



SOUND INFORMATION

Seattle-Tacoma International Airport Airport Noise Reduction Programs

The Port of Seattle provides one of the most comprehensive noise management programs in the nation with Sea-Tac's noise abatement and mitigation measures. Sea-Tac's noise programs are divided into **Noise Abatement** and **Noise Remedy**. Noise abatement programs relate directly to noise reduction at the source — models of aircraft and engine types at Sea-Tac, flight procedures, ground noise restrictions, etc.. Noise remedy programs are those that mitigate the effects of noise in the impacted communities. These type of programs include sound insulation of homes, sales assistance and the home acquisition and relocation program.

NOISE ABATEMENT PROGRAMS

Noise Budget

This program guarantees that Sea-Tac will move steadily and predictably toward an all Stage 3 (the quietest) jet fleet, reducing noise each year over the next 10 years. The "budget" allocates the maximum amount of noise that airlines are allowed to make each year at Sea-Tac and this allocation is reduced annually. Since the inception of the program in January 1991, Sea-Tac's Stage 3 fleet mix has increased from 50% to 85%. The national Stage 3 fleet mix in 1996 was 70%.

Nighttime Limitations

This program, which went into effect Oct. 1, 1990, phases out Stage 2 (the noisiest) jet aircraft flights during the nighttime hours. Each year the nighttime hours expanded until October 1, 1995. Since 1995, operations of these jets have been restricted between 10 p.m. and 7 a.m..

Ground Noise Control

Powerbacks. Airlines at Sea-Tac are not allowed to use engine power to back away from gates. With the use of tugs, all aircraft are now pushed away from gates to reduce noise.

Run-ups. Regulations have been established for when and where jet engine maintenance run-ups may occur. During the daytime, run-ups are allowed but only at designated airport locations. Between 10 p.m. and 7 a.m., engine run-ups are allowed only under special circumstances or if related to a departure between 7:00 a.m. and 8:30 a.m.

Noise Abatement Procedures

Routing aircraft to reduce noise is always difficult in densely populated regions. Of the many flight patterns in the greater Seattle-Tacoma metropolitan area, however, certain routing procedures have been designed to help reduce aircraft noise for the community at large by flying aircraft over as few homes as possible. These procedures include:

- *The initial "straight-out" departure corridors, both north and south
- *The Duwamish/Elliott Bay Departure Corridor
- *Puget Sound Nighttime Departure Procedures
- *Puget Sound Arrival Procedures

Flight Track Monitoring

The noise abatement office uses information from the FAA's air traffic control radar system to monitor aircraft performance while operating within established noise abatement corridors. Also, community residents can request flight investigations to identify reasons for noisy events and determine if procedures are being met by the air traffic controllers and airline pilots. The Port of Seattle forwards the findings to the FAA, airlines, pilots, and the Sea-Tac Noise Advisory Committee and seeks the assistance of the airlines and FAA in achieving good performance.

Noise Monitoring

The Port of Seattle has an 11-station permanent noise monitoring system that records noise exposure levels around the airport. These monitors provide data that is used in updating the Sea-Tac noise contours (or noise exposure patterns), which are the basis of the noise remedy programs. Also, this data is used to track the overall reductions in airport noise and to analyze significant noise events.

Noise Information/Complaint Line **call: 433-5393 or toll free: 1-800-826-1147**

The noise information/complaint line operates 24 hours a day and is an excellent way for the public to ask for information or to let the Port of Seattle know what is most troublesome about aircraft noise over their neighborhoods (i.e. nighttime noise, specific flight, etc.) Calls are either recorded or taken in person and records of citizen concerns are distributed to Port, FAA officials, airlines and the general public.

NOISE REMEDY PROGRAMS

Acquisition and Relocation

The acquisition and relocation program allows the purchase of the most severely impacted homes for their fair market value. The occupants also were assisted in relocating. This program was completed in 1993 with the acquisition of 1,400 homes. (These figures do not include properties which may be acquired due to third runway construction.)

Sound Insulation and Sales Assistance

The goal of the insulation program is to significantly reduce noise within homes around the airport, thus reducing the noise impacts on airport area residents and supporting the residential nature of the neighborhoods. There are no out-of-pocket costs to qualified homeowners.

For details on the noise remedy programs, call **431-5913** or stop by at 1410 South 200th.

Public Information Materials

The Port publishes a wide variety of informational materials to help people understand the aircraft noise issue. You may call the noise information line at **433-5393** to receive any of the following materials:

- *A **quarterly newsletter** which provides information about airport activities including noise issues, citizens' concerns and statistical results of noise reduction programs;

- *The monthly *Sea-Tac Forum* newsletter, which contains information about the Airport's planning and noise programs and projects;

- ***Fact sheets** with detailed information about noise reduction programs and other noise related topics.



SOUND INFORMATION

THE NIGHTTIME LIMITATIONS PROGRAM

General Information

The mission of the Port of Seattle's Nighttime Limitations Program is to achieve reductions in the noise level at Sea-Tac Airport by phasing out the use of Stage 2 jet aircraft during nighttime hours. This Stage 2 "curfew" is one of the most valuable among the Port's diverse scope of programs to reduce airport noise. Jim Lynch, a citizen member of the Sea-Tac Noise Advisory Committee, explained it most effectively when he stated in the Port of Seattle's October 1994, FORUM: "I consider this part of the Noise Mediation Agreement the most important, because the benefits to the community are readily perceived. A good night's sleep is essential to everyone's sanity." This program requires the Port to phase in a schedule of restrictions on these noisy

jets. Initiated on October 1, 1990, these nighttime restrictions are enforceable through the authority of Sea-Tac Airport's Rules and Regulations. The implementation schedule for this program is listed in the box below. Step four of this schedule marked the achievement of full implementation of the Nighttime Limitations Program.

What do you mean by Stage 2 versus Stage 3 jet aircraft?

The Federal Aviation Administration provides noise certificates on various types of jet aircraft under the federal regulation Part 36 standards. Stage 1 aircraft, the oldest and noisiest (i.e. B707) have been phased out. Stage 2 jet aircraft include models such as the B727, B737-200 and DC9. Stage 3 jets include the B757, B737-300, MD80, and DC10, and others. Stage 3 jets may also include aircraft that were Stage 2 when manufactured, but have since been hushkitted or completely re-engined to meet the Stage 3 noise standards.

Nighttime Limitations Program Implementation Schedule

- (1) Effective October 1, 1992, Stage 2 jet aircraft may not operate from midnight to 6:00 a.m.
- (2) Effective October 1, 1993, Stage 2 jet aircraft may not operate from 11:00 p.m. to 6:30 a.m.
- (3) Effective October 1, 1994, Stage 2 jet aircraft may not operate from 10:30 p.m. to 6:45 a.m.
- (4) Effective October 1, 1995, Stage 2 jet aircraft may not operate from 10:00 p.m. to 7:00 a.m.

Why do I still hear noise at night if there are restrictions on loud planes?

This program has reduced noise considerably but airport neighbors may occasionally experience noisy aircraft flights at night. Stage 3 jet aircraft are permitted to operate at night and are not subject to the curfew hours in the Nighttime Limitations Program. Although many Stage 3 jet aircraft are quieter than comparable Stage 2 jet aircraft and are usually newer model planes, some Stage 3 jets create noisy flight events. Weather conditions may also effect noise levels. For example, heavy cloud cover can trap noise

at lower altitudes and prevent the quick dissipation of sound. While this program restricts the use of Stage 2 flights at night, some will occur now and then because of variances and exemptions. A *temporary variance* is defined as written permission obtained from the Port of Seattle by the carrier to operate outside the program for a maximum of four months. A *regular variance* is written permission to operate outside the provisions of the program for a period of longer than four months and requires a public notification and comment process.

When an air carrier requests a variance to these restrictions they must demonstrate a compelling need. Before a variance is issued, the Port takes several factors into consideration. These factors include the noise impact upon the community, technological and economic feasibility, and whether the air carrier has taken bona fide measures to comply with the program requirements. These criteria allow the program to be flexible which helps increase its chances for success in the long run.

Exemptions may be allowed in cases where weather delays, air traffic control delays, or other factors beyond the control of the air carrier effect the scheduled time of operation. Each request is carefully reviewed before approval or denial is issued. International operations conducted with a bilateral agreement from the U.S. Government are also exempt.

How does the Port monitor compliance to the Nighttime Limitations Program?

The Nighttime Limitations Program is monitored using information from the Airport Noise and Operations Monitoring System (ANOMS). The ANOMS computer tracks aircraft flights using information provided by the Federal Aviation Administration (FAA). ANOMS has the ability to list each aircraft op-

eration during nighttime hours individually. Aircraft flights are reviewed to determine whether the operation complied with the Nighttime Limitations Program.

Do you ever have violations to the Nighttime Limitations Program?

Occasionally there are violations to the program which are discovered through the review of the ANOMS data and comments from citizens who have noticed unusually loud nighttime flights. The Nighttime Limitations Program mandates that an air carrier receive a letter of admonishment for their first violation. If an air carrier has more violations within the same quarter, they are then assessed monetary fines. The first fine is \$500, the second is \$1000, and additional violations within that quarter are \$2000. A special account has been set up for the collection of this money. This account ensures that any funds collected be spent on noise insulation for community buildings such as libraries or churches.

Information about the nighttime jet activity is published monthly in a Nighttime Limitations Program Report. A copy of this report is forwarded to the FAA, airlines, pilots, and the Sea-Tac Noise Advisory Committee. These groups work together to achieve overall compliance with the Nighttime Limitations Program. If you would like to notify noise staff about an unusually loud nighttime flight, or receive the quarterly noise abatement report please call the noise information line.

Noise Information/Complaint Line

Call: 433-5393

or

Toll Free: 1-800-826-1147



SOUND INFORMATION

FACT SHEET #11

THE NOISE BUDGET PROGRAM

BACKGROUND AND PURPOSE

On January 1, 1991, the Sea-Tac Airport Noise Budget went into effect. The Noise Budget is a long-term program and one of the most significant noise reduction measures contained in the 1990 Noise Mediation Agreement.

The purpose of the Noise Budget is to guarantee that Sea-Tac will move steadily and predictably toward an all Stage 3 fleet. It will reduce noise incrementally between 1991 and 2001 while providing the airlines with the flexibility to meet the current and future demand for air transportation services. Together, the Noise Budget and Nighttime Limitations Program provide the major portion of the noise reduction anticipated from the Noise Mediation Agreement — 50% by the year 2001.

WHAT IS SEA-TAC'S NOISE BUDGET?

The Sea-Tac Noise Budget is similar to a financial budget, but noise energy is apportioned instead of dollars. With the noise budget, specific amounts of noise energy are allocated to each airline and the airport. The Mediation Committee agreed that Sea-Tac Airport would be allowed to use a set amount of noise annually. This amount is based on each airline's noise allocation plus a portion of noise held in reserve as the "Airport Noise Fund", which is administered by the Port of Seattle for special needs such as in the case of new airline entrants into the Seattle market.

The budgeted allocation of noise reduces each year up to year 2001. This includes

reductions to individual airline noise allocations as well as reductions to the Airport Noise Fund. Each airline affected by the budget started in 1991 with a noise allocation, which was a reduced level of its 1989 baseline noise level. An airline must stay within its annual noise allocation but may do so in a variety of ways: switching to quieter Stage 3 aircraft; altering the time of day for takeoffs and landings; or reducing the number of operations.

Because the Noise Budget is aimed at controlling noise from airlines that generate significant noise levels, it contains exemptions for smaller airlines whose operations make a relatively small amount of noise. The Noise Budget also excludes all international flights, as these operate under agreements between the governments of two countries and represent a very small proportion of the overall airport noise. Aircraft used for international flights are typically Stage 3. Emergency and government flights are also exempted.

A major feature of Sea-Tac's Noise Budget is the strong incentive it provides for an airline to convert as rapidly as possible to Stage 3 aircraft. If an airline meets or exceeds certain levels of Stage 3 aircraft scheduling at Sea-Tac, it may operate outside its noise allocation. For 1991, that level was set at 70% Stage 3 and increases each year up to 95% in 1997.

Because an airport may not exclude any carrier from serving Sea-Tac or regulate airline rates, routes or services, the Mediation Committee devised a way to allow new entrants access to Sea-Tac and to provide for airline expansion or necessary service modifications. Airlines may therefore buy or

sell "noise" to each other or may petition the Port of Seattle for use of a portion of the Airport Noise Fund. This "fund", like the noise allocation for each airline, reduces every year. The noise in the Airport Noise Fund is held in reserve and will not be provided to an airline without a petition process and determination by the Airport Director based on set criteria.

The Noise Budget was developed for the Mediation Committee by the engineering firm of Mestre Greve Associates from Newport Beach, California. It is based on a similar noise budget program at Raleigh-Durham Airport and one which was used at the former Denver Stapleton Airport. Only a few other airports have programs like Sea-Tac's Noise Budget.

MONITORING COMPLIANCE

The Sea-Tac Noise Abatement Office monitors airline compliance with the Noise Budget requirements every three months and determines on a yearly basis each airline's performance. Failure to stay within its noise allocation may result in the Port of Seattle assessing an airline a substantial fee.

The Sea-Tac Noise Advisory Committee, composed of some individuals who participated in the Noise Mediation process, monitored the implementation of the Noise Budget. Regular compliance reports are provided to the Sea-Tac Noise Advisory Committee and printed in the Port of Seattle's Noise Abatement Quarterly Report.

1991 FEDERAL NOISE POLICY

In November 1990, Congress enacted the Airport Noise and Capacity Act of 1990 (the Noise Act). The Noise Act established a new national aviation noise policy and directed the

Federal Aviation Administration to phase-out the operation of all Stage 2 aircraft by December 31, 1999. The Noise Act also directed the FAA to establish a national program to review noise and access restrictions on aircraft operations imposed by airport proprietors.

In the FAA regulations, implementing the Noise Act, air carriers have the option of choosing a phase out schedule for Stage 2 aircraft or a phase-in schedule for Stage 3 aircraft. The **national compliance schedule** for these alternatives is in the table below.

National Compliance Schedule

Compliance Date	Phase-out (max. Stage 2)	Phase-in (min. Stage 3)
Dec. 31, 1994	75%	55%
Dec. 31, 1996	50%	65%
Dec. 31, 1998	25%	75%
Dec. 31, 1999	0%	100%

The regulations permit an aircraft operator to apply for a waiver of these interim deadlines. Consequently, there may still be some Stage 2 aircraft operating until December 31, 2003.

Although the Noise Act prohibits airports from enacting any new local noise reduction measures that are more restrictive than the national policy, Sea-Tac's package of noise reduction measures was agreed to prior to the implementation of this policy. Because of this, Sea-Tac's Noise Budget program, which is more restrictive than the national policy, was allowed to remain in effect.

For further information, please call the Sea-Tac Noise Abatement Office at 433-5393.



SOUND INFORMATION

THE NOISE MEDIATION PROJECT

INTRODUCTION

On March 31, 1990, after a year and a half of meetings, the Sea-Tac Noise Mediation Committee (Mediation Committee) reached agreement on a package of noise reduction measures for Seattle-Tacoma International Airport. The package contained both long-term and short-term measures that are expected to reduce aircraft noise by at least 50 percent by the year 2001. This noise reduction will be in aggregate noise and will occur primarily as a result of the Sea-Tac Noise Budget and Nighttime Limitations Programs. As stated in Port of Seattle Commission Resolution No. 3016, the noise reduction package will provide substantial noise mitigation and abatement without limiting capacity or the economic benefits that result from the successful operation of the airport.

The elements of the Mediation Agreement include a noise reduction program called a "Noise Budget"; a phase out of stage 2 aircraft at night; a doubling of the rate of home insulation, plus other improvements to the noise insulation program; improvements to procedures directing and monitoring aircraft using noise abatement routes; ground noise controls; state of the art flight track monitoring and; a committee to monitor implementation of the Mediation Agreement.

The "package" concept, which introduced a number of actions together, was meant as a means to reduce noise in a variety of ways and gave those involved in mediation the opportunity for trade-offs on programs that were especially significant to them. For that reason, a decision to implement any one program or action was contingent on acceptance of the entire package. The various elements of the package were estimated to cost approximately \$29 million, of which nearly \$26 million would be used for noise remedy modifications, primarily to the sound insulation program. The Port stated its intention to apply for FAA funding for these improvements.

BACKGROUND

The idea for using mediation to develop noise programs for Sea-Tac came from a citizen committee called the Joint Committee on Aircraft Overflights (Joint Committee). The Joint Committee grappled with the issue of aircraft noise and flight patterns. Its members decided that the problem was so complex and involved so many neighborhoods in the greater Seattle-Tacoma metropolitan area, that a new and innovative process was needed that would be supported by many different areas. The Joint Committee went on to recommend the process itself - environmental mediation. This is a consensus-based approach that had been used before in the Pacific Northwest (but not at an airport), to resolve conflicts over environmental issues.

The Port of Seattle Commission, realizing that noise was fast becoming an issue that could limit Sea-Tac's capacity to meet growing air travel demand, accepted the recommendation by the Joint Committee on Aircraft Overflights and formally adopted it on September 8, 1987 in Port Commission Resolution 3016.

The Convening Process. The Noise Mediation Project began with a convening process. To initiate and carry out this work, the Joint Committee selected professional mediators with experience in environmental mediation. Their job was to ascertain if mediation was likely to be a productive approach to the problem of aircraft noise. They were to identify and then interview key members of the various parties required for such an effort. With the help of Port staff and members of the Joint Committee, the mediators contacted a number of individuals within the airlines, chambers of commerce, FAA, and numerous citizen groups. They listened to their concerns about aircraft noise, explained what a mediation process would entail and asked if the approach sounded worthwhile. Finally they questioned interviewees about their willingness to be part of such an endeavor.

At the end of the convening process, the mediators reported to the Port Commission that a number of issues had been identified as concerns to the people interviewed. They reported that those interviewed were willing to give mediation a chance if these concerns could be addressed.

NEGOTIATING PHASE.

The Mediation Committee. On November 14, 1988, the Mediation Committee met for the first time. The parties at the table included the Air Line Pilots Association, the Airlines, Airport Users (representatives from the area's chambers of commerce), FAA, Port of Seattle, and impacted communities. In all, there were twenty people who sat at the negotiating table representing the six different parties called "caucuses". Each caucus was to come to the table speaking with one voice. For some caucuses, such as the Airline caucus and the community caucus, this was very difficult due to the wide divergence of opinion on some issues. The Airline caucus included the Air Transport Association, United Airlines, Alaska Airlines, Federal Express and Horizon Airlines.

Community Caucus. The community caucus was the largest and most diverse of all the caucuses. It was the only one that was further subdivided into subcaucuses, with five different ones identified by geographic area. Each subcaucus came prepared to the table by meeting independently to negotiate its own procedures and positions among its members. Because the majority of caucuses and subcaucuses themselves adhered to the rule of consensus, this structure enabled individuals to have an influence on the outcome. In fact, the ground rules, as described later in this document, refer to these active caucus participants as "negotiators". This was an im-

portant feature for members of the community caucus, approximately seventy-five (75) active participants. Many of these individuals were also active in their community groups and councils and were charged with keeping these groups informed.

Formation of the community caucus and subcaucuses was essentially a system of self-selection, as there was no one entity that represented all noise-impacted citizens. There were, however, many individuals that had been active over the years in efforts to reduce aircraft noise. During the convening phase, a number of these individuals were contacted and became the first members of the community caucus. As more publicity was available, additional members were funnelled into the process. The Port of Seattle funded the hiring of a team of community coordination professionals to assist the diverse groups in working productively together. This team of individuals worked with the citizens, facilitating meetings and coordinating the flow of information.

Special Features. The Noise Mediation Project had some special features that were recommended by the Joint Committee. The process was completely voluntary, not a result of legal action. Community leaders worked directly with decision-making representatives of the agencies and businesses and all decisions were to be reached by consensus. Thus, no one party could control the outcome. This was further ensured by the committee's right to select its own consultants: mediators, community coordination professionals and technical consultants for noise, airspace and legal aviation issues. The Port of Seattle funded the project at nearly \$1 million.

Public Agency Participation. At the beginning of mediation, the Mediation Committee invited a number of public agencies and officials to attend mediation meetings so they would understand the committee's work. The cities of Seattle and Mercer Island designated Mediation Committee members as official liaisons and the cities of Des Moines and Normandy Park both had councilmen who were on the Mediation Committee itself. In addition, one state representative was on the Committee. In general, however, the flow of information to public agencies and officials was handled in two ways: through formal briefings and through mailings of information materials or telephone calls. Local and state officials and agencies were on the mailing list, received meeting notices and were invited periodically to receive briefings. The committee designated the mediators as the primary sources of information for public agencies and officials.

Subcommittees. The Mediation Committee made wide use of subcommittees to perform special tasks, such as selecting a mediation team, a community coordination team and a team of technical consultants. Subcommittees were used in developing ground rules, schedules, educational presentations and technical options. They were used to review the work of the various consultant teams and in designing and implementing a public information program. All subcommittees included a cross section of membership from the various caucuses and were facilitated by a member of the Mediation

Committee. The subcommittees included those for selection of the mediation team, the community coordination team and the technical analysis team. They also included the Technical Services Subcommittee, the Options Subcommittee, the Ground Rules Subcommittee, and the Public Information Subcommittee.

As with the work of the Mediation Committee itself, all subcommittees worked on consensus. The subcommittees were authorized by the Mediation Committee to develop recommendations and to then bring these recommendations back to the Mediation Committee for action.

Ground Rules. The first agreement that the Mediation Committee made was on a set of ground rules. These ground rules included a statement of the purpose of mediation. The purpose of the mediation process was twofold and was stated as follows:

1. The purpose of the mediation process is to reach a consensus on programs which will mitigate and/or reduce noise and which will be implemented for Seattle-Tacoma International Airport. Any noise impact caused by operation of aircraft into and out of Seattle-Tacoma International Airport may be part of the negotiations.
2. It is intended that the consensus will include a commitment by each caucus to carry forward and fully support the consensus programs through necessary administrative and other processes of implementation.

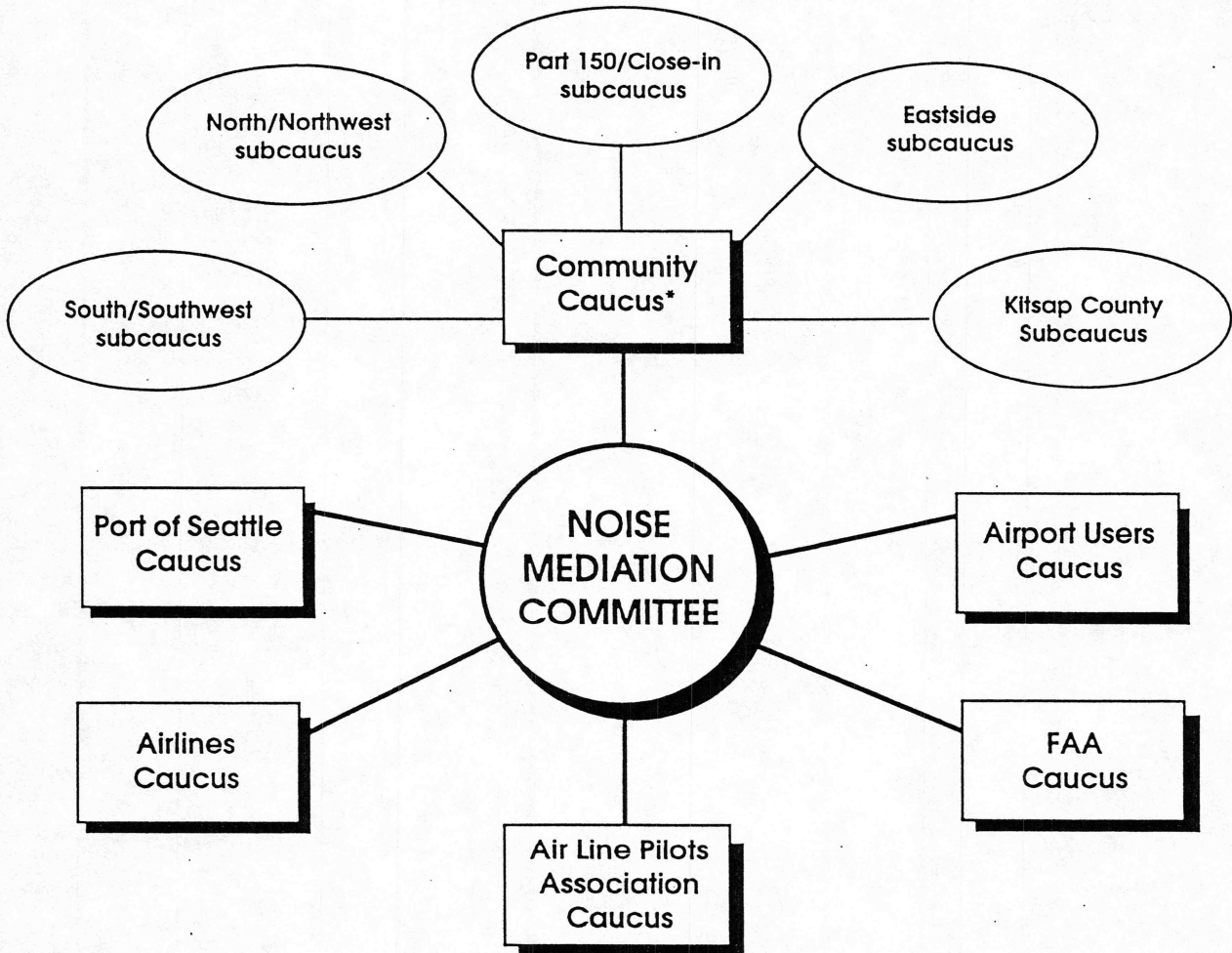
The ground rules also included rules for group decision making, personal behavior and committee and subcommittee procedures. The task of developing these ground rules went to a subcommittee called the Ground Rules Subcommittee.

Education Program. Prior to beginning the actual negotiations on technical matters, the Mediation Committee formed the Technical Services Subcommittee to develop a number of educational presentations that would allow all members of the process to obtain a baseline of information from which to deliberate. The subcommittee decided on topics and on speakers. Speakers were selected to present a range of views.

Identifying Interests. Before getting started on the negotiations over noise programs, the mediators spent time with the Mediation Committee asking each party to identify its "interests". The mediators explained that the participants should avoid locking themselves into "positions," which were described as inflexible and incompatible with the give-and-take nature of environmental mediation.

An "interest" was described as a need that was so important to the party that in order for it to agree to a proposal, it must be convinced that its interest would be met in some important way. The party would refrain from

Table 1



* A professional community coordinator was selected by citizens to assist the subcaucuses in working effectively together.

saying "how" the interest could be met. Presumably, agreement could be reached on any number of issues as long as the vital interest of each group could be accommodated. It was for this reason that the concept of a package became so important. The committee decided to pursue a package of actions that would give the optimum noise reduction, yet would be able to include enough different items that everyone's vital interest could be met.

IDENTIFYING TECHNICAL OPTIONS

One of the educational presentations that the Mediation Committee received was an overview on the many noise abatement options that were available and in practice throughout the United States and the world. The committee used information from this presentation to brainstorm all the noise abatement actions that should be examined for Sea-Tac. The Options Subcommittee was then formed to study the technical options and make recommendations to the full Mediation Committee. The subcommittee categorized the options and developed a process for hiring a technical consulting team to do the detailed analysis of the preferred options.

From a list of seventy-three possibilities, the Subcommittee with the assistance of its technical consulting team, narrowed the options by first identifying what problems were being experienced by residents around Sea-Tac and then listing options under those problems. Many of the options were found to be redundant; others impractical. For those options that were seen as good candidates, a second round of discussions occurred based on data and explanations of the value of the option from the consultants.

When the options were finally narrowed to final candidates, the Options Subcommittee divided into working groups to tackle in detail how each option should be described and proposed. This final round of work went back to the full Mediation Committee in the form of a draft package of noise abatement actions for consideration. The Mediation Committee then negotiated over this package, agreeing to its final form on March 31, 1990 after nearly a year and a half of meetings.

The contents of the agreement include:

A "noise budget" or allocation of noise for the Airport and airlines that will decrease over time. The budget will limit and control aircraft noise and accelerate use of the new (quieter) Stage III airplanes. The goal is for Sea-Tac's fleet to be nearly 100-percent Stage III by the year 2001. This measure in conjunction with the other elements of the agreement will reduce noise 50% by 2001.

Nighttime restrictions on the use of Stage II aircraft. For the first two years of the program, no new Stage II flights may be introduced between midnight and 6 a.m. Only existing Stage II flights that have "grandfathered" rights may operate during these hours. Effective October 1, 1992, no Stage II aircraft may operate between midnight and 6 a.m. Over the next three years the restricted hours expand until they encompass 10 p.m. to 7 a.m. on October 1, 1995.

Doubling of the rate of the Port's existing sound insulation program and changing the "cost-share" insulation area to 100% Port paid.

Control of aircraft ground noise by restricting use of engine power for backing aircraft away from gates, improving run-up regulations, investigating the

reduction of reverse thrusts (used in landings), limiting use of auxiliary power units, and erecting a "hush" facility if a maintenance base is built at Sea-Tac.

Implementation of a state-of-the-art flight track monitoring system to better monitor compliance with noise abatement flight track procedures.

Improvement of flight procedures through the Elliott Bay corridor and over Puget Sound to minimize jet noise to adjacent residential areas, with special attention to nighttime flights.

Control of noise from "single event" aircraft operations that are particularly annoying by improving the Port's complaint hotline and monitoring systems.

Establishment of a Noise Abatement Committee to ensure implementation of the agreement.

The committee could not reach agreement on changes to flight patterns. Special language was included in the agreement stating that this inability of the committee did not in any way negate the agreed upon actions.

PUBLIC INFORMATION

Although the public was actively involved in mediation through the activities of the community caucus, the Public Information Subcommittee was formed to develop a strategy to inform the community at large. A program was developed that included editorial boards, press releases, articles for newspapers and newsletters, display boards, speakers bureau, special informational bulletins and a series of eight (8) workshops. The mailing list for informational newsletters included approximately 41,000 names.

The workshops were a very important element of the program. They were held in the community subcaucus areas in community facilities throughout the Puget Sound area from February 26 through March 8, 1990. This allowed input from the general public prior to the scheduled conclusion of the committee's work. Specifically, these workshops provided detailed information on the preferred options and solicited comments from the public. They were advertised in the major and community newspapers.

IMPLEMENTATION

The Mediation Agreement contained only two implementation dates: October 1, 1990 for the Nighttime Limitations Program and January 1, 1991 for the Sea-Tac Noise Budget. It was understood that the Port of Seattle and the airlines would need to work out a number of the final details of these two programs. The Port began discussions to finalize these two programs on May 8, 1990 when it invited airline representatives to a comprehensive briefing. Over the next eight months, the Port spoke by telephone and corresponded with each airline providing draft documents for review

and comment. All comments from the airlines were taken into consideration and, if in accordance with the Mediation Agreement, accommodated as much as possible. All major concerns were settled prior to making the Noise Budget operational.

SEA-TAC NOISE ABATEMENT COMMITTEE

The remaining programs were implemented according to a schedule developed by the Port staff in cooperation with the Sea-Tac Noise Abatement Committee. This committee was mandated by the Mediation Agreement itself to ensure that implementation would occur in a timely fashion and in accordance with the agreement. It's membership was drawn from the original Mediation Committee.



SOUND INFORMATION

**SEATTLE-TACOMA INTERNATIONAL AIRPORT
SEA-TAC NOISE INFORMATION LINE
CALL: 433-5393 or TOLL FREE: 1-800-826-1147**

When defining the impact of aircraft noise on citizens, no one is more important than the citizen receiving the noise. With this in mind, the Port of Seattle has established the airport noise information line as an important part of Seattle-Tacoma International Airport's comprehensive noise abatement program. The information line serves as:

Sounding Board - Area citizens need a way to comment on aircraft noise and how it affects them. As a sounding board, the information line provides citizens with the opportunity to express views, voice concerns and relay opinions about aircraft noise.

Information Resource for Citizens - The information line serves as a valuable resource for citizens inquiring about the many aspects of Sea-Tac's noise abatement programs.

Information Resource for the Port - The information line monitors public sentiment toward aircraft noise, and data collected from noise information calls are used to monitor the Port's noise programs. Information from callers also supplements long range planning studies such as it did in the Noise Mediation Project.

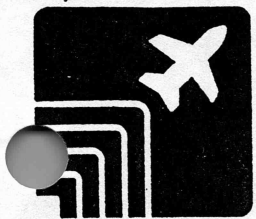
Link to the Community - The information line serves as a vital communications link between neighborhood residents and Port Commissioners, Port management and staff, FAA air traffic control officials and air carriers using the national airspace system. This link provides all the parties involved a sense of what is happening in the community.

Integration with Flight Track Monitoring - With our computer systems we are able to identify and display a variety of information including flight tracks of aircraft to monitor our programs and respond to individual complaints. You can request an evaluation of particularly annoying noise occurrences by leaving your name, address, and phone number. We use the information you provide to analyze the noise event(s) in order to determine or isolate the source. Once the source is identified we can discuss any potential mitigation action that may be taken by the Port, the FAA or the airlines.

SEA-TAC AIRCRAFT NOISE INFORMATION LINE
PAGE TWO

Perhaps even more important to you is what the Noise Abatement Office actually does when you call the hotline. First of all, your call is documented and entered into a data base which allows us to identify and summarize specific trends. In addition to forwarding a copy of **every** complaint to FAA air traffic officials, we distribute these summaries to the public, the Port Commission, Port executives, and others.

It is just as important for you to understand what the noise abatement staff is **not** able to do. The Port of Seattle cannot take immediate action to reduce noise as a result of a phone call to the airport noise information line. For example, the Port staff cannot make a modification to a flight track as the result of aircraft noise complaints. Nor do we judge the severity of a noise problem by the number of calls we get from any particular neighborhood. We are interested in hearing from anyone who feels he or she has a noise problem because you can help us understand what you are experiencing. That information assists us in monitoring our noise abatement programs. Also, in the past when the Port has developed new noise abatement programs, we have evaluated complaint information to assist in program development.



SOUND INFORMATION

PORT OF SEATTLE

SEATTLE-TACOMA INTERNATIONAL AIRPORT

FLIGHT TRACK PLOT SAMPLE - TURBOJETS

Flight track plots are a graphic illustration of the ground paths of aircraft traffic, as observed from above, for a specific time period. The flight track plots represent both arrivals and departures of jet aircraft to and from Sea-Tac Airport, according to the direction of traffic flow (north or south). These plots represent daytime flight activity from 6:00 a.m. to 10:00 p.m.

The flight track sample gives the date and time range, the type of operation (arrival or departure), and the traffic flow direction.

The data used in creating the flight tracks is generated by the air traffic control system operated by the Federal Aviation Administration. This system is called ARTS, or Automated Radar Terminal System.

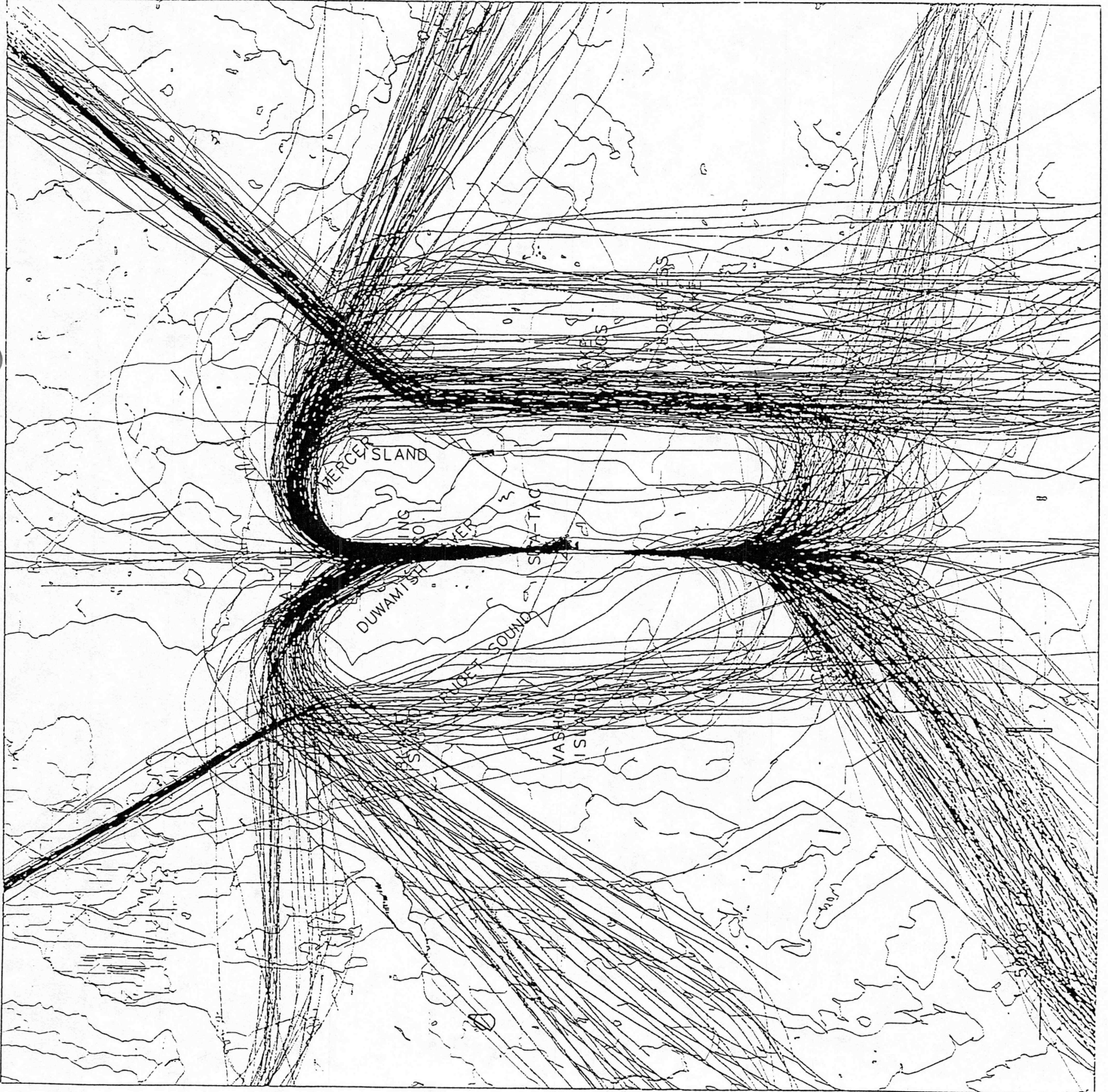
Of great significance is the fact that aircraft flying identical procedures do not necessarily fly along the same ground track. Unlike cars or trains, aircraft in flight cannot be physically restrained to a narrow corridor such as a roadway or a railroad track. Aircraft operate in three dimensional space and are subject to variations in pilot technique, air traffic control, weather and aircraft performance. These variations will cause the aircraft to fly within a corridor, which becomes broader as the distance from the airport is increased. Therefore, even though several aircraft may be assigned the same route, their track and flight profiles along that route will not be identical.



Sea-Tac Jet Aircraft Flight Track Patterns

NORTH FLOW
May 5, 1996
6am-10pm

Green = Departures
Red = Arrivals

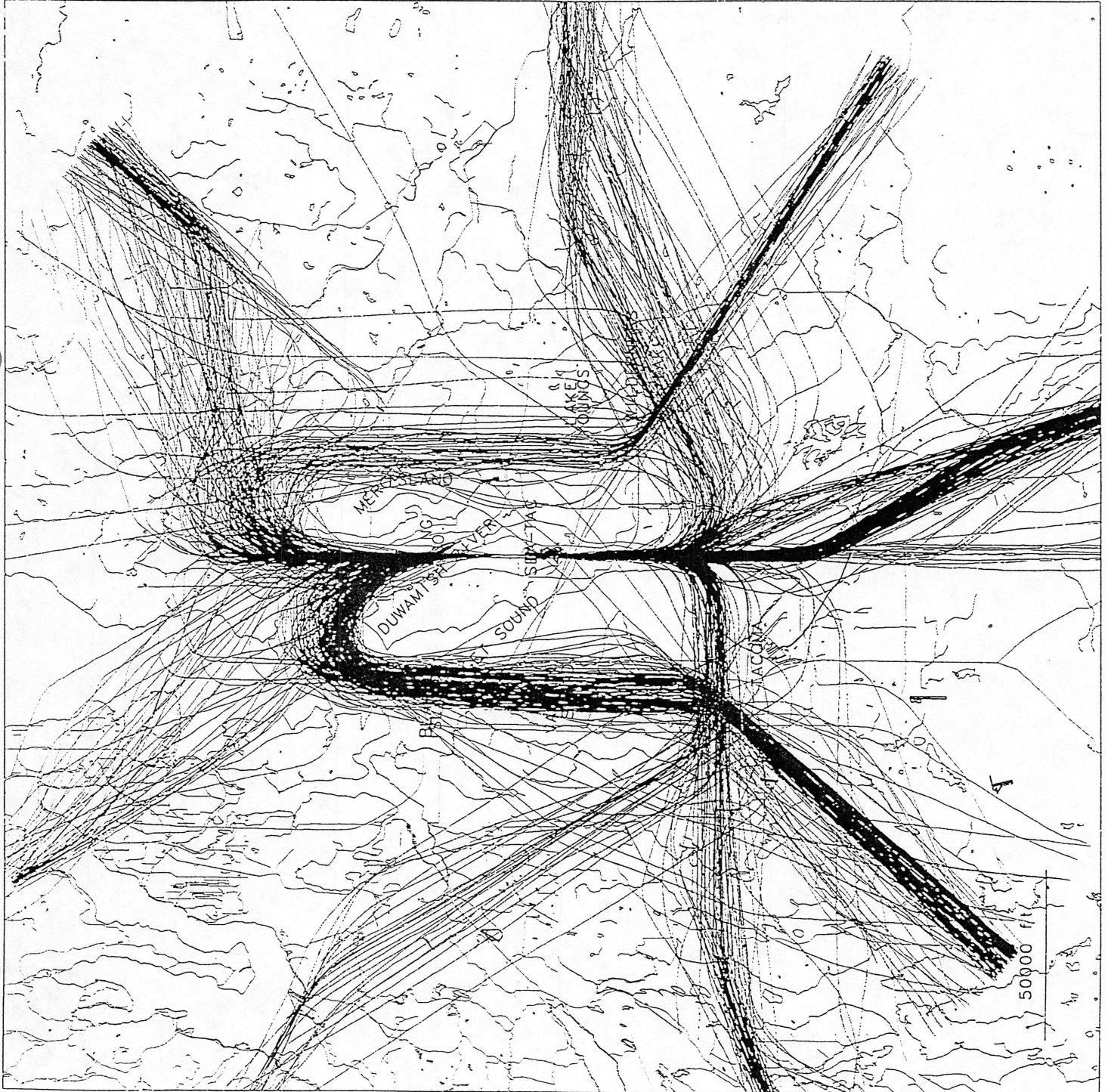




Sea-Tac Jet Aircraft Flight Track Patterns

SOUTH FLOW
May 3, 1996
6am-10pm

Green = Departures
Red = Arrivals





SOUND INFORMATION

PORT OF SEATTLE

SEATTLE-TACOMA INTERNATIONAL AIRPORT

FLIGHT TRACK PLOT SAMPLE - TURBOJETS

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SOUND INFORMATION

Ground Noise Control Programs

What is Ground Noise?

There are many sources of ground noise at an airport such as Sea-Tac and it is difficult to pinpoint the source of an individual community's concern due to these varying sources. Sources of aircraft ground noise can include takeoff roll, taxi, idle, thrust reversal, powerbacks, maintenance run-ups, and the use of ground power units. Adding to the difficulty of identifying sources of ground noise is the effect meteorological conditions have on the propagation of noise over distances. You may notice that ground noise is louder on days when the skies are overcast or when certain wind conditions exist.

There are currently programs in place at Sea-Tac to address the issue of ground noise. These programs focus on minimizing jet engine maintenance run-ups during the nighttime hours and eliminating the use of reverse thrust for aircraft departing a gate. These programs are designed to reduce the noise impact on surrounding communities by addressing the peak sound levels and the duration of the noise events. Engine maintenance run-ups and the use of reverse thrust for aircraft departing a gate are the two noise sources that are perceived as being the most annoying to surrounding communities and are therefore the focus of the ground noise control programs.

Engine Maintenance Run-Ups

When certain types of maintenance activities are performed on an engine, the operator of an aircraft must test the engine prior to the next flight. This testing of the engine is known as a maintenance run-up and consists of power being applied to the engines while the aircraft remains stationary. Depending on the scheduled departure time of that aircraft, run-ups can occur at anytime day or night.

In an effort to minimize noise impacts to surrounding communities, areas on the airfield were established for run-ups. Two sites were chosen at each the north and south ends of the airfield to accommodate the operation of the airfield in both directions. When aircraft depart to the south, an aircraft conducting a run-up will be directed to an area located at the south end of the airfield. The aircraft is turned into the wind (e.g., facing south) directing the jet blast back across the airfield rather than towards an immediately adjacent community.

The Federal Aviation Administration has recognized a time period during the night, from 10:00 p.m. to 7:00 a.m., when people are more sensitive to airport noise. This time period also coincides with the hours established by the Port for restrictions on engine run-ups. Aircraft operators conducting engine run-ups during these hours must have permission from the Airport Operations Supervisor. If absolutely necessary, run-ups not exceeding two minutes duration can be authorized. The only exception to the two minute rule is when an aircraft is scheduled to depart between the hours of 7:00 a.m. and 8:30 a.m.. For those instances, maintenance run-ups may be conducted as necessary between the hours of 6:00 a.m. and 7:00 a.m. with the permission of the Airport Operations Supervisor.

Because of the operating nature of the airlines, we do not anticipate the elimination of engine maintenance run-ups at night. The Noise Abatement Office will continue to monitor developing technologies, as well as work with the aircraft operators to further reduce the ground noise created by engine maintenance run-ups.

Powerbacks

Certain types of aircraft have the capability to use reverse thrust to back out from their gate parking positions. This maneuver is known as a powerback, and requires the aircraft to attain a high level of power prior to movement. This procedure is most often used by aircraft with tail mounted engines, such as the Boeing 727 and the McDonnell Douglas MD-80 aircraft. The noise generated from the use of this procedure can have a significant effect on areas close-in to the airport boundary. In 1991, the Port of Seattle prohibited the use of powerbacks by aircraft operating at Sea-Tac. Aircraft are now pushed back from their parking positions by ground vehicles.

What About Other Ground Noise Sources?

As mentioned previously, other sources of ground noise at an airport can include taxiing aircraft, the use of reverse thrust to slow the aircraft after landing, and the use of auxiliary power units when servicing an aircraft at the gate. The Port of Seattle is investigating ways to more effectively monitor and measure ground noise sources at the Airport in an effort to develop mitigation programs for these sources.

One of our best sources to use in documenting ground noise are the calls we receive from you and your neighbors. We would like to encourage you to continue to call our information line at 433-5393 to let us know when you feel ground noise is excessive. Your call helps us keep in touch with public opinion, as well as enforce our programs, gauge our performance, and plan for future noise reduction programs.



SOUND INFORMATION

NOISE ABATEMENT PROCEDURES PROGRAM

WHAT ARE NOISE ABATEMENT PROCEDURES?

Noise Abatement Procedures are specific headings and altitudes for airplanes to fly in order to minimize noise impacts. Over the years, Noise Abatement Procedures were established by the Federal Aviation Administration (FAA) in cooperation with the Port and local communities. These procedures were designed to minimize jet overflights of residential neighborhoods by taking advantage of existing geographical and compatible land use conditions where possible. The Duwamish Industrial Area, Elliott Bay and Puget Sound provide some opportunities for aircraft to overfly non-residential areas to the north of Sea-Tac Airport. The attached maps depict the Noise Abatement Procedures that are used to the maximum extent possible, air traffic conditions permitting. These maps are not intended to show actual flight tracks, only the corridors that are monitored for arrival and departure noise abatement procedures. These are not all the flight corridors, only those specifically related to noise.

North Flow

The map entitled "North Flow" shows the corridors used when jet aircraft depart Sea-Tac to the north. The *Initial Departure Procedure*, shown in yellow, is intended to confine departing aircraft to the narrowest flight path possible. During the busier daytime hours, currently 6:00 a.m. to 10:00 p.m., aircraft will proceed from the Initial Departure Corridor into the *Duwamish/Elliott*

Bay Corridor. This is the solid and hashed red colored area, from which aircraft may turn east or west. If traffic conditions allow when turning west, the airplanes are directed over Elliott Bay. Before starting their turn to the east, jets first fly eight nautical miles (nm) north and reach an altitude of 4,000 feet.

During the less busy nighttime hours, currently 10:00 p.m. to 6:00 a.m., jet aircraft are directed over the solid red colored area of the *Duwamish/Elliott Bay Corridor* and proceed west. Once out of Elliott Bay, the aircraft are turned north or south in the green colored areas which are designated as *Puget Sound Departure*. Jets remain over Puget Sound until reaching a specific altitude or distance from the Airport before turning east or west over the shoreline.

When flying north over the Sound, the aircraft must reach an altitude of 10,000 feet or a point 20 nm from the Airport before turning east. When turning west, aircraft must reach the 20 nm point **at or above** 10,000 feet before starting their turn.

When heading south, the aircraft must remain west of the shoreline at or above an altitude of 10,000 feet until crossing the SEA 220 degree radial before starting a turn to the east. (This area is depicted by the straight edge portions of the dark green section on the map.)



SOUND INFORMATION

South Flow

The other map, "South Flow", shows corridors used by aircraft arriving from the north over the city of Seattle and departing to the south. The large orange colored area is *Puget Sound Arrival*. The objective of this procedure is to have jet aircraft fly over or to the north of Elliott Bay. The yellow colored area south of the Airport is *Initial Departure* which is intended to confine departing jets to the narrowest flight path possible. Aircraft remain in this corridor until they are 5 nm from the Airport at an altitude of 3,000 feet. Once out of the initial departure corridor they can either continue south or start a turn to the east or west.

WHY DO AIRPLANES FLY OUT OF THE CORRIDORS?

There are many reasons, sometimes beyond the airline's control, why a jet may fly out of the noise abatement corridors. These include traffic conflicts, weather, air traffic control directives, safety considerations, aircraft performance and pilot technique.

HOW ARE PROCEDURES MONITORED?

Although the Federal Aviation Administration has sole authority over aircraft in flight, the Port of Seattle, as operator of Sea-Tac Airport, has taken the lead responsibility for monitoring and reporting jet air traffic activities in regard to noise abatement. Data from the FAA's Automated Radar Terminal System (ARTS) is used to monitor aircraft performance while operating within established noise abatement corridors. Every month, a randomly selected

sample of flight events are evaluated for each noise abatement procedure. The results pinpoint how successful air traffic controllers and pilots are at keeping flights within the noise abatement corridors.

The results are published in the form of a quarterly report and are shared with the airlines, the FAA, and Sea-Tac's Noise Advisory Committee (SNAC). This program's success is dependent on cooperative efforts between these groups. A quarterly newsletter is also distributed to local citizens which includes results from this and other noise abatement programs.

If you would like to be added to our mailing list, or need further information on Sea-Tac's noise abatement programs, please call (206) 433-5393 or Toll Free (800) 826-1147.

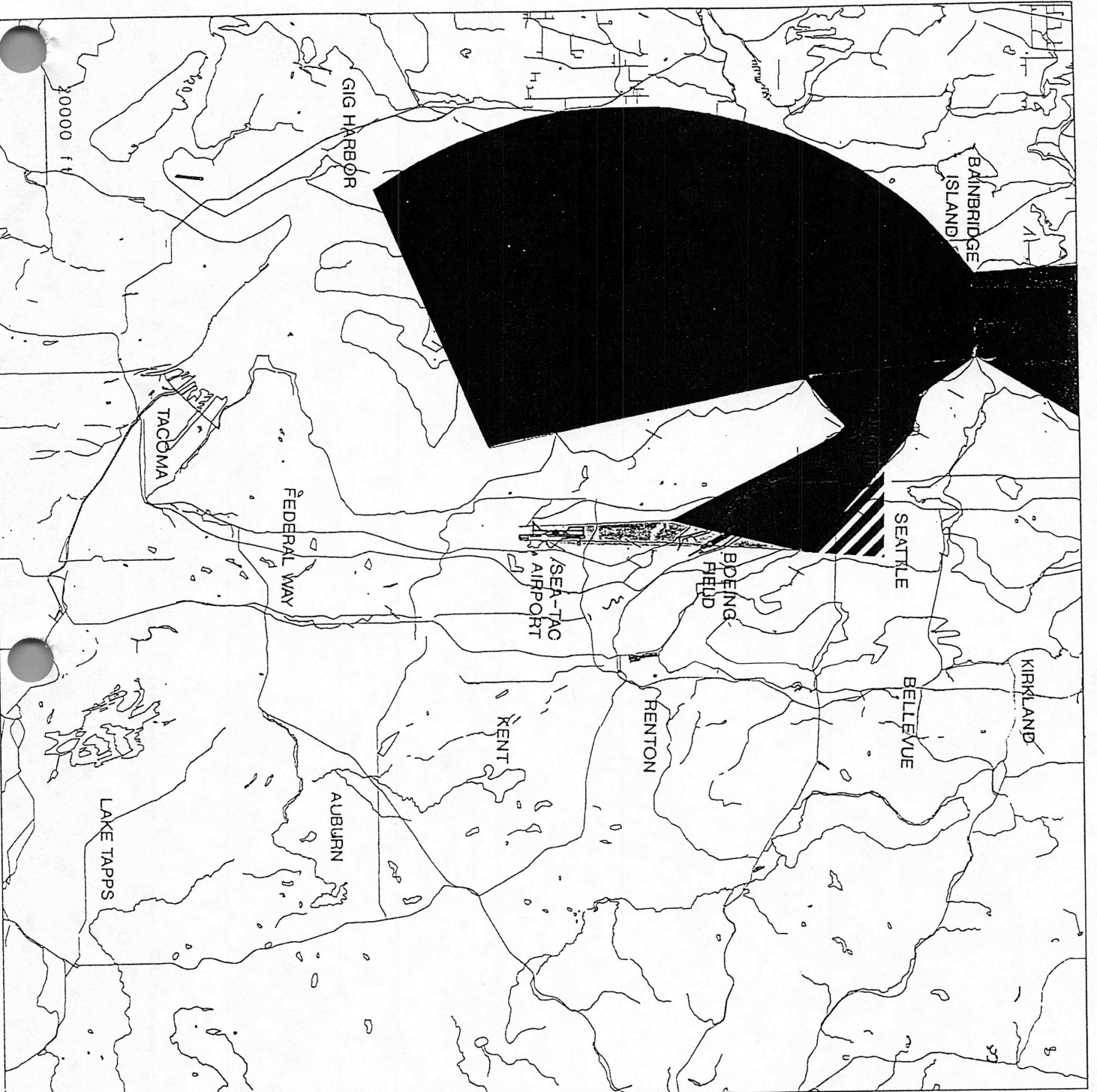


Port of Seattle

Seattle - Tacoma
International Airport

Noise Abatement Procedures

NORTH FLOW



INITIAL DEPARTURE



DUWAMISH / ELLIOTT BAY
DEPARTURE - NIGHT



DUWAMISH / ELLIOTT BAY
DEPARTURE - DAY



PUGET SOUND
DEPARTURE - NIGHT

30000 FT

Port of Seattle



Seattle - Tacoma International Airport

Noise Abatement Procedures

SOUTH FLOW

INITIAL DEPARTURE



PUGET SOUND ARRIVAL

