives, buildings/barriers constructed along the western edge of BIF (along Jeffries Point Cove) should provide some reduction of activity noise levels. (For building/barrier location, see Figure 5.1-6, in Section 5.1.6, buffer zone 2.)

Whether or not such reductions occur depends not only upon the relative locations of the aircraft, the buildings/carriers, and the community residences, but also upon wind conditions. Wind effects are not well understood, and are discussed further under Mitigation Measures, Section 5.1.6. However, the buildings/barriers, regardless of winds, should reduce the noise of Eastern/USAir jets and the noise of truck traffic, as heard in McCormack Square. Consequently, the levels (both equivalent levels and maximums) shown for Eastern/USAir jets and the equivalent levels for truck traffic as heard in McCormack Square include the reductions provided by the buildings/barriers that are to be constructed along Jeffries Point Cove.

Additionally, Table 5.1-4 shows the truck traffic sound levels that will result at residences along Maverick Street. These resultant levels are shown for two conditions: 1) with no building/barrier near the road parallel to Maverick Street airport property line; 2) with a continuous building/barrier 20 feet high constructed along this property line. Mitigation Measures, Section 5.1.6, also discusses the noise reduction effects of this continuous building/barrier.

Conclusions

- Aside from takeoffs, taxiing Eastern/USAir jets and helicopters are currently the activities most likely to produce annoyance (speech and/or sleep interference).
- Under any alternative, quieter jets will make Eastern/USAir jet activity noise slightly less

annoying. Note that quieter future jets reduce maximum Eastern jet levels more than they reduce total equivalent levels. The taxiing Eastern aircraft produce the maximums heard on Jeffries Point, and quieting these taxiing aircraft reduces the maximums by 5 dB to 10 dB. But significant sound energy is contributed by gate operations (engine start, breakaway) and by USAir operations. Noise from these operations is reduced, in the future, less than the noise from taxiing Eastern jets. Thus, hourly L_{eq} is less affected by the quieted jets than are the taxiing Eastern jet maximums.

- In all future build alternatives, the presence of the buildings/barriers along the edge of Jeffries Point Cove (buffer Zone 2, Figure 5.1-6 in Section 5.1.6) should significantly reduce the noise produced by taxiing Eastern/USAir jets. In Jeffries Point, noise levels produced by these operations should be reduced approximately 7 dB from an hourly L_{eq} of 63 dB(A) (day) or 55 dB(A) (night) to 56 dB(A) and 48 dB(A), respectively. Thus, these noise levels should be reduced below the levels identified (Table 5.1-1) as likely to produce activity interference.

- Two possibly significant new noise-producing activities - taxiing cargo aircraft and truck traffic - will be introduced into the BIF area by any of the three build alternatives. Taxiing cargo jets are not likely to produce much annoyance during the day, especially for the low intensity alternative, but may, under the high intensity and mixed use alternatives, produce significant activity interference at night.

- The truck traffic, because of predicted high volumes (6,000 to 10,000 vehicles passing by each day, that is, 3,000 to 5,000 vehicle round trips) may produce significant activity interference for residences along Maverick Street. Construction of a continuous 20 foot high building/barrier on airport property reduced these levels by about 13 dB, as shown. (See 5.1.6, <u>Mitigation Measures</u>.)

- An increase in annoyance due to helicopter noise can be expected regardless of build/no-build alternative because of increased number of operations. The build alternatives may result in the flight track being moved slightly away from the community, however, thus lowering the predicted levels.

- Takeoff noise will not be increased by choice of build/no build alternative (but may be reduced under certain circumstances - see Section 5.1.6).

- General aviation activity noise will be lower, in all future alternatives, than it is today, and probably will not be noticeable. But this lowering of levels will occur only if general aviation gates are moved from their present location near Maverick Street to the eastern end of BIF or to the North Apron.

<u>Bremen Street Residences</u> (Tables 5.1-6 and 5.1-7)

- Taxiing cargo aircraft are currently likely to produce annoyance or activity interference (see also Table 5.1-1).

- In the future, quieter jets should make cargo ground operations noticeably less annoying than at present, regardless of build/no-build alternative.

- Any build alternative should be less annoying than the no-build alternative, because there will be fewer aircraft operations near Bremen Street (the operations will take place on BIF).

- General aviation activities will probably not be noticeable, even if GA is placed on the North Apron.

<u>Neptune Road Residences</u> (Table 5.1-6)

- Taxiing cargo aircraft are currently likely to produce speech and sleep interference.

- In all future alternatives, quieter jets should make cargo ground operations noticeably less annoying than they are presently.

- General aviation noise, when it is generated on the North Apron, should not produce activity interference, but during the daytime will be more noticeable than the noise from cargo operations.

Table 5.1-8 presents time above 65 dB(A) percentages for the future build/no-build alternatives. The numbers shown can be used to judge how much noise the various activities produce relative to each other. They should not be used, however, to judge exactly how many minutes out of the day resultant noise levels will actually exceed 65 dB(A). That is, the numbers of Table 5.1-8 are judged to be correct in a relative sense, but should not be used to judge absolute values.

Note that the noise levels produced by Eastern jets do not, for any build alternative, exceed 65 dB(A), whereas, for the no build alternative, this noise exceeds 65 dB(A) approximately 36 percent of the day and 4 percent of the night. This reduction of Eastern jet ground operations noise results from the construction of continuous 40 foot high buildings/barriers along the western edge of Logan property at Jeffries Point Cove, (Zone 2, Figure 5.1-6). If these buildings/barriers were not constructed, 65 dB(A) would continue to be exceeded 36 percent and 4 percent of the daytime and of the nighttime, respectively.

Boston/South Boston

Noise levels that will be produced by taxiing cargo jets and by taxiing Eastern/USAir jets were predicted for Boston (Harbor Tower Apartments) and for South Boston (Fort Independence). Noise levels produced by either activity are within or below measured existing non-aircraft equipment noise levels (Figure 5.1-2), and consequently should not be noticeable. For example, taxiing Eastern/USAir jets will produce hourly daytime equivalent levels at Harbor Tower Apartments in the low 50's while existing equivalent daytime levels are in the high 60's. At Fort Independence, these taxiing operations are predicted to produce daytime hourly equivalent levels in the high 40's and existing hourly equivalent levels are also in the high 40's. Daytime cargo operations are predicted to produce hourly equivalent levels at both locations in the high 30's and low 40's.

- Construction Noise

Predictions were made of construction activity noise for both Jeffries Point and for the Bremen Street residences. These predictions, of necessity, are rough estimates rather than precise detailed calculations, and should be used to identify potential problems, rather than to show exactly what construction noise levels will be.

At the planning stage of a project, it is impossible to know exactly what construction methods will be used, how construction activities will be scheduled, what the types of construction equipment will be, or how many pieces of construction equipment will be used. Consequently, typical industrial and nonresidential construction scenarios were used to determine types of equipment that might be used during construction of the buildings on BIF and on North Apron.15/ For construction of roadways and aprons, and installation of utilities, Hoyle, Tanner & Associates, Inc. estimated types of equipment used.

With knowledge of estimated equipment types, approximate percent usage of the equipment, and noise levels produced by the equipment,16/ average hourly equivalent sound levels, as heard in Jeffries Point and along Bremen Street, were predicted for the noisiest construction phase likely to occur.

Jeffries Point

Construction activities for the high- and low-intensity alternatives are estimated to produce hourly equivalent sound levels in Jeffries Point in the mid-50s to mid-60s dB(A). These noise levels are comparable to, or less than, typical measured existing levels (Figure 5.1-1) and should not be particularly noticeable. For the mixed use alternative construction of the high-rise hotel and of the mid-rise housing may produce somewhat louder levels - in the mid- to upper 60s, and would be more noticeable. Even these levels in the mid- to upper 60s, however, are still no higher than the measured existing noise levels.

It should also be recalled that construction noise levels are for the loudest phases, and thus will not exist throughout the construction project. Other phases are generally 3 dB to 5 dB quieter.

Construction noise levels could be reduced further if the 50 foot high buildings/barriers along Jeffries Point Cove were constructed first. Though, obviously, the noise from construction of the 40 foot high buildings/barriers would not be abated, noise from other, subsequent, construction on BIF could be reduced by up to 5 dB to 10 dB.

Predicted construction noise levels have assumed that little pile driving will be required. If pile driving is required for many of the buildings, resultant levels may be higher, depending upon type of piles driven, weight of pile driver, etc. On average, pile driving could result in almost continuous sound levels in Jeffries Point of 65 to 70 dB(A).

Whether or not any of the resultant noise levels will exceed the residential standard of 75 dB(A) L_{10} of "Regulations for the Control of Noise in the City of Boston - Regulation 3", depends upon the relationship of L_{10} to the predicted hourly equivalent sound level, leq. For most fairly continuous noise sources, L_{10} is usually greater than L_{eq}. For highway traffic noise, $L_{10} = L_{eq} + 3$ dB, but the true relationship is complex and depends upon how much the noise levels fluctuate with time.

New York State Department of Transportation has estimated that for construction noise, L_{10} is 3 dB greater than L_{eq}.17/ Also, it should be noted that the further one is from a large source, such as a construction site, the less L_{10} and L_{eq} generally will differ. By assuming that L_{10} is 3 dB to 4 dB greater than L_{eq}, L_{10} is likely to be overestimated rather than underestimated. Consequently, if L_{10} is assumed to be 3 dB to 4 dB greater than L_{eq}, 75 dB(A) L_{10} will not be exceeded unless L_{eq} is predicted to be in the low to mid-70's. Thus, for the predictions made here, construction noise is not likely to exceed the residential standard of Regulation 3.

- Bremen Street Residences

Analysis of construction noise levels that will be produced by building the North Apron facilities suggests that resultant hourly equivalent levels along Bremen Street may be in the low to mid-60's. Thus, construction noise levels here should not exceed the residential standard.

- Pure Tone Considerations

Jeffries Point residences have been concerned that changes at Logan may introduce aircraft with pure tones more significant than those produced by jets using the Southwest Terminal. In an effort to provide these residents with some baseline information, a series of 1/2-octave band and narrowband (12.5-Hz-wide) plots have been prepared. The plots, presented in Appendix B, Source Document B-1, show resultant data for several common aircraft types taxiing past BIF. As an additional aid, tone corrections have been computed for four of the aircraft - the DC-9, BAC 111, 727, and the small general aviation jet - and are given on the corresponding 1/2-octave band plots. The tone correction was done in accordance with the procedure of Appendix B of FAR Part 36.

Whether or not the cargo planes that may be introduced to BIF will have pure tones cannot easily be estimated. Most of the planes/aircraft engines that will be in use in year 2000 do not yet exist or are in the developmental stage. Though it is possible to estimate what A-weighted levels these planes may produce, it is difficult to estimate what the tonal content will be for the taxiing aircraft.

5.1.6 Mitigation Measures

One of the most effective methods for reducing community noise levels is construction of a large wall, berm, or building between the community and the source of the noise. For Jeffries Point, the noise reduction effects of various walls/berms/buildings located in the different buffer zones of Figure 5.1-6 were investigated.

Buffer zones 2 and 3 are assumed to have, for all build alternatives, continuous buildings/barriers at least 40 feet high. For the Mixed Use alternative continuous buildings 70 feet high are assumed to be located in the northern portion (upper portion in Figure 5.1-6) of zone 3 and in the southern (lower) portion of zone 2.

Previous sections have shown that, for Jeffries Point, the noise sources most likely to produce activity interference either now or in the future if BIF is developed are:

- Existing General Aviation
- Trucks servicing BIF developments
- Taxiing Eastern/USAir jets
- Taxiing cargo aircraft
- Takeoffs on Runways 4R and 9.
- Truck Traffic

Truck traffic is predicted to produce noise levels at residences along Maverick Street that may interrupt speech and sleep (see Tables 5.1-1 and 5.1-4). These potential adverse effects result because, as studied, no buildings or barriers were located in Zone 1 (Figure 5.1-6) between the truck road on Airport property, and the residences along Maverick Street. If, however, a continuous row of buildings approximately 20 feet high were built in Zone 1, the truck-produced noise levels as heard along Maverick Street at third floor windows would be reduced significantly - approximately 12 dB to 15 dB. For areas of the community that are farther from the truck traffic, noise reduction would be less. In McCormack Square, for example, noise reduction provided by the buildings would be about 3 to 4 dB.

- Taxiing Eastern/USAir Jets

As discussed earlier, the proposed buildings/barriers of Zone 2 (approximately 40 feet high) should reduce Eastern/ USAir taxi noise (leq) by 7 dB. If the buildings in Zone 2 were higher - as high, for example, as the proposed mid-rise building in Zone 3 of the mixed use alternative (70 feet) - total reductions would be as high as 12 dB. Further, reductions of single maximum levels will be about 7 to 10 dB for the 40 foot high buffer and about 15 to 20 dB for 70 foot high buildings.

- Taxiing Cargo Aircraft

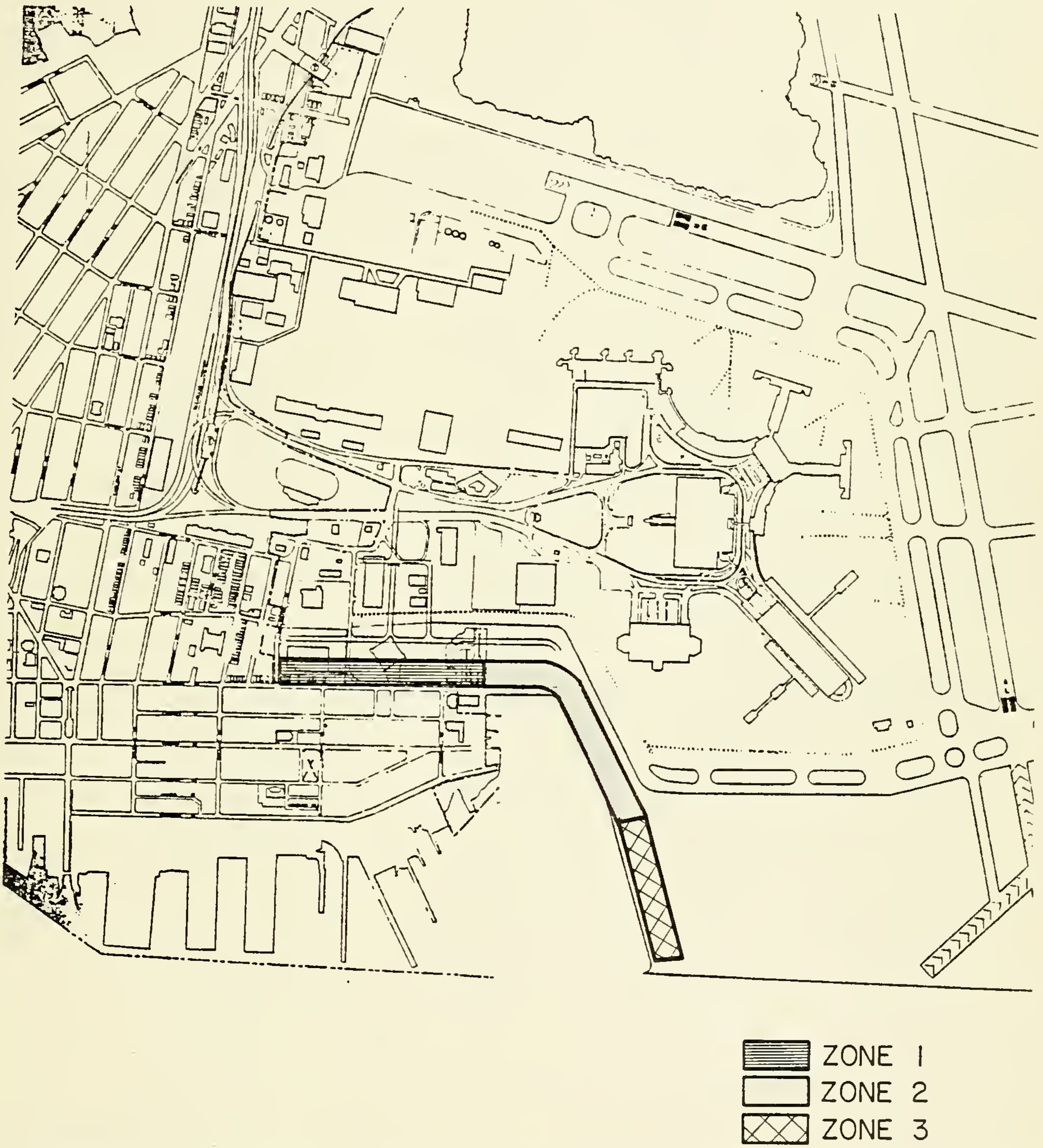
It should be recalled that Logan activity noise tends to be loudest in Jeffries Point when winds blow from the east toward the community. Unfortunately, it is just these wind conditions that may minimize the noise reduction provided by the buffer zone structures. And these winds are more likely to minimize reductions for noise sources, barriers, and community locations that are widely separated.

Taxiing cargo planes will be located fairly far east of the buffer zones - 1000 feet or more. Thus, for taxiing cargo planes (and also for the takeoffs discussed below), easterly winds are likely to reduce the benefits provided by buffer zone buildings.

It is likely that at least two basic wind related effects may affect the noise reduction achieved. First, winds from the east will tend to bend or refract sound back toward the ground. This refracted sound could pass over the buildings and down into the community. A simple analysis of this bending effect 18/ suggests that very low wind speeds (less than 5 mph) may reduce the effectiveness of the buildings as noise barriers.

The second effect is the scattering and bending of sound caused by turbulence. The larger the obstacles in the wind's path, the greater will be the turbulence. Such turbulence could also affect the extent to which the sound is refracted - and may in fact reduce refraction.

In sum, though it is likely that refracted/scattered sound may reduce noise barrier effectiveness, without a rather detailed measurement program it is not possible to determine an expected reduction of effectiveness. In what follows, then, it should be remembered that the stated reductions assume no wind. With easterly winds the reductions are likely to be somewhat less.19/



Source: Bolt, Beranek and Newman Inc.

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

GENERAL LOCATION OF NOISE BUFFER / BARRIER ZONES AS DISCUSSED IN TEXT.

HTA

FIGURE 5.1-6

Buffer zone buildings 40 feet high in Zones 2 and 3 can reduce the noise (Leq) of taxiing cargo aircraft by 8 to 10 dB - a significant reduction - and cargo plane gate activity by as much as 15 to 20 dB. Higher buildings (70 foot high) could provide an additional 5-dB reduction, but only if located at least partially in Zone 2. That is, to be effective, the buildings must be located between the taxiing aircraft tracks and Jeffries Point residences.

Another way to reduce the noise levels produced by taxiing cargo aircraft is by towing. Table 5.1-4 shows that the main noise problem associated with taxiing cargo aircraft is likely to be sleep interference from nighttime activities of either the High Intensity cargo or Mixed Used alternatives; the predicted equivalent sound level is 59 dB(A). If cargo aircraft using the four cargo gates nearest to the community (located near the center of BIF, adjacent to the taxiways) were towed out to the vicinity of 4L with only APU's running, resultant community noise levels should be noticeable reduced by at least 5 dB.

- Takeoffs on 4R and 9

Low buildings (40 feet high) are not likely to reduce takeoff noise because they are just barely high enough to obstruct the community's view of aircraft taking off. If, however, aircraft could start takeoff further west on Runway 9, at least start of takeoff might be reduced by 5 to 8 dB.

Higher buildings (70 feet high), again located at least partially in Zone 2, would provide more substantial reductions of takeoff noise. Noise from the start of the takeoff roll on Runway 9 could be reduced by 6 to 14 dB.

5.2 AIR QUALITY IMPACTS

To perform the impact assessment, a field monitoring program and a detailed diffusion modeling analysis were conducted to estimate the potential impact on ambient air quality. The results of the field monitoring program and the modeling analysis of the existing baseline situation are described in Sec. 5.2.1. Results of the modeling analysis for both the build and the no-build alternatives are given in Sec. 5.2.2. The assessment of the effectiveness of various mitigating measures is highlighted in Sec. 5.2.3. For a detailed discussion of assumptions, results and conclusions, refer to Appendix C.

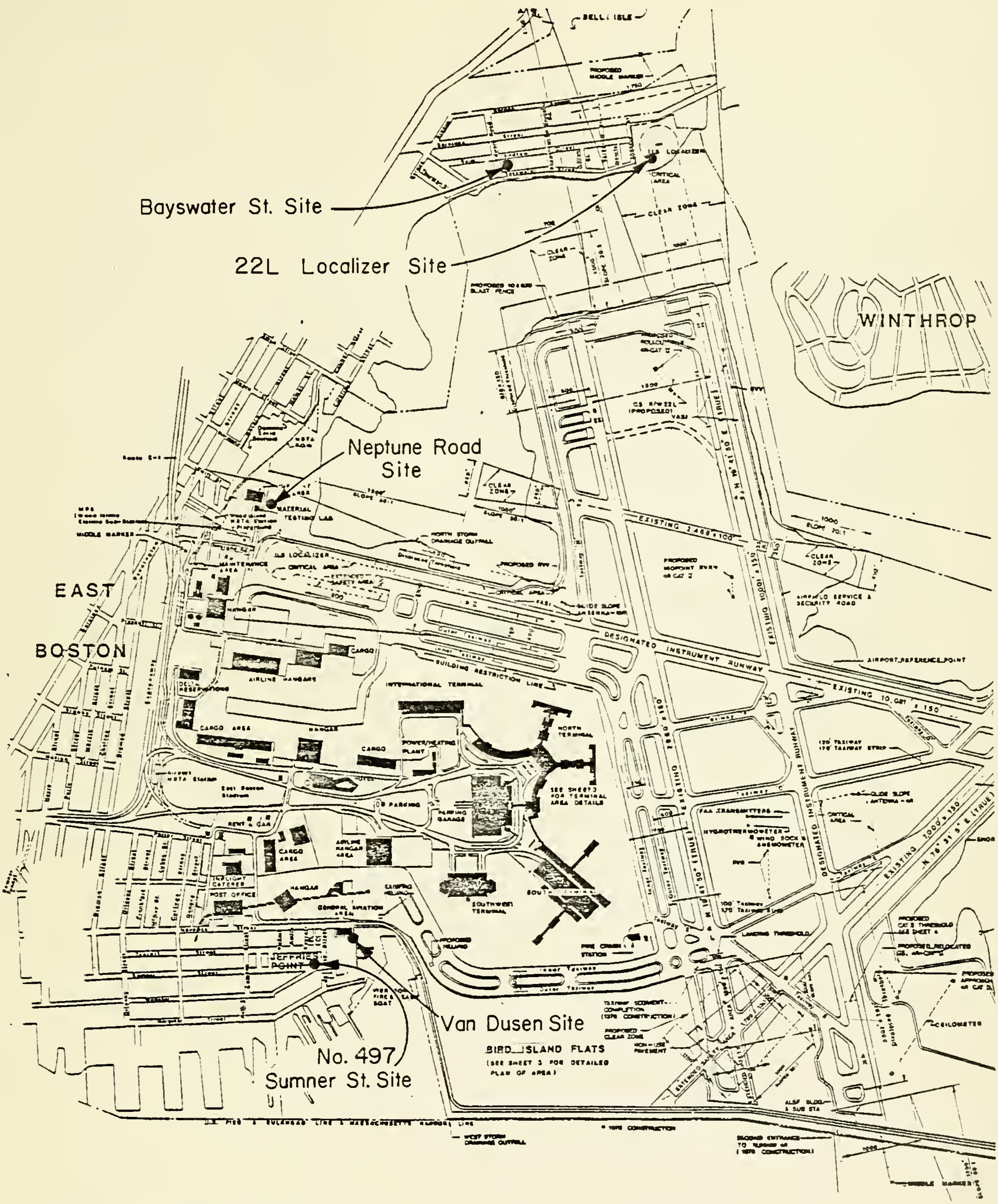
5.2.1 Existing Conditions

- Measured Ambient Air Quality

The field monitoring program consisted of the measurements of ambient carbon monoxide (CO), oxides of nitrogen (NO_x), and total hydrocarbons (HC) on a continuous basis for three months at one site in Jeffries Point. Also at this site, total suspended particulates (TSP), as well as the various particle size fractions, were collected on an alternate-day schedule. The collected particulate matter were then analyzed for lead content. Massport has also sponsored a number of other measurement programs during 1978 through 1980 in the communities adjoining the Airport. Figure 5.2-1 shows the locations of the various monitoring sites that were involved in these measurement programs. The results of these other measurements were reviewed and consolidated with the present ongoing field program, and the results to date are highlighted below.

Carbon Monoxide. The measured CO shows a maximum 1-hr reading of 9 parts per million (ppm) at the Van Dusen site, which is far below the Federal and state standard of 35 ppm. The maximum 8-hr average CO measured is 5.6 ppm, which is about 62% of the 9 ppm standard. Neither the 1-hr nor the 9-hr standard was exceeded at this site. No exceedance of the standards was reported at any of the other measurement sites in East Boston, except near the tunnel portals, where the state-operated monitor recorded numerous violations of the 8-hr standard. This particular monitoring station, by virtue of its proximity to the tunnel portals, is heavily impacted by emissions from idling vehicles during periods of traffic congestion. As such, therefore, the high pollutant concentrations recorded at this site are not representative of impact from Airport sources.

Oxides of Nitrogen. For NOx, both the nitric oxide (NO) and the nitrogen dioxide (NO_2) are measured separately but concurrently. The maximum 1-hr NO measured at Jeffries Point to date is 0.22 ppm. There is presently no ambient standard for NO. The maximum 1-hr NO_2 recorded is 0.17 ppm. The short-term NO_2 standard has not been promulgated at this time. The 1-hr NO_2 standard that is being considered by the U.S. Environmental Protection Agency (EPA) is in the range of 0.25 to 0.5 ppm. The maximum 1-hr NO_2 concentration recorded at Jeffries Point, therefore, represents about 65% of the more stringent standard. At the tunnel portals, the maximum 1-hr NO_2 concentration reported by the state station is 0.25 ppm. This level is equal to the more stringent of the proposed NO_2 standard.



Source: Bolt Beranek and Newman Inc.

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS
LOGAN AIRPORT AND EAST BOSTON COMMUNITIES, SHOWING LOCATIONS OF AIR QUALITY MONITORING SITES.

HTA

FIGURE 5.2 - 1

Hydrocarbons. The maximum 1-hr HC concentration measured at Jeffries Point is 4.3 ppm. There is no 1-hr standard for HC at this time. There is presently a 6 a.m. to 9 a.m. "criterion" for nonmethane HC of 9.24 ppm. This criterion level is not a standard that mandates compliance, but is used only as a guide for state air pollution control agencies in their region-wide HC plans to attain and maintain the ozone standard. Exceedance of this criterion value was reported for more than 50% of the days monitored at a site on Neptune Road, and another in Orient Heights. It should be noted that at these monitoring locations there is a major source of HC to the north of Logan Airport (the fuel farms along Route C-1), which is believed to be responsible for a significant fraction of the measured HC.

Lead. Lead is measured at Jeffries Point by integrated sampling on a 24-hr basis. Although the analysis is still in progress, the results to date show a maximum value of 1.5 micrograms per cubic meter (ug/m^3) and a median value of 0.8 ug/m^3. There is a 3-month average standard for lead of 1.5 ug/m^3. If similar levels were to be found for the remainder of this field program, it is anticipated that exceedance of this standard will be very unlikely.

Suspended Particulates. Maximum 24-hr average concentration of total suspended particulates (TSP) obtained so far in the present field program is 82 ug/m^3. This concentration is about 32% of the corresponding standard of 260 ug/m^3.

Respirable particulate matter at various cutoff sizes is being collected by cascade impacting devices. The preliminary results suggest that the respirable fraction of TSP at this particular monitoring site varies from 10% to 90%. There is presently no ambient air quality standard of suspended particulates that specifically provides for particle size.

- Modeling Results

The modeling analysis of the existing conditions consists of:

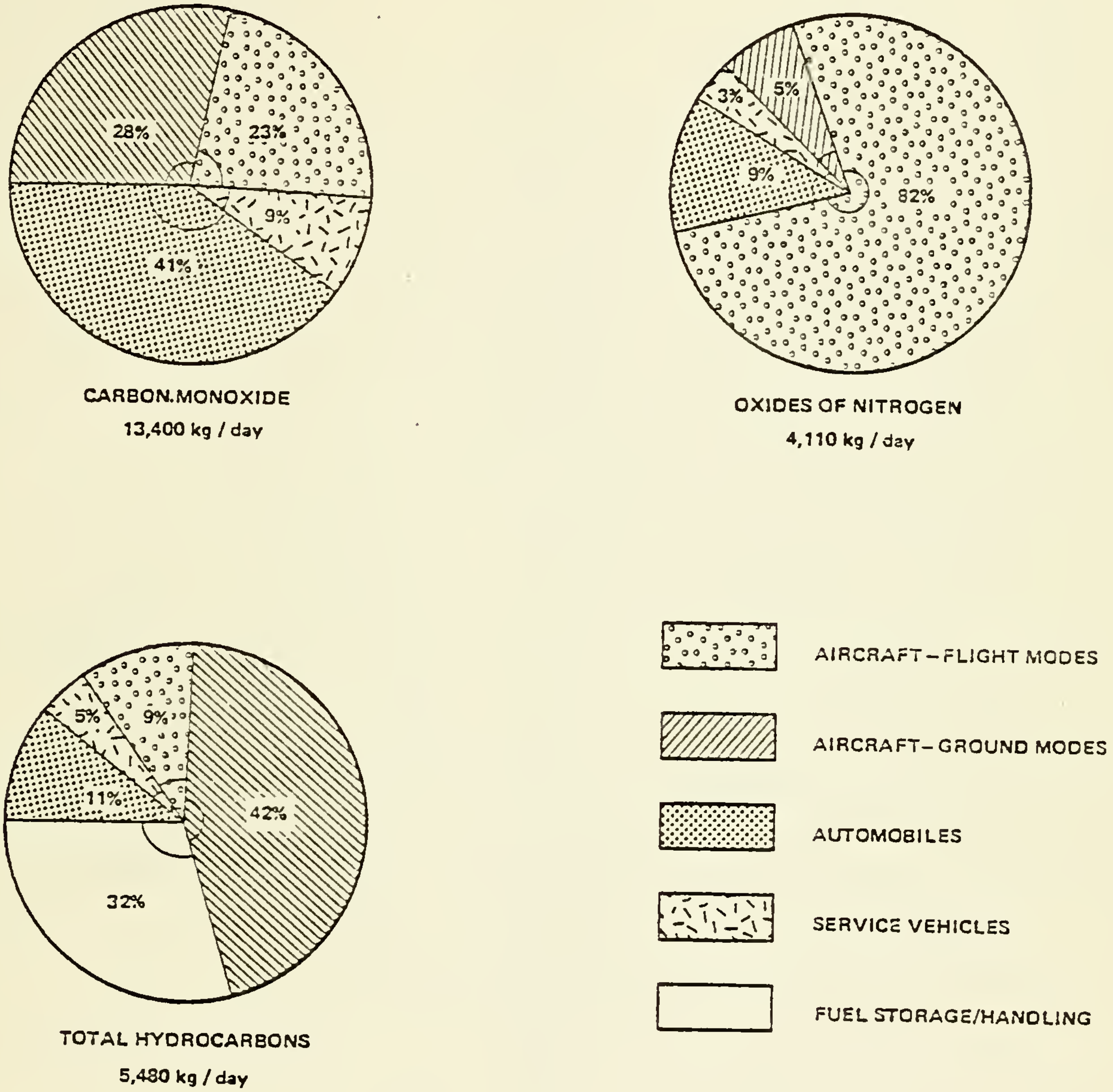
- Estimating total emissions of CO, NO_x, and HC from various sources at the Airport
- Using diffusion models to estimate the resulting ambient concentrations of CO, NO_2, and HC at Jeffries Point and other communities adjoining the Airport
- Comparing the predicted pollutant concentrations with applicable standards and criteria.

The procedures for estimating the emissions and resulting ambient concentrations followed the latest EPA and FAA guidelines. These procedures are elaborated in Appendix C and the supporting Source Document. Accounting of emission sources in the analysis has generally been very thorough, except that emissions from motor vehicle sources associated with the peak hour congestion in the immediate vicinity of the tunnel portals in East Boston are not included in the inventories.

In the estimation of maximum 1-hr ambient concentrations, the conservative assumption was made that peak 1-hr aircraft activity takes place during poor atmospheric dispersion conditions. The atmospheric variables assumed are a low wind speed of 1 m/sec, a stable atmosphere (Pasquill stability class E), and a mixing height of 50 m. In the modeling analysis, wind directions from the major compass directions were simulated, and the highest 1-hr results were used to report the maximum 1-hr concentrations.

Existing conditions in 1978 at Logan Airport show that automobile sources are responsible for about 40% of all the CO emissions. Aircraft sources contribute another 50% to the CO burden. These emission contributions are illustrated in Figure 5.2-2, which shows the total estimated 24-hr emissions from the whole Airport disaggregated by various source categories. Using the modeling techniques described in Appendix C, maximum 1-hr CO concentrations at selected receptor locations in the Jeffries Point community, the Chelsea/Putnam Street section of East Boston, and within the Airport itself were estimated. These results were then presented in the form of concentration isopleth maps. The concentration isopleths are contour lines connecting points with equal ambient concentrations. These isopleths provide an expedient means of visualizing the distribution of pollutant levels over large areas and of identifying areas of relatively high concentrations. Figure 5.2-3 shows the isopleths of maximum 1-hr CO concentrations for the existing conditions. No exceedance of any standard is predicted anywhere, except perhaps at the main air carrier terminals and garages, where a potential exists for violation of the 8-hr CO standard.

For NO_x emissions, the aircraft - especially gas turbine engines during high power settings - alone contribute over 80% of the total emissions. As shown in Figure 5.2-2, non-aircraft sources are estimated to contribute only about 13% of the total NO_x emissions. The diffusion modeling analysis of maximum 1-hr NO_x concentrations is shown in Figure 5.2-4. No definitive data bases exist in order to estimate with confidence the NO_2 component of the NO_x. However, based on limited validation and other related studies, a maximum 1-hr NO_2 of about 0.32 milligrams per cubic meter (mg/m^3) is estimated at Jeffries Point. This concentration represents approximately 67% of the more stringent proposed standard.



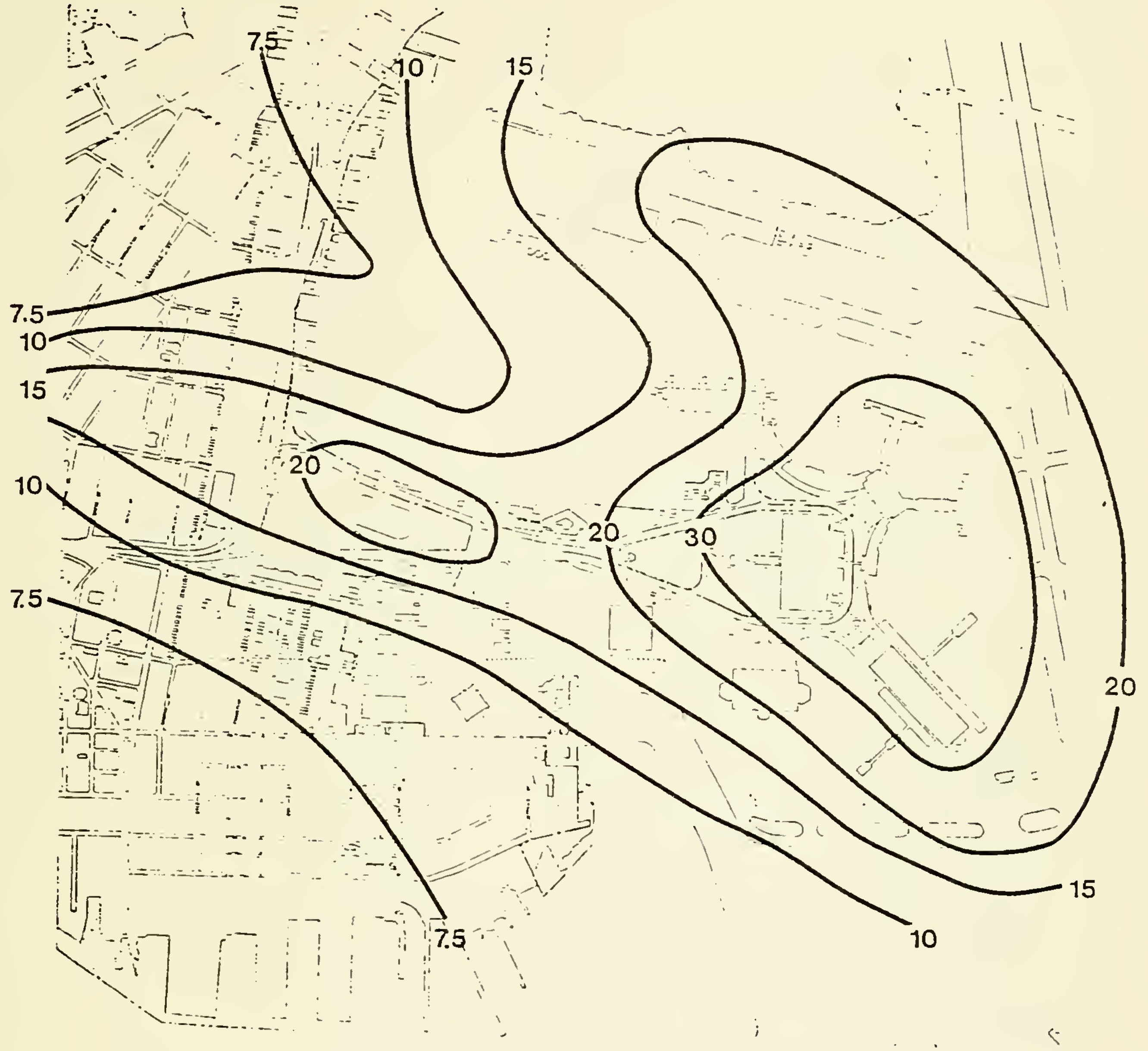
Source: Bolt Beranek and Newman Inc.

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

TOTAL ESTIMATED 1978 EMISSIONS FROM LOGAN AIRPORT FOR AN AVERAGE 24-HR PERIOD.

HTA

FIGURE
5.2-2



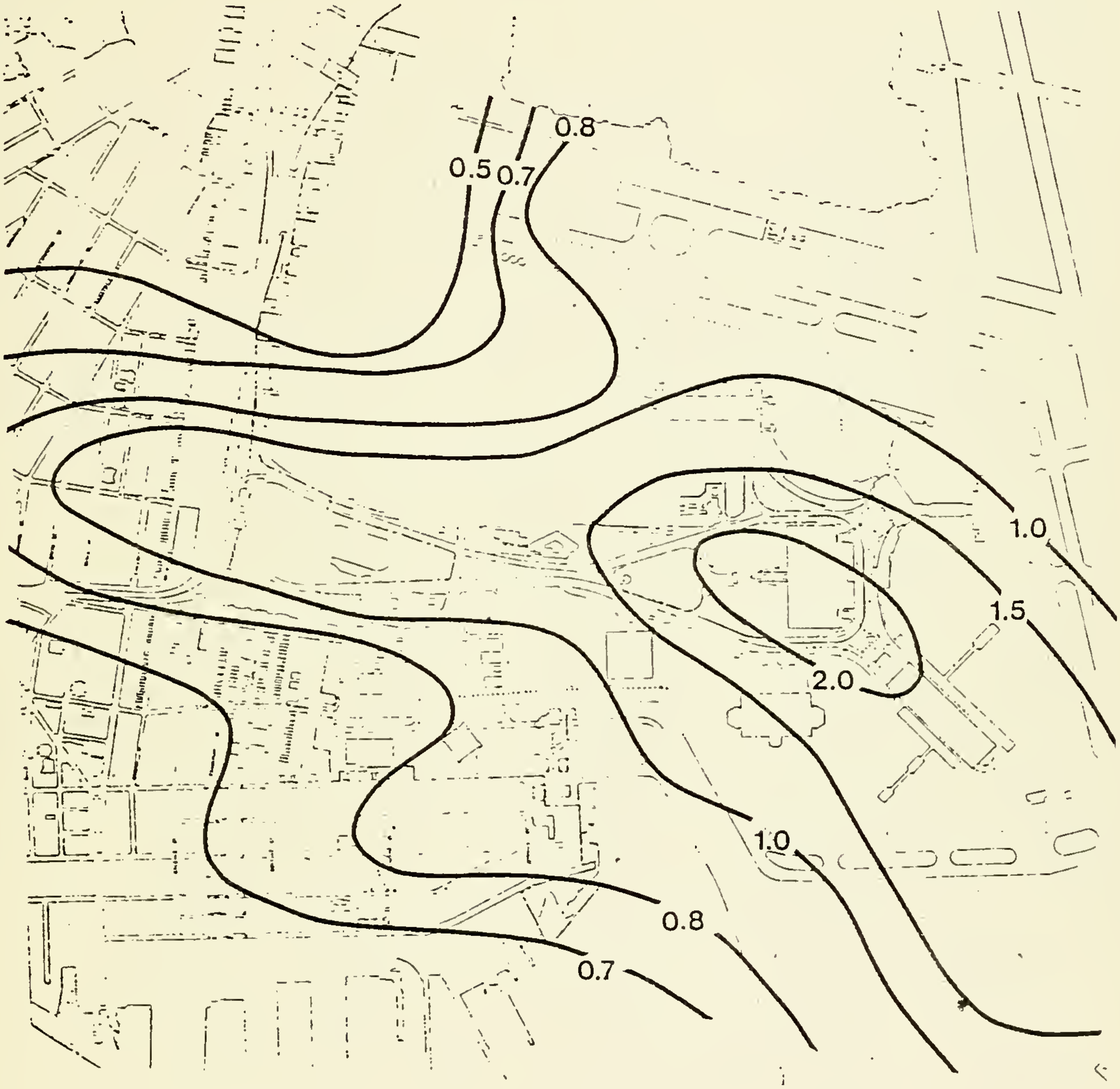
Source: Bolt, Beranek and Newman Inc.

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

ESTIMATED MAXIMUM 1-HR CARBON MONOXIDE CONCENTRATIONS (IN PPM) FOR EXISTING 1978 CONDITIONS AT LOGAN AIRPORT.

HTA

FIGURE 5.2-3



Source: Bolt, Beranek and Newman Inc.

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

ESTIMATED 1-HR OXIDES OF NITROGEN CONCENTRATIONS (IN MG/M3)
FOR THE EXISTING 1978 CONDITIONS AT LOGAN AIRPORT

HTA

FIGURE
5.2-4

For HC, the aircraft sources and the fuel storage and handling facilities contribute respectively about 52% and 32% of the total emissions. Automobile sources are estimated to contribute another 11%. These contributions are illustrated in Figure 5.2-2. The maximum 1-hr total hydrocarbon concentrations estimated for the Airport and its vicinity are shown in Figure 5.2-5. Relatively high concentrations were estimated for the air carrier terminal areas, and in areas encompassing the fuel farm at the North Apron. There is no HC standard to compare the model predictions with the estimated HC concentrations from the monitoring program. The HC predictions are used primarily for the purpose of the odor impact analysis.

5.2.2 Air Quality Impact Assessment

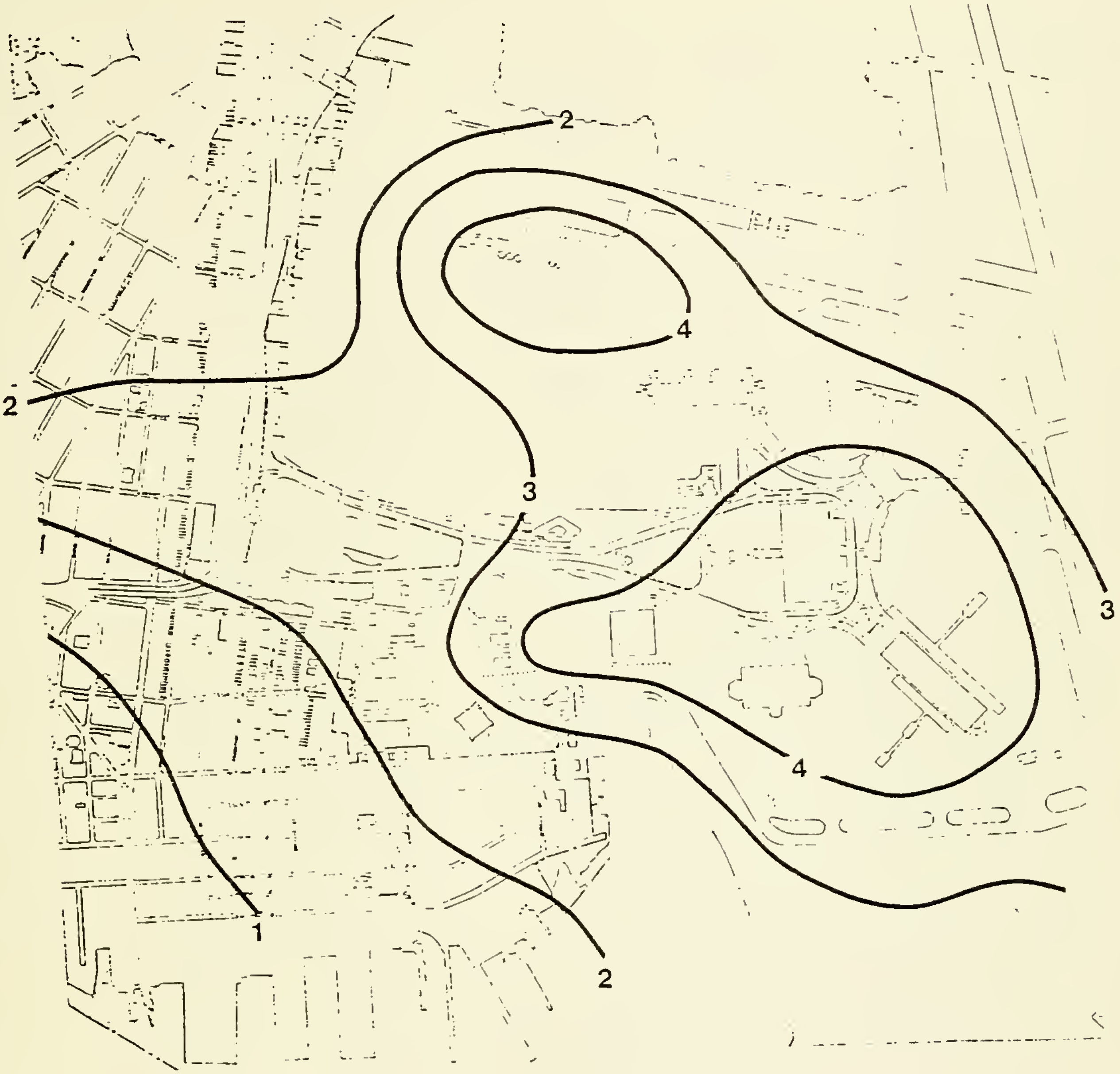
The modeling analysis of the future conditions with the No-Build and each of the construction alternatives consists of:

- Estimating emissions inventories and maximum ambient concentrations, and comparing the results with applicable standards and criteria
- Using estimated HC concentrations and wind frequency analysis to examine the odor ramification
- Assessing the potential impact from emissions of particulate matter
- Examining the impact from power and space heating requirements
- Assessing construction and staging impacts.

The procedures for estimating the emissions and resulting ambient concentrations and the assumptions of worst case meteorology conditions are the same as those used in estimating the existing conditions.

- No-Build Alternative

Areawide distribution of maximum 1-hr CO concentrations under the No-Build alternative for BIF in year 2000 is shown in Figure 5.2-6. Compared with the existing conditions, predicted CO concentrations everywhere at the Airport and its vicinity are expected to improve. This general improvement is credited primarily to the effects of the Federal Motor Vehicle Control Program (FMVCP) which mandates very stringent limitations on exhaust emissions from automobiles.



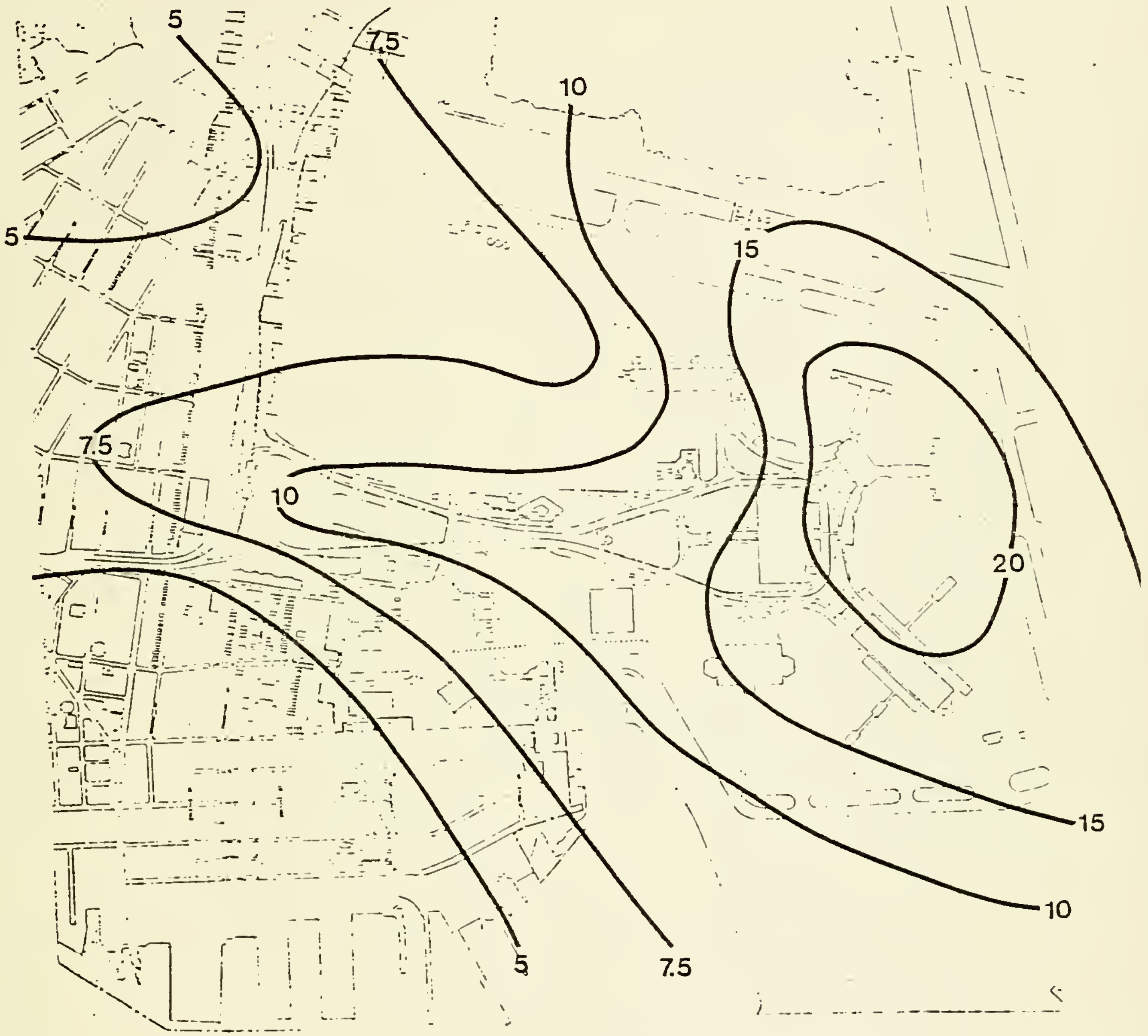
Source: Bolt, Beranek and Newman Inc.

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

ESTIMATED MAXIMUM I-HR TOTAL HYDROCARBON CONCENTRATIONS (IN MG/M^3) FOR EXISTING 1978 CONDITIONS AT LOGAN AIRPORT.

HTA

FIGURE 5.2-5



Source: Bolt, Beranek and Newman Inc.

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

ESTIMATED MAXIMUM 1-HR CO CONCENTRATION (IN PPM) FOR THE NO-BUILD ALTERNATIVE IN YEAR 2000.

HTA

FIGURE
5.2-6

For NO_x, however, an overall deterioration is predicted at all receptor locations examined. This is evident by comparing the year 2000 results shown in Figure 5.2-7 with the baseline conditions shown in Figure 5.2-4. This deterioration is attributed to an increase in activity, a shift in the aircraft fleet mix toward the wide-bodied jets with more efficient engines that have higher NO_x emissions potential, and an anticipated relaxation and/or delay in NO_x emission regulations for gas turbine engines. Maximum 1-hr NO_2 concentrations at receptor points in proximity to the Airport are estimated at about 0.6 mg/m^3, which is within the range of the proposed standard of 0.47 to 0.94 mg/m^3.

Areawide distribution of maximum 1-hr HC concentrations is illustrated in Figure 5.2-8. Compared with the existing conditions, there is a slight overall improvement - especially in the communities where ambient HC concentrations are more impacted by automobile sources that are expected show HC reduction as a result of the FMVCP.

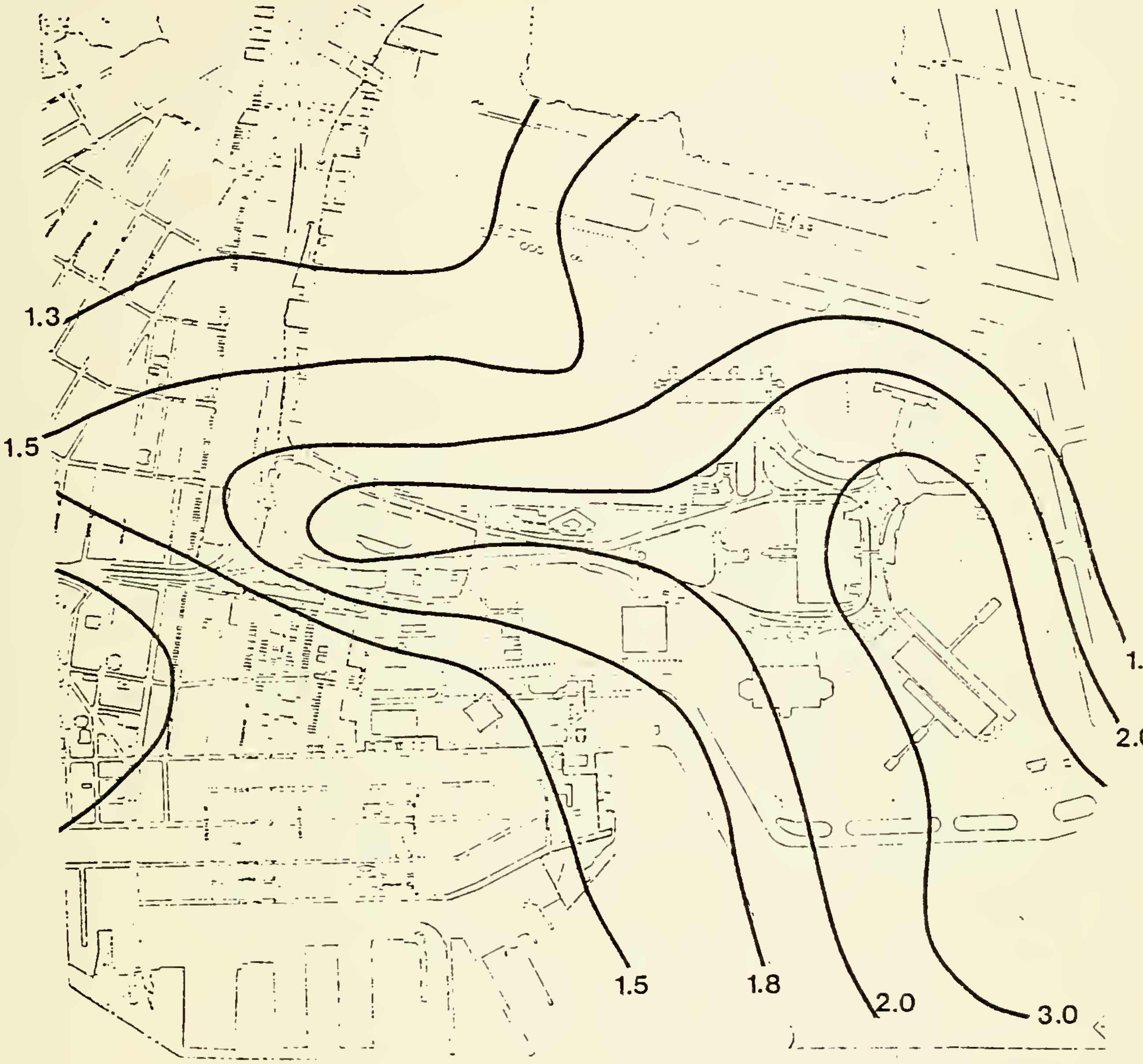
- High Intensity Alternative

The proposed High Intensity Cargo Development with GA activity will result in an increase of about 4% CO, 1% NO_x, and 1% HC in total Airport emissions when compared with the No-Build. The 24-hr emissions for each of the project alternatives are summarized in Table 5.2-1 for CO, Table 5.2-2 for NO_x, and Table 5.2-3 for HC. Truck emissions are estimated to increase dramatically, but since truck emissions represent only 2% to 3% of total Airport emissions, the net impact is quite small.

Areawide distributions of maximum 1-hr concentrations of CO, NO_x, and HC are illustrated in Figures 5.2-9, 5.2-10 and 5.2-11, respectively. Compared with the No-Build, the proposed High Intensity development is estimated to result in an increase of about 2% to 3% in ambient concentrations for all pollutants at Jeffries Point, and a decrease of about 10% over in the Chelsea/Putnam Streets section of East Boston. The potential NO_2 problem that is suggested by the modeling results for the No-Build will continue with this construction alternative.

- Low Intensity Alternative

Emissions inventories for a 24-hr period with the proposed Low Intensity Cargo Development, with and without GA activity at BIF, are exhibited in Table 5.2-1 for CO, 5.2-2 for NO_x,



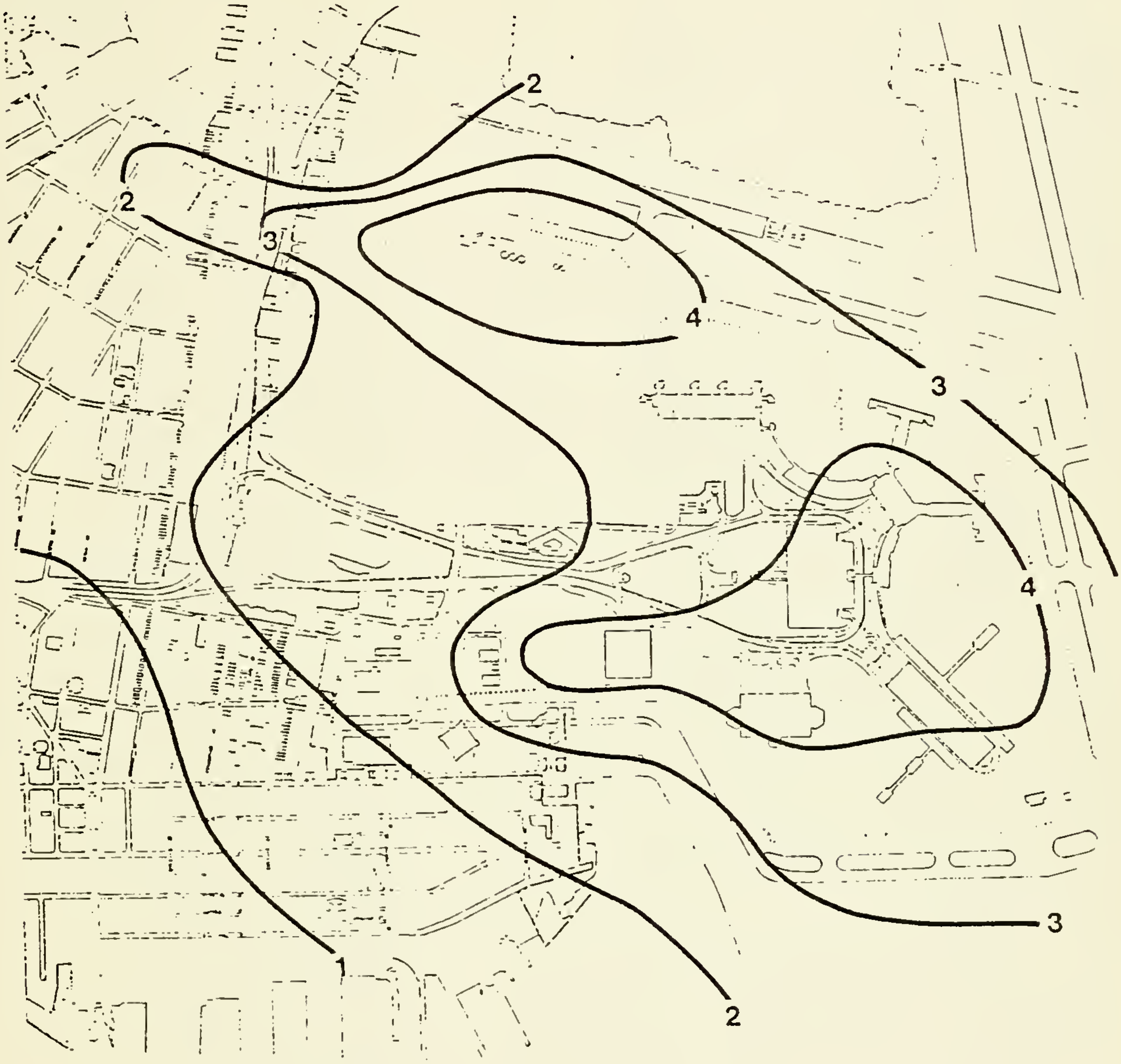
Source: Bolt, Beranek and Newman Inc.

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

ESTIMATED MAXIMUM 1-HR NOx CONCENTRATION (IN MG/M^3) FOR THE NO-BUILD ALTERNATIVE IN YEAR 2000.

HTA

FIGURE 5.2-7



Source: Bolt, Beranek and Newman Inc.

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

ESTIMATED MAXIMUM 1-HR TOTAL HYDROCARBONS CONCENTRATION (IN MG/M3) FOR THE NO-BUILD ALTERNATIVE IN YEAR 2000.

HTA

FIGURE 5.2-8

TABLE 5.2-1 TOTAL CARBON MONOXIDE EMISSIONS (IN KILOGRAMS) FROM LOGAN AIRPORT AND ITS IMMEDIATE VICINITY FOR A 24-HR PERIOD IN YEAR 2000, BY PROJECT ALTERNATIVE.

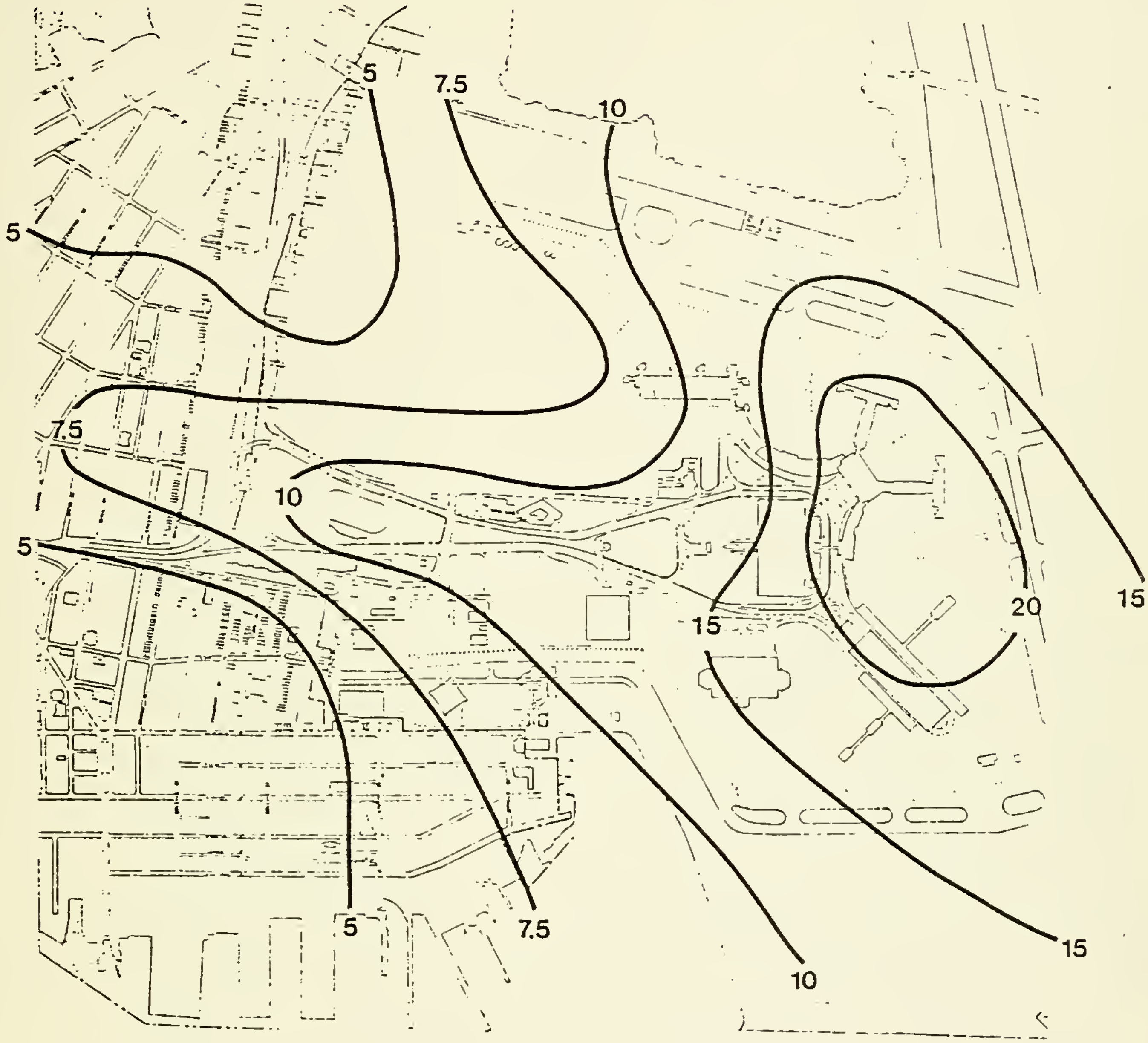
		High Intensity		Low Intensity		Mixed Use	
	No-Build	With G/A	Without G/A	With G/A	Without G/A	With G/A	Without G/A
Aircraft							
Air Carriers	6,390	6,390	6,390	6,390	6,390	6,390	6,390
Commuters	381	394	394	394	394	394	394
General Aviation	722	685	741	680	736	685	741
Cargo	1,200	1,121	1,105	1,153	1,150	1,121	1,105
Total Aircraft	8,690	8,590	8,630	8,610	8,670	8,590	8,630
Nonaircraft							
Service Vehicles	1,750	1,750	1.750	1,750	1,750	1.750	1,750
Auto Parking/Terminal/Loop	4,070	4,210	4,210	4,390	4,390	4,470	4,470
Employee Parking	138	138	138	138	138	138	138
Trucks	311	813	703	561	559	697	587
Fuel Storage/Handling	--	--	--	--	--	--	--
Total Nonaircraft	6,270	6,910	6,800	6,840	6,840	7,060	6,950
Total Airport	15,000	15,500	15,400	15,500	15,500	15,600	15,600
Surrounding Automobiles	1,410	1,410	1,410	1,410	1.410	1.410	1,410
TOTAL	16,400	16,900	16,800	16,900	16,900	17,200	17,100

Table 5.2-2 TOTAL OXIDES OF NITROGEN EMISSIONS (IN KILOGRAMS) FROM LOGAN AIRPORT AND ITS IMMEDIATE VICINITY FOR A 24-HR PERIOD IN YEAR 2000, BY PROJECT ALTERNATIVE.

		High Intensity		Low Intensity		Mixed Use	
	No-Build	With G/A	Without G/A	With G/A	Without G/A	With G/A	Without G/A
Aircraft							
Air Carriers	6,700	6,700	6,700	6,700	6,700	6,700	6,700
Commuters	268	269	269	269	269	269	269
General Aviation	79.9	78.8	80.6	78.7	80.5	78.8	80.6
Cargo	1,030	1,020	1,020	1,020	1,020	1,020	1,020
Total Aircraft	8,070	8,060	8,070	8,070	8,070	8,060	8,070
Nonaircraft							
Service Vehicles	100	100	100	100	100	100	100
Auto Parking/Terminal/Loop	385	404	404	428	428	439	439
Employee Parking	18	18	18	18	18	18	18
Trucks	28	73	63	51	51	63	53
Fuel Storage/Handling	--	--	--	--	--	--	--
Total Nonaircraft	531	595	585	597	597	620	610
Total Airport	8,600	8,660	8,650	8,660	8,660	8,680	8,680
Surrounding Automobiles	174	174	174	174	174	185	185
TOTAL	8,770	8,830	8,820	8,840	8,840	8,870	8,860

Table 5.2-3 TOTAL HYDROCARBON EMISSIONS (IN KILOGRAMS) FROM LOGAN AIRPORT AND ITS IMMEDIATE VICINITY FOR A 24-HR PERIOD IN YEAR 2000, BY PROJECT ALTERNATIVE.

		High Intensity		Low Intensity		Mixed Use	
	No-Build	With G/A	Without G/A	With G/A	Without G/A	With G/A	Without G/A
Aircraft							
Air Carriers	1620	1620	1620	1620	1620	1620	1620
Commuters	175	182	182	182	182	182	182
General Aviation	218	198	228	195	225	198	228
Cargo	338	314	309	325	321	314	309
Total Aircraft	2350	2310	2330	2320	2340	2310	2330
Nonaircraft							
Service Vehicles	389	389	389	389	389	389	389
Auto Parking/Terminal/Loop	490	508	508	531	531	542	542
Employee Parking	16	16	16	16	16	16	16
Trucks	22	56	49	39	39	48	41
Fuel Storage/Handling	3090	3090	3090	3090	3090	3090	3090
Total Nonaircraft	4010	4060	4060	4070	4070	4090	4080
Total Airport	6360	6370	6390	6390	6410	6400	6410
Surrounding Automobiles	164	164	164	164	164	180	180
TOTAL	6520	6540	6550	6550	6570	6580	6590



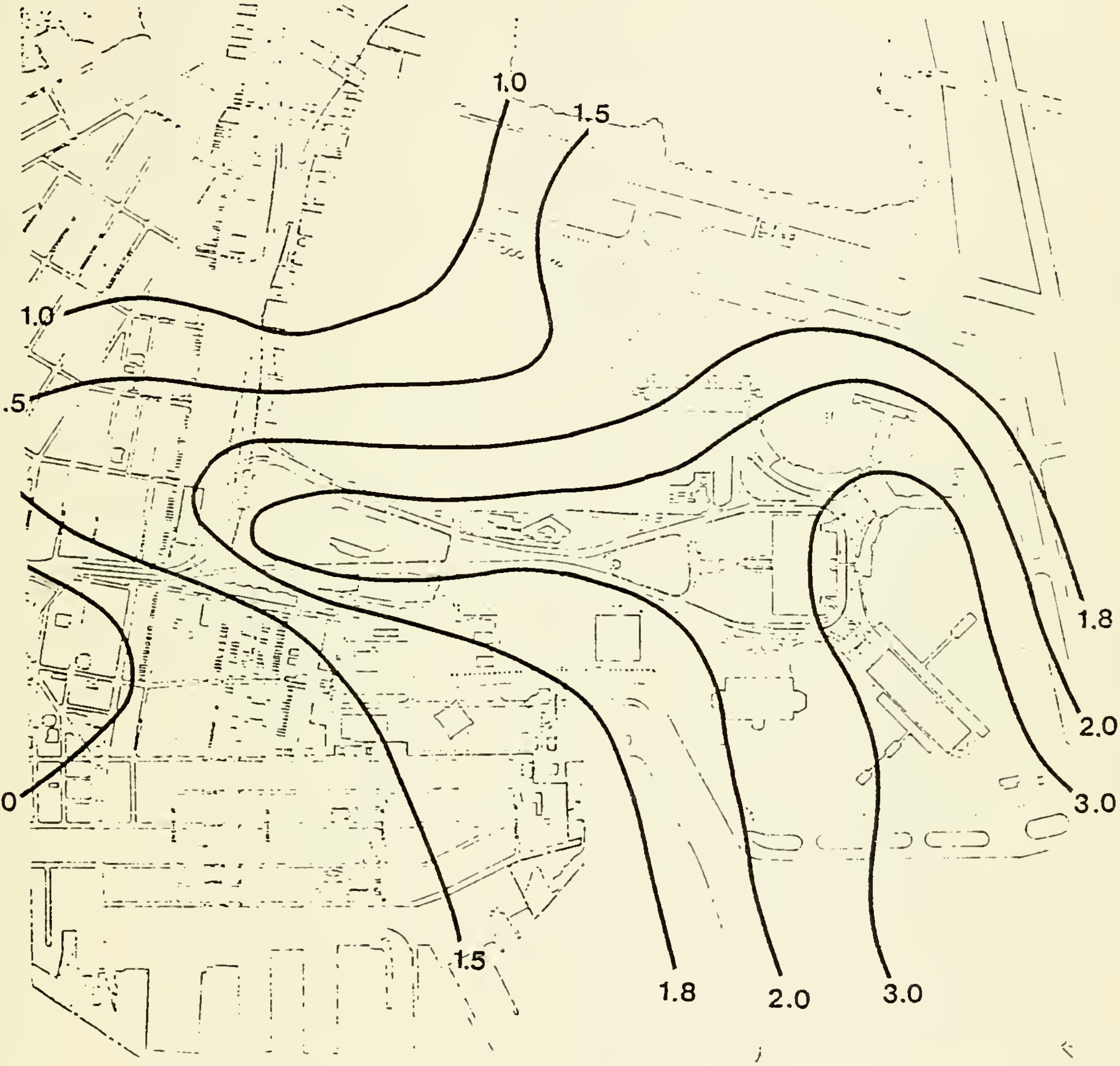
Source: Bolt, Beranek and Newman Inc.

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

ESTIMATED MAXIMUM I-HR CO CONCENTRATION (IN PPM) FOR THE HIGH INTENSITY WITH GENERAL AVIATION ALTERNATIVE IN YEAR 2000.

HTA

FIGURE 5.2-9



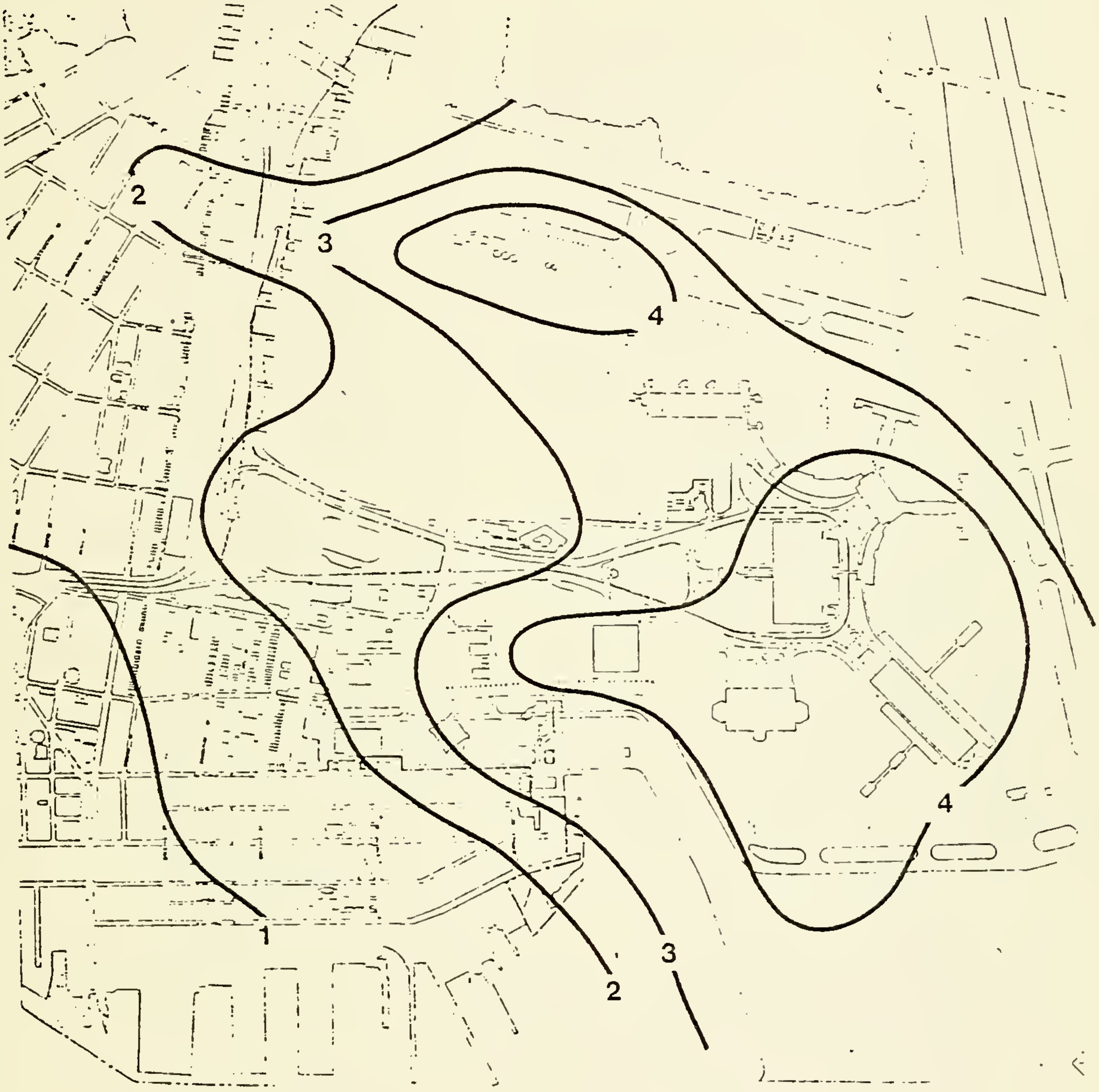
Source: Bolt, Beranek and Newman Inc.

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

ESTIMATED MAXIMUM 1-HR NOx CONCENTRATION (IN MG/M3) FOR THE HIGH INTENSITY WITH GENERAL AVIATION ALTERNATIVE IN YEAR 2000.

HTA

FIGURE 5.2-10



Source: Bolt, Beranek and Newman Inc.

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

ESTIMATED MAXIMUM 1-HR TOTAL HYDROCARBONS CONCENTRATION (IN MG/M3) FOR THE HIGH INTENSITY WITH GENERAL AVIATION OPTION FOR YEAR 2000.

HTA

FIGURE
5.2-11

and 5.2-3 for HC. Compared with the No-Build, the Low Intensity alternative with GA is expected to result in an increase of 3% CO, 1% NO_x, and 1% HC in total Airport emissions. Truck emissions are predicted to increase but not as significantly as with the High Intensity alternative.

The distribution patterns of maximum 1-hr concentration isopleths for the Low Intensity alternative are very similar to the corresponding High Intensity cases. Consequently, the isopleths for this alternative are not illustrated as separate figures. As with the No-Build and the High Intensity alternative, NO_2 will continue to be a potential problem. This is because, when compared with the No-Build alternative, the Low Intensity Cargo alternative is estimated to result in increases of between 0.01 and 0.02 mg/m^3 of NO_x for the Jeffries Point Community.

- Mixed Use Alternative

The proposed Mixed Use development at BIF, with or without the GA activity option, will result in the heaviest impact when compared with the other alternatives. This impact is attributable to the projected addition of about 7,500 two-way vehicle trips per day (i.e., 7,500 vehicles entering and 7,500 vehicles leaving BIF per day) that will be generated because of the Mixed Use development.

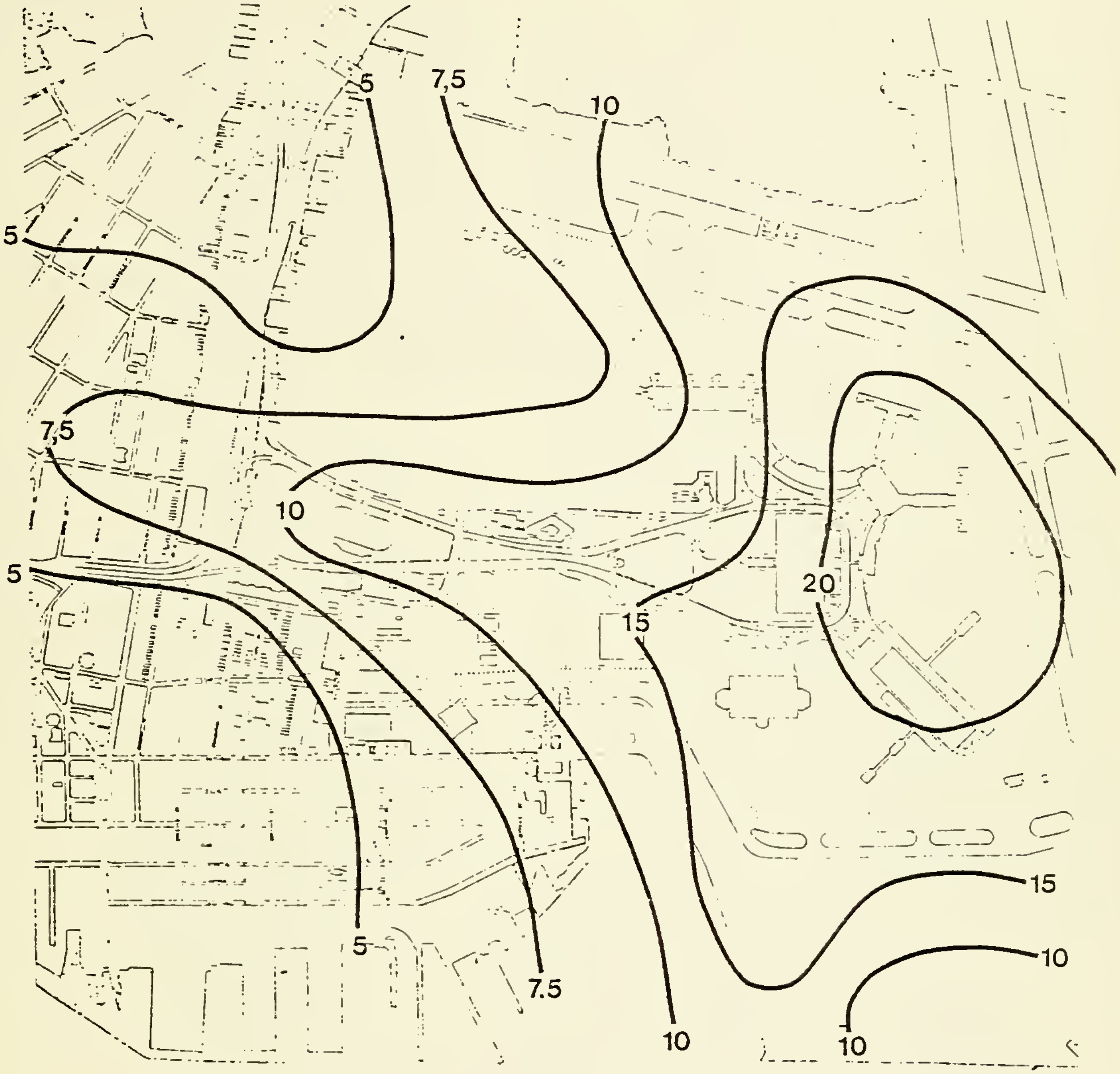
An examination of the emissions inventories shown in Tables 5.2-1 through 5.2-3 suggests that, when compared with the No-Build, increases of 5% CO, 1% NO_x, and 1% HC in total Airport emissions are anticipated.

Areawide distributions of maximum 1-hr CO, NO_x, and HC concentrations are exhibited respectively in Figures 5.2-12, 5.2-13, and 5.2-14. The distribution patterns are generally very similar to the corresponding High Intensity cases, except that ambient air quality at BIF itself is generally worse with the Mixed Use alternative.

Similar to all the other alternatives considered, predicted maximum 8-hr CO concentrations that are very close to the 9 ppm standard are anticipated at most of the major air carrier terminals and parking garages. Also, like the No-Build alternative, NO_2 will continue to be a potential problem.

- Odor Ramifications

Odor is a sensory response to certain chemical stimuli involving the olfactory senses. The characteristics or properties of odor can generally be described in terms of its



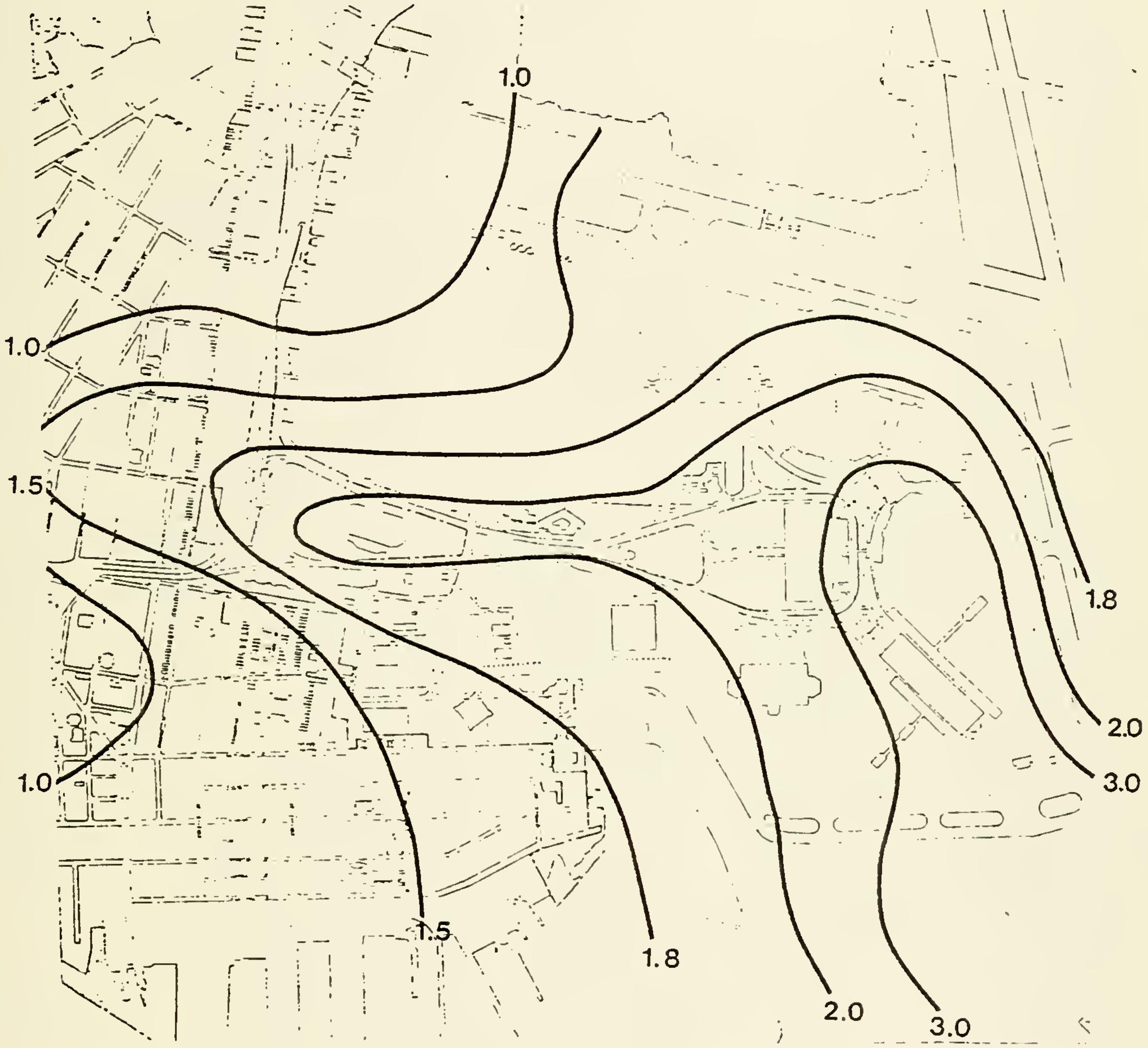
Source: Bolt, Beranek and Newman Inc.

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

ESTIMATED MAXIMUM 1-HR CO CONCENTRATION (IN PPM) FOR THE MIXED-USE WITH GENERAL AVIATION ALTERNATIVE IN YEAR 2000

HTA

FIGURE
5.2-12



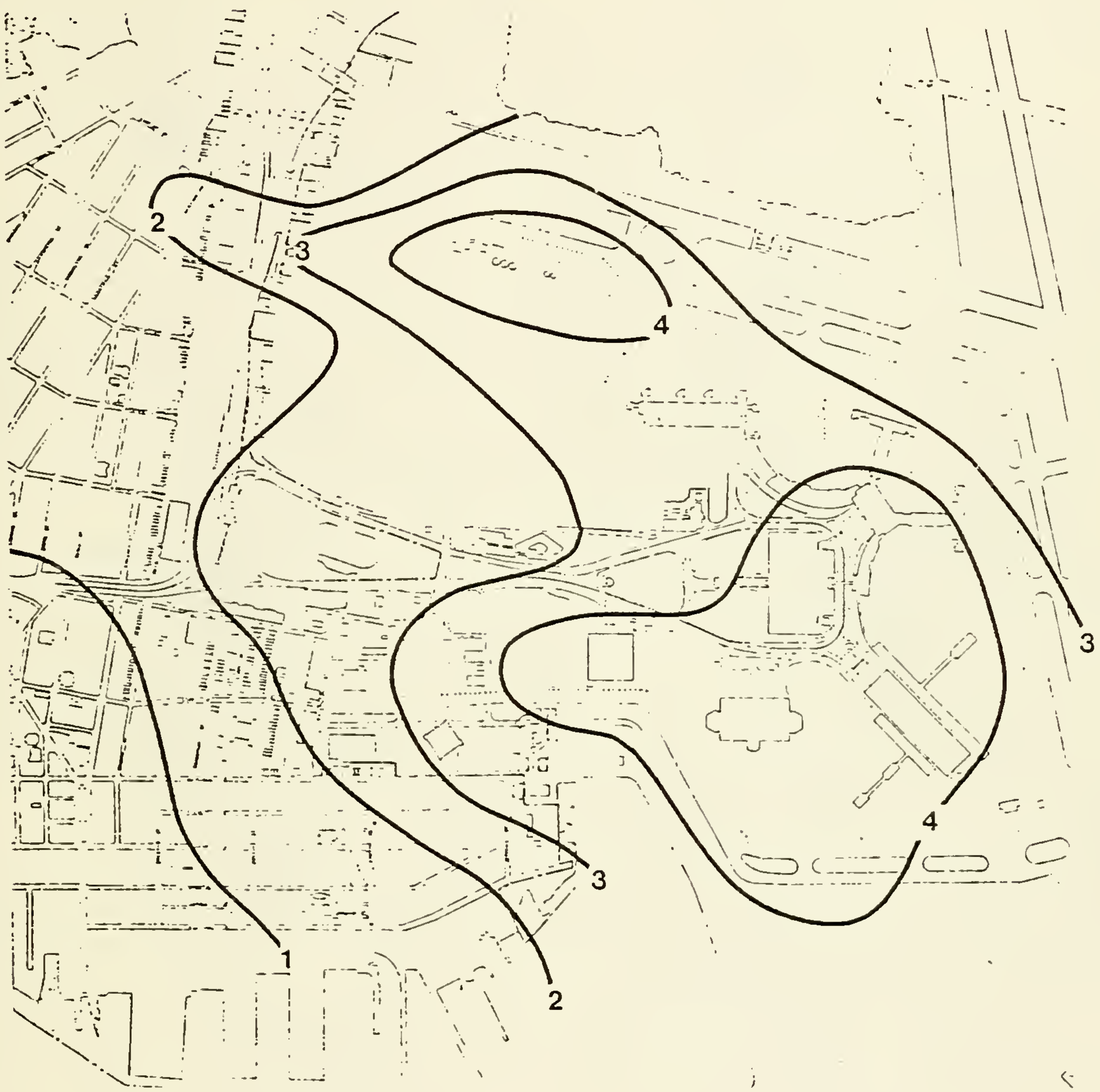
Source: Bolt, Beranek and Newman Inc.

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

ESTIMATED MAXIMUM 1-HR NOx CONCENTRATION (IN MG/M3) FOR THE MIXED-USE WITH GENERAL AVIATION ALTERNATIVE IN YEAR 2000.

HTA

FIGURE
5.2-13



Source: Bolt, Beranek and Newman Inc.

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS
ESTIMATED MAXIMUM 1-HR TOTAL HYDROCARBONS CONCENTRATION (IN MG/M3) FOR THE MIXED-USE WITH GENERAL AVIATION ALTERNATIVE IN YEAR 2000.

HTA

FIGURE
5.2-14

character (or nature) and its intensity (or strength). Appendix C elaborates on the very subjective nature of human perception of odor. The sources of emissions at Logan Airport that have the potential to develop into a detectable odor situation at Jeffries Point and other East Boston communities include vaporized jet fuel and gasoline from storage, fuel transfer or spillage, and exhaust combustion products from jet aircraft, piston aircraft, trucks, automobiles, and other ground support service equipment. The assessment of impact is presented in terms of the character of the odor, the odor intensity, and the frequency of impact.

With the proposed development of BIF, there should be no perceivable difference in the nature or character of the odor at either Jeffries Point or any other East Boston community. This conclusion is based on the fact that the proposed BIF development is not bringing into the Airport area a new odor source or taking away an existing source.

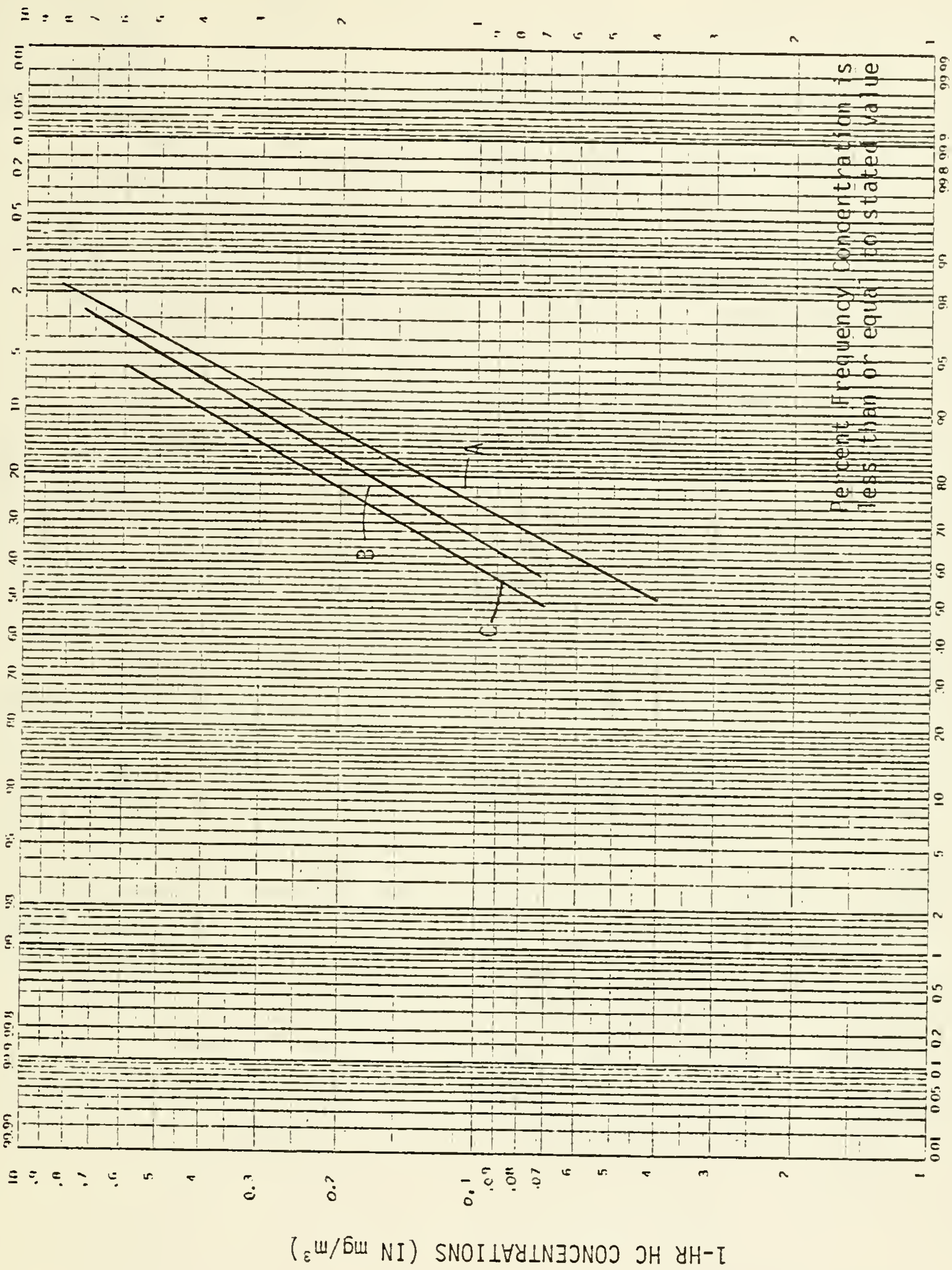
Using a procedure that is described further in Appendix C, changes in odor intensity for each of the construction alternatives were estimated using the No-Build alternative as a reference. The results are set forth in Table 5.2-4. Increases in intensity at Jeffries Point are anticipated with all construction alternatives. A maximum increase of about 1.4% is estimated with the Mixed Use alternative. This increase, however, is not expected to be perceivable to the human olfactory senses. In the Chelsea/Putnam Streets section of East Boston, an improvement is predicted for all construction alternatives. At the level that is anticipated at this location, this improvement is also not expected to be recognized.

Change in the frequency of impact is directly linked to the distribution of ambient concentrations of the odorant at a given location. Using a procedure that is further elaborated in Appendix C, the changes in the frequency of impact at Jeffries Point and at the Chelsea/Putnam Streets section of East Boston are illustrated in Figures 5.2-15 and 5.2-16, respectively.

At Jeffries Point, all construction alternatives are expected to result in an increase in the frequency of impact. Maximum increase is anticipated with the proposed Mix Use alternative. At the Chelsea/Putnam Streets section of East Boston, all construction alternatives will result in a decrease in the frequency of impact. A maximum decrease in the frequency is expected with the High Intensity alternative.

TABLE 5.2- 4. ESTIMATED CHANGES IN ODOR INTENSITY AT SELECTED EAST BOSTON COMMUNITIES, FOR VARIOUS SITUATIONS.

Descriptions of Scenarios and Alternatives	Estimated Changes in Intensity	
	Range	Most Likley Change
Doubling of Concentration (hypothetical)	+15% to +74%	+58%
50% increase in concentration (hypothetical)	+ 8% to +38%	+31%
High Intensity Alternative with G/A: max. change in concentration at		
— Jeffries Point (+1.0%)	+0.2% to +0.7%	+0.6%
— Chelsea/Putnam (-12.9%)	-2.7% to -10.5%	-8.7%
High Intensity Alternative without G/A: max. change in concentration at		
— Jeffries Point (+0.6%)	+0.1% to +0.5%	+0.4%
— Chelsea/Putnam (-13.4%)	-2.8% to -10.9%	-9%
Low Intensity Alternative with G/A: max. change in concentration at		
— Jeffries Point (+0.6%)	+0.1% to +0.5%	+0.4%
— Chelsea/Putnam (-11.9%)	-2.5% to -9.6%	-8.0%
Low Intensity Alternative without G/A: max. change in concentration at		
— Jeffries Point (0.6%)	+0.1% to +0.5%	+0.4%
— Chelsea/Putnam (-12.1%)	-2.6% to -9.8%	-8.2%
Mixed Use Alternative with G/A: max. change in concentration at		
— Jeffries Point (+2.1%)	+0.4% to +1.7%	+1.4%
— Chelsea/Putnam (-12.5%)	-2.6 to -10.1%	-8.4%
Mixed Use Alternative without G/A: max. change in concentration at		
— Jeffries Point (+1.9%)	+0.4% to +1.5%	+1.2%
— Chelsea/Putnam (-12.9%)	-2.9% to -10.5%	-8.7%



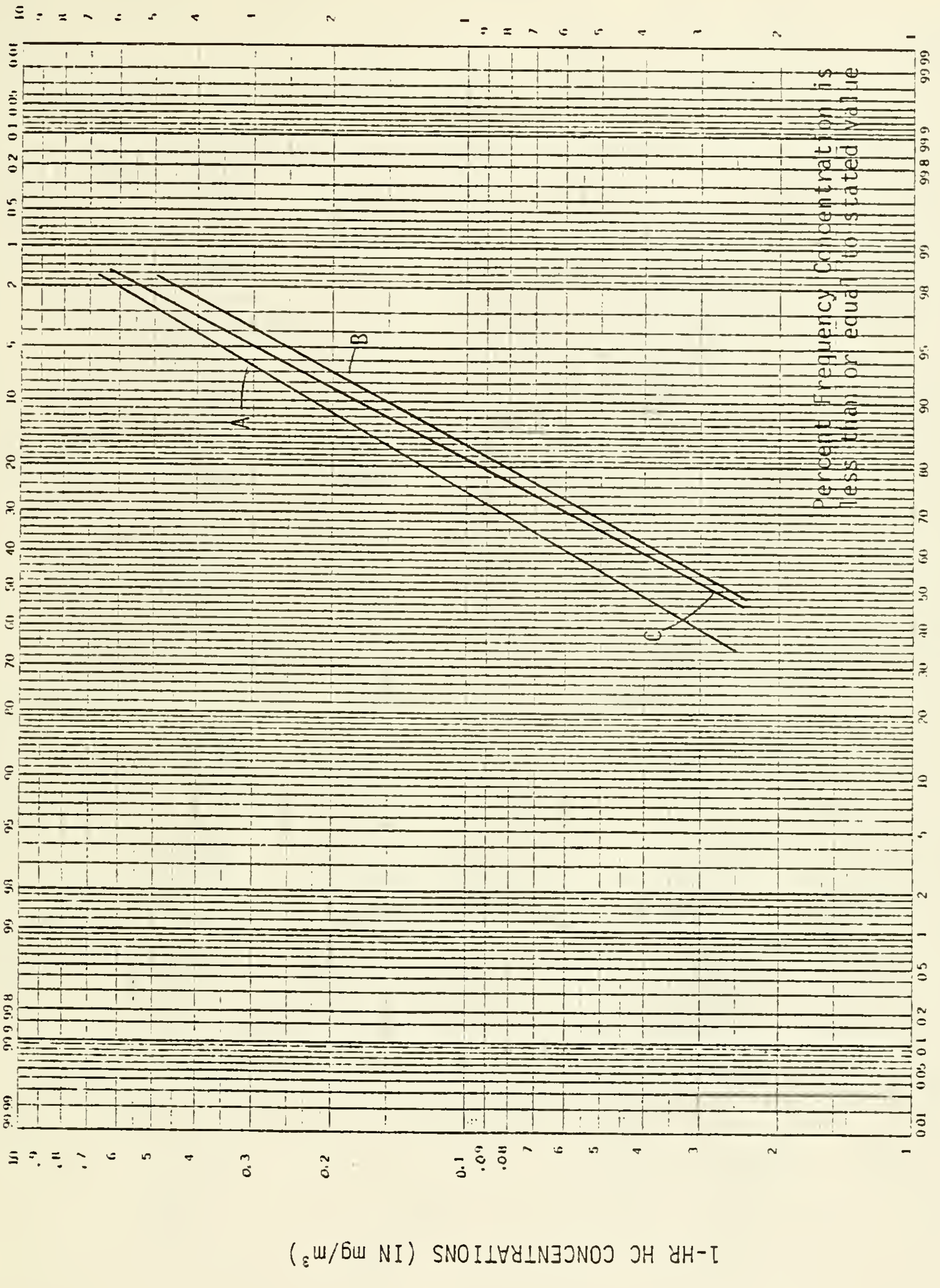
Source: Bolt Beranek and Newman Inc.

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

PREDICTED FREQUENCY OF OCCURRENCE FOR MAXIMUM
1- HR HYDROCARBON CONCENTRATION AT JEFFRIES POINT.

HTA

FIGURE
5.2-15



Source: Bolt Beranek and Newman Inc.

BOSTON - LOGAN INTERNATIONAL AIRPORT
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PREDICTED FREQUENCY OF OCCURRENCE FOR MAXIMUM 1-HR HYDROCARBON CONCENTRATION AT CHELSEA / PUTNAM STREETS SECTION.

HTA

FIGURE 5.2-16

- Effects of Background Sources of Emissions

The estimates of maximum 1-hr ambient concentrations of CO, NO_x, and HC presented above, do not take into account any contributions from non-Airport emission sources. The ambient concentrations resulting from these sources are referred to as the "background" concentrations.

Background concentrations for any given pollutant are generally specific to a given location and vary with wind direction. These concentrations should be arrived at by long-term monitoring at appropriately located measurement sites. The data compiled for Massport to date are unable to meet either one of these criteria. However, as described further in Appendix C, some estimates of the background concentrations were attempted, and the effects of these estimated background concentrations on the impact assessment of the BIF development are summarized in the following section.

For CO, a background concentration of 1.5 ppm to 2 ppm should be added to the modeling results for the existing conditions. Even with this added background concentration, estimated CO concentrations everywhere in the adjoining communities are still below the 1-hr and the 8-hr standards. The only possible exception is the area in East Boston that is impacted by the tunnel portal and the Airport ramps off McClellan Highway. The predictions for year 2000 for all alternatives will continue to be valid, except that a background concentration of about 0.6 ppm should be added to the modeling results.

Based on measured NO_2 compiled at the Van Dusen site, a 1-hr NO_2 background concentration of about 0.03 ppm is judged to be appropriate for the entire study area for year 1978. This concentration is applicable to the winter season. There is insufficient data to estimate a background for the summer months, although a higher background for the warmer seasons is believed to be appropriate. By year 2000, background NO_2 is expected to increase because of the increasing use of diesel-powered motor vehicles, which have higher NO_x emissions potential. This increase is more than offset, how ever, by anticipated decreases in NO_x emissions because of the effects of the Federal Motor Vehicle Control Program (FMVCP). Aircraft sources are not involved in estimating the background concentrations. Therefore, as a first estimate, the 0.03 ppm background concentration should continue to be applicable in Year 2000. The major impact of this background concentration is to underscore the potential problem with the proposed short-term NO_2 standard that was described previously.

Background levels of HC are more difficult to estimate. The presence of the fuel farms on Route C-1 in Revere and in South Boston and the limited data compiled to date do not permit an accurate estimate of background HC concentrations that are specific both to location and wind direction. One-hour concentrations at Jeffries Point, due to transported HC from South Boston, could reach 4 ppm. Background concentrations that should be added to Airport sources are estimated at 1 ppm to 1.5 ppm. Background HC concentrations in year 2000 are expected to decrease, due in large part to the FMVCP. The impact of including a background HC to the analysis of odor intensity is to reduce the magnitude of the estimated changes in intensity, as reported in Table 5.2-4. In terms of the frequency of odor impact, the addition of a background HC concentration will result in overall increase in frequency of impact, but the relative frequency of impact between project alternatives should remain unchanged.

- Respirable Particulates

Particulates refer to a class of emission products that vary in chemical composition and in shape, and exist in the ambient atmosphere in the form of finely suspended solids or liquids (aerosols). The respirable fraction is generally defined as airborne particulates that are less than or equal to 15 microns in size. Emission of particulate matter into the atmosphere arises from industrial processes, fuel combustion, construction operations, transportation, and natural origins. Transportation sources emit particulate matter in a number of ways, including aerosols in the exhaust gases, tire wear, and entrainment of small particles on roadways and other surfaces.

In terms of health effects, the particulates that are of primary concern are the particulate polycyclic organic matter (PPOM). PPOM is produced in any combustion process involving fossil fuels or compounds containing carbon and hydrogen. One group of aromatic compounds of PPOM, known as the polynuclear aromatics (PNA), is suspected to include several carcinogenic components such as benzol [a]pyrene (BaP). PNA are believed to result from incomplete combustion of materials in the fuels, synthesis of aromatic hydrocarbon of lower molecular weight, and pyrolysis of lubricating oil. The sources of PPOM at the Airport and in East Boston include diesel-powered cars and trucks, gasoline-powered vehicles (especially those without catalysts), and gas turbine engines on aircraft.

Total suspended particulates (TSP) measurements, taken from a number of locations in East Boston, indicate no violation of existing ambient standards. Depending on the site and meteorology conditions, the respirable fractions of the TSP were found to vary from 10% to 90%. However, there are presently no ambient standards on particulates that are discriminatory with respect to size. Also without detailed chemical analyses of the samples for PNA compounds and other toxic substances, little additional information on health hazards can be deduced from these measurements.

To assess the feasibility of a quantitative analysis of impact of the proposed BIF development on ambient particulate matter concentrations, data on emission factors for both aircraft and motor vehicle sources were reviewed. As elaborated in Appendix C, the review found the data to be very limited and out-of-date. Consequently, a quantitative impact analysis is not warranted. The current data base on PPOM (or more specifically, BaP) emission factors is also not of sufficient coverage and reliability to assess the impact of Logan Airport operations on the PNA-related health hazard in East Boston. Since PPOM are so small and can remain airborne for extended periods of time, PPOM from power plants, industrial sources, and residential heating sources from other areas of metropolitan Boston, can also be transported into East Boston. Because of these limitations, an accurate assessment of impact associated with the proposed BIF development project on East Boston is not practical at this time.

- Power and Space Heating

Power requirements for the proposed development at BIF will not result in increased emissions at Logan Airport because this additional power will be purchased from an existing utility that supplies all of Logan's present needs. It is anticipated that the present power plant that supplies steam to a number of terminals will not be used to provide the additional space heating requirements for any development at BIF. Since gas is a very clean fuel (i.e., low emissions potential), the air quality impact associated with gas combustion is expected to be negligible. If oil is used as a fuel, air pollutants will increase.

- Impacts on Other Communities

No quantitative analysis of impact was done for other communities such as South Boston and Winthrop. However, a qualitative assessment was made, and the results are summarized in the following section.

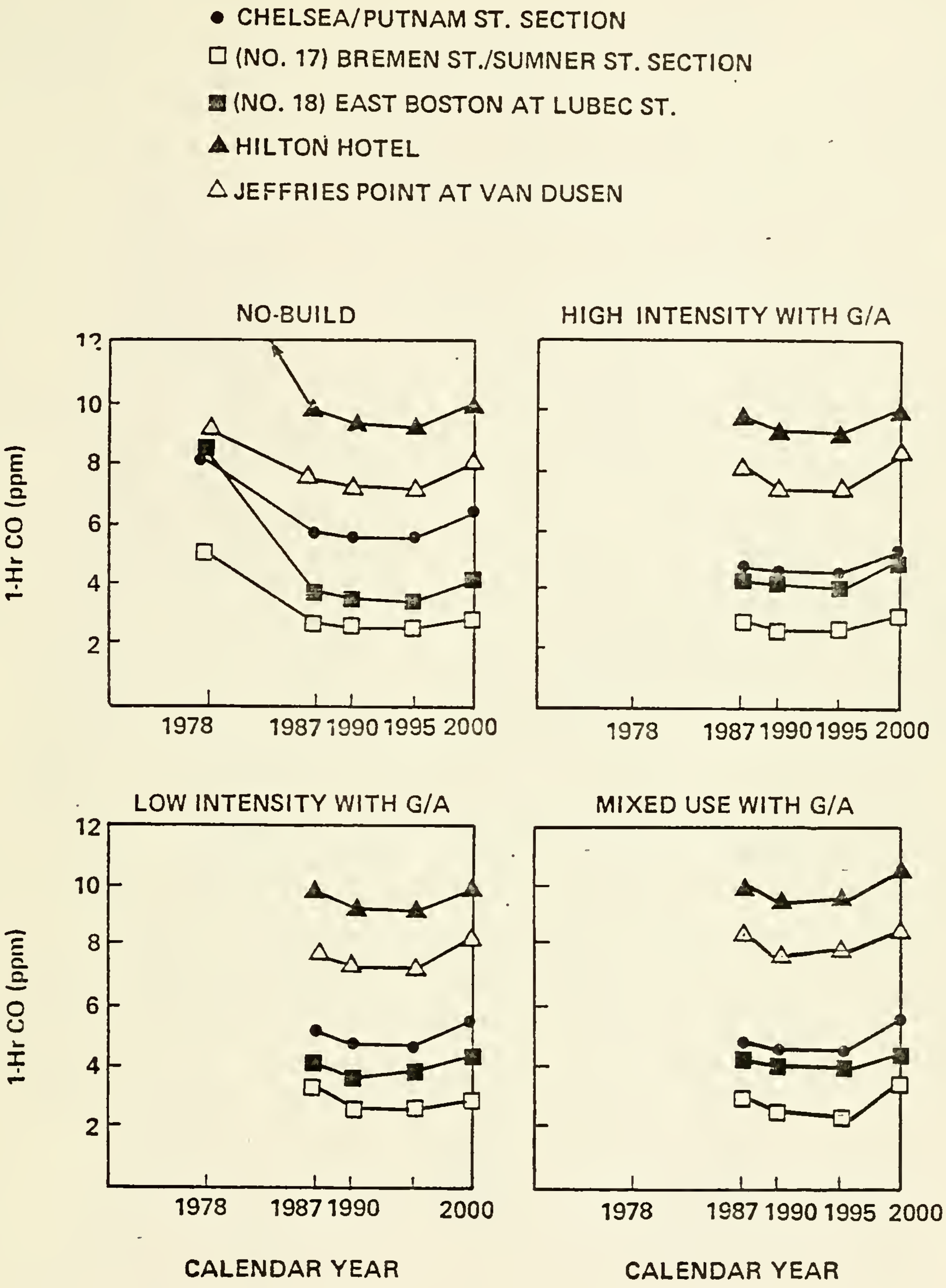
Irrespective of project alternatives, maximum impact at South Boston is anticipated with a north wind and aircraft taking off on Runways 4R and 9. Any development on BIF will result in increased impact, but this increase will be quite insignificant. Also, differences in impact between project alternatives will be very small. In the Bayswater section of Orient Heights, maximum impact will be felt with a south to southwest wind and aircraft taking off on 22R and/or 22L. Significant impact could arise under this situation. However, this impact is independent of whether the proposed BIF project is implemented or not. With the proposed development at BIF, there should be a small improvement, but this improvement will be insignificant. For residences in Court Park at Winthrop, maximum impact under existing and the No-Build alternative takes place with a light southwest wind and aircraft taking off on 22L and/or 22R. The proposed BIF development will have little or no effect on this community. At Point Shirley, maximum impact will be felt with a west or a west-southwest wind with aircraft taking off on Runway 27. None of the proposed BIF developments will have any significant impact in this area.

- Construction and Staging Impacts

Emissions from construction activities - either directly from construction equipment, or indirectly from increased automobile emissions due to increased traffic congestion - are believed to be quite insignificant when compared with emissions from other Airport sources. This temporary impact is, therefore, judged to be of little consequence.

Because of changes in the mix of aircraft and automotive power plants, the projected increases in activity, and the implementation of emissions control regulations, estimated ambient pollutant concentrations at any given receptor location can vary during the intervening period between existing conditions and the time of full project implementation. Trends in pollutant concentrations were therefore analyzed at selected locations to assess impact during various stages. For CO, estimated concentrations are expected to decrease through the early 1990s. This decrease is attributable primarily to the effects of the FMVCP. After about 1995, the benefits of this program are outweighed by the increases in activity, and predicted maximum CO concentrations will increase again. Figure 5.2-17 shows the CO trends at selected receptor locations at the Airport and its adjoining communities for the No-Build and the three construction alternatives. No violation of either the 1-hr or the 8-hr standard is found.

Figure 5.2-18 shows the anticipated changes in maximum 1-hr NO_x concentration at various selected receptor locations. For all alternatives examined, estimated NO_x concentrations are expected to increase with time. The main reason is that NO_x concentrations are heavily impacted by emissions from jet aircraft, and regulations on NO_x emissions from



Source: Bolt Beranek and Newman Inc.

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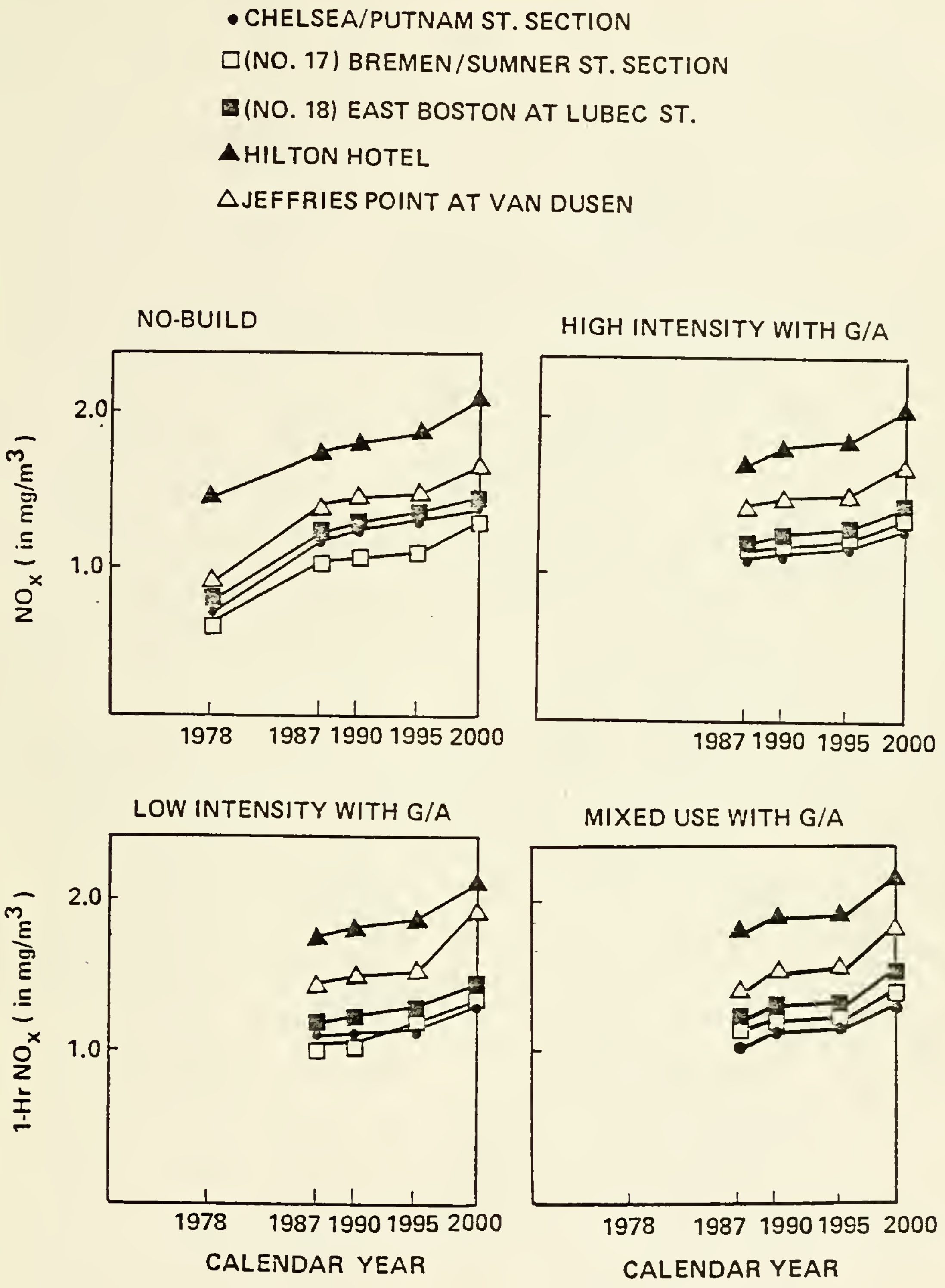
CHANGE IN ESTIMATED MAXIMUM 1-HR CO CONCENTRATIONS AT SELECTED RECEPTOR LOCATIONS WITH TIME, FOR VARIOUS PROJECT ALTERNATIVES.

HTA

FIGURE
5.2-17



Source: Bolt Beranek and Newman Inc.

BOSTON - LOGAN INTERNATIONAL AIRPORT
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CHANGES IN ESTIMATED MAXIMUM 1-HR NO_x CALCULATIONS AT SELECTED RECEPTOR LOCATIONS WITH TIME, FOR VARIOUS PROJECT ALTERNATIVES.

HTA

FIGURE 5.2-18

gas turbine engines have been relaxed and/or delayed by EPA. Based on this analysis, therefore, the potential NO_2 problem at Logan Airport and its vicinity will continue to get worse in the future.

For HC, the trend is mixed, although for the most part, this trend is similar to that of CO. Figure 5.2-19 summarizes the HC trends at selected receptor locations for each of the alternatives examined.

During the surfacing and grading phase, special steps (such as hosing) should be undertaken in order to reduce particulates.

5.2.3 Mitigating Measures

A number of mitigating measures were evaluated from the standpoint of their overall effectiveness in reducing emissions of CO, NO_x, and HC. The results of this evaluation are summarized in the following section.

A strategy involving a reduction in the number of engines in operation during the taxi mode and increasing the engine power in the remaining operating engines will result in a decrease of aircraft emissions of CO and HC. But for NO_x, an increase in emissions is anticipated. With aircraft towing, aircraft taxiing emissions would be eliminated, but increased emissions from the tow tractor would result. There will be a net savings in both CO and HC, but for NO_x, this savings is inconsequential when measured against the overall NO_x emissions during a landing and takeoff cycle. As with all of the other ground operations strategies considered, there are implications for operations safety, implementation, and cost associated with these strategies. None of these implications are evaluated at this time. Substitution of on-board APUs by ground-based power supplies can result in some savings in emissions. This savings, however, is quite negligible. Another strategy involves controlled engine start-up and gate departure. This strategy is not expected to result in significant savings in CO or HC. For NO_x, it would be quite ineffective. Use of staging areas and associated passenger transportation is not expected to result in any savings in taxiing emissions at Logan Airport.

Another strategy examined relates to control of HC emissions from fuel storage and handling facilities. If controls were implemented, overall HC emissions from this category of sources at Logan could be reduced by about 45% (not HC in the region). However, it must be emphasized that even if this reduction were realized, no perceivable improvement in the odor impact is anticipated.

Further discussion of mitigating measures can be found in Appendix C and in Chapter 6.

5.3 WATER QUALITY

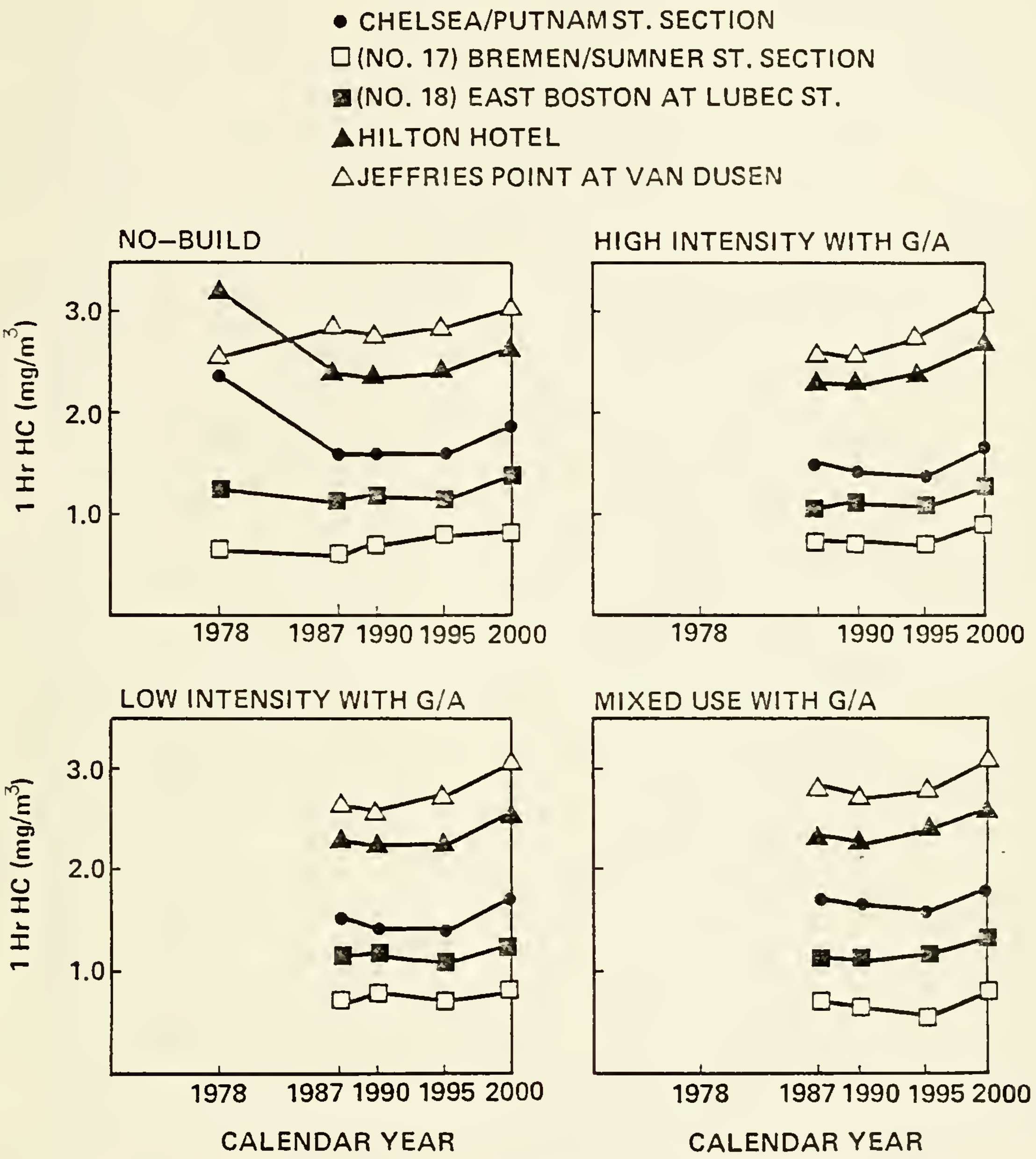
The BIF site is served by the West Drainage system. Surface runoff processed by this system is treated at an oil/water separator in the southwest corner of the site. The North Apron is part of the North Drainage Area and is served by another oil/water separator. Drains connecting to existing culvert and oil/water separator systems will be installed to serve all developed land areas on the BIF and North Apron sites over which substantial quantities of hydrocarbons will be transferred, transported or stored. Liquid and solid wastes generated by normal operations on BIF and the North Apron will be transported and treated off site. None of the Build alternatives include fuel farms, so large oil spills are not anticipated.

The following water quality contaminants may be produced as a result of development of BIF and proposed changes in the use of the North Apron:

- oils and grease from automobiles and aircraft
- hydrocarbon residues from accidental fuel spills
- sand
- salt, urea and glycol from deicing
- urban dust and associated contaminants (including lead, zinc)
- harmless and hazardous liquid and solid residues from broken cargos

Many of these contaminant releases will be contained before they ever reach the storm drainage system. The storm drainage system and pollution control unit are of sufficient capacity to handle the contaminant load which could conceivably occur as the result of an accidental fuel spill. Water quality of the harbor will also be protected by procedures specifically developed for dealing with these contaminants from the development sites.

Nine activities associated with BIF development and having the potential for producing water quality impacts were identified and are displayed on Table 5.3.1. The designation of "light", "moderate" or "heavy" impact refers to the relative impacts of each alternative - not the relative impact of the various activities. Although the no-build alternative has the least impact upon water quality, none of the build alternatives will result in significantly greater water quality impacts. Ferry and marine facilities which are



Source: Bolt Beranek and Newman Inc.

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CHANGE IN ESTIMATED MAXIMUM I-HR TOTAL HYDROCARBON CONCENTRATIONS AT SELECTED RECEPTOR LOCATIONS WITH TIME, FOR VARIOUS PROJECT ALTERNATIVES.

FIGURE
5.2-19

TABLE 5.3-1 MAJOR ACTIVITIES PLANNED FOR THE BIRD ISLAND FLAT DEVELOPMENT INCLUDING THE MIXED USE OPTION AND QUALITATIVE ASSESSMENT OF POTENTIAL WATER QUALITY IMPACTS.

LAND USE/ACTIVITY	NATURE OF IMPACT	BASIS OF EVALUATION	IMPACT OF ALTERNATIVES						
			HIGH INTENSITY CARGO W GA	HIGH INTENSITY CARGO W/O GA	LOW INTENSITY CARGO W GA	LOW INTENSITY CARGO W/O GA	NO BUILD ON BIF	MIXED USE W GA	MIXED USE W/O GA
1. Fuel storage and transfer	Surface runoff controlled from aircraft aprons, uncontrolled from other surfaces	Freighter aprons and GA or no GA (see Table D-6 in Appendix D)	heavy	heavy	moderate	moderate	light	heavy	heavy
2. Aircraft maintenance	Surface accumulation managed by absorbent material pickup major fuel spills possible	Number of maintenance positions (see Table 3.2-1)	light	light	heavy	heavy	light	light	light
3. Food Service Operations	Largely solid waste; liquid waste to sanitary sewer	Work space provided (see Table 3.2-1)	light	light	light	light	light	light	light
4. Sanitary Facilities	Liquid waste to sanitary sewer	Gallonage of sewage produced (see Table D-4 in Appendix D)	light	light	moderate	moderate	light	heavy	heavy
5. Cargo Handling	Spillage from broken cargos handled according to FDA emergency procedures	Work space provided and aprons (see Table 3.2-1)	moderate	heavy	light	moderate	light	moderate	heavy
6. Parking Areas and Roadways	Very moderate use of deicing compounds mostly sand; some oily runoff from vehicles	Roadway and parking acreage (see Table D-6 in Appendix D)	moderate	moderate	light	light	light	moderate	moderate
7. Urbanization (buildings)	Modest amounts of particulate accumulation, airports kept somewhat cleaner than other urban environments because turbine engines are highly susceptible to grit and sand	Acreage of buildings and pavement (see Table D-6 in Appendix D)	heavy	heavy	moderate	moderate	light	heavy	heavy
8. Construction (10 mos)	Fuel and lubricant residues from motorized equipment, erosion/siltation during active earthworking	Acreage and land use intent (see Table D-6 in Appendix D)	moderate	moderate	moderate	moderate	light	heavy	heavy
9. Landscaped areas, buffer zone	Low pollution potential, these areas tend to adsorb and hold contaminants; low quantities of runoff	Acreage (see Table D-6 in Appendix D)	light	light	light	light	light	moderate	moderate

part of the Mixed Use alternatives will result in slightly greater water quality impacts as compared to any of the other alternatives. No-build results in congested activity at North Apron but this congestion will not result in significant water quality impacts.

During construction, water quality could marginally be degraded by siltation, especially if such activity coincides with a period of heavy precipitation. Accidental fuel spillage by construction equipment is also a possibility, but volumes would be small.

Low intensity cargo alternatives should not generate significantly more stormwater discharge than is produced under existing or "No-Build" conditions. High Intensity cargo and Mixed Use options, on the other hand, may increase the amount of runoff. However, this increase is not expected to have any noticeable effect on water quality in Boston Inner Harbor.

Further discussion of water quality impacts and related data are contained in Appendix D.

5.4 HYDROLOGY/FLOOD IMPACTS

Although earthworking could produce ponding during wet weather, flooding is not expected to be a significant hazard under any of the build alternatives. Construction of the marina and ferry terminal under the Mixed Use alternative, however, might require certain permits beyond the EIR/EIS under Federal and State statutes pertaining to coastal and navigable waters.1/ For further discussion of these impacts, refer to Appendix E.

5.5 WETLANDS AND COASTAL ZONE

Neither the Bird Island Flats development area nor North Apron contain any vegetated wetlands. The retaining wall, however, qualifies under Massachusetts law as a coastal bank extending beneath the ocean surface. If construction activities are kept away from the immediate vicinity of the retaining wall, no wetlands or coastal zone conflicts result from any of the alternatives. Construction of a marina and a ferry terminal under the Mixed Use alternative, however, will require permits (see Section 5.4). Additional environmental Analysis, as applicable under CEQ's concept of "tiering" may be necessary with regard to the Mixed Use Alternative, once more detailed design data becomes available.

5.6 FLORA AND FAUNA

BIF is the result of a recent landfill; and the North Apron is a paved area. Neither site has stable plant or wildlife communities. Although development of Bird Island Flat will remove remaining habitat for wildlife (such as insects, blackbirds, muskrats and field mice, which readily adapt to austere conditions), such habitat losses are negligible.

Although Boston inner harbor has high aquatic productivity, organism diversity has been reduced due to water pollution from many sources in addition to Logan. Lobsters, crabs and up to 30 species of finfish inhabit marine waters in the vicinity of BIF. Construction of a marina and ferry terminal under the Mixed Use alternative would have a short-term impact on local populations of these aquatic organisms, although the overall impact, considering neighboring populations, will be undetectable. In the long term, increased boat traffic poses a slight risk of injury to aquatic life from chronic small-volume marine hydrocarbon releases. The High and Low Intensity cargo alternatives are not expected to have any impact on aquatic life.

For a detailed listing of flora and fauna at BIF, refer to Appendix G.

5.7 SOCIAL AND ECONOMIC IMPACTS

Both primary and induced social and economic impacts are discussed in this section. Primary impacts are those which occur as a direct result of BIF development and include changes in employment, community amenities and impacts on businesses or residence on the BIF site or adjacent to it. Secondary impacts are those impacts which are indirectly related to BIF development and include impacts such as changes in population in the city or region, or creation of jobs off the site.

5.7.1 Displacement and Relocation of Residences and Businesses

All alternatives for BIF development will take place within existing airport borders. No displacement of any residences or businesses would be necessary. Development of the BIF site continues the implementation of the Massport policy of encouraging the relocation of existing airport-related businesses such as car rental agencies and freight forwarders from the East Boston community to Logan (identified in Figure 5.7-1). These relocations allow sites vacated in East Boston to be converted to uses more compatible with the residential community. In addition, relocation will remove traffic generated by these businesses from the local streets in East Boston. These streets are barely adequate to handle the traffic generated by neighborhood businesses, and this congestion is currently aggravated by traffic associated with the airport-related businesses located in the community.

Implementation of any of the Build alternatives may involve relocation of businesses from the North Apron on to BIF. Disruption to these businesses will be minimized by construction staging, which will be responsive to the particular needs of businesses which are moving.

5.7.2 Employment

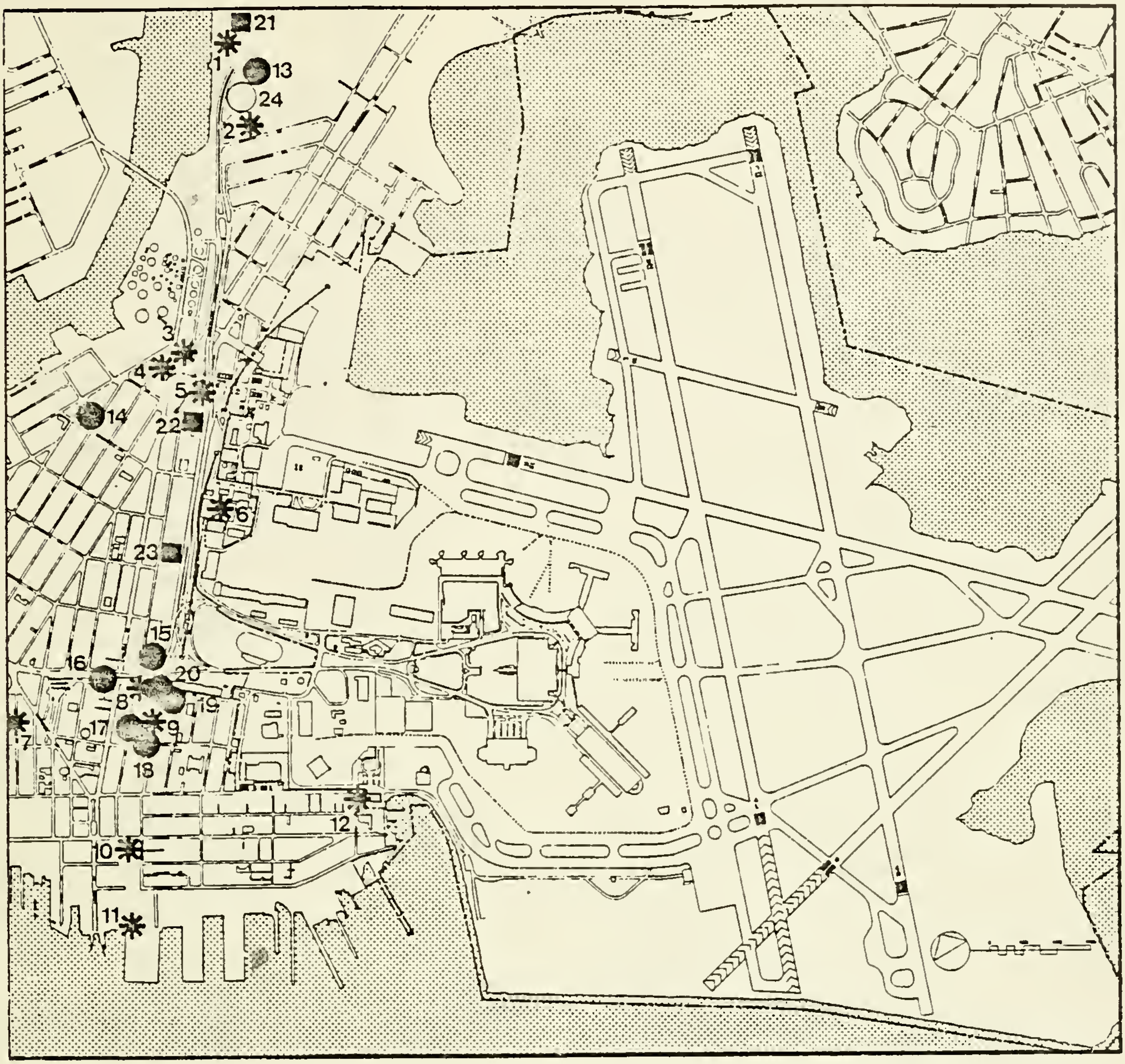
Development of the BIF site will produce short-term employment opportunities during construction and additional long-term employment opportunities as a result of the increase in cargo handling activities accommodated by the development. Most of these jobs, however, would also occur under the No Build as well. These activities will also have a positive effect upon the local regional economics and generate secondary, related employment opportunities.

Implementation of any of the Build alternatives will increase jobs in the construction and related industries. Construction employment, purchase of materials and use of related services will produce both primary and secondary short-term impacts upon employment. The number and types of jobs created by construction will depend upon the types of facilities built on the site and the time period over which construction takes place.

Projected increases in demand for cargo-related and other aviation uses at the airport underlie the need for development of the BIF site. Employment at the airport can be expected to increase as a result of these increased demands.

The airport currently employs approximately 12,000 people. The existing employment patterns at Logan can be seen in Table 5.7-1. Cargo-related employment is approximately 11 percent of total employment. Future employment levels for both cargo-related activities and the airport, as a whole, depend upon general economic conditions, technological change within the aviation industry, and the configuration of land uses and facilities in the airport.

In order to provide some assessment of employment impacts related to development of the BIF site, future cargo employment was projected by relating employment to square footage of buildings used for cargo handling. For the purposes of this analysis "cargo" refers to both all-cargo carriers (freighters) and the cargo activities of combination carriers (cargo carried in the belly of passenger aircraft). The cargo industry is analyzed because cargo is the most important job-producing component of development of the BIF site (except for the Mixed-Use alternative).



Legend

- ✱ Air Freight
- ● Car Rental
- ▨ Parking
- ○ Hotel

Air Freight
1. Burlington Northern A.F.
   Profit By Air
2. Demetrios A.F.
   A.F. Forwarding
   U.S. International A.F.
3. Air Cargo Corp.
4. Door to Door
   Airline Freight
   ADCI
   Forward Air
5. Reliable Trucking
   Reardon
   Wits A.F.
6. Robie Industrial Park
7. Mosher A.F.
   London A.F.
8. Amerford
9. Forty-Four Air Express
   Mosher Trucking
   Hanson Forwarding
   Bor-Air
10. Crystal Cheese Co.
11. Procter
    Pistorino
    Stone & Downer
12. Crescent Trucking
    Kuenn & Nagel

Car Rental
13. Auto Rental Center
14. Continental Limo
15. Local Auto Rental
16. Low Cost
17. Thrifty
18. American International
19. Airways
20. Ajax

Parking
21. Park & Fly
22. Park & Fly
23. Park & Fly

Hotel
24. Ramada Inn

Source: Wallace, Floyd, Ellenzweig, Moore Inc. / Griffith Associates

BOSTON-LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS
EXISTING OFF AIRPORT RELATED LAND USES

HTA

FIGURE
5.7-1

TABLE 5.7-1

Employment by Job Category

Total Logan-Based Employment	11,739	
administrative/manager/proprietor	702	6.3%
airline customer service	856	7.7
airline ground crew	516	4.6
airline baggage or freight handling	821	7.4
shop/factory/warehouse worker	419	3.8
maintenance/repair	1,052	9.5
service work (for example, waiter or porter)	770	6.9
airline flight crew	2,979	26.8
professional/technical	486	4.4
sales	904	8.1
secretarial/clerical	524	4.7
bus, taxi, truck, limousine, or other driver	354	3.2
other	738	6.6
	11,121[1/]	100.0
passenger-related	4,128	45.8%
both passenger- and cargo-related	1,197	13.1
cargo-related	1,256	13.9
neither passenger- nor cargo-related	2,438	27.0
	9,019[1/]	99.8

[1/] The numbers add to less than 11,739 due to incomplete response totals. It is anticipated by CSI that the remaining responses would conform to the aggregate percentage breakdown.

Source: Cambridge Systematics, Inc. (CSI); Logan Airport Tenant Inventory, September, 1979, Table 3.

Present cargo employment occurs in a ratio of 18 employees per 10,000 square feet of building area[1/]. Increases in cargo handling space for BIF and the North Apron combined range from 709,000 to 911,000 square feet. Projections of future cargo employment which were developed using these data are presented in Table 5.7-2. The table includes only direct cargo employment at the BIF and North Apron sites; increased cargo employment at the southwest service area and the four airline terminals are not included in the projections. Cargo employment levels will rise as a result of implementation of any alternatives by 1,300 to 1,640 new jobs. Projected employment with the Mixed Use alternative was estimated by assuming that there would be one employee per each 250 feet of net floor area and 0.6 employees per hotel room (Table 5.7-3). Around 2,600 new non-cargo related jobs will be generated by the Mixed Use alternative.

5.7.3 Population Movement and Growth

No population growth or shifts in location of population are expected to occur as a result of implementation of any of the Build or No-Build alternatives.

5.7.4 Community Amenities, Utilities and Public Service

None of the proposed alternatives will cause the loss or serious degradation of parks, recreation areas, schools, or other facilities or amenities contributing to the quality of life in East Boston. Rather, all build alternatives for BIF include provisions for a new waterfront promenade with landscaped open space along its southwestern edge. The impacts of these proposals are further discussed in Section 5.11.

None of the development alternatives will have any impacts on the surrounding community's water supply, sewage disposal system or solid waste disposal. (See further discussion in Sections 5.13, 5.14, and 5.15 of this EIR.)

There will be no impacts to the public service supply in the surrounding community due to increased demands placed on them by any of the BIF development alternatives.

5.8 TRANSPORTATION IMPACTS

The traffic flows are noted for each of the BIF development alternatives in Table A-2-18 in Appendix A-2.

TABLE 5.7-2

PROJECTED CARGO INDUSTRY EMPLOYMENT BY ALTERNATIVE

ALTERNATIVE	BIRD ISLAND FLATS		NORTH APRON		TOTAL	
	Building Area (sq. ft.)	Employnent[1]	Building Area (sq. ft.)	Employment[1]	Building Area (sq. ft.)	Employment[1]
Low Itensity Cargo with GA	371,000	668	371,000	668	742,000	1,336
Low Intensity Cargo without GA	371,000	668	338,000	608	709,000	1,276
High Itensity Cargo with GA	776,000	1,397	135,000	243	911,000	1,640
High Intensity Cargo without GA	641,000	1,154	135,000	243	776,000	1,397
Mixed Use with GA	573,500	1,031	337,500	609	911,000	1,640
Mixed Use without GA	438,500	788	337,500	609	776,000	1,397
No-Build	0	0	743,000	1,337	743,000	1,337

---

[1] Rounded to the nearest whole number.

TABLE 5.7-3

NON-CARGO RELATED EMPLOYMENT UNDER THE MIXED USE ALTERNATIVE

Use	Net Floor Area (sq. ft.)	Number of Employees
Office	320,000	1,280
Retail	24,000	96
Manufacturing	240,000	960
Hotel	500 rooms	300
		2,636

5.8.1 Traffic Impacts

The increase in freight and cargo movement anticipated for the year 2000, along with the proposed improvements contemplated at Logan, will have a major impact on the traffic at the entire airport, and particularly on BIF and the North Apron.

Vehicular traffic at BIF is now virtually nonexistent except for some construction trucks, maintenance vehicles, and a van to remote GA Bravo Apron. With the new improvements at both BIF and North Apron, it is expected that 60% of approximately 6,000 truck trips (round trips) projected for the year 2000 will be using the new BIF facilities, while the remaining 40% will use North Apron. This distribution of truck traffic applies to all Low and High Intensity alternatives. In the case of a No-Build alternative, the North Apron will have to handle the 6,000 round truck trips mentioned previously, compared to the 3,500 round truck trips that use the present facilities.

Along with the increase in freight and cargo in the year 2000, there will be the need for more employees to handle the additional work-load on the landside, and additional parking for employees working at these facilities. Although traffic on BIF will consist of light, medium and heavy trucks for cargo pickup and delivery, employee automobile and other vehicles can also be expected. On the North Apron, passenger-related vehicles such as taxis, private cars and limousines will be added to the vehicular mix noted at BIF.

Vehicular traffic and truck movements in the year 2000 at Logan are projected to be between 150% to 250% of the present day volumes. Therefore, vehicular access roads to the airport should be improved to accommodate the increase in demand anticipated for the design year.

The traffic generated from the Mixed Use alternative results in an additional 7,500 vehicular round-trips per day.

In this study a conservative assumption was adopted on projection of Cargo related truck traffic. Further analysis might indicate that the volume of truck traffic is lower than projected. This assumption is, however, consistant with the worst case assessment that has been used throughout. For a detailed analysis of the traffic flows assumed in this study, see Appendix A.2.

5.8.2 Local Access

WFEM/GA investigated special roadway alternatives for reducing airport traffic using local East Boston roads. This project assumes that a north/south service road will cross the main terminal loop (inbound and outbound roads) and link the northern part of the airport to BIF. It would cross the main loop either by means of a tunnel, a bridge, or an at-grade alignment at the existing signalized intersection on the airport's inbound and outbound roadways.

It would have only one airport entry/exit point for service vehicles. WFEM/GA recommended that this access point connect directly to the McClellan Highway, thus avoiding local East Boston streets. To ensure this objective, all present access points would be closed to vehicular traffic south of the main terminal loop, such as Maverick Street east of its intersection with Jeffries Street. This roadway alignment is assumed in all BIF Build alternatives.

5.9 DEPARTMENT OF TRANSPORTATION SECTION 4(f) LAND IMPACTS

Section 4(f) of the Department of Transportation Act of 1966 (P.L. 89-670 as amended by P.L. 90-495; 49 U.S.C. 1653) states that approval will not be given to projects requiring the use of publicly owned land from a public park, recreation area, wildlife and waterfowl refuge, or land from an historic site of national, state or local significance 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 an area.

A careful literature search was undertaken. In addition appropriate Federal, State, County, local and private agencies were contacted to identify Section 4(f) lands in the vicinity of BIF. (Pertinent documentation in this regard is contained in Appendix H.)

It was determined that no 4(f) land would be taken as part of the proposed development on BIF, nor by any internal roadway improvements between BIF and the North Apron. In addition, there will be no major adverse environmental impacts on any 4(f) lands, including the East Boston Stadium, since none are close enough to BIF. Therefore proposed development on BIF will not affect any Department of Transportation Section 4(f) lands.

5.10 HISTORIC AND ARCHAEOLOGICAL SITES

In evaluating the impact of proposed development upon historic places (within the meaning of Section 106 of the National Historic Preservation Act of 1966 and Executive Order 11593) the following criteria are used as a guideline to assist in determining if there would be any adverse impact on a National Register property.

- Destruction or alteration of all or part of a property.
- Isolation from, or alteration of, its surrounding environment.
- Introduction of visual, audible, or atmospheric elements that are out of character with the property and its setting.
- Transfer or sale of a federally owned property without adequate conditions or restrictions regarding preservation, maintenance, or use.
- Neglect of a property resulting in its deterioration or destruction.

Historical societies in the area, as well as the State Historic Preservation Officer, were contacted and the National Register of Historic Places was reviewed, to document whether or not any historic or archaeological sites of significance exist that could potentially be impacted by the proposed action. Correspondence to this effect is contained in Appendix H, along with the listing of societies contacted.

Boston has many historic sites within its city limits, but no registered sites are in East Boston. No other historic sites are close enough to BIF that they would face destruction, alteration, or isolation from their surrounding environment.

Since Bird Island Flats is a new landfill area, no archaeological sites or artifacts are on or under the land. It has been determined, therefore, that no archaeological sites will be affected by BIF development.

5.11 VISUAL IMPACTS

5.11.1 The Existing Visual Environment

The airport/community borders are currently in need of landscape improvement. These areas, where community and airport land uses meet, characteristically have sharp transitions in building density and scale.

The aesthetic enhancement of the southwestern edge of Logan is especially important, since this edge is visible to the residents of Jeffries Point and from much of downtown Boston. The BIF landscape, separated by water from Jeffries Point, is currently barren, being composed of the rock dike which surrounds BIF, the dock and crash/fire/rescue boat, telephone poles and some temporary uses (trailers and/or automobiles). All Build alternatives will improve the visual relationship between the airport and the adjacent community. Design, art and architectural values were important considerations in visual analysis. There are no visual improvements to BIF associated with the No-Build alternative.

The ground elevations of residential structures on Jeffries Point and the top stories of these structures range from 27 feet to 52 feet higher than the airport/ elevation of roughly 20 feet MSL. Portions of aircraft are presently visible above the 10 foot high concrete barrier that parallels the airport service road to BIF. During the Year One Study, WFEM/GA determined that an approximately 30 to 40 foot high building in conjunction with landscaping along the western edge of BIF would screen the visibility of aircraft from Jeffries Point. This treatment is also functionally necessary as an aircraft noise barrier, and its specific design will therefore be influenced by engineering determinations. However, as discussed in the next section, all the proposed build alternatives will have landscaping in common which will positively enhance the appearance of this area to the Jeffries Point community.

Design criteria will be developed before the construction of buildings begins. Maximum effort will be expended to achieve a pleasing appearance in any building facades.

5.11.2 Landscaped Open Space and Pedestrian Promenade

Feasibility studies were done by WFEM/GA to generate landscape concepts which can be used to relieve the possible starkness that a continuous building facade might create.

These concepts are illustrated by the cross-sections presented in Figure 5.11.1.

This area of BIF will therefore provide improved visual amenities for the Jeffries Point residents, since it will provide a smooth transition from residential to airport land use. Furthermore, public open space extended along this edge of BIF, will provide additional amenities. According to the BRA, East Boston is in need of additional natural open space, having less than half the open space per person than City of Boston averages.[1] The open space provided for under the Mixed Use alternative would also introduce housing, hotel and office facades, as well as the marina and ferry boat.

5.11.3 Summary of Visual Impacts

All the BIF Build alternatives include the landscape improvements to the southwestern portion of Logan.

The No-Build alternative does not include landscape improvement for the southwestern portion of BIF. Rather, the No-Build alternative would involve denser land use activity on the North Apron of Logan, which could possibly have a negative visual impact.

5.12 LIGHT EMISSION IMPACTS

There will be a need to provide security lighting for the entire developed area. This will probably entail the use of security and roadway lighting identical to the types presently in use throughout Logan, primarily high-pressure sodium lamps. Under the Mixed Use alternative, additional light emissions would result (in the southwestern edge of BIF) from the hotel and apartment units. These are, however, not anticipated to be a problem since they are similar to the lighting throughout the area.

5.13 ENERGY SUPPLY AND NATURAL RESOURCES

In this section the discussion focuses on potential impacts on energy and resources resulting from implementation of any of the proposed alternatives. Figure 5.13-1 shows the location of the existing utilities at Logan. The following were evaluated:

- Electrical Supply
- Gas
- Oil

- Sewage and Treatment
- Water Supply and Fire Demand
- Aircraft Fuel
- Natural Resources

Alternate and renewable energy sources, as well as conservation plans, are being increasingly employed in the building designs. Building design is currently under the jurisdiction of the "Massachusetts Building Code". The consultant has projected energy demands at BIF based upon that code, modified by existing energy requirements of buildings which serve similar functions as those projected for BIF.

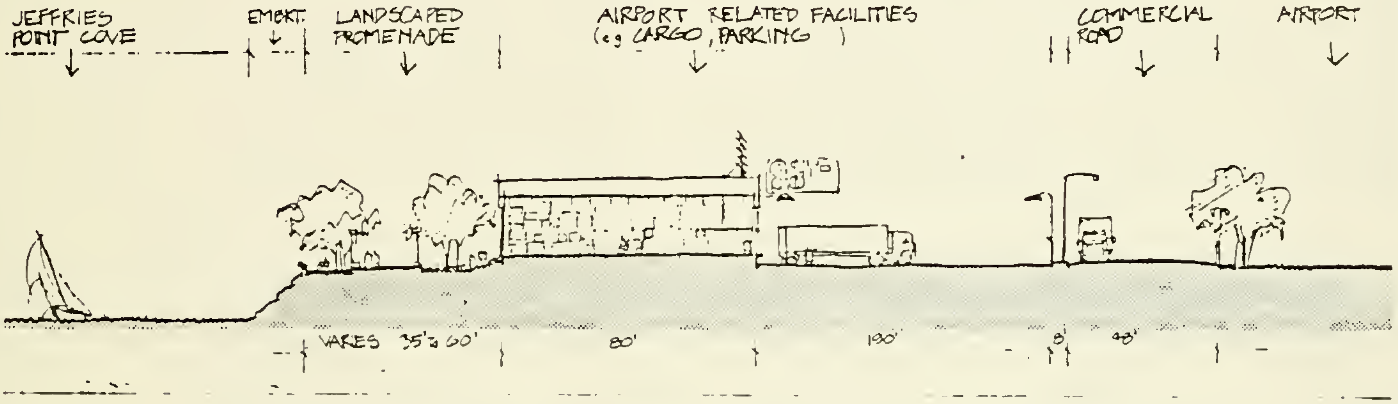
It is difficult to project energy requirements for buildings which may be constructed during the next five years or so on BIF due to energy design innovations coming into use. There is, however, a proposed rule which may dictate these requirements - the "Building Energy Performance Standards" 1/ (BEPS) for new buildings. It has been proposed by the U.S. Department of Energy, Office of Conservation and Solar Energy, as a Federal requirement for all new buildings. If and when enacted into law (possibly this session of Congress), they would be implemented through the state and local building codes.

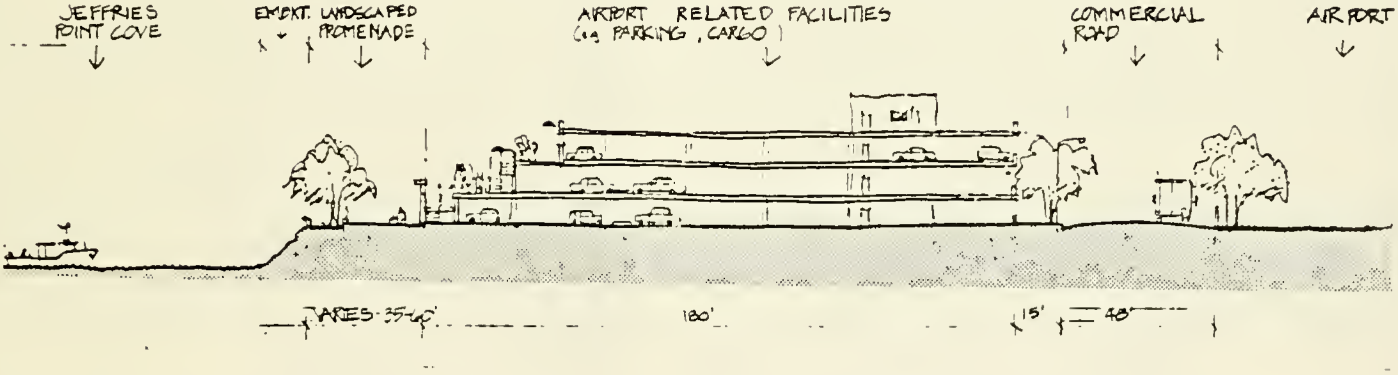
Briefly, these standards would set a design energy budget (DEB) which includes energy requirements for heating, cooling, domestic hot water, fans, exhaust fans, elevators, escalators and lighting. These standards vary depending upon the building function and climate. All energy units are in thousands of British thermal units per square foot per year (MBTU/S.F./YR.). Architects and engineers would be required to determine the design energy consumption (DEC) such that the DEC is less than the DEB. The proposed rule also has weighting factors to be applied for particular types of fuel used in the DEC and for commercial buildings. These are:

• Natural Gas	1.0
• Oil	1.2
• Electricity	3.08

The designer first calculates the energy requirements by fuel type. The energy requirements for each fuel type are then multiplied by the appropriate weighting factor for the fuel type. These weighting figures are summed over all fuels to arrive at the DEC of the building. 2/

If the proposed standards become law, there will be an increased need to substitute alternate energy sources wherever technology allows in order to meet the proposed DEB, especially for electrical energy. This can be done by the following methods:



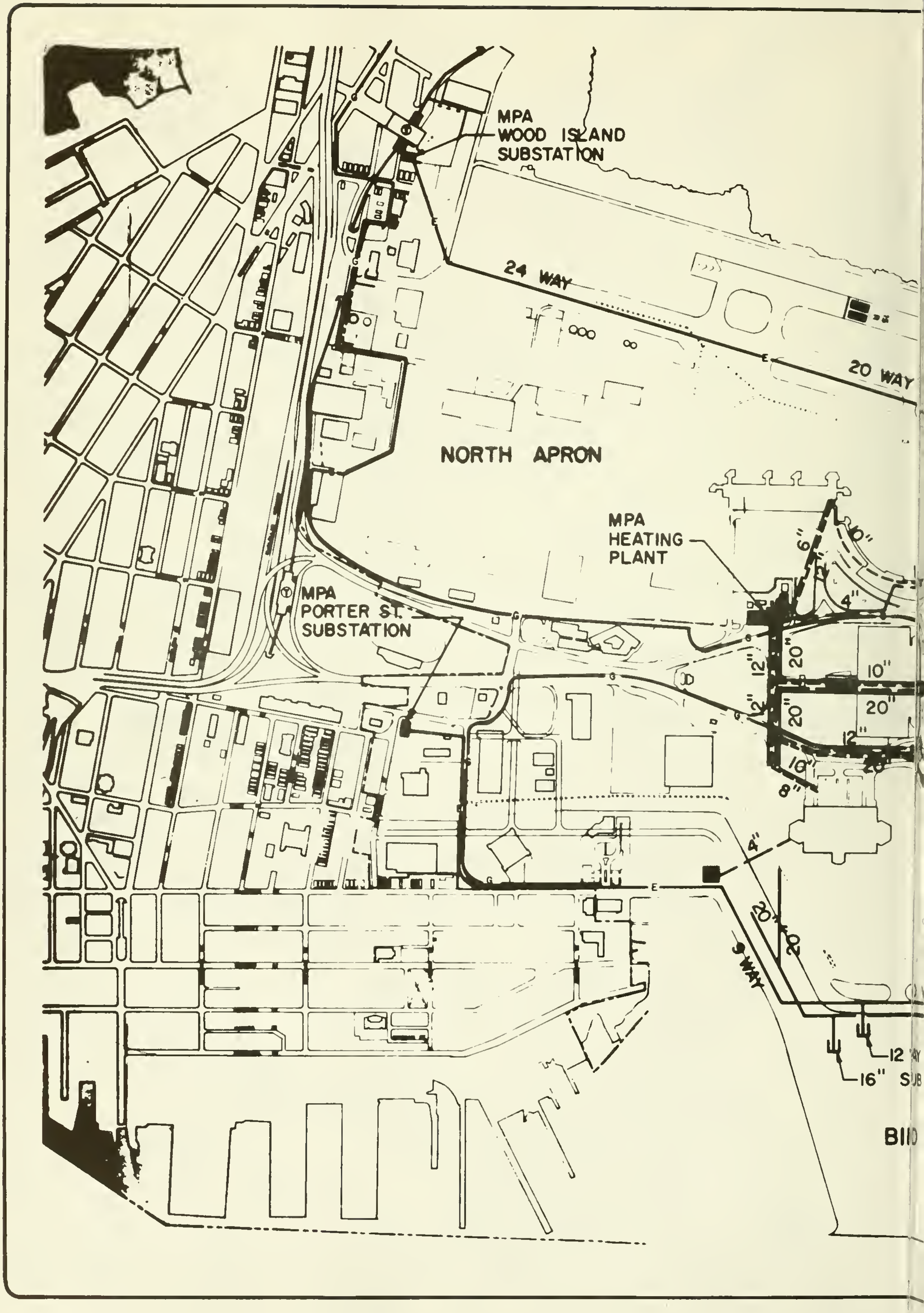


Source: Wallace, Floyd, Ellenzweig, Moore Inc. / Griffith Associates

BOSTON - LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS EIR / EIS

TYPICAL OPEN SPACE CROSS SECTIONS

FIGURE
5.11-1


MPA
WOOD ISLAND
SUBSTATION
24 WAY
20 WAY
NORTH APRON
MPA
HEATING
PLANT
6"
10"
4"
MPA
PORTER ST.
SUBSTATION
12"
20"
10"
12"
20"
20"
12"
10"
8"
4"
20"
20"
3 WAY
12 WAY
16" SUB
BI

LEGEND

—E—	U.G. ELECTRIC DUCT SYSTEM (WITH APPROXIMATE NUMBER OF DUCTS)
—G—	GAS
—W—	WATER
- - -	CHILLED WATER
— —	STEAM LINE
═══	UTILITY TUNNEL

BOSTON-LOGAN INTERNATIONAL AIRPORT
BIRD ISLAND FLATS

EXISTING UTILITIES

FIGURE 5.13-1

- Increased use of natural light.
- Use of the more efficient high pressure sodium lights.
- Utilization of passive solar capabilities.
- Increased energy conservation (i.e. cargo air locks to prevent heat loss at cargo building doors).
- Using gas as an energy source wherever feasible.
- Increased utilization of the latest energy innovations.

Considering the above possible modifications to building design, the energy projections for electricity, oil and gas may have larger variations than normally expected. Electrical projection will be particularly susceptible to change if BEPS is enacted. Therefore, electrical projections that follow consider both current design standards and the proposed BEPS.

5.13.1 Electricity

The airport receives 13.8 KV power (from Boston Edison Company) at two substations - one at Wood Island, and the other at Porter Street. Massport distributes power at 13.8 KV to their tenants at the airport. The substations and distribution system are owned and maintained by Massport. Massport purchases power at Boston Edison's commercial General Service Rate G-3 and bills the tenants at Boston Edison rates appropriate to the individual tenant demands.

There are interties between the two distribution systems to preclude power failure if one system should break down.

There is an existing underground duct system which skims the northeast border of the BIF area. This system has space for additional cables as may be required to service BIF. In addition, there are two existing conduit stubs which extend into the BIF site. Massport intends to construct two additional substations: a satellite station for parking lots and apron lighting and another for buildings.

Distribution voltage will occur via a dual line system to allow maintenance to one line without interrupting service. Transformers will be required at each building to produce secondary voltages of 480/277. The use of high voltage distribution minimizes energy losses in the distribution system.

Additional distribution lines are required to serve the proposed facilities. Construction costs for installation of the additional ducts should be low due to the nature of the existing fill material and the scarcity of existing facilities in the area.

Energy demands are projected for full development in Table 5.13-1. This table projects energy demand considering both current building code requirements and proposed Building Energy Performance Standards (BEPS). (See Section 5.13.1 for a discussion of these criteria.)

During 1979, Massport purchased over 97 million KW hours of electrical energy for Logan. Considering the maximum development and energy projections, development of BIF could necessitate a 47% increase in power requirements for all Logan. Considering the proposed changes to the building codes, the increase could be as little as 2.6%. With increased use of energy conservation in existing airport facilities, however, both of the above increases may be lower.

There will be no problem meeting the maximum projected increase.

5.13.2 Natural Gas

The majority of existing facilities which are not on Massport steam lines are heated by natural gas. By experience, this energy source is the most economical one, as long as it is available. Small facilities at BIF might have continuous gas service. Larger facilities would most likely be interruptible users. For an interruptible gas user, the switch to oil might be mandated at a time of the year when the heating loads are at their peak. Hence, each large facility will need to be equipped to burn oil and gas. As explained in Section 5.13.1 the proposed building code (BEPS) will encourage gas as an energy source by the weighting factor for this fuel. Therefore, it is expected that this fuel will be used for a heat source, if possible.

There is an existing gas main in Maverick Street. Boston Gas has sufficient gas to serve the proposed site. A main extension into BIF will be required. Also, Boston Gas is considering other improvements to the distribution system which will benefit all of the Logan area. Particularly, this will consist of replacing about 1/8 mile of mains between Eagle Square and Logan.

Based upon the more energy efficient building design encouraged by energy costs, but tempered by existing codes, the estimated gas requirements are projected in Table 5.13-2.

TABLE 5.13-1

BIRD ISLAND FLATS ELECTRICAL DEMANDS (KW-HOURS PER YEAR[1])

Alternative	Building Code	Building	Apron	Parking Roads	Total
Low Intensity Cargo with GA	BEPS	2,006,000	154,000	459,000	2,619,000
	Existing	9,236,000	154,000	459,000	9,849,000
Low Intensity Cargo without GA	BEPS	1,909,000	156,000	459,000	2,524,000
	Existing	8,800,000	156,000	559,000	9,415,000
High Intensity Cargo with GA	BEPS	3,510,000	96,000	570,000	4,176,000
	Existing	16,164,000	96,000	570,000	16,830,000
High Intensity Cargo without GA	BEPS	3,413,000	98,000	570,000	4,081,000
	Existing	15,717,000	98,000	570,000	16,385,000
Mixed Use[2]	BEPS	12,000,000	154,000	459,000	12,613,000
	Existing	45,000,000	154,000	459,000	45,613,000

---

[1] Usage does not account for distribution losses.

[2] Includes total High Intensity Cargo Program.

TABLE 5.13-2

NATURAL GAS REQUIREMENTS

Alternative	Building Area (Acres)	Volume (MCF/YR.)
Low Intensity Cargo with GA	12.4	24,600
Low Intensity Cargo without GA	11.8	23,400
High Intensity Cargo with GA	21.7	43,000
High Intensity Cargo without GA	21.1	41,800
Mixed Use[1]	--	160,000

---

[1] Includes total High Intensity Cargo Program.

5.13.3 Oil

Many facilities such as the airline terminal buildings, the control tower, Eastern Reservation Center and the hotel are heated by the central heating plant at Logan (Figure 5.13-1). The plant has three oil fired boilers which have capacities of 100,000; 135,000 and 150,000 pounds of steam per hour (#/hr). Existing maximum demand is estimated at 150,000 #/hr.

It would appear there is more than enough capacity to expand the steam distribution system, but these figures are misleading. Each boiler must be overhauled once a year. The remaining system demand may be met by either of the remaining boilers (with conservation measures) but it is desirable to have one boiler on standby. There are also other proposed buildings in the vicinity of the existing distribution system which will use some of this reserve capacity. Another major factor which discourages use of the central heating plant is the distance to the BIF area, which is about 3400 feet to the project site's northern border. There are approximately 1800 feet of existing utility tunnels which may be used to extend the steam and return lines, but the remaining 1600 feet would require trenching to the site. This type of construction is extremely expensive, requiring crossings of a maze of existing utilities and facilities, as well as temporary disruption to roadways, etc.

It is, therefore, anticipated that oil would be used as an energy source by individual boilers at BIF only if the gas distribution system does not prove to be feasible for facility improvements or if natural gas supply is interrupted. A central heating plant at BIF would appear to be feasible, only if the Mixed Use alternative were adopted.

5.13.4 Sewerage System

The proposed sewerage system would consist of 8-inch gravity sewers which would flow to a package-type pumping station. The required force main from the station has already been constructed from the northwest corner of BIF to where it flows into the gravity system by the Eastern Airfreight Building. The existing airport sewers have more than enough capacity to handle the expected flows. The existing airport system connects into the MDC sewer system (Sewage flows are shown in Table 5.13-3).

TABLE 5.13-3

SEWAGE FLOWS

	Alternative	Area S.F.	Population Density #/1,000 S.F.	Population	Gal. Per Person Per Day	Gal/Day
I.	Low Intensity Cargo with GA					
	Cargo	396,000	1.5	594	15	8,910
	Forwarder	144,000	2.0	288	15	4,320
	Food Prep.	60,000	4.0	240	60[1]	14,400
						27,630
II.	Low Intensity Cargo without GA					
	Cargo	371,000	1.5	556.5	15	8,347
	Forwarder	144,000	2.0	288	15	4,320
	Food Prep.	60,000	4.0	240	60	14,400
						27,067
III.	High Intensity Cargo with GA					
	Cargo	801,000	1.5	1,201	15[2]	18,022
	Forwarder	144,000	2.0	288	15	4,320
						22,342
IV.	High Intensity Cargo without GA					
	Cargo	760,000	1.5	1,164	15	17,460
	Forwarder	144,000	2.0	288	15	4,320
						21,780
V.	Mixed Use Development[4]					
	Cargo	606,000	1.5	909	15	13,635
	Forwarder	92,000	2.0	184	15	2,760
	Office	400,000	3.2	1,280	15	19,200
	Hotel	500 Room	-	-	110 Gal/Room[2]	55,000
	Retail & Service	30,000	3.2	96	15	1,440
	Residential	180 Units	1.5/Unit	270	65	17,550
	Light Manuf.	300,000	3.2	960	15	14,400
	Marina	1,000 L.F.	15 L.F./Slip	66 Slips	50 Gal/Slip[3]	3,300
						127,285

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[1] Consultant's estimate based on number of meals prepared per day.

[2] Massachusetts Department of Environmental Quality Engineering Standard.

[3] Consultant's estimate based on 1,000 L.F. of docks with 15 L.F./slip.

[4] Includes total High Intensity Cargo Program.

5.13.5 Water Supply and Fire Demand

Water consumption will approximate the sewage flows plus whatever is used for exterior irrigation or washing. Outside use will probably be quite small since forwarders and cargo tenants are not expected to work on vehicles or planes at the site. Also the landscaped areas, contiguous to buildings, would be limited.

Massport owns 20-inch distribution mains on the site's northern border. There are 16-inch and 20-inch stubs into the area. Massport receives water at pressures which routinely vary from 50 to 60 PSI. The pressure is boosted at a pump station on Prescott Street to approximately 100 PSI. Domestic flows and pressures are controlled by 5 electric pumps which vary in capacity from 250, 500, 750 and two at 1000 gallons per minute (GPM). When these pumps can not meet the demand there are 6 diesel fire pumps, one at 2,600 GPM and five at 3,500 GPM. There is a 1,750,000 gallon storage capacity at the station for possible fire demand. This station and the existing distribution system would be more than sufficient to supply fire flows to the proposed BIF distribution system. Since the system is now sized for existing high density development, there should be more than sufficient water to supply fire flows for the Low and High Intensity options. The Mixed Use option however, may require some improvements (i.e. additional storage facilities etc.). Possible improvements would be determined after a review of proposed plans by Factory Mutual Engineering Research Corporation.

They will determine the required fire flow within the BIF area, after review of a proposed site plan, information of building materials, design, intended use and occupancy densities. Internal distribution lines will be sized to supply the required flows.

The Boston Water and Sewer Commission which supplies low pressure water at Logan through Massport's pumping station (where it is converted to high pressure), has indicated that there will be no problem meeting the increased demand.

5.13.6 Aircraft Fuel

There will be increased consumption of aviation fuel by aircraft using Logan due to the increased number of operations anticipated in the future. This increase is anticipated, for the most part, with or without implementation of any of the alternatives. It is further anticipated that the present level of operational efficiency will be continually improved with the introduction of more fuel efficient aircraft.

5.13.7 Natural Resources

There are no known deposits of energy or mineral resources under the project site. Preliminary site work has already brought the project area up to a rough finished grade with borrowed fill.

The majority of materials required for the construction of facilities (as a part of implementation of any of the build alternatives) will be obtained from or through contractors within the Commonwealth of Massachusetts. It is not anticipated that the procurement of any materials necessary would have an adverse impact on the natural resources of the State.

5.14 SOLID WASTE IMPACTS [1]

The volume of solid waste presently collected at the airport is estimated at 4400 loose yards per week. It is hauled to an incinerator in Saugus and a landfill site in Randolph. Both of these sites are in the Commonwealth of Massachusetts and are State approved. The firm in charge of hauling these solid wates estimates that by the year 2000, Logan will produce approximately 6000 loose yards of solid waste per week. They anticipate no capacity problem in either Saugus or Randolph in the future. The difference between the No-Build and the BIF low and high cargo alternatives is insignificant. Further solid waste can be expected from the Mixed Use alternative.

5.15 CONSTRUCTION IMPACTS

BIF development should be considered in several stages. The first stage is the primary construction phase, which consists of grading and surfacing and construction of infrastructure (utilities, roadways). The next stage is the construction of some of the buildings with the appropriate aprons and landside/airside interfaces. Following that is the operational stage with the resulting truck and aircraft operations. Undoubtedly, for a long period, the construction of additional facilities will be coupled with the operational activities from other facilities. Thus far, in this analysis, the emphasis has been on the impacts resulting from the full utilization of each development plan (to present a worst case analysis). But it is also necessary to focus on the construction phases and their impacts. In the final EIR the connections between the construction of new facilities and the operational activity from those already built will be further explored.

5.15.1 Construction Noise

Construction activities for the High and Low Intensity alternatives are estimated to produce hourly sound levels in Jeffries Point from around 55-65 dBA. These noise levels are comparable to, or less than, typical measured existing levels. For the Mixed Use alternative, construction of the high-rise hotel and of the mid-rise housing may produce somewhat louder levels - in the mid to upper 60 dBA.

These predictions are based on the assumption that very little pile driving will be required. If extensive pile driving were used, continuous sound levels of 65 to 70 dB(A) could result in Jeffries Point during the pile driving operation. The noise levels predicted for normal construction is not likely to exceed the "Regulations for the Control of Noise in the City of Boston - Regulation 3". It should be noted that Regulation 3 does not apply to "Impact Devices", e.g. pile drivers.

Analysis of the construction noise levels that would be produced by building the North Apron facilities not accommodated on BIF suggests that resultant hourly equivalent levels along Bremen Street may be in the low to mid-70 dBA. Thus, construction noise levels at the North Apron may exceed the residential standards.

It is anticipated that all construction operations will occur during the normal workday; thus, normal nighttime sleeping hours would not be disturbed.

5.15.2 Air Quality

Emissions from construction activities - either directly from construction equipment, or indirectly from increased automobile emissions due to increased traffic congestion - are believed to be quite insignificant when compared with emissions from other airport sources. This temporary impact is, therefore, judged to be of little consequence.

The generation of dust (particulates) during the early construction phase could pose a problem to nearby communities. Hence, it will be necessary to hose the disturbed earth and to take other precautions that will minimize the spreading of dust.

5.15.3 Water Quality

Under any of the build alternatives, site preparation work at Bird Island Flats is expected to take approximately 10 months. During this period such heavy equipment as bulldozers, front end loaders and dump trucks will be actively working 30 to 80% of the time, five days a week. Some on-site storage of construction materials will be necessary. Conceivably, water quality could be marginally affected adversely by siltation should a period of heavy precipitation accompany earthworking activities.

Roadways, aircraft aprons and parking lots will be paved with essentially inert materials. Potentially harmful substances are tightly bound and should not reach adjacent marine waters in detectable quantities even if paving operations were to be immediately followed by heavy rainstorms.

Following the site preparation period, the building construction period is expected to last five years or more depending upon demand for facility space. This period is expected to produce even less disruption of water quality conditions than would the site preparation period.

5.15.4 Hydrology/Flood Hazards

Earthwork, especially the laying of pipe for utilities, water and sanitary sewer lines could create conditions conducive to local ponding during wet weather. The work period during which such conditions could prevail would be approximately 5-1/2 months. The succeeding building construction period of five years or more is not expected to create any flooding hazard.

5.15.5 Wetlands and Coastal Zone

Since there are no vegetated freshwater wetlands on Bird Island Flats, there will be no short-term construction impacts on wetlands.

Due to the design and material of the rock dike surrounding BIF, there should be no damage due to construction on BIF, such that the dike's function (storm breakwater, etc.) is compromised.

5.15.6 Flora and Fauna

Regrading and other earth-moving activities during construction operations will destroy the existing plant community. The loss is not significant because the area has already been highly disturbed and the plant community is not an efficiently functioning ecosystem. Construction will also destroy the habitats of wildlife which have become adapted to the austere conditions existing on the site. Losses of such habitat are not significant and are consistent with the wildlife control programs now in operation at Logan.

5.15.7 Access

Most of the construction materials required for the preferred alternative will be obtained from or through sources in Massachusetts. It will be stipulated that construction haul routes to and from the airport be set forth in construction contracts so that vehicles will not use local (residential) streets and that construction vehicles to and from the site be required to meet applicable local, State and Federal weight load·limits. Deliveries are expected to be made during normal working hours to minimize truck noise annoyances.

5.15.8 Disposal

Solid waste resulting from any construction activity will be disposed of at the existing approved disposal sites.

5.16 RELATIONSHIP BETWEEN SHORT-TERM USES OF THE HUMAN ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The proposed development of BIF would provide facilities to serve projected demands for cargo handling and other airport-related facilities. Improved utilization of space within the airport and relocation of airport-related businesses from East Boston onto airport property will enhance the long-term growth and productivity of the airport and promote use of land in East Boston which is more in character with adjacent residential uses. The long-term commitment of resources and short-term environmental disruption during the construction period are justified by the beneficial impacts of the project.

5.17 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Development of BIF would require the long-term commitment of capital, land, and permanent commitment of labor and construction materials. No unusual or limited resources will be involved in the project. During the operational phase of the project an increase in the amount of resources consumed (as compared to existing levels) can be expected.

NOTES

CHAPTER 5

(Section 5.1)

[1] U. S. Environmental Protection Agency, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, 550/9-74-004, March 1974, Appendix D.

[2] A brief discussion of "Pure Tone Considerations" is also provided, however, in an attempt to address concerns that changes at Logan Airport may introduce more or new "pure tone" noise into the surrounding communities.

[3] U. S. EPA Report 550/9-74-004, op. cit.

[4] Typical existing daytime hourly equivalent levels do exceed 60 dB(A) in communities around BLIA. See Section 5.1.4.

[5] U. S. EPA Report 550/9-74-004, op. cit., Page D-6.

[6] It should be noted here that the discussions in Section 5.1.5 of predicted future noise levels will tend to center not on ranges, but on single numbers. Such an approach does not mean that future noise levels will fluctuate less than existing noise levels, but rather that we cannot predict ranges confidently.

[7] Miller, N.P. and K.M. Eldred, "Environmental Assessment of a Proposed Commuter Pier at Logan Airport's Southwest Terminal: Noise, "Bolt, Beranek, and Newman Report No. 4085", April 1979.

[8] Ibid.

[9] Ibid, Appendix E.

[10] Rudder, F.F. and P. Lam, Users Manual: TSC Highway Noise Prediction Code: MOD-04, FHWA-RD-77-18, FHWA, Office of Research, Environmental Design and Control, Washington, D.C., January 1977.

[11] Miller and Eldred, op. cit., Appendix A.

12/ Miller and Eldred, op. cit., Appendix C.

13/ SEL is the level of a noise of one second duration that has the same total sound energy as the actual noise event.

14/ No landing noise predictions have been made since landings occur so infrequently on 9 and 15R (respectively, about 1% and 3% of the time).

15/ U. S. Environmental Protection Agency, Noise From Construction Equipment and Operations, Building Equipment, and Home Appliances, NTID 300.1, December 1971.

16/ Ibid, Appendix A.

17/ Carlson, T.W., Construction Noise Regulation in New York State: A Review of the Positions of the Industry and Concerned State Agencies, Materials Bureau, New York State Department of Transportation, April 1975.

18/ R. DeJong, E. Stusnick, Noise Control Engineering, "Scale Model Studies of the Effects of Wind are Acoustic Barner Performance", Volume 6, No. 3, May - June 1976.

19/ Conversely with westerly winds, the reductions should be somewhat greater than those given. Recall that westerly winds can reduce noise levels in Jeffries Point by as much as 10 to 20 dB.

(Section 5.4)

1/ U.S. Army Corps of Engineers (Permits 404,10)$_{S}$ Ma-Ch 91 - Ma DEQE Division of Waterways Ma-Ch 131,^{S}40 - Ma DEQE, Division of Water Pollution Control.

(Section 5.7)

1/ The cargo industry density (CID) of 18 employees per 10,000 square feet was arrived at in the following manner. First, current numbers of employees and square footages by individual company were obtained through Massport. Then, existing square footages were divided by the number of employees to yield company densities. These numbers were combined into two categories - all-cargo carriers and combination carriers. These category numbers were weighted and then averaged, yielding the CID. This number was decreased by an arbitrary figure of one-third to allow for the fact that when a company reaches a certain square footage of building area, some of that area will be used as warehouse space, thus decreasing the CID.

NOTES

CHAPTER 5 (continued)

(Section 5.11)

[1] Boston Redevelopment Authority, East Boston District Profile and Proposed 1979-1981 Neighborhood Improvement Study, Boston, Massachusetts, 1979, P. 3.

(Section 5.13)

[1] See: Federal Register - Vol. 44, No. 230 Energy Performance Standards for New Buildings; Proposed Rule, 10 CFR Part 435, November 28, 1979.

[2] Ibid.

(Section 5.14)

[1] The information for this section came primarily from Browning, Ferris Industries, Inc., the firm in charge of disposing of Logan's solid waste.

CHAPTER 6: MEASURES TO MITIGATE ADVERSE ENVIRONMENTAL IMPACTS

6.1 NOISE IMPACTS

As one can see on the land use designs set forth in the alternatives (Chapter 3), some of the essential mitigating measures were built into each of the BIF development alternatives (cf. discussion in 5.1.6).

- Noise Barriers

The construction of a wall/berm and or building(s) along the western edge of BIF is one of the most effective measures for reducing noise. A proposed 40 foot barrier/building was designed into each BIF development alternative, and will result in a reduction of Eastern U.S. Air taxi noise (Leq) by about 7 dB and a 7 to 10 dB reduction of the single maximum noise levels. If the building along the westerly edge of BIF were 70 feet along the entire length (as proposed for part of the edge in the Mixed Use alternative) the taxi noise would be reduced by 12 dB and the single maximum noise levels by 15 to 20 dB.

In addition to the buffer area along the westerly edge, other mitigating measures were built into each BIF alternative. In each alternative the air freighter operations were located as far from the Jeffries Point community as feasible; and the buildings were oriented in such a manner to buffer the noise impacts as much as possible.

It should be noted, however, that the above reductions are possible about 86% of the time when the wind is not blowing directly from the east. With easterly winds of 5 mph or more the effectiveness of these buildings as noise barriers can be substantially reduced. Even at winds from the east less than 5 mph the buffer effects are reduced somewhat.

As a result of this investigation, one can see that the most serious noise impacts occur due to truck movements to BIF parallel to Maverick Street. Hence, one of the most effective mitigating measures is the construction of a continuous barrier parallel to Maverick Street (Zone 1 in Figure 5.1-6). If a continuous row of buildings approximately 20 ft. high were built near the roadway parallel to Maverick Street, the noise caused by trucks as heard along Maverick Street (at 3rd floor levels) would be reduced approximately 12 to 15 dB. In areas in Jeffries Point further from the truck route (such as McCormack Square) the noise reduction provided by the 20 ft. high barrier would be 3 to 4 dB. Hence, it appears that a continuous barrier of some type in this area is warranted.

- Take-Off Noise Buffer

The 40 ft. high buildings along the westerly edge of BIF would not have an effect on takeoff noise on Runway 9 unless the takeoff start along Runway 9 were moved further west, or all of the Runway 9 extended safety area was recaptured for active runway use. If the takeoff were moved further west, the takeoff noise might be reduced from 5 to 8 dB. Some legal problems, such as litigation brought by the City of Boston, need to be resolved before Runway 9 could be recaptured. Higher buildings (70 ft.) such as those considered in the Mixed Use alternative, would reduce noise caused by the start of the take-off roll on Runway 9 by 6 to 14 dB.

- Towing

Another measure that can reduce nighttime noise impacts at Jeffries Point is the towing of aircraft to and from the Southwest Terminal and from the west side of the South Terminal to the eastern side of BIF. Towing presents some operational problems to the airlines, particularly at peak hours, but in Massport's opinion should present no significant problems during off-peak cargo operations. Also, potential safety issues associated with towing are now being studied.

6.2 WATER QUALITY

In all BIF development alternatives, the apron stormwater runoff will be routed to the existing culvert and will run through the oil/water separation system at the West Outfall. Under most conditions this system works effectively, especially for small oil spills, which is the only impact anticipated by BIF development options since there are no fuel farms proposed for BIF. Therefore, additional mitigating water quality measures do not seem warranted.

6.3 AIR QUALITY IMPACTS

Various mitigating measures to reduce adverse air quality impacts are discussed extensively in Appendix C, Pages C-62-C-72.

As can be seen from the air quality impact sections, the HC, NO_x pollutants emanating from aircraft and ground vehicles are not localized as is CO. Hence, strategies that reduce HC and NO_x anywhere at Logan should be considered under mitigating measures to improve air quality. The most effective airport-wide air pollution control strategies appear to be:

- Gate Hold Procedures

This strategy, which has been used at Logan, is designed to minimize aircraft engine operation, while the aircraft is on the ground. Engines would be shut down at the gate, and would be started up under the direction of the ground traffic control system. One major objective would be to minimize delays at the head of the runway.

This procedure would reduce emissions due to idling, but would not affect emissions due to taxiing. Reductions of up to 10% CO and HC can be expected by effective engine start controls. But since the ground operating modes do not contribute significantly to NO_x production, this gate hold strategy will do little to reduce NO_x emissions.

Gate hold procedures can, however, make a significant contribution to the reduction of odiferous compounds and can decrease the frequency of odors at the sensitive receptors. One such receptor is the Bayswater section of East Boston, which is adversely affected by queueing of aircraft at Runway 22R. Since this runway is used during warmer weather when the southwest winds are prevalent, gate hold procedures can be particularly useful when Runway 22R is used for departures. The Point Shirley community in Winthrop would also benefit from reductions in queueing on Runway 27 just as the Jeffries Point community would benefit if queueing were reduced at Runway 9.

- Towing

The use of tow tractors instead of aircraft taxiing would result in lower air pollution emission since the new emissions from the tractor are less than those from the aircraft engines. Here again the reductions will be mostly in HC and CO and not NO_x. Once again, potential safety issues are being studied.

- Fuel Storage

The HC emissions at Logan could be reduced if vapor control measures were installed at the Logan fuel farms. It should be noted, however, that such controls are not required by environmental regulatory agencies for jet fuel because of its relatively low vapor pressure. Hence, the cost effectiveness of such measures is not yet clear, nor are the effects on odor reduction.

Based on a recent Logan air quality study[1/] it appears that the high hydrocarbon concentration in the surrounding communities are more the result of the off-airport fuel farms along Chelsea Creek that handle lighter products than do the eleven Logan fuel farms.

- Aircraft Emissions Control Regulations

Without question, the most important method for reducing aircraft emissions is the imposition of effective emission standards as soon as possible. (A discussion of this can be found in Appendix C, Pages C-67-69). It is anticipated that the CO and HC emission reductions resulting from the new regulations will be around 25 to 50%. NO_x standards for turbofans and turbojets engines have been relaxed with regard to both implementation dates and levels of emission.

- Reduction in the Number of Engines at Increased RPM

This strategy involves a reduction in the number of engines in operation during the taxiing phase and increase in the engine power in the remaining operating engines, so that the thrust levels for taxiing can be maintained. Based on a fleet mix projected in 2000, it is estimated that this strategy will reduce CO emissions by 35% and HC by 50% during the taxiing phase. But a 60% increase in NO_x is expected due to higher efficiencies of operating engines. If NO_x might be the most critical pollutant at the airport in the future, it does not seem wise, from an air quality standpoint, to encourage this type of operation.

- Other

In the discussion on measures to mitigate air quality impacts other techniques were explored such as providing staging areas and passenger transportation to aircraft parked away from the terminals, improvements in space heating use, and substitution of on board APUs by ground based power equipment. None of these seemed to offer much from an air quality standpoint.

The building orientation and "buffer" areas - continuous buildings - that are effective from a noise abatement standpoint, are not expected to have any effects on air quality impacts.

Other mitigating measures to reduce air and noise impacts are increased public transportation alternatives in order to reduce automobile traffic to Logan. The ferry boat, included in the Mixed Use alternative, is one such measure. In addition, increased Shuttle Bus Service connecting with the Blue Line will be needed especially to reduce the increased automobile activity resulting from the Mixed Use alternative.

In addition, precautions (such as hosing) will be needed to reduce dust in the construction phase.

NOTES

CHAPTER 6

1/ "Logan Airport Air Quality Study", draft of final report, January 1980 Environmental Research and Technology (prepared for Massport).

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