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SEA-TAC INTERNATIONAL AIRPORT

PART 150 : AIRPORT NOISE COMPATIBILITY PROGRAM

PORT OF SEATTLE
SEATTLE, WASHINGTON
1985

SEA-TAC INTERNATIONAL AIRPORT

PART 150

AIRPORT NOISE COMPATIBILITY PLANNING

PORT OF SEATTLE
SEATTLE, WASHINGTON

1985

PREFACE

The Port of Seattle has prepared this document in adherence to the Federal Aviation Administration's requirements for airport noise compatibility programs. It contains both Phase I, Noise Exposure Maps, and Phase II, Noise Compatibility Programs bound together in this document. The first phase was completed by the Port and officially submitted to the local FAA office in October 1984. The second phase has been thoroughly discussed with the FAA, and is herein submitted for official review in February, 1985.

NOISE EXPOSURE MAPS: Phase I/Part 150: 1984/85

- o Official submission was delivered to the Seattle Airports District Office, FAA on October 16, 1984.
- o Official FAA comments were received by the Port of Seattle on January 24, 1985.
- o Port changes to the original Noise Exposure Maps submittal are incorporated within this document.

NOISE COMPATIBILITY PROGRAM: Phase II/Part 150

- o A Draft Noise Compatibility Program was delivered to the Seattle Airports District Office, FAA on October 8, 1984.
- o FAA preliminary comments on the draft program were received by the Port on November 13, 1984.
- o The Port Commission adopted the Noise Remedy Program on January 8, 1985.
- o This document constitutes the Port's official submission of the Noise Compatibility Programs: Phase II/Part 150 to the FAA.

Because Phase I and Phase II were prepared sequentially, there is some repetition between the two reports. For example, the second chapter of Phase II briefly describes land uses around the airport and refers the reader to the Phase I report for more detail and copies of the maps. The sequential nature of the documents has also resulted in duplicate chapters reporting on plan processes. Since Phase II was written at a later date, it expands reporting on jurisdictions, agencies, and citizen involvement, and includes information on the events and meetings that took place later in 1984.

SEA-TAC INTERNATIONAL AIRPORT

NOISE EXPOSURE MAPS : PHASE I / PART 150 : 1984/85

PORT OF SEATTLE : SEATTLE, WASHINGTON

SEA-TAC INTERNATIONAL AIRPORT

PHASE I/ PART 150

NOISE EXPOSURE MAPS

October 1984

Port of Seattle

(Amended in response to FAA comments / February 1985)

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INTRODUCTION

INTRODUCTION

0.1 Report Purpose

Noise of all types is a disruptive intrusion on our everyday activities. Aircraft noise is of particular concern to the Port of Seattle, whose objective is "...the development of an increasing flow of commerce into, out of and through the District, with the aim of broadening and strengthening the economic base of the District while working within the constraints of good environmental planning."

To meet this objective, the Port has strived to make the Sea-Tac International Airport and the surrounding community better neighbors. Over the past ten years, the Port has actively participated in planning and implementing noise remedies both at the airport and in the surrounding community. At present the Port is carrying out various noise remedy programs and, furthermore, is initiating additional programs that extend noise remedy measures to areas further away from the airport.

The purpose for this Noise Exposure Maps report is to establish a system for the measurement of airport noise and determine the exposure of individuals to that noise. In other words, this report serves to document noise contours around the airport, and to identify land uses within those contours that are deemed incompatible based on criteria prepared by the Federal Aviation Administration (FAA). By documenting and identifying this information, it will be possible to systematically monitor the noise environment and the affected land uses as they change over time.

This report includes documentation for the present year (1984/85), and it forecasts changes that are expected in the year 1990. A comparison of the current and forecasted noise contours and land uses will provide the means to evaluate progress in achieving a compatibility between the airport and surrounding communities.

This report also fulfills a portion of the Port's voluntary participation in the FAA's Part 150 program. A second report, Noise Compatibility Programs (Phase II/Part 150), will be prepared subsequent to the acceptance of this Noise Exposure Maps report by the FAA. Together, these reports will meet the Port's total participation in the Part 150 Program.

Part 150 is a Federal Aviation Regulation which was prepared by the FAA to provide guidance for Noise Control and Compatibility Planning in accordance with the Aviation Safety and Noise Abatement Act of 1979 (P.L. 96-193).

0.2 History of Sea-Tac Airport

In 1942, the Civil Aeronautics Administration (now the FAA) selected an airport site near swampy Bow Lake in King County, Washington. Since neither King County nor the City of Seattle had adequate funds for such a project, the Port of Seattle acquired the original 906 acres and developed the airport. Its southwest King County situation was desirable since it was close to midway between Puget Sound's two major cities, Seattle and Tacoma. Its pastoral rural setting promised distance from city congestion and less impact on a sparsely settled community.

Sea-Tac's early scale of operations was overshadowed by its area predecessor, nearby Boeing Field. It was not until the advent of the jet age, with its pursuant needs of longer runways and generally enlarged facilities, that the booming airline industry shifted its local focus to Sea-Tac. In the meantime, the Airport's surrounding land character had undergone considerable change.

The area's proximity to manufacturing in south Seattle and Renton was a substantial factor in its rapid postwar growth, which continued through the early 1960s. With land-use controls and environmental concerns less sophisticated than today, the accelerating urbanization of the area took its toll in water and air pollution, land-use conflicts, traffic inadequacies and visual blight. Opportunities for commercial ventures, centered on the airport and its surrounding populations, tended to contribute to shortsighted community development rather than more reasoned, long-term considerations. Changes in the area's basically single-family character were sometimes sudden and, to the homeowner, appeared to threaten the integrity of its residential make-up.

The introduction of large jets in the 1960s to an already growing air industry pushed the airlines and most airports onto a whole new threshold of operations. The tides of postwar affluence pitched this new mode of air travel to the limits of many an American airport's capabilities, including Sea-Tac's. The Port responded to meet the challenge by then confirming the vast opportunities a major airport can bring to a region's economic markets. The Port expanded the airport to 1,500 acres, then 2,200 acres, extending runways and expanding terminal and other support facilities.

Technology increased the jet's size, enabling payloads to double and triple, but also ushering in large engines with their associated ill effects of heightened noise and deteriorating ambient air quality. In addition, airport growth created an accelerated need for airport-related facilities and land uses in the vicinity, such as increased highway capacity, motels and restaurants, and living accommodations for thousands of airport employees.

Although there were attempts at spot remedial actions, no overall strategy developed to alleviate growing conflicts between the airport and its anxious neighbors. Perhaps most damaging to local residents was the "Climate of Uncertainty" created by what appeared to be ever expanding airport traffic and on-site perimeters. Property-owner uncertainty over future airport intents and effects destabilized the neighborhood. In addition to numercus lawsuits against the Port, the noise situation had caused the Federal Housing Authority (FHA) to withhold mortgage commitments in certain residential sectors near the Airport. Information about aircraft noise exposure was then either unavailable or in dispute.

Citizens, both individually and in organized groups, were frustrated in their attempts to cope with the worsening situation. By the summer of 1972, it had become abundantly clear to both the Port of Seattle and King County that a coordinated plan of programs for improvement was needed for the Sea-Tac area. The incorporated areas of Normandy Park and Des Moines, the Highline School District and other governments of the area also expressed the need for a remedial program.

0.3 Sea-Tac Communities Plan

In March of 1973, the Port of Seattle and King County initiated a jointly sponsored study to develop a plan for the coordinated improvement of Sea-Tac International Airport and surrounding communities. The FAA, anxious to assist as a catalyst in developing solutions to airport-vicinity environmental problems, provided a federal grant for the program, later to be known as the "Sea-Tac/Communities Plan."

The FAA's Airport Trust Fund furnished two-thirds of the money for the 18-month program. The Port and County, using their own personnel and equipment, each contributed in kind to fund the remaining cost of the project.

The noise remedy program of the Sea-Tac/Communities Plan was designed to assist the airport and the surrounding communities in becoming more compatible over time and was based on a thorough analysis of noise exposure. Three general policy objectives helped direct this program development, which included:

1. To minimize noise at the source through local programs where possible.

2. To identify and support national and/or aviation-industry noise-source reduction programs.

3. To apply community-based remedies directly in neighborhoods significantly affected by noise exposure, remedies which deal with residual problems not resolvable at the source.

The recommended noise remedy program that resulted included two categories of noise remedies: (1) remedies that would reduce noise at the source, and (2) remedies that would be applied within the noise-affected residential neighborhoods.

The Sea-Tac/Communities Plan was adopted in 1975/1976 by both the Port of Seattle and King County. In ordinance 2883, King County adopted the Sea-Tac/Communities Plan as "official County policy in determining future actions with the Port of Seattle on matters pertaining to Sea-Tac International Airport, the application of noise programs, development of acquisition areas and other action on the Airport or in the vicinity." In Resolution No. 2626, the Port of Seattle "accepts the Sea-Tac/Communities Plan and endorses its recommendations in general terms as a guide for development of the Sea-Tac International Airport within its community.

0.4 Phase II, Part 150 Noise Compatibility Programs

In 1982, the Port of Seattle began its first update of the Sea-Tac/Communities Plan. As a first step in this update process, the Port prepared the Sea-Tac International Airport Noise Exposure Update. The purpose of the report was to update the noise analysis presented in the Sea-Tac/Communities Plan.

The Noise Exposure Update identifies 1980 levels of aircraft-generated noise exposure and forecasts future levels of aircraft-generated noise exposure for the years 1985, 1990 and 2000. The noise contours that were prepared to represent noise exposure are reproduced in this Phase I/Part 150 report. In Chapter 3 of this report, the reasoning used for establishing 1984/85 noise contours is described.

Based on the Noise Exposure Update, the Port began its update of the 1976 noise remedy program in 1983. This effort has continued through 1984 and is expected to be completed late in the year. The program update, titled Sea-Tac International Airport Noise Remedy Program Update, will be submitted to the FAA as Phase II/Part 150. This submission will follow the FAA's acceptance of the Phase I/Part 150 report.

0.5 Noise Remedy Program Schedule

The Phase I/Part 150 report will be submitted for review by the FAA in October 1984. Subsequent to the FAA's acceptance of the first phase, the Port expects to submit Phase II/Part 150 for review in December 1984. During 1985, the Port, with assistance and support from the FAA, plans to carry out a demonstration program to list various noise-remedy concepts outlined in the plan (Phase II/Part 150). Thereafter, the Port would refine the implementation of the new remedies and carry out the program through the end of the century.

This general schedule may require changes due to the fact that some of the noise remedies are untested at this point. Experience in carrying out the program may lead to a need to update the entire program again at a later date.

0.6 Acknowledgements

This Phase I/Part 150 report was prepared by Port of Seattle Planning and Research staff with consultant assistance. In preparing this report, the staff also liberally used several other Port documents, from which entire sections were reproduced without referencing specific citations. This approach enabled the staff to keep the format simple and make efficient use of past Port publications. The following list of acknowledgments names the staff, consultants and documents used in preparing this Phase I/Part 150 document.

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	George Frost and Associates	Land Use Mapping

PORT DOCUMENTS

Sea-Tac/Communities Plan 1975/76

Sea-Tac International Airport
Noise Exposure Update, 1982

Sea-Tac Airport Master Plan

CHAPTER 1

SUMMARY AND CONCLUSIONS

CHAPTER 1

SUMMARY AND CONCLUSIONS

1.1 Summary

Sea-Tac International Airport, located between Seattle and Tacoma in the State of Washington is the major airport for the most urbanized west portion of the state. There are approximately 250,000 annual aircraft operations at the facility and about ten million passengers were accommodated in the past year. Sea-Tac is owned and operated by the Port of Seattle.

To describe the noise environment around the airport, the Port of Seattle published a noise exposure update report in 1982. This update report depicts noise contour lines that were prepared using the Integrated Noise Model (INM) recommended by the Federal Aviation Administration (FAA). Furthermore, the data used in the model was the most current available, and forecasts used were the most recent developed to represent future aviation demand.

The 65 Ldn contour around the airport acts as the outermost boundary of the Noise Remedy Program and encompasses approximately thirty square miles. The predominant developed land use in this area is residential, and there are also large areas in natural or open use (generally undeveloped). Commercial land uses within the 65 Ldn contour are primarily located along Pacific Highway (which runs parallel to the airport on the east side), in Burien (an unincorporated commercial area) to the northwest of the airport, and in the City of Des Moines to the south. Public facilities such as schools, nursing homes, churches and hospitals are scattered throughout residential areas all around the airport. Most industrial land within the 65 Ldn contour is located several miles north of the Sea-Tac runways.

There are approximately seventy-eight thousand people living within the current 65 Ldn contour line around Sea-Tac. Few of these are within the 80 Ldn contour due to the acquisition program which the Port of Seattle has carried out over the past decade.

Most of the land within the 65 Ldn contour around Sea-Tac is within King County jurisdiction. The area is known as the Highline Community. There have been attempts to incorporate Highline into a city, but to date this has not been achieved. In addition to King County, the small City of Des Moines is completely within the 65 Ldn and small portions of Kent, Normandy Park and Seattle are within the mapped noise contour lines.

The Port of Seattle began its efforts to minimize and mitigate noise problems around Sea-Tac in the early 1970s. Both the Port and King County adopted a plan to remedy the noise in 1975/76. Implementation of the plan to date has consisted of acquiring residences in the most impacted area (750 homes). At present the Port is preparing an update of the noise remedy plan and will submit the update to the FAA in the near future.

1.2 Conclusions

There is a significant noise impact on the communities surrounding the Sea-Tac Airport due to aircraft activity. The Port of Seattle has responded to this problem over the past decade and is in the process of planning additional remedies to make the airport and the people living near the facility better neighbors.

1.3 Certified True and Complete

The noise exposure maps and accompanying documentation for the Noise Exposure Maps of Sea-Tac International Airport, submitted in accordance with FAR Part 150 with the best available information, are hereby certified as true and complete to the best of my knowledge and belief.

SIGNED _____ DATE 10/15/84

Lynn Taylor
Director of Planning & Research
Port of Seattle

CHAPTER 2

AIRPORT FACILITIES AND OPERATIONS

CHAPTER 2

AIRPORT FACILITIES AND OPERATIONS

2.1 Introduction

This inventory documents all pertinent information related to airport facilities and aircraft operations at the Sea-Tac Airport and the surrounding area. Sea-Tac is located about 12 miles south of downtown Seattle and to the west of U.S. 99. Within its boundaries are 2,400 acres which accommodate a parallel runway and taxiway system, a passenger terminal complex of 56 aircraft gates and 1,915,000 square feet of building space, over two acres of general aviation transient aircraft parking apron, and over 500,000 square feet of air cargo building space.

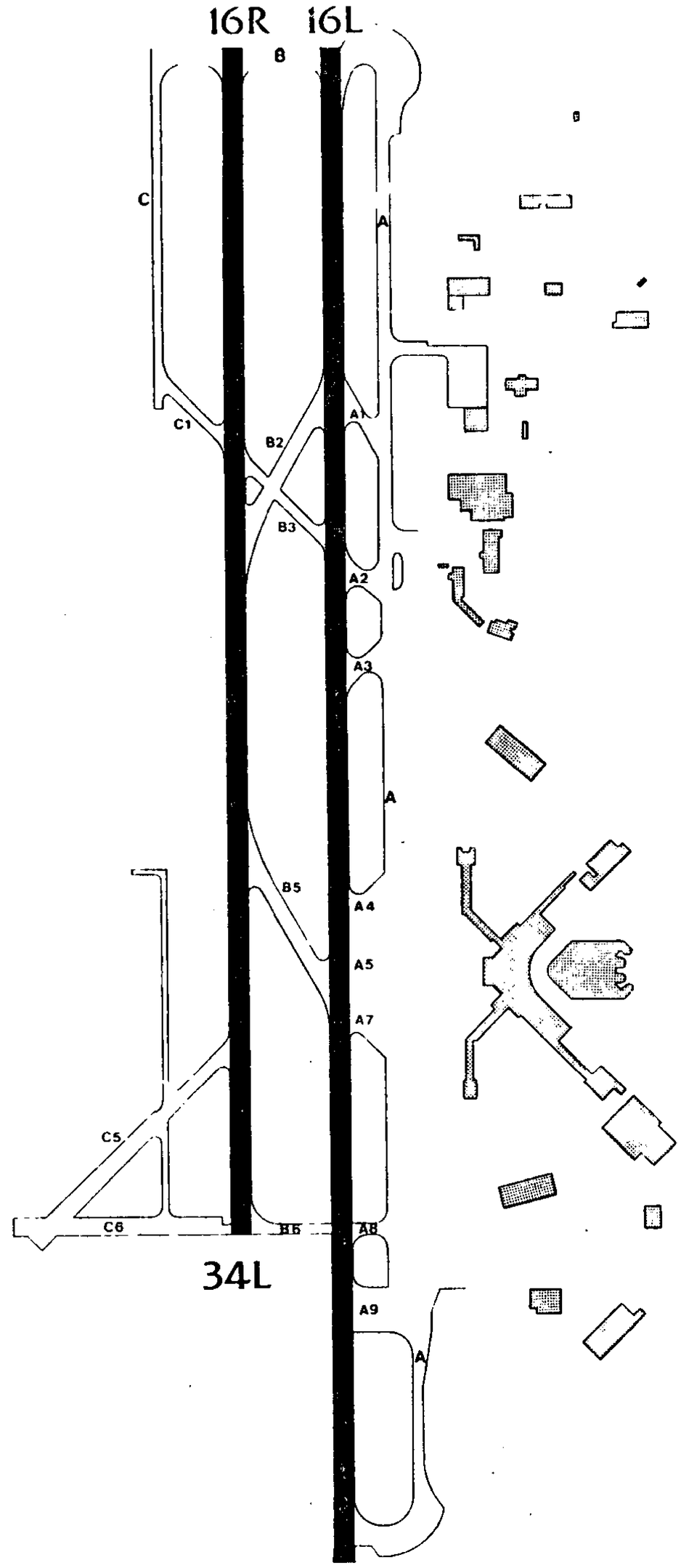
2.2 Runway Locations and Alignments

The Airport's runway system consists of a north/south set of parallel runways, 16R/34L and 16L/34R, located west of the main terminal. Runway 16R/34L is the westerly of the two runways and is 9,425 feet long and 150 feet wide. It is equipped with High Intensity Runway Lights (HIRL), an instrument landing system -- Category II on 16R (i.e., the north end of the runway) and a Visual Approach Slope Indicator (VASI) on 34L (i.e., the south end of the runway). Runway 16L/34R is the easterly of the two runways and is 11,900 feet long and 150 feet wide. It is equipped with HIRL, an instrument landing system -- Category I on 34R (i.e., the south end of the runway) and a VASI on 16L (i.e., the north end of the runway).

The Airport's taxiway system consists of a major taxiway thoroughfare and a number of access taxiways which connect the runways with the passenger terminal building and cargo areas. Taxiway A is the major taxiway thoroughfare. It runs parallel to runways between Runway 16L/34R and the terminal area. Taxiways A1, A2, A3, A4, A5, A7, A8, and A9 provide access between Runway 16L/34R and Taxiway A. Taxiways B, B2, B3, B5 and B6 provide access between the west side of the airfield and Runway 16R/34L. All taxiways have centerline lighting except the extreme south end of Taxiway A. The airfield layout is illustrated in Exhibit 2-1.

2.3 Airport Boundaries

The airport is located in unincorporated King County, about twelve miles south of downtown Seattle and about three miles north of Des Moines, Washington. Pacific Highway (Highway 99) runs north and south on the east side of the airport, and Highway 509 is similarly located on the west side. To the north, Freeway 518 is the approximate boundary of the airport, and the southern boundary is about 196th Street, although the street does not actually cross the land south of the airport.



SEA-TAC INTERNATIONAL AIRPORT

NOISE EXPOSURE UPDATE

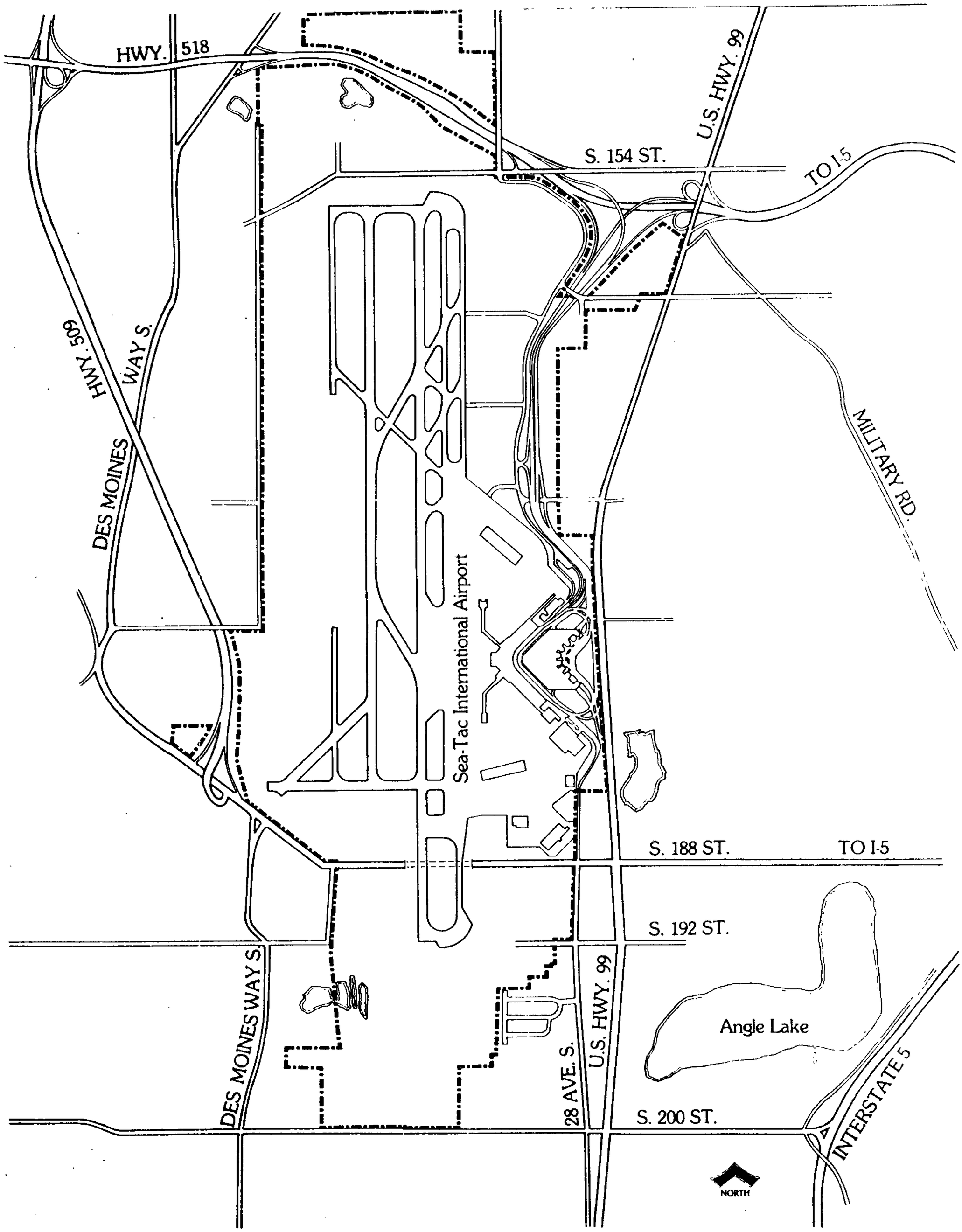
PORT OF SEATTLE · SEATTLE WASHINGTON

SEA-TAC AIRFIELD

LAYOUT

FEET 0 6 12 1800

Exhibit 2-1



SEA-TAC INTERNATIONAL AIRPORT

NOISE REMEDY UPDATE

AIRPORT BOUNDARIES

PORT OF SEATTLE · SEATTLE, WASHINGTON

Exhibit 2-2

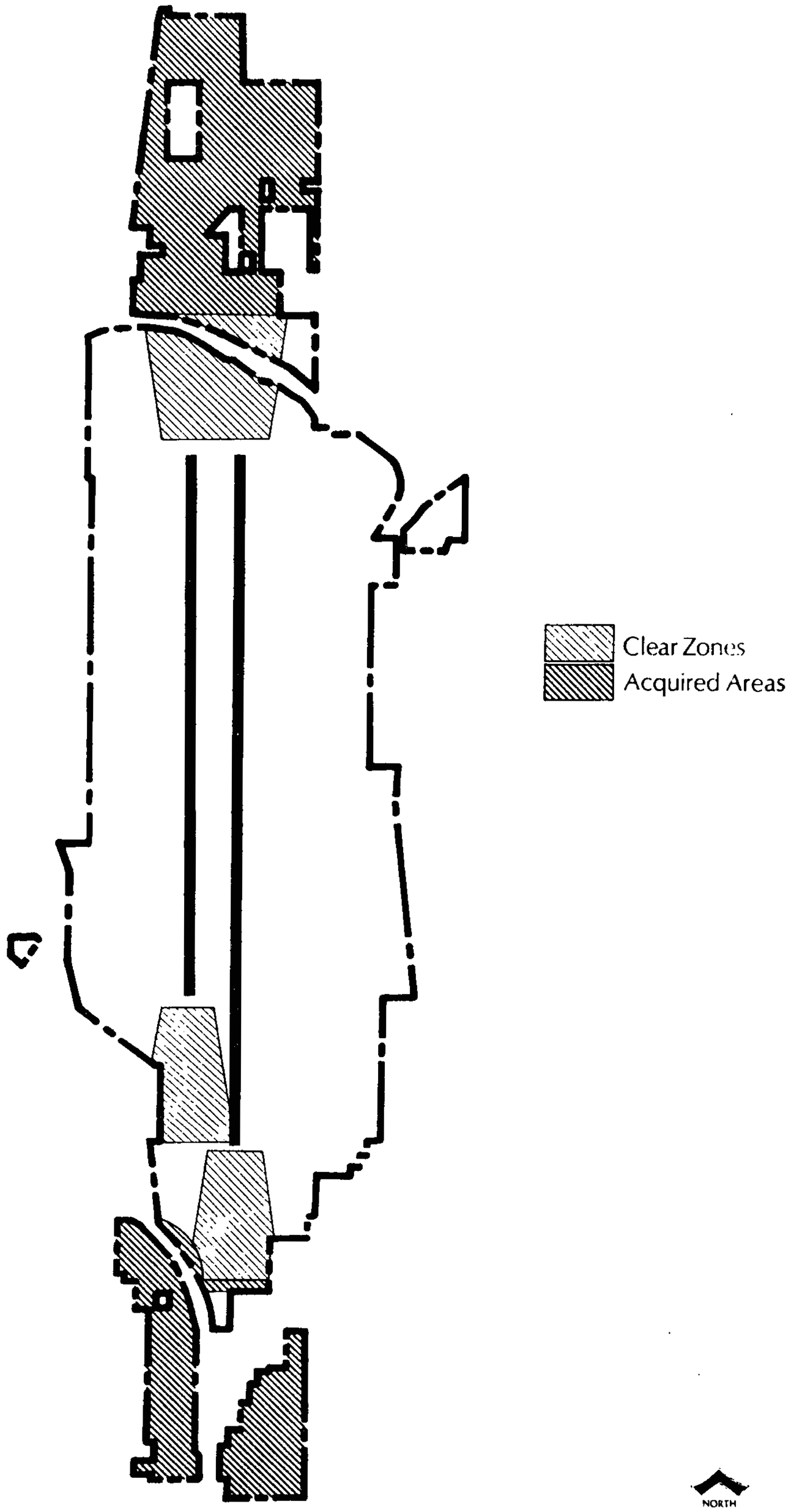
Land owned by the Port of Seattle and directly used for the operation of the airport is shown in Exhibit 2-2. These lands are generally accessible from the runways without crossing public rights-of-way or private property. This land encompasses Sea-Tac International Airport facilities, and it includes approximately 2,200 acres.

In addition to the land described as within the Sea-Tac Airport boundary, the Port owns several hundred acres of land to the north and south of the runways. Some of this land has been acquired to provide a clear approach zone, although the majority has been purchased to remedy noise impacts. Most of the land was originally in residential use, but once acquired by the Port, it has been cleared and is primarily in open-space use. The boundaries of this Port-owned land are shown in Exhibit 2-3.

2.4 Aircraft Operations

In 1980, there were 212,744 aircraft operations (i.e., arrivals or departures), and from August 1983 through July 1984 there were 190,778 operations at Sea-Tac. Estimates of operations by various aircraft categories are made using Civil Aeronautics Board Service Segment Data, the Official Airline Guide and sample counts at Sea-Tac. The 1980, and the August 1983 to July 1984, fleet mixes are estimated below:

Aircraft Category	Percent of Total in 1980	Percent of Total in 1983/4
1. Two-engine, narrow body (e.g., DC9, B737)	9.8%	17.3%
2. Three-engine, narrow body (e.g., B727)	35.8%	40.2%
3. Four-engine, narrow body (e.g., DC8, B707)	1.9%	2.0%
4. Twoand three-engine, wide body (e.g., A300, DC10, L1011)	10.4%	9.7%
5. Four-engine, wide body (e.g., B747)	4.5%	4.5%
6. Single-engine piston (e.g., Beech Bonanza, Cessna Skylane)	4.7%	1.9%
7. Twin-engine piston (e.g., Britten Norman Islander, Cessna 402)	18.1%	8.9%
8. Turboprop (e.g., Beech 99, Swearingen Metro)	11.9%	12.3%
9. Turbofan and Turbojet (e.g., Cessna Citation, Learjet)	2.3%	--
10. Other	0.6%	3.1%
TOTAL	100%	100%



SEA-TAC INTERNATIONAL AIRPORT

NOISE REMEDY UPDATE

PORT OF SEATTLE · SEATTLE, WASHINGTON

PORT-OWNED LAND

0 1 2 3,000'

Exhibit 2-3

Runway utilization is a function of a combination of factors which include weather conditions, pilot preference, aircraft performance, navigational aids, noise abatement procedures, and aircraft traffic requirements. The distribution of aircraft arrivals and departures by runway was based on observed frequency of use and was estimated for 1980 as follows:

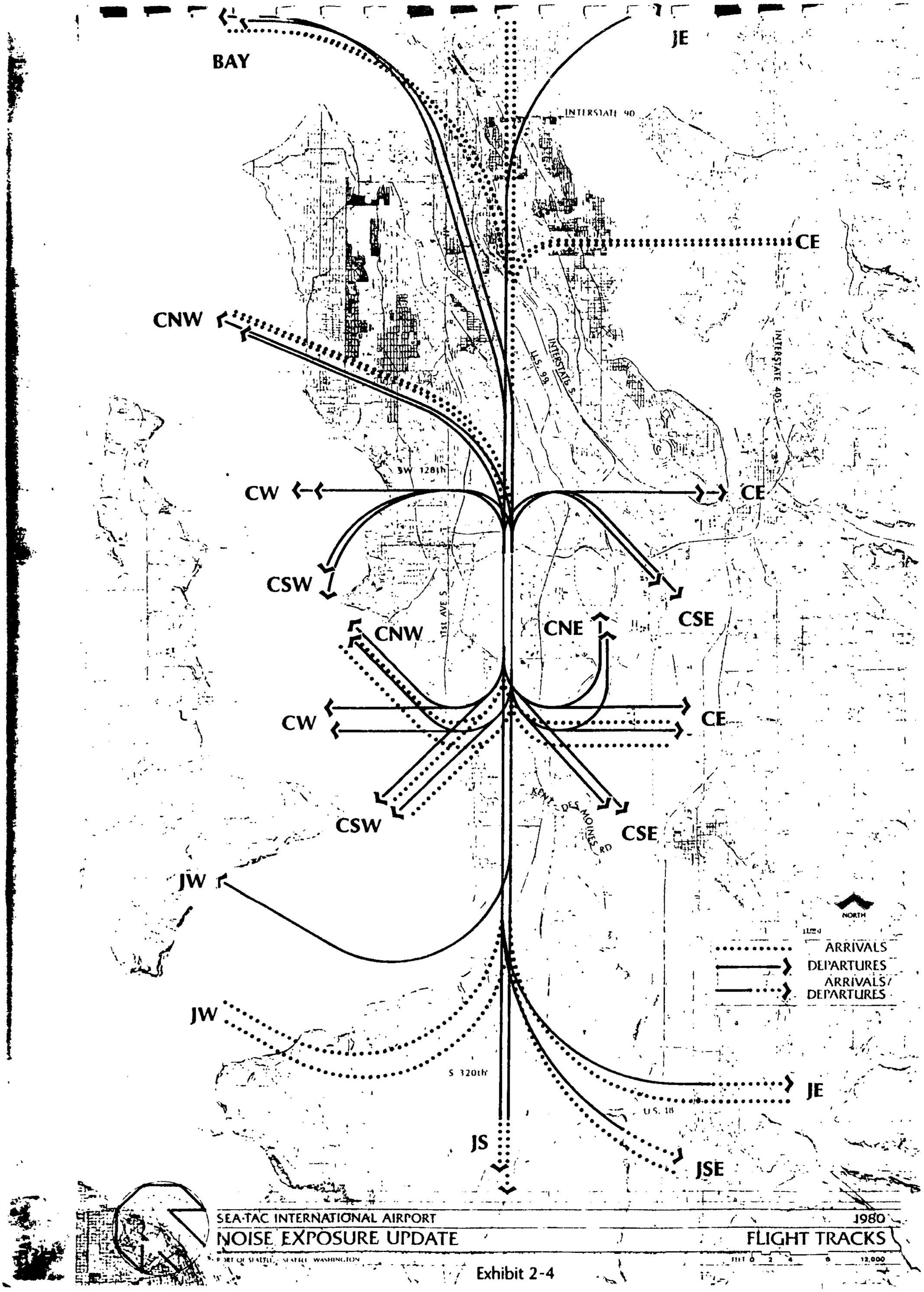
	Air Carrier Arrivals (%)	Air Carrier Departures (%)
Runway 34R	30.4	6.4
Runway 34L	1.6	25.6
Runway 16R	55.9	3.4
Runway 16L	12.1	64.6
	100.0	100.0

	Commuter and General Aviation Arrivals (%)	Commuter and General Aviation Departures (%)
Runway 34R	26.0	21.5
Runway 34L	6.0	10.5
Runway 16R	55.9	13.6
Runway 16L	12.1	54.4
	100.0	100.0

2.5 Flight Tracks

Flight tracks are defined by the path of an aircraft projected on the ground as the aircraft either lands or takes off from the runway. The flight tracks shown in this study (Exhibit 2-4) are not intended to be inclusive of all paths available to aircraft on approach and departure. Many factors influence the individual flight path taken by an aircraft such as aircraft routing by the Federal Aviation Administration's Air Route Traffic Control Center and the Sea-Tac Air Traffic Control Tower, the origin and destination of the aircraft, the amount and loca- tion of other aircraft traffic in the area, performance charac- teristics of the aircraft, utilization of airport navigational aids, weather conditions, and pilot discretion.

Propeller-driven aircraft arrivals and departures are represented by the flight tracks closest to the airport and are identified by a "C" (for conventional) on Exhibit 2-4. These aircraft are allowed by the FAA, on departure, to turn after takeoff upon reaching 1,000 feet mean sea level (MSL). Turbojet aircraft arrivals and departures are represented by flight tracks identi- fied by a "J" (for jet). These aircraft are required to follow noise abatement procedures identified in FAA Order Sea TWR 7110.071 C (October 7, 1980) and are summarized as follows.


BAY
JE
INTERSTATE 90
CE
CNW
INTERSTATE 5
HWY 99
INTERSTATE 405
SW 128th
CW
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CSW
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SEA-TAC INTERNATIONAL AIRPORT
1980
NOISE EXPOSURE UPDATE
FLIGHT TRACKS
PORT OF SEATTLE, SEATTLE, WASHINGTON
FEET 0 2 4 6 12,000

Exhibit 2-4

In a southerly flow of traffic, aircraft generally follow the flight tracks shown in Exhibit 2-4. Weather and traffic permitting, turbojet arrivals are routed over Elliott Bay. Turbojet departures are not allowed to turn following takeoff until reaching (a) 3,000 feet MSL and at least three nautical miles south of the airport for westbound aircraft and (b) 3,000 feet MSL and at least five nautical miles south of the airport for eastbound aircraft.

In a northerly flow of traffic, aircraft generally follow the flight tracks shown in Exhibit 2-4. Turbojet arrivals are turned onto the final approach course four or more nautical miles south of the airport. Turbojet departures are routed westbound over Elliott Bay except for departures between the hours of 6 a.m. and 10 p.m., which are allowed to turn east eight nautical miles north of the airport at or above 4,000 feet MSL.

2.6 Sea-Tac Airport Master Plan

Sea-Tac International Airport's existing airport master plan does not conform to FAA Advisory Circular 150/5020-6 ("Airport Master Plan"). Growth and development of facilities during the past 10 years has been guided by the original Terminal Area plans developed by The Richardson Associates (TRA) in 1968 and by the Sea-Tac Communities Plan of 1975/1976. Both of these plans were developed before the deregulation of the airline industry.

Because facility demand vs. capacity reached a point where case-by-case facility planning was no longer possible, the Port applied for and received FAA funds to prepare a master plan in 1983. Currently the master planning process is underway, and selection of a plan to guide future decisions is expected in late 1984.

No new runways or extensions of present runways are expected in the next 15 years. The master plan will therefore show no new runway configurations. The changes and expansion addressed in the master plan will be primarily found in the terminal and supporting facilities. The changes are expected to accommodate a doubling in passenger and cargo capacity.

CHAPTER 3

NOISE CONTOURS

CHAPTER 3

NOISE CONTOURS

3.1 Approach in Developing Noise Contours

The first major noise analysis for Sea-Tac Airport was part of the Sea-Tac/Communities Plan. This analysis, completed in 1974, presented measured Noise Exposure Forecast (NEF) noise levels for 1973 operations as well as some predicted Adjusted Noise Exposure (ANE) noise levels.

After the completion of the Sea-Tac/Communities Plan, significant events altered the level, composition, and structure of aircraft operations at Sea-Tac. The most notable of these events were airline deregulation and the growth of the commuter airline industry. Airline deregulation resulted in an increase in the number of major airlines operating at Sea-Tac from twelve to over twenty-five. Operations by commuter airlines using small aircraft almost doubled by 1982. These and other changes in operations altered the noise exposure levels predicted by the 1975/76 Plan.

In 1982, the Port conducted an update of the projected noise exposure levels and published the results in Sea-Tac International Airport, Noise Exposure Update, June 1982. The update identified 1980 levels of aircraft-generated noise exposure and forecasted noise exposure for the years 1985, 1990 and 2000. The projected levels were based on the available data and forecasts for aviation demand. The methodology used was the state of the art in noise prediction techniques.

Since 1982, noise and aircraft operation data have been collected on a continual basis. These data indicate that the noise exposure identified for 1980 is practically the same as that for mid-1984. In other words, the predictions made in the Noise Exposure Update have not materialized. As a consequence, the noise contours around Sea-Tac have not significantly changed since 1980.

Based on data that show similar noise exposure in 1980 and 1984, the Port has established the 1980 contours (as published in the 1982 Noise Exposure Update) as the 1984/85 noise contours for the purposes of the Phase I/Part 150 Report. In the following paragraphs the Port staff has documented the data that justify the use of the selected contours.

3.2 Noise Exposure Update, 1982 Contours

In the 1982 Noise Exposure Update, noise levels attributed to aircraft operations at Sea-Tac International Airport (Sea-Tac) were modeled for 1980 operations and forecast years (1985, 1990, and 2000). The Federal Aviation Administration Integrated Noise Model (INM) was used with some modifications as advised by the FAA. The INM was calibrated to match both monitored noise levels and Sea-Tac specific approach and departure procedures as controlled by the FAA and reported by the airlines. In addition, INM output was adjusted to reflect an aircraft noise source (taxiing aircraft) not modeled by the INM.

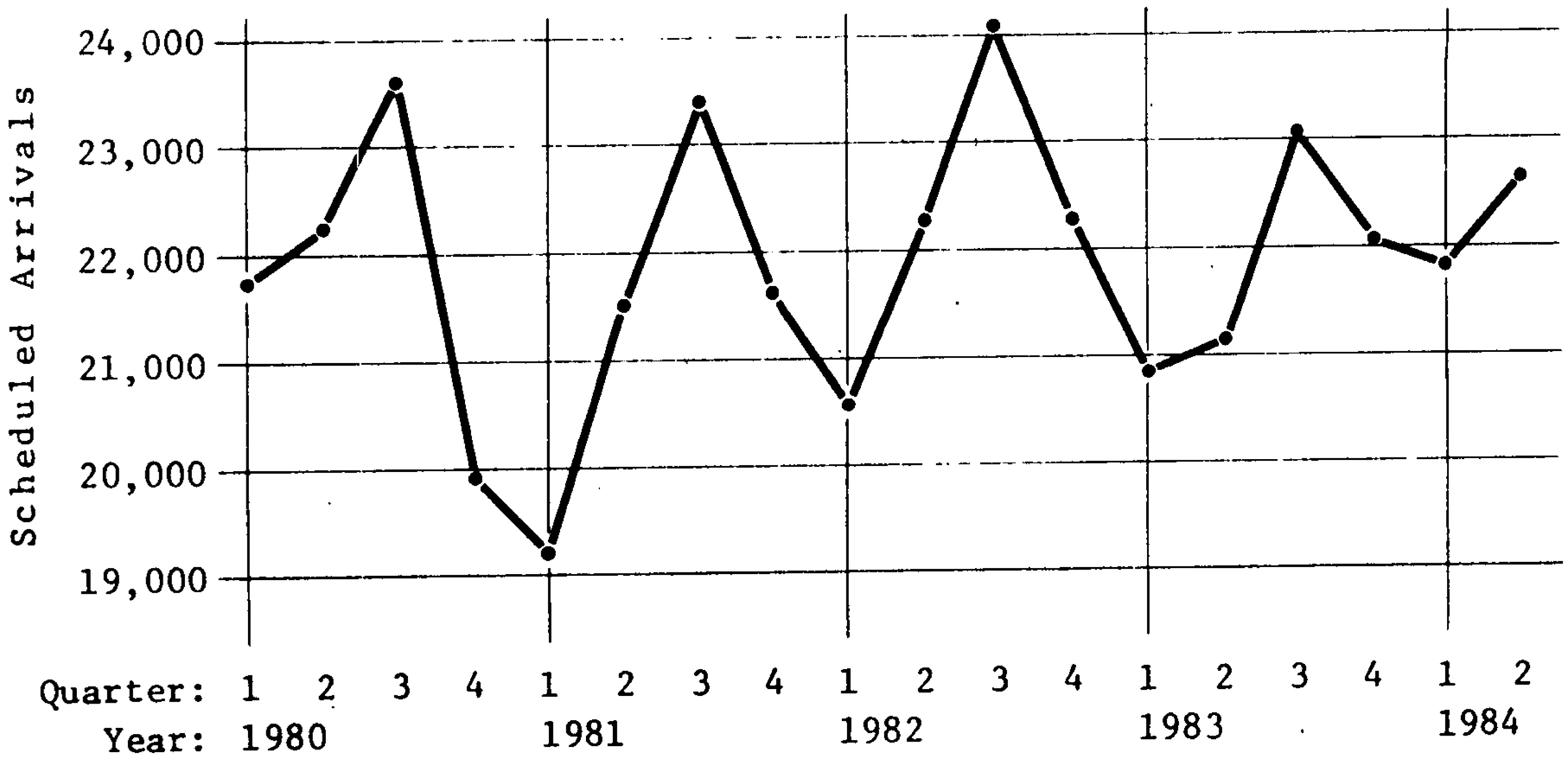
Utilizing the methodology described above, noise exposure levels were prepared as annual average day-night levels (Ldn). These levels were based on a number of variables which included: runway configuration and utilization, flight track identification and utilization, approach and takeoff profiles, aircraft noise and performance characteristics, and traffic mix (i.e., the number of operations and the distribution of operations by aircraft type, arrival vs. departure, time of day, and trip length of departures). Based on a comparison of predicted and measured noise, the Integrated Noise Model (INM) was evaluated and calibrated to reflect the site specific characteristics of Sea-Tac. Noise exposure contours were generated by the validated model for existing and future levels of aircraft operations.

3.3 Comparison of 1980 and Current Operations

In 1980, there were 87,482 total scheduled arrivals at Sea-Tac Airport. The number of arrivals dropped to 85,756 in 1981 and then increased to 89,379 in 1982. The number of arrivals decreased to 87,111 in 1983, and in the first half of 1984 there were 44,563 arrivals, which is comparable to the first half of 1980. These changes in the number of arrivals shows that the level of activity at Sea-Tac has varied over the past several years but was essentially the same in 1980 and 1984. Exhibit 3-1, portraying the arrivals by quarter from 1980 through mid-1984, is presented below to show the variance in the four-year period. The exhibit also shows the similarity in the number of arrivals in 1980 and 1984.

Exhibit 3-1

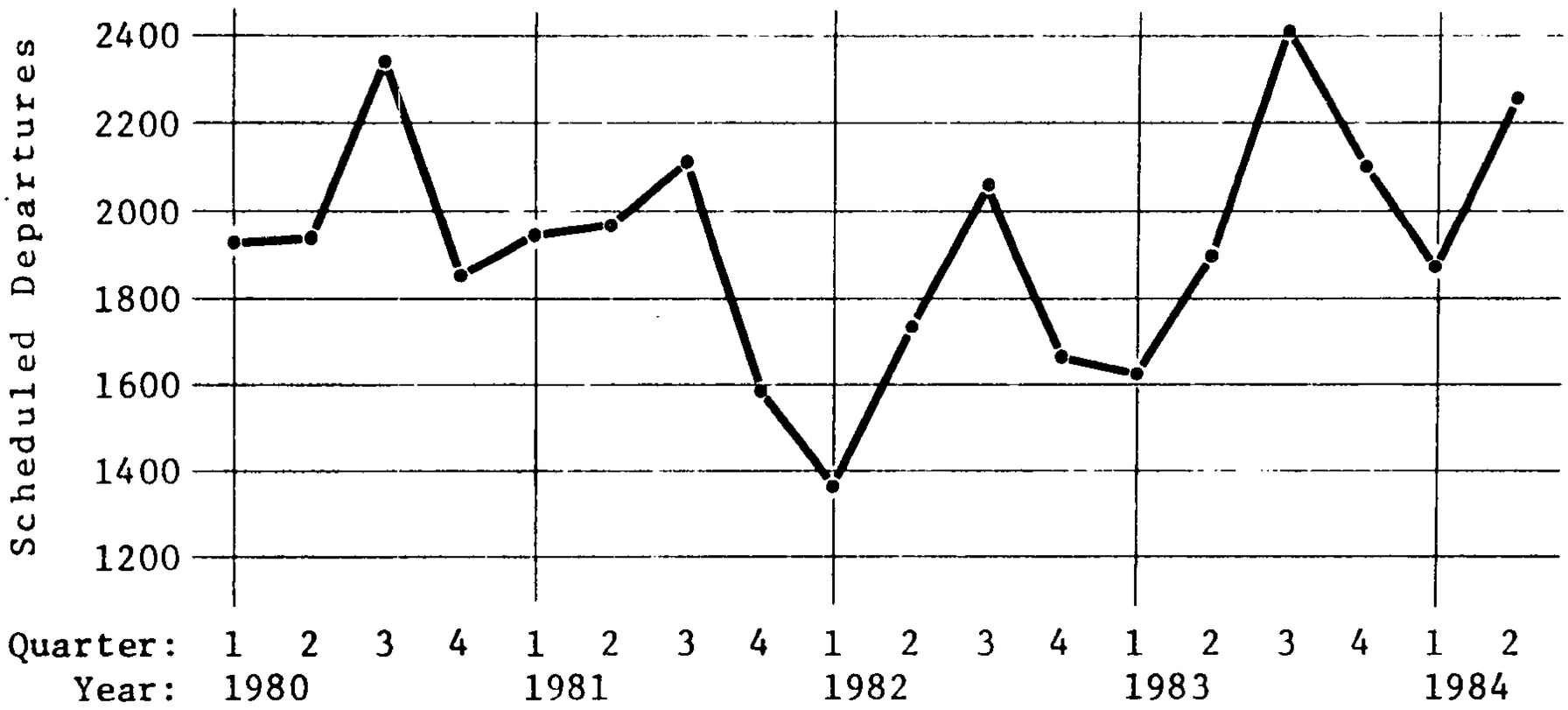
SCHEDULED AIRCRAFT ARRIVALS
by Quarter



Because the Integrated Noise Model is particularly sensitive to noise between 10:00 p.m. and 7:00 a.m., it is necessary to compare the number of operations for this time of the day if the 1980 noise contours are to be established as an accurate representation of noise in 1984. Exhibit 3-2 shows a comparison of the number of nighttime (10:00 p.m. to 7:00 a.m.) departures for each quarter starting in 1980 and continuing through the first half of 1984. Although there was a decrease in nighttime departures in 1981 and 1982, the number of such departures returned to the 1980 level in 1983 and the beginning of 1984.

Exhibit 3-2

SCHEDULED AIRCRAFT DEPARTURES (between 10 P.M. and 7 A.M.)
by Quarter



The data presented indicate that input into the INM program for 1980 is very similar to the data that would be used for 1984/85. This data similarity in part provides a basis for utilizing the 1980 noise contours as an accurate representation of current noise levels.

3.4 Noise Monitoring Data

Monitored noise data over the past four years also show very little change in the noise environment around Sea-Tac. In fact, all functioning monitoring stations show essentially no change, as the recorded noise levels measure within a single decibel or less when comparing the present data with 1980. The Exhibit 3-3 shows the averaged noise levels for each station in 1980 and in 1983/84.

EXHIBIT 3-3
Monitored Noise Data

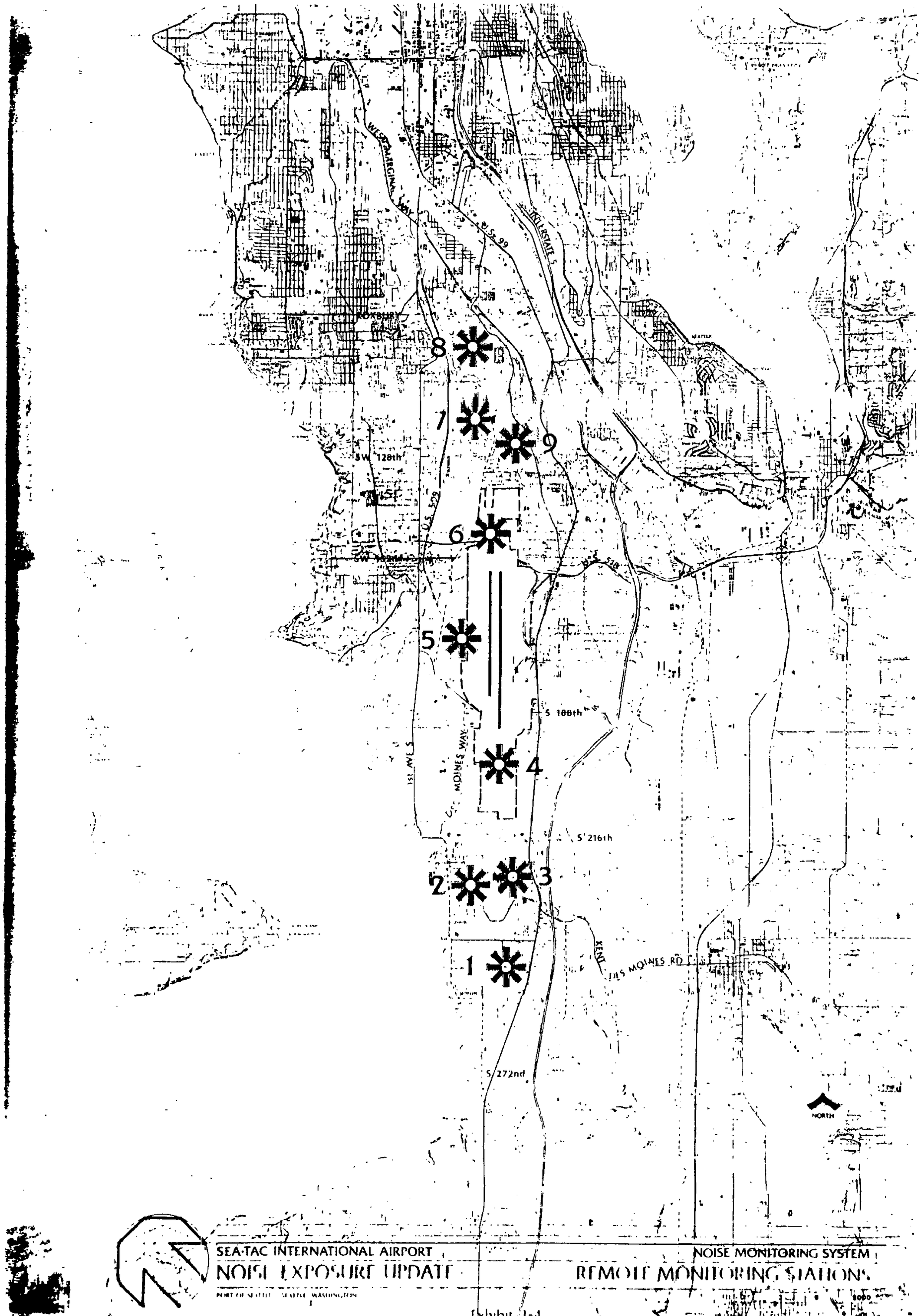
Permanent Monitor Stations	1980 Average LDNA	June 1983 to May 1984
1	71	71
2	71	71
3	74	73
4	83	malfunction
5	70	69
6	81	81
7	73	73
8	69	70
9	70	69

The locations of the nine permanent remote monitoring stations are shown in Exhibit 3-4.

3.5 1984/85 Noise Contours

The Port of Seattle has prepared this Phase I/150 report on the assumption that the 1980 noise contours provide an accurate description of the 1984/85 noise environment around Sea-Tac Airport. This assumption is founded on data showing that operational levels and recorded noise levels are essentially the same for the two different time periods. This assumption, and the methodology upon which it is based, have been discussed with FAA staff over the past several months. These discussions and the Port's internal detailed review of all available information, have provided sufficient justification to proceed in utilizing the 1980 noise contours for 1984/85 in this report.

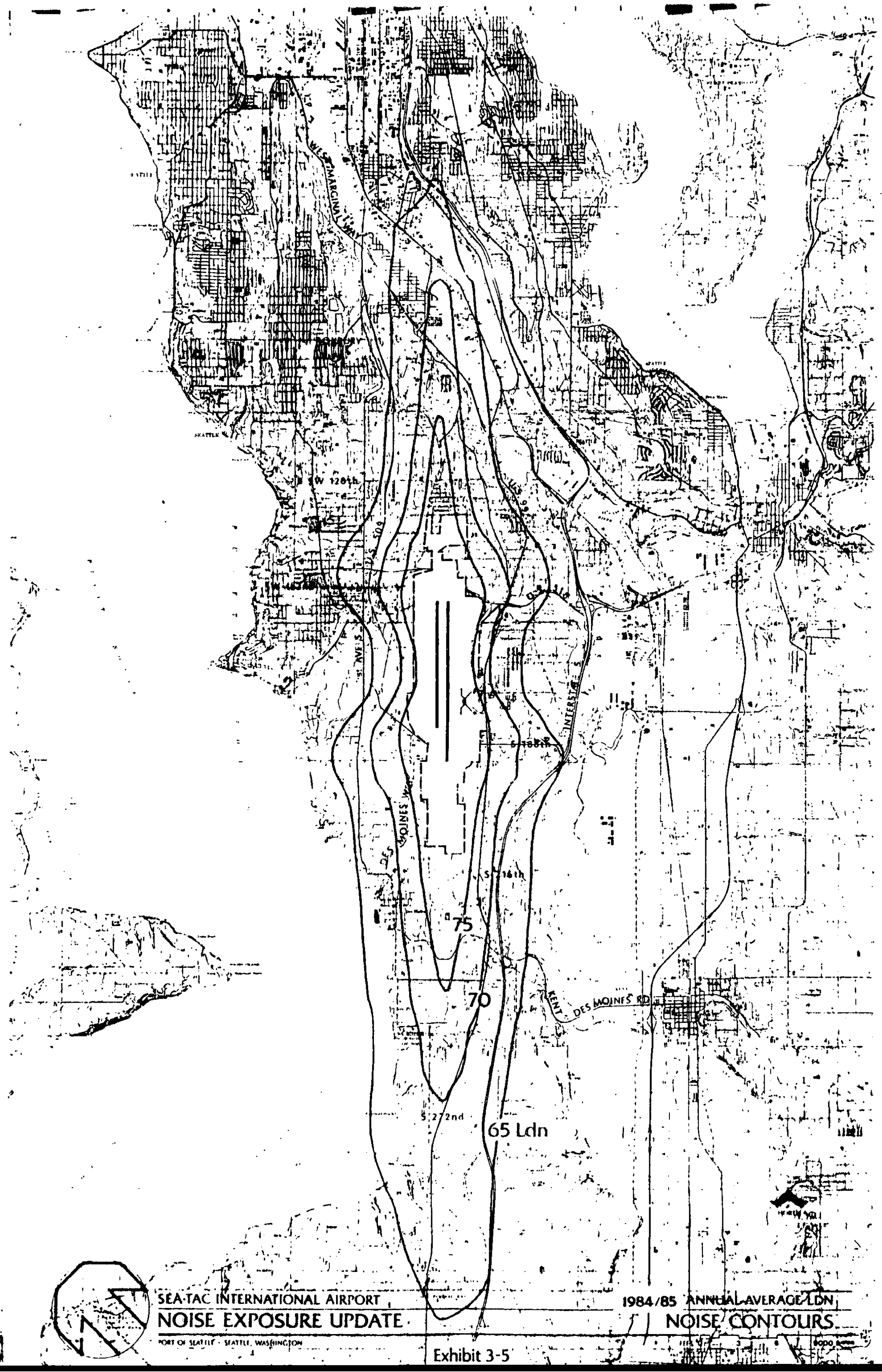
Noise contours for 1984/85 are illustrated in Exhibit 3-5. The 80 Ldn contour extends from 132nd Street South to 216th Street South and encompasses 2.7 square miles of land. Between the 80 Ldn contour and the 75 Ldn contour there are 3.3 square miles, the area extending north to the Rainier Golf and Country Club and south to about South 240th Street. The area between the 70 and 75 Ldn contours extends north to the Duwamish Waterway and south to about South 268th Street, encompassing approximately 7.1 square miles. The area beyond the 70 Ldn contour to the 65 Ldn contour extends north to King County International Airport (Boeing Field) and south to Federal Way, encompassing approximately 16.6 square miles. The entire land area with a 65 Ldn or higher due to aircraft noise is about 29.7 square miles.



SEA-TAC INTERNATIONAL AIRPORT
NOISE EXPOSURE UPDATE
PORT OF SEATTLE · SEATTLE, WASHINGTON

NOISE MONITORING SYSTEM
REMOTE MONITORING STATIONS

Exhibit 3-4



SEA-TAC INTERNATIONAL AIRPORT

NOISE EXPOSURE UPDATE

PORT OF SEATTLE · SEATTLE, WASHINGTON

1984/85 ANNUAL AVERAGE LDN

NOISE CONTOURS

Exhibit 3-5

3.6 1990 Annual Average Noise Exposure Projections

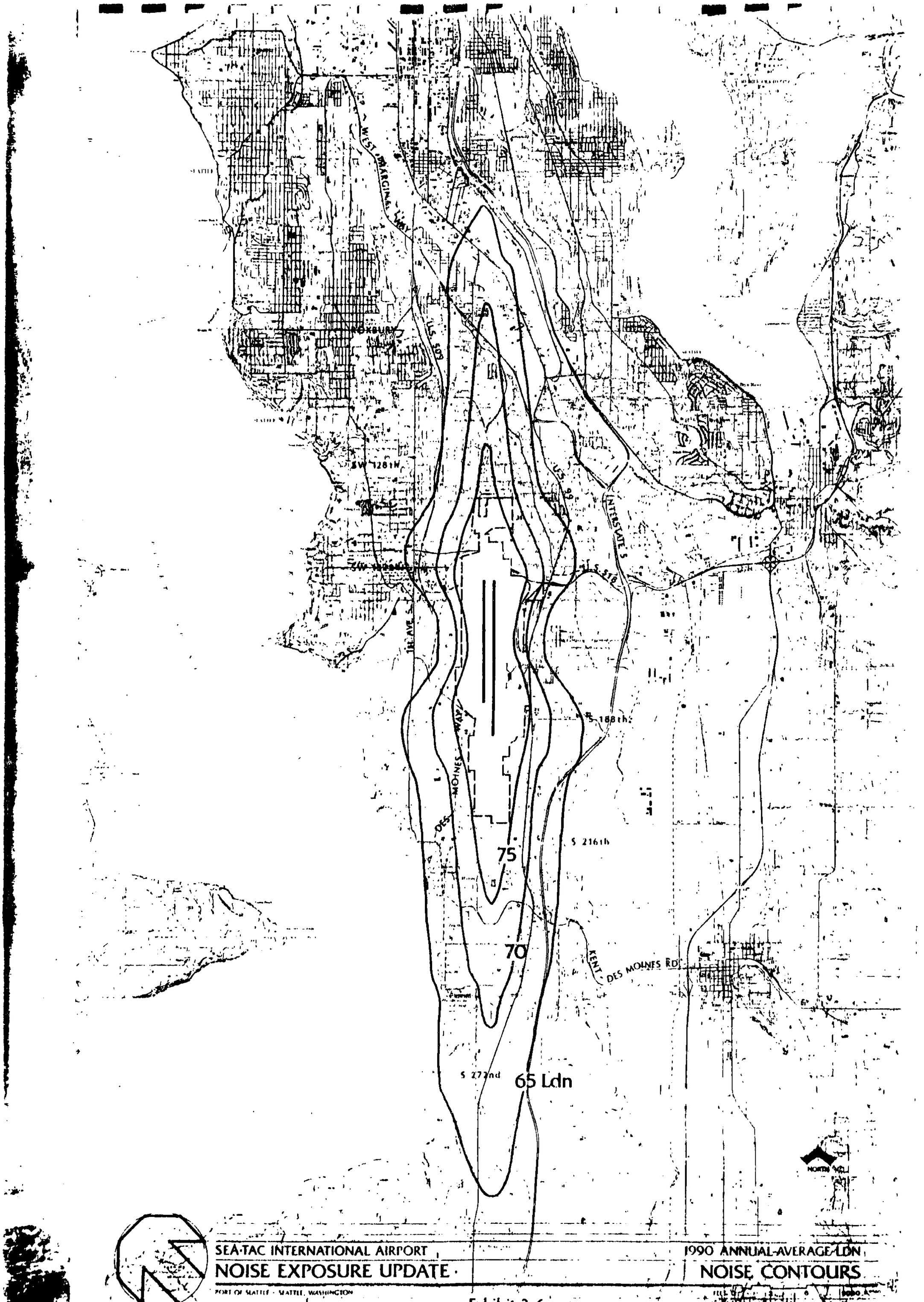
Noise contours projected for 1990 are illustrated in Exhibit 3-6. The 75 Ldn contour extends north to about South 124th Street and south to Mt. Rainier Senior High School, encompassing approximately four and one-half square miles. (The comparable 1984/85 contour covers six square miles.) The 70 Ldn contour extends north to about West Marginal Place South and south to about South 260th Street and encompasses approximately ten square miles. (The comparable 1984/85 contour covers thirteen and one-tenth square miles.) The 65 Ldn contour extends north to Boeing Field and south to about South 298th Street, encompassing approximately twenty-three square miles. (The comparable 1984/85 contour covers twenty-nine and seven-tenths square miles.)

Noise Contour Bands	Square Miles of Land 1984/85	1990
75 Ldn and higher	6.0	4.5
70 to 75 Ldn	13.1	10.0
65 to 70 Ldn	29.7	23.0

The 1990 noise contours are those that have been established in the Noise Exposure Update prepared in 1982. The area within the 1990 contours is about 25% less than the area within the contours established for 1984/85. The reason for this decrease in area is the projected decreasing levels of noise generated by aircraft. (See Noise Exposure Update, Chapter 6.)

A summary of aviation forecasts for 1990 as presented in the Noise Exposure Update is reproduced below.

Forecast	1990
Passengers	11,687,600
Operations	
Air Carrir	141,320
Commuter Aviation	38,650
General Aviation/Aviation	40,080
Military	540
Total	220,590



SEA-TAC INTERNATIONAL AIRPORT
NOISE EXPOSURE UPDATE

PORT OF SEATTLE · SEATTLE, WASHINGTON

1990 ANNUAL-AVERAGE-LDN
NOISE CONTOURS

Exhibit 2-6

CHAPTER 4

LAND USES WITHIN THE 65 LDN CONTOUR

CHAPTER 4

LAND USES WITHIN THE 65 LDN CONTOUR

4.1 Introduction

The description of existing and future aircraft noise contours in the preceding chapter provides only a portion of the information necessary for the evaluation of noise impacts around Sea-Tac Airport. Existing and anticipated use of land in the vicinity of the Airport is also a major determinant of these impacts. Obviously, if there were no people or incompatible land uses near the airport or under the flight tracks, there would be little noise impact. But as is the case at Sea-Tac Airport, there are many incompatible land uses impacted by aircraft noise.

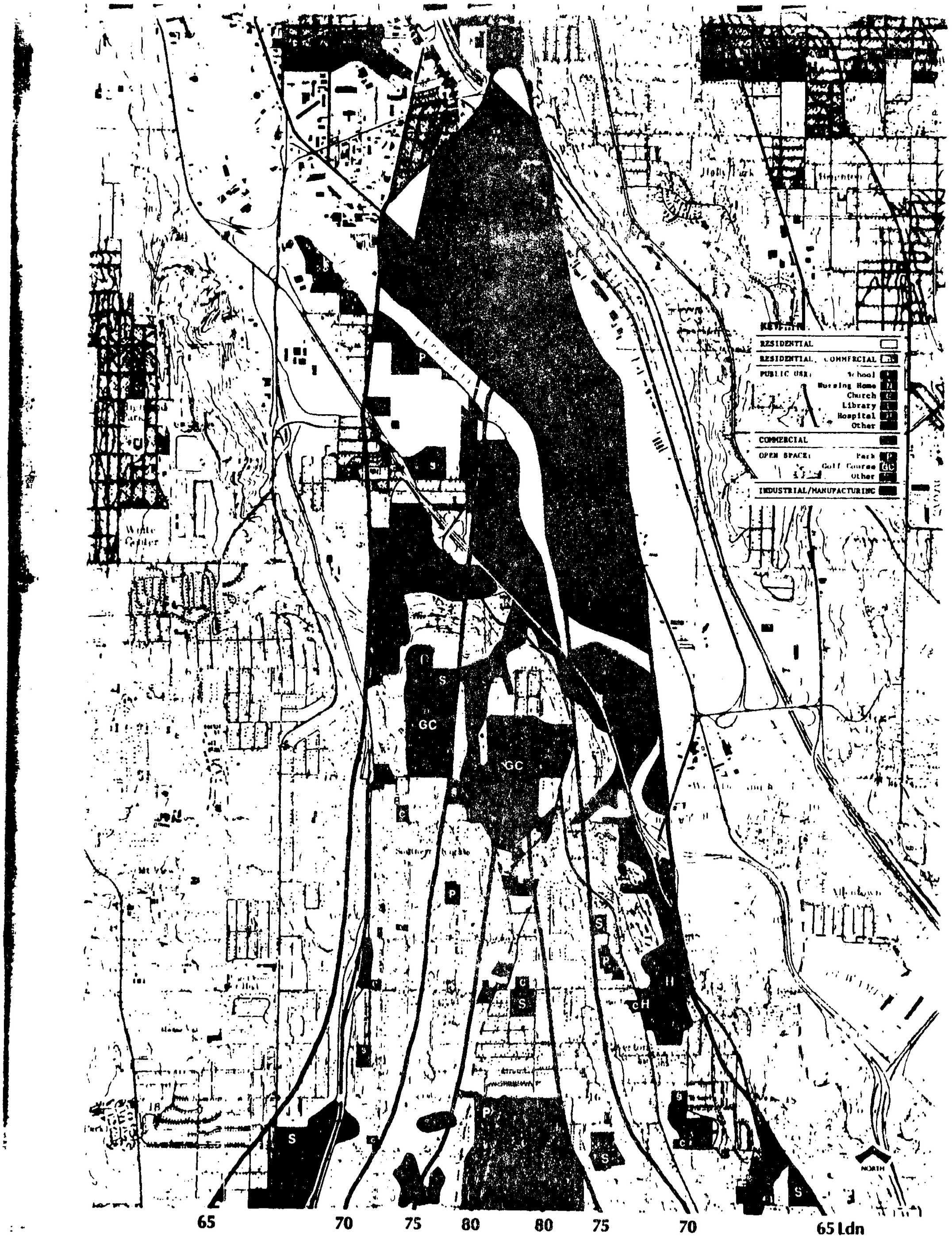
This chapter summarizes land-use data collected and analyzed from recent aerial photography and field surveys. The land-use data was first mapped for all areas within the 65 Ldn for 1980. All land uses were then interpreted as being compatible or incompatible using criteria prepared by the FAA in Part 150.

4.2 1984/85 Land Uses

To map current land uses under the established contours, aerial photographs were taken in May 1984. Prints of this photography at a scale of 1" = 400' were prepared and used as a basis for the land use mapping. To identify specific land uses, a combination of available land use maps, photographic interpretations and field surveys was used. The work was completed by a consultant under contract with the Port.

Land uses were mapped in general categories as outlined in FAA regulations, and circulars were published to provide guidance in developing airport noise compatibility programs. The general land-use categories are residential, public use, commercial, industrial (manufacturing and production), and open space (recreational). To assist in providing further detail regarding particular uses (i.e., nursing homes, schools, hospitals) some of the categories are identified by alphabetical letters that are keyed in the legend. These categories were developed in consultation with local FAA staff, who assisted in interpreting the intent of the regulations.

Land uses within the 65 Ldn contour are shown in Exhibits 4-1, 4-2 and 4-3. As is evident, much of the land is in residential use. An approximately equivalent amount is in open use (or simply undeveloped). Commercial use is concentrated along Pacific Highway (Highway 99) and much of it is related to airport activity. Commercial nodes also exist in unincorporated Burien northwest of the airport and in incorporated Des Moines south of the airport. Public uses, on the other hand, are sprinkled throughout the residential areas, with some clusters of educational and retirement facilities. The majority of the industrial land uses are north of the airport between the 65 and 70 Ldn contours.



SEA-TAC INTERNATIONAL AIRPORT

1984/85

NOISE REMEDY UPDATE

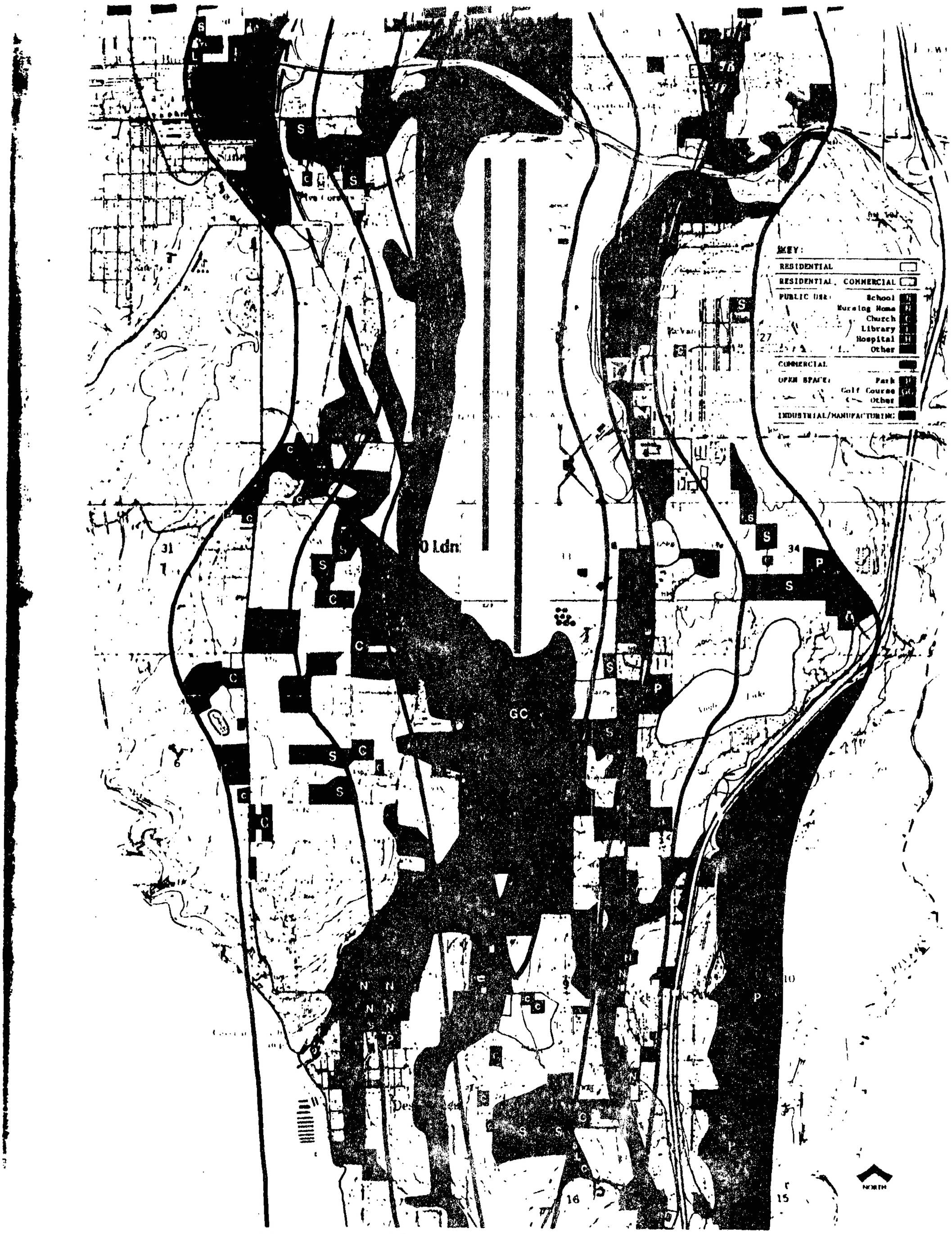
LAND USE

PORT OF SEATTLE SEATTLE WASHINGTON

0 1 2 3,000'

A significant reduction in the number of acres/people is expected within the

Exhibit 4 I



SEA-TAC INTERNATIONAL AIRPORT

1984/85

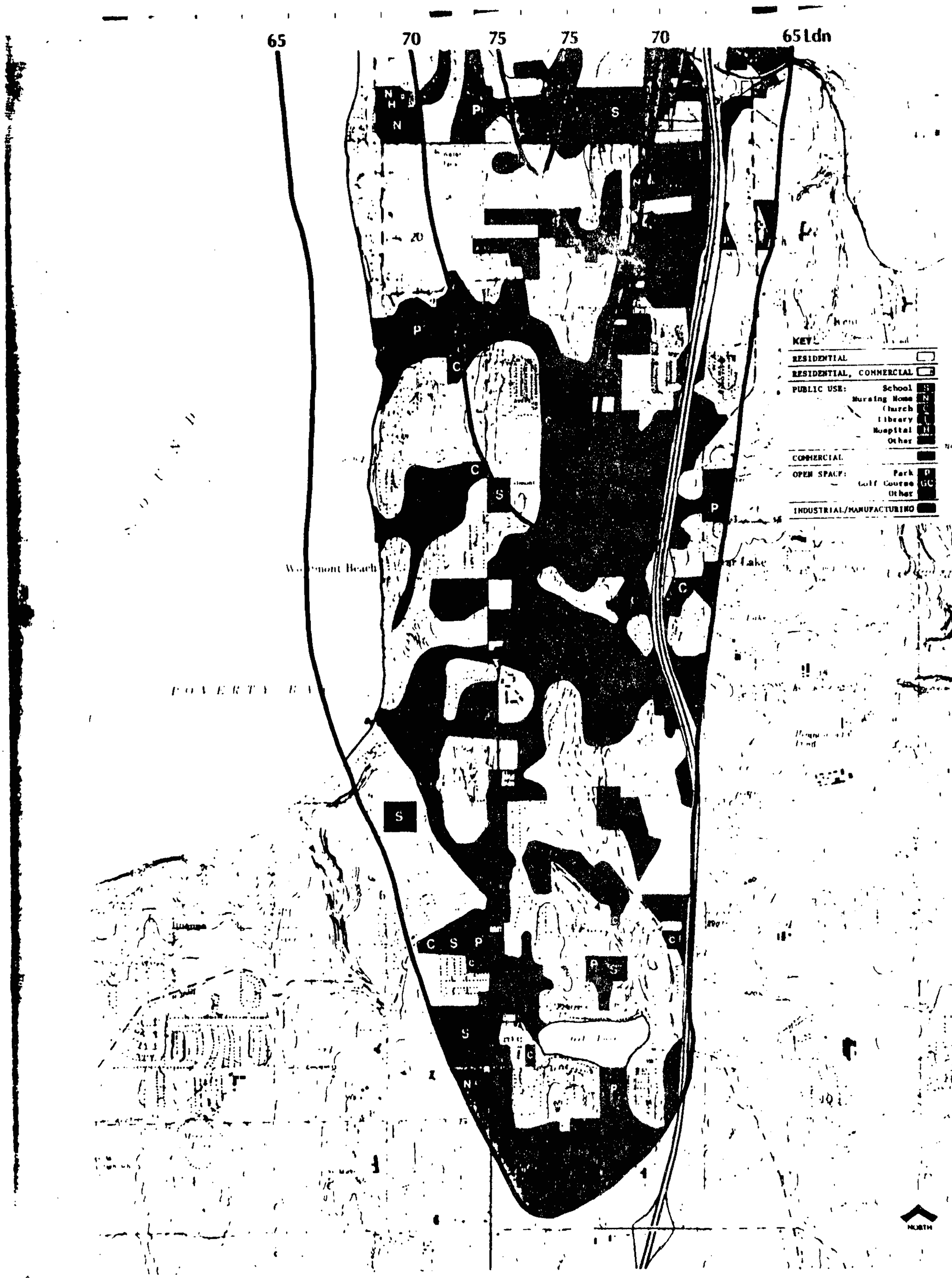
NOISE REMEDY UPDATE

LAND USE

PORT OF SEATTLE · SEATTLE, WASHINGTON

0 1 2 3,000'

A significant reduction in the number



SEA-TAC INTERNATIONAL AIRPORT

NOISE REMEDY UPDATE

PORT OF SEATTLE · SEATTLE WASHINGTON

1984/85

LAND USE

0 1 2 3,000'

A significant reduction in the number of acres/people is expected within the

Exhibit 4-3

4.3 Population and Land Area within the 1984/85 65 Ldn

The extent of the noise impact on residents is largely determined by the number of people residing within the noise contours around the airport. An estimate of the number of people in each contour band around the airport is recorded in the following table. These estimates were prepared by a Port consultant using June 1984 aerial photography and Puget Sound Council of Government (PSCOG) Official 1982 Housing and Population Estimates. Household sizes were obtained from the PSCOG information and used as multipliers for the various types of housing units. The findings of this exercise are represented in Exhibit 4-4 below.

EXHIBIT 4-4
Estimated Resident Population and Land Areas

	1984/85 Ldn Contour Bands				
	65-70	70-75	75-80	80+	Total
Population	48,011	24,357	5,592	186	78,146
Area (square miles) Excluding Water Area	16.6	7.1	3.3	2.7	29.7

Exhibit 4-4 also portrays the land area (exclusive of water surfaces) within each of the Ldn contour bounds. Almost 30 square miles of land around Sea-Tac have a rating of 65 Ldn or higher.

4.4 Definition of Noncompatible Land Uses

Land use compatibility within the noise contour bands surrounding Sea-Tac is based on published Federal Aviation Regulations. The local community has not made any noise compatibility determinations that would change the suggested land-use compatibility tables as presented in Appendix A of Part 150, Airport Noise Compatibility Planning published by the FAA.

The official responsibility for determining the acceptable and permissible land uses around the airport lies with local jurisdictions having land-use control. King County and the cities of Des Moines, Kent, Normandy Park and Seattle each have land jurisdiction in the area covered by the 65 Ldn around Sea-Tac Airport. These jurisdictions have plans, zones and codes that in part reflect the noise environment, and they continue efforts to achieve better compatibility. Nevertheless, the jurisdictions have not made specific land-use compatibility determinations for the noise information which has been prepared by the Port of Seattle.

The compatibility table prepared by the FAA includes criteria to distinguish compatible and incompatible structures of various uses based on NLR (Noise Level Reduction). In other words, noise-sensitive land uses can be made compatible in certain noise-exposureareas if the structures housing the uses are sufficiently sound insulated. To determine whether or not structures are sufficiently sound insulated to achieve acceptable interior noise levels, acoustical audits of each structure would be necessary. Such audits are not feasible for the 25,000 to 30,000 structures within the 65 Ldn contour around Sea-Tac Airport. Therefore, the land-use compatibility table used in determining compatibility/noncompatibility has been simplified by excluding references to NLRs. The resulting table is reproduced in Exhibit 4-5.

EXHIBIT 4-5

Land Use Compatibility Index Used for
Phase I/Part 150 Land Use Map

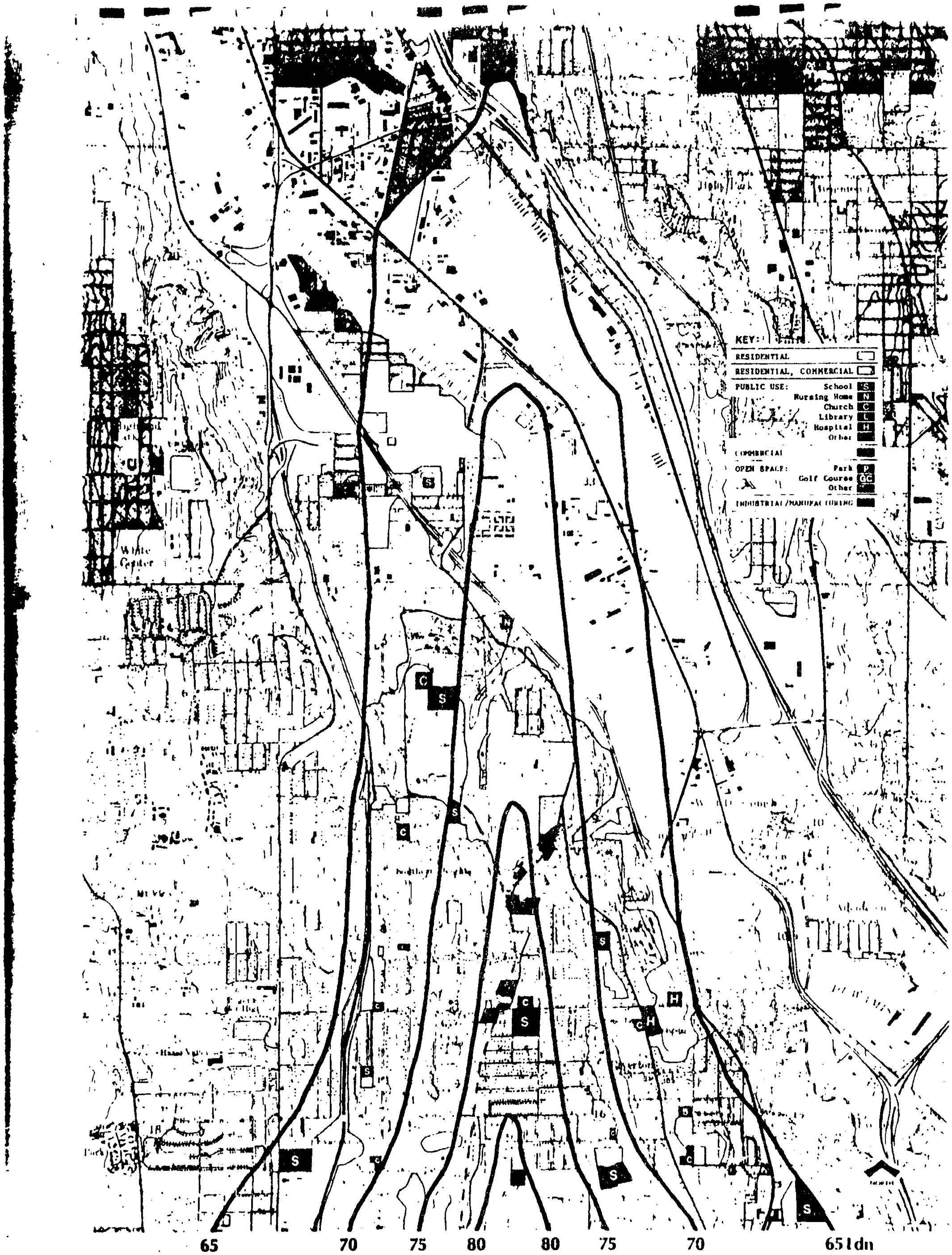
LAND USE	1984/85 LDN CONTOUR BANDS 65-70	70-75	75-80	80+
Residential				
- Residential Including Mobile Homes and Transient Lodging	N	N	N	N
Public Use				
- Schools, Hospitals, Nursing Homes, Churches, Auditoriums, and Concert Halls	N	N	N	N
- Governmental Services	Y	N	N	N
- Transportation and Parking	Y	Y	Y	Y
Commercial Use				
- Offices, Business and Professional	Y	N	N	N
- Wholesale and Retail--Building Materials, Hardware and Farm Equipment	Y	Y	Y	Y
- Retail Trade--General	Y	N	N	N
- Utilities	Y	Y	Y	Y
- Communication	Y	N	N	N
Manufacturing and Production				
- Manufacturing, General	Y	Y	Y	Y
- Photographic and Optical	Y	N	N	N
- Agriculture (Excluding Livestock) and Forestry	Y	Y	Y	Y
- Livestock Farming and Breeding	Y	Y	N	N
- Mining and Fishing, Resource Production and Extraction	Y	Y	Y	Y
Recreational				
- Outdoor Sports Arenas and Spectator Sports	Y	Y	N	N
- Outdoor Music Shells, Amphitheaters	N	N	N	N
- Nature Exhibits and Zoos	Y	N	N	N
- Amusements, Parks, Resorts and Camps	Y	Y	N	N
- Golf Courses, Riding Stables and Water Recreation	Y	Y	Y	N

Y = Compatible
N = Not Compatible

4.5 1984/85 Noncompatible Land Uses

Based on the land use compatibility index in Exhibit 4-5, noncompatible land uses have been identified in Exhibits 4-6, 4-7, and 4-8. The predominant incompatible land uses in the Sea-Tac Airport vicinity are residential. Other incompatible uses include a large number of public uses scattered throughout the residential areas, and some commercial uses in the higher noise exposure areas.

NOTE: The homes within the 80 Ldn line south of S. 128th that showed up on the USGS base map are no longer in existence. These homes have been acquired by the Port during the past several years, the people have been relocated, and the structures have been removed. The base map has been altered to remove the small rectangles that at one point represented houses.



SEA-TAC INTERNATIONAL AIRPORT

NOISE REMEDY UPDATE

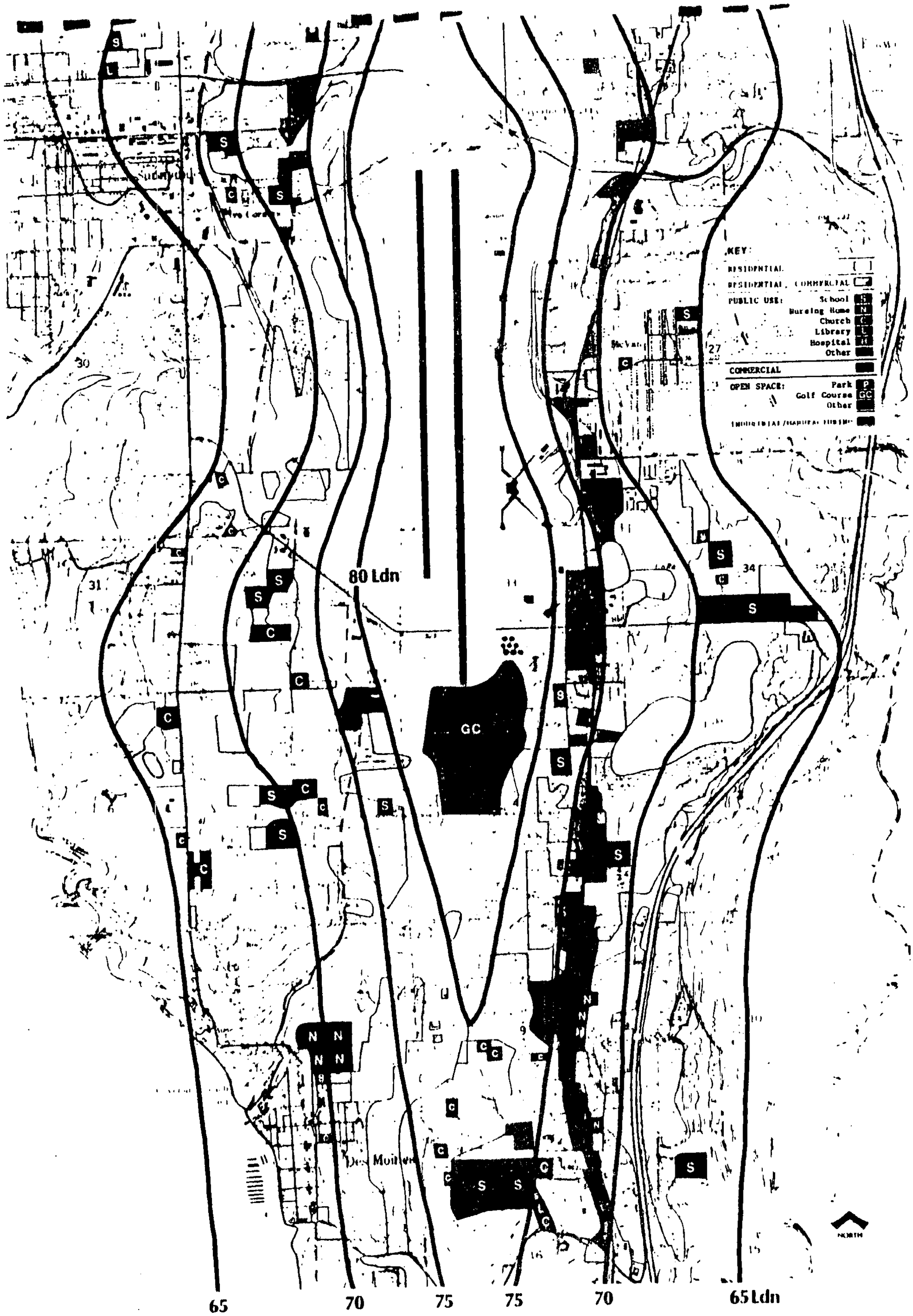
1984/85 BASED ON FAA CRITERIA

NONCOMPATIBLE LAND USE

PORT OF SEATTLE · SEATTLE, WASHINGTON

0 1 2 3,000'

A significant reduction in the number



SEA-TAC INTERNATIONAL AIRPORT

NOISE REMEDY UPDATE

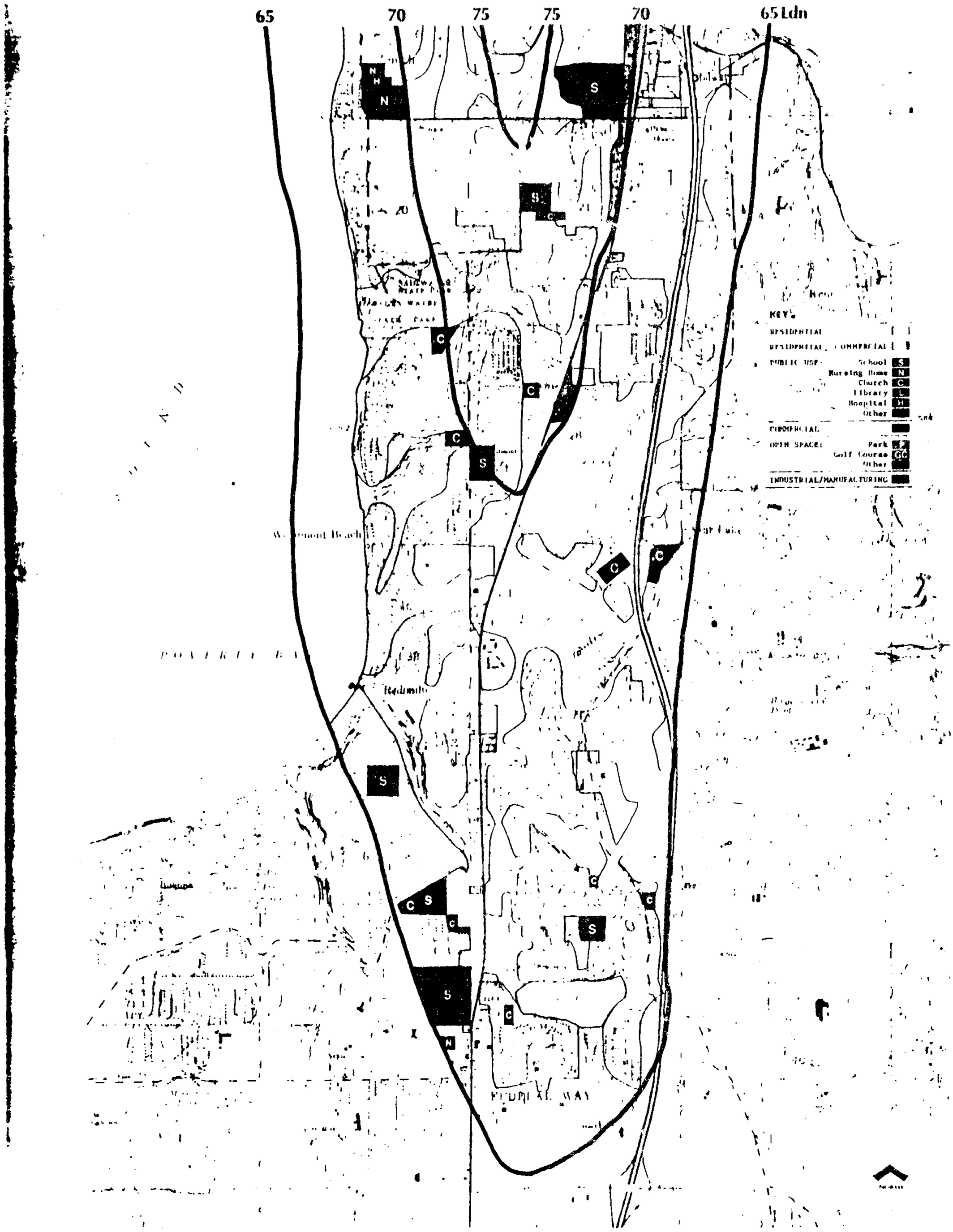
PORT OF SEATTLE · SEATTLE, WASHINGTON

1984-85 · BASED ON FAA CRITERIA

NONCOMPATIBLE LAND USE

A significant reduction in the number of acres/people is expected within the

Exhibit 4 /



SEA-TAC INTERNATIONAL AIRPORT

NOISE REMEDY UPDATE

PORT OF SEATTLE · SEATTLE, WASHINGTON

1984-85 BASED ON FAA CRITERIA

NONCOMPATIBLE LAND USE

0 1 2 3,000'

A significant reduction in the number

Exhibit 4-8

CHAPTER 5

JURISDICTIONAL LAND DEVELOPMENT CONTROLS

CHAPTER 5

JURISDICTIONAL LAND DEVELOPMENT CONTROLS

5.1 Municipalities with Land Use Controls

There are five municipalities with land-use controls within the 1984/85 65 Ldn contour (designated noise-impacted area). The majority of the noise-impacted land is within unincorporated King County. The northern tip of the impacted area is within the Seattle City Limits. To the southwest of the airport a small portion of impacted land is within Normandy Park. South of the airport the entire city limits of Des Moines is located within the designated impact area. And, to the southeast of Des Moines (and the airport) a small portion of Kent is within the 65 Ldn contour. Exhibit 5-1 portrays the jurisdictional boundaries in the designated noise-impact area around Sea-Tac Airport.

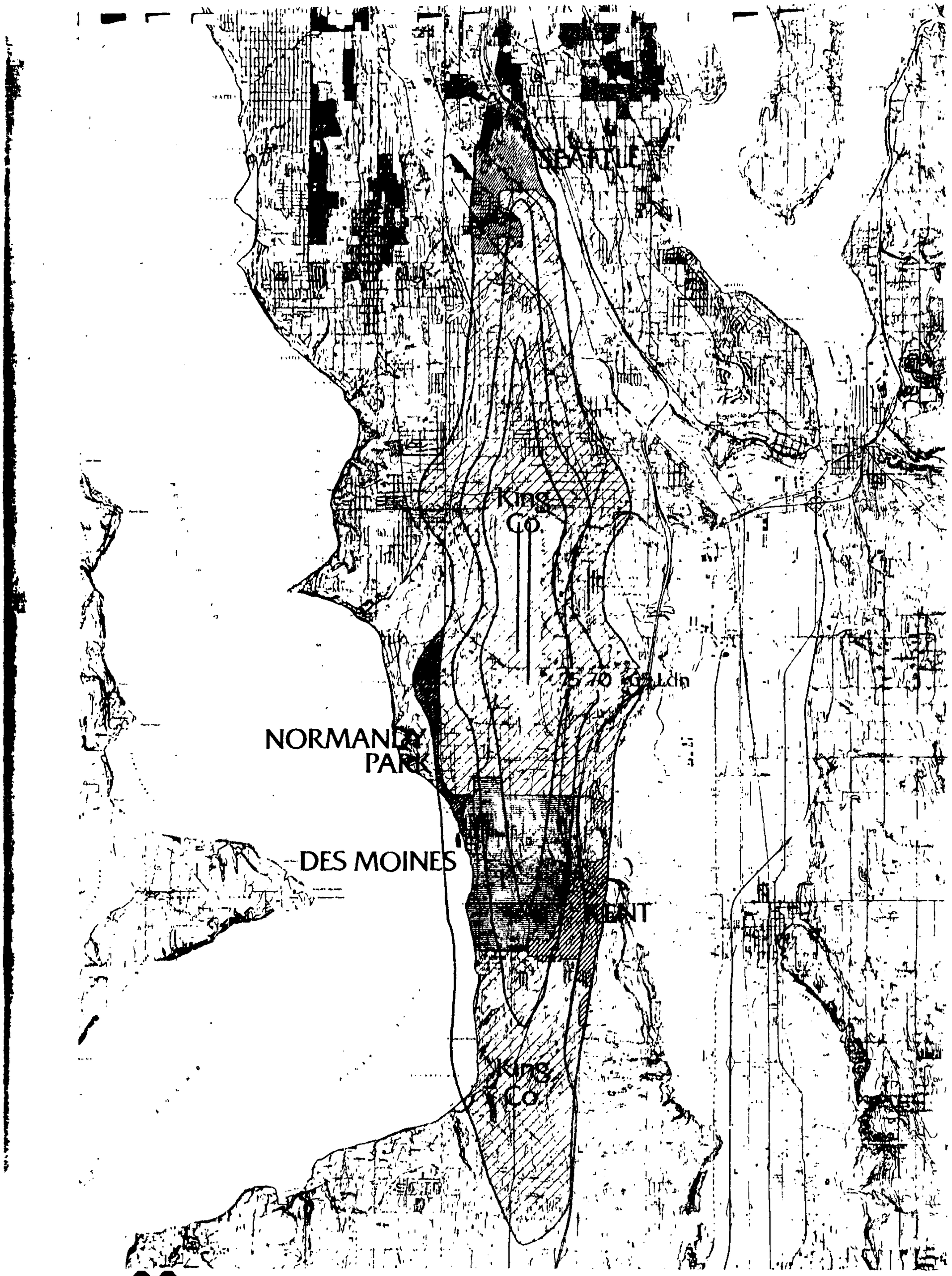
Three of the five municipalities listed above are almost between the 65 and 70 Ldn contours, which is the least impacted band. They are Seattle, Normandy Park and Kent. Des Moines land is located between the 65 Ldn contour and the 80 Ldn contour. There is no incorporated land within the 80 Ldn contour.

Although King County has land use responsibility for the remainder of the impacted area, there could be a change in the jurisdictional status. The smaller cities in the area could annex additional land, and much of the unincorporated area could become new cities. In fact, over the past several years there have been attempts at incorporation in both the Highline Community (generally the area from Des Moines to Seattle) and the Federal Way Community (south end of the noise-impacted area).

All the jurisdictions (including King County) with designated noise-impacted land within their boundaries have land-use plans, zoning codes and building codes. The plans in part reflect the airport-related noise environment, but only the Highline Communities Plan (King County) considered the airport noise environment as a major factor in its planning process. Because of this, the areas directly north and south of the runways (within the 80 Ldn contour) were designated "Airport Open Use" and "Park and Recreation," both considered noise compatible.

With the intention of improving noise insulation qualities of future homes built around the airport, King County recently began a study of building codes. The study is in part funded by the FAA and is scheduled for review in 1985. Other jurisdictions around the airport have voiced an interest in the building code once it has been prepared by the County.

Within the noise contours, the only major planned land use changes are in the areas already acquired by the Port or are programmed for acquisition in the Sea-Tac Communities Plan. In each of these cases the designated residential acquisition areas are currently planned for park and recreation use.



SEA-TAC INTERNATIONAL AIRPORT

NOISE REMEDY UPDATE

1984/85 ANNUAL AVERAGE LDN

JURISDICTIONAL BOUNDARIES

As conditions around the airport improve due to Part 36 and the noise remedy efforts by the Port and other governmental bodies, there may be new development in vacant land outside the Port's designated acquisition areas. If this were to occur, it is expected that the development would be residential and similar in character to the existing community. It is unlikely that the demographics of the area would significantly change other than in the number of residents in the community. At this time an accurate survey of the additional holding capacity of the vacant land around Sea-Tac International Airport is not available. However, an analysis based on current aerial surveys shows that approximately 20,000 additional residents could be housed within the 65 Ldn for 1984/85.

5.2 Consultations with Municipalities

The Port of Seattle staff has actively encouraged municipal involvement in the Noise Remedy Update. Communication channels have been established with the affected communities through Port briefings and presentations to committees and public officials.

The Port staff meets regularly with the Technical Working Committee, the Joint Committee on Aircraft Overflights, and the Sea-Tac Task Force. These committees are comprised of a variety of community interests. The Technical Working Committee has strong participation from noise-impacted neighborhoods as well as representation from the FAA, King County and the Cities of Tukwila and Des Moines. The Joint Committee on Aircraft Overflights holds open meetings attended by representatives from each of the nine County Council districts. Meetings with the Sea-Tac Task Force enable the Port to exchange information with Federal, State, County, local, business and citizen representatives.

In addition to these established committees, Noise Remedy presentations have been made to the City of Des Moines, the City of Normandy Park, and the Federal Way Community Council. Briefings have been held with King County Councilpersons Paul Barden, Ruby Chow, Gary Grant, Bob Grieve, Audrey Gruger, Lois North and Cynthia Sullivan. Meetings with Councilpersons Bill Reams and Bruce Laing have been scheduled for late October.

Briefings have also been held with local state legislators in the 11th, 30th, 33rd and 34th districts, as well as with U.S. Representative Mike Lowry, Representative Norm Dicks (October 29) and Representative Rod Chandler (October 9), plus U.S. Senator Slade Gorton's staff.

Other presentations are scheduled with the Highline Community Council, the City of Kent, the City of Seattle, the City of Tukwila, King County staff, and interested citizens' groups.

CHAPTER 6

COMMUNITY INVOLVEMENT

CHAPTER 6

COMMUNITY INVOLVEMENT

6.1 Workshops

Since the original Noise Remedy Program was established, substantial changes have occurred in the environment, noise levels, finances and community goals. The Port of Seattle is interested in how the community views these changes, and most importantly how it regards the role of the Port in relation to these changes.

In order to elicit the community input that the Port of Seattle requires for a complete program, a series of five sets of Workshops and Open Houses was scheduled in the Sea-Tac environs. These Community Workshops and Open Houses provided a continued interchange of information between the Sea-Tac community and Port staff, enabling the Port to address a number of issues of concern to the community. These issues included the identification of noise remedies for inclusion in the recommended program, the distribution of funds among noise remedies, the use of land acquired under acquisition programs, and density guidelines for the North Sea-Tac Park.

Five sets of two to three Workshops were held in May, August and December, 1983, and January and July, 1984, for a total of twelve separate events. Because the concerns of citizens with respect to the project may vary from neighborhood to neighborhood, the Community Workshops and Open Houses were held at a variety of locations within the study area and scheduled on several consecutive evenings. This allowed for maximum opportunity for attendance by community members and consequently the most efficient interchange of information between the Project Staff and interested citizens. The Workshops were publicized in daily newspapers serving the area as well as in a Port newsletter mailed before each meeting took place.

The Workshops were staffed by members of the Noise Remedy Update Project staff, with representatives from the Port of Seattle, airport noise consultant Peat Marwick Mitchell, King County, and the Federal Aviation Administration available to answer questions and respond to community concerns on a one-on-one basis. The Workshop format differed slightly from series to series as different concerns were addressed. During the first Workshops, for example, the events were focused on small group discussions and information gathering sessions. As the program progressed the focus of the Workshops shifted from gathering initial input to the education of the residents about the progress of the Update itself. Consequently, during the later Workshops residents were given information packets and encouraged to address questions individually to Project staff.

The Workshops and Open Houses elicited a wide variety of public comment: not only were comments and suggestions heard orally, but written responses to the Program were solicited in the form of several community attitude surveys and comment sheets as well. Data from these sources were collected and analyzed for consideration by Project staff. Furthermore, after each event a summary was compiled of suggestions and concerns, which was then mailed to all members on the mailing list, particularly members of the decision-making agencies.

6.2 Community Attitude Survey

The Community Attitude Survey, conducted and prepared by the McClure Research Company under contract with Peat Marwick Mitchell, was completed in January 1984. The purpose of this study was to gather community opinions and attitudes for use in supplementing and refining the Port's understanding of community viewpoints concerning the Noise Remedy Update. This information was used as a guideline to determine:

- suitability and acceptability of various noise remedy programs in the community (in particular: purchase guarantee, cost-sharing of noise insulation, direct purchase of homeowners' avigation easements).

- likely participation rates for each program option, in order to project the financial feasibility of various combinations of programs.

- probable rate of participation in a purchase guarantee program in terms of time to help establish an overall program schedule.

- level of the Port's financial participation in program options.

The Community Attitude Survey consisted of three separate surveys which can be summarized as follows:

1. General Community Survey: a random telephone survey conducted in August 1983, among 151 residents (homeowners and renters) in areas substantially affected by airport noise. The survey was designed to obtain community reactions to general planning and noise management issues facing the Port and the community such as residential development in the Airport vicinity, mandatory fair disclosure of noise levels to home purchasers, and usage and development of area parks.

2. Survey of Community Workshop Participants: a self-administered survey covering the same information as in the General Community Survey, distributed to all participants in a set of three community workshops. A total of 242 participants completed this survey. (August 1983)

3. Target Area Survey: A random-sample telephone survey of 734 homeowners in six areas selected as representative of neighborhoods that might be covered by specific noise remedy programs. This survey covered specific reactions to the noise remedy program concepts: purchase guarantee, cost-sharing of noise insulation, and direct purchase of homeowner's avigation easement. (September-October 1983)

6.3 Committees

A variety of committees and interest groups exist which influence, review and/or advise the progress of the Update project.

The Technical Working Committee, the most influential of these committees, was organized to provide regular and timely inputs to the Project Staff and policy makers throughout the Study. The purpose of the committee is to maintain, through its membership, appropriate liaison with local, regional, state and federal public agencies and organized interest groups. The committee serves in an advisory capacity with members involved in such tasks as review of study products, monitoring of study progress; provision of technical assistance, etc.

The Technical Working Committee is comprised of representatives of government agencies and established organizations with aviation-related interests. This includes such agencies and organizations as the FAA, King County, Puget Sound Council of Governments, Air Transport Association, and several citizen interest groups.

Meetings of the Technical Working Committee permit the agency and group representatives to: be informed about Study progress and findings; describe their group goals, activities, and organizational setup in both oral and written formats; and learn about concerns and suggestions posed by other group representatives on the committee.

The Port of Seattle recommended the formation, in mid-1984, of the Joint Committee on Aircraft Overflights to study airline compliance with FAA-established abatement procedures. Made up of community and aviation representatives, and conducted by the Port Staff, the committee has as its purpose the accomplishment of two basic tasks:

1. Determining if aircraft are complying with the established noise abatement procedures, which consist of turning altitudes and aircraft routes; and

2. Recommending to the Port methods to promote or ensure compliance. It is the responsibility of the Port to formally submit these recommendations to the appropriate responsible agencies (e.g. FAA) or organization (e.g. ALPA) or businesses (e.g. airlines).

The Sea-Tac Task Force was formed in 1983 with the primary purpose of developing a plan for the area in the vicinity of the Sea-Tac Airport. It is comprised of elected officials, business people, residents of the area and personnel from the Port of Seattle, King County and the State of Washington.

Specific goals of the Task Force include redevelopment of the community through a strong economic base, a communication system, a comprehensive plan for roads and public works projects, a visitor and convention plan, including facilities for cultural events and exhibits, a historical sites plan, a public safety plan and a plan for development of the proposed park site near the Airport.

The Policy Advisory Committee is a joint committee comprised of representatives from the Port of Seattle, King County, the FAA, and other organizations or agencies affected by the Sea-Tac Communities Plan. As it was begun in 1973, its original purpose was to assist with the development of the Sea-Tac Communities Plan, thereby facilitating compatibility between the Sea-Tac Airport and its surrounding communities.

Since the adoption in 1976 of the Sea-Tac Communities Plan, the role of the Policy Advisory Committee has changed from an organization actively involved in the development of the Plan to a group involved with monitoring and implementation of the Plan. (Because of this less active role, interest in the committee has been declining and there is the possibility that the committee will be terminated in the future.)

The Port of Seattle also receives input for the Noise Remedy Update from several citizen organizations which exist in the Sea-Tac vicinity. Southend Citizens Against Noise (SCAN) and Sea-Tac Threat are two such organizations which were originally formed to impact implementation of the Sea-Tac Communities Plan. These community-based groups continue to give the Port feedback and input, primarily on issues concerning noise.

Finally, the Port is able to seek community opinion on broader issues relating to the Update (e.g., zoning and land use) through the Highline Community Council and the Highline Community Parks Board.

6.4 Complaints

The community involvement program provides opportunity to interested citizens and groups to become informed about the project by attending Workshops or other meetings. However, since many concerned citizens have individual questions and comments about the Project and its effects on them, the Port of Seattle Noise Remedy Project Manager and Community Involvement Coordinator are available at the Port of Seattle Pier 66 Offices Monday through Friday from 8:00 a.m. to 4:30 p.m. The public is welcome to address their comments to these Port employees by telephone, letter, or in person. Every effort is made to respond to community inquiries in a helpful and timely manner. Data from the interchanges is then collected and analyzed so that public comments can be considered by Project Staff.

In addition to the Noise Remedy Staff located in the Pier 66 Offices, the Port of Seattle has installed a Noise Hotline at the Airport that is staffed 24 hours/day. This hotline is for use by area residents who wish to complain about excessive noise caused by aircraft and other aircraft-related problems. Information collected from the hotline is then documented in weekly reports to the Project Staff.

Finally, questions concerning acquisition, transaction-assistance, and relocation may be addressed to the Port's Relocation Office located in the Sea-Tac environs. Though the primary function of this office is not to respond to complaints about noise in general (these are directed to the Noise Hotline), the staff is able to serve as an additional source for informational interchange with the Sea-Tac community.

SEA-TAC INTERNATIONAL AIRPORT

NOISE COMPATIBILITY PROGRAMS: PHASE II / PART 150

PORT OF SEATTLE : SEATTLE, WASHINGTON

SEA-TAC INTERNATIONAL AIRPORT

PHASE II/PART 150

NOISE COMPATIBILITY PROGRAM

January 1985

Port of Seattle

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INTRODUCTION

0.1 Report Purpose

As part of its daily operations, Sea-Tac International Airport handles roughly 600 flights, with a current annual total of approximately 225,000 aircraft operations. These operations contribute to the regional economy and are a vital component of the national transportation system. Thus, these flights are essential to helping the Port reach its main objective, which is "the development of an increasing flow of commerce into, out of, and through the District, with the aim of broadening and strengthening the economic base of the District while working within the constraints of good environmental planning."

These operations, however, also cause noise which adversely affects many residents of the community surrounding Sea-Tac. The Sea-Tac International Airport Noise Remedy Update has therefore been recently adopted by the Port of Seattle Commission to seek a balance between the efforts to solve these noise problems and the benefits derived by aircraft operations. The Update specifies measures that can be taken to reduce noise at the source as well as measures to reduce noise impacts within homes around the airport.

The purpose of this Noise Remedy report is to document the noise mitigation measures that were considered and the process that was followed by the Port of Seattle, operator of Sea-Tac International Airport, in preparing the noise compatibility program. The intent of the program is to reduce existing non-compatible land uses, and to prevent additional non-compatible land uses within the Sea-Tac environs as described in the Noise Exposure Maps (FAR Phase I/Part 150) previously submitted to the FAA.

This report includes a brief assessment of the current noise environment in the Sea-Tac vicinity; the measures taken by the Port of Seattle to completely evaluate the problem, gathering data from consultations with air carriers, municipalities, and residents of the airport vicinity; alternative noise abatement and noise mitigation measures; and the proposed Noise Remedy Update as adopted by the Port of Seattle Commission and submitted to the FAA for funding approval. This report is submitted subsequent to the Phase I/Part 150 Noise Exposure Maps, and completes the Port's participation in the FAA's Part 150 Program. The programs described in this report are scheduled for implementation as noted, assuming the required funding continues to be available and is appropriated as necessary for implementation.

Part 150 is a Federal Aviation Regulation which was prepared by the FAA to provide guidance for Noise Control and Compatibility Planning in accordance with the Aviation Safety and Noise Abatement Act of 1979 (P.L. 96-193).

0.2 Noise Exposure Maps: Phase I/Part 150: 1984/85

In 1980, the Port of Seattle became convinced that due to significant changes in both the noise environment and the technical know-how used to describe noise, an update of the noise analysis presented in the Sea-Tac Communities Plan was necessary. As a result, the Port prepared the Sea-Tac International Airport Noise Exposure Update which became the first step in updating the Port of Seattle's Sea-Tac Noise Remedy Program.

The Noise Exposure Update identifies 1980 levels of aircraft-generated noise exposure and forecasts future levels of aircraft-generated noise exposure for the years 1985, 1990 and 2000. Based on the information presented in the Noise Exposure Update, the Port began its update of the 1976 noise remedy program in 1983. This update was completed in January 1985 when the Port of Seattle adopted the Noise Remedy Update Program.

As a part of the update process, the Port prepared the voluntary Phase I report. The bulk of this document was written from July to October, 1984, with the assistance of a consultant. It documents existing airport facilities and operations, current and predicted noise contours, land uses within the Ldn 65 contour, jurisdictional land development controls, and community involvement in the planning processes.

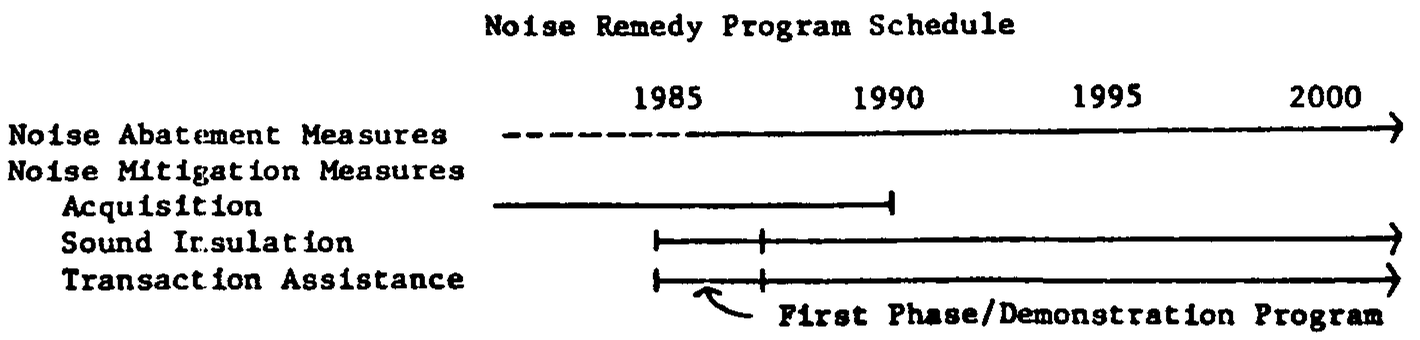
The current submission of this Phase II/Part 150 report follows the Port's submission of Phase I/Part 150, and concludes the Port of Seattle's obligations in meeting the requirements of the FAA's Part 150 Program.

0.3 Noise Remedy Program Schedule

The Phase I/Part 150 report was submitted for FAA review in October, 1984. Subsequently the Port is submitting this Phase II/Part 150 for review in February, 1985.

During 1985 and early 1986, the Port, with assistance and support from the FAA, will carry out the first phase of the updated Noise Remedy Program to test various noise-remedy concepts as outlined in Chapter 6. Outright Acquisition, which has been going on since the Sea-Tac Communities Plan was adopted in 1976, will be continued at an increased rate, and without interruption. It is expected to be completed by 1990. The large scale Neighborhood Reinforcement and Cost-Sharing Insulation portions of the program will follow the test phase in 1986 and will be conducted simultaneously with Acquisition, facilitating a rapid implementation of the Program as well as enabling interaction between the various programs (e.g. relocating a resident whose home has been acquired to a home that is for sale in the Neighborhood Reinforcement area).

All of the nine Noise Abatement remedies described in the Noise Remedy Program are already in effect or will be pursued in 1985.



The Program is scheduled to continue through the end of the century, during which time annual reviews and 5-yearly updates will be conducted. Implementation of the remedies can be refined as necessary. After the year 2000, some ongoing noise remedies may remain in effect, depending on program status.

This general schedule may require changes due to the fact that some of the noise remedies are untested at this point. Experience in carrying out the noise remedy program may lead to a need to update the entire program again at a later date.

0.4 Acknowledgements

This Phase II/Part 150 report was prepared by the Port of Seattle Planning and Research staff. In preparing this report, the staff liberally used several other Port documents, from which entire sections were reproduced without referencing specific citations. This approach enabled the staff to keep the format simple and make efficient use of past Port publications. The following list of acknowledgments names the staff, consultants and documents used in preparing this Phase II/Part 150 document.

PORT STAFF

Director of Planning & Research	Lynn Taylor
Director of Aviation	Vern Ljungren
Project Manager	Barney Myer
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Agency Coordinator	Vicki Schmitz
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CONSULTANT DOCUMENTS

Noise Remedy Update Background Studies prepared by Peat Marwick, Mitchell and Co., 1982 - 1984

PORT DOCUMENTS

Sea-Tac/Communities Plan 1975/76

Sea-Tac International Airport
Noise Exposure Update, 1982

Sea-Tac International Airport Master Plan

Sea-Tac International Airport
Noise Exposure Maps: Phase I/Part 150: 1984/85

Sea-Tac International Airport
Noise Remedy Program: Environmental Addendum: 1984

Sea-Tac International Airport
Noise Remedy Program: Background Studies

CHAPTER I

SUMMARY AND CONCLUSION

CHAPTER 1
SUMMARY AND CONCLUSION

1.1 Summary

The entire Sea-Tac International Airport Noise Remedy Program encompasses an estimated 25 square miles and could affect more than 9,000 single-family residences. These homes fall into one of three designated program areas, which are determined according to noise criteria:[1] Acquisition (areas with noise-impact levels of 80 Ldn and above in 1980, 75 Ldn and above in 2000), Neighborhood Reinforcement (75-80 Ldn in 1980, 70-75 Ldn in 2000), and Cost-Sharing Insulation (70-75 Ldn in 1980, 65-70 Ldn in 2000). In addition to these noise mitigation measures the Noise Remedy Program sets forth several noise abatement measures as well.

The Acquisition program, which is currently underway under the Sea-Tac Communities Plan, has already relocated over 770 homes. As of January 1985, approximately 70 more homes will have been bought by the Port and families relocated under the Sea-Tac Communities Plan. Acquisition under the Noise Remedy Update Program is scheduled to take place over the next 5 years and includes approximately 524 homes.

The goal of the Neighborhood Reinforcement Program is to improve and enhance the existing residential areas in the immediate Sea-Tac Airport vicinity. Approximately 2,393 homes and 474 mobile homes could benefit from the three-point Program, which provides full sound insulation at Port cost and/or sales Transaction Assistance for those who wish to sell their homes and are having difficulty doing so. The Port will also actively encourage local jurisdictions to target the Sea-Tac neighborhoods for other improvements (i.e., landscaping, curbs and gutters, public facilities).

The Cost-Sharing Insulation program provides sound insulation to owners of single-family residences on a cost-share basis. Approximately 7,000 impacted homeowners could benefit from this program.

During 1985 and 1986 the Port of Seattle will conduct a Demonstration Program (the first phase of the program in areas outside the designated acquisition areas) in an effort to test insulation and transaction assistance remedies, and to set up a framework for implementing the plan. Both the Neighborhood Reinforcement and Cost-Sharing Insulation programs will be initiated after the Demonstration Program has been satisfactorily concluded and an assessment made, enabling the Port to conduct the program in the most efficient manner possible. These two programs will be carried out through the year 2000 and perhaps beyond. Acquisition, however, will continue uninterrupted during the Demonstration Program, and is scheduled for completion by 1990.

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[1]Because of FAR Part 36 requirements, noise exposure levels for the Sea-Tac vicinity are expected to decrease significantly over the next 20 year period. The noise criteria used to determine the program boundaries accounts for this decrease in noise exposure.

Although the focus of the Sea-Tac International Airport Noise Remedy Program is on home-oriented remedies, nine noise abatement measures have been included in the program. These range from use of VOR radials to curb aircraft drifting, to the establishment of an Airport Noise Abatement Office, to the curtailing of taxiing of aircraft during nighttime hours. All of the noise abatement and noise mitigation measures are fully described in Chapter Six of this Noise Compatibility Program document.

1.2 Conclusion

In carrying out this Noise Remedy Program the Port of Seattle is breaking new ground not only in attempting to remedy noise at Sea-Tac Airport, and thereby creating an atmosphere for improved relations with its neighbors, but in setting a precedent for other major metropolitan airports throughout the country as well.

CHAPTER 2

NOISE EXPOSURE MAP

CHAPTER 2
NOISE EXPOSURE MAP

2.1 Map Preparation

With airline deregulation, the growth of the commuter airline industry, and other factors changing the noise environment in the Sea-Tac vicinity, the Port of Seattle recognized a need to update existing noise exposure data, and in 1982 conducted an updated noise exposure study. The results were published in a document entitled "Sea-Tac International Airport, Noise Exposure Update, June 1982". This document updated the data and analysis generated in the 1975 Sea-Tac Communities Plan.

Using the Integrated Noise Model (INM Version 2.7) as recommended by the Federal Aviation Administration at the time, 1980 levels of aircraft-generated noise exposure were identified and noise exposure forecasted for the years 1985, 1990, and 2000. Since 1982, noise and aircraft operation data have been collected on a continual basis as part of this Update. This data indicates that the noise exposure identified for 1980 is practically identical to that for mid-1984; the early predictions made in the Noise Exposure Update, therefore have not materialized. As a consequence, the noise contours around Sea-Tac have not changed significantly since 1980.

To identify noise compatible land uses, land-use data was first mapped for all areas within the 65 Ldn contour for 1980. All land uses were then interpreted as being compatible or incompatible using criteria prepared in Part 150 by the FAA. Land uses within the 65 Ldn contour were described in the Part 150/Phase I Report that was previously submitted to the FAA.

2.2 Description of Map

The 65 Ldn contour (for 1980) around the airport acts as the outermost boundary of the Noise Remedy Program and encompasses approximately thirty square miles. Much of the land in this area is in residential use. An approximately equivalent amount is in open use (or simply undeveloped). Commercial use is concentrated along Pacific Highway (Highway 99, which runs parallel to the Airport on the east side), and much of it is related to airport activity. Commercial nodes also exist in unincorporated Burien northwest of the airport and in incorporated Des Moines south of the airport. Public uses, on the other hand, are sprinkled throughout the residential areas, with some clusters of educational and retirement facilities. The majority of the industrial land uses are north of the airport between the 65 and 70 Ldn contours.

Based on the land use compatibility index used for the Phase I/Part 150 Report, non-compatible land uses have been identified and are illustrated in the Phase I/Part 150 Document. These land use maps reveal that the predominant incompatible land uses in the Sea-Tac Airport vicinity are residential. Other incompatible uses include a number of public uses scattered throughout the residential areas, and some commercial uses in the higher noise exposure areas.

CHAPTER 3

CONSULTATIONS

CHAPTER 3
CONSULTATIONS

3.1 Municipalities

The Port of Seattle staff has actively sought out municipal involvement in the Noise Remedy Update. Communication channels have been established since the early 1970's by including local jurisdictions on the many advisory committees and furthermore by meeting independently with the staffs and governing bodies of each entity.

The Port staff has met regularly with three advisory groups that facilitate a flow of information between the Port and local organizations, contributing to the development of an effective Noise Remedy Program. The Technical Working Committee, the Joint Committee on Aircraft Overflights, and the Sea-Tac Task Force all have memberships representing a variety of interests, including federal, state, and local jurisdictions. The Technical Working Committee has strong participation from noise-impacted neighborhoods as well as representation from the cities of Normandy Park, Seattle, Tukwila and Des Moines, the Highline and Federal Way Community Councils, King County, and the FAA. The Joint Committee on Aircraft Overflights holds open meetings attended by representatives from each of the nine King County Council districts and the airlines. Meetings with the Sea-Tac Task Force (a citizen-initiated group) enable the Port to exchange information with Federal, State, County, local, business and citizen representatives.

In addition to these established committees, Noise Remedy presentations have been made to the cities of Des Moines, Kent, Normandy Park, Seattle, Tukwila, and the Highline and Federal Way Community Councils, as well as interested citizens' groups. Many residents living within these areas also contact their King County Councilperson or State Legislator for assistance with these matters. As a result, the Port has had a long history of consultations with both King County and many of the local State Legislators. Numerous briefings have been held with King County Staff and with Councilpersons Paul Barden, Ruby Chow, Gary Grant, Bob Greive, Audrey Gruger, Lois North and Cynthia Sullivan. Meetings with King County Councilpersons Bill Reams and Bruce Laing have been scheduled for February, 1984. Similar briefings have also been held with local state legislators in the 11th, 30th, 33rd and 34th districts, as well as with U.S. Representatives Mike Lowry, Norm Dicks, and Rod Chandler, and with the staffs of U.S. Senators Dan Evans and Slade Gorton.

During preparation of the Noise Remedy Program Update, consultations were held with all public agencies having jurisdiction of land within the 65 Ldn contour. These jurisdictions include King County, and the cities of Des Moines, Normandy Park, Seattle and Kent. All provided valuable assistance in accurately mapping existing land uses including pinpointing schools, churches, residential developments, etc. Furthermore, King County has committed staff resources to update the Highline Community Plan in response to the Port's Noise Remedy Plan. (See the letter on pages 4a, 4b and 4c.)

King County Executive
Randy Revelle

January 24, 1985

The Honorable Gary Grant
Chairman, King County Council
C O U R T H O U S E

RE: Supplemental Appropriation for Highline Community Plan Update

Dear Mr. Chairman:

If approved, the enclosed ordinance will appropriate $38,880 in additional funding to the Planning Division, and $27,515 to Fund 316, the Parks Recreation and Open Space Fund, to undertake a Highline Community Plan update. The Highline update project would begin in July, 1985. Funds will be used to initiate work in 1985 to: (1) update the North Sea-Tac Park Master Plan; (2) resolve land use, zoning, access and capital improvement issues related to Port of Seattle new acquisition areas; (3) determine land use designations for South Sea-Tac open spaces such as the proposed veteran's cemetery site, and (4) update the south Sea-Tac area traffic circulation plans.

On November 19, 1984 Councilmembers rejected a proposed budget of $96,000 for this project, yet approved a budget proviso that the work be accomplished, starting in February, 1985. The least disruptive tradeoffs in the Planning Division's 1985 work program to undertake the Highline Community Plan update as requested in the proviso without additional funds would be a combination of the following actions:

(a) delay work on completing the Vashon plan update until mid 1986;
(b) delay completing the Bear Creek and Snoqualmie community plans six to nine months each (currently, these plans are on schedule and Council transmittal is estimated for summer, 1986);
(c) drop the planned public opinion survey for the Snoqualmie community plan in 1985;
(d) delay submittal of the County Transportation Plan from the fourth quarter of 1985 to the first quarter of 1986; and,
(e) undertake no plan revision studies in 1985. One study in Highline has been requested by the Council (Questar).

Given community expectations and County commitments to address these planning efforts in a timely manner, we believe the County should not defer these responsiblities in favor of the Highline project in 1985. We do, however, believe that the scope and issues emerging in the Highline area require our attention in 1985 as an additional work program item.

As you are aware, however, there is a great deal of concern in the Highline community that the County work to address new and significant land and transportation issues which have arisen since the Highline Community Plan was adopted in December, 1977 and have begun to come to a head in recent months. Key concerns include Port of Seattle acquisitions and land uses, transportation impacts of changes in land use patterns, creation of a Veteran's cemetery, and maintenance of park facilities and lands.

In considering a response to your proviso to address these issues we have assessed four basic options:

1. Undertake the Highline update as requested in the Council proviso through deferral of current work commitments outlined above.

2. Seek a supplemental appropriation of $84,500 to undertake the work outlined in the budget proviso. A 1985 cost reduction of $11,500 can be achieved by starting the project in March rather than February, a logistical necessity at this point.

3. Seek a supplemental appropriation of $27,500 to update only the North Sea-Tac Park master plan in 1985, delaying other Highline update issues to 1986.

4. Begin work on the full scope of issues, outlined in the Council budget proviso, but defer the start date from February to July, 1985, to minimize 1985 expenditures while beginning to address the important issues facing the Highline community. We believe this is the best approach, and propose the attached $66,395 supplemental appropriation to fund the additional staff and resources to undertake the effort.

I respectfully request your approval of the enclosed ordinance, which will implement the attached scope of work. This will enable us to begin soon to address important Highline Community issues, avoid significant delays in other projects, and minimize County expenditures in response to the Council's previous decision not to fund the full costs of beginning this activity in January, 1985.

To transfer Park Forward Thrust funds for the purpose of updating the North Sea-Tac Park master plan element of the Highline update, it is necessary to amend the Forward Thrust "housekeeping" ordinance. We will transmit an amended ordinance to the Council for consideration later in the year.

Your early and favorable consideration of this proposed ordinance will be appreciated. I certify that funds are available.

Sincerely,

RANDY REVELLE
King County Executive

RR/LS/GS:bt

Enclosure

cc: King County Councilmembers
ATTN: Cheryle Broom, Program Director
Jerry Peterson, Council Administrator
Holly Miller, Director, Planning and Community Development
ATTN: Harold Robertson, Manager, Planning Division
Lois Schwennesen, Chief, Community Planning Section
Joe Nagel, Manager, Parks and Recreation Division
Shelly Yapp, Budget Director
ATTN: Jean Baker, Budget Supervisor, Physical Services Section
Debora Gay, Budget Analyst
Greg Scharrer, Budget Analyst

3.2 Air Carriers and Other Airport Users

The Port of Seattle has actively encouraged involvement of the forty air carriers and numerous users (concessionaires, airport employees, etc.) of Sea-Tac International Airport in the formulation of the Noise Remedy Update. A number of opportunities have been made available to these parties to promote such involvement.

The Technical Working Committee, for example, which has been responsible for advising the Port on policy issues concerning Noise Remedy, has had a representative of the Air Transportation Association actively participate since the Committee's inception in May, 1982.

However, it is the Seattle Airlines Airport Affairs Committee (the Airport Affairs Committee), comprised of 24 of the air carriers serving Sea-Tac International Airport, that functions as the main point of contact between the airport management and the airlines on major policy, financial, and planning matters such as the Noise Remedy Program. The important role played by the Airport Affairs Committee is based upon the contracts between the airlines and the Port concerning landing fees and other matters relating to the air carriers' operations at Sea-Tac. These contracts contain restrictions on the funding of major new capital improvement projects which require the Port to obtain the approval of the air carriers as a condition to the financing of those expenditures through increases in landing fees. Review of and comment on the Noise Remedy Program by the air carriers is therefore necessary to the financing and implementation of the Noise Remedy Program.

The Seattle Airlines Airport Affairs Committee has participated in continuing informal review of the Noise Remedy Plan. During 1984, the Port of Seattle conducted several presentations and discussions concerning the Noise Remedy Plan and in the fall of 1984 several follow-up meetings on the subject of airport finances, including funding for Noise Remedy, were held with the Airport Affairs Committee's Finance Committee. Detailed briefings of the proposed program were presented, offering opportunity for informal review by the air carriers. A prime concern of the air carriers has been that the Port use Noise Remedy funds in the most cost-effective manner possible and within guidelines that are closely coordinated with the FAA.

This close working relationship between the Airlines and the Port culminated in success for both parties as the Airlines Airport Affairs Committee has indicated its general support to the Noise Remedy program for the years to come. In his testimony at the November 13, 1984 Public Hearing on the Noise Remedy Update, Cliff Argue, Chairman of the Airlines' Airport Affairs Committee, stated on behalf of the committee that the Port has done a good job preparing the program, and that the Airport Affairs Committee is "...prepared to work with the (Port) staff in the spirit of cooperation and partnership to implement the various aspects of it."

The Committee's statement was accompanied by the following concerns, all of which have been addressed by the Port:

1) The Port should commit to a strong public relations program, emphasizing the importance of the airport and air carriers in everyone's lives.

2) The Port must increase the efforts to work with other local government agencies to bring about responsible land-use planning and zoning that is compatible with the noise generated by the airport. All jurisdictions must help.

3) The airlines request continual involvement during implementation such as has occurred during the planning stages.

While participation of airport users in the formulative process of the Noise Remedy Update has not been as actively solicited by the Port, tenants have been kept well informed of the Noise Remedy Program through articles appearing in Flyer, a monthly newsletter published by the Port of Seattle for employees and tenants of Sea-Tac International Airport. Articles such as "Workshops Involve Community in Noise Study" and "Airlines Contribute to Noise Remedy Effort" inform both airlines and airport users of Noise Remedy progress and extend open invitations to attend Noise Remedy events.

Participation of the general public (also airport users) can be found in the following chapter entitled "Community Involvement."

CHAPTER 4

COMMUNITY INVOLVEMENT

CHAPTER 4
COMMUNITY INVOLVEMENT

4.1 Workshops

In order to elicit the level of community input that the Port of Seattle required for a complete program, a series of Workshops and Open Houses was scheduled in the Sea-Tac environs. These Community Workshops and Open Houses provided a continued interchange of information between the Sea-Tac community and Port staff, enabling the Port to address a number of issues of concern to the community. These issues included such topics as the identification of noise remedies for inclusion in the recommended program, the Transaction Assistance Program, program boundaries, the distribution of funds among noise remedies, and density guidelines for and the use of land purchased under acquisition programs.

Five sets of two to three Workshops were held in May, August and December, 1983, and January and July, 1984, for a total of twelve separate events. Total attendance at the workshops was about 1,500 people. Because Port staff was aware that the concerns of citizens with respect to the project often vary from neighborhood to neighborhood, the Community Workshops and Open Houses were held at a variety of locations within the study area and scheduled on several consecutive evenings. This allowed for maximum opportunity for attendance by community members and consequently the most efficient interchange of information between the Project Staff and interested citizens. The Workshops were publicized in daily newspapers serving the area as well as in a Port newsletter mailed before each meeting took place.

The Workshops were staffed by members of the Noise Remedy Update Project staff, with representatives from the Port of Seattle, airport noise consultant Peat Marwick Mitchell, King County, and the Federal Aviation Administration all available to answer questions and respond to community concerns on a one-on-one basis. The Workshop format differed slightly from series to series as different concerns were addressed. During the first Workshops, for example, the events were focused on small group discussions and information-gathering sessions. As the program progressed the focus of the Workshops shifted from gathering initial input to the education of the residents about the progress of the Update itself. Consequently, during the later Workshops residents were given information packets and encouraged to address questions individually to Project staff.

The final workshops, in which seven stations were set up in a numerical order, serve as an example of this procedure. Residents were given an informational packet and comment sheet upon arrival, and encouraged to visit all stations at their own pace, spending the most time at those stations with which they were the least familiar. Port, King County, and FAA officials staffed each station to answer questions and provide explanations.

Topics represented at the final workshop were as follows:

1. Accomplishments/Terminology
2. Program Area Boundaries
3. Soundproofing of Residential Structures
4. Transaction Assistance
5. Land Uses
6. Demonstration Program
7. Noise Remedy Program Schedules

Following several hours of one-on-one discussion a group question and answer session was held, allowing residents to pose more general questions to Port officials.

The Workshops and Open Houses produced a wide variety of public comment: not only were comments and suggestions heard orally, but written responses to the Program were solicited in the form of several community attitude surveys and comment sheets as well. Data from these sources was collected and analyzed for consideration by Project staff. Furthermore, after each event a summary was compiled of suggestions and concerns, which was studied by the Noise Remedy Program staff and mailed to all names on the mailing list, particularly members of the decision-making agencies.

Though most people who filled out comments sheets at the workshops had some sort of criticism of the program, the majority of these comments were constructive in nature (e.g., "The Noise Remedy Program is good, but should include more homes."), and most were accompanied by appreciative remarks about the efforts by the Port of Seattle to mitigate the noise. The most repeated criticisms at the final workshop were:

- o Program boundaries should be enlarged.
- o Aircraft must stay in their prescribed paths to ensure program effectiveness.
- o If homeowner desires to sell his/her home, it may not bring a fair market value.
- o Program should be implemented at a swifter rate.
- o Port of Seattle must work with King County to improve police and fire protection in the area.

All of these concerns have since been addressed by the Port Staff, and some have been incorporated into the Noise Remedy Program. Community groups in the area have expressed their appreciation to the Port for addressing the problems, and have since declared their general support of the Program.

4.2 Community Attitude Surveys

The first Community Attitude Survey, conducted and prepared by the McClure Research Company under contract with Peat Marwick Mitchell, was completed in January, 1984. This Community Attitude Survey consisted of three separate surveys which can be summarized as follows:

1. General Community Survey: a random telephone survey conducted among 151 residents (homeowners and renters) in areas substantially affected by airport noise. The survey was designed to obtain community reactions to general planning and noise management issues facing the Port and the community such as residential development in the Airport vicinity, mandatory fair disclosure of noise levels to home purchasers, and usage and development of area parks. (August 1983)

2. Survey of Community Workshop Participants: a self-administered survey covering the same information as in the General Community Survey, distributed to all participants in a set of three community workshops. A total of 242 participants completed this survey. (August 1983)

3. Target Area Survey: A random-sample telephone survey of 734 homeowners in six areas selected as representative of neighborhoods that might be covered by specific noise remedy programs. This survey covered specific reactions to the noise remedy program concepts: purchase guarantee, cost-sharing of noise insulation, and direct purchase of homeowner's avigation easement. (September-October 1983)

The purpose of this study was to gather community opinions and attitudes for use in supplementing and refining the Port's understanding of community viewpoints concerning the Noise Remedy Update. This information was used as a guideline to determine:

- suitability and acceptability of various noise remedy programs in the community (in particular: transaction assistance, cost-sharing of noise insulation, direct purchase of homeowners' avigation easements).

- likely participation rates for each program option, in order to project the financial feasibility of various combinations of programs.

- probable rate of participation in a purchase guarantee (transaction assistance) program in terms of time to help establish an overall program schedule.

- level of the Port's financial participation in program options.

Because it had become apparent that public meetings were attracting many of the same people again and again, and consequently were not providing a completely accurate perspective of community attitudes, the Port of Seattle decided to conduct a second survey to determine public awareness of the Port's activities, as well as community interest in and support of such programs as the Noise Remedy Update.

Consequently, during November 1984, the Port, with the assistance of GMA Research Corporation, conducted an updated community attitude survey. Airport related objectives of the survey included:

- o Measure the community's awareness of and attitude toward the Noise Remedy Program, distinguishing the attitudes of the impacted neighborhoods from those of the southwest King County community at large.

- o Learn whether the community views the noise level as a problem and obtain recommended solutions.

- o Determine the community's level of awareness of and attitudes toward airport activities.

- o Discover the Port's level of impact on the community and the reasons for these perceptions.

This survey was conducted by telephone on a random sample of 600 King County residents selected by scientific means from an area spanning from West Seattle to the southern King County border, and from the Valley Freeway (Highway 167) to Puget Sound. Two focus groups of ten people each were first used in a discussion format in order to determine key issues and themes from which the survey questions were derived. Although results of this survey are not available as of this writing, they will be helpful as the Noise Remedy Program is implemented.

4.3 Committees

A variety of committees and interest groups exist which influence, review and/or advise the progress of the Update project.

The Technical Working Committee, the most influential of these committees, was organized to provide regular and timely inputs to the Project Staff and policy makers throughout the Study. The purpose of the committee was to maintain, through its membership, appropriate liaison with local, regional, state and federal public agencies and organized interest groups. The committee served in an advisory capacity with members involved in such tasks as monitoring of study progress, review of study products, communication of community and agency attitudes toward the study, provision of technical assistance, etc.

Meetings of the Technical Working Committee permitted the agency and group representatives to: be informed about Study progress and findings; describe their group goals, activities, and organizational setup in both oral and written formats; and learn about concerns and suggestions posed by other group representatives on the committee.

The Technical Working Committee was comprised of approximately thirty representatives of government agencies and established organizations with aviation-related interests. This included such agencies and organizations as the FAA, King County, Puget Sound Council of Governments, Air Transport Association, representatives of the City governments within the program boundaries, and several citizen interest groups.

During January and February, 1984, a sub-committee of the Technical Working Committee met several times a week on a regular basis to review the developing plan and recommend changes and additions. Out of this work evolved a report of sixteen separate recommendations concerning changes in the Noise Remedy Program. Ten of these were completely accepted by the staff, four were partially or possibly accepted, and only two were not accepted at all. The summary on the following two pages outlines these sixteen sub-committee recommendations and their influence on the program.

SUMMARY

Influence on the Proposed Subcommittee Recommendations (16)	Noise Remedy Program (10 Accepted) (4 Partially or Possibly Accepted) (2 Not Accepted)
1. Additional acquisition along 24th Ave. S.	No. The problem being addressed is not aircraft noise, & the acquisition would merely move the identified problem east.
2. Additional acquisition of residenial islands.	Partial. Although the islands as such were not incorporated, a change in the application of the noise criteria resulted in the inclusion of some of the identified "island" homes.
3. Additional purchase assurance areas.	Partial. The reasoning accepted, & both areas accepted although area reduced.
4. Program should be implemented soon.	Yes. In fact, sooner than anticipated because staff paralleled program development & environmental process.
5. Acquisition should be completed in 1990 at a rate of eight homes per month.	Yes. Because of increases in acquisition, the rate of ten homes per month is needed to complete acquisition in 1990.
6. Purchase Assurance Demonstration should start before 1986.	Yes. Start Demonstration in 1985 with ten homes in Transaction Assistance.
7. Start sound insulation as soon as acquisition is complete.	Yes. Start insulation in 1985 with a Demonstration Project and continue thereafter (1986+). Better by years than the subcommittee recommendation.
8. Establish some form of community advisory committee.	Yes. Establish the Forum and continue issue-related committees.
9. Priorities for selecting homes based on 1983 workshops.	Yes. Workshop comments are on file and will be incorporated as the program is developed.
10. Two appraisals for Purchase Guarantee Program.	Partial. Consider comparables both within and outside the noise impacted area in making appraisals.
11. Process for Purchase Assurance Program.	Partial. A similar process is recommended in the Transaction Assistance Program.

12. Avigation Easement should be acquired in conjunction with other remedies.	Yes.
13. Sound insulation for buyer in Purchase Assurance Program.	Yes. Same idea carried into the Transaction Assistance process.
14. Resale of homes should require owner occupancy.	No. Not legal to tell property owner how to live in new purchase.
15. New construction should not be eligible for noise remedies.	Yes.
16. Committee should be involved in Purchase Assurance program development.	Yes. Committee has been involved, and a similar committee will continue involvement as program proceeds.

This summary is representative of the kinds of correspondence that occurred between the Technical Working Committee and the Port Staff.

In mid-1984 the Port of Seattle, responding to an increase in public comment concerning a change in overflights, established the Joint Committee on Aircraft Overflights, a citizens' committee to study airline compliance with FAA-established noise abatement procedures at Sea-Tac Airport. This committee is comprised of community and aviation representatives and conducted by Port staff. There are fourteen voting members, which include: two citizen representatives of each of the two county council districts that contain Sea-Tac Airport within their boundaries and one representative each from the remaining seven districts (these representatives are appointed by their councilperson); one representative each from the Air Transport Association; the Airline Pilots Association; and the Washington Pilots Association. In addition, several others regularly attend meetings, working closely with the committee in a consultation capacity: these are representatives from the FAA, the City of Seattle, and the Port of Seattle.

The committee has as its purpose the accomplishment of two basic tasks:

1. Determining if aircraft are complying with the established noise abatement procedures, which consist of turning altitudes and turning routes, and recommending to the Port methods to provide or ensure compliance. It is the responsibility of the Port to formally submit these recommendations to the appropriate responsible agencies (e.g., FAA) or organizations (e.g., ALPA) or business (e.g., airlines).

2. At the request of the Port, the Committee recently voted to take upon itself the additional task of examining current flight tracks for their appropriateness, and in certain cases recommending procedural changes.

Monthly meeting agendas include both educational and problematic items. Experts and involved parties such as pilots and air traffic controllers speak to the group about noise abatement procedures. Committee members then use this background information as a reference point from which to determine if pilots and controllers are complying with noise abatement procedures.

In order to determine this compliance, samplings of traffic have been furnished from FAA air traffic control computerized data. An independent consulting firm subsequently transposed this data onto maps of the airport community which resulted in the establishment of "noise gates" based on current noise abatement procedures. These gates recognize aircraft tracks that are not complying with present noise routes and altitudes. Committee members analyze this and other data, submitting their reports to the appropriate agencies.

To date, meetings of the Joint Committee on aircraft overflights have resulted in the following:

- o 24 hour Noise Complaint Hotline
- o "Sound Information" Newsletter
- o Newspaper columns addressing noise issues of particular concern to local citizens.
- o Noise Abatment Signs placed at ends of runways.
- o Letter to Airmen outlining Sea-Tac's noise abatement procedures.
- o Port Representatives speak to Citizens' Groups.
- o Noise Abatement Office.

The Policy Advisory Committee is a joint committee comprised of representatives from the Port of Seattle, King County, the FAA, and other organizations or agencies affected by the Sea-Tac Communities Plan. Established in 1973 by the Port of Seattle, its original purpose was to assist with the development of the Sea-Tac Communities Plan, thereby facilitating compatibility between the Sea-Tac Airport and its surrounding communities.

Since the adoption in 1976 of the Sea-Tac Communities Plan, the role of the Policy Advisory Committee has changed from an organization actively involved in the development of the Plan to a group involved with monitoring and implementation of the Plan. At the public hearings held by the Port in November, 1984, residents of the noise-impacted areas expressed dissatisfaction with the current status of the Policy Advisory Committee and requested the implementation of a more effective method of community input.

As a result of a Port study of community input, including the testimony received through the public hearings, the Port has recommended replacing the Policy Advisory Committee with a different method for coordinating Port/local government/citizen issues: the Airport Community Forum. The purpose of this Forum would be to provide an arena through which jurisdictions could exchange information and coordinate the airport-related projects which each is undertaking. Once implemented, the Forum would be comprised of representatives from government jurisdictions whose activities may impact the Sea-Tac Communities. Jurisdictions represented would include the Port, King County, the FAA, the Washington State Department of Transportation, local governments, and school, fire, and utility districts in the area.

The bi-monthly meetings of the Forum would be widely publicized, and citizen attendance and participation would be encouraged. Citizens would be given an opportunity to comment on issues discussed by Forum members, and to initiate discussion of issues which concern them. A Forum newsletter would be issued which would contain summaries of issues previously discussed at meetings, highlights of issues to be discussed, and details of how citizens could get involved.

The Port of Seattle also received input for the Noise Remedy Update from several citizen organizations which exist in the Sea-Tac vicinity. The Sea-Tac Task Force is a self appointed committee that was formed in 1983 with the primary purpose of developing a plan for the area in the vicinity of the Sea-Tac Airport. It is comprised of elected officials, business people, residents of the area and personnel from the Port of Seattle, King County and the State of Washington.

Specific goals of the Task Force include redevelopment of the community through a strong economic base, a communication system, a comprehensive plan for roads and public works projects, a visitor and convention plan, including facilities for cultural events and exhibits, a historical sites plan, a public safety plan and a plan for development of the proposed park site near the Airport.

Southend Citizens Against Noise (SCAN) and Sea-Tac Threat are two additional such organizations which were originally formed by citizens to impact noise remedy planning around Sea-Tac. These community-based groups continue to give the Port feedback and input, primarily on issues concerning noise. The input from these groups has been channeled through the Technical Working Committee which has heavily influenced the planning efforts.

Finally, the Port is able to seek community opinion on broader issues relating to the Update (e.g., zoning and land use) through the Highline Community Council and the Highline Community Parks Board

4.4 Public Meetings and Public Hearings

On the evening of October 8, 1984, the Port of Seattle staff made a full presentation to the Port Commission of the proposed Noise Remedy Plan as it was prepared by the Planning and Research Department. Over four hundred citizens attended this meeting, which was advertised through Port newsletters and local media, and held at a local high school. No questions or comments were taken at the presentation; these were reserved for the public hearings that were scheduled in November. Rather, this was an occasion for the public to learn the full scope of the proposed Noise Remedy Program as prepared by the staff and advisory groups, and to understand its potential impact on the Sea-Tac neighborhood. To assist with this process, the Port staff prepared a comprehensive presentation and slide show which was followed by questions from the Port Commission. Finally, citizens were given maps of the proposed Program boundaries and copies of the proposed Noise Remedy Program to take with them. Port staff was available to answer individual questions both immediately after the presentation and via telephone during the ensuing weeks.

The Port of Seattle conducted two public hearings on the Noise Remedy Update on November 13 and 19, 1984. In order to give a greater opportunity for all to attend, the time of the hearings were staggered: The November 13 hearing was held from 3:00 - 5:00 p.m., and the November 19 hearing was scheduled from 7:30 - 9:30 p.m. Approximately 275 people attended these hearings, which were held in the Sea-Tac vicinity. The Port Commissioners received oral testimony from a combined total of sixty people, and over 55 pieces of written testimony in the form of letters and comment sheets, many authored by more than one individual. Representatives from the FAA, Seattle Airlines Airport Affairs Committee, local citizen interest groups, churches, and homeowners all voiced their opinions of the Noise Remedy Update.

There were several significant changes made to the Noise Remedy Program as a result of the testimony received. These changes were implemented as follows:

- o Due to concerns about how the Transaction Assistance Program will work, particularly about whether the value of houses outside the noise-impacted area will be used in determining a fair market value, the Port adjusted the plan to specifically consider sales data from outside the noise-impacted area as well as nearby.

- o In response to comments from representatives of several churches within the 65 Ldn contour recommending that the Port extend eligibility for program benefits to churches, an amendment was made, giving the Port the flexibility to offer some form of compensation to churches.

- o Because of many residents' concerns that the plan be amendable, the plan was changed to include a provision for annual reports on the progress, effectiveness, and cost of the Noise Remedy Program, as well as a major review and update to be conducted every five years, with full public review.

- o Due to questions regarding the accuracy of the noise contours, the plan was changed to include possible adjustments once information is available from two new monitors being installed northeast and southwest of the Airport. These changes might take place under the yearly review or 5-yearly update process.

- o As a result of citizen demand for substantial involvement in the Noise Remedy Program, the oversight mechanism was clarified to ensure that provisions were made for inclusion of citizen advisory committees to monitor implementation of the program.

- o Because of citizens requesting land use changes in Port-owned clear-zones, the Port has increased efforts to involve King County in planning these clearzones during 1985.

CHAPTER 5

ALTERNATIVE NOISE ABATEMENT AND NOISE MITIGATION MEASURES

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5.1 Introduction

This chapter documents noise abatement and noise mitigation measures considered to achieve a greater compatibility between an airport and its neighboring communities. Many of these measures have been previously considered for use at Sea-Tac International Airport, and some have been implemented or are currently recommended for implementation under the Noise Remedy Program. This chapter identifies the range of noise remedies available, presenting them according to implementation authority (i.e., Port of Seattle, other local jurisdictions, and FAA), and evaluates the measures in terms of their feasibility at Sea-Tac. A more detailed description of these measures as well as a more thorough evaluation of the feasibility of their implementation at Sea-Tac can be found in the Noise Remedy Update Background Studies prepared by Peat, Marwick, Mitchell and Company, and available in the Port of Seattle Planning and Research offices.

As a result of the public workshops held in the Sea-Tac communities in May, 1983, many citizens identified noise abatement and mitigation measures that they would like to see implemented. These measures are summarized on the following pages and are more fully described in the Background Studies.

5.2 Noise Remedies Under Port of Seattle's Implementation Authority

1. Curfews are regulations banning aircraft operations during certain nighttime hours. An airport operator can adopt and enforce a curfew, which most often requires flights to be rescheduled. He must, however, work very closely with the airport users to identify economic impacts or hardships that might accrue, and weigh them against the benefits. A curfew at one airport for example, imposes a systemwide effect on the national and international air transportation network, because it effectively reduces the arrival and departure "time windows" at other airports. The airport operator therefore must also be sure that a proposed curfew places no undue burden on interstate or foreign commerce and that it does not unjustly discriminate between different categories of airport users.

   Since the impetus for a curfew probably comes from neighboring communities, and since tower operations will undoubtedly change, representatives of surrounding towns and the FAA must also be included in the decision-making process.

   Nearly 40 airports in the U.S. have curfews, the most common time period being from 10:00 p.m. to 6:00 a.m. Furthermore, many airports have less than full curfews.

   A general ban on nighttime operations at Sea-Tac would probably be found to be unconstitutional on the basis that a ban could place an undue burden on interstate and foreign commerce. A major factor would probably be that there are no other air carrier airports in the local region to which the flights could be shifted.

With regard to Sea-Tac International Airport, a limited rescheduling of flight times on a voluntary basis may be practical, particularly with regard to short-haul flights (less than 200 miles). The emphasis here would be to try to reschedule those short-haul flights between 10 p.m. and 7 a.m. to operate earlier or later, as the case may be. The measure would apply mostly to those flights that operate before midnight and between 5 a.m. and 7 a.m.

A strict nighttime curfew at the Airport is considered impractical at this time. However, limited voluntary rescheduling of short-haul nighttime flights by jet aircraft into and out of Sea-Tac Airport has been recommended in the Noise Remedy Program (see Chapter 6, measure A-1).

2. Noise monitoring systems can be used to record noise levels in areas that experience aircraft noise problems. Permanent noise monitoring systems typically cost over $300,000; portable systems have a wide range of capabilities, and their cost varies accordingly.

A complete monitoring system could include monitors for weather and flight profiles, remote sensors that capture single-event hourly and daily noise levels against an ambient background, and an aircraft identification system. The data would be integrated and collated by a central processing unit and stored for retrieval. The output of such a system could include the following information: single-event excesses, runway use, flight path use, airport ground noise, community background noise, and airline and aircraft identification.

Such reports are usually provided monthly, but the system could be programmed for additional or other reporting periods. Information provided in the reports could be analyzed to determine (1) which aircraft operations are not in compliance with noise abatement procedures, (2) the airport's contribution to total noise, (3) community background noise other than that from airport operations, and (4) the relative performance by air carrier and other types of aircraft.

In 1976, a permanent noise monitoring system was recommended in the Sea-Tac Communities Plan. The original system was designed and installed at the Airport in July 1979 and began operations in September of that year. In 1982, the Sea-Tac International Airport Noise Exposure Update reevaluated the noise analysis in the 1976 Sea-Tac/Communities Plan. This recent study states that noise exposure levels differ from those shown in the Sea-Tac/Communities Plan; noise exposure levels have decreased in some areas but increased in others.

The Noise Exposure Update indicates that there are significant "noise bulges" on both the east and west sides of the Airport. These areas contain noise levels that may be comparable to noise levels in some of the areas currently being monitored directly north and south of the runways. Predictably, these "bulges" are located at the northern and southern sidelines of the runway. They are caused by the approach and takeoff operations. However, no monitoring stations are within the existing noise monitoring system to validate this information, to

monitor continuing noise exposure trends, or to gather objective information on which to base future noise remedy planning activities for these specific areas. Further, community members have requested that additional noise measurements be taken in the areas adjacent to the Airport.

Because of this gap in the noise data, the Port Commission recently approved the acquisition of two additional permanent monitors to be located on the southwest and northeast sides of the Airport. By installing monitors on both the east and west sidelines, it will be possible to monitor noise levels generated from approaches and departures, including the reverse thrust of arrivals and the engine run-ups associated with departures. The following two locations have been selected for the additional monitoring stations:

EAST SIDE OF AIRPORT: A "noise bulge" with predicted levels of more than 70 Ldn occurs in the Riverton Heights area (S. 152nd and 26th S.) immediately northeast of the Airport. This area has reportedly shown an increase in the noise levels over the noise exposure levels predicted in the original Sea-Tac/Communities Plan.

WEST SIDE OF AIRPORT: A "noise bulge" with predicted levels of more than 70 Ldn occurs in the area immediately southwest of the Airport (around S. 192nd Street and 8th S.).

In summary, as long as aircraft operate from Sea-Tac there will be a need to monitor noise around the Airport in order to continue validation of the model predictions and provide continuous assessment of the impacts of aircraft operations on the communities surrounding the Airport. It is the aim of this noise abatement measure (A-4, Chapter 6) to provide this data throughout the Noise Remedy Program and beyond.

3. Noise abatement staffs have been created at many airports to process complaints and to initiate and coordinate operational measures to control aircraft noise. These noise abatement staffs are part of a considerable effort that has been made to make the public aware of airport efforts to control aircraft noise.

The Port of Seattle has already established a relocation office and has staff who are responsible for the noise monitoring system and noise remedy planning. While these staffs are expected to continue in their roles, the Port of Seattle Commission has authorized, as part of the Noise Remedy Program, (see measure A-5, Chapter 6), the formation of a Noise Abatement Office to be located at Sea-Tac International Airport. The primary responsibility of this office will be to initiate, implement, and monitor the various noise abatement measures to be carried out by the Port of Seattle.

4. Noise abatement committees are not an "operational strategy," but they provide a forum for the airport and the community to exchange information and ideas on noise abatement. To plan and implement a noise abatement program, such committees should have broad representation from the affected communities, airport users, special interests, and the airport operator. The committees can influence development actions and make constructive contributions to the airport master planning process.

   The Noise Remedy Program calls for the establishment of such a noise abatement committee to monitor noise remedy activities and recommend new procedures. This committee was established in May, 1984, as the Joint Committee on Aircraft Overflights. The committee membership, which consists of representatives from organized private or semi-private community/interest groups and also from local, regional, state and federal public agencies, reports to the Port of Seattle Aviation Department (see measure A-6, Chapter 6).

5. Location of facilities. Sometimes a neighborhood may be located off to the side of the major runways at an airport but very near a parking ramp (perhaps for cargo or general aviation aircraft). Under such circumstances, residents may be more significantly bothered by ground power units, engine starts, and taxi operations, than by flight operations.

   Although it is unlikely that a facility such as a terminal building or an air cargo building would be located just to reduce the noise from the very localized ground sources around it, the intent behind this action is that noise should at least be considered when the opportunity or necessity to locate facilities arises for some other reason in the master planning process. As a general rule, the aircraft parking ramp should be located as far as possible from residential areas with any buildings located between the ramp and any nearby residences.

   Such a measure at Sea-Tac would relate to the placement of apron expansion areas and new aprons associated with air cargo rather than to the placement of the terminal building. Wherever practical, aprons should be as far removed from off-Airport noise-sensitive areas as possible and buildings should be located to buffer residences. Measure A-7 (Chapter 6) of the Noise Remedy Program addresses this abatement measure and therefore consideration will be given to noise in the master planning process.

6. Restrictions on the ground movement of aircraft is an action aimed at reducing the need to use ground power units, make engine starts, and taxi. An appropriate regulation might require that an aircraft not be moved to alternate gates or not be moved from a maintenance hangar to a gate under its own power: aircraft movement would require towing instead. Hours during which the action would be in effect may or may not be specified. Other types of restrictions on ground operations could require pilots to check for delays with ground control prior to engine start. Such "gate hold" procedures reduce idling time, taxi noise, and fuel consumption.

Under this action, normal arrivals and departures are presumed to continue operation as usual, going through their start, taxi, and shutdown procedures as required. However, the same operations for maintenance purposes or schedule changes would require towing. Although this would not reduce the noise from an individual ground operation, the number of times each of these operations is carried out is reduced and, thus, so is total noise exposure.

Improvements from adoption of this kind of measure would be small, noticeable only to residents quite near the ramp areas who can identify significant noise from ground sources.

Although as few as four or five movements under power occur during the nighttime hours, the benefits to the adjacent communities in terms of alleviating single-event annoyance would be substantial. The Port of Seattle, therefore, has recommended in Chapter 6 (measure A-8) that airlines be requested to tow aircraft which must be repositioned or moved to or from maintenance areas during nighttime hours.

7. Outright acquisition in fee simple of all incompatible land uses and conversion to compatible uses is perhaps the most definitive means of achieving land use compatibility in airport environs. These lands would then be (1) leased for airport-compatible land uses; (2) resold with avigation easements and deed restrictions that would permit only specific compatible land uses; (3) retained by the airport and maintained in permanent open space; or (4) used by other governmental agencies for public purposes, such as storage yards, parks, and other noise-tolerant land uses.

   Since acquisition programs involving noise sensitive housing can result in severe disruption to residential neighborhoods, such programs should be limited to critical locations where other solutions are not practicable.

   A financial consideration in any acquisition program is that all lands and improvements would be publicly owned and no longer producing property tax revenues, unless they are resold with deed restrictions to ensure compatible land uses. If it is determined that open space uses would be the most desirable for compatibility with the airport, it is unlikely that such lands would ever be resold, unless they could be used for noise compatible land uses.

   For any acquisition program that includes developed residential land, relocation programs and assistance (both costs and social aspects) must also be considered--particularly when federal funding is involved.

   Acquisition programs at Sea-Tac have been in effect since 1972, and will continue as outlined in Chapter 6 (measure M-1), of the Noise Remedy Program. The program will focus on the acquisition of single-family residences in aircraft noise exposure areas of Ldn 75 and over in the year 2000 (Ldn 80 and over in the year 1980).

8. Acoustical treatment for existing incompatible structures can be accomplished in areas where the conversion of land use would destroy a community or where the conversion is prohibitively expensive. Such treatment can be accomplished at a cost to the airport or through some form of cost sharing, and it is usually provided in exchange for an avigation easement. The purpose is to alleviate noise problems in the interiors of structures while confirming the right of the airport to continue aircraft operations in the area.

Many methods of acoustical treatment are available, such as (1) sealing or weather-stripping windows, doors, vents, and external openings; (2) replacing hollow-core doors with solid doors; eliminating direct paths of exterior-interior noise transmission; (3) installing central air conditioning, acoustically treated ceiling panels, wall panels, and double-glazed windows; (4) eliminating windows; and (5) insulating entryways, attics, and crawl spaces. Ventilating systems would be required with sealed windows. The selection of sound-insulation measures should be made on a case-by-case basis.

This measure was recommended in the Sea-Tac/Communities Plan and has been retained as an integral part of the Noise Remedy Plan (see Measure M-2, Chapter 6).

9. Under a purchase assurance program, (transaction assistance) owners of residential property are assisted in selling their homes at full market value if they decide to sell. If the property cannot be sold by the owner on the open real estate market within a specified period of time, the airport sponsor could purchase the home, provide sound insulation to the extent possible, and resell it with an avigation easement attached to and made part of the property deed acquired by the new owner.

The concept of purchase assurance as a bona fide airport noise remedy has been intensely analyzed by the Port of Seattle since it was recommended in the Sea-Tac/Communities Plan in 1975. As a result of this study the Port concluded that the focus of the program as implemented in the Sea-Tac environs would have to be the development of Port-sponsored ways and means to improve existing residential neighborhoods impacted by aircraft noise. Because of this emphasis on improving noise-impacted neighborhoods, the Port has designated the areas within the 75-80 Ldn area (1980) as Neighborhood Reinforcement. Similarly, the term "Transaction Assistance" has replaced the term "Purchase Assurance" when reference is made to this form of noise remedy. The Transaction Assistance program has been adopted as one of the noise remedies for which single family residents may be eligible if they are in the Neighborhood Reinforcement Area.

Measure M-3 in Chapter 6 of this document provides a general description of how the Port of Seattle intends to implement this type of noise remedy.

10. An avigation easement is a type of remedy that is based on less-than-fee purchase. One form of easement grants an airport sponsor the right to perform aircraft operations over the property, including those that might cause noise, vibrations, and other effects.

Avigation easements can be acquired through negotiated purchase or condemnations. The price in a negotiated settlement is based or the value to the owner of the rights surrendered, and it can be as much as 10% to 20% of the appraised value of the property. Easements are permanent, enforceable through civil courts, and the title is held until sold or released.

Limitations to avigation easements include the following: (1) the actual numbers of citizens willing to participate in a voluntary program may be quite low, and (2) the cost to the airport could amount to millions of dollars while the amount of money provided to individual property would not necessarily be considered substantial.

The Port intends to obtain avigation easements from property owners living within the Neighborhood Reinforcement or Cost-Sharing Insulation areas in return for relief from, or mitigation of, excessive noise exposure. In addition, the possibility of an owner receiving monetary compensation for an avigation easement only, is recommended as part of the Noise Remedy Program. This would be of particular interest in cases in which a home cannot be satisfactorily sound-insulated. It would also be of interest in the event that the Port chooses to mitigate noise impacts on churches within the program boundaries.

This noise remedy is more fully detailed under measure M-4, Chapter 6.

11. Property Advisory Services: Advisory services can be made available (at no charge) to noise-impacted residential property owners in the Airport environs as well as to real estate, legal, and financial organizations. The services can include:

- o Detailed information about noise exposure characteristics associated with individual property locations.
- o Information about the various noise remedies available for the use and benefit of affected property owners.
- o Consultation on housing-related decisions and options that an owner or occupant of residential property might require from time to time.
- o Referrals to other housing services, and guidance as to the locations and types of housing available in the Seattle area.

The Port of Seattle's Relocation Office has provided many of these services to property owners and others involved in the outright acquisition program in effect over the past 10 years or so. However, this function was not extended to other noise remedy activities since they were never activated or funded.

From an evaluation standpoint, there is little reason not to offer property advisory services as a noise mitigation measure. In addition to being relatively inexpensive (from $50,000 to $100,000 per year), this type of remedy has the advantage of being available to all property owners within the Airport environs--regardless of location or position relative to aircraft noise exposure. Moreover, the proper application of such services will eliminate or certainly reduce uncertainties about housing decisions that may occur to a given owner/tenant. An added bonus is the fact that this form of mitigation affords the Port a means to correct rumors or misinformation that may circulate within the environs from time to time. Measure M-5, Chapter 6 was therefore adopted as part of the Noise Remedy Program.

12. The purchase of development rights is the public acquisition of a landowner's rights to develop property into uses incompatible with airport/aircraft operations. This measure is more applicable to undeveloped areas for the purpose of restricting the types of uses for which the property may be developed. Maximum heights of structures may also be specified. The airport sponsor is protected against damage claims, and the landowner is compensated for the limitation of developing the property and for the effects of continued aircraft operations. In addition, the property remains on the local tax rolls.

    The main problem with purchasing development rights is the cost, which can range from 40% to 80% of the appraised property value and can be prohibitive. As the cost approaches 50% to 60% of the appraised value, outright acquisition in fee simple may be more appropriate and should be considered. Therefore, the purchase of development rights was not adopted by the Port of Seattle.

13. Land banking is a means of ensuring the future development rights of an airport to expand or relocate through either land acquisition or options to purchase the land needed by such a program. Land banking is not often pursued because (1) the airport does not want to expend funds now for land that may or may not be needed in the future, and (2) local jurisdictions may vigorously protest the loss of land from the tax rolls unless an immediate need can be shown.

    In the case of Sea-Tac Airport, no land has been identified as necessary for future use. In fact, land acquired through the acquisition program is not needed for airport purposes in the foreseeable future. The Port and local jurisdictions are currently investigating possible uses for the excess land. Therefore, land banking as a noise remedy at Sea-Tac is not applicable and is not included as a remedy in the adopted plan.

14. Aircraft engine runups are a source of noise at most airports. Measures to reduce the noise include relocating runup areas and rotating the use of runup areas on the basis of climatic conditions. Many airports restrict runups to certain hours, keeping night operations to a minimum, or not allowing them at all during specified night-time hours.

Another option is to restrict engine power settings to specified levels and to reduce the amount of operating time at various levels. "Hush-houses" for engine testing have been constructed at many airports where a considerable amount of engine overhauling is done.

Analyses performed for the Sea-Tac "Noise Exposure Update" indicates that existing run-up practices do not significantly contribute to overall noise exposure. The Port has designated curfew times and specific areas on one taxiway to be used for engine run-up activities; the location to be used at a specific time is determined by wind conditions.

A survey conducted from September 20 through October 8, 1982, showed that a total of seven aircraft engine run-ups occurred. Of these seven run-ups, only two occurred after 10 p.m. or before 7 a.m. An amendment to the Airport rules and regulations pertaining to the extension of the run-up curfew was approved by the Port Commission on November 22, 1983. The amendment extended the aircraft engine run-up curfew to be effective between 10 p.m. and 7 a.m., except for run-ups needed between 6 a.m. and 7 a.m. if directly related to flight operations.

Several factors have to be considered in selecting locations for run-up areas. From an operational viewpoint, the run-up areas should be located such that the aircraft does not interfere with movements on the active runways and taxiways. From an environmental viewpoint, the run-up areas should be located as far away as possible from any adjacent noise-sensitive uses, and to the extent possible, use should be made of on-airport structures to attenuate the noise. The locations currently in use at the Airport are satisfactory in these regards and no further action is recommended.

15. Limitations on the number or types of operations or types of aircraft. This action encompasses a wide range of measures for reducing airport noise through regulated limits on operations and on aircraft. Quotas can be set on the number of annual or daily operations through slot allocations or lease agreements; or regulations can prohibit aircraft that do not meet some specified noise limit (such as the lowest Stage 3 limit in Federal Aviation Regulation Part 36). Many other examples exist. Some apply only to operations on a particular runway rather than to the entire airport, but in all cases, the basic principle behind the limitation is to reduce noisy operations.

The magnitude of the benefits from such limitations will depend on how restrictive the limitation is and how much the restricted activity contributes to the total noise environment.

The airport operator is generally responsible for any noise abatement regulation limiting the number or type of operations at the airport. The regulatory process typically involves input from all affected parties, however, including the users, communities, and the FAA.

One important point to note is that although the operator does retain this authority to impose use restrictions, the U.S. Constitution prohibits taking any action that imposes undue burden on interstate or foreign commerce and unjustly discriminates between different categories of airport users.

The FAA has also generally opposed aircraft noise limits requiring monitoring of individual events for enforcement but prefers, instead, limitations based on already published levels in their advisory circulars (36-1B, 36-2A, and 36-3).

Setting specific noise limits that would effectively ban an aircraft type has been tried at other airports and has met limited success in the courts. Some exceptions have been working at other airports, such as preventing entry of new airlines to the airport unless its aircraft meet FAR Part 36 noise standards. Because the compliance date for FAR Part 36 noise standards was January 1, 1985, there would now be no benefit of imposing such restrictions. However, because there are a few exceptions to Part 36 (i.e., two-engine aircraft with 100 seats or less, serving small cities, are exempt until January 1, 1988), it is recommended that the Port continue to support efforts to ensure compliance with the FAR Part 36 noise standards in accordance with the current schedule.

In any event, general aviation use is not encouraged at Sea-Tac International Airport and the Port has limited the development of general aviation facilities.

16. High-speed exit taxiways form an oblique angle to the runway. They require a turn of about 30 degrees for the aircraft to leave the active runway, while normal taxiways often require a full 90-degree turn. With the smaller turn, aircraft can taxi at higher-than-normal speeds and spend less time on the runway during landing roll. As a noise abatement measure, high-speed exit taxiways may lead to less frequent use of thrust reversal and can reduce the need to add the power that is sometimes required to exit via perpendicular taxiways. Depending on geometry, however, there may be an overall increase in taxi time and resulting air pollution.

Community annoyance attributable specifically to thrust reversal or to taxi noise is not usually the most pressing noise problem at an airport. Notice of it depends heavily on the position of a runway and its taxiways relative to surrounding communities. Complaints of this nature usually come from very close neighbors to the side and near the roll-out end of a runway, where the effect of thrust reversal is the greatest and the effect of aircraft flight operations (departures and approaches) is reduced. The same neighborhoods are also likely to complain of aircraft on the start of takeoff roll, for the same reason. High-speed exit taxiways are already in place at Sea-Tac International Airport and therefore no further development of this type is needed.

17. A runway threshold displacement or runway extension has the effect of increasing aircraft altitude along approach and departure flight tracks, thereby increasing the distance between the noise source and the noise receivers.

A displaced threshold for landing aircraft results in the aircraft being higher over a noise sensitive community lying below the flight path, reducing noise levels in the approach areas near the airport. Similarly, a runway extension at the other end of the runway would be beneficial in dealing with aircraft departures. Depending on the length of the runway extension, such construction may permit larger (and sometimes noisier) aircraft to use the airport.

A displaced threshold is already in effect on Runway 16R for arriving aircraft. Because of the north-south alignment of the runways and residential development in the approaches both north and south, extending the runway would only result in a shift of noise exposure from areas to the north to areas to the south, or visa versa. The measures would not result in an actual reduction of noise exposure off-Airport, and a shift in the exposure pattern would probably have little effect on the amount of existing incompatible land use or the numbers of people residing in areas exposed to high levels of aircraft noise. With these considerations in mind, it is recommended that the existing condition of intersection takeoffs will be continued and no new procedures need to be implemented.

18. A new runway, in some instances, could increase airport capacity, and also reduce noise. The reasoning is that if an additional runway is not built, noise in the approach and departure corridors would increase as air carrier aircraft operations increase. A new runway could shift the increased operations away from the existing runway, thereby dispersing noise.

This measure is contrary to established Port of Seattle policy and therefore has been eliminated from further consideration. A general aviation runway (Runway 17-35) was used for general aviation and commuter traffic until closed by the Port of Seattle. It is no longer included in any airfield development plans as a runway--it has been designated as Taxiway C. In addition, because of the existing Airport configuration, a new runway would not result in total reduced noise levels over existing residential areas.

19. Noise-related landing fees. At most airports, aircraft weight is used to determine landing fees. Heavy aircraft, which generally require a longer runway, thicker pavement, and larger terminal areas, thus end up paying a larger share toward the cost of the facility. A similar argument could be made for noise: an airport could base a portion of the landing fee on the noise produced by aircraft. One approach to this charge might be to assess aircraft in proportion to the noise they produce relative to FAR Part 36 noise standards.

There would be two basic benefits derived from noise-related landing fees. First, the income accrued from the noise portion of the fee could be used to fund other noise abatement or mitigation actions. Second, the fees might add an incentive to airlines to use quieter equipment. In both cases, the result could be a reduction in noise impact around the airport.

It is not clear how effective this action would be, since no U.S. airport has as yet adopted a noise-related landing fee and the elasticity of the market is unknown. Furthermore, several of the airlines have long-term lease agreements that set forth how landing fees are to be computed. There may be a question of legality with respect to discrimination if noise-related landing fees are assessed for other carriers. Therefore, it is recommended that noise-related landing fees not be pursued at this time.

20. The shifting of aircraft operations to another airport, or denying airport access to certain types or classes of aircraft, is not generally considered a feasible noise control strategy. In the case of shifting operations, other airports serving a region are almost always general aviation or military facilities, which are not suitable for air carrier operations. Very few metropolitan regions have two air carrier airports. An alternative is to build an entirely new airport and shift all air carrier operations to it, but the cost is usually too high and a lead time of at least 10 years is required.

    Most of the noise exposure from Sea-Tac is caused by air carrier operations. There are no other air carrier airports in the region to which the flights could be shifted nor are any new airports being contemplated. Therefore, this measure has been eliminated from further consideration.

21. The construction of noise barriers or berms has limited value as a method of noise mitigation. In certain instances, however, a noise barrier or berm may function more as an effective psychological control than as an actual aircraft noise mitigation measure. For example, noise complaints were reduced about 70% at Minneapolis-St. Paul International Airport after a berm was constructed. Although some of the noise created on the airport was shielded from surrounding neighborhoods, the berm did little, if anything, to reduce noise once aircraft were airborne. However, the berm is an aesthetic improvement, and the visual shielding of aircraft and the airport may be playing an important psychological role in "reducing" the noise level perceived by surrounding residents.

    Noise barriers or berms would probably be ineffective along the boundaries of the Sea-Tac International Airport site which are adjacent to homes such as those in Riverton Heights and the Sunset district. First, noise barriers are effective only in line-of-sight situations. Differences in terrain elevations that place the noise-sensitive receptor at a higher elevation than the noise source negate the effectiveness of a noise barrier because the barrier cannot be constructed high enough to block the line-of-sight transmission of the noise.

Furthermore, barriers are effective in reducing noise only in the higher frequency ranges. This limits their effectiveness in shielding noise-sensitive uses adjacent to airports because the ground run-up noise of jet aircraft from engine testing, taxiing, or acceleration on takeoff is dominated by the low frequency components. High frequencies can be deflected or absorbed by noise barriers, the lower frequencies with their higher vibration components cannot.

A similar set of problems relates to constructing a noise barrier or berm to mitigate aircraft noise in residences adjacent to the western boundary of the Airport. The primary source of noise that might be mitigated by a noise barrier on the west side of the Airport is from aircraft taxiing on the east side of the airfield or from aircraft on the runways. Around Sea-Tac it is not possible to construct a barrier or berm close enough to the source of the noise (within 150 feet) that would be effective. The construction of a barrier or berm close to the residences themselves would be largely ineffective due to the difference in elevation of the airfield and the majority of the affected residences. Therefore, the construction of noise barriers or berms is not recommended as a mitigation measure at Sea-Tac.

5.3 Noise Remedies Under Implementation Authority of Local/State Agencies

1. Comprehensive land use planning (a function of local municipal jurisdictions) for the airport environs is a coordinated effort to ensure the compatibility of airport operations with the needs of the airport environs and the region. Such planning can also safeguard the general public welfare by presenting recommendations that minimize adverse socioeconomic impacts and mitigate unavoidable environmental impacts to the maximum extent possible. The purpose of the planning is to seek practical solutions and to formulate and implement compatible land use measures that are consistent with airport development.

   Comprehensive planning includes land use, access, and public facility issues, as well as considerations of air and water quality, drainage, surface transportation, and other factors affecting the quality of life. The effectiveness of comprehensive planning may be limited in a multijurisdictional situation, but a comprehensive plan must be more than just a guide to future growth that can be ignored when development decisions are made.

   Comprehensive planning in the environs of Sea-Tac International Airport has been ongoing for many years, and plans have been formally adopted by King County for both the Highline and Federal Way communities. The current Highline Community Plan, as adopted by the County Council in December 1977 and amended in May 1981, covers virtually all of the Airport environs area. This Plan, together with the related Area Zoning for Highline, reflects the various land use policies embodied in the 1976 Sea-Tac/Communities Plan.

The 1985 Update of the noise element in the Sea-Tac Communities Plan requires an update of the Highline Community Plan. There are new areas designated for acquisition, new or refined compatible land use schemes that are bing considered in areas already cleared of residences, and changes in the major access plans near the Airport. Based on the need to update the comprehensive plans in the area, the Port has adopted a noise remedy measure to encourage a comprehensive plan update (measure M-6, Chapter 6). At present (January 1985) the Port is actively persuading King County and other local municipalities with land use jurisdiction to update plans and other related ordinances to reflect Port noise remedies, ensuring that future development in the area will be compatible with the Airport and its operations.

2. Zoning is one means of implementing a comprehensive plan. Zoning changes in undeveloped areas exposed to high levels of aircraft noise are intended to (1) prohibit future incompatible land uses, or (2) restrict noise-sensitive land uses to specified building or population densities. This second purpose might include the specification of maximum allowable concentrations of employees, customers, or persons in public assembly in the zoning ordinance.

Zoning changes in developed areas are more difficult than those in undeveloped areas, but they may effectively preclude or restrict future incompatible uses. For instance, a residential area may be rezoned for a less-sensitive land use, with the stipulation that the restriction is waived until such time as the nonconforming dwelling units cease to exist for any reason. Rezoning would preclude the construction of a replacement dwelling unit, so that eventually, the area could be redeveloped into compatible use.

Zoning can and should be used constructively to increase the value and productivity of land within the noise-affected areas. The zoning plan must clearly identify reasonable present and future needs of the community and the airport. Zoning can also be used to prohibit the location near airports of facilities that may be hazardous to safe aircraft operations, such as petroleum storage or industrial facilities that produce concentrations of dust or smoke.

Because of the relative impermanence of zoning regulations, some form of continuous monitoring is necessary to preclude encroachment by incompatible development in undeveloped noise-sensitive areas. Zoning that achieves compatibility is subject to continual pressure for change from those who seek urban expansion and those who might profit from such change.

The 1981 Highline Area Zoning Ordinance was based on the 1977 Highline Community Plan. The Plan, in turn, incorporated Airport compatibility recommendations from the Sea-Tac Communities Plan. Noise concerns expressed by residents of the Airport environs during preparation of the two plans were reflected in the documents as adopted by the King County Council. Similarly, the subsequent zoning ordinance also reflected these noise concerns through both density and land use provisions.

The planning and zoning process that King County followed after completion of the Sea-Tac Communities Plan, as just outlined, was technically and procedurally correct insofar as can be determined. However, with the Port's adoption of the Noise Remedy Update and due to other changes in the Highline area, the zoning is no longer appropriate in some areas. The process for changing the inappropriate zones is to first change the Community Plan and subsequently address needed zone changes. As reported under the Community Plan section, this updating by King County is being strongly encouraged by the Port.

3. The purposes of a height/noise/safety zoning overlay are (1) to ensure aircraft safety by specifying maximum height limits on structures, (2) to restrict noise-sensitive land uses in areas with high levels of noise exposure, and (3) to provide safety areas under the approaches to each runway.

The primary purpose of height restriction ordinances is to ensure aircraft safety by controlling the location and height of trees, towers, poles, buildings, and smokestacks in the airport vicinity. The objective is to ensure that entire runway lengths are available for use and that instrument landing systems are not restricted. Height restrictions around airports are determined by Federal Aviation Regulations Part 77, Objects Affecting Navigable Airspace.

A special zoning overlay that prescribes additional height, noise, or safety provisions in relation to aircraft operations at Sea-Tac is not considered to be necessary. Height/noise/safety restriction ordinances separated from the zoning regulations might be difficult or legally impossible to enforce in King County. Such ordinances, if enacted by the Port, may be viewed as a preemption of the local police power afforded under zoning. Therefore, restrictions should probably be incorporated into the local zoning rather than attempted as a separate ordinance to be enforced by a different entity. The purpose of the height regulations would be to apply the FAR Part 77 and other FAA obstruction clearance criteria in areas where they are more stringent than existing height regulations.

4. Acoustical treatment standards for new structures can be established to ensure the use of sound-attenuating construction techniques in areas subject to moderately high levels of noise. When incorporated in building codes, such standards can provide a relatively satisfactory method of achieving land use compatibility without unduly restricting development in communities that have limited areas available for development.

Any new structures housing noise-sensitive uses to be constructed in areas exposed to high levels of aircraft noise would be required to be acoustically treated so that interior noise levels do not exceed Ldn 45 in habitable rooms as a result of exterior noise. Most of the energy insulation now used in building construction would satisfy the sound-proofing requirements. With reference to the Sea-Tac environs, however, such a criterion should be applied via the King County Building Code to applicable new structures located within any noise exposure area of Ldn 65 or greater, as depicted by the 1980 and 2000 Noise Contour maps contained in the Noise Exposure Update report released by the Port of Seattle in June 1982.

King County is in the process of preparing a noise insulation code. A grant from the FAA to assist in this code preparation was received by the county in 1984. The current schedule for completion is late 1985. The Port is supportive of this effort and is monitoring the County's progress.

5. Redevelopment programs involve the removal of existing incompatible land uses and their replacement with compatible uses. Application of the redevelopment process can be a viable means of achieving land use compatibility, especially in blighted areas. However, implementation measures that rely on redevelopment can also be very expensive in social and economic terms. Redevelopment programs remove those uses most sensitive to the noise exposure (e.g., residential) and replace them with uses that are more compatible with existing and projected levels of aircraft noise (e.g., warehousing or open space).

Among other problems, large-scale redevelopment can result in extremely costly relocation programs that extend over a long time. It can severely disrupt existing residential living patterns and create problems elsewhere, particularly in regard to schools, because of a shift in the residential population. Nevertheless, this remedy is most appropriate in those limited areas where noise is the worst.

It is recommended that the land use conversion programs described in the Sea-Tac/Communities Plan should essentially be retained, particularly those that are incorporated in the Highline Community Plan. Additional recommendations for the new acquisition areas have been incorporated in the updated noise remedy program detailed in Chapter 6.

6. Modification of building codes to include acoustical treatment can be considered where local conditions indicate that substantial gains in the overall living environment would result. Although acoustical treatment does not eliminate noise, it can improve the indoor environment and it may be very useful for residential structures. In areas where considerable outdoor activity takes place during a significant part of the year, acoustical treatment is a less effective noise abatement measure. It does, however, contribute to energy insulation benefits.

Codes could be modified to specify minimum soundproofing standards in new construction that would contain noise-sensitive uses. The King County Building and Land Division study will address ways and means to specifically modify the King County Building Code in order to ensure that new construction in connection with aircraft noise-sensitive uses will comply with minimum soundproofing standards. The Port is supportive of King County's current efforts in preparing the new code.

7. Subdivision regulations can be amended to require that transmission of sound from exterior sources is minimized in new development. As a means of protecting the airport, subdivision regulations could require the granting of noise avigation easements for new development proposed within the airport environs. Subdivision regulations could also require fair disclosure or buyer information notices upon the sale or transfer of existing property.

The Port of Seattle has recommended under Noise Mitigation measure M-6 of the Noise Remedy Program (see Chapter 6) that King County use noise as a determinant in all ordinances affecting land development in the noise-impacted areas surrounding Sea-Tac Airport.

8. Many jurisdictions affected by airport noise have enacted fair disclosure or truth-in-sales ordinances. The purpose is to require that the prospective buyer of residential property be made fully aware of the expected sound levels at the location and any locally adopted requirements for sound insulation. The effectiveness of such an ordinance normally depends on the willingness of the community to enforce it. In addition, the seller must be willing to bear the financial cost, and penalties should be attached for noncompliance.

   Similar to avigation easements, fair disclosure ordinances do not provide noise relief. However, residents moving into the area should be made aware of the existing and projected noise exposure. The Port will make copies of the Noise Remedy Plan readily available to real estate agencies and local depositories of public documents. Furthermore, the Port is encouraging King County, via measure M-6 in Chapter 6, to implement such a fair disclosure ordinance in noise-impacted areas of South King County.

9. The timing of capital improvements and public works projects can strongly influence land use trends and demands. The timing of such projects is related to urban growth management, in that the denial or delay of projects (where local authority legally permits it) serves to discourage development. The projects may include road construction or widening, and the development of schools, park and recreation facilities, water and sewer mains, and flood control facilities. In contrast, early completion of such projects encourages development. As an implementation method for achieving land use compatibility, the judicious use of capital improvements related to public works can greatly assist changes in land use or reduce the demand for growth in an area.

   The use of capital improvement staging techniques is typically associated with the control of growth in undeveloped areas. Although the Sea-Tac environs are primarily developed urban areas, there does appear to be some potential use of this technique.

   The King County Capital Improvements Program will be reviewed during the Highline Community Plan Update in 1985. During the process consideration will be given to emphasizing projects that will reinforce neighborhoods by means of such publicly financed actions as street repaving, park facility additions, drainage improvements, and the like. If this is done, the future tax-generating capability of these areas—as well as the desired residential environment--will be protected as a result of both County and Port policies. Measure M-6 of the Noise Remedy Program (Chapter 6) documents the Port's intentions to encourage King County and other jurisdictions to implement such neighborhood reinforcing policies as timing of capital improvements.

10. Tax incentives are a means of allocating noise reduction costs equitably. Such incentives can be used to induce future as well as present property owners to comply with performance standards for noise relief in the housing and building codes. Lowered property taxes can provide a form of compensation to owners of property subjected to aircraft noise. Tax policy can also discourage the conversion of facilities, such as golf courses, to more intensive uses by offering preferential tax treatment for compatible land uses.

    Although tax incentives are typically applied in rapidly developing areas as a means to preserve open space and other desirable environmental features, consideration should be given to the possibility of using tax incentives to encourage the installation of noise insulation in prescribed areas in much the same manner that energy consideration improvements have been handled by several states, including Washington. In order to be implemented, however, a special study of the legal and political ramifications of such a program should be undertaken under sponsorship of King County. The Port of Seattle will offer support and encouragement to King County, as stated under measure M-6, Noise Remedy Program.

5.4 Noise Remedies Under Federal Implementation Authority

1. FAR Part 36[1] requires commercial aircraft that do not meet acceptable levels of aircraft noise to be modified (e.g., have their engines retrofitted) or retired from the fleet. This regulation implements the Aviation Safety and Noise Abatement Act of 1979, Public Law 96-193, dated February 18, 1980.

    Compliance with the public law will result in a significant decrease in (1) the types of engine noise (high-pitch front end and low-pitch rear end) and (2) the total amount of generated noise. The phased compliance deadlines were based on what is technologically practicable and economically reasonable. In general, compliance is proceeding at or ahead of schedule. Although some airports have required early compliance in an effort to reduce noise levels, such requirements at Sea-Tac would be short-term, and provide little benefit. The Port of Seattle is therefore in support of efforts to ensure compliance with the current schedule.

2. Equalizing or rotating the use of runways can reduce aircraft noise if some of the noise is shifted to less-sensitive areas in the airport environs. In most instances, however, this strategy is designed to "spread the noise around" so that many communities--rather than one or two--share the noise exposure. Implementation of this kind of noise abatement measure obviously requires that the airport in question has sufficient runways to permit different directions of operations when weather permits.

[1]Federal Aviation Administration, "Federal Aviation Regulations, (FAR) Part 36--Noise Standards: Aircraft Type and Airworthiness Certification," December 1969, as amended.

The existing use of the runways at Sea-Tac is determined by wind conditions and instrumentation. Because the two runways are parallel and close together (800-foot separation), equalizing or rotating the use of runways would not reduce noise levels.

3. Preferential runway use procedures give preference to the use of a specific runway(s) to reduce the overflight of noise-sensitive areas. Preferential runway use can also include a conscious effort to maximize or restrict the use of specific runways by class and type of aircraft in order to reduce aircraft exposure. In this instance, a runway whose approach and departure paths are over dense residential areas may be restricted to light general aviation aircraft. A preferential runway use procedure is already in effect under Tower Order SEA TWR 7110.071D and it is assumed the procedure will be maintained.

4. Takeoff, climb-out, and landing procedures can be changed to reduce noise provided that aircraft performance, safety, and air traffic control requirements are met. Generally, for aircraft departures, these procedures involve steeper climb angles and some form of power reduction after the aircraft is safely airborne. For arriving aircraft, increasing altitudes during approaches to airports can significantly decrease noise exposure when such a strategy is consistent with aircraft performance and safety requirements. This strategy has consistently been opposed by pilot organizations as unsafe and is rarely implemented. Enforcement of adherence to the procedures, therefore, is a difficult task as a pilot can claim that deviation from a procedure was necessary for the safety of the aircraft.

Special noise abatement procedures relating to takeoff and approach altitudes are already specified in Tower Order SEA TWR 7110.071C and are consistent with the safe operation of aircraft at the Airport. For example, in a south flow of traffic, the Order calls for pilots to fly a runway heading for 3 miles and reach an altitude of 3,000 feet before making a turn to the west. However, to address citizens' concerns about aircraft drifting from this departure track, the FAA has implemented new runway departure procedures that require all departures in a south flow to climb out on the Seattle VOR 158 radial. The FAA has also implemented new runway departure procedures that require all departures in a north flow to climb out on the Seattle VOR 338 radial. These procedures will assist the pilot in adhering to the procedures set forth in Order 7110.071D. At this time it is recommended that there be no changes made to the altitude specifications contained in this order, although the Joint Committee of Aircraft Overflights (a citizen/agency advisory committee) is scheduled to evaluate current procedures and possibly recommend changes.

5. Changing flight patterns for arriving and departing aircraft can significantly reduce noise exposure if substantial numbers of the "noisiest" types of aircraft can be routed over areas that are less sensitive to noise, or if the amount of time an aircraft flies at low altitudes over noise-sensitive areas can be reduced. Other factors, such as airport congestion, induced delay, and route of flight and safety, must of course be considered in determining the feasibility of changing flight patterns.

Tower Order SEA TWR 7110.071D contains specific departure headings for aircraft to follow after takeoff from Sea-Tac. These departure tracks have been designed to segregate and expedite traffic flow. The primary operational considerations in determining the spatial dimensions of such tracks are the location of the "departure fix" or the first "en route fix" in relation to the departure runway, the air route structure, and the destination airport. Exhibits showing current arrival and departure flight tracks are found in Chapter 2 of the attached Noise Exposure Maps: Phase I/Part 150: 1984/85 document.

Several suggestions have been made concerning variations to the procedures set forth in the Order. These suggestions are discussed in the following paragraphs.

With regard to air carrier aircraft flight patterns, one suggested change is that aircraft make a right turn toward Puget Sound immediately on departure during south traffic flow. The anticipated benefit of such a change in flight track was that fewer people would be exposed to noise because the aircraft would be flying the shortest route from the Airport to Puget Sound. However, this change has several drawbacks:

- Because of differing aircraft operating characteristics, aircraft would be turning anywhere from one mile to three miles following takeoff. This would mean a broader path of noise exposure than is experienced with the current straight-out Order procedure.

- In a turn, aircraft would not only be lower, but would require more thrust (and hence make more noise) than in a straight-out path.

- Departing aircraft would have to be restricted to a lower altitude to stay clear of arrivals.

- Arrivals would have to be moved farther west.

- Controller workload would increase.

It was concluded that the current procedure with a straight-out track for 3 miles and 3,000 feet is the best noise abatement procedure for departures in a south flow of traffic.

In response to numerous citizen complaints of aircraft noise, the Port requested that the FAA noise abatement procedures in Tower Order 7110.071D be modified. Specifically, the Order prescribes a departure route in a north traffic flow which takes turbojet aircraft over Elliott Bay and Puget Sound in order to avoid areas of dense population. It also prescribes an exception to this route which allows the operation of turbojet aircraft directly over major Seattle residential areas at or above 4,000 feet between 6 a.m. and 10 p.m. The Port requested that the FAA cancel this exception because of noise complaints in the residential areas.

The FAA circulated for public comment the proposed elimination of the exception to the north flow noise abatement procedures. Three thousand one hundred and three (3,103) individuals responded to this study; 82 indicated no opinion or the comments made were not germane to the study; 2,806 voiced objections. Additionally, the King County Council provided the results of a similar Council study conducted by questionnaire. That poll of 2,772 King County residents showed 2,611 people object to the change of existing aircraft routes. Despite these objections, the FAA concluded that the procedure currently in use under the "exception" to Tower Order SEA TWR 7110.071D could be eliminated. However, eliminating this exception would result in:

- o An increase in jet noise along already established and utilized routes whenever north flow procedures are in effect.

- o Some departure delays in order to avoid congestion along these routes.

- o An increase of aircraft overflying certain communities above 8,000 feet after leaving Puget Sound, e.g., Normandy Park and Ballard.

As a result of the FAA's evaluation of this change, the Port withdrew its request for elimination of the exception to the noise abatement procedures.

It has also been suggested that aircraft departing Runways 34L and 34R (to the north) should be routed over the industrial areas along the Duwamish Waterway, rather than turning over Beacon Hill, to reach Elliott Bay. While such a routing change could potentially reduce aircraft noise exposure, it may also result in air traffic control problems because of the proximity of Sea-Tac with Boeing Field. With the current operation, departures turning over Beacon Hill may achieve lateral separation from aircraft departing Boeing Field to the north. However, if Sea-Tac departures were routed over the Duwamish Waterway to Elliott Bay, this would put them on essentially the same track as Boeing Field departures. Such a routing would increase the amount of voice communications between air traffic control personnel at Sea-Tac and Boeing Field and could result in increased delays to aircraft at both airports.

Another suggestion concerning modifications to air carrier aircraft flight patterns involved diversion of southbound departures in a south traffic flow to Puget Sound. Normally the southbound departures would go straight out on the runway heading over Federal Way. The suggestion would have these aircraft follow the noise abatement procedure for westbound aircraft--turning to the west after reaching a point 3 miles south of the airport and reaching an altitude of 3,000 feet. Although this suggestion would allow the southbound departures to avoid overflying Federal Way, it would increase the aircraft overflights over the City of Des Moines--a tradeoff in noise exposure. Further, the additional travel time resulting from this suggestion would increase aircraft operating costs, and departing aircraft would have to be restricted to a lower altitude to stay clear of arrivals, resulting in an increase in air traffic controller workload.

With regard to general aviation flight patterns, the Tower Order specifies that for noise abatement purposes, propeller-driven arrivals shall not be given approval to make a base leg within the Airport boundary and that propeller-driven departures shall not be turned after takeoff until reaching 1,000 feet MSL. There is a natural tendency for general aviation pilots to want to get away from the paths of air carrier aircraft as soon as possible (because of speed differentials, wake turbulence, etc.), thus noise abatement procedures may sometimes not be followed.

Relief from the "single event" noise exposure caused by general aviation traffic patterns might be obtained, but at the expense of increased aircraft delays. If general aviation aircraft were required to comply with the arrival and departure procedures followed by air carrier aircraft, the general aviation aircraft would fly over property north and south of Sea-Tac that has been acquired by the Port for noise abatement purposes. Such compliance would reduce the number of people being exposed to general aviation aircraft noise. However, the resulting mix of small (slower) and large (faster) aircraft over greater periods of time would decrease runway capacity and, hence, increase aircraft delays. Also, noise exposure close to the ends of the runways might increase if delayed aircraft had to wait on the taxiway for takeoff clearance.

In summary, changes to approach and departure tracks for air carrier aircraft that deviate from a straight-in/straight-out alignment do not show much promise in remedying noise impacts. Furthermore, changes to the current alignments may be in conflict with the Port's acquisition program. However, at present (January 1985) the Port-formed advisory group, the Joint Committee on Aircraft Overflights, is reviewing current flight tracks and may recommend changes in the latter months of 1985.

6. The fanning out of aircraft departure tracks (or divergent departure headings), as a general operational procedure, tends to diffuse rather than reduce noise levels. As with rotating the use of runways, fanning tends to "spread" the noise over a larger geographical area so that one or two areas are less heavily affected by noise. The difficulty is that many communities are not willing to "share" if they are not currently exposed to noise.

   Because the Port of Seattle has already implemented a major acquisition program to the north and south of the Airport, a fanning out measure would conflict with the acquisition program and with established Port policy in regard to the Sea-Tac/Communities Plan. Therefore, the measure has been eliminated from further consideration.

7. Noise abatement procedures for helicopters, primarily to increase helicopter altitudes, can reduce noise levels significantly where helicopter operations are a large component of aircraft activities. However, noise from helicopters is more difficult to control than noise from other types of aircraft because helicopters usually do not follow prescribed approach and departure paths.

The present level of helicopter activity at Sea-Tac is low (about 0.3% of total operations) and has an insignificant environmental effect on the areas around the Airport.

If the number of helicopter operations increases significantly (as a percentage of total operations), altitude restrictions or preferred routes could be established. However, current air traffic control procedures as set forth in the Air Traffic Control Handbook 7110.65B are adequate, and additional restrictions are not necessary. Therefore, none have been recommended.

8. The elimination of military jet operations is seldom feasible at major airports. Military aircraft contribute very little to the cumulative noise exposure values at most airports because of the low number of military operations (compared with the number of airline operations). Military aircraft are excluded from Federal Aviation Regulations Part 36 which sets forth requirements for acceptable levels of aircraft noise.

In 1983, military operations represented less than 0.2% of the total combined air carrier and military operations at Sea-Tac and are projected to decline by the year 2000. Eliminating military operations at the Airport will have little effect on overall noise exposure, however the Port's plan does recommend doing what is possible t.. discourage military operations. (See measure A-2, Chapter 6.)

9. Training flight restrictions may include, but are not limited to (1) restrictions on multiple practice instrument landings or approaches; (2) diversion of training flights to other less-sensitive airports; (3) altitude restrictions for certain aircraft operations or types of aircraft; and (4) as in the case of military aircraft, restrictions on formation approaches or departures, restrictions on overhead landing patterns, and rescheduling of flights to less disturbing times. The most annoying type of training operation is the "touch-and-go" (continuous takeoff and landing) because the plane keeps flying at low altitudes in the airport traffic pattern.

The only training flights now conducted at the Airport are military aircraft using the ILS. However, the actual number of operations is very small: FAA records show that during the past 12 months only 22 training operations were conducted by C130 and C141 type aircraft and none occurred at night. As stated above, it is recommended in the Noise Remedy Program (Measure A-2, Chapter 6) that these operations be discouraged and every effort be made to have the training flights moved to another facility.

10. Improving mortgage insurance policies and practices have been considered at some airports. The policies and practices were to be developed through discussions with applicable federal agencies. The U.S. Department of Housing and Urban Development and the Veterans Administration generally do not insure mortgages for new residential construction in areas exposed to noise levels of Ldn 75 or higher. The denial of such mortgage insurance has deterred incompatible development adjacent to airports in many parts of the country.

Both the Department of Housing and Urban Development (HUD) and the Veterans Administration (VA) have established guidelines with respect to the acceptability of residential development in noise exposure areas. These guidelines, which govern the provision of mortgage commitments (insurance) to otherwise eligible applicants within such areas, are in general conformance with the land use policies of the noise remedy program in the 1976 Plan.

Continuation of the favorable relationship between the HUD/VA guidelines and this Noise Remedy Program Update is therefore very important, especially in neighborhood reinforcement areas where a key objective is to stabilize property values by all means possible. The Port will make a special effort to make certain that local HUD and VA offices know of the Noise Remedy Program described in the next chapter.

CHAPTER 6

NOISE REMEDY PROGRAM

CHAPTER 6
NOISE REMEDY PROGRAM

6.1 Noise Remedy Program for Sea-Tac International Airport

On January 8, 1985, the Port of Seattle Commission voted to adopt Resolution No. 2943. This resolution directs the Executive Director of the Port to implement the Noise Remedy Program as the guide for carrying out noise remedy actions around Sea-Tac. The Noise Remedy Program as prepared by the Port's Planning and Research Department is attached to the resolution and is therefore the Port's official noise remedy policy.

The resolution and appendix have been reproduced on the following pages of this Part 150/Phase II Report.

RESOLUTION NO. 2943, AS AMENDED

A RESOLUTION of the Port Commission of the Port of Seattle, King County Washington, adopting an updated Noise Remedy Program for Sea-Tac International Airport as an element to replace the Noise Remedy element of the previously adopted Sea-Tac Communities Plan described in Resolution No. 2626.

WHEREAS, the Port of Seattle along with King County completed the Sea-Tac Communities Plan and the Port adopted it by Resolution No. 2626 on June 3, 1976, as a guide to development and environmental compatibility for the Airport and its vicinity;

WHEREAS, the Sea-Tac Communities Plan contained a major element dealing with noise impact and mitigation;

WHEREAS, that element contained a series of noise remedy proposals dealing with property acquisition and measures to reinforce or stabilize other impacted residential areas;

WHEREAS, the Port of Seattle in accordance with the Sea-Tac Communities Plan has continued a program of land acquisition for noise compatibility purposes;

WHEREAS, such programs are based on extensive technical analysis of noise exposure patterns;

WHEREAS, periodic updating of such noise exposure information is desirable to determine changes in noise patterns and to employ more recent measurement technology;

WHEREAS, the Port Commission authorized an updated Noise Exposure Study which was completed in June 1982;

WHEREAS, a complete update of the Noise Remedy Program portion of the Sea-Tac Communities Plan was authorized by the Commission on October 26, 1982; and

WHEREAS, the previous Environmental Impact Statement has been adopted and an addendum has been prepared in compliance with the State Environment Policy Act;

NOW, THEREFORE, BE IT RESOLVED by the Port Commission of the Port of Seattle as follows:

Section I. The Noise Remedy Program For Sea-Tac International Airport and Environs (attached as Appendix A) is adopted as a guide for carrying out noise remedy actions at Sea-Tac International Airport and in the surrounding communities. The boundaries for carrying out noise remedy actions are set forth in the Exhibit entitled Overall Program Boundaries (in Appendix A).

Section II. Noise Abatement. The identified nine noise abatement remedies shall be implemented by Port staff when appropriate, or encouraged by Port staff when other agencies are responsible for implementation. The Executive Director is authorized to hire or assign staff and/or consultants to carry out the remedies, and provide the office space, support services, equipment and facilities necessary to effectively implement the abatement remedies. The identified abatement remedies shall be undertaken subject to budgetary approvals.

Section III. Acquisition. Properties designated for acquisition in the Noise Remedy Program for Sea-Tac International Airport and Environs (Appendix A) shall be acquired on the basis of qualified appraisals and/or by eminent domain proceedings following amendment of Unit 18 of the Comprehensive Schedule as contemplated to include property identified in this section. Generally, the sequence for acquiring identified properties shall be prepared by staff and based on noise levels as described in the established noise exposure contours by acquiring groups of homes in the higher noise areas first and proceeding to lower noise areas. In selecting particular properties for acquisition within groups of homes being acquired, priority for acquisition shall be given to hardship cases as identified by a hardship committee which shall be appointed by the President of the Port Commission. Otherwise, sequencing of acquisitions shall be determined by the Port's Acquisition Program Manager. The decisions as to which houses shall be acquired first shall be final and shall not be subject to appeal. In implementing the acquisition program, the Executive Director is authorized to hire staff, contract for services, pay for property, provide relocation benefits as required by law, and carry out all acquisition proceedings as are necessary subject to budgetary approval.

Section IV. Demonstration Project and Additional Mitigation Remedies. The Port shall implement a Demonstration Project to test remedies in addition to acquisition. Homes to apply and test the transaction assistance remedy and the noise insulation remedy will be selected by staff from volunteers in the noise

impacted community. To carry out the Demonstration Project, the Executive Director is authorized to hire or assign staff, *and take all necessary steps to* contract for services, contract for noise insulation improvements, *(including, but not limited to, preparing plans and specifications, advertising for bids awarding contracts and accepting contracts upon completion)*, make remedy payments, and provide office space, support services, equipment and facilities as necessary. Furthermore, the Port shall participate with citizen* committees and agencies as necessary to coordinate the project and inform the public and interested organizations concerning the progress and results of the Demonstration Project.

The Demonstration Project shall be undertaken with a budget not to exceed one million dollars, of which $650,000 is included in the 1985 Budget. *Approximately $375,000 of the total applies to consulting services for acoustic analysis, real estate analysis and appraisal services and architectural and engineering services*. Upon completion of the Demonstration Project, Port staff shall deliver a report that evaluates the tested remedies and recommends changes, refinements, and/or additions to the noise remedies. Furthermore, specific rules, regulations, and procedures to be used in implementing the tested remedies shall be prepared. *In general, such program rules, regulations and procedures shall give priority in scope and eligibility on the basis of greatest length of residency, intensity of noise and hardship (utilizing a hardship committee and procedures as outlined in Section III.) When appraisals are required to conduct the Transaction Assistance Program, qualified appraisals shall be obtained using comparable sales data from outside the noise impacted area, as well as nearby, similar to methods presently employed by the Acquisition Program (Section III)*.

Based on the findings and changes recommended in the Demonstration Project, the Port shall proceed to implement noise remedies in addition to acquisition. The Executive Director is authorized to hire or assign staff to implement the program, and the staff shall be provided with necessary office space, support services, equipment, facilities, and contracting authority subject to budgetary approvals.

Section V. Reporting. Annual reports summarizing the progress, effectiveness, and cost of the Noise Remedy Program shall be prepared in conjunction with budget preparations for use in evaluating the program and

*The word citizen was a final amendment to the resolution, and was made on January 8, 1985 just prior to adoption of the resolution.

budgeting for its continuation. *Particular reporting attention shall be given to the results obtained from the first year's output from the two newly authorized remote noise monitoring stations*. Beginning in 1990 and every five years thereafter, a major review and update of the program will be conducted with full public review. The program will be evaluated for its effectiveness in accomplishing the goals and objectives identified in the program.

Section VI. The Director of Aviation shall have the authority to apply for and accept appropriate grants and funds to implement the Noise Remedy Program.

Section VII. The Executive Director's authority as set forth herein shall be undertaken subject to budgetary amounts and shall not be limited by Resolution No. 2887, Paragraphs V, VII, IX or X.

Section VIII. Local jurisdictions shall be encouraged to participate in achieving the goals of this plan, and in carrying out their responsibilities to the communities in the Sea-Tac Airport vicinity.

ADOPTED by the Port Commission of the Port of Seattle at a regular meeting held this 8th day of January, 1985 and duly authenticated in open session by the signatures of the Commissioners voting in favor thereof and the seal of the Commission.

JACK S. BLOCK

PAUL S. FRIEDLANDER

JIM WRIGHT

IVAR HAGLUND

HENRY T. SIMONSON

Port Commissioners

(Appendix A - Noise Remedy Program for Sea-Tac International Airport and Environs.)

APPENDIX A

RESOLUTION NO. 2943

AS AMENDED

NOISE REMEDY PROGRAM

For

Sea-Tac International Airport and Environs

Port of Seattle

As Amended

January 1985

CONTENTS

CONTENTS (Continued)

PREFACE

The recommended Sea-Tac International Airport Noise Remedy Program presented herein represents the equivalent of Chapter 6 of the complete Noise Remedy Program Update Background Studies. This approach has been taken so that the recommended program can function either as a "stand alone" end product or as one part of the overall report.

Section 1

OVERVIEW OF RECOMMENDED PROGRAM

BACKGROUND

As adopted by the Port of Seattle Commission in 1975,* the nationally recognized Sea-Tac Communities Plan included an extensive program designed to improve aircraft noise exposure conditions for that part of King County, Washington, most affected by the presence and operation of Sea-Tac International Airport. Accomplished with fund assistance from the Federal Aviation Administration (FAA), implementation to date of the Sea-Tac Communities Plan has involved the outright acquisition of some 730 parcels of land at a cost in excess of $41 million. Approximately 2,500 persons have also been relocated away from high noise exposure areas situated to the north, west, and south of the Airport boundary (as it was in 1975-1976).

This document describes an updated noise remedy program for Sea-Tac International Airport and its environs. Developed on the basis of new noise exposure information produced as part of a special 1982 study** by the Port of Seattle, the updated program does include recommendations for certain revised/added noise abatement procedures, as well as the purchase of some additional single-family homes. However, the program's primary focus is on such noise remedies as sound insulation, real estate sales assistance, encouragement of local government neighborhood reinforcement, and the acquisition of appropriate avigation easements by the Port.

OVERALL PROGRAM GOALS

As first expressed by the 1975 Sea-Tac Communities Plan, the various noise remedy efforts that have been taken to abate or mitigate aircraft noise exposure are based on several important program goals. In particular, these goals are to:

- Continue the operation of Sea-Tac International Airport in its present location for as long into the future as necessary.
- Make the Airport and surrounding community better neighbors.
- Enhance and protect existing areas within the Airport Environs that are planned for continued use as residential neighborhoods.

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*The Plan was also formally adopted by the King County Council in 1976.
**"Sea-Tac International Airport Noise Exposure Update," June 1982.

TWO KINDS OF NOISE REMEDIES

The recommended program consists of two different but related kinds of remedies for the noise associated with Sea-Tac International Airport. When referring to Airport and/or air traffic control actions that are designed to lessen noise produced by the source (e.g., the aircraft engine), the term noise abatement is used. When off-Airport measures are discussed that make aircraft noise less intense, less serious, or less severe for receivers of the "unwanted sound" (e.g., occupants of the Airport Environs), the term noise mitigation is used. As detailed in the pages that follow, the updated Sea-Tac remedy program consists of nine noise abatement actions and five noise mitigation measures.

PROGRAM IMPLEMENTATION

The overall Noise Remedy Program is designed to be accomplished over the period from January 1985 through the year 2000. Thereafter, some ongoing noise remedies may remain in effect depending on program status. Most of the nine noise abatement remedies are already in effect or will be by the end of 1985. The most extreme off-Airport noise mitigation remedy, outright acquisition, is to be accomplished by the end of 1990.

In general terms, the mitigation effort would involve: (a) fee simple acquisition of some 524 single-family residential properties; (b) the use of transaction or sales assistance by approximately 1,147 owner-occupants at some point during the 1986-2001 Program implementation period (assuming 40% of eligible households are transacted); (c) sound insulation of nearly 1,434 homes at no cost to their owners (assuming 50% of eligible households are insulated); and (d) sound insulation of another 3,500 single-family dwellings on a cost-sharing basis (assuming 50% of eligible households are insulated). In addition, an indeterminate number of avigation easements would be purchased by the Port of Seattle over the next decade and one-half.

Calculated on the basis of constant 1984 dollars, the updated Noise Remedy Program would require approximately $138 million in capital funds. This sum represents a gross average of $9.2 million in capital funds during each of the calendar years from 1986 through 2000.

PROGRAM IMPLEMENTATION (Continued)

To maintain close contact with the communities affected by the Noise Remedy Program, the Port intends to establish appropriate citizen advisory committees for each phase of implementation. These committees will be similar to those established in the past years of the noise remedy effort.

Section 2

NOISE ABATEMENT REMEDIES

NOISE ABATEMENT GOAL

In keeping with the overall Program goals previously described, specific noise abatement remedies are to be employed at Sea-Tac International Airport that are intended to:

- Reduce present and future noise exposure levels to the maximum possible extent by means of Airport/aircraft operational changes.

The extent to which this noise abatement goal is actually achieved will have a major bearing on how much "residual" noise exposure needs to be mitigated (and paid for) within the Airport Environs.

RECOMMENDED NOISE ABATEMENT MEASURES

Nine noise abatement measures are recommended as part of the updated Sea-Tac remedy program. The following information is provided for each of these measures: brief description; anticipated effect of implementing the measure; implementation steps and schedule; responsible agency (or agencies); estimated costs and sources of funding; and the relationship to other plans, programs, policies, or procedures.

Measure A-1. Explore Limited Rescheduling of Nighttime Flights

Description:

This measure would involve the voluntary rescheduling of the flight times (earlier or later as the case may be) of nighttime short-haul flights by jet aircraft. The measure would primarily address those short-haul flights that currently are scheduled to operate between 10 p.m. and midnight or between 5 a.m. and 7 a.m.

Anticipated effect of implementing measure:

Implementation of this measure would reduce the number of operations by jet aircraft during periods of low ambient noise in the Airport Environs.

Implementation steps and schedule:

All of the short-haul flights during nighttime hours arrive from or depart to Portland, Oregon, and involve nine different airlines. The Port Aviation Department should initiate exploratory discussions with some of these airlines in an attempt to persuade them to reschedule the flights in question. In these discussions safety, cost and efficiency issues will be taken into account. To the extent this proves practical, it is estimated that the measure could be fully (or at least partially) implemented within six months of initiation.

Responsible agency:

Port of Seattle Aviation Department.

Estimated costs and source of funding:

There are no capital costs associated with implementing this measure. Port of Seattle staff time would be necessary to conduct meetings with airline personnel, but this cost is incidental to normal operating procedures.

Relationships to other plans, programs, policies, or procedures:

Any airline schedule changes would have to be incorporated in published documents such as the Official Airline Guide.

Measure A-2. Eliminate Training Activity

Description:

This measure would reduce the use of Sea-Tac International Airport for training activities (primarily practice instrument approaches by military aircraft).

Anticipated effect of implementing measure:

[illegible] activity is very [illegible] ment of this activity would not significantly alter aircraft noise exposure as depicted by the noise contours or grids. The real benefit of carrying out the measure would be to reduce the "single event" noise exposure. Aircraft currently using Sea-Tac for training activity would have to use other airports.

Implementation steps and schedule:

As the training activity is primarily by military aircraft, the best approach would be to try and have this activity moved to another facility on a voluntary basis. This entails the Port Aviation Department contacting the appropriate military personnel and soliciting their cooperation. Should such cooperation not be forthcoming, the Port could adopt a policy that training activity not be permitted at Sea-Tac, and this policy could be incorporated in the Airport Operating Rules and Regulations. If such a policy is adopted, then the FAA would be requested to inform pilots requesting permission for touch-and-gos, low approaches, etc., that such activity is not permitted at Sea-Tac. It is estimated that this measure could be implemented within six months of initiation.

Responsible agencies:

The Port of Seattle Aviation Department would have the responsibility for initiating the measure, and the FAA would be requested to assist in implementation.

Estimated costs and source of funding:

There are no capital costs associated with implementing this measure. Port of Seattle staff time would be required to coordinate necessary changes to pertinent documents such as the Airport Operating Rules and Regulations. This cost is incidental to normal operating expenses.

Relationship to other plans, programs, policies, or procedures:

Implementation of the measure may require modifications to the Airport Operating Rules and Regulations.

Measure A-3. Use VOR Radials to Curb Aircraft Drifting from Noise Abatement Track

Description:

This measure uses very high frequency (VHF) omnidirectional range radials to curb departing aircraft from drifting off the runway heading tracks specified in Tower Order SEA TWR 7110.071C, Noise Abatement Procedures.

Anticipated effect of implementing measure:

As a result of early Study recommendations, the Port requested that the FAA investigate the use of VOR radials as a means of avoiding aircraft drift. Due to this recommendation and subsequent FAA evaluation, the use of VOR radials for turbojet aircraft departures in both a north and south flow of traffic has been implemented.

Implementation steps and schedule:

Measure already in effect.

Responsible agencies:

Port of Seattle, Aviation Department.

Evaluation and implementation: FAA.

Estimated cost and source of funding:

The cost of implementing this measure was incidental to normal operating expenses as it involved Port of Seattle and FAA staff time only.

Relationship to other plans, programs, policies, or procedures:

Implementation of this measure requires modification to the Standard Instrument Departure (SID) procedures for Sea-Tac as published in Jeppesen & Co. charts.

Measure A-4. Expand Noise Monitoring System

Description:

Measure #A-4 would expand the noise monitoring system at Sea-Tac by installing two additional permanent monitors in locations east and west of the Airport. On the east side, it is proposed that a permanent noise monitor be installed in the Riverton Heights area, where noise levels in excess of 70 Ldn have been projected. To the west, it is proposed that a permanent noise monitor be placed in a location southwest of the Airport; noise levels in this general location have also been projected to be in excess of 70 Ldn.

Anticipated effect of implementing measure:

Implementation of this measure will allow the Port to monitor noise in two locations where previously measurements have not been available and where aircraft noise has been perceived by the respective communities to be a major problem.

Implementation steps and schedule:

The first step toward implementing this measure has already been accomplished; namely, the Port Commission approved the purchase of two additional noise monitors. The next step--procurement of the monitors--is currently being undertaken by the Port Engineering Department. Once the monitors are in hand, they will be installed and connected to the existing noise monitoring system during 1985.

Responsible agency:

The Port of Seattle Engineering Department is responsible for the procurement, installation, and operation of the noise monitors.

Estimated cost and source of funding:

Estimated cost of the two new permanent noise monitors and installation is $92,000. This amount has been authorized, and work is underway.. Once installed and in operation, the estimated $600 annual maintenance cost would be covered by the Sea-Tac Airport's maintenance budget.

Relationship to other plans, programs, policies or procedures:

Noise exposure information recorded by the new monitors would have to be incorporated into the existing noise reporting system.

Measure A-5. Establish Noise Abatement Office

Description:

This measure would establish a noise abatement office to initiate, implement, and monitor the various noise abatement actions discussed herein. Because of the demands for staff time to implement other noise remedy measures, it is recommended that the noise abatement office be established at the Airport. It should be staffed as follows: (a) by a noise analyst with knowledge of aviation, acoustics, and the ability to make public presentations; (b) by a noise technician with knowledge of the noise monitoring system, and (c) by an administrative aide to maintain accurate records of the various office activities (including receiving and taking appropriate action on noise complaints).

The noise abatement office should maintain a special information "hotline" that would enable the staff and residents of the Airport community to have two-way communications concerning particular noise events, runway use patterns, aircraft arrival and departure procedures, and similar questions. (At present this function is being carried out by the Aviation Department on a trial basis.) When a call is received, the office staff would provide information, make inquiries with the FAA's Air Traffic Control Tower and elsewhere, and record the source and nature of the call. This phone line would furnish the Port with direct and immediate access to citizens affected by Sea-Tac's operations, and also provide these citizens with similar access to Airport representatives who are able to provide accurate and up-to-date information.

The noise abatement office should be in direct communication with the property advisory services (see latter part of this document) off-Airport office.

Anticipated effect of implementing measure:

Implementation of this measure would provide the Port with the capability, within a single location, to:

- o maintain continuous contact with community leaders and citizens (respond to noise complaints)

- o implement and monitor other noise abatement measures
- o evaluate changes in flight patters or flight operations

Implementation steps and schedule:

Following approval of this measure, the first step toward implementation would be to hire the requisite noise abatement office staff. It is estimated that this measure could be fully implemented within six to twelve months after initiation.

Responsible agency:

The Port of Seattle's Aviation Department should be responsible for the establishment and operation of the recommended noise abatement office.

Estimated costs and source of funding:

It is estimated that the capital cost of establishing the noise abatement office would amount to some $20,000, assuming suitable Port office space is available at the Airport (this includes an allowance of $10,000 for computing equipment). Annual operating costs are estimated to be about $150,000, of which approximately $100,000 would be for staffing.

Relationship to other plans, programs, policies, or procedures:

Some of the activities that the noise abatement office staff would be responsible for are currently being handled by others in various Port departments. The consolidation of these various activities in the noise abatement office would necessitate a realignment of internal staff responsibilities and assignments.

Measure A-6. Establish Noise Abatement Committee

Description:

The sixth recommended measure would establish a noise abatement committee to monitor applicable noise remedy activities and recommend new procedures. This committee, to function in an advisory capacity to the Port's Director of Aviation, would monitor the effectiveness of the noise abatement program and the incidence of noncompliance with noise abatement procedures, and review records of noise complaints, among other things.

Implementation steps and schedule:

This measure has already been partially implemented. In May 1984, a committee was established, primarily through efforts of the Aviation Department, to examine current airline compliance with noise abatement flight tracks. Membership includes representatives from organized private or semi-public community/interest groups and also from local, regional, state, and federal public agencies.

Responsible agency:

Port of Seattle Aviation Department.

Estimated costs and source of funding:

The only costs involved are for Port of Seattle Aviation Department staff time--such costs are incidental to normal operating expenses.

Relationship to other plans, programs, policies, or procedures:

The activities of this committee should be closely coordinated with the noise abatement office and the property advisory services office (should both of these functions be established).

Measure A-7. Use Siting of On-Airport Facilities as Noise Buffer

Description:

As facilities at Sea-Tac are expanded, new or remodeled buildings should be used as a buffer between taxiing aircraft and adjacent noise-sensitive uses to the extent possible, consistent with the operational function or purpose of the on-Airport activity involved.

Anticipated effect of implementing measure:

Implementation of this measure where, when, and as possible may be expected to provide some reduction in noise exposure for off-Airport development immediately adjacent to the Sea-Tac boundary.

Implementation steps and schedule:

This measure should be reflected by appropriate policy guidelines for the Sea-Tac Master Plan Update Study that is currently under way. Further, the requirement that Port staff review all plans for the construction of on-site buildings at the Airport should be incorporated in the "Regulations for Tenant Construction at Sea-Tac International Airport." This requirement is particularly important for any development that may take place on the west side of the airfield. Implementation of this measure should take place indefinitely (as long as buildings continue to be constructed at Sea-Tac).

Responsible agency:

The Port of Seattle's Aviation Department, together with the Port's Engineering and Planning & Research Departments.

Estimated costs and source of funding:

The initial cost of implementing this measure is represented by Port of Seattle staff time--such costs are incidental to normal operating expenses. Over the long term, it is possible that additional building construction costs may be incurred as a result of the measure, but such costs would have to be evaluated on a case-by-case basis.

Relationship to other plans, programs, policies, or procedures:

Implementation of this measure would require input to the Sea-Tac Master Plan Update Study policy guidelines and incorporation of appropriate text in the "Regulations for Tenant Construction at Sea-Tac International Airport."

Measure A-8. Restrict Taxiing of Aircraft to/from Maintenance Areas during Nighttime Hours

Description:

This particular measure would require airlines that use the Airport to tow aircraft to and from maintenance areas or to reposition aircraft from one gate to another during nighttime hours.

Anticipated effect of implementing measure:

There are currently as few as 4 or 5 movements under power that occur during nighttime hours. However, the benefits to the adjacent communities in terms of alleviating single event annoyance would be substantial if the aircraft were towed during the nighttime hours when the ambient noise level is very low.

Implementation steps and schedule:

It is recommended that the Port Aviation Department contact those airlines that currently move aircraft on the ground under power (rather than by towing) during nighttime hours to see if voluntary compliance with the measure can be accomplished. If voluntary compliance cannot be achieved, the Port should investigate the possibility to incorporate this measure in the Airport Operating Rules and Regulations--thus requiring compliance by all airlines. It is estimated that this measure could be implemented, either on a voluntary or mandatory basis, within three months of approval.

Responsible agency:

Port of Seattle Aviation Department.

Estimated costs and source of funding:

Port Aviation staff time and related costs will be necessary to implement this measure. Such costs are considered incidental to normal operating expenses.

Relationship to other plans, programs, policies, or procedures:

In the event that mandatory compliance is a necessity, the measure would need to be incorporated in the Airport Operating Rules and Regulations.

Description:

Compliance with FAR Part 36 noise standards is typically required by January 1, 1985, with few exceptions. Some airlines, with the support of certain airport sponsors, are applying to the FAA for exemptions that would result in delays in complying with these noise standards. Under this final recommended measure, the Port would support efforts to ensure compliance with the federal noise standards in accordance with the current schedule.

Anticipated effect of implementing measure:

If compliance with the noise standards is achieved as now scheduled, all of the older, noisier aircraft (now mainly operated by foreign air carriers) would be precluded from operating at U.S. airports. The projected noise contours for Sea-Tac assume that aircraft which do not meet FAR Part 36 would not use the airport after the legislated dates.

Implementation steps and schedule:

The Port has already begun to implement this measure as a result of an early study recommendation. A letter was sent to the FAA Administrator in March 1984 urging support of compliance with the FAR Part 36 noise standards in accordance with the current schedule. As noted, implementation of this measure has already started and should continue until full compliance with FAR Part 36 noise standards has been achieved.

Responsible agency:

Port of Seattle Commission and the Port's Aviation Department. Another agency responsible is the FAA which is involved in implementing the U.S. Department of Transportation's Aviation Noise Abatement Policy dated November 18, 1976.

Estimated costs and source of funding:

Port of Seattle Aviation Department staff time will be necessary to continue implementation of this measure--the cost is considered incidental to normal operating expenses.

Relationship to other plans, programs, policies, or procedures:

Not applicable.

Section 3

NOISE MITIGATION REMEDIES

NOISE MITIGATION GOAL

As with the various noise abatement actions described in Section 2, a general goal has been established relative to the application of noise mitigation measures. That goal is:

- To provide residential property owners and other occupants of the Sea-Tac International Airport environs with maximum possible relief from adverse present and future noise exposure.

The degree to which this goal is actually accomplished depends largely upon (a) the acceptance and use by affected property owners of the noise mitigation measures hereinafter discussed, and (b) the amount of funds available to the Port of Seattle (from federal as well as local sources) over the 1984-2000 program period. Success of the program is also dependent on a good working relationship with the community. The community's cooperation may include such efforts as accommodating remedy personnel working on residential structures, assisting with noise audits, or cooperating with local government efforts.

RECOMMENDED NOISE MITIGATION MEASURES

Six noise mitigation measures are of particular importance to existing Airport Environs residents and property owners. These six measures, as generally described over the next several pages, represent what may be referred to as primary activities of the recommended Noise Remedy Program. Five can be implemented by the Port of Seattle with little or no direct involvement by other local governmental entities, and one measure must be carried out by local government jurisdictions.

Measure M-1. Outright Acquisition

The program initiated in 1972 by the Port of Seattle to acquire noise-sensitive residential properties located within high exposure areas should be continued. Some 524 single-family homes are recommended for outright (fee simple) acquisition. Of these 524 dwellings, 163 remain to be purchased by the Port from the 1,008 units designated for such action by the 1975-1976 Sea-Tac Communities Plan. Therefore, an additional 361 residences have been identified as part of this Noise Remedy Program Update Study. (Including homes acquired since 1975 under the Sea-Tac Communities Plan, a total of 1,369 have been identified for acquisition.)

Following acquisition of a given landholding and satisfactory relocation of the owners (if required), the Port would then have all structures removed and the lot returned to a natural, undeveloped condition. Depending upon location, the Port-owned property would then remain as "open space" or be converted to accommodate an appropriate compatible land use.

Measure M-2. Sound Insulation

About 9,000 to 10,000 existing single-family residences are eligible for special sound insulation. This is far and away the most important noise mitigation measure in terms of potential benefits to future as well as current residents of the Airport Environs.

The ability to achieve a significant level of noise reduction will vary. For example, the amount and type of sound insulation required would depend on: (a) the amount of aircraft noise exposure involved, and (b) the age, type of structure, and present condition of candidate dwellings. In cases, some portions of structures may better lend themselves to attenuation than others. A system of cost-sharing ranging from 100% Port-0% owner, to 50% Port-50% owner, or an alternative to noise insulation, is incorporated in the sound insulation recommendations for existing residential units, depending on the program area in which the home is located and the feasibility of insulating particular structures. Details for this program should become available as a result of the Demonstration Program.

Measure M-3. Transaction Assistance

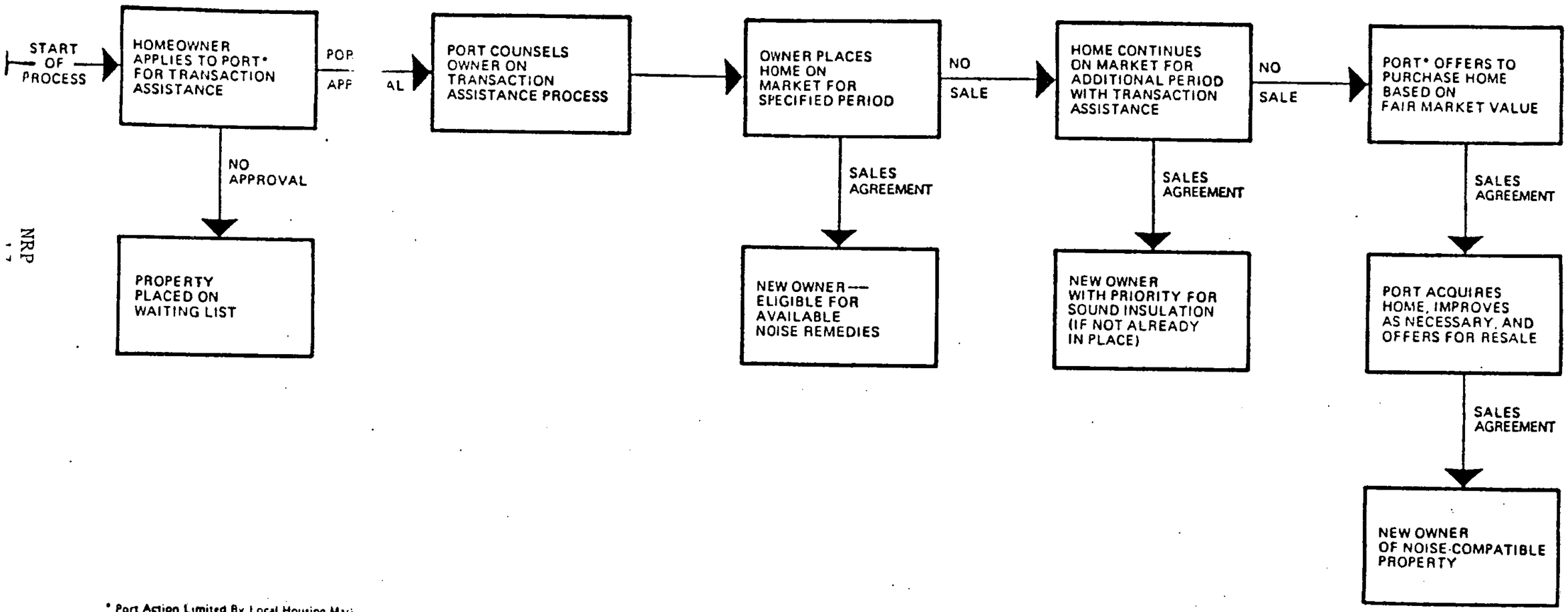
Formerly referred to as "purchase assurance," this measure is now termed transaction assistance in keeping with its primary function. The intent is to provide financial and technical assistance to owner-occupants of single-family residences who desire to sell out and move away from areas of relatively high [illegible] adjacent to or [illegible] for outright acquisition by the Port of Seattle. This transaction (or sales) assistance process is illustrated in the form of a generalized flow diagram on the next page.

Sea-Tac International Airport Noise Remedy Program

GENERALIZED TRANSACTION ASSISTANCE PROCESS

(FOR NEIGHBORHOOD REINFORCEMENT PROGRAM AREA)

September 1984



* Port Action Limited By Local Housing Mark
Conditions to Assure that Transaction Assist
Program Achieves Goal of Neighborhood
Reinforcement/Stabilization.

FLOW DIAGRAM

SOURCES: Port of Seattle
Peat, Marwick, Mitchell & Co.

NRP

The process has been designed (and will need to be administered) in such a way as to disrupt the local residential real estate market as little as possible. Properly handled, the transaction assistance noise remedy should aid an eligible homeowner to dispose of his or her hard-to-sell property in an orderly but reasonably sure fashion. If the various forms of assistance to be made available (all or a portion of real estate agent's fee, mortgage subsidy, sound insulation, etc.) do not result in an acceptable sales transaction, then the Port could acquire the house and lot at fair market value--minus the real estate fee--as "buyer of last resort." Following necessary improvements (which could include sound insulation), the Port would then resell the property to a willing buyer with an avigation easement attached to the deed.

In preparing appraisals for the Transaction Assistance Program comparables from noise-impacted areas, as well as other areas, will be used. The appraisal methodology will be similar to that currently practiced in the acquisition program area.

It should be emphasized that the amount and type of assistance to be provided by or through the Port would be governed not only by the availability of funds, but also by what is needed to "normalize" the local housing market; i.e., to obtain the number of sales transactions necessary to achieve a market turnover rate comparable to neighborhoods or areas not impacted by aircraft noise. Also, an excessive amount of real estate involvement by the Port of Seattle could actually "destabilize" the housing market/area and thus be counter to the various program goals that have been cited.

Measure M-4. Easement Acquisition

The Port should obtain avigation easements in return for sound insulation or transaction assistance, as well as for situations of a specialized nature in

tion, the possibility of a property owner being able to receive money for an appropriate avigation easement is also recommended as part of the updated Noise Remedy Program. Although noise exposure levels may not be affected by this form of remedy, the compensation derived by an owner from the sale of an avigation easement to the Port does "mitigate" the problem of unwanted sound (e.g., aircraft noise)--at least to some extent. In some residences, the Port could

purchase individual avigation easements from an eligible owner-occupant of a single-family structure who desires to continue living in the same location, even though the house cannot be satisfactorily sound-insulated. Other cases where avigation easements may be appropriate include churches. The easement fee paid by the Port could be used to provide some measure of noise remedy by sound insulating noise sensitive areas of church structures.

Measure M-5. Property Advisory Services

The relocation assistance furnished over the years by the Port's Real Estate Department to individuals and families affected by the outright acquisition of their homes has proven to be of great value. While this type of assistance can and should be continued until the acquisition effort is fully accomplished, certain other property advisory services also need to be offered by the Port. Both the recommended sound insulation and transaction assistance noise remedies are complex enough to cause many questions to be raised by affected property owners and other parties of interest.

Continuance and expansion of a comprehensive advisory service is important to the ultimate success of the recommended Noise Remedy Program. Residents and property owners of the Airport Environs need and should have access to timely, factual information--information that will enable them to (a) know what noise remedies they may be eligible for and how, (b) make good decisions when they have a variety of options to choose from, (c) properly cope with rumors (good or bad) that may crop up relative to the overall Program or any of its parts, and (d) assure their neighbors and friends that the various noise remedies are indeed aimed at improving the living, working, and leisure-time environment.

The two-way nature of this advisory service process should also provide the Port Staff and Commission with current information about the concerns of many who are daily confronted with Airport/aircraft impacts. Moreover, the degree of success or failure of the Program can be monitored to some extent by means of the process. To accomplish these potential results, the recommended advisory service should include the following, in addition to case-specific relocation assistance:

- Information about noise exposure characteristics associated with individual property locations.

- o Information about the various noise remedies available for the use and benefit of affected property owners.

- o Consultation on housing-related decisions and options that an owner or occupant of residential property might require from time to time.

- o Referrals to other housing services, and guidance as to the locations and types of housing available in the Seattle area.

Measure M-6. Local Government Remedy Support

By insulating homes and assisting in real estate transactions, the Port with its limited authority can participate in making the airport and surrounding residents better neighbors. But, the Port alone cannot accomplish all program goals. Local governments with land use jurisdiction and obligations to provide services must also participate if the goal is to be achieved, especially in the long term. New homes should be built to insulate the interior living spaces from unacceptable noise; changing land uses must in part be determined based on noise levels, and residents should be provided services commensurate with their needs. The sixth noise remedy is therefore dependent on local government action. The Port will encourage the local governments to undertake projects, provide services, and adopt laws that reinforce the neighborhoods and make them compatible with the airport. The Port will also work closely with the affected jurisdictions in coordinating activities and exchanging data.

OFF-AIRPORT PROGRAM AREAS

Reflecting noise exposure conditions varying from highest to lowest, three different areas have been identified and delineated as locations within which one or more of the primary mitigation measures would be applied. These three off-Airport program application areas have been designated as (1) Acquisition, (2) Neighborhood Reinforcement, and (3) Cost-Sharing Insulation. Brief descriptions of the different areas follow, together with a map on the next page that shows their geographic boundries.

Acquisition

The updated Noise Remedy Program recommends two key criteria for the continued use of outright acquisition as a primary noise remedy. They are:

1. Program focus should be on the acquisition of single-family residences in aircraft noise exposure areas of Ldn 75* and over in the year 2000, or Ldn 80 in the year 1980.

2. Properties identified for acquisition (but not yet obtained) by the 1975-1976 Sea-Tac Communities Plan should continue to be eligible.

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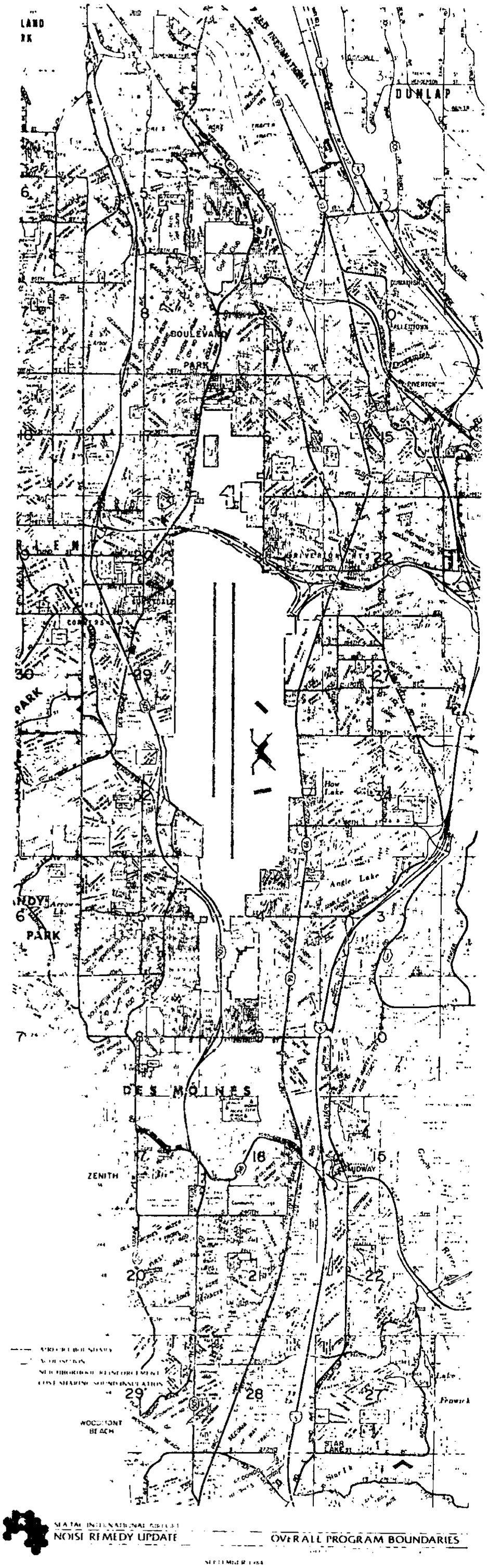
*The day-night sound level, or Ldn, is the currently accepted method used to describe aircraft noise exposure. Ldn values are expressed in decibels and represent the level of noise experienced over an average annual 24-hour period.


DUNLAP
BOULEVARD PARK
PARK
DES MOINES
ZENITH
PARK
Angle Lake
How Lake
STAR LAKE
WOODMONT BEACH
SEATAC INTERNATIONAL AIRPORT
NOISE REMEDY UPDATE
OVERALL PROGRAM BOUNDARIES
SEPTEMBER 1984

The single-family detached residences recommended for outright acquisition on the basis of these technical criteria are located on both the north and south sides of Sea-Tac International Airport. The eligible 524 residential properties would be purchased via fee simple acquisition by the Port of Seattle through the use of procedures well established as a result of previous undertakings of a similar nature. It is also anticipated that relocation benefits would be involved since the Port would apply for and receive federal funding assistance to the maximum extent possible.

Neighborhood Reinforcement

Areas designated as neighborhood reinforcement include noise sensitive land uses that are:

1. Exposed to aircraft noise levels of Ldn 75 and over in 1980 and Ldn 70 and over in the year 2000; and

2. Identified for the "purchase guarantee" noise remedy program by the 1975-1976 Sea-Tac Communities Plan.

3. Directly adjacent to designated acquisition areas.

Based on the foregoing technical criteria, as well as a careful determination of what should serve as logical boundary lines,* the neighborhood reinforcement areas depicted on the map include approximately 2,393 single-family residences, plus some 474 mobile homes. As implied by the term "neighborhood reinforcement," a variety of special programs designed to improve and enhance these existing residential areas are to be undertaken and carried out in future years, particularly by the Port of Seattle.

Cost-Sharing Insulation

The very large cost-sharing insulation program area shown on the accompanying map contains an estimated 6,090 single-family residences and about 900 mobile homes. This area was established in accordance with the following criteria:

1. Existing single-family structures located in areas with a noise exposure of Ldn 70 and above in 1980 or Ldn 65 and above in the year 2000.

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*See Port of Seattle Planning and Research Department report entitled "Program Area Boundaries/Noise Remedy Update/Sea-Tac Airport Summary and Staff Recommendations" (July 1984).

2. Structures/uses identified under the various sound insulation noise remedy programs included as part of the Sea-Tac Communities Plan.

While the primary intent of the updated Program in cost-sharing insulation areas is to offer financial assistance to eligible property owners for purposes of soundproofing their homes, the Port of Seattle should also provide property advisory services in such areas. This is discussed further in the next subsection.

APPLICATION OF NOISE REMEDIES

The next step in the development of the updated Noise Remedy Program assigns appropriate noise mitigation measures to program application areas in accordance with the nature and degree of remedy or "treatment". The resultant combinations are as follows:

- o Acquisition Area
  - Fee Simple Acquisition (Measure M-1)
  - Property Advisory Service (Measure M-5)

- o Neighborhood Reinforcement Area
  - Sound Insulation (Measure M-2)
  - Transaction Assistance (Measure M-3)
  - Easement Acquisition (Measure M-4)
  - Property Advisory Service (Measure M-5)
  - Local Government Remedy Support (Measure M-6)

- o Cost-Sharing Insulation Area
  - Sound Insulation (Measure M-2)
  - Easement Acquisition (Measure M-4)
  - Property Advisory Service (Measure M-5)
  - Local Government Remedy Support (Measure M-6)

The remainder of this subsection contains the following information about each of these area/measure combines: anticipated effect of implementing the assigned measures; implementation steps and schedule; responsible agency (or agencies); estimated costs and source(s) of funding; and relationship to other plans, programs, policies, or procedures. As the Port proceeds with the Demonstration Program, there may be a need to refine or change estimated costs and/or details regarding the implementation steps that follow.

Acquisition Area - Measures M-1 and M-5

Anticipated effect of implementing the assigned measures:

Full implementation of the recommended number of fee simple acquisitions would permit 524 homeowners now exposed to high aircraft noise levels to receive fair market value (FMV) for their properties and to relocate (with assistance, if needed).

Implementation Steps and Schedule:

The latest acquisition program authorized by the Port Commission in early 1983 (150 parcels) is currently under way and is expected to be completed by the Fall of 1985. Thereafter, at an assumed rate of 10 units per month, the remaining 524 properties could be fully acquired and cleared by the end of 1990.

Responsible agencies:

The Port of Seattle through its Real Estate Department would acquire the designated properties and also furnish relocation advice and funding assistance. The FAA would be requested to provide appropriate matching fund grants (80% federal - 20% local) throughout the 1985-1990 acquisition period.

Estimated costs and sources of funding:

Based on an average net cost per unit of $90,000 for each of the 524 single-family residences within the Acquisition Area, close to $47 million in 1984 dollars would be required to fully accomplish this part of the updated Program.

If the FAA is able to provide 80% of the needed funds ($37.6 million) at an average rate of about $7.5 million per year, then the Port would need to furnish approximately $9.4 million or an average of $1.9 million per year. The latter amount can be derived from a combination of Airport resources other than revenue bonds, as described in separate Noise Remedy Program financial analysis material prepared by the Update Study Consultant, Peat, Marwick, Mitchell & Co.

Relationship to other plans, programs, policies, or procedures:

The noise mitigation measures to be applied in the Acquisition Area represent continuations of presently in-place noise remedy programs. However, the Port of Seattle's Capital Improvement Program and King County's Highline Communities Plan and Area Zoning documents will need to be modified to reflect the additional acquisitions recommended by this updated Noise Remedy Program.

Neighborhood Reinforcement Area - Measures M-2, M-3, M-4, M-5 and M-6

Anticipated effect of implementing the assigned measures:

As noted previously some 2,867 residential properties would be eligible for Sound Insulation (Measure M-2) and/or Transaction Assistance (Measure M-3) within the delineated Neighborhood Reinforcement Area. The owners of these properties would also have access to Measure M-5, Property Advisory Services, and in certain cases to the acquisition of avigation easements (Measure M-4). Local government assistance (M-6) would also be encouraged by the Port.

For purposes of developing a reasonable plan for implementing the updated Noise Remedy Program in neighborhood reinforcement areas, the following assumptions were made:

- o One-half (50%) of all eligible property owners would select and be satisfied with appropriate sound insulation if fully paid for by the Port of Seattle (with fund assistance from the FAA).
- o One out of every ten (10%) eligible property owners would decide to use none of the mitigation measures offered.
- o The remaining four in ten (40%) eligible owners would decide to apply for transaction assistance at some point between 1986 and the year 2000.

properties in designated neighborhood reinforcement areas would become more compatible with aircraft operations at the Sea-Tac International Airport over the next 15 years or so. This would include 1,434 sound-insulated dwellings and 1,147 sales transactions.

In addition to providing a means for some current residents who desire (or need) to sell their holdings and move away from aircraft noise exposure, the various noise mitigation measures available within neighborhood reinforcement areas should result in a substantial improvement in the interior noise environment for thousands of residents, stabilization of the local real estate market and related property values, and overall evidence of neighborhood improvement throughout the program application area.

Implementation steps and schedule:

Actual implementation of Measures M-2 and M-3 should not be initiated prior to completion and review of the special demonstration project outlined in a later subsection. This project, designed to provide detailed information about the suggested sound insulation, transaction assistance, and property advisory service procedures, is proposed for accomplishment during 1985 and early 1986. Fund allocations for insulation, sales assistance, and advisory service mitigation measures could then be made for 1986 and each succeeding year through 2000, based on results of the demonstration project as well as subsequent experience with such measures.

Responsible agencies:

Overall responsibility for the project, would be assigned to the Real Estate Department.

The Engineering Department would direct technical support in carrying out the noise remedy programs, especially in noise insulation of structures. An acoustical consultant would be hired to provide technical assistance.

Fund assistance (and technical support as needed) would be requested of the FAA by the Port's Aviation Department on an 80-20 match basis for each year that such federal aid is available. Hopefully, the U.S. Congress will see fit to continue the current Airport Improvement Program (AIP) when the present authorization expires in 1987.

As the local general governmental units for the Airport Environs, both King County and affected cities would be requested to aid the Port, the FAA, and affected property owners in carrying out other neighborhood improvement/ reinforcement activities, as appropriate.

Estimated costs and sources of funding:

It is estimated that the cost of fully sound insulating a single-family dwelling within the neighborhood reinforcement noise exposure area would entail an average cost per unit of some $19,000. This figure includes $850 for a noise audit by an acoustical consultant; $15,150 for construction and installation by a building contractor; and approximately $3,000 for Port Engineering Department supervision, inspection, and administration. The comparable figure for a mobile home on an individual lot is $14,000.

Therefore, if constant 1984 dollars are used, the total costs involved in treating 1,197 single-family units ($22.743 million) plus 237 mobile homes ($3,318,000) amounts to $26,061,000, or essentially $26 million over the 1986-2000 program period.

Similar estimates for the transaction assistance noise remedy yield a projected need for nearly $33 million. This latter figure represents a $30,000 average total assistance outlay per single-family dwelling times 957 units ($28.71 million) plus $22,400 per mobile home times 190 units ($4,256,000) for a total of $32,966,000, or $33 million.

In addition, the recommended implementation plan calls for up to $200,000 per year for the acquisition of avigation easements and another $100,000 annually for the provision of property advisory services. Both of these mitigation measures would also be programmed to start in 1986 and carry through the year 2000.

As with the outright acquisition area, the FAA would be requested to assist on an 80-20 match basis for the sound insulation and transaction assistance noise mitigation measures.

Relationship to other plans, programs, policies, or procedures:

The four noise mitigation measures recommended for application within the neighborhood reinforcement area represent new activities for the Port of Seattle and for the Northwest Mountain Region of FAA. As such the costs associated with these measures must mesh with the Sea-Tac Airport Improvement Plan and budget as well as the Port's overall Capital Improvement Program.

Successful accomplishment of the proposed sales assistance and sound insulation noise programs may also be expected to favorably affect the local tax base over time. This would bolster, among other things, school and special district (fire, water, etc.) budgets, local land use plans and land use control mechanisms, and the provision of needed public services and facilities.

Cost-Sharing Insulation Area -- Measures M-2, M-4, M-5 and M-6

Anticipated effect of implementing the assigned measures:

Approximately 7,000 single-family residential units are encompassed by the Cost-Sharing Insulation area shown on the accompanying map. This includes 910 mobile homes scattered throughout the area.

It is possible, of course, that each and every owner of these 7,000 separate dwellings may decide to install sound insulation prior to the end of 2000 if Measure M-2 (Sound Insulation) is made available by the Port on a shared-cost basis. However, it has been assumed that no more than 50% of all eligible residences (3,500 units) would actually be treated by or before the year 2001 because:

(a) Numerous owners may well decide that noise exposure relative to their property is not enough of a problem to justify paying for one-half of the insulation considered necessary to reduce interior noise levels.

(b) Some structures will prove to be incapable of being properly improved due to old age, deterioration, or other defects; and

(c) A certain number of homes will already have been satisfactorily soundproofed by the owner or original builder.

For these and other reasons, Measure M-4 (Easement Acquisition) and Measure M-5 (Property Advisory Services) would also be offered to qualified property owners throughout this program application area. Measure M-6, Local Government Remedy Support, will also be encouraged in the CostSharing Insulation Area but with less priority than in the designated Neighborhood Reinforcement area.

Some 3,500 single-family homes would become more livable if the assumed 50% rate of owner participation is achieved with respect to the installation of sound insulation on a shared-cost basis. Also, an indeterminate number of additional property owners could also receive monetary compensation in return for selling avigation easements to the Port. All in all, as many as 4,000 homeowners could be benefited in some way by implementation of the assigned mitigation measures in this part of the Airport Environs.

Implementation steps and schedule:

Implementation of the noise remedies proposed for the Cost-Sharing Insulation area should begin on a modest basis in 1986 and continue throughout all of the suggested 15-year implementation period. Again, as with the Neighborhood Reinforcement area, completion of the recommended demonstration project should be accomplished prior to the initiation of any substantial program activity.

Responsible agencies:

The Port's Real Estate Department would have the prime responsibility for carrying out a cost-sharing insulation program, with the Engineering Department handling contracts and staff responsible for insulation plans and specifications. Appropriate fund assistance from the FAA would again be sought by the Aviation Department.

Estimated costs and sources of funding:

The average cost of constructing and installing sound insulation for a single-family residence exposed to Cost-Sharing Insulation area noise levels is estimated to be $8,450. This compares to a $5,700 estimate for a mobile home on a lot that is treated as real property by the King County Tax Assessor.

Total average program costs for the single-family and mobile home dwellings amount to $12,300 and $9,550, respectively. Each of these figures includes $850 for a noise audit and $3,000 for Port administrative expenses.

Based on these per unit averages, the 3,045 single-family units to be insulated (50% x 6,090) would require some $37,453,500 over the 1986-2000 period. Nearly $42 million is involved when 455 mobile homes at $9,550 apiece ($4,345,250) are added to this latter figure.

If participating property owners are required to pay 50% of the construction and installation costs only, then these owners would account for $12,865,125 (3,045 x .5 x $8,450) plus $1,296,750 (455 x .5 x $5,700) or about $14 million of the $42 million total. The Port with FAA assistance would thus need to allocate (over time) some $28 million in 1984 dollars for Measure M-2 on a cost-sharing basis.

Relationship to other plans, programs, policies, or procedures:
The Port's Capital Improvement Program would need to be modified in order to accommodate the noise mitigation measures assigned to the Cost-Sharing Insulation area. Also, current procedures that indicate how best to use Airport Improvement Program (AIP) entitlement and discretionary funds may also require modification if the updated Noise Remedy Program is to be implemented as set forth in this document.

Section 4

DEMONSTRATION PROJECT

As a forerunner to the establishment of expensive sound insulation and transaction assistance noise remedy programs, the Port of Seattle plans to carry out a demonstration project with financial assistance from the Federal Aviation Administration (FAA). The need for such a project, a general description of the proposed effort, a suggested time schedule, and estimated costs as well as financing are discussed in this section.

NEED FOR SUCH A PROJECT

A recent review of experience in other parts of the United States (St. Louis, Reno, Tucson) with the concept of purchase assurance pointed up the fact that no airport sponsor has yet established an ongoing program of this type. Although the Port of Seattle created the idea of purchase assurance (guarantee) in the 1975-1976 Sea-Tac Communities Plan, this form of noise remedy has not yet been implemented by the Port due to the allocation of all available funds since that time for higher-priority outright acquisition programs. The other airport operators mentioned above have also adopted but not yet initiated a purchase assurance program for essentially the same reason.

As a consequence, the Port of Seattle once again has an opportunity to lead the nation via development of a workable transaction assistance/purchase assurance approach to the problem of airport-oriented noise. Because such an approach is far more complex than outright acquisition, however, a demonstration project is needed to:

a. Test the validity of recommended program priorities, assumptions, criteria, and procedures; and

b. Ensure that Port dollars (and federal funds, if used) can be effectively budgeted and spent on [illegible] designated neighborhood reinforcement program areas in future years.

In a similar vein, there is considerable interest within Airport Environs communities for solid information about the pros and cons of sound insulation as a method of improving interior noise levels, particularly for single-family residential uses. Inclusion of a sound insulation component in the proposed project should not only result in obtaining the desired information, but also pinpoint what should and should not be done to establish a cost-effective sound insulation program of improvements.

Finally, a demonstration project of the nature contemplated could permit possible property advisory services and techniques to be tested prior to full implementation of this form of noise mitigation. Again, both time and dollars should be saved in the future due to the experience gained from such a project.

GENERAL DESCRIPTION OF THE RECOMMENDED PROJECT

Sound Insulation Component

Not more than sixteen (16) owner-occupied homes should be included in the sound insulation component of the demonstration project. The structures selected for testing should be representative of the different single-family residential contruction types (brick veneer, wood-stucco, aluminum siding, etc.) to be found in the Airport locale.

To the extent possible, the homes of four (4) volunteer property owners in each of the four major quadrants of the Sea-Tac Airport Environs (north, east, south, and west) should be chosen for appropriate sound insulation. All of the properties involved should be located in those parts of the Airport Environs designated (in whole or in part) for Neighborhood Reinforcement noise remedies by the Port of Seattle. Highest priority should be given to those eligible, long term volunteer owners who sincerely desire to remain in their present homes and neighborhoods, provided that interior noise levels can be effectively reduced.

This part of the demonstration project should essentially be carried out by a qualified acoustical consultant under contract to the Port of Seattle. Services to be provided by the consultant could include the following, generally in the order listed:

- o Identification through field surveys, as well as interviews with local contractors and building inspectors, of the typical single-family dwelling construction types that prevail within the Airport Environs.

- o Assistance in selection of the 16 homes to be sound insulated during the project by (a) reviewing applications received by the Port from eligible volunteer owner-occupants, and (b) screening out candidate structures that appear from an exterior examination to be incapable of being insulated to achieve desired interior noise exposure levels.

- o Performance of detailed "noise audits" on the agreed-upon test homes. Involving both interior and exterior investigations, these noise audits would provide the information needed to prepare specifications for the improvements recommended in each case. Documentation of interior and exterior noise levels at each demonstration home would be made and available prior to any construction activity.

- o Preparation of plans and specifications, receipt of bids and analysis for construction and installation of recommended improvements.

- o Assistance in selecting and contracting one or more qualified local building firms to perform the specified sound insulation work, with concurrence by the Port of Seattle.

- o Documentation of interior and exterior noise levels at each demonstration home after all improvements have been completed.

- o Preparation of a report that describes the process and results of the demonstration project's sound insulation component.

The Port of Seattle, with FAA assitance if available would pay for all costs associated with the sound insulation component. In return for improvement of their homes, participating owner-occupants would provide the Port with an aviga-tion easement. Each owner might be provided with a voucher with other noise [illegible] that he or she may wish to [illegible] in the future, following establishment of a formal program based on results generated by the demonstration project.

Transaction Assistance Component

A maximum of ten (10) volunteer property owners should be selected to take part in the transaction assistance/purchase assurance component of the project. As with the sound insulation effort, each major quadrant of the Airport Environs should be represented, and all properties should be designated for neighborhood reinforcement by the Port of Seattle, with concurrence by King County.

With regard to participation in the transaction assistance test, highest priority should be given to eligible owners who are (a) truly desirous of moving away from the Airport, and (b) have lived in their present home for at least the past twenty-five (25) years, or (c) have a bona fide situation that could be eased through sale of their property and relocation elsewhere. Such hardship might involve an ill or elderly resident who is particularly bothered by noise, a job change for the owner requiring a move to a location outside of the Seattle Metropolitan Region, or other acceptable reason of an "emergency" nature.

For purposes of this effort, the term "hardship" should not be interpreted to include situations where a given owner has simply been unable to sell his or her home for a price acceptable to that owner, even if the property in question has been on the market for a long period of time.

The transaction assistance/purchase assurance component of the demonstration project should be administered by the Port's Real Estate Department, aided by Planning and Research personnel as well as outside realtors, property appraisers, and others, as appropriate.

Property Advisory Service Component

The provision of special advisory services for the use and benefit of homeowner participants and the general public should also be included as another component of the sug[illegible] such activities or products as:

- o Neighborhood meeting presentations and/or news media releases that describe the demonstration project, how the sound insulation and transaction assistance processes would work, and the participant selection criteria. Follow-up presentations could also be made to describe the progress and results of the project.

- o Information packets designed to provide project participants with what they may need to know about the sound insulation of residential structures, transaction (sales) assistance, marketing and financial matters, or other aspects of the project.

- o Individual counseling of participants who have questions about procedures, options available to them, real estate market conditions, noise exposure characteristics, or any other subject that is pertinent to their role in the demonstration.

- o Briefing sessions (supplemented by appropriate printed materials) for real estate agents, property appraisers, sound insulation contractors, and other technicians or agency representatives that are taking part in the demonstration project.

- o Follow-up opinion surveys to solicit pro and con views from project participants and others as to (a) the project process and outcomes, and (b) what features should or should not be incorporated in the larger insulation, transaction assistance, and advisory service programs to be established after the demonstration has been completed.

It is anticipated that most of the Port's administrative and operating departments would take some part in the provision of advisory services as outlined. However, the Real Estate, Planning and Research, Aviation, Engineering, and Public Information departments would no doubt be more involved than other units. Some outside specialists may also be needed, such as opinion survey firms.

Project Time Schedule

The sound insulation/transaction assistance/property advisory service demonstration project should be initiated in early 1985 and be accomplished within about a 18-month time period. This would allow for a one-year demonstration followed by a 3-month review, assessment, and documentation of project results.

Due to the national as well as local significance of the proposed demonstration project, the Port of Seattle should seek FAA participation and fund assistance in carrying out all or part of this important undertaking. At a minimum the Port should establish a close working relationship with the FAA regarding eligibility criteria applicable to a permanent program.

Estimated Costs and Financing of the Project

Pending development of and agreement on a detailed work program (or study design), the dollar amount needed to accomplish the recommended demonstration project has been estimated on a preliminary basis. If any one element of this Demonstration Project is delayed, then other elements should proceed if at all possible.

Component of Project	Per Unit Average	Number of Units	Totals
Sound Insulation			
Acoustical Consultant/Contractor	$10,000	16	$160,000
Construction/Installation	$15,150	16	242,000
Port Administration	2,000	16	32,000
Subtotal	$27,150		$434,400
Transaction Assistance			
Property Appraisal	$ 200	10	$ 2,000
Other Appraisal or Real Estate Analysis			35,000
Noise Audit (Acoustical Consultant)	1,200	10	12,000
Real Estate Fee (one-half)	2,625	10	26,250
Sound Insulation			
Acoustical Consultant	8,800	10	88,000
Construction/Installation	15,150	10	151,500
Mortgage Subsidy	3,325	10	33,250
Port Administration/Processing	3,000	10	30,000
Subtotal	$34,300		$378,000
Program Additions			$55,000
Property Advisory Service			
Consultants			$ 41,000
Printing, Mailing, Miscellaneous			40,000
Port Personnel/Advisors	2,000	26	52,000
Subtotal			$133,000
GRAND TOTAL			$1,000,000

Source: "Special White Paper on the Concept of Purchase Assurance as an Airport Noise Remedy," Peat Marwick, May 1984.

Section 5

PROGRAM SUMMARY

Designed for use as a quick reference, a condensed tabular summary of the recommended Noise Remedy Program that has been detailed and recommended in this document is provided on the next page. The summary focuses on the responsibilities, estimated costs, and implementation schedules that are associated with the nine noise abatement and five noise mitigation measures included in the overall remedy program.

Tabular Summary

SEA-TAC INTERNATIONAL AIRPORT NOISE REMEDY PROGRAM

NOISE REMEDY	RESPONSIBILITY	ESTIMATED COST [A]	YEAR(S) OF IMPLEMENTATION
Noise Abatement Remedies:			
1. Explore limited rescheduling of nighttime flights.	POS Aviation Department	-- [B]	1984-1985
2. Eliminate training activity.	POS Aviation Department/FAA	-- [B]	1984-1985
3. Use VOR radials to curb aircraft drifting from noise abatement track.	POS Aviation Department/FAA	-- [B]	Implementation under way
4. Expand noise monitoring system.	POS Engineering Department	$92,000 + $600 annual maintenance cost	Implementation under way
5. Establish noise abatement office.	POS Aviation Department	$20,000 + $150,000 annual operating expenses	1984-1985
6. Establish noise abatement committee.	POS Aviation Department	-- [B]	Implementation under way
7. Use siting of on-Airport facilities as noise buffer.	POS Aviation[C]/Planning & Research/Engineering Departments	-- [B]	1984
8. Restrict taxiing of aircraft to/from maintenance areas during nighttime hours.	POS Aviation Department	-- [B]	1984-1985
9. Support compliance with FAR Part 36.	POS Aviation Department	-- [B]	Implementation under way
Noise Mitigation Remedies:			
1. Outright acquisition.	POS Real Estate Department	$47 million	1986-1991
2. Sound insulation.	POS Real Estate[C]/Engineering/ Planning & Research Departments	$26 million (100% POS/FAA) $28 million (50% POS/FAA)	1986-2001
3. Transaction assistance.	POS Real Estate[C]/Planning & Research Departments	$33 million	1986-2001
4. Easement acquisition	POS Real Estate[C]/Planning & Research Departments	$3 million	1986-2001
5. Property advisory service.	POS Real Estate[C]/Planning & Research Departments	$100,000 per year	1986-2001
6. Pilot Demonstration Program	POS Real Estate Department	$1 million annual operating expenses	1985-1986

[A] 1984 dollars (Port of Seattle with FAA assistance, as appropriate)
[B] Incidental to normal operating expenses
[C] Primary responsibility

Source: Peat Marwick, September 1984

4676p - 01/07/85

6.2 Responses to FAA Comments

Prior to the Port's adoption of the Noise Remedy Program in January 1985, a copy of the final draft Noise Remedy plan was provided to the local FAA office for review. The Port responded to the concerns raised by the FAA in a letter dated January 8, 1985. The FAA's comments and the Port's responses are reproduced on the following pages.

US Department
of Transportation

**Federal Aviation
Administration**

Seattle Airports District Office
7300 Perimeter Road South
Seattle, Washington 98108

November 13, 1984

Mr. Barney Myer
Department of Planning and Research
Port of Seattle
P. O. Box 1209
Seattle, Washington 98111

Dear Mr. Myer:

We have reviewed the working draft document entitled "Recommended Noise Remedy Program for Sea-Tac International Airport and Environs" dated September 1984. Our overall comments regarding the working draft were presented by David Field at the November 13, 1984, public hearing. A copy of his presentation is enclosed. Also enclosed are our detailed comments on the working draft.

Please call if you have any questions regarding any of our review comments.

Sincerely,

George K. Saito
Community Planner

Enclosures (2)

PORT OF SEATTLE
P O BOX 1209 SEATTLE, WASHINGTON 98111

January 8, 1985

Mr. Dave Field
Airports District Office FAA
7300 Perimeter Road S.
Boeing Field
Seattle, Washington 98108

Dear Dave:

We have appreciated your and your staff's cooperation during the development of the Noise Remedy Update for Sea-Tac Airport. Your testimony supporting the adoption of the program at our November public hearing was particularly helpful and encouraging.

Attached to your general comments you also provided us with twenty-one specific comments. We have subsequently changed some of the plan details in response to these comments. To help you understand what changes you prompted and to give you a complete response to each comment, we have prepared the enclosed attachment. This attachment will also appear in our PART 150/Phase II submittal.

Also enclosed you will find the Noise Remedy Update Resolution as it was adopted by the Port Commission today.

We are now excited about the Demonstration Project that should be well underway in the next several months. Thank you once again for your continued cooperation and assistance.

Sincerely,

Lynn Taylor
Director, Planning and Research

cc George Saito, Dennis Ossenkop

5285p
Enclosure

RESPONSES TO FAA'S DETAILED REVIEW COMMENTS (11/13/84) ON THE PORT OF SEATTLE'S RECOMMENDED NOISE REMEDY PROGRAM.

FAA Comment #1: Page 1, First paragraph: It is mentioned that "...implementation to date of the Sea-Tac Communities Plan has involved the outright acquisition of some 730 parcels..." On page 14, it is stated that "...163 remain to be purchased by the Port from the 1008 units designated for such action by the 1975-1976 Sea-Tac Communities Plan." This would indicate that 845 units have been purchased. How does this figure of 845 units related to the 730 parcels mentioned on page 1?

Response: The 730 parcels acquired to date by the Port include instances where more than one unit was purchased per parcel (i.e. mobile home courts), hence the discrepancy between parcels and units. No change is necessary in the program.

FAA Comment #2: Page 2, Third paragraph: It should be mentioned that the figures presented reflect specific assumptions that only a certain percentage of the residents in the affected area will participate in the transaction assistance and insulation programs.

Response: To clarify the basis for the estimates on page 2, the assumptions from pages 24 through 27 have been briefly summarized parenthetically on page 2.

FAA Comment #3: Page 3: Under measure "A-1", it is mentioned that "implementation of this measure would reduce the number of operations by jet aircraft during periods of low ambient noise in the Airport Environs." How many operations would be involved in this reduction? What is the anticipated effect on noise impact? Will it be a significant effect?

Response: There are about 13 short haul flights currently scheduled between 10 p.m. and 7 a.m. Voluntary rescheduling of these flights would therefore result in 0 to 13 fewer flights during that time period. Because this is such a small proportion of the total flights, the resulting noise effect would be minimal.

FAA Comment #4: Pages 4 and 5: It is mentioned that "aircraft currently using Sea-Tac for training activity (primarily military) would have to use other airports in the Puget Sound Region, such as Boeing Field, Paine Field, ..." We would not recommend Boeing Field or Paine Field in this regard because of the noise sensitive areas adjacent to these facilities. We suggest that the text describe the number of training operations involved and thereby indicate the "single event" noise benefits to be gained through this measure. What is the legal impact of a Port policy not to permit any training activity at Sea-Tac?

Response: There is currently only about one military event per day at Sea-Tac. Discouraging this limited activity at the airport could possibly reduce this to no flights. However, the Port does not intend to ban such flights and therefore it would not make the abatement measure a legal issue. Mention of the other airports where the military flights might be made has been struck from the recommended plan.

FAA Comment #5: Page 6, First paragraph: What has been the effect of implementing measure "A-3" so far in terms of noise impacts? We feel this should be discussed in the first paragraph.

Response: The Port is in the process of evaluating the effects of establishing VOR radials for turbojet aircraft departures. A computerized monitoring system to record takeoff patterns is being developed. Results should be available in early 1985.

To date citizen response to the VOR radial takeoff procedure has been mixed. Some people claim that aircraft noise has decreased where others claim many more overhead flights outside of the established flight tracks.

FAA Comment #6: Page 8, Last paragraph: Under measure "A-5", will implementation of this measure provide the Port with the capability to identify individual aircraft which significantly "drift" from the flight tracks?

Response: Yes, individual aircraft drifting from flight tracks will be identified by airline and flight number.

FAA Comment #7: Page 9, Last paragraph: Under measure "A-6", would the Noise Abatement Committee be set up to recommend new procedures in addition to monitoring activities with respect to existing noise abatement procedures? This committee would involve the costs of other agency staff time in addition to those of the Port.

Response: Yes, the Joint Committee on Aircraft Overflights has recently agreed to recommend new procedures. This change in the role of the committee has been added to the noise remedy program.

FAA Comment #8: Page 12, Last paragraph: Under measure "A-8", is towing still considered a practical means of moving aircraft from a safety standpoint (especially if relatively long distances are involved)? Do some airlines employ towing now at Sea-Tac as described under this measure? Will this measure involve significant additional costs to the airlines?

Response: Some airlines do tow their aircraft while others do not. This procedure will be dealt with by the noise abatement office which is recommended by the Noise Remedy Update to be established. One of its tasks will be to study the cost, safety and noise impacts resulting from towing aircraft.

FAA Comment #9: Page 13: Under measure "A-9", it should be mentioned in the first paragraph (anticipated effect of implementing measure) that the projected noise contours for Sea-Tac assume that aircraft which do not meet FAR Part 36 would not use Sea-Tac after certain specific dates. Responsible agencies would also include FAA and there is a relationship to the U. S. Department of Transportation's Aviation Noise Abatement Policy dated November 18, 1976.

Response: These additions have been made to the recommended plan.

FAA Comment #10: Page 15, Second paragraph: It is mentioned that about 9000 existing single-family residences would be eligible for special sound insulation under the Noise Remedy Program. This does not match the figures presented on page 21 (2393 residences plus some 474 mobile homes in the reinforcement area and 6090 residences plus about 900 mobile homes in the cost-sharing insulation area) which total 9857 residences.

Response: The actual number of residences in the program areas includes homes that may be too old or in too poor a condition to feasibly insulate. These structures may have to be dropped from the insulation program. To "remedy" the noise impact of these homes the Port may have to consider a simple acquisition of an avigation easement as an alternative to noise insulation.

To avoid the apparent inconsistency of numbers in the plan, the 9000 figure on page 15 has been changed to 9,000 to 10,000.

FAA Comment #11: Page 19, First paragraph, 9th line: Incomplete sentence. Footnote should describe Ldn as an "annual" average 24-hour period.

Response: Appropriate changes to the recommended plan have been made.

FAA Comment #12: Page 25: Under "Responsible agencies," the responsibility of the Port is described for the noise insulation program. We assume the Port will hire an acoustical consultant to assist in this program.

Response: Yes, the Port will hire an acoustical consultant to assist in this program. The recommended plan has been changed to clarify this.

FAA Comment #13: Page 28, First paragraph: It is mentioned that "...as many as 4,000 homeowners could be benefited in some way by implementation of the assigned mitigation measures in this part of the Airport Environs." On page 29, the cost sharing insulation program is said to cost some $28 million but this involves only the estimated 3,500 homes. What is the estimated cost of dealing with the remaining 500 homes?

Response: The remaining 500 homes would be benefited by Measures M-4 and M-5 as explained on page 27.

FAA Comment #14: Page 33, First paragraph: It is mentioned that the designation for neighborhood reinforcement would be established by the Port of Seattle with concurrence by King County. We recommend that the role of King County in the demonstration project is further explained (e.g., in the sound insulation component).

Response: King County has been consistently involved in the development of the Noise Remedy Plan for Sea-Tac Airport. At present the Port and the county are scheduling an update of the land use plan for the Sea-Tac vicinity. The plan is within King County's jurisdiction. The Port's role in this plan process will be secondary. King County's involvement in the development of the noise remedy plan and its commitment to updating the land use plan are evidence of their cooperation with the Port of Seattle.

In addition, County planners will be involved during the Demonstration Program to clarify the details of County involvement and participation in the neighborhood reinforcement program.

FAA Comment #15: The table on the page following page 35 indicates that the demonstration project would cost $879,400. The table on page 37 shows this cost to be $1,000,000. Does the difference ($120,600) represent the cost of planning to set up the demonstration project which would cost $879,400 to implement?

Response: The cost of the Demonstration Project is estimated to be approximately $1,000,000. The table on page 36 has been changed to reflect this estimate. The exact cost of the program can not be determined because of the nature of the program which is research oriented with many unknowns. At present the Port's estimate of $1,000,000 does include the cost of setting up the Demonstration Project once it has been adopted in principle by the Port Commission.

FAA Comment #16: The table on page 37 shows that the noise audit would cost $1,200 per unit (average). Page 28 (last line) indicates that the noise audit would cost $850 per unit. Why does the noise audit for the demonstration project cost more than for the main program?

Response: The difference in the noise audit is due to the number of audits to be performed. The limited number of audits in the demonstration project will probably cost more than the later ones which can be done with some economies of scale.

FAA Comment #17: In the area proposed for insulation, there are homes not capable of successful noise treatment. We recommend your consideration of buying and removing these homes and replacing them with better homes from the acquisition areas (at least during the 5-year land acquisition program). The homes from the acquisition area should have a noise audit before moving them to the insulation area.

Response: There may be some merit to this suggestion but the Port must proceed with caution. Outright acquisition may appear to be an extension of the acquisition program which would not only deteriorate the established program boundaries (especially from the point of view of other people in the reinforcement area), but could also require higher program costs for relocation. Never-the-less the idea of moving good homes from the acquisition area into the reinforcement area makes sense. During the Demonstration Program we intend to explore how this can best be accomplished to meet the overall noise remedy goals.

FAA Comment #18: We recommend the use of contract real estate agents for control and cost saving on the transaction assistance program.

Response: We are considering use of contract real estate agents to assist in the Transaction Assistance Remedy. During the Demonstration program we will have to determine just how we can best use their services.

FAA Comment #19: Is there any consideration of later adding to the overall program the insulation of any public buildings (especially those being used for noise sensitive purposes).

Response: Most public structures in the noise insulation program areas are schools. The Port and the Highline School District have already settled the noise issue. The Port made a payment to the District for noise insulation costs. Other buildings that we may consider for some type of assistance in remedying noise are the churches within the program areas. The most likely remedy for churches would be the of purchase avigation easements.

FAA Comment #20: We suggest that detailed discussions be held with the tax assessor regarding the effect on individual assessed valuation from noise insulation treatment during the demonstration project. The home owner who wants to participate in the insulation program should know up front what this could mean in terms of the related taxes he will have to pay.

Response: We expect to involve King County's assessor in the development of the detailed noise remedy program as we carry out the Demonstration Project.

FAA Comment #21: Finally, please be advised that the format of the working draft is acceptable for purposes of the Noise Remedy Program Update Study Report (Chapter 6) but not for the purposes of meeting FAR Part 150 requirements. Noise compatibility program reports under FAR Part 150 must follow the format called for in that regulation and related guidance material.

Response: The Port of Seattle has prepared a seven chapter FAR Part 150/Phase II report that meets FAA's requirements. Within this report the complete Noise Remedy Plan is included as part of the last chapter as are these responses to FAA's comments.

6.3 Relationship to Other Airport and Noise Planning Actions

Noise remedy planning efforts at Sea-Tac Airport have been carefully coordinated with other airport and noise planning actions. Within the Port, interdepartmental steering committees and reviews of all planning documents assure that decisions are interrelated and consistent in achieving the overall goals and objectives of the Port. With other governmental bodies and agencies, coordination of planning efforts and noise remedy takes place in formal advisory committees as well as in meetings, both formal and informal, with appropriate staff and elected officials.

The paragraphs below summerize other related airport and noise planning efforts that have been coordinated with the adopted noise remedy program.

Airport Master Plan

Sea-Tac International Airport's existing airport master plan does not conform to FAA Advisory Circular 150/5020-6 ("Airport Master Plan"). Growth and development of facilities during the past 10 years has been guided by the original Terminal area plans developed by The Richardson Associates (TRA) in 1968 and by the Sea-Tac/Communities Plan of 1975/1976. Both of these plans were developed before the deregulation of the airline industry.

Because facility demand vs. capacity reached a point where case-by-case facility planning was no longer possible, the Port applied for and received FAA funds to prepare a master plan in 1983. Currently the master planning process is underway, and selection of a plan to guide future decisions is expected in 1985.

No new runways or extensions of present runways are expected in the next 15 years. The master plan will therefore show no new runway configurations. The changes and expansion addressed in the master plan will be primarily found in the terminal and supporting facilities. Nevertheless, the facility changes are expected to accommodate a doubling in passenger and cargo capacity.

The operations forecast for the master plan and the noise compatibility planning have been coordinated to maintain consistency in the planning processes. In like fashion all physical aspects of the master plan are reflected in the Noise Remedy Update.

Airport Noise Control and Land Use Compatibility (ANCLUC) Planning Studies

The Sea-Tac/Communities Plan was adopted in 1975 prior to the initiation of ANCLUC studies. The Noise Remedy Update is a refinement of the noise element of the Sea-Tac Communities Plan. In combination the original plan and the update are in essence the ANCLUC study for Sea-Tac Airport.

Airport Systems Plans

Sea-Tac International Airport is named the major regional airport for Western Washington in both the National and State airport system plans. The Noise Remedy Program assumes this role for Sea-Tac and includes measures to assist in maintaining this role by mitigating the noise impacts of the airport on the surrounding community.

Environmental Assessments

An environmental assessment for the Noise Remedy Update (as found in Chapter 6) has been prepared and delivered to the District FAA office at Boeing Field in Seattle. The document is currently being reviewed. The assessment is expected to meet all environmental reporting requirements as specified in the National Environmental Protection Act (NEPA).

Federal Aviation Regulations, Part 36

Federal Aviation Regulations, Part 36 contains noise certification standards for most airplane types, generally requiring newly designed and manufactured aircraft to be significantly quieter than older aircraft. However, as a certification standard, Part 36 has no provisions to control either the operations or numbers of operations at an airport in order to stabilize or reduce noise impacts. Part 150 works as a compliment to Part 36 by integrating the gains in reduced aircraft noise emissions into an overall noise compatibility program with controls on both aviation noise and land uses to assure full implementation and long-term protection to both the airport and its environs. The Port is very supportive of the Part 36 certification standards and has advocated strict adherence to the compliance schedule.

OMB A-95 Notification and Review

To implement the Noise Remedy Program the Port will apply for FAA funding. All applications will comply with OMB A-95 notification requirements. As a matter of process the Port includes A-95 reviews with all federal grant applications.

Relocation Plan

A specific parcel by parcel relocation plan for the designated acquisition areas will be prepared by the Port. It will be essentially the same as the relocation plans prepared for acquisitions that have been carried out over the past decade. The relocation plan is based on the Noise Remedy Update and is one of the specific plans prepared to implement the Noise Remedy Program.

Other Noise Planning Actions

The Port does not have land use jurisdiction around Sea-Tac Airport, except concerning Airport development. Therefore, the Port cannot sponsor or carry out planning processes or actions to determine land use in the vicinity of the Airport. However, the Port has adopted a policy in the Noise Remedy Update to encourage and participate with local jurisdictions having land use control. Please refer to Chapter 5, Section 5.3, of this report for more detail on how the Noise Remedy Program is related to these other planning activities.

KEY:

RESIDENTIAL	
RESIDENTIAL, COMMERCIAL	
PUBLIC USE: School	S
Nursing Home	N
Church	C
Library	L
Hospital	H
Other	
COMMERCIAL	
OPEN SPACE: Park	
Golf Course	
Other	
INDUSTRIAL/MANUFACTURING	

CERTIFIED TRUE AND COMPLETE

The noise exposure maps & accompanying documentation for the Noise Exposure Maps of Sea-Tac International Airport, submitted in accordance with FAR Part 150 with the best available information, are hereby certified as true and complete to the best of my knowledge and belief.

Signed

Lynn Taylor : October 15, 1984
Director, Planning and Research
Port of Seattle

65 65 70 70 75 75 80 80 80 75 75 70 70 65 65 Ldn

NORTH

— — — : 1990

SEA-TAC INTERNATIONAL AIRPORT

1984/85

NOISE REMEDY UPDATE

LAND USE

PORT OF SEATTLE · SEATTLE WASHINGTON

0 1 2 3,000'

A significant reduction in the number of acres/people is expected within the aircraft noise contours by 1990.

Exhibit 4-1

CERTIFIED TRUE AND COMPLETE

The noise exposure maps & accompanying documentation for the Noise Exposure Maps of Sea-Tac International Airport, submitted in accordance with FAR Part 150 with the best available information, are hereby certified as true and complete to the best of my knowledge and belief.

Signed

Lynn Taylor : October 15, 1984
Director, Planning and Research
Port of Seattle

KEY:

RESIDENTIAL	
RESIDENTIAL, COMMERCIAL	
PUBLIC USE: School	S
Nursing Home	N
Church	C
Library	L
Hospital	H
Other	
COMMERCIAL	
OPEN SPACE: Park	P
Golf Course	GC
Other	
INDUSTRIAL/MANUFACTURING	

80 Ldn
80
75
65 65 70 70 75 75 70 70 65 65 Ldn

NORTH

— — — : 1990

SEA-TAC INTERNATIONAL AIRPORT 1984/85

NOISE REMEDY UPDATE

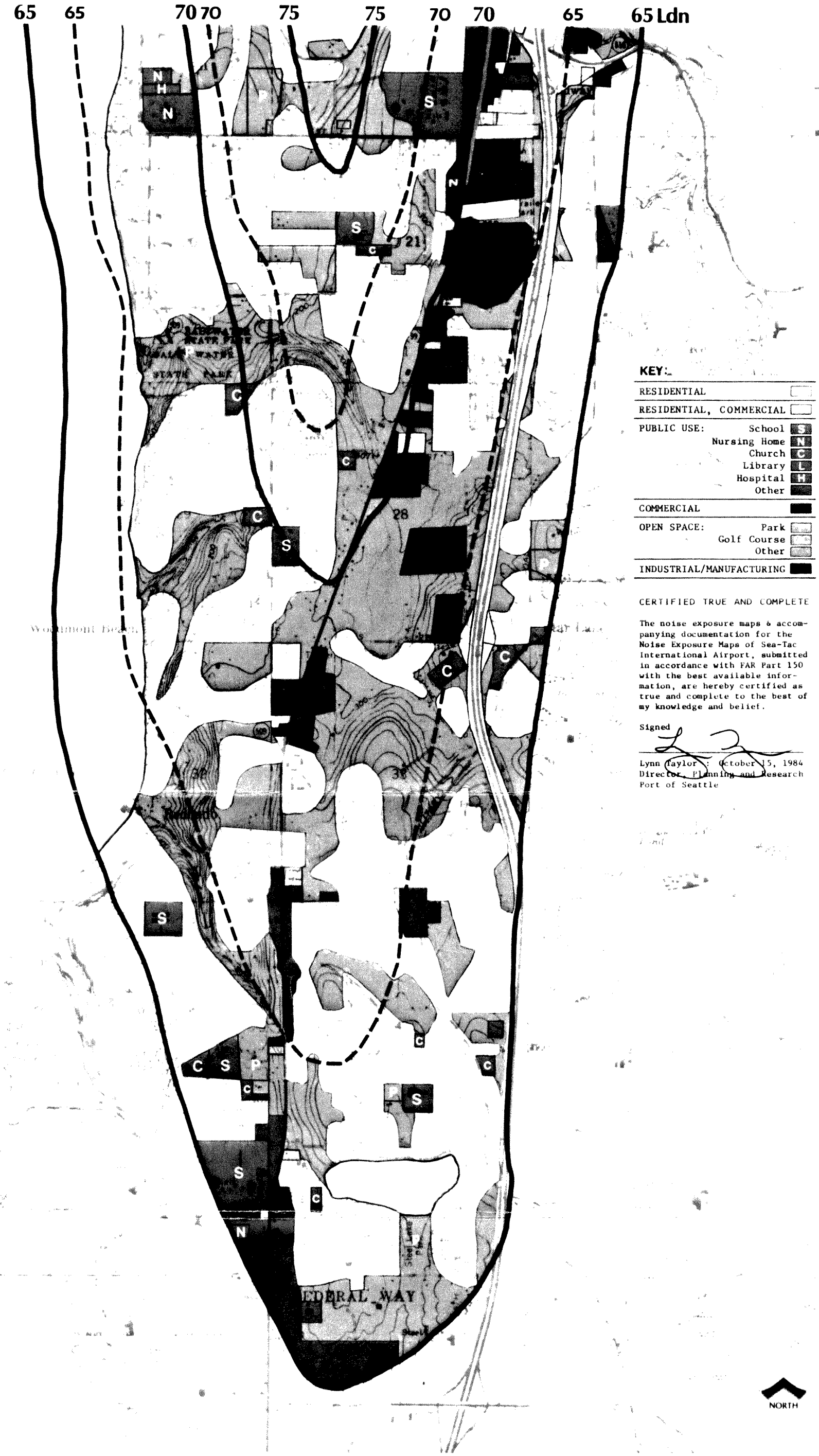
LAND USE

PORT OF SEATTLE — SEATTLE, WASHINGTON

0 1 2 3,000'

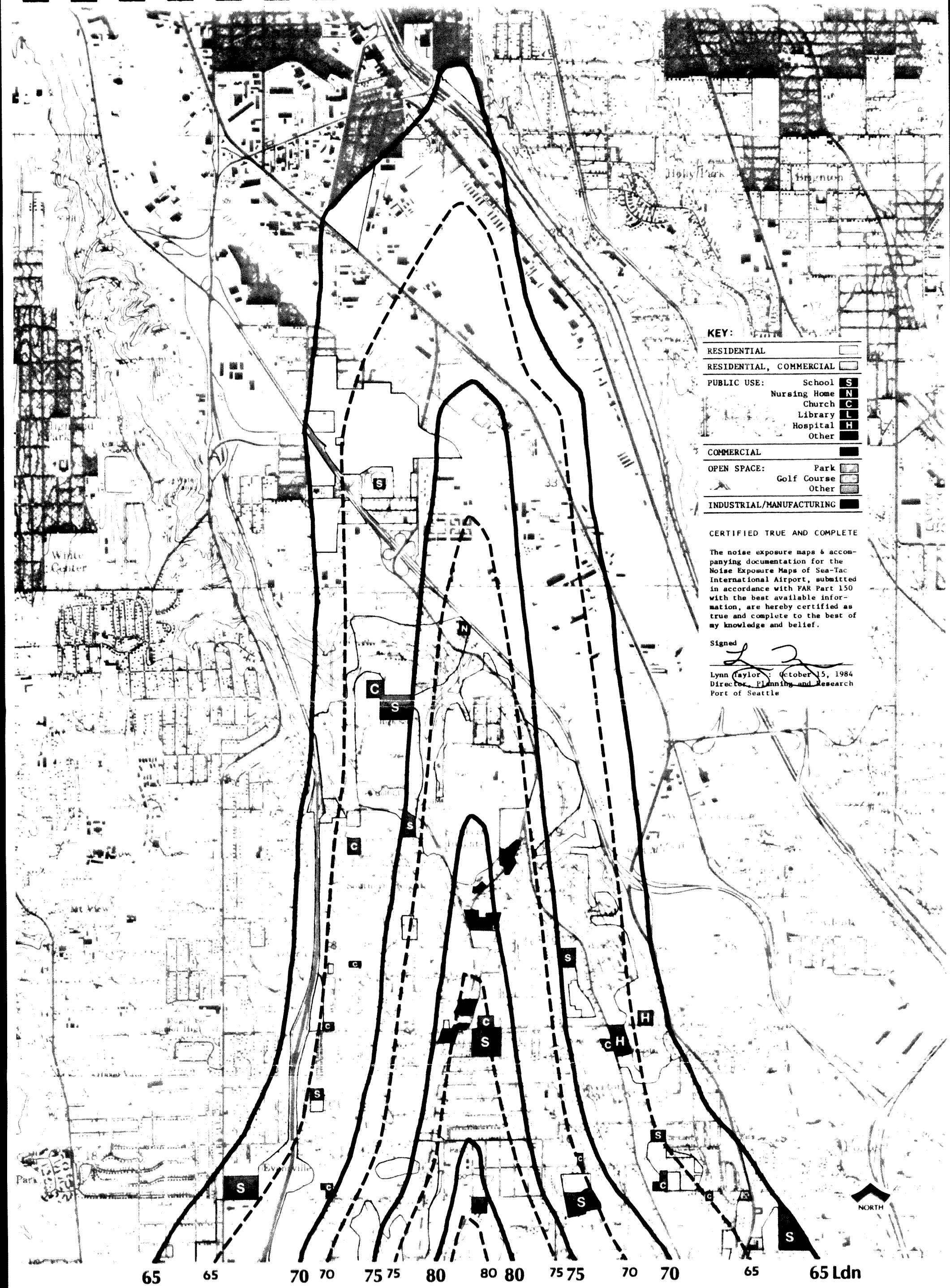
A significant reduction in the number of acres/people is expected within the aircraft noise contours by 1990.

Exhibit 4-2



A significant reduction in the number of acres/people is expected within the aircraft noise contours by 1990.

Exhibit 4-3



SEA-TAC INTERNATIONAL AIRPORT

NOISE REMEDY UPDATE

1984/85 · BASED ON FAA CRITERIA

NONCOMPATIBLE LAND USE

0 1 2 3,000'

PORT OF SEATTLE · SEATTLE, WASHINGTON

A significant reduction in the number of acres/people is expected within the aircraft noise contours by 1990.

Exhibit 4-6

CERTIFIED TRUE AND COMPLETE

The noise exposure maps & accompanying documentation for the Noise Exposure Maps of Sea-Tac International Airport, submitted in accordance with FAR Part 150 with the best available information, are hereby certified as true and complete to the best of my knowledge and belief.

Signed

Lynn Taylor, October 15, 1984
Director, Planning and Research
Port of Seattle

KEY:

RESIDENTIAL	
RESIDENTIAL, COMMERCIAL	
PUBLIC USE: School	S
Nursing Home	N
Church	C
Library	L
Hospital	H
Other	
COMMERCIAL	
OPEN SPACE: Park	P
Golf Course	GC
Other	
INDUSTRIAL/MANUFACTURING	

80 Ldn

75

80

65 65 70 70 75 75 70 70 65 65 Ldn

NORTH

— — — : 1990

SEA-TAC INTERNATIONAL AIRPORT

1984/85 · BASED ON FAA CRITERIA

NOISE REMEDY UPDATE

NONCOMPATIBLE LAND USE

PORT OF SEATTLE · SEATTLE, WASHINGTON

0 1 2 3,000'

A significant reduction in the number of acres/people is expected within the aircraft noise contours by 1990.

Exhibit 4-7

65 65 70 70 75 75 70 70 65 65 Ldn

KEY:

RESIDENTIAL	
RESIDENTIAL, COMMERCIAL	
PUBLIC USE: School	S
Nursing Home	N
Church	C
Library	L
Hospital	H
Other	
COMMERCIAL	
OPEN SPACE: Park	P
Golf Course	GC
Other	
INDUSTRIAL/MANUFACTURING	

CERTIFIED TRUE AND COMPLETE

The noise exposure maps & accompanying documentation for the Noise Exposure Maps of Sea-Tac International Airport, submitted in accordance with FAR Part 150 with the best available information, are hereby certified as true and complete to the best of my knowledge and belief.

Signed

Lynn Taylor : October 15, 1984
Director, Planning and Research
Port of Seattle

NORTH

— — — : 1990

SEA-TAC INTERNATIONAL AIRPORT

1984/85 · BASED ON FAA CRITERIA

NOISE REMEDY UPDATE

NONCOMPATIBLE LAND USE

0 1 2 3,000'

PORT OF SEATTLE · SEATTLE, WASHINGTON

A significant reduction in the number of acres/people is expected within the aircraft noise contours by 1990.

Exhibit 4-8