U. S. DEPARTMENT OF TRANSPORTATION

FEDERAL AVIATION ADMINISTRATION

NORTHWEST MOUNTAIN REGION

RECORD OF DECISION

FOR THE

MASTER PLAN UPDATE DEVELOPMENT ACTIONS

SEA-TAC INTERNATIONAL AIRPORT

JULY 3, 1997

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I. INTRODUCTION

This Record of Decision (ROD) provides final Federal Aviation Administration (FAA) approval for the Master Plan Update development actions adopted by the Port of Seattle (POS) on August 1, 1996, in POS Commission Resolution # 3212, as amended on May 27, 1997, in POS Commission Resolution No. 3245.

This ROD provides final approval for those agency actions necessary in order to provide FAA support for a new 8500-foot dependent air carrier runway, for a 600 foot southerly extension of runway 16L/34R, for expanded runway safety areas for runways 16R and 16L, and for various landside Master Plan Update improvements scheduled to be completed through the year 2010. The phasing of these various projects is graphically presented on pages 2-22 to 2-23 of the Final Supplemental Environmental Impact Statement [FSEIS], and is also presented in Appendix A of this ROD.

II. BACKGROUND

Over the past decade, the Federal Aviation Administration (FAA) has worked closely with local and regional officials and with the Port of Seattle (POS) aviation planning staff to investigate ways in which to accommodate the increasing passenger and operational activity demands at Seattle-Tacoma International Airport (Sea-Tac). As documented in Chapter I of the Final Environmental Impact Statement (FEIS) and in Chapter 2 of the FSEIS, the present airport runway configuration, with two closely-spaced runways, is currently responsible for significant airside delays, particularly during poor weather conditions, and is forecast to be responsible for increasing such delays in the future. Furthermore, the present design and configuration of airport landside facilities cannot adequately accommodate projected increases in activity without severe landside congestion.

On the regional level, the FAA has worked for a number of years with the local metropolitan planning organization [currently entitled the Puget Sound Regional Council (PSRC)], and with other local planning agencies, to find solutions to the related problems of inadequate capacity and increasing delays which are forecast for Sea-Tac. The FAA participated in the 1989-1992 Flight Plan Study, which recommended a multiple airport system that included a new runway at Sea-Tac. The agency also funded a PSRC study of the feasibility of a major supplemental airport, which concluded on October 27, 1994, with PSRC Resolution # EB-94-01, determining that there were no feasible sites for such a airport, and deciding not to proceed with further such studies on

a regional level (See FEIS Appendix B for detailed information on regional alternatives).

On January 5, 1994, the FAA began the public phase of the environmental process involving POS site-specific development proposals, which included a third Sea-Tac runway, by announcing in the Federal Register its intent to prepare an Environmental Impact Statement (EIS), and by requesting scoping comments (59 Fed. Reg. 645). Scoping meetings were held with the general public and with Federal, State and local agencies on February 9 and 10, 1994 (See FEIS Appendix A for detailed information on this scoping process).

During this same time frame, the POS began its Master Plan Update study, designed to develop recommendations for improvements to Sea-Tac which would reduce existing and forecasted poor weather aircraft operating delay and would accommodate forecasted growth in passengers, cargo, and aircraft operations. The Master Plan Update study process occurred concurrently with the initial environmental studies discussing the impacts of the development actions being proposed.

On April 24, 1995, the FAA published in the Federal Register a Notice of Availability of the Draft Environmental Impact Statement (DEIS) [60 Fed. Reg. 20149]. Public comments were taken on the DEIS from the date of its release until August 3, 1995. During the comment period, two public hearings were held, on June 1, 1995 and June 14, 1995. Final Environmental Impact Statement (FEIS) Appendix T, located in Volumes 5, 6, and 7, contains the transcript from the public hearings, and letters commenting on the DEIS which were received from the public and government agencies. FEIS Volume 4, Appendix R contains responses to the issues presented during the comment period.

The FEIS, approved by the FAA on February 1, 1996, was released to the public on February 9, 1996 (see 61 Fed. Reg. 5056). The FEIS addressed areas of public concern by way of modifications to the DEIS text and specific responses to public comments.

The U.S. Environmental Protection Agency (EPA) published a notice of the availability of the approved FEIS, pursuant to 40 CFR 1506.10 (61 Fed. Reg. 6243) in the Federal Register on February 16, 1996.

Although the FAA did not solicit public comments on the FEIS (on issues other than air quality conformity), several public agencies, community groups, and citizens nevertheless submitted written comments for agency consideration on the FEIS. Appendix A of the Final Supplemental Environmental Impact Statement

(FSEIS) responds to substantive agency and public comments on the FEIS, other than those pertaining to air quality conformity.

On July 11, 1996, in Resolution A-96-02, the PSRC General Assembly approved an amendment to the Metropolitan Transportation Plan to include a third runway at Sea-Tac Airport, with specific noise reduction measures based upon the recommendations of an expert Panel.

On August 1, 1996, the Commissioners of the Port of Seattle met to discuss the Master Plan Update proposals discussed in the FEIS. During the course of that meeting, by approving Resolution No. 3212, they adopted and approved a preferred development alternative, and authorized implementation of the first phase of those development actions. To date, due to the superseding events discussed below, no such implementation activity has taken place.

In May of 1996 the FAA Northwest Mountain region became aware of the fiscal year 1996 Terminal Area Forecast (TAF) prepared by the FAA headquarters Office of Policy and Plans. The TAF suggested that the air travel demand forecasts used in the Master Plan Update may have significantly understated the actual demand currently being experienced at Sea-Tac Airport and likely to be experienced at the airport in the foreseeable future. Over the next six months, a more detailed reexamination of those national forecasts, with more focus upon local conditions, was undertaken by the FAA and the Port of Seattle, together with their consultants. In December 1996, the FAA decided that a Supplemental EIS (SEIS) was necessary in order to reexamine, with public participation, how this anticipated growth might affect the conclusions reached in the February 1996 FEIS.

By Federal Register notice dated December 27, 1996 [61 Fed. Reg. 68327], the FAA published a Notice of Intent to prepare this SEIS. On February 4, 1997, the FAA and the POS released a Draft SEIS to the public. A public notice of availability of the Draft SEIS was published in local newspapers on February 9, 1997, in the Federal Register on February 13, 1997 [62 Fed, Reg. 6831] and by the Environmental Protection Agency [EPA] on February 14, 1997 [62 Fed. Reg. 6969]. A public hearing was held at the Sea-Tac International Airport on March 4, 1997, during which oral comments were taken from approximately 26 members of the public. By the March 31, 1997, close of the public comment period, 85 written public comments on the DSEIS had been received [reprinted at Final SEIS Appendix G]. All substantive oral and written public comments [including those pertaining to air quality conformity] are responded to in Appendix F of the FSEIS.

On May 13, 1997, the FAA signed and released the FSEIS to the public. A public notice of availability of the FEIS was published in local newspapers on May 19, 1997, in the Federal Register on May 21, 1997 [62 Fed. Reg. 27831] and by the Environmental Protection Agency [EPA] on May 23, 1997 [62 Fed. Reg. 28469]. Although not solicited, further public comments (not pertaining to air quality) were received on the FSEIS, which are responded to in Appendix D of this ROD. Public Comments on the FSEIS Air Quality analysis are responded to in Appendix E of this ROD.

On May 27, 1997, the Commissioners of the Port of Seattle met to discuss the Master Plan Update proposals discussed in the FSEIS. During the course of that meeting, by approving Resolution No. 3245, they again adopted and approved a preferred development alternative [as outlined in Appendix A of this ROD], and authorized immediate implementation of the first phase of those development actions.

III. THE PROPOSED AGENCY ACTIONS AND APPROVALS

FEIS page II-42 outlines a variety of actions that will require Federal approval prior to undertaking the proposed development actions. The majority of these actions will require FAA approval. However, the U.S. Army Corps of Engineers, a cooperating agency for the FEIS, will be responsible for permitting processes under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. The necessary FAA actions, determinations and approvals are summarized below.

a. Determination of project eligibility for Federal grant-in-aid funds (49 U.S.C. § 47101, et. Seq.) and Passenger Facility Charge [PFC] funds (49 U.S.C. § 40117), for land acquisition and relocation (49 CFR Part 24), site preparation, runway, taxiway, runway safety area, and other airfield construction, terminal and related landside development, navigational and landing aids, and environmental mitigation.

b. Conclusions regarding air quality conformance of the proposed facility with applicable air quality standards under the Clean Air Act, as amended. (42 U.S.C. § 7506, Section 176(c)(1)), and 40 CFR Part 93).

c. Approval for relocation/upgrade of the existing airport traffic control tower and various navigational aids (49 U.S.C. § 44502(a)(1)).

d. Decisions to develop air traffic control and airspace management procedures to effect the safe and efficient movement of air traffic to and from the proposed new runway, including the

development of a system for the routing of arriving and departing traffic and the design, establishment, and publication of standardized flight operating procedures, including instrument approach procedures and standard instrument departure procedures (49 U.S.C. § 40103(b)).

e. Determinations, through the aeronautical study process, under 14 CFR Part 77, regarding obstructions to navigable airspace (49 U.S.C. § 40103(b) and 40113).

f. Determinations under 14 CFR Part 157 as to whether or not the agency objects to the airport development proposal from an airspace perspective, based upon aeronautical studies (49 U.S.C. § 40113(a)).

g. Determinations under the 49 U.S.C. Sections 47106 and 47107 pertaining to FAA funding of airport development [including approval of a revised airport layout plan (ALP), 49 U.S.C. § 47107(a)(16)], Environmental approval (see 42 U.S.C. §§ 4321-4347, and 40 CFR § 1500-1508), and approvals under various executive orders discussed in the ROD.

h. A certification that the proposed facility is reasonably necessary for use in air commerce or for the national defense (see 49 U.S.C. § 44502(b)).

IV. ALTERNATIVES ANALYSIS

The Master Plan Update Study process identified four broad development needs at Sea-Tac, which formed the basis for the site-specific EIS. These four needs, discussed in detail in FEIS Chapter I and in FSEIS Chapter 2, are summarized as follows:

(1) Improve the poor weather airfield operating capability in a manner that accommodates aircraft activity with an acceptable level of aircraft delay;

(2) Provide sufficient runway length to accommodate warm weather operations without restricting passenger load factors or payloads for aircraft types operating to the Pacific Rim;

(3) Provide Runway Safety Areas (RSA's) that meet current FAA standards; and

(4) Provide efficient and flexible landside facilities to accommodate future aviation demand.

FEIS Chapter II and FSEIS Chapter 3 discuss in detail the alternatives considered by the FAA and the POS during the EIS study process for each of these four identified needs. For each need, the no action alternative was also considered. A summary of the FAA's consideration of alternatives for each of these needs is set forth below:

(1) Improve the poor weather airfield operating capability in a manner that accommodates aircraft activity with an acceptable level of aircraft delay;

The Puget Sound region of Western Washington is renowned for its poor weather, characterized by frequent precipitation, clouds and fog. Under FAA aircraft separation criteria, the two existing Sea-Tac runways are too close together to permit simultaneous approaches to both runways during much of this poor weather. Under these weather conditions, therefore, there is but one usable approach path for aircraft landing at Sea-Tac. A one runway airport operates much differently from a multiple runway airport in terms of its ability to accommodate aircraft landings during periods of heavy air traffic demand. The FEIS and FSEIS document the current and forecasted aircraft delays resulting from the inadequate spacing of the two existing Sea-Tac runways, and the resulting single approach stream of air traffic during poor weather.

As noted at the beginning of this ROD, the FAA has participated for many years in regional attempts to find a solution to the Sea-Tac delay problem through the development of a replacement or supplemental airport or airports, or the expanded use of existing airports, in the Puget Sound region, in order to reduce the aircraft demand existing at and forecast for Sea-Tac (see FEIS Appendix B). However, for the reasons documented in the EIS and SEIS, the FAA has concluded that these regional solutions are currently not reasonable alternatives to meet the defined need. Likewise, the FAA has considered the reduction and management of demand at Sea-Tac through the use of other modes of transportation, demand and system management alternatives, and the use of additional air traffic and flight technology alternatives, and concluded that these alternatives would not meet the defined need.

As discussed at FEIS I-13 and at FSEIS 3-5 to 3-6, the FAA and the POS have in recent years made a number of procedural and technological improvements at Sea-Tac, which have increased the efficiency of the air traffic flow. However, we have now exhausted all known available and reasonable improvements of this nature. Additional technological and procedural alternatives which have been suggested are not reasonable solutions to the defined need, for the reasons explained at FEIS II-14 through II-

18, and in response to public comments in FEIS Appendix R and in FSEIS Appendix F.

Finally, the FAA has considered the use of delayed or blended alternatives as a means to avoid the immediate construction of a new runway at Sea-Tac. For the reasons discussed in FSEIS pages 3-6 to 3-7, the FAA and the POS have decided that limitations on financial resources, and a refined consideration of the construction process, require extending the runway construction period and delaying the commissioning of the runway until late in the year 2004. It is recognized that this delay will cause significant inconvenience to the traveling public and additional costs to airport users. However, the phasing plan outlined at FSEIS pages 2-22 to 2-23 represents a compromise which balances construction-related financial constraints with the costs associated with rapidly increasing airside delays.

As part of the POS Master Plan Update, an extensive evaluation was undertaken, summarized at FEIS pages II-12-14, to identify the appropriate alignment, spacing and length for a proposed third runway. The FAA worked closely with the POS to develop the assumptions and methodologies during this portion of the alternatives evaluation, which relied upon FAA design standards and the results of recent FAA Capacity Enhancement Plan updates. The FAA believes that this evaluation process was appropriately conducted, and therefore does not consider it necessary, in its independent Federal consideration of alternatives, to undertake a de novo comprehensive alternatives analysis of alignment, spacing, and length issues. The Port of Seattle, as the sponsor and airport operator, has the fundamental role of planning and developing aviation facilities at Sea-Tac.

Considered further in FEIS Chapter IV and in FSEIS Chapter 5, were the reasonably foreseeable environmental consequences of the Do-Nothing/No-Build alternative and the site-specific runway development alternatives. These evaluations concluded that the proposed third runway project would not result in any significant environmental impacts which could not be adequately mitigated [see ROD Section VI and Appendix F for summaries of mitigation].

The Port's decisions, at its August 1, 1996, and May 27, 1997, Commission meetings, to proceed with a third parallel runway spaced at 2500 feet from runway 34R/16L, and 8500 feet in length, are well supported by airspace, engineering, environmental, and financial considerations, as documented in the Master Plan Update and in the FEIS and FSEIS.

Under the Do-Nothing/No-Build alternative, a third runway at Sea-Tac would not be developed now or in the near future. However, Federal adoption of this alternative would fail to alleviate the

current and forecast airside delays at Sea-Tac which are documented in the FEIS and FSEIS. Although the FEIS and FSEIS find that, with appropriate mitigation, the POS preferred alternative will have no significant environmental impacts, the Do-Nothing/No-Build Alternative would still be the least environmentally impacting alternative, and thus the Do-Nothing/No-Build alternative is environmentally preferable. However, since it would fail to accomplish the principal purpose and need for the project, this alternative is not supported by the FAA.

In its consideration of alternatives, the FAA has been mindful of its statutory charter to encourage the development of civil aeronautics and safety of air commerce in the United States (49 U.S.C. 40104). We have also considered the congressional policy declaration that airport construction and improvement projects that increase the capacity of facilities to accommodate passenger and cargo traffic be undertaken to the maximum feasible extent so that safety and efficiency increase and delays decrease (49 U.S.C. 47101(a)(7)).

As a further policy consideration, the construction and operation of the proposed third Sea-Tac runway will alleviate delays and congestion at Sea-Tac International Airport, as extensively documented in the administrative record for this ROD. Although the $587 million cost for property acquisition, runway construction, and environmental mitigation (as specified in the SEIS) is significant by any standard, the annual delay savings from an 8500 foot new runway are expected to be approximately $438 million by the year 2005, and $646 million by the year 2010. ROD Appendix G presents a recent Benefit-Cost Analysis for the third runway project, prepared by the agency's System and Policy Analysis Division at FAA headquarters. That analysis reflects that the total benefit of the proposed runway exceeds the total project cost by a factor of approximately 5, based upon a comparison of present values of benefits and costs. Based upon the Appendix G figures, discounted to present value, it is evident that if the third runway becomes operational by the year 2005, the delay savings will compensate for the runway costs within a two year period.

Although the benefit/cost analysis reflects savings from both airline operation and passenger delays, there are other more qualitative considerations. The FAA and the POS seek to relieve passenger and public inconvenience, and to make travel to and from this region more attractive by reducing travel delay and uncertainty. The FAA therefore concludes that the third runway project is both cost effective, and otherwise worthy of Federal support through the approvals in this ROD.

This support and these approvals do not, however, suggest that an FAA commitment to provide a specific level of financial support for the new runway project has yet been made. Future FAA discretionary funding decisions will be based upon the statutory criteria set forth in 49 U.S.C. § 47115(d), and upon the FAA policy announced in the Federal Register on June 24, 1997 (62 Fed. Reg. 34108), or under subsequent revisions to that agency policy.

After careful consideration of the analysis of the impacts of the various alternatives considered, and of the ability of these alternatives to satisfy the identified purpose and need for this proposal; and after review and consideration of the testimony at the various public hearings, of the comments submitted in response to the circulation of the DEIS, FEIS, DSEIS and FSEIS and of coordination with Federal, state and local agencies; and after considering the policy matters discussed above; the FAA hereby selects the runway alternative adopted and approved for construction by the POS on August 1, 1996, and on May 27, 1997, as the FAA's preferred runway alternative.

(2) Provide sufficient runway length to accommodate warm weather operations without restricting passenger load factors or payloads for aircraft types operating to the Pacific Rim.

The FEIS documents the inability of existing Sea-Tac runways (at 9,425 and 11,900 feet) to service unrestricted warm weather non-stop operations to Pacific Rim destinations. The inability of Sea-Tac to accommodate unrestricted operations to these destinations is expected to result in ever-increasing airline economic losses throughout the planning period (estimated at $1.2 million in the year 2000 and $2 million by the year 2010).

The Master Plan Update determined that a 12,500 foot runway is the minimum length necessary to permit unrestricted B747-200B operations at 76°F. Although consideration was given to meeting this need by extending runway 16R/34L to a length of 12,500 feet, this alternative was rejected as unreasonable due to impacts on wetlands and the expense of roadway relocations, as discussed in the FEIS. Consideration was also given to development of a new third runway with a 12,500 foot length, but this alternative was also rejected due to the extensive disruption of existing development and the expense associated with roadway relocation, as discussed in the FEIS. The FEIS identifies a 600 foot southward extension of Runway 16L/34R as being the most cost effective and least environmentally damaging development alternative. The net cost of this runway extension is estimated at $12,700,000.

With regard to the Delayed/Blended alternatives, although these were considered at FEIS page II-21, they were dismissed from further study and not chosen as the preferred alternative. Although the POS had not earlier identified a preferred development date for this aspect of the Master Plan Update (see FEIS footnote #19, page II-44), the Final SEIS [at page 2-22] states an intent to proceed with this development aspect of the Master Plan Update in the year 2010, when it is anticipated that this development project will become cost-effective (payback period estimated at 11.1 years in year 2000 but reduced to 6.5 years by the year 2010). In order to maintain the integrity of the FEIS environmental process, which requires the consideration of connected, cumulative and similar actions in one document, the FEIS and FSEIS evaluated this runway extension project during this EIS process. Under FAA Order 5050.4A paragraph 102.b., a written environmental reevaluation of this project will likely be required prior to the commencement of construction.

Under the Do-Nothing/No-Build alternative, a runway extension at Sea-Tac would not be developed now or in the foreseeable future. Although the FEIS and FSEIS find that, with appropriate mitigation, the POS preferred alternative will have no significant environmental impacts, the Do-Nothing/No-Build Alternative would still be the least environmentally impacting alternative, and thus the Do-Nothing/No-Build alternative is environmentally preferable. However, since it would fail to accomplish the principal purpose and need for the project, this alternative is not supported by the FAA.

Having considered the policies set forth at 49 U.S.C. sections 40104 and 47101, the ability of the available alternatives to meet the articulated need, and the administrative record which concerns the proposed runway extension, the FAA hereby selects as its preferred alternative the runway extension alternative identified in the FEIS as the POS planning staff's preferred alternative, as adopted by the POS as part of its Master Plan Update and ALP at its August 1, 1996, and on May 27, 1997, meetings.

The FAA's approval of the runway extension project in this ROD signifies that the project meets FAA standards for approval of the agency actions discussed in Section II of this ROD. It does not, however, signify an FAA commitment to provide financial support for the runway extension, which is a decision which may not be made unless and until the project can be justified under the criteria prescribed by 49 U.S.C. § 47115(d), and under the agency policy announced in the Federal Register on June 24, 1997 (62 Fed. Reg. 34108), or under subsequent revisions to that agency policy.

(3) Provide Runway Safety Areas (RSA's) that meet current FAA standards.

The FEIS documents the fact that existing Sea-Tac runways do not meet current FAA safety design standards, in that three of the four runway ends have RSA's which are of insufficient length to ensure safe operations in the event of aircraft runway overruns [As noted at FEIS I-18 and at FSEIS 4-3, the RSA for runway end 34L was brought into compliance in 1995]. FAA approval of the RSA for runway end 34R was provided in a FAA Record of Decision dated April 18, 1996, notice of which was given through publication of an announcement in several local newspapers [discussed at FSEIS 3-8 and 4-3]. Construction is expected to be completed in late 1997.

For the remaining two RSAs (16R and 16L), consideration was given to the Do-Nothing/No-Build alternative during the EIS process. A literal do nothing approach (See FEIS II-24, footnote #12) was rejected as an unreasonable option early in the process, since it would not address the immediate need to correct a runway design which does not meet current FAA standards. Considered further as part of the detailed analyses of development alternatives 2, 3, and 4, were the No-Build alternative (requiring the establishment of displaced threshold/declared distance procedures for each runway), and the POS preferred alternative, involving the construction of a 1,000 foot RSA for the two remaining runway ends, as well as standard size RSAs on both ends of the new proposed third runway.

Under the Do-Nothing/No-Build alternative, these runway safety area improvements at Sea-Tac would not be developed now or in the near future. Although the FEIS and FSEIS find that, with appropriate mitigation, the POS preferred alternative will have no significant environmental impacts, the Do-Nothing/No-Build Alternative would still be the least environmentally impacting alternative, and thus the Do-Nothing/No-Build alternative is environmentally preferable. However, since it would fail to accomplish the principal purpose and need for the project, this alternative is not supported by the FAA.

As explained at FEIS page II-23, the FAA does not favor the establishment of displaced threshold/declared distance procedures at Sea-Tac, for reasons of safety and efficiency. Accordingly, having considered the policies set forth at 49 U.S.C. sections 40104 and 47101, the ability of the available alternatives to meet the articulated need, and the administrative record which concerns the proposed RSA extensions, the FAA hereby selects as the FAA's preferred alternative the RSA extension alternative

adopted by the POS as part of its Master Plan Update and ALP, at its August 1, 1996, and May 27, 1997, meetings.

The FAA's approval of the RSA extension projects in this ROD signifies that the projects meet FAA standards for approval of the agency actions discussed in Section II of this ROD. It does not, however, signify an FAA commitment to provide a specific level of financial support for the RSA extensions, which is a future decision which will be made under the agency policy announced in the Federal Register on June 24, 1997 (62 Fed. Reg. 34108), or under subsequent revisions to that agency policy.

(4) Provide efficient and flexible landside facilities to accommodate future aviation demand.

The FEIS and FSEIS document the need to incrementally improve existing terminal and other landside facilities at Sea-Tac over the next several decades, in order to alleviate the congestion and passenger inconveniences anticipated to result from regional growth and increased demand for airport services.

During the EIS process, the FAA considered but rejected for further detailed evaluation, the reduction of demand at Sea-Tac landside facilities through the development of a replacement or supplemental airport or airports in the Puget Sound region, through the use of other modes of transportation, or through demand and system management alternatives. For the reasons discussed in the FEIS, the FAA concluded, as it did in the case of the proposed third runway project, that these alternatives were unreasonable.

Although Delayed/Blended alternatives were also rejected in the FEIS as not meeting the need for landside improvements, it should be noted that the POS originally planned to incrementally expand and improve the Sea-Tac landside facilities discussed in the FEIS over the next 25 years, as the need for specific improvements was justified by the rate of increased demand placed upon existing facilities. With the accelerated demand forecast in the FSEIS, the terminal and landside facilities are now needed even sooner than originally forecast in the FEIS, and accordingly, the Delayed/Blended alternative is an even more unreasonable alternative. The current project phasing plans documented at FSEIS pages 2-22 to 2-23 and in Appendix A to this ROD represent earlier timeframes for many of these terminal and landside facilities, in order to accommodate these increased demand forecasts.

Carried forward for detailed evaluation in FEIS Chapter IV, and considered also in FSEIS Chapter 5, were the Do-Nothing/No Build

alternative, along with three development alternatives, centered around a central terminal concept, a north unit terminal concept, and a south unit terminal concept. As part of the POS Master Plan Update, an extensive engineering and financial evaluation was undertaken by the POS, to evaluate these proposed landside improvements. The FAA worked closely with the POS to develop the assumptions and methodologies during this portion of the alternatives evaluation. The FAA believes that this evaluation process was appropriately conducted, and therefore does not consider it necessary, in its independent Federal FEIS consideration of alternatives, to undertake a de novo comprehensive alternatives analysis of these landside improvements. The Port of Seattle, as the sponsor and airport operator, has the fundamental role of planning and developing aviation facilities at Sea-Tac. The preferred alternative recommended in the FEIS and FSEIS by the POS's planning staff (the North Unit Terminal concept), is well supported by airspace, engineering, environmental, and financial considerations, as documented in the Master Plan Update and in the FEIS and FSEIS.

Under the Do-Nothing/No-Build alternative, these landside improvements would not be developed now or in the next several decades. However, Federal approval of this alternative would fail to alleviate the congestion and passenger inconveniences anticipated to result from regional growth and increased demand for airport services. Although the FEIS and FSEIS find that, with appropriate mitigation, the POS preferred alternative will have no significant environmental impacts, the Do-Nothing/No-Build Alternative would still have the fewest developmental impacts. However, the Do-Nothing/No-Build Alternative would not be the environmentally preferable alternative, since it would fail to alleviate the significant environmental impacts associated with increased surface transportation congestion, which the preferred alternative is designed to remedy. Furthermore, since the Do-Nothing/No-Build Alternative would fail to accomplish the principal purpose and need for these landside development projects, this alternative is not supported by the FAA.

Accordingly, having considered the policies set forth at 49 U.S.C. sections 40104 and 47101, the ability of the available alternatives to meet the articulated need, and the administrative record which concerns these landside development projects, the FAA hereby selects as the FAA's preferred alternative the landside development recommended in the FEIS and FSEIS by the POS's planning staff (alternative #3, North Unit Terminal), as adopted as Part of its Master Plan Update and ALP, and as partially approved for immediate construction by the POS at its' August 1, 1996, and May 27, 1997, meetings.

The FAA's approval of these landside expansion and improvement projects in this ROD signifies that these projects meet FAA standards for approval of the agency actions discussed in Section II of this ROD. It does not, however, signify an FAA commitment to provide a specific level of financial support for these projects, which must await future decisions to be made under the criteria prescribed by 49 U.S.C. § 47115(d), and under the agency policy announced in the Federal Register on June 24, 1997 (62 Fed. Reg. 34108), or under subsequent revisions to that agency policy.

V. THE AGENCY FINDINGS

The FAA makes the following determinations for this project, based upon the appropriate information and analysis set forth in the FEIS and FSEIS and upon other portions of the administrative record:

A. The project is consistent with existing plans of public agencies for development of the area surrounding the airport. [49 U.S.C. 47106(a)(1)].

The determination prescribed by this statutory provision is a precondition to agency approval of airport project funding applications. It has been long-standing policy of the FAA to rely heavily upon actions of metropolitan planning organizations (MPOs) in amending regional airport system plans (RASPs) to satisfy the project consistency requirement of 49 U.S.C. 47106(a)(1) [see, e.g., Suburban O'Hare Com'n v Dole, 787 F.2d 186, 199 (7th Cir, 1986)]. Furthermore, both the legislative history and consistent agency interpretations of this statutory provision make it clear that reasonable, rather than absolute consistency with these plans is all that is required.

Under the provisions of both Federal and State Law (see FEIS Appendix S, and FEIS Appendix R, response to comment R-2-1), the Puget Sound Regional Council (PSRC) has been designated as the MPO for the Puget Sound metropolitan area, and given primary responsibility for transportation planning in the region. On April 29, 1993, the PSRC adopted Resolution No. A-93-03 amending the Puget Sound area RASP, to provide for a third runway at Sea-Tac. That resolution stated that a third Sea-Tac runway shall be authorized by April 1, 1996, subject to the following three conditions:

1. Unless shown through an environmental assessment, which will include financial and market feasibility studies, that a supplemental site is feasible and can eliminate the need for the third runway. [By PSRC resolution EB-94-01, dated October 27,

1994, the PSRC determined that a supplemental airport site was not feasible].

2. After demand and system management programs are pursued and achieved or determined not to be feasible, based upon independent evaluation. [By final order dated December 8, 1995, the expert panel appointed by the PSRC to independently evaluate this issue, determined that that demand and system management programs were not feasible].

3. When noise reduction performance objectives are scheduled, pursued and achieved based on independent evaluation and based on measurement of real noise impacts. [By final order dated March 27, 1996, a PSRC expert panel found that the POS had not satisfied this condition. However, on July 11, 1996, in Resolution A-96-02, the PSRC General Assembly approved an amendment to the Metropolitan Transportation Plan to include a third runway at Sea-Tac Airport, with specific noise reduction measures based upon recommendations of the expert panel].

In consideration of the above-described actions of the PSRC in amending the local RASP to authorize the third runway project [more fully described at FSEIS pages 4-1 to 4-2], the FAA is satisfied that 49 U.S.C. 47106(a)(1) has been fully complied with.

With regards to this issue, however, the FAA has also reviewed the substantial documentation in the administrative record demonstrating that throughout the EIS process the POS has shown great concern for the impact of the proposed development actions on surrounding communities, and has attempted to ensure the consistency of its project proposals with the planning efforts of neighboring communities. The administrative record for this Record of Decision includes a detailed chronology of coordination between the POS and neighboring jurisdictions concerning local planning proposals, along with documents describing the extensive public meetings, hearings, and other means by which public participation in project planning was accommodated. Further discussion of consistency of the proposed development projects with public agency planning is summarized at FEIS pages IV.2-7 through IV-2-18, and at FSEIS Chapter 4.

As noted in the referenced text, Sea-Tac Airport lies almost totally within the boundaries of the City of SeaTac. The extent to which City of Sea-Tac regulations apply to Sea-Tac Airport development is unresolved, and the POS is currently involved in a process with the City to resolve this question. Meanwhile the POS has committed itself to participating in the City's land use planning activities, to address any issues relating to the proposed Sea-Tac Airport development to the extent required.

As discussed at FEIS IV.2-10 through IV.2-16, the cities of Des Moines, Normandy Park, Burien, and Tukwila have each engaged in recent land use planning actions which appear designed to limit airport expansion. These local plans and ordinances establish land use compatibility guidelines with noise levels for residential and other noise-sensitive areas that are substantially more restrictive than those established by the FAA. Some of these local plans and ordinances also establish zoning policies (a prohibition on use of lands acquired by public entities to be used for new commercial activities). These ordinances purport to restrict the use of some lands within these jurisdictions (e.g., for the third runway northern Runway Protection Zone), needed by the POS in order to implement important safety and aircraft operation aspects of its preferred alternative.

It has not yet been decided under Washington state law whether the Master Plan Update proposed development actions would be subject to any of these plans and ordinances adopted by these adjacent cities. Thus there may be little or no inconsistency here. With regard to noise planning, the FAA has considered the fact that implementation of the POS preferred alternative will not result, after mitigation, in any significant increases in noise impacts on lands of these neighboring jurisdictions. To the extent that these adjacent cities impose restrictions on land acquisition by the POS for essential aviation safety and aircraft operation purposes, the FAA believes that such planning policies are inapplicable and invalid under Federal law.

In making its determination under 49 U.S.C. 47106(a)(1), the FAA has considered the fact that each of these local governments has been represented on the PSRC, and has participated as a member of that organization in its decision to authorize the third runway project at Sea-Tac (although some of these local governments may have disagreed, as individual PSRC members, with that ultimate decision). The FAA has also recognized the fact that none of these jurisdictions has regulatory authority over airport operations, since long-established doctrines of Federal preemption preclude these communities from regulating aircraft operations conducted at Sea-Tac.

Furthermore, these local government planning policies, which appear designed to obstruct the proposed Sea-Tac development, appear to be in conflict with provisions of the Washington State Growth Management Act, 1990, such as those found at RCW §§ 36.70A.100 and 36.70A.200, which require these city comprehensive plans to be coordinated with and consistent with regional policy decisions (e.g., the 1995 update of the Vision 2020 Growth and Transportation Strategy. Vision 2020 is the region's long-range

growth management, economic, and transportation strategy. The transportation component of Vision 2020 specifically incorporates PSRC Resolution A-93-03 which authorizes the third runway project).

The Growth Management Act also requires these local plans to be coordinated with and to be consistent with King County countywide planning policies and the comprehensive plans of King County and neighboring cities such as Sea-Tac, and prohibits any local comprehensive plan from precluding the siting of essential public facilities such as airports.

Given the FAA determination in this ROD, under appropriate Federal law, that there is a compelling need for the proposed Sea-Tac improvements, as documented in the FEIS, it is inappropriate for these local communities to attempt to exercise local zoning control in a manner which would conflict with the domestic and international aviation requirements of this airport. If there were to be a conflict between Federal and local policies, the local policies must give way to the Federal policies, under the doctrine of Federal preemption.

B. The interests of the community in or near which the project may be located have been given fair consideration. [49 U.S.C. 47106(b)(2)]

The determination prescribed by this statutory provision is a precondition to agency approval of airport development project funding applications. The regional planning process over the past decade and the environmental process for this project-specific EIS which began in 1994 and extended to this point of decision, provided numerous opportunities for the expression of and response to issues put forward by communities in and near the project location. Nearby communities and their residents have had the opportunity to express their views during the Draft EIS public comment period, at several public hearings and a congressional hearing, as well as during the comment periods following public issuance of the FEIS, the DSEIS, and the FSEIS,. The FAA's consideration of these community views is set forth in FEIS Appendix R, in FSEIS Appendix F, and in Appendix A of this ROD.

C. The State of Washington has certified in writing that there is reasonable assurance that the project will be located, designed, constructed, and operated in compliance with applicable air and water quality standards [49 U.S.C.§ 47106 (c)(1)(B)].

The determination prescribed by this statutory provision is a precondition to agency approval of airport development project funding applications involving a major runway extension or new runway location.

By letter dated December 20, 1996 [see Appendix B to this ROD], the Washington State Department of Ecology, acting under delegated authority from the Governor of the State of Washington, provided this certification, conditioned upon a number of mitigation measures to be undertaken by the Port of Seattle. Pursuant to general principles of agency and administrative law, and absent evidence that delegation is unauthorized or unlawful as a matter of state law, the FAA has interpreted this statute to permit state chief executive officers to delegate this certification responsibility to lower state officials with appropriate subject matter jurisdiction over state air and water quality [see FAA Order 5050.4A, paragraph 47e.(5)(e)]. As described at FSEIS Appendix F, page F-79, the delegation to the Department of Ecology which occurred in this case was appropriate under Washington State law.

However given the public controversy which has arisen over this delegation, by letter dated June 30, 1997, (see Appendix C to this ROD], the Governor of the State of Washington further certified that the airport project evaluated in the FEIS and FSEIS will be located, designed, constructed and operated so as to comply with applicable air and water quality standards.

D. Effect On Natural Resources [49 U.S.C. § 47106(c)(1)(C)]

Under this statutory provision the FAA may approve funding of a new runway or runway extension having a significant adverse effect on natural resources, only after determining that no possible and prudent alternative to the project exists and that every reasonable step has been taken to minimize the adverse effect.

As documented in the FEIS and FSEIS, for several natural resource impact categories which have established significance levels, the agency finds that, without implementation of the mitigation summarized in Section VI and Appendix F of this ROD, the preferred alternative would have a significantly adverse affect. However, given the inability of other alternatives discussed in the FEIS and FSEIS, to satisfy the purposes and needs for the preferred alternative, we have concluded that no possible and prudent alternative exists to development of the proposed alternatives. As discussed in Section VI and Appendix F of this ROD, and documented throughout the FEIS, FSEIS and the administrative record, every reasonable step has been taken to

minimize adverse environmental effects resulting from the project.

As discussed generally in FSEIS Chapters 1 and 2, and more specifically at FSEIS Appendix F, response to comment 2-J, specific airport activity levels and their associated environmental impacts were determined not to be reasonably foreseeable at this time following the year 2010. Accordingly, that year was set as the end of the planning horizon for the revised master plan update proposal evaluated in the FSEIS. However, FSEIS Appendix D did present possible activity levels and their associated environmental impacts for three test cases through the year 2020, based upon an extrapolated quantification of anticipated impacts prior to the year 2010. Although that extrapolated presentation is quite speculative, for the reasons explained in FSEIS Appendix F, the FSEIS does acknowledge that after the year 2010 there will likely be some level of adverse noise and land use impacts resulting from the approval of the preferred development alternatives, when compared to the no action alternative after that date.

Accordingly, in order to consider further mitigation under NEPA, and to address any possible adverse environmental effects resulting from the projects approved in this ROD, the FAA has decided to condition such approval upon the following additional noise and land use mitigation measure:

Following commencement of operations on the new runway, but prior to the year 2010, the POS and the FAA will undertake a further supplemental evaluation of noise and land use impacts anticipated after the year 2010. That supplemental evaluation may be included as part of a future Part 150 study undertaken by the POS. Following completion of that evaluation, if significant additional adverse environmental impacts are found, the Port of Seattle will be required to adopt further noise and land use mitigation measures designed to minimize any significant adverse affects found in that evaluation. This conditional approval will be enforced through a special condition included in future Federal airport grants to the Port of Seattle.

The FAA has reviewed the amount of such additional mitigation which would be required if the maximum additional adverse environmental effects estimated in FSEIS Appendix D should occur. This additional mitigation required would be similar to mitigation programs that have been implemented by the POS in the past, and are expected to be implemented as mitigation in connection with the projects approved in this ROD. Therefore, the FAA concludes that such additional mitigation is feasible. The POS has indicted that such additional mitigation would be financially feasible if it were to be required, based on this

special condition. The FAA also concludes that even if the maximum additional adverse environmental effects estimated in Appendix D should occur, it would still make the decisions set forth in this ROD and would approve the projects, subject to the special condition with respect to additional mitigation.

E. Appropriate action, including the adoption of zoning laws, has been or will be taken to the extent reasonable to restrict the use of land next to or near the airport to uses that are compatible with normal airport operations. [49 U.S.C. § 47107(a)(10)].

The sponsor assurance prescribed by this statutory provision is a precondition to agency approval of airport development project funding applications. In addition to the actions described in section IV.A. of this ROD, the Port of Seattle has worked extensively with local jurisdictions over the past two decades to develop and implement plans and policies to ensure compatible land use in the airport vicinity.

FEIS pages III-2 through III-4 and FSEIS chapter four, describe the current status of zoning and land use planning for lands near the airport. FEIS Appendix C, pages 3-9 outline former and existing noise programs which have been designed to either reduce noise at the source or mitigate the noise received by sensitive land uses in the airport vicinity. As explained in FEIS Chapter IV, sections 1 and 2, and FSEIS Section 5-3, with planned mitigation, development of the Master Plan Update proposals will not result in any increased significant impacts on non-compatible land uses. Based upon the entire administrative record for this ROD, the FAA has concluded that existing and planned noise reduction programs at Sea-Tac provide for appropriate action to ensure compatible land use in the airport vicinity.

F. Clean Air Act, Section 176(c)(1) Conformity Determination regarding Seattle-Tacoma International Airport Master Plan Update Development Actions (42 U.S.C. § 7506(c).

The determination prescribed by this statutory provision is a precondition for Federal agency support or approval of airport development actions which are projected to exceed the *de minimis* air emission levels prescribed at 40 CFR § 93.153. USEPA regulations more generally governing the conformity determination process are found at 40 CFR Part 93, Subpart B.

In the 1996 FEIS, the FAA made a Draft Conformity Determination on the POS Master Plan Update proposals [FEIS pages IV.9-10 and IV.9-11]. Pursuant to the provisions of the USEPA regulations,

the FAA published notice of this draft conformity determination in the Federal Register on February 9, 1996 (61 Fed. Reg. 5055), announced the availability of the draft determination in several local newspapers, and provided notice to appropriate Federal, state and local public agencies. In these notices, the agencies and the general public were invited to review and comment on the draft conformity determination. Through a series of Federal Register notifications, the FAA ultimately extended this comment period until June 6, 1996 (61 Fed. Reg. 27944). Comments received during this 1996 comment period are presented at FSEIS Appendix B, Attachment D and are addressed at FSEIS Appendix B, Attachment A.

In February 1997, a Revised Draft Conformity Analysis was issued as part of the Draft SEIS, with a 30 day comment period announced in a February 9, 1997, Seattle Times advertisement. On March 7, 1997, the FAA announced an extension of the comment period on this draft analysis until March 31, 1997 [62 Fed. Reg. 10606]. FSEIS Appendix G presents all public and agency comments on the draft SEIS, including those pertaining to air quality issues. FSEIS Appendix F, section six, responds to those comments which concern air quality and conformity issues.

Due to a number of changes in the nature and timing of the Master Plan Update Development Proposals from those originally evaluated in the FEIS, the draft SEIS air quality analysis projected air quality emission levels below the 40 CFR § 93.153 *de minimis* levels.

Several commenters on the draft SEIS air quality and conformity analyses stated that factual errors had been made in those analyses. At the FAA's request, the EIS consultant then performed a detailed quality assurance reevaluation for the data input to the air emissions and dispersion models. This led to a revised air emissions inventory, with several revisions to the specific emission estimates presented in the draft SEIS. However, this quality assurance process confirmed the overall conclusion of the draft SEIS, which projected air quality emission levels below the *de minimis* levels set forth in 40 CFR § 93.153. FSEIS Appendix B details the basis for this conclusion. Accordingly, a formal conformity determination is not legally required under applicable EPA regulations.

ROD Appendix E presents letters dated June 23, 1997, from the United States Environmental Protection Agency, the State of Washington Department of Ecology, and the Puget Sound Air Pollution Control Agency. In their letters, each of these air quality agencies has concurred with the FSEIS analysis conclusion that the *de minimis* thresholds have not been exceeded for general conformity under the Clean Air Act.

However, in order to achieve maximum public disclosure and to address community concerns, the FSEIS nevertheless presents an analysis of air quality impacts utilizing the regulatory structure set forth in the EPA conformity regulations. The FSEIS Appendix B analysis demonstrates that if the FAA were legally obligated to make a conformity determination for the projects approved in this ROD, the project would not cause or contribute to any new exceedences of air quality standards. As confirmed by the Washington State Department of Ecology, the project conforms to the Washington State Implementation Plan.

As noted above, the Final SEIS, approved on May 13, 1997, included as Appendix B a Final Air Quality Conformity Analysis. At the request of several air quality agencies, the FAA agreed to provide an additional 30 day comment period on the FSEIS air quality analysis, due to the revisions which had been made to that analysis since issuance of the DSEIS. Notice of the availability of that analysis for public review and comment was published in the Federal Register on May 21, 1997 [62 Fed. Reg. 27830]. Appendix E to this ROD presents the comments received in response to this notice and the agency's response to those comments.

Based upon the air quality information and discussion presented in the FEIS, the FSEIS, and Appendix E of this ROD, and upon other supporting material in the administrative record, the FAA finds that the development actions summarized in ROD Appendix B will not cause air emissions that exceed de minimis thresholds set forth in 40 CFR § 93.153, and conform to the provisions of the Washington State Implementation Plan and the National Ambient Air Quality Standards (AAQS).

Because projects at Sea-Tac Airport are governed by the maintenance area designation, the FSEIS shows that the project will not cause or contribute to any new violations of any of the AAQS in the project area or the metropolitan area. Because the computer modeling predicts that exceedances of the Carbon Monoxide AAQS could occur in the future without the proposed improvements (Do-Nothing/No-Build), consideration was also given to the two non-attainment area principles, and the FSEIS showed that the project will not increase the frequency or severity of any existing violations of any AAQS, and that the project will not delay timely attainment of the AAQS or any required interim emission reduction in the project area.

G. For this project, involving new construction which will directly affect wetlands, there is no practicable alternative to such construction. The proposed action includes all practicable measures to minimize harm to wetlands which may result from such use. [Executive Order 11990, as amended]

This executive order requires all Federal agencies to avoid providing assistance for new construction located in wetlands unless there is no practicable alternative to such construction and all practicable measures to minimize harm to wetlands are included in the action.

FEIS Chapter IV Section 11, and FSEIS Section 5-5 document that the preferred development alternative (North Terminal with 8500 foot runway) selected by the POS from the Master Plan Update study will directly affect approximately 12.23 acres of wetlands. Given the extensive FEIS and FSEIS alternatives analyses (summarized at FEIS IV.11-5 and FSEIS Chapter 3) showing that there are no other reasonable alternative to developing a third runway at Sea-Tac, the FAA additionally concludes that there is no practicable alternative to constructing such a runway, resulting in these wetland impacts, given the purposes and needs documented in the FEIS, consideration of environmental and economic factors, and land use issues.

FEIS Chapter IV, Section 11 and FSEIS Section 5-5, state that for each of the three landside development alternatives, an 8,500 foot runway would result in impacts to slightly more wetlands than would 7,000 foot or 7,500 foot runways. Additional runway length beyond 7,500 feet would require filling additional wetlands. Extending the runway to 8,100 feet requires filling 0.19 additional acres of wetlands, and extension to the full 8,500 feet requires filling a yet additional 0.86 acres. The FEIS and FSEIS demonstrate that these are low quality wetlands. Two of their significant functions, floodwater attenuation and floodwater storage, would be fully mitigated within the airport basin. Additional wetland functions for these wetlands will be mitigated at the Auburn site as part of the overall wetlands mitigation program.

An important purpose of the additional 600 and 400 feet of runway (to 8,100 or 8,500 feet) beyond the 7,500 foot runway is to provide the maximum air transportation service and efficiency available to the POS and the national air transportation system. Although a 7,500 foot runway provides many of the benefits of a new runway, it does not provide all of the desirable benefits. Alternatives of staggering runway ends or relocating the entire runway are not practicable, because, among other reasons, they would require considerable additional cost and complicate air traffic control procedures. Considering these and other reasons

described more fully in Appendix C of this ROD, considering the standards set forth at 40 CFR 230.10(a)(2), and taking into consideration cost, existing air traffic control and aviation technology and logistics, in light of the overall purpose of the runway project, the FAA finds that there is no practicable alternative to the wetland loss associated with an 8500 foot runway.

As noted in FEIS Chapter IV, Section 11, FEIS Appendix P, and FSEIS Section 5-5, the U.S. Army Corps of Engineers (COE) has worked with the FAA and the POS as a cooperating agency to ensure that all practicable measures will be taken to minimize harm to wetlands which will be impacted through development of the preferred alternative, through Best Management Practices during construction and the development of a wetland compensatory mitigation site. Following issuance of this ROD , the COE, in consultation with the Washington State Department of Ecology, will complete its processing of a Section 404 permit, required for the POS to proceed with development impacting wetlands. The project approvals in this ROD and this wetlands determination are expressly conditioned upon permit approval and conditions to be outlined by the U.S. Army Corps of Engineers, and upon the POS accomplishing the wetlands mitigation measures identified in the FEIS, FSEIS, and any COE permit approval.

Although it is generally preferable to attempt to mitigate wetland loss through replacement wetlands in the same watershed [a goal reflected in the local regulations discussed at FSEIS Appendix F, page 127], this is not the case where such replacement would create man-made wetlands adjacent to airport aircraft movement areas. Included at the end of FSEIS Section 5-5 is a reprint of FAA Advisory Circular 150/5200-33, dated May 1, 1997, which states the FAA's strong opposition to wetland mitigation projects located within 10,000 feet of airports serving turbine-powered aircraft [such as SEA-TAC], due to the safety hazard such wetlands present as attractants of wildlife, which significantly increase the risk of bird/aircraft strikes.

The safety standards set forth in this FAA policy statement are recommended for the operators of all public-use airports. Furthermore, for airport sponsors who are the recipients of Federal grant funding, adherence to safety standards set forth in FAA advisory circulars are a requirement of standard grant assurance #34, as acknowledged in paragraph 4-6.a. of Advisory Circular 150/5200-33.

This recent agency policy determination supports the FEIS and FSEIS determinations that the replacement wetlands for the Sea-Tac Master Plan Update development actions should not be located in the vicinity of the airport. Given the limited land area in

the Sea-Tac watershed available for wetland replacement, and the hazard associated with the creation of wildlife attractions within 10,000 feet of jet runways, there is no practicable alternative to the replacement of these impacted wetlands outside of the Sea-Tac watershed.

As detailed in FEIS Appendix P, and FSEIS Section 5-5, a detailed wetland mitigation program has been developed to offset the impacts of the project and to recognize other long-term biological problems. The mitigation plan calls for replacing the filled wetlands on a 47 acre mitigation site located on a 69 acre parcel of land along the Green River in Auburn Washington.

H. For this project, involving a significant encroachment on a floodplain, there is no practicable alternative to the selected development of the preferred alternative. The proposed action conforms to all applicable state and/or local floodplain protection standards. (Executive Order 11988)

This executive order, together with applicable DOT and FAA orders, establish a policy to avoid supporting construction within a 100 year floodplain where practicable, and where avoidance is not practicable, to ensure that the construction design minimizes potential harm to or within the floodplain.

Chapter IV Section 12 of the FEIS explains that, without mitigation, construction and operation of the Master Plan Update preferred alternative could result in significant adverse floodplain impacts in both the Miller and Des Moines Creek basins. The FSEIS analysis does not alter the FEIS analysis, but presents additional information at FSEIS Appendix F, pages 123-124, based on a 1997 POS Stormwater Review Study.

As outlined in the "alternatives" discussion earlier in this ROD and in the FEIS and FSEIS, there is no practicable alternative to the preferred alternative. Development of this alternative achieves the purposes and needs for the projects in the most cost-effective manner with the least impact on the surrounding land uses. As shown in FEIS Appendix P, a mitigation program has been designed which will create an equivalent amount of floodplain so that there would be no net loss of flood storage capacity or increased risk of loss of human life or property damage. This program has been designed to comply with applicable requirements of the permitting agencies, with whom the FAA and the POS have been coordinating in order to ensure that the construction design minimizes potential harm to or within the floodplain. Each of these agencies have agreed with the mitigation plan in concept and the coordination will continue throughout the permitting process.

I. Relocation Assistance (42 U.S.C. § 4601 *et. seq.*)

These statutory provisions, imposed by Title II of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (URA), require that state or local agencies undertaking Federally-assisted projects which cause the involuntarily displacement of persons or businesses, must make available relocation benefits to those persons impacted.

As detailed in FEIS Chapter IV, Sections 6 and 8, the preferred development alternative would displace up to 391 single family, 260 condos/apartments, and 105 businesses. Of the 105 businesses identified by the FEIS, 88 are located in the Runway Protection Area. While the FAA prefers airport sponsors to have control over the land in the RPZ, exceptions to property ownership can occur as long as the use of the land does not represent a hazard to aircraft operation. The Port has surveyed these property owners and their use.

The FAA will continue to coordinate with the POS concerning the need for acquisition versus the purchase of easements to ensure the appropriate land use control. The FAA will require the POS to provide fair and reasonable relocation payments and assistance payments pursuant to the provisions of the URA. Comparable decent, safe, and sanitary dwellings are available for occupancy on the open market. (See FEIS, pages IV.6-5 to IV.6-7).

J. For any constructive use of lands with significant historic sites, there is no prudent and prudent and feasible alternative to using the land, and the project includes all possible planning to minimize harm resulting from the use. [49 U.S.C. § 303(c)]

FEIS Chapter IV, Section 4, concluded that the Master Plan Update development actions would not involve either the use or constructive use of resources protected by this statutory provision, more commonly referred to as "4(f)" resources.

However the FSEIS, at Section 5-5, pages 8-19, shows that when comparing the no action and the preferred alternative using the updated airport activity forecasts, several structures (one school and three homes) which may be of local historical significance, will experience noise impacts which exceed the Federal standard (a 1.5 DNL increase within the 65 DNL contour).

As discussed at FSEIS Section 5-5, pages 13-14, the FAA questions whether most of these structures are truly of historical significance, despite their designation as such by communities

surrounding the airport. The FAA also questions whether these structures will be "constructively used" under the circumstances discussed in the referenced FSEIS text, because there will be no significant degradation of the noise environment of these structures since the time when they were designated as locally significant, and thus there will likely be no significant degradation of their historic or architectural values.

Nevertheless, assuming such "local historical significance" and such a "constructive use", the referenced FSEIS text demonstrates that there is no prudent or feasible alternative to any such constructive use. Furthermore, based upon the acoustical insulation planned for these structures by the POS (discussed at FSEIS Section 6-6, pages 17-19), the FAA concludes that there has been all possible planning to minimize any harm resulting from any such constructive use.

K. There are no disproportionately high and adverse human health or environmental effects from the project on minority or low-income populations. [Executive Order 12898]

Environmental justice concerns were addressed in Chapter IV.6, page IV.6-6 and IV.6-7 of the FEIS, and it was concluded that no minority, age or income group would be disproportionately affected by displacements that would occur as a result of the Preferred Alternative. Individual comments regarding environmental justice were also addressed on page R-102 of FEIS Appendix R. The FSEIS contained an extensive discussion of environmental justice issues on page F-98 through F-101 in response to comments on this issue. It was concluded that the proposed noise exposure impacts from the Proposed Master Plan Update improvements will not disproportionately affect minority and low-income communities and that the impacts of the higher demand forecasts were not different than those discussed in the FEIS.

L. The FAA has given this proposal the independent and objective evaluation required by the Council on Environmental Quality. [40 CFR 1506.5]

As outlined in the FEIS, there was a lengthy process that led to the ultimate identification of the preferred alternative and appropriate mitigation measures. This process began through the FAA competitive selection of an independent EIS contractor which was financially-disinterested in the project outcome, and continued throughout the NEPA process. The FAA provided input, advice, and expertise throughout the planning and technical analysis, along with an administrative and legal review of the

project. From its inception, the FAA has taken a strong leadership role in the environmental evaluation of this project, and has maintained its objectivity.

VI. MITIGATION

In accordance with 40 CFR 1505.3, the FAA will take appropriate steps, through Federal funding grant assurances and conditions, airport layout plan approvals, and contract plans and specifications, to ensure that the following mitigation actions are implemented during project development, and will monitor the implementation of these mitigation actions as necessary to assure that representations made in the FEIS and FSEIS with respect to mitigation are carried out. The approvals contained in this Record of Decision are specifically conditioned upon full implementation of these mitigation measures. These mitigation actions will be made the subject of a special condition included in future Federal airport grants to the POS.

FEIS Chapter V, and Appendix F to this ROD include summaries of the mitigation actions discussed more fully in FEIS Chapter IV and FSEIS Chapter 5, for each environmental impact category. Based upon these discussions, the FAA finds that all practical means to avoid or minimize environmental harm have been adopted, through appropriate mitigation planning. Mitigation measures for those impact categories where mitigation measures are necessary to avoid or minimize significant environmental impacts, as well as identified or adopted monitoring and enforcement programs, are summarized below:

A. Noise and Land Use

As discussed in FEIS Chapter IV, Sections 1 and 2, and FSEIS Chapter 5, Sections 3 and 6, future noise impacts within the study area will be less than current noise exposure due to the continued phase-out of Stage II (noisier) aircraft. However in the future the preferred alternative is expected to still result in greater significant [1.5 DNL within the 65 DNL contour] noise exposure in comparison to the future do-nothing alternative. [See FSEIS Exhibit 5-6-1 for a graphic comparison of noise exposure for no action alternative and the preferred alternative in the year 2010].

To facilitate continued noise reduction, the following noise and land use mitigation programs now in effect will continue to be implemented.

- Noise Budget – The goal of the Noise Budget of an all Stage 3 fleet is anticipated to be reached by the year 2001.
- Nighttime Limitations Program – limiting the hours of operation for Stage 2 aircraft.
- Ground Noise Control – reducing the noise of ground events such as powerback operations, run-ups, and reverse thrust on landing.
- Flight Corridorization – maintenance of north flow east turn runway heading flight track by departing jets until reaching altitudes above 4,000 feet.
- Flight Track and Noise Monitoring – maintenance of noise level records and flight track location information for identification of deviations and communication with the public and users.

The FEIS concluded that since relatively few properties were projected to experience significant impacts, and since they already fall within the boundaries of one or more of the POS's existing noise remedy programs designed to mitigate to non-significance airport noise levels, no additional project-related mitigation would be needed, as described at FEIS page IV.2-6,7.

However, the updated airport activity forecasts evaluated in the FSEIS resulted in an increase of noise exposure of approximately 7.69 square miles, and 11 percent more persons [approximately 1,280 persons, in an additional 460 dwelling units) being significantly affected by the preferred alternative in contrast to the do-nothing alternative, by the year 2010.

Furthermore, by the year 2010, a small portion of this area [with approximately 170 newly impacted residents], would be located outside of the POS existing noise remedy boundary [This is graphically shown in FSEIS exhibit 5-6-1]. The POS will be required to modify its mitigation strategy, as described at FSEIS pages 5-6-5 to 5-6-7, and in the following paragraph #4, to include these 170 newly-impacted residents within in its Noise Remedy Program.

To address changes in specific noise conditions, primarily associated with the third parallel runway, the Port will be required to undertake the following specific mitigation actions:

1. Mitigating Significant Noise Impacts on Public Facilities and Historic Sites: The following nine public facilities or historic sites would experience significant increased noise impacts (i.e. an increase of 1.5 DNL or more) in the year 2010 in comparison to the Do-Nothing alternative:

   - Sea-Tac Occupational Skills Center;
   - Woodside Elementary School;
   - Sunnydale Elementary;

- Albert Paul House;
- Homer Crosby House;
- Sunny Terrace Elementary School;
- Brunelle Residence;
- Coil House;
- Bryan House.

Impacts on the facilities incompatible with noise associated "With Project" will be mitigated by acoustical insulation that would allow their uses to be compatible with increased noise levels. Because of their historic value, the five residences and Sunnydale School (locally significant historic facilities) could require custom treatment to avoid significant alteration of the architectural style. In pursuing sound insulation of these structures, the Port's Noise Remedy Office will work with a historian to preserve such characteristics.

2. Provide Directional Soundproofing: Residences that were insulated prior to 1992 may need additional directional soundproofing to mitigate noise generated from a new flight path from the operation of the proposed new third runway. To mitigate noise caused by the proposed airport improvements, the Port will conduct audits and sound insulate these facilities if additional insulation is warranted.

3. Acquisition in the Approach Transitional Area: In recognition of the fact that the standard Runway Protection Zone (RPZ) dimensions do not always provide sufficient buffer to the satisfaction of nearby residents, the FAA has indicated that funding could be available to airport operators acquiring up to 1,250 feet laterally from the runway centerline, and extending 5,000 feet beyond each end of the primary surface. Based on the configuration of current airport land, local streets, and residential development patterns, the approach and transitional area selected for use as a mitigation area includes the standard Runway Protection Zone and a rectangular extension of the RPZ outward another 2,500 feet.

   Acquisition would include all residential uses, and any vacant, residentially zoned properties which cannot be compatibly zoned, within selected areas both to the north and the south of the new runway ends. Commercial land uses, which make up most of the eligible area to the south, will not be acquired. Input from the affected residents is necessary to design and initiate an acceptable relocation program. The Port will develop the appropriate implementation program for this action during the forthcoming Sea-Tac Airport FAR Part 150 Update, which the Port anticipates undertaking during 1997. The implementation plan will include coordination with eligible residents concerning

their desire to participate and then establish relocation objectives, timing and funding priorities.

Sound insulation of residences affected by 1.5 DNL or greater within 65 DNL noise exposure: About 170 of these homes within 65 DNL would be exposed to 1.5 DNL or higher noise levels as a result of the proposed improvements and are not already subject to the Port's existing Noise Remedy Program. The Port will develop an implementation strategy to sound insulate these 170 additional homes within the 65 DNL noise contours as part of the Part 150 Noise Compatibility Plan study effort. The purpose of delegating finalization of the implementation approach for this action to determination during the Part 150 process is to ensure that consideration is given to the proposed Approach Transition Area acquisition and the relationship of that area to the existing Noise Remedy Program boundary, as well as the westerly expansion of the Noise Remedy Program to accommodate this added insulation.

In Port Resolution No. 3125 dated November 1992, the POS committed to develop and implement a plan to insulate up to 5,000 eligible single family residences in the existing noise remedy program included on the waiting list as of December 31, 1993, before commencing construction of the proposed runway. The remaining eligible single family residences on the waiting list are to be insulated prior to operation of the proposed runway. In addition, the Port has committed to complete insulation of all single-family residences that become eligible for insulation as a result of actions taken based on the site-specific EIS and are on the waiting list as of December 31, 1997, prior to commencing operations of said runway.

Pursuant to PSRC Resolution A-96-02, the POS will be required to conduct a Part 150 study with the goal of assessing needed additional noise abatement and mitigation. This study began late in 1996, and is expected to take several years.

The FAA will consider as required mitigation a standard insulation package for homes that fall both inside and outside the 65 DNL project contours, which are within the POS noise remedy program boundaries, since this was the intent of the PSRC in conditioning its regional approval of the 3rd runway upon the accomplishment of additional noise mitigation measures.

The FAA will continue to support and monitor the POS's existing and future noise programs, in order to ensure that any anticipated significant project noise and land use impacts are fully mitigated by the time the third runway becomes operational.

Finally, for significant project noise impacts which might occur after the year 2010, the FAA will also require a supplemental environmental evaluation and appropriate mitigation, as described in Section V.D. of this ROD.

B. Archaeological, Cultural and Historical Resources

FEIS Chapter IV, Section 3, finds that no known significant archaeological or cultural sites would by physically impaired as a result of the preferred alternative, and that mitigation is therefore not anticipated to be necessary. The FSEIS [Chapter 5, Section 5-6] does not alter that conclusion. ROD Section V.J. addresses the issue of mitigating any noise-based "constructive use" of these resources.

Both the FEIS and the FSEIS state that in the event artifacts are discovered during construction activities, construction in the area will be halted immediately in order to record the finding, determine its level of significance, and develop appropriate mitigation measures.

As noted in FSEIS Section 5-6, the Sunnydale Elementary School could receive significant increased noise in the future when a comparison is made between noise associated "with project" versus noise associated with the "do nothing" alternative. Because of this noise increase, the agency, through its EIS consultant team, initiated consultation with the Washington Department of Community, Trade and Economic Development, Office of Archeology and Historic Preservation (the State Historic Preservation Officer, or SHPO).

At the time that the FEIS was published in February 1996, a significant change in noise impact to this school associated with the project was not anticipated. However, since that time, through preparation and publication of the FSEIS, the data suggests that noise impacts associated with the higher forecast operations might result in a significant noise impact to this school. The following summarizes the noise impact at Sunnydale Elementary School:

	Do-Nothing	With-Project
Existing	65.8	NA
Year 2000	61.6	61.6
Year 2005	61.7	63.7
Year 2010	62.3	65.1

As is shown in the above noise exposure data, "with-project" will be less than existing or past noise exposure. During earlier

years, this school was exposed to even greater noise exposure. The 1984-1985 noise contour indicates that this school was exposed to between 70-75 DNL sound levels during that period (Sea-Tac International Airport Part 150 Study Noise Compatibility Planning, dated February 1985, Exhibit 3-5).

While this site is not currently listed on the National Register of Historic Places, during consultation on the 1996 FEIS, the SHPO indicated that it could be eligible. Because of the change in impacts, a follow-up request concerning eligibility was made of the SHPO. On February 10, 1997, the SHPO stated "It is my opinion that the Sunnydale School is eligible for National Register listing. Information provided indicates that the school has played a significant role in the development of the Burien area, and retains character defining features conveying its historic function as a school". As suggested by the SHPO, a April 14, 1997, letter was forwarded to the Advisory Council on Historic Preservation (ACHP) for the purpose of determining if the ACHP wished to participate in the development of a Memorandum of Agreement to address mitigation.

Because the school is currently affected by noise above 65 DNL, and could continue to be affected in the future, the POS has proposed to sound insulate this school. Recognizing it's historic context, the FSEIS notes that "Because of their historic value, these facilities [*several homes which the SHPO has since determined not eligible for inclusion on the National Register, and Sunnydale school*] could require custom treatment to avoid significant alteration of the architectural style. In pursuing sound insulation of these structures, the Port's Noise Remedy Office will work with a historian to preserve such characteristics" [*emphasis added*]. The City of Burien Public Hearing Draft Proposed Comprehensive Plan dated April 1997 (page II-96) states "Cedarhurst and Sunnnydale elementary schools will be remodeled to increase capacity to 650 students by the year 2002". The current capacity of Sunnydale is 525 students. Thus, the sound insulation could be done as part of the scheduled remodel and can be conducted to ensure compatibility of the structure relative to its continued use as an educational facility.

On April 14, 1997, at the request of the SHPO, the FAA's EIS historic consultant sent a letter to Ms. Claudia Nissley of the ACHP Western Office of Project Review summarizing this situation and stating: "In response to a request from the SHPO, we are asking if the Advisory Council would like to be involved in the MOA...If I do not hear from you within (30) days after your receipt of this letter, I will assume that you do not wish to participate in the MOA". This letter was addressed to the ACHP Western Office address of record and was not returned to the

sender. However, as a courtesy, the consultant contacted the ACHP Western Office in June 1977 to follow up on the letter. As part of this contact, the ACHP verbally indicated that it had not received the letter, but that it would refer the issue to the Washington DC office of ACHP. No response has been received from either the ACHP Western Office or the ACHP Washington DC office as of the date of approval of this ROD.

For the reasons discussed in FEIS section 5-6, the FAA questions whether the consultation procedures under the National Historic Preservation Act apply to the Sunnydale School. Nevertheless, the FAA has attempted to consult with the appropriate agencies. As is noted in the Final Supplemental EIS, relative to the National Historic Preservation Act, this school is the only property arguably affected. The FAA is approving the Master Plan Update project at this time having considered the following:

- The noise impacts that would be experienced at this school would be less than the current noise exposure;
- The noise exposure has not altered the use of this site as a school and is not related to its historic significance;
- Appropriate mitigation has been proposed and will be required by the FAA to address any significant aircraft noise exposure impacts;
- In light of the failure of the ACHP to respond to correspondence concerning this project, the FAA and the POS have initiated additional consultation with the SHPO concerning the development of a Memorandum of Agreement to address sound insulation mitigation.

Consultations have occurred with the SHPO and have been attempted with the ACHP as part of the FAA's comprehensive efforts to involve all appropriate commenters and as a courtesy, the FAA and the POS will continue to work with the appropriate agencies. In reaching its conclusions relative to the National Historic Preservation Act, the FAA's findings are supported by the FSEIS and ROD evaluation performed relative to DOT Section 4(f).

C. Social and Induced Socio-Economic Impacts

As detailed in FEIS Chapter IV, Section 6, the preferred development alternatives would displace up to 391 single family, 260 condos/apartments, and 105 businesses. Of the 105 businesses identified by the FEIS, 88 are located in the Runway Protection Area. While the FAA prefers airport sponsors to have control the land in the RPZ, exceptions to property ownership can occur as long as the use of the land does not represent a hazard to aircraft operation. The Port has surveyed these property owners and their use and will continue to coordinate with the FAA

concerning the need for acquisition versus the purchase of easements to ensure the appropriate land use control. Given the anticipated displacement and relocation of people, the FAA will require the POS to provide fair and reasonable relocation payments and assistance payments pursuant to applicable provisions of 42 U.S.C. § 4601 *et. seq.* and implementing regulations.

D. Air Quality

As noted in ROD section V.C., the Governor of the State of Washington has certified to the FAA after reviewing the FEIS and FSEIS that the project will be located, designed, constructed, and operated in compliance with applicable air quality standards.

In Section V.F. of this ROD air quality conformity under 42 U.S.C. § 7506(c) is discussed, and it is concluded that the project will, although not exceeding the *de minimis* thresholds for general conformity, nevertheless conforms to the Washington State Air Quality Implementation Plan and the National Ambient Air Quality Standards. With no significant air quality impacts, no air quality mitigation is necessary.

FEIS Chapter IV, section 9 and its supporting Appendix D, had included a worst-case intersection "hot spot" analysis of the preferred alternative, which predicted slight potential exceedences of air quality standards for carbon monoxide at two key intersections at the northeast side of the airport, as the year 2010 approached. The FEIS had contemplated future air monitoring and evaluation in order to determine whether specific mitigation of these exceedences would be required.

However, as explained at FSEIS page 5-2-10, project planning of the surface transportation features for those two intersections has since been modified so as to eliminate these modeled potential exceedences, thus avoiding the necessity for future mitigation of this nature. Specifically, the POS will accomplish the following:

- At the time that the North Unit Terminal is undertaken, the Port will develop additional southbound right turn and northbound left turn capability at the intersection of S. 170th Street at International Blvd., unless shown by then current conditions that these improvements are no longer necessary; and
- At the time that the North Employee Parking Lot is undertaken, the Port will develop additional intersection turning capability at the intersection of South 154th Street at 24th Avenue S.

- To ensure that construction emissions do not exceed the air conformity de-minimis levels, the Port will ensure that annual construction-related truck haul does not exceed 280,700 two-way trips by Heavy Duty Diesel Vehicles.
- To minimize construction related particulate emissions, the Port will implement construction Best Management Practices (BMPs) as noted in Table 5-4-8 in the Final Supplemental EIS.

E. Water Quality

As noted in ROD section V.C., the Governor of the State of Washington has certified to the FAA after reviewing the FEIS and FSEIS that the project will be located, designed, constructed, and operated in compliance with applicable water quality standards. Furthermore, the approvals in this ROD are expressly conditioned upon the POS accomplishing the water quality mitigation measures identified in the FEIS and FSEIS.

With implementation of the preferred alternative developments, there would be widespread surface area disturbance throughout the study area, which has the potential to significantly affect area hydrology. Absent mitigation, the extensive earthmoving required during project construction has the potential to significantly impact the flow rates and water quality of soil infiltration, surface runoff, and stream flow.

FEIS pages IV.10-16 through IV.10-20 provide an extensive set of mitigation measures designed to avoid or minimize these hydrological impacts. These include a set of stormwater management measures based upon Department of Ecology standards, BMPs (best management practices) required by applicable Federal, state and local laws, policies and design standards, as well as other requirements set forth in existing and additional NPDES permits to be required of the POS.

Specifically, the POS will be required to implement the following water quality and hydrology mitigation:

a. Construction Erosion and Sedimentation Control Plan. Prepare a construction erosion and sedimentation control plan for the construction of the new runway. The plan shall require use of Best Management Practices (BMPs) including but not limited to the following:

   - Erosion control measures such as use of mulching, silt fencing, sediment basins, and check dams that are properly applied, installed, and maintained pursuant to agreements with contractors.

- Spill containment areas to capture and contain spills at construction sites and prevent their entry into surface or ground waters. Install proper temporary fuel storage areas and maintenance areas to reduce the potential for spills and contamination.
- Phasing of construction activities to minimize the amount of area that is disturbed and exposed at any one time.
- Where feasible, use of temporary and permanent terraces for fillslopes and cutslopes to reduce sheet and rill erosion and reduce transport of eroded materials from the construction site.
- Install gravel and wheel wash facilities on construction equipment access roads and encourage covering of loads to minimize sediment transport onto nearby roads.

b. Stormwater Management Plan. Prepare a stormwater management plan for the new runway that includes the following:

- Detention criteria should be based upon Department of Ecology standards limiting 2-year peak flow rates from the developed portions of the site to 50% of the existing 2-year rate, limiting the developed 10-year rate to the existing 10-year rate, and limiting the developed 100-year flow rate to the existing 100-year rate.
- Design stormwater facility outlets to reduce channel scouring, sedimentation and erosion, and improve water quality. Where possible, flow dispersion and outlets compatible with stream mitigation will be incorporated into engineering designs.
- Maintain existing and proposed new stormwater facilities. Stormwater management facilities will be maintained according to procedures specified in the operations manuals of the facilities.

C. NPDES Permit Requirements. Comply with the requirements of the National Pollution Discharge Elimination System permit for the airport dated June 30, 1994, as may be revised from time to time.

FSEIS pages 5-7-4 through 5-7-6 discuss additional mitigation measures relating to groundwater concerns of the Seattle Water Department. Additional related mitigation measures are set forth in a June 20, 1997, agreement between the POS and The City of Seattle Public Utilities Department, pertaining to the proposed North Employee Parking Lot at SEATAC. That agreement is incorporated by reference in this ROD.

F. Wetlands

FEIS Chapter IV, Section 11, documents that the preferred development alternative (North Terminal with 8500 foot runway) will directly affect approximately 10.37 acres of wetlands. FSEIS Section 5-5 modifies this figure to approximately 12.23 acres of wetlands. As noted in FEIS Chapter IV, Section 11, FEIS Appendix P, and FSEIS Chapter 5, section 5-5, the U.S. Army Corps of Engineers (COE) has worked with the FAA and the POS as a cooperating agency to develop a wetland compensatory mitigation site. The mitigation plan calls for replacing the filled wetlands on a 47 acre mitigation site located on a 69 acre parcel of land along the Green River in Auburn Washington. As explained in this ROD at Section V.G., this off-site, out-of-watershed mitigation is consistent with FAA policy, and will be required as a condition of FAA grant assurances associated with Federal funding of the Master Plan Update development projects.

In December 1996, the Port submitted an application to the Army Corps of Engineers for a permit to fill wetlands at Sea-Tac Airport associated with the Master Plan Update improvements in compliance with the Clean Water Act, Section 404. The 404 permit application submitted to the Corps of Engineers includes a completed Joint Aquatic Resources Project Application (JARPA) form, in a report entitled "JARPA Application for Proposed Improvements at Seattle-Tacoma International Airport" dated December 1996. Upon issuance of this ROD, the COE, in consultation with the Washington State Department of Ecology, will complete its processing of a COE Section 404 permit, required for the POS to proceed with development impacting wetlands.

G. Floodplains

Chapter IV Section 12 of the FEIS explains that, without mitigation, construction and operation of the Master Plan Update preferred alternative could result in significant adverse floodplain impacts in both the Miller and Des Moines Creek basins. As shown in FEIS Appendix P, a mitigation program has been designed which will create an equivalent amount of floodplain so that there would be no net loss of flood storage capacity or increased risk of loss of human life or property damage. This program has been designed to comply with applicable requirements of the permitting agencies, with whom the FAA and the POS have been coordinating in order to ensure that the construction design minimizes potential harm to or within the floodplain. Each of these agencies have agreed with the mitigation plan in concept and the coordination will continue throughout the permitting process. The FSEIS does not alter the conclusions or mitigation approach discussed in the FEIS.

H. Surface Transportation

FEIS Chapter IV, Section 15, presented the results of both an initial analysis and a refined analysis of level of service volumes for the preferred alternative, at relevant intersections and freeway ramp junctions in the airport vicinity. The initial analysis indicated a slight and nonsignificant degradation of level of service at only one intersection, not requiring any mitigation.

The FEIS refined analysis of the preferred alternative included two scenarios, one assuming the construction of a SR 509 extension, and one assuming no such extension. This refined analysis showed adverse impacts (defined as a significant degradation in level of service when compared with the do-nothing alternative) at a number of intersections and at one freeway ramp junction, with and without SR 509, requiring a variety of intersection and ramp junction improvements as mitigation.

However, the revised surface transportation analyses presented in the FSEIS reflected changes in the design and timing of the surface transportation components of the Master Plan Update development actions. The FSEIS analysis concluded that no significant adverse changes in Levels of Service would result from the preferred alternative for any of the evaluated intersections and freeway ramp junctions in the airport vicinity during the project planning period. Accordingly, no surface transportation project-related mitigation is required.

I. Plants and Animals

FEIS Chapter IV Section 16 discusses the impacts of the preferred alternative upon vegetation and wildlife communities. Absent mitigation, the greatest project-related impacts to these resources would result from the degradation of area hydrology, water quality, aquatic habitat and biota of Miller and Des Moines Creeks, due to the realignment and relocation of portions of these waterways.

FEIS pages IV.16-11 through IV.16-15 and FEIS Appendix P discuss these anticipated impacts and planned measures to mitigate these biological impacts. These mitigation measures include a wetlands replacement plan, creek relocation and habitat improvement plans, a stormwater pollution prevention plan, and a spill prevention control and countermeasures plan. These plans are subject to approval of a number of other Federal, state and local agencies, as conditions to issuance of required permits.

The FSEIS presents no additional information which would alter the FEIS conclusions with regard to this mitigation.

J. Services/Utilities

FEIS Chapter IV Section 18 discusses the impacts of the preferred alternative upon public services and utilities serving the immediate airport vicinity. The greatest project-related impacts to these resources would result from relocation or abandonment of fresh water, sanitary sewer, electrical power and telephone pipes and lines which transverse the project area. FEIS page IV.18-7 discusses the required mitigation, which includes POS assuming the cost of these relocations and abandonments. The FSEIS presents no additional information which would alter the FEIS conclusions with regard to this mitigation.

K. Earth

FEIS Chapter IV Section 19 discusses the impacts of the preferred alternative upon the geology, soils and hazard areas in the immediate airport vicinity. The greatest project-related impacts to these resources would result from the extensive clearing, grading, excavation, and fill placement required throughout the project area. FEIS page IV.18-7 discusses mitigation measures, which include the design and implementation of an erosion and sedimentation control plan subject to approval by state and local authorities, and a landscaping plan. The FSEIS presents no additional information which would alter the FEIS conclusions with regard to this mitigation. Specifically, the POS will implement the following earth-related mitigation:

- The FEIS identifies two seismic hazard areas on the site of the new runway, referred to as "relatively small areas of loose shallow sediment". The Port will remove the sediment and replace it with compacted fill, or other appropriate engineering approach to stabilizing these areas, should be included in the final engineering plans.

- Prepare a landscaping plan for the new runway area, including plans for seeding and planting of vegetation to stabilize areas of fill that will not be covered by impervious surface.

L. Hazardous Substances

FEIS Chapter IV Section 21 discusses the impacts of the preferred alternative associated with hazardous substances. Concerns in

this area include the exposure of contaminated soils during excavation activities, release of hazardous substances during underground storage tank removal and building demolition activities associated with facility relocations, and spills of construction-related hazardous materials. FEIS pages IV.21-8,9 discuss mitigation measures, which include the development of a spill pollution, control and countermeasures plan for the transport, storage and handling of hazardous materials, and a hazardous substances management and contingency plan for the removal, storage, transportation and disposal of hazardous wastes. The FSEIS presents no additional information which would alter the FEIS conclusions with regard to this mitigation.

M. Construction

FEIS Chapter IV Section 23 and FEIS Appendix J, discussed the temporary impacts to the environment associated with the construction activities necessary to implement the preferred alternative. These temporary impacts included air, water and noise pollution, social and socio-economic impacts, and the disruption of surface transportation patterns. Since detailed design and construction plans for the proposed projects had not yet been prepared, it was not then possible to identify the specific types of construction equipment or the frequency of its usage. Accordingly, the FEIS discussed a range of construction-related impacts, using worst-case assessments which assume a range of excavation sources and means of transporting fill material.

Under the FEIS worst-case analysis, absent mitigation, the most significant construction-related impacts would be a temporary degradation of the level of service levels on freeways, highways, arterials, and permitted local streets used for truck hauling of fill material through congested areas during peak travel times.

The FEIS construction impacts section discussed mitigation measures, including the development of a construction and earthwork management plan, which will specify hours of operation, haul routes, and similar controls, and would discourage haul activities along extremely congested routes and during extreme roadway congestion periods. This plan would also provide for signalization and other improvements to several intersections in the vicinity of the airport which may be impacted by construction hauling activity.

Additional construction-related mitigation measures include property acquisition to minimize potential social and neighborhood disruption, fill spillage prevention and removing

procedures, fugitive dust prevention, and an erosion and sediment control plan.

FSEIS Chapter 5, section 5-4, presents additional information developed since publication of the FEIS, including changes to construction phasing, a lengthening of the runway haul duration, the identification of additional haul routes, and the identification of two temporary interchanges on SR 518 and SR 509. This additional information permitted a refined analysis of possible construction impacts in the FSEIS, and the identification of additional mitigation measures presented at FSEIS Table 5-4-8.

Based on the selected fill hauling plan, the FAA will require the POS to include essential provisions of its construction and earthwork management plan in construction earthwork bid documents as contractual requirements.

VII. DECISION AND ORDER

Although the "No Action" alternatives have fewer developmental impacts than the preferred alternative, they fail to achieve the purposes and needs for these projects. For the reasons summarized earlier in this ROD, and supported by detailed discussion in the FEIS and FSEIS, the FAA has determined that the preferred alternatives are the only possible and prudent alternatives as well as the most practicable.

Having made this determination, the two remaining decision choices available for the FAA are to approve the agency actions necessary for the projects' implementation, or to not approve them. Approval would signify that applicable Federal requirements relating to airport development planning have been met, and would permit the Port of Seattle to proceed with the proposed development and receive Federal funds for eligible items of development. Not approving these agency actions would prevent the Port of Seattle from proceeding with Federally supported development in a timely manner.

I have carefully considered the FAA's goals and objectives in relation to various aeronautical aspects of the proposed master Plan Update development actions discussed in the FEIS, including the purposes and needs to be served by the projects, the alternative means of achieving them, the environmental impacts of these alternatives, the mitigation necessary to preserve and enhance the environment, and the costs and benefits of achieving these purposes and needs in terms of effective and fiscally responsible expenditure of Federal funds.

Based upon the administrative record of this project, I make the certification prescribed by 49 U.S.C. § 44502 (b), that implementation of the preferred alternatives approved in this ROD are reasonably necessary for use in air commerce.

Therefore, under the authority delegated to me by the Administrator of the FAA, I find that the projects summarized in this ROD at Appendix B are reasonably supported, and for those projects I therefore direct that action be taken to carry out the agency actions discussed more fully in Section II of this Record, including:

A. Approval under existing or future FAA criteria of project eligibility for Federal grant-in-aid funds and/or Passenger Facility Charges, including the following elements:

1. Land Acquisition
2. Site Preparation
3. Runway, Taxiway, and Runway Safety Area Construction
4. Terminal and Other Landside Development
5. Certain POS-Installed Navigational Aids
6. Environmental Mitigation

B. Approval of a revised airport layout plan (ALP), based on determinations through the aeronautical study process regarding obstructions to navigable airspace, and that the agency does not object to the airport development proposal from an airspace perspective.

C. Approval for relocation/upgrade of the existing Airport Traffic Control Tower (ATCT), radars, and various navigational aids. I specifically reaffirm, in the context of the policy considerations set forth in this ROD, my April 4, 1997, approval of the SEA-TAC ATCT Siting Study. As demonstrated by that study, a replacement ATCT at SEA-TAC is required immediately, whether or not the other Master Plan Update development actions are approved.

D. The development of air traffic control and airspace management procedures to effect the safe and efficient movement of air traffic to and from the proposed new runway, including the development of a system for the routing of arriving and departing traffic and the design, establishment, and publication of standardized flight operating procedures, including instrument approach procedures and standard instrument departure procedures.

Lawrence B. Andriesen 7-3-97
Date

Lawrence B. Andriesen
Regional Administrator,
Northwest Mountain Region

RIGHT OF APPEAL

This decision constitutes the Federal approval for the actions identified above and any subsequent actions approving a grant of Federal Funds to the Port of Seattle. Today's action is taken pursuant to 49 U.S.C. Subtitle VII, Parts A and B, and constitutes a Final Order of the Administrator, subject to review by the courts of appeals of the United States in accordance with the provisions of 49 U.S.C. § 46110.

APPENDIX A

TABLE 2-7
Seattle-Tacoma International Airport
Supplemental Environmental Impact Statement

MASTER PLAN UPDATE IMPROVEMENTS - PHASING

Project	Changes in Phasing or Projects Definition
New Parallel Runway and associated operational procedures and taxiways	
Acquisition of land for the new parallel runway	*1996-2000 As the runway moves to the 2nd phase, acquisition is now separately identified*
Relocation of ASR and ASDE	*1996-2000*
Relocation of S.154/156th around 16X end	*1996-2000* *Not previously separately identified*
Temporary construction interchange off SR-509 and SR-518	*Previously assumed* *Not previously separately identified*
Construction of the new parallel runway	*1997-2004 First year of operation 2005*
Extension of Runway 34R by 600 feet	*2010*
Clearing and Grading For the Runway Safety Areas	
Development of the RSA embankments	*1996-2000*
Relocation of S.154/156th around 16L and 16R RSAs	*1996-2000* *Not previously separately identified*
Terminal and Landside Improvements **1996-2000 (Phase I)**	
Expansion of Concourse A, *including expansion of Main Terminal at A*	No Change - *clarification of action*
Improvements to the Main Terminal roadway and recirculation roads, *including a partial connection to the South Access Roadway and a ramp roadway from the upper level roadway to the airport exit*	No Change - *clarification of action*
Overhaul and/or replacement of the STS	No Change
Expansion of the main parking garage to the South,. *North and East*	*Phase II and III expansion of the main garage was moved to this phase.*
Construct first phase parking lot north of SR 518 for employee use (3500 stalls).	*Moved from Phase III (2006-2010) to Phase I (1996-2000*
Construction of the overnight aircraft parking apron	*Not previously separately identified*
Construction of the new air traffic control tower/TRACON	No Change
Removal of the displaced threshold on Runway 16L	*Not previously separately identified*
Relocation of Airborne Cargo due to new Control Tower	No Change
Expansion or redevelopment of the cargo facilities in the north cargo complex	No Change
Development of a new snow equipment storage facility between RPZ and 34L and 34X	No Change
Site preparation at SASA site for displaced facilities	No Change
Removal of the Northwest Hangar - replacement in SASA	No Change
Development of a ground support equipment location at SASA	*Previously assumed, but not separately listed*
Development of GA/Corporate aviation facilities in SASA or north airfield location	*Previously listed as 2001-2005*
Development of a new airport maintenance building *and demolition of existing facility*	*Moved from Phase II (2001-2005) to Phase I (1996-2000)*
Development of on-airport hotel	No Change
Development of the Des Moines Creek Technology Campus	No Change

TABLE 2-7

Sea-Tac International Airport
Supplemental Environmental Impact Statement

MASTER PLAN UPDATE IMPROVEMENTS PHASING

2001-2005 (Phase II)	
Dual taxiway 34R	No Change
Improved access and circulation roadway improvements at the Main Terminal, *provide upper roadway transit plaza at Main Terminal*	No Change *Plaza moved from Phase III (2006-2010) to Phase II (2001-2005)*
Additional expansion of the main parking garage	No Change
Expansion of the north employee parking lot (North of SR518) to 6,000 stalls *including improvements to the intersection of S. 154th/24th Ave. S.*	*Added intersections improvements to address this lot and the ramps associated with the North Unit Terminal at 24th Ave. S. at SR 518*
Construction of second phase of overnight apron	*Was assumed completed in Phase I*
Development of the first phase of the North Unit Terminal (south Pier), *development of the ramps off SR-518 near 20th Ave. S. and intersection improvements to S. 160th St. to address surface transportation issues associated with the closure of S. 170th Street to through traffic.*	*Moved from Phase III (2006-2010) to Phase II (2001-2005, identified the ramps separately, and added surface transportation improvements at S. 160th Street/International Blvd.*
Construct first phase of the North Unit Terminal parking structure for public and rental cars	*Moved from Phase I (1996-2000) to Phase II (2001-2005)*
Development of the North Unit Terminal Roadways	*Moved from Phase III (2006-2010) to Phase II (2001-2005)*
Interchange near 20th/SR-518 for access to cargo complex	*Previously included in the project above, now for clarity, separately identified*
Relocate ARFF facility to north of the North Unit Terminal	*Moved from Phase III (2006-2010) to Phase II (2001-2005)*
Additional improvements to the South Access Roadway connector	*Moved from Phase III (2006-2010) to Phase II (2001-2005)*
Relocation of the United Maintenance complex to SASA	*Not previously separately listed*
Continued expansion of the north cargo facilities	No Change
2006-2010 (Phase III)	
Expansion of North Unit Terminal (North Pier)	*First phase is now in Phase II*
Additional taxiway exists on 16L/34R	*Moved from Phase IV(2011-2020) to Phase III (2006-2010)*
Complete connectors to South Access Roadway (to eventual SR 509 Extension and South Access)	*Now separately identified*
Additional expansion of main parking garage	*New Project*
Additional Expansion of north employee lot to 6,700 stalls	No Change
Further expansion or redevelopment of north cargo complex	No Change
Expand North Unit Terminal parking structure for public parking	No Change
2011-2020 (Phase IV)	
Development as needed to accommodate growth in demand	No change
SR 509 Extension/South Access	*Not previously listed / part of Do-Nothing and With Project*

APPENDIX B

GARY LOCKE
Governor

STATE OF WASHINGTON
OFFICE OF THE GOVERNOR

P.O. Box 40002 • Olympia, Washington 98504-0002 • (360) 753-6780 • TTY/TDD (360) 753-6466

June 30, 1997

The Honorable Rodney Slater, Secretary
U.S. Department of Transportation
400 7th Street SW
Washington, DC 20590

Dear Secretary Slater:

The purpose of this letter is to reaffirm the conclusions in the December 20, 1996 letter from Washington Ecology Director Mary Riveland to Mr. Dennis Ossenkop. In that letter, the State of Washington provided reasonable assurance that the proposed airport development project involving the Sea-Tac Airport third runway will be located, designed, constructed and operated so as to comply with applicable air and water quality standards. Since the State provided that assurance, the Port of Seattle and the Federal Aviation Administration have prepared and distributed a supplemental environmental impact statement. With this letter, the State of Washington is again certifying that we will take the necessary actions to assure that the project is built and operated in compliance with applicable air and water quality standards.

The Washington Department of Ecology has reviewed the information contained in the Final Supplemental Environmental Impact Statement for the Proposed Master Plan Update at Seattle Tacoma International Airport and other relevant documents. As a result of that review, the State of Washington reaffirms its earlier findings and hereby provides that there is reasonable assurance that the airport development project involving the Sea-Tac third runway will be located, designed, constructed and operated so as to comply with applicable air and water quality standards, if the Port of Seattle implements the following measures:

1. The Port of Seattle will obtain and comply with all applicable air and water quality regulations, permits and approvals including the air conformity determination required under the Federal Clean Air Act.

2. The Port of Seattle will implement stormwater control measures that comply with the requirements contained in the most current Stormwater Management Manual for the Puget Sound Basin or other equivalent stormwater manuals approved by the Department of Ecology.

3. The Port of Seattle will establish and implement a process for monitoring construction activities to ensure compliance with applicable air and water standards. As part of this

process, the Port of Seattle will perform the following activities after Ecology review and comment:

a) prepare a new runway construction sediment and erosion plan which adheres to available best management practices (BMPs) and procedures which the Port of Seattle will attach to the bid packages when seeking contractors to construct the runway;
b) prepare site-specific sediment and erosion control plans which describe specific BMPs and procedures for individual construction and borrow sites;
c) implement procedures for reviewing mitigation requirements with contractors and subcontractors prior to initiating construction activities;
d) implement procedures for addressing changes in plans and construction activities and resolving disagreements on the interpretation of mitigation requirements, permit conditions, and allowable construction activities; and
e) establish and fund an independent qualified construction pollution control officer to advise on and determine compliance with applicable air and water quality standards.

4. As part of its ongoing efforts to address hazardous substance releases under the Model Toxics Control Act (MTCA), the Port of Seattle will complete a ground water evaluation at the airport as defined in the MTCA Agreed Order which will be finalized after review of public comments. The purposes of this evaluation include:

a) determine ground water flow characteristics and identifying fate and transport mechanisms;
b) modeling to assess potential risks to area drinking water supplies and adjacent surface water bodies; and
c) conducting additional characterization of ground water and/or long-term monitoring as necessary.

5. The Port of Seattle will design and construct the third runway such that the project will not cause changes in the location of the hydrologic divide between Miller and Des Moines Creeks in a manner that alters the average instream flow of either creek. The Port of Seattle will evaluate the feasibility of constructing an aquifer under the third runway as a means to control stormwater flows and minimize impacts on instream flows. The Port of Seattle will submit a report to Ecology describing the results of this evaluation.

As stated in the December 20, 1996 letter, the State of Washington expects that the proposed project will be implemented in a manner that is consistent with mitigation requirements under the National Environmental Policy Act/State Environmental Policy Act, other environmental

monitoring studies, and control measures and permitting actions involving air and water quality at Sea-Tac Airport. In particular, implementation of the proposed project must take into account the air monitoring evaluation being conducted by the Port, the Puget Sound Air Pollution Control Authority (PSAPCA), EPA, and Ecology.

This letter reaffirms and supersedes the December 20, 1996 letter issued by former Ecology Director Mary Riveland. Consequently, this letter constitutes the state certification required under 49 U.S.C. 47101 et seq. All parties are aware that this letter does not constitute a commitment to issue any specific permit. I have directed the Department of Ecology and other state agencies to implement and enforce applicable air and water quality standards in a manner that protects the health of Washington's citizens and the environment.

If you or your staff have questions regarding this letter, please contact Mr. David Bradley (360/407-6907) or Mr. David Williams (425/649-7071).

Sincerely,

Gary Locke
Governor

cc: Tom Fitzsimmons, Department of Ecology
Dennis McLerran, Puget Sound Air Pollution Control Authority
Gina Marie Lindsey, Port of Seattle

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
P.O. Box 47600 • Olympia, Washington 98504-7600
(360) 407-6000 • TDD Only (Hearing Impaired) (360) 407-6006

December 20, 1996

Mr. Dennis Ossenkop
Federal Aviation Administration
Seattle Airports District Office
1601 Lind Avenue SW
Renton, Washington 98055-4056

Dear Mr. Ossenkop:

I have been delegated the authority by Governor Mike Lowry to respond on behalf of the State of Washington to the August 12, 1996 letter from Ms. Gina Marie Lindsey. In that letter, the Port of Seattle requested a letter of certification concerning air and water quality standards applicable to the proposed runway project at the Sea-Tac airport. As you are aware, 49 U.S.C. 47101 et seq. (formerly known as the Airport and Airway Improvement Act) requires a state to provide reasonable assurance that certain types of FAA-funded projects will be located, designed, constructed and operated in compliance with applicable air and water quality standards.

The Washington Department of Ecology has reviewed the information contained in the Final Environmental Impact Statement for the Proposed Master Plan Update at Seattle Tacoma International Airport and other relevant documents. As a result of that review, the State of Washington hereby provides that there is reasonable assurance that the airport development project involving the Sea-Tac third runway will be located, designed, constructed and operated so as to comply with applicable air and water quality standards, if the Port of Seattle implements the following measures:

1. The Port of Seattle will obtain and comply with all applicable air and water quality regulations, permits and approvals including the air conformity determination required under the Federal Clean Air Act.

2. The Port of Seattle will implement stormwater control measures that comply with the requirements contained in the most current Stormwater Management Manual for the Puget Sound Basin.

3. The Port of Seattle will establish and implement a process for monitoring construction activities to ensure compliance with applicable air and water quality standards. As part of this process, the Port of Seattle will perform the following activities after Ecology review and comment:

(a) prepare a new runway construction sediment and erosion control plan that adheres to best management practices (BMPs) and procedures, which the Port of Seattle will attach to the bid packages when seeking contractors to construct the runway;
(b) prepare site-specific sediment and erosion control plans that describe specific BMPs and procedures for individual construction and borrow sites;
(c) implement procedures for reviewing mitigation requirements with contractors and subcontractors prior to initiating construction activities;
(d) implement procedures for addressing changes in plans and construction activities and resolving disagreements on the interpretation of mitigation requirements, permit conditions, and allowable construction activities; and
(e) establish and fund an independent qualified construction pollution control officer to advise on and determine compliance with applicable air and water quality standards.

4. As part of its ongoing efforts to address hazardous substance releases under the Model Toxics Control Act (MTCA), the Port of Seattle will complete a ground water evaluation at the airport as defined in a MTCA Agreed Order which will be finalized after review of public comments. The purposes of this evaluation include:

(a) determining ground water flow characteristics and identifying fate and transport mechanisms;
(b) determining potential risks to area drinking water supplies and adjacent surface water bodies; and,
(c) conducting additional characterization of ground water and/or long-term monitoring, as necessary.

5. The Port of Seattle will design and construct the Third Runway such that the project will not cause changes in the location of the hydrologic divide between Miller and Des Moines Creeks in a manner that alters the average instream flow of either creek. The Port of Seattle will evaluate the feasibility of constructing an aquifer under the third runway as a means to control stormwater flows and minimize impacts on instream flows. The Port of Seattle will submit a report to Ecology describing the results of this evaluation.

It is also my expectation that the proposed project will be implemented in a manner that is consistent with mitigation requirements under the National Environmental Policy Act/State Environmental Policy Act, other environmental monitoring studies, control measures and permitting actions involving air and water quality at Sea-Tac Airport. In particular, the proposed project should take into account the air monitoring evaluation being conducted by the Port, the Puget Sound Air Pollution Control Authority (PSAPCA), EPA, and Ecology.

This letter constitutes the state certification required under 49 U.S.C. 47101 et seq. All parties are aware that this letter does not constitute a commitment to issue any specific permit. I have directed my staff to implement and enforce applicable air and water quality requirements in a manner that protects the health of Washington's citizens and the environment.

If you have questions regarding this letter, please contact Mr. David Bradley (360/407-6907) or Ms. Janet Thompson (206/649-7128).

Sincerely,

Mary Riveland

Mary Riveland
Director

cc: Gina Marie Lindsey, Port of Seattle

APPENDIX C

Seattle-Tacoma International Airport Master Plan Update

ASSESSMENT OF RUNWAY LENGTH AND LOCATION FOR THE THIRD PARALLEL RUNWAY

June, 1997

As is shown in the Final EIS and Final Supplemental EIS, developing an air carrier Third Runway is the only prudent and reasonable alternative to the need identified: "Improve the poor weather airfield operating capability in a manner that accommodates aircraft activity with an acceptable level of delay". A detailed review of the alternatives are discussed in the Flight Plan Final EIS; the Major Supplemental Airport Study; and Chapter II of *Final Environmental Impact Statement for the Proposed Master Plan Update Development Actions at Seattle-Tacoma International Airport* dated February, 1996, and Chapter 3 of the *Final Supplemental Environmental Impact Statement for the Proposed Master Plan Update Development Actions at Seattle-Tacoma International Airport* dated May 13, 1997. In addressing ways to avoid or minimize impacts to wetlands, the location of the Third Runway was evaluated. The key to placing the runway rests with:

- its westerly separation from the existing runway system;
- the relative siting of the north end of the new runway; and
- the length of the new runway.

As was shown in the Final EIS/Supplemental EIS, a runway with the closest separation to the existing runway would avoid and/or minimize impacts to wetlands.[1] However, as was also shown, development of a runway with a separation of less than 2,500 feet would not enable two arrival streams during poor weather conditions due to the requirement of increased lateral spacing when pilots are relying on their instruments and to address the resulting wake vortex (wind turbulence) caused by aircraft landings. This operation is effectively the existing condition and, thus, poor weather arrival delay would not be reduced. Two parallel runways separated by less than 2,500 feet apart require that pilots be able to visually confirm that their aircraft are on the proper approach and to ensure that the wake vortices from aircraft ahead of them do not create unsafe conditions. Technologies do not exist to eliminate the wake vortex constraint nor are any envisioned in the short or near-term.

The development of a Third Runway at a location 2,500 feet west of existing Runway 16L/34R would place it generally along 12th Avenue S. At this location, with the requisite FAA design guidelines (reflecting mandated safety areas) requires that the runway be no longer than about 8,500 feet. A longer runway length would affect South 188th Street (to the south) or SR 518 (to the north). SR 509 bounds the site on the west.

In achieving the greatest operational benefit relative to the cost of new runway development, two conditions were considered: 1) all runway ends aligned on the north end, and 2) the new Third

[1] A separation of greater than 2,500 feet would affect SR 509 on the west and could result in the impact of a 30 acre high quality wetland, west of SR 509 north of South 176th Street.

Runway north threshold staggered south. For operational reasons, the stagger option is not practicable. Where a stagger exists, greater coordination is required between the arrival streams and departures. As a result, during about 7% of the weather conditions, a staggered threshold would produce inefficiencies. This added complexity in air traffic operations would occur at times when the operations are at their highest level and during poor weather, a time when air traffic controllers are at their highest work load.

As is noted in this paper, an 8,500 foot long runway provides the maximum runway length possible within the land envelope west of the existing airfield, without disruption of S. 188th Street or SR 518/SR 509. A new runway with a length shorter than 8,500 feet would create inefficiencies in air traffic operations relative to avoiding 0.86 acre of low value, fragmented, and isolated wetlands.[y] As continued evolution of the aviation industry post deregulation, airlines have struggled to achieve a financial profit, creating significant difficulties in predicting activity levels and air service patterns. These uncertainties are expected to remain with the industry in the near term as air travel evolves in a global economy. The development of a new runway at Sea-Tac Airport represents a critical investment in aviation facilities to address the poor weather operating constraint. As a result, to minimize the risk that other future improvements will be needed, and probable impacts on natural resources such as wetlands, the capability of the new facility should be maximized.

A staggered threshold associated with a length less than 8,500 feet on the Third Runway would reduce the operating capability of the new runway when air traffic control cannot maintain visual separation between an arriving and departing aircraft. The FAA Air Traffic Control Manual, FAA Order 7110.65J, Section 5-8-5 states that in order to conduct simultaneous operations between an aircraft departing on the near runway (existing runway 16L/34R) and an aircraft on final approach to another staggered parallel runway (the new runway), that "The runway centerlines separation exceeds 2,500 feet by at least 100 feet for each 500 feet the landing thresholds are staggered". The need for the increased spacing is primarily due to the procedures used to protect the separations between the arriving aircraft and the departing aircraft in the event the arriving aircraft executes an aborted landing (referred to as a missed approach procedure).

Another issue involved with runway stagger is wake vortex. Wake vortex is the turbulence created by the wing tips of an aircraft as the wing of the aircraft creates lift. It is a powerful phenomena resembling small horizontal tornadoes and has been a key element in determining required aircraft and runway separations. While the 2,500 foot separation proposed for the Third Runway meets the requirement for avoidance of wake vortices, aligned thresholds provide an added safety buffer over a staggered threshold. This is due to the fact that aircraft landing on a staggered Third Runway would be touching down in front of a potential departure on the existing runway. However Runway 16R is located at a distance of 1,700 feet from the new runway. As a result, departures queuing for takeoff on this runway would be required to wait until the wake vortex dissipates. Alternatively, arriving aircraft to the new runway could be slowed to allow for a "gap" for the departure.

[y] Impacts associated with the Master Plan Update improvements are to small (<0.5 acre) wetlands that are isolated from other significant aquatic or semi-aquatic habitat, and occur in a landscape fragmented by streets, commercial, residential, or airport development. Therefore, for most functions, the wetlands were not considered to provide high function.

While the primary purpose of the Third Runway is to enable two arrival streams during poor weather, there are times when the Third Runway will be used for departures, as was evaluated in the Final EIS/Supplemental EIS. Concerns with the north thresholds exist due to the dominance of the south flow operation, which occurs about 65% of the year. If the thresholds are aligned on the north, at a separation of 2,500 feet, arrivals to the new runway (16X) and departures on existing Runway 16L can occur independently. However, if the 16X threshold is staggered, separations between the 16X arrival and the 16L departure must be maintained when the air traffic controllers cannot provide visual separations, which occurs about 18% the time south flow occurs. This could be avoided by moving the runway an additional 100 feet west for every 500 feet of threshold stagger. However, this 100 foot movement further west would requiring either a shortening of the runway on the south (to about 5000 feet) or the relocation of SR 509.

In addition, the alignment of the thresholds also could affect the delay between departing aircraft. For instance, if the thresholds are aligned, a light aircraft can be released for departure on Runway 16X about 2 minutes after a heavy departs from Runway 16L. This time would increase to 3 minute separation if the thresholds are staggered.

In the planning stages for the Third Runway, various groups were requested to provide technical input on the layout of the runway. The recommendation of the Chief Pilots was that runway lengths of less than 8,000 feet should not be considered and that 8,500 feet was their preferred option. One of the primary concerns expressed by the Chief Pilots was that the percentage of aircraft projected to be able to use various runway lengths was based solely on performance data listed in the operations manuals for the various aircraft types. They noted that the performance data is developed based on the maximum operating capability of the aircraft and that pilots prefer to avoid operating at maximum limits where other options are available.

The Chief Pilots further suggested that the operational benefits of shorter runway lengths could be significantly less than indicated given that pilots would prefer to use the longer existing runway. Although the FAA prescribes the rules by which pilots and air traffic controllers must operate, the pilot is given the ultimate authority and responsibility for the safety of operations. If a pilot is not comfortable with the distance available to land on the runway the air traffic controller assigns, it is the pilot's discretion to reject the controller's choice and request the longer runway. The frequency with which this occurs is referred to as the "pilot rejection rate".

Another factor pointed to by the Chief Pilots was the increased safety margin offered by the 8,500 foot length. In the event of an unusual circumstance, additional runway would be available for an arriving aircraft to continue past it's normal landing length or for a departing aircraft reject the takeoff and stay on the ground. This is especially important given that the runway is intended to be used primarily for arrivals during poor weather conditions and when the pavement is most likely to be wet.

The input from the Chief Pilots was further substantiated by input from the Air Transport Association and FAA Air Traffic Control supporting an 8,500 foot runway. FAA Air Traffic Control stated that "...a runway in excess of 8,000 feet allows for the operation of most category aircraft. Shorter distance will inhibit our flexibility and restrict operations which detracts from the runway utilization". Restated, shorter length runways would restrict the type of aircraft that can

use the runway. In turn, this would reduce runway efficiency by forcing controllers to sort and sequence aircraft to the appropriate runways rather than allowing the aircraft to flow directly to nearest runway without regard to size. The FAA Air Traffic letter went on to state that "Our desire is to have the longest runway feasible with no less than the 8,500 feet...". The letters from each of the organizations are attached.

Other issues that were considered by the Port that pertain to the practicability of the Third Runway length include:

- The Master Plan recommended that, in the event that a shorter runway is built, that protections be put in place to enable extension of the new runway to 8,500 foot at some future time. The overall cost to extend a shorter runway at a future date will be higher due to cost escalation, re-mobilization of equipment, and the additional process involved in seeking appropriate approvals.

- By being able to accommodate virtually all aircraft, the 8,500 foot length provides greater flexibility for landing aircraft in the event one of the other runways is closed for either an emergency or repair. Currently, when these situations occur in the course of a normal day, the airport is restricted to the use of one runway for arrivals and departures severely impacting the operations and capacity of the airport.

- Currently, major rehabilitation to the existing runways is conducted at night to avoid disruption to the operation of the Airport during the day. The 8,500 foot length would allow for longer duration closures for daytime construction on the other runways when major rehabilitation is required. This would avoid costlier nighttime construction due to more expensive materials, specialized equipment, equipment mobilization and logistics, and safety procedures. Nighttime construction is estimated to be about three times more expensive.

To examine specific wetlands which might be avoided, consideration was given to shortening the runway from either the north or from the south. With the thresholds aligned on the north, the only manner to avoid or minimize impacts to wetlands would require the runway to be shortened from the south. Avoidance of wetlands #25 and 26 (0.06 and 0.02 acres respectively) would require a runway length of 6,750 feet. The reduction in landing length would result in the runway being useable by less than 97% of the future aircraft for landing or less than 82% for departure. This reduction in operating capability is not practicable. The wetlands that would be avoided are fragmented and of low values relative to serve stormwater storage, groundwater recharge, and water quality enhancement. Thus, with the thresholds aligned, the 8,500 foot long runway is the only practicable runway length.

In evaluating avoidance of wetlands on the north end of the site, several options were considered:

- Shorten by 400 feet (8,100 feet) - avoidance of wetlands #9, 11, 12, 13 (0.86 acres)
- Shorten by 700 feet (7,800 feet) - avoidance of wetlands #9, 11, 12, 13, 14 (1.05 acres)
- Shorten by 1,500 feet (7,000 feet)- avoidance of wetlands #9, 11, 12, 13, 14, 15 (1.33 acres)

Each of these options would result in a runway stagger on the north end, and thus would create operational inefficiencies that are not practicable.

As documented in Final EIS Volume 3 (Appendix H-B) and the Final Supplemental EIS (Section 5-5) these wetlands have low values and function primarily for stormwater storage, floodwater attenuation, groundwater discharge, water quality enhancement, and wildlife foraging opportunities. The proposed mitigation plan calls for replacing the stormwater storage functions in the Master Plan Update stormwater management facilities. All of these functions will be mitigated at the wetland mitigation site in Auburn with values greater than what occurs in the Sea-Tac Airport area.

APPENDIX D

APPENDIX D

COMMENTS ON THE FINAL SUPPLEMENTAL EIS

This appendix of the Record of Decision (ROD) summarizes the comments received concerning the *Final Supplemental Environmental Impact Statement for Proposed Master Plan Update Development Actions at Seattle-Tacoma International Airport* dated May 13, 1997, including the Final Conformity Analysis. Letters 1 through 6 below reflect comments received issues other than air quality. Appendix E contains the response to comments concerning air quality and the final conformity analysis.

1. **Henry Frause,** 411 SW 186th, Normandy Park, WA 9816 May 21, 1997

   1. "The following comments are submitted in response to the subject 'Ground Water Study'.

   Response: The issue of groundwater contamination has been thoroughly discussed in the Final EIS (Chapter IV, Section 10 and the applicable appendices) and Final Supplemental EIS (Section 5-7). See also Section VI - E of the Record of Decision (ROD) To date no additional authoritative information has been produced that conflicts with the analysis in these documents.

   2. "The FSEIS along with the Final -Rule summary cannot exist in any Supreme Court decisions without a Federal Docket No. to show full continuity of the FEIS."

   Response: The FAA only assigns a docket number in rulemaking cases or adjudication cases, which at this time are not applicable to the processing of a Draft/Final EIS or Draft/Final Supplemental.

   3. "How do you justify the fact that you are now participating in an illegal marriage known as a Municipal Corporation?"

   Response: The of a municipal corporation raised by this commentor has been addressed in the Final EIS (see response to comments in Appendix R, responses R-2-1 and R-2-2) and the Final Supplemental EIS (Appendix F, response to comment 1-J).

2. **John Hayden, Boeing Company**, P.O. Box 3703 MS 14-49, Seattle, 98124-2207 May 23, 1997

   - Agree with conclusions of SEIS

   Response: Comment acknowledged.

3. **Margaret & Glen Farrell**, 21220 - 4th Place South, Des Moines, WA 98198 June 16, 1997

1. "Why is FAA and the Port of Seattle still ignoring the questions and comments of the people who are most affected by the Port's operation of Sea-Tac Airport?"

Response: All applicable comments have been responded to in the Final EIS and the Final Supplemental EIS. Three volumes (Volumes 5 through 7) of the seven volume Final EIS present the public and agency comments, while Appendix R (Volume 4) presents the responses to the comments.

2. "... expanding operations at Sea-Tac can only make air and water quality much more worse than ever?"

Response: . As is shown in the Final EIS and Final Supplemental EIS, the proposed improvements are not anticipated to have a significant adverse impact on air quality or water quality. Under the Clean Air Act General Conformity Regulations, de minimis has been demonstrated. See also letters numbered A-7 through A-9 from the U.S EPA, Puget Sound Air Pollution Control Agency (PSAPCA), and Department of Ecology concerning the adequacy of the conformity analysis. Mitigation for significant adverse impacts is proposed.

3. "How can we find out how a wetland be moved? Who made that determination?"

Response: The proposed wetland mitigation does not call for actual "movement" of the wetlands. Instead, wetland functions (such as wildlife habitat) which conflict with safe aircraft operations will be developed at the Auburn site. Hydrological functions will be retained in the airport area. Approval of the wetland mitigation ultimately will rest with the U.S. Army Corps of Engineers under the Section 404 permitting process.

4. "Will our drinking water be safe from airport produced contaminates"

Response: No adverse impacts to drinking water or water quality are expected.

3. **Cutler & Stanfield, Airport Communities Coalition (ACC)**, June 19, 1997

1. "inaccurate and implausible assumptions about the number of operations and passengers" (Pg 2)

Response: No specific comments were submitted with these June 20th comments concerning the forecast of passengers and operations, with the exception of the attachment prepared by Dr. Clifford Winston. Cutler & Stanfield, and their technical experts have continued to allege that a new runway will result in increased demand for air travel. However, they have been unable to provide a plausible argument for how natural demand (based on income, population and air fares as defined by the Master Plan) differs from demand that would arise from an additional runway. Based on this information, it appears that there is a professional difference of opinion concerning aviation forecasts; the FAA and the Port stand by the forecasts prepared for the Draft/Final Supplemental EIS. While the specific forecast suggested by Dr. Winston

was not examined, Appendix D of the Final Supplemental EIS and Appendix R of the Final EIS contain an analysis of alternate forecasts.

As was noted in the Final EIS and Final Supplemental EIS, an unconstrained level of demand was identified based on the variables that stimulate demand: population, income and air fares. This unconstrained level reflects the demand that could arise regardless of the facilities that are available. Thus, the addition of a runway or any other facility would not alter the quantity of unconstrained demand. In contrast, reflecting that the existing airport system at some level (quantified as 460,000 annual operations) will impose a constraint on the ability to serve demand, a constrained forecast was prepared. A constrained demand can equal unconstrained demand until the point at which the airport facilities are no longer capable of satisfying the demand level. As was shown in the Final EIS and re-validated for the Final Supplemental EIS, the existing facilities would not be able to accommodate forecast aircraft operations above 460,000 annual operations. Therefore, when demand for air travel exceeds the capability of the constraint (the unconstrained demand would be greater than the constrained demand), demand would not be satisfied by existing facilities. Because the activity was examined in this fashion, the forecast did not underestimate the number of operations that would occur due to the construction of the Third Runway.

The regression models used by the Port to forecast future passenger and operations demand, in Winston's words, "do a good job of explaining the present by the past." Thus, these models provide a realistic projection of future demand based on the same relevant factors that explain historical activity levels. By his own admission, Winston's cross-section model does not explain the present or the past. Thus, it is questionable how the model would be accurate in predicting future demand. The addition of independent variables to a model does not increase the R^2 value (ratio of correlation). The R^2 value is increased only when the variables considered strengthen the correlation. Winston's demand model includes independent variables for the number of runways and connecting hub status, if they prove anything, they prove that airports with higher demand build adequate facilities to serve the projected demand. As a result, the act of building a runway does not cause demand to increase, as the runway does not affect population, income or air fares.

Appendix F of the Final Supplemental EIS and Appendix R (Volume 2) of the Final EIS (Volume 4) respond to earlier comments of the Airport Communities Coalition concerning the proposed project and forecast demand issues.

2. "FSEIS continues to rely on the data and analysis prepared for the Final EIS which are out-of-date and largely irrelevant" in light of new forecasts, changes in expansion plan, implicit changes in purpose and need. (Pg 3)

Response: As is noted in the Final Supplemental EIS, the purpose of that report is to analyze the impact of new aviation activity forecasts and other new data that had arisen between issuance of the Final EIS in February 1996 and issuance of the Final Supplemental EIS in May 1997. Included in the Final Supplemental EIS are changes in the timing of proposed facilities based on the higher level of demand and slight improvements that had been identified in the Master Plan Update. No changes in project purpose or need were identified.

3. FSEIS "does not provide sufficient detail about each of the actions to be undertaken.."

Response: No comments have been received seeking clarification or elaboration concerning the proposed Master Plan Update improvements, other than concerning construction of the Third Runway. As is noted in the EIS, specific construction traffic levels and routes will not be known until a contractor(s) is selected. Thus, to account for worst-case conditions, peak traffic levels were considered for all possible haul routes. It is unclear what additional information is desired. The commentor notes that impacts from the Des Moines Creek route of a conveyor belt was not assessed relative to water quality impacts. The Final EIS and Final Supplemental EIS assess the impact of a truck haul construction process; if a conveyor belt transport alternative along the Des Moines Creek corridor were pursued, additional environmental analysis would be conducted.

4. Commentor indicated that the FSEIS does not examine reasonable alternatives

Response: All reasonable and prudent alternatives have been examined, as documented in the Flight Plan Study, the Major Supplemental Airport Study, the Expert Panel process, the Master Plan Update and the Final EIS/Final Supplemental EIS.

5. Commentor indicated that the FSEIS does not consider reasonable mitigation.

Response: The Final EIS and Final Supplemental EIS contain appropriate mitigation for all significant adverse environmental impacts.

6. Commentor indicated that the FSEIS fails to describe or analyze properly the significant environmental impacts:

- Destructive effects from haul
- Insufficient detail concerning construction
- Mitigation of construction impacts
- Understates the extent actions would violate GMA
- Noise impacts rely on 1994 for existing conditions
- Inadequate analysis of air quality impacts
- Surface transportation analysis is flawed: 1) project impact, 2) inaccurate freeway operation conditions 3) unfounded assumptions concerning number of improvements to the regional system
- Inadequate evaluation of effects on housing stock
- Ignores existence of suitable wetland mitigation in basin
- Does not adequately consider water quality impacts

Response: As is noted in the EIS, specific construction traffic levels and routes will not be known until a contractor(s) is selected. Thus, to account for worst-case conditions, peak traffic levels were considered for all possible haul routes. Final EIS, Chapter IV, Section 23 and Final Supplemental EIS Section 5-4 presents the impact of two construction scenarios: maximized on-site fill usage and maximized off-site fill usage.

The Final EIS and Final Supplemental EIS document the appropriate and detailed evaluation of noise, land use, air quality surface transportation, social and induced socio-economic impacts, wetland impacts, and water quality in accordance with the National Environmental Policy Act and State Environmental Policy Act.

7. Commentor indicated that the FSEIS postpones assessment of impacts beyond 2010.

Response: As is noted in the Final Supplemental EIS, forecasting demand beyond year 2010 presents such uncertainties concerning activity, and the context in which the Airport will operate, that these projections are not capable of being meaningfully evaluated. With the exception of aircraft noise exposure impacts, Federal and state regulations will require that significant adverse impacts not occur in future time frames. As is shown in Appendix D of the Final Supplemental EIS, while emissions are not reasonably foreseeable beyond 2010, the generalized analysis indicates that emissions post 2010 would not likely result in significant adverse impact. Recognizing the issues associated with aircraft noise, the FAA is requiring a future assessment of noise, as documented in Section V.D of the ROD.

4. **Julia Patterson, State Senate**, P.O. Box 40482, Olympia, WA ,June 23, 1997

1. "It did not examine the real impacts on the local and regional roads, on schools and on the community of thousands of daily truck trips transporting millions of cubic yards of fill dirt six days a week for at least five years."

Response: Construction impacts were evaluated based on the level of information available at this time, as contractor(s) have not been selected for the Master Plan Update improvements. As a result, a worst-case evaluation was performed for five periods of the day (AM peak, PM peak, afternoon, evening, and night) based on peak hour fill transport conditions along the possible haul routes.

2. "The impacts of noise on the community are not completely analyzed. It is difficult for even a lay person to swallow the idea that although operations will increase, that noise from the airport will continue to decrease."

Response: Noise impacts were evaluated using the required methods as well as with use of alternative noise measures (SEL and Time Above). In accordance with the Airport Noise and Capacity Act of 1990, aircraft noise exposure is expected to decrease as the aircraft fleet transitions to Stage 3 aircraft engines.

3. "It is also difficult to accept that with increasing operations the number of major air pollutants will decrease, that water quality will not be affected by a large increase in stormwater runoff resulting from the addition of may acres of new paved, impervious surfaces. The Final SEIS ignores completely the concerns of the communities of the loss of wetlands and the effect on Des Moines and Miller Creek drainage basin."

Response: Impacts to water quality, stormwater and wetlands were evaluated in accordance with standard methodologies as required by the National Environmental Policy Act and State Environmental Policy Act.

4. "I am extremely concerned that the Final SEIS did not address reasonable mitigation for the affected communities. The state of Washington recently sponsored and funded a year-long study of mitigation measures...."

Response: Mitigation was evaluated for all significant adverse impacts. See Final Supplemental EIS, Appendix F, Response to comment 4-J.

5. **Len Oebser, Regional Commission on Airport Affairs** (RCAA), June 23, 1997

1. "The comments of the Regional Commission on Airport Affairs were misrepresented in Appendix F, FSEIS, as being only the personal comments of Len Oebser. Authorship should have been attributed to the organization...." (Pg. 3)

Response: All comments received on the Draft EIS and Draft Supplemental EIS were indexed by the party transmitting the letter and organization, if applicable (see Final EIS Appendix R, Table R-1 and Final Supplemental EIS, Appendix F, Table F-2). The actual summary of the comment and response (in FEIS Appendix R and FSEIS Appendix F) noted the name of the individual commentor to enable cross-reference of the letter. In FSEIS Appendix F, a numerical index followed the name [i.e., Mr. Oebser (55RCAA,2-8)] to indicate the location within the letter. In many cases, the organization was noted (i.e., Mr. Oebser submitted comments on behalf of RCAA).

2. The commentor expressed concern with the absence of an index to the Final EIS. (3-4)

Response: An index was provided in the Draft EIS, Final EIS, and Final Supplemental EIS. It appears that this commentor believed that this index was not adequate and that an index to the comments should have been prepared. Comment noted.

3. Commentor indicated that the FSEIS did not respond to comments. (Pg 4)

Response: This comment did not note which comment did not receive a response. Later comments were more specific and specific responses are enclosed.

4. Commentor indicated that the FSEIS failed to respond to the thrust of comment. (Pg 4)

Response: This comment failed to note what specific issue did not receive a response. Later comments were more specific and specific responses are enclosed.

5. Commented noted that the RCAA comments were not listed in order of their presentation. (Page 4)

Response: Comment noted. Responses were presented in topic order, for all comments received. Thus, in some cases the responses were not in the order in which an individual commented.

6. Commentor noted that technical material and bibliographies were not reproduced in the Final EIS/Final Supplemental EIS and that technical reports were not available to the public. (Pages 4, 8, 44)

Response: It is not possible to include all documents in the Final EIS or Supplemental EIS that were relied upon in preparing the technical analysis. This is particularly true of a study process which began in the late 1980s, and which is culminating in the Master Plan Update EIS process. As a result, it is an accepted industry and legal standard to incorporate by reference documents, such that individuals questioning the underlying data have an opportunity to review the references. All technical materials which were used in preparation of the Draft EIS/Final EIS and Draft/Final Supplemental EIS were available for public review at the FAA offices in Renton, Washington. A complete set of the reference material was provided to the Airport Communities Coalition. While the documents did not contain a bibliography, each chapter and section contained footnotes citing specific reference material. Throughout the 1996 Final EIS were notations to the use of the Preliminary Engineering Study (i.e., *Seattle-Tacoma International Airport Third Dependent Runway Preliminary Engineering Study*, HNTB, 1994). The Port Financing Plan and Net Present Value Evaluation (prepared in February 1997) were included in the reference material for the Final Supplemental EIS. These documents were available to the public, as evidenced by the references to these documents in the ACC's comments on the Draft Supplemental EIS (see Final Supplemental EIS, Volume 3, Appendix G, pages G-718 though G-721).

The Port of Seattle has submitted the referenced wetland mitigation permit and stream relocation plan documents to the U.S. Army Corps of Engineers (COE) as part of the Section 404 permit application in December 1996. The COE requested some formatting revisions, which have recently been completed. The COE is expected to issue public notice of the permit application in July 1997, at which time the final permit application material will be available for public review.

7. Commentor expressed concerns with the practice of presenting projections as hard numbers instead of a range. (Page 6)

Response: The Final EIS and Final Supplemental EIS note that the projections reflect a forecast of future conditions. To enable the consideration of environmental impacts, a specific forecast level of activity must be used. Thus, the standard practice for considering impacts is through the use of a specific activity level representing the most realistic projection of future activity.

8. Commentor expressed concerns with the lack of mitigation commitment. (Page 6)

Response: The purpose of an EIS is to present probable environmental impacts and possible mitigation to address the significant adverse impacts. The Sea-Tac Airport Master Plan Final EIS and Final Supplemental EIS were prepared in this approach. This Record of Decision contains the appropriate mitigation commitments.

9. Commentor requested peak hour and daily construction truck trip data. (Page 6)

Response: As is noted in the EIS, specific construction traffic levels and routes will not be known until a contractor(s) is selected. Thus, to account for worst-case conditions, peak traffic levels were considered for all possible haul routes. The Final EIS and Final Supplemental EIS present peak hour truck conditions in contrast to five daily time periods (AM peak, PM peak, afternoon, evening and night). These enable a comparison of possible traffic conditions relative to total traffic on all possible haul routes. Daily traffic levels were not calculated as this level would not provide meaningful comparison to traffic conditions.

10. Commentor requested a map of construction noise impacts. (Page 7)

Response: While construction noise impacts were discussed in Chapter IV, section 23 of the Final EIS and Section 5-4 of the Final Supplemental EIS, maps were not prepared.

11. Commentor requested a construction schedule, hours of construction, and fill traffic routes. (Pg 7, 10)

Response: As is noted in the EIS, specific construction traffic levels and routes will not be known until a contractor(s) is selected. It is anticipated that permit applications will note the contractors desired haul routes and time of operations. Thus, to account for worst-case conditions, peak traffic levels were considered for all possible haul routes. Specifically, the Final EIS and Final Supplemental EIS examined peak hour construction traffic levels during five hours of the day (AM Peak, PM Peak, afternoon, evening and night). As stated in these documents, transport of fill material from off-site sources could occur as much as 270 days per year and 16 hours per day. Transport of fill material from on-site sources could occur as much as 210 days per year and 16 hours per day. It is anticipated that during peak construction periods, haul could occur more than 16 hours a day.

12. Commentor requested use of new EPA air quality standards. (7,11)

Response: In late 1996, the U.S. EPA announced its proposed rulemaking for new ambient air quality standards for Ozone and Particulate Matter. As is noted in the Final Supplemental EIS, Appendix F, as these standards have not been formally adopted by EPA and have not been included in a State Implementation Plan, they are not applicable for consideration as part of this Supplemental EIS or the air conformity analysis.

13. Commentor requested quantification of social-impact data. (7)

Response: The Final EIS and Supplemental EIS present the social impacts from construction activity. It is not clear from the comment as to what specific social data is requested for quantification.

14. Commentor requested scientific basis for use of the 65 DNL and indicated that noise outside the 65 DNL should be considered. (8, 31)

Response: Use of the 65 DNL noise contour is required by FAA Orders implementing the National Environmental Policy Act. This noise measure, as well as several metrics which are not required by FAA guidance were presented in the Final EIS and Final Supplemental EIS. The 65 DNL noise contour is based on the FAR Part 150 Land Use Compatibility guidelines which were defined after extensive consideration by various agencies (i.e. EPA, HUD, FAA, etc.) of the impact of aircraft noise.

The commentor noted "It is also not true, as the Response suggests, that noise outside the 65 LDN contour must be ignored for FAA purposes." Recognizing that residents located outside the 65 DNL experience noise exposure concerns, the Final EIS and Final Supplemental EIS examined noise through 60 DNL and examined conditions at noise sensitive facilities less than 60 DNL.

15. Commentor requested health impacts of noise. (8, 15)

Response: The Final EIS (Chapter IV, section 7) contains a discussion of the impact on human health of aircraft noise exposure. The submittal of the bibliography of alternative noise source data does not conflict with the information presented in this section of the Final EIS.

16. Commentor requested copies of noise mitigation interlocal agreements. (8)

Response: No such interlocals exist at this time.

17. Commentor indicated that noise exposure contours from other airports should be presented and respective impacts combined. (8)

Response: Response to comment 7-O in Appendix F of the Final Supplemental EIS addresses the noise from Boeing Field. As the noise exposure impacts would not combine to create a 65 DNL or greater noise contour, noise contours from Boeing Field or other airports were not included.

18. Commentor requested inclusion of a Port agreement with the Highline School District to insulate Highline Schools. (8)

Response: Port Resolution 3212 (and reaffirmed in Resolution 3245) contain the Port's commitment to work with the Highline School District to insulate noise affected schools (see

Final Supplemental EIS, Appendix F, Page F-56). While no such agreement has been developed, the Port and the Highline District have initiated discussions concerning the insulation of schools.

19. "Is local residential construction typically 'cold weather' construction." A request was also made to supply more information concerning the character of the homes and questioned why the document referenced a cold climate construction. (8, 21)

Response: The basic type of current construction in the Pacific Northwest is generally considered cold climate construction. This is in contrast to the types of construction found in the southern portions of the country, which contain less insulation and use single pane windows or jalousie windows. As is noted in FSEIS Appendix F, homes in the airport area that are wood frame have been found to provide 10-15 dBA attenuation of noise, without sound insulation. This reference was included in the EIS to provide clarity as to the natural sound attenuation provided by structures in the area. No further data is warranted, as regardless of the types of residential construction, the Port has committed to insulate single family residential structures.

20. "4-6 asks for specific discussion of Miller Creek" and "4-9 Lost-opportunity costs should be discussed." (8)

Response: All appropriate discussions of Miller Creek are provided in the Final EIS (Chapter IV, Sections 10, 11, 12 and 16) and Final Supplemental EIS (Section 5-5). Lost opportunity costs are not relevant to information disclosed in an EIS.

21. Commentor requested a contingency plan "should construction money for the third runway not be available at the hoped-for time." (9)

Response: The resulting impact of a lack of funding would be a Do-Nothing condition, which has been thoroughly evaluated in the Final EIS/Final Supplemental EIS.

22. Commentor questioned if fill hauling will be accomplished by trucks only or truck-trailer combinations. (10)

Response: It is anticipated that both types of equipment will be used.

23. Commentor asked if there is no impact from truck noise if there is a pre-existent aircraft noise. (10)

Response: Based on the logarithmic properties of noise discussed in the Final EIS, the cumulative impact of construction noise added to aircraft noise is not expected to result in a significant adverse impact. These impacts are not expected to be significant because residential areas near the embankment receive significant aircraft operating noise. As a result, the cumulative impact would not result in a significant change in noise.

24. Commentor requested information on aircraft particulate emissions. (11)

Response: Response to comment 6-G in Appendix F of the Final Supplemental EIS addresses the issue of the evaluation of particulate emissions. Final Supplemental EIS Appendix C-2 presents the emissions inventory for PM_{10} emissions. Because PM_{10} concentrations have not been measured to approach or exceed ambient air quality standards in the Airport area, the air agencies (US EPA, PSAPCA, and Department of Ecology) agreed that dispersion modeling for particulates was not warranted. To evaluate construction conditions, a dispersion analysis was conducted, as presented in the Final EIS (Chapter IV, section 23) and the Final Supplemental EIS (Section 5-4).

25. Commentor requested authority for delegation of governor's certificate to Department of Ecology.(12)

Response: On June 30, 1997 Governor Locke issued a new governor's certificate reflecting the State's review of the Final Supplemental EIS. This new letter supersedes the earlier letter signed by the Director of the Department of Ecology.

26. Commentor requested SEL contours.(12)

Response: Final EIS Appendix C contains SEL contours for the five dominant aircraft types at Sea-Tac Airport. In addition, SEL data is presented in grid point tabular form in Appendix C of the Final EIS and Appendix C-3 of the Final Supplemental EIS.

27. Commentor requested use of INM 5.1, preparation of contours for 1996, and authority for response 7-P. (12, 13)

Response: See response to comment 7-P of the Final Supplemental EIS concerning the use of the model. With FAA guidance, Landrum & Brown (the consultant that prepared the EIS noise analysis), prepared the initial response concerning how Version 5.1 would differ from the version used in preparing the EIS contours (Version 4.11), based on their experience with use of both models. This consultant participated in an industry review of the FAA's development of INM Version 5.1.

Several individuals/organizations requested that the existing conditions noise analysis be updated from 1994 to 1996 in the Final Supplemental EIS. However, as is noted in Appendix F of the Final Supplemental EIS, noise impacts are expected to have declined between 1994 and 1996. Further, the existing conditions analysis is provided as a reference to enable greater understanding of future conditions with and without the proposed improvements. As a result, updating the existing conditions would not have altered the concluding future impact evaluation or mitigation.

28. Commentor indicated that modeling data and assumptions were not available for public review. (13, 19)

Response: Appendix C-3 of the Final Supplemental EIS contains a discussion of the modeling data. Copies of the modeling data were provided to everyone who requested the raw data during preparation of the Draft EIS through preparation of the Final Supplemental EIS.

29. Commentor requested seasonal noise contours, statistical correlation between predicted INM contours, and noise measurements from the monitoring stations and comparison of SEL noise as measured and SEL noise as computer modeled. (14,15, 16, 18)

Response: Response to comment 7-P in Appendix F of the Final Supplemental EIS discusses a comparison of the existing noise exposure contours to actual noise measurements. While residents expressed a desire to see seasonal noise exposure contours, they were not prepared. While there is some seasonality to the runway usage conditions (north flow versus south flow), FAA guidance requires the preparation of average annual noise exposure contours. No further analysis is warranted for the EIS process.

30. Commentor requested a cost/benefit analysis of the Third Runway. (16, 44)

Response: See Appendix G to the Record of Decision.

31. Commentor requested method for determining population impacts.(17)

Response: Analysis of the population affected by aircraft noise was prepared based on the 1990 census. Noise contours were electronically overlain on census blocks. The percentage of population affected was then determined based on multiplying the population within the block by the proportion of the block within a noise contour. While a margin of error exists in any form of population and housing impact analysis, the approach used is an accepted industry practice. Any margin of error would apply equally to all alternatives evaluated.

32. Commentor requested ground noise data used in the noise modeling. (17)

Response: The Final Supplemental EIS response to comment 7-Z referred the reader to the ground noise evaluation prepared for the Final EIS (see Volume 2, Appendix C).

33. Commentor requested consideration of an earth berm and contrast to berm at Paine Field. (18)

Response: Earth berms are generally common types of noise mitigation used to address specific noise conditions – noise from ground level noise with the berm placed close to either the noise source or receiver. While an earth berm could be useful in addressing certain conditions at Sea-Tac, it would not alleviate significant adverse noise caused by the proposed improvements at Sea-Tac.

34. Commentor requested noise exposure maps using the FAA's Terminal Area Forecast (TAF). (18)

Response: While the TAF reflects a higher number of total operations in contrast to the Port's new forecast, the FAA determined that the Port's forecast is within an acceptable range of variation. Adding to the reasons that the TAF was not used, is that the information is not produced at a level of detail to enable a detailed evaluation of aircraft noise conditions. For instance, the TAF does not provide aircraft fleet mix information, time of day of operation, or the average daily traffic levels which are necessary to the evaluation.

35. Commentor requested official documentation to corroborate the operational procedure assumptions. (18)

Response: Existing operational conditions were verified through use of FAA radar data, as obtained from the ANOMS system. This data reflects actual implementation of tower orders and departure procedures. As a future tower order has not been prepared, nor is it a normal process to prepare such procedures as part of an EIS, the response contained in the Final Supplemental EIS could not provide such information.

36. Commentor requested actual INM data. (18-19)

Response: Because of the volume of information, and that few people understand the formatting and presentation of INM raw data, it was not included in the Final EIS or Final Supplemental EIS. It has, however, been provided to any individual that has requested the data. As was noted in the response to comments in Appendix F of the Final Supplemental EIS, Appendix C-3 contains a summary of the data input to the model.

37. Commentor questioned the reliability of local use of the INM. (19)

Response: It is unclear what the commentor is requesting when questioning the reliability of the INM. As is shown in response to comment 7-P, actual noise conditions do vary from results of the computerized model. The model has been validated by the FAA to present noise conditions with an accuracy range of +/-3 dBA.

38. Commentor requested modeling of contours on maps with topographic features. (18)

Response: The commentor has asked for additional maps which contrast the noise contours with topographic conditions. Normal FAA noise maps are prepared on street based maps. Inclusion of topographic lines on the street maps would make the maps illegible. As a result, the Final EIS presented the topographic conditions in Chapter IV, section 19 "Earth" and the noise impacts on standard street maps in the Final EIS Chapter IV section 1 and the Final Supplemental EIS, in Section 5-2.

39. Commentor requested review of noise abatement departure corridors, profiles, runway use, and conduct of a Part 161 Study. (20)

Response: The suggestions for consideration of these actions has been received, and in some cases are reflected in the commitments that the Port of Seattle has already made in the PSRC process. Issues of departure corridors, climb profiles, and runway use will be considered in the Part 150 Study that was initiated in 1997. Thus, these actions were not considered as part of the Final EIS/Final Supplemental EIS, as the significant adverse impacts of the project have been identified and alternative mitigation proposed and committed to in the ROD.

40. Commentor requested the conduct of social surveys. (20)

Response: While the conduct of social surveys might provide information of interest to area residents, the information would not alter or affect the conclusions of an EIS process and is beyond the scope of an EIS. As a result, these surveys were not conducted.

41. Commentor requested a financial commitment by the Port of Seattle for noise sensitive facility insulation. (20)

Response: The Port of Seattle has made its commitments to sound insulation in Resolutions 3125 issued in November 1992, Resolution 3212 issued on August 1, 1996 and Resolution 3245 issued on May 27, 1997.

42. Commentor requested explanation of the progress toward compliance with the Expert Panel's recommendation to expand the residential acquisition program.

Response: Expansion of the acquisition program was not included in the recommendations of the PSRC in amending the Metropolitan Transportation Plan. The Final EIS/Final Supplemental EIS examined acquisition needed to construct the preferred alternative and recommended further consideration of the acquisition of residences located in an area defined by the Approach Transition Area, given that the affected jurisdictions and citizens concur. No other acquisition is warranted to address conditions arising from the proposed improvements.

43. Commentor noted that response 2-V moved, but that no notation was provided as to its location.

Response: The reference to comment 2-V in the response to comment 7-AB is a typographical error. In ordering the responses, 2-V was moved to the 7-AH location, and the references (which only occurred in the response to comment 7-AB) should have been changed to note 7-AH.

44. Commentor indicated a belief that a Superior Court Agreement precludes modification to Miller Creek. (23)

Response: This comment appears to be directed at a settlement agreement in the Kludt et al v. King County and Port of Seattle case . As noted in Appendix F of the Final Supplemental

EIS, a substantial amount of change has occurred in the Miller Creek Basin since this settlement. This case related to stormwater runoff and flooding in the vicinity of Miller Creek, among other matters. In the settlement agreement, the Port agreed to undertake certain steps regarding drainage detention. The concerns addressed in the settlement agreement, i.e., stormwater detention, have been considered with regard to the Master Plan Update projects, as documented in the Final EIS and Supplemental EIS. Stormwater detention to address stormwater runoff from the Master Plan Update improvements is included in the Master Plan Update and assessed in the Final EIS/Supplemental EIS. Also concerns with flooding in Miller Creek led to a desire to not increase in-stream flows. As is shown in the Final EIS, the proposed Master Plan Update improvements will not increase in-stream flows (see Final EIS, Chapter IV, Section 10 "Water Quality and Hydrology"). Thus, this agreement does not appear to be an impediment to the proposed improvements.

45. Commentor expressed that there are legal barriers to wetland mitigation out of the basin. (23)

Response: The wetland mitigation will be conducted in accordance with all applicable laws and regulations. See Response to comment 9-N and 9-U in Appendix F of the Final Supplemental EIS.

46. Commentor requested explanation of why the DSEIS did not mention the storm drainage comprehensive plan and requested comparison of it to the Miller Creek Relocation Plan. (23)

Response: The Draft SEIS did not mention the storm drainage comprehensive plan as it had not been completed at the time that the Draft SEIS was printed; a summary of it is included in the Final Supplemental EIS. All of the water resource studies at Sea-Tac have been coordinated to ensure that applicable and appropriate information was used as it became available. No further analysis or comparison of these studies is warranted.

47. Commentor indicated that the Draft SEIS contained no information concerning the impact of the project on the aquifer. (24)

Response: The purpose of the Supplemental EIS was to present all new data that had become available since issuance of the Final EIS in February 1996. As no new data was available concerning aquifer conditions, and the other identified changes would not alter conditions associated with the aquifer, no further analysis was warranted.

48. Commentor requested definition of goals to meet fish habitat preservation. (24)

Response: The requisite level of detail needed for an EIS is provided in the Final Supplemental EIS concerning the mitigation goals.

49. Commentor requested information on: consequence of acquisition, residential displacements, disruption of existing communities, disruption of planned development, changes in community demographics, changes in employment patterns, and impact on schools from changes in demographics. (26)

Response: The Final EIS Volume 1, Chapter IV, Section 6 (as well as other sections in this chapter) adequately discussed the social consequences of the proposed improvements.

50. Commentor suggested that the FSEIS should take into account the final, published version of the Burien Mitigation Study. (26)

Response: Final Supplemental EIS Appendix F, response to comment 4-J reflects the review of the Burien Mitigation Plan. During public meetings, officials from Burien have indicated that the text of this report will not be altered, and that the final report will be a binding together of the draft report and the public and agency comments received. Thus, no further consideration is warranted.

51. Commentor requested a definition of significant adverse impact. (27)

Response: FAA Orders 5050.4A and 1050.1D, and federal regulations, define the thresholds of significant adverse environmental impact. As an example, a significant adverse noise impact is defined as an increase in noise of 1.5 DNL or greater at a noise sensitive use within the 65 DNL noise exposure area.[FAA Order 5050.4A, Paragraph 47e(1)(d)2] Thus, as in the example cited by the commentor, a school would not be adversely affected unless the existing noise exposure above 65 DNL increased by 1.5 DNL or more.

52. Commentor questioned if other Environmental Justice "protected classes" other than non-white populations are affected. (35)

Response: Based on the available information, the other "protected" class is low-income which would not be disproportionately affected. If viewed from a community at large perspective, as suggested by the commentor, the finding would be the same, that the project does not create disproportionate impacts on minority communities.

53. Commentor questioned what effect a 5-year delay in implementing the runway will have on rail serving as a viable alternative to the runway. (35)

Response: Chapter 2 of the Final Supplemental EIS addresses rail as an alternative to the Third Runway. As is shown, the new construction schedule does not alter the conclusions concerning the viability of rail as an alternative.

54. Commentor indicated that the EIS failed to consider possible transportation and demand/management alternatives. (36-39)

Response: In the March 1997 comments, and this submittal, alternatives suggested included rail, telecommunications, demand/system management, technology, and commercial service at alternative airport sites. These alternatives are thoroughly assessed beginning with the Flight Plan Study, the Expert Panel, and the Master Plan Update Final EIS and Final Supplemental EIS. These efforts showed that these alternatives are not reasonable or feasible. No further analysis is warranted.

55. Commentor asked if the earth work/fill movement practicable and if engineers were involved in the planning. (40)

Response: The review of available options to satisfying the need at SeaTac (as opposed to the need at Albuquerque) demonstrates that the development of the Third Runway is reasonable and practical. Engineers were involved in the Master Plan Update, the Preliminary Engineering and the preparation of the Master Plan Update Final EIS and Final Supplemental EIS.

56. Commentor questioned what will happen when the capacity of the third runway is reached in a few years? What are the plans for a fourth runway. (41)

Response: See response to comment 2-Q in Appendix F of the Final Supplemental EIS.

57. Commentor requested a definition of acceptable delay. (43)

Response: The maximum "acceptable" delay for any single component of the National Airspace System – NAS –(such as an individual airport) is extremely subjective and dependent on a number of factors unique to an individual facility. Factors that typically influence "acceptable" delay levels at airports include the relative occurrence of poor weather conditions, passenger expectations, airline cost of delay, and the effect of delays at other airports throughout the NAS. Since operating conditions are unique at each airport, a single level of acceptable delay that applies to all airports can not be established. In addition, the definition of acceptable delay varies by user of each facility. As a result, the Final EIS and the Final Supplemental EIS notes the delay levels used by various sources, and how those levels relate to planning and development considerations.

58. Commentor questioned the derivation of the $1.6 billion entire master plan update improvements cost estimate. (44)

Response: Master Plan Update Technical Report Number 8 contains a detailed listing of the derivation of this cost.

59. Commentor requested additional information concerning cumulative impact projects. (46)

Response: The commentor requested the status of the planning for the projects included in the cumulative impact evaluation. No new details have been produced as of publication of the Final Supplemental EIS to enable further elaboration.

- *On-Airport Hotel* - A SEPA Final EIS was completed for this project in 1995.
- *Des Moines Creek Technology Campus* (DMCTC) with CTI development - during the preparation of this additional environmental analysis, the City of Des Moines and the Port of Seattle discontinued discussions of the DMCTC project. No changes were made in the assumptions associated with development of this site, as it is anticipated that commercial development will occur on the site at some time in the future.

- *City of SeaTac Airport Business Center* - This proposed project is reflected in the City of SeaTac's Comprehensive Plan.
- *Federal Detention Center* - the facility that was completed in 1996.
- *South Aviation Support Area development*- A NEPA/SEPA Final EIS was approved for this project in 1994. The Master Plan Update Do-Nothing alternative assumes that the site known as SASA is developed for maintenance functions as discussed in the 1994 Final EIS for that project. The Master Plan Update Final EIS and the Final Supplemental EIS reflect development of this area to support displaced and/or growth in cargo and maintenance facilities.
- *Roadway projects* included in the Transportation Improvement Plan, such as widening International Boulevard, 28th/24th Avenue South improvements, etc. - numerous projects are included in the Transportation Improvement Plans of jurisdictions in the Airport area and implementation and planning for these projects are in various stages. For instance, a portion of the International Blvd. widening was completed during 1996, and a second phase is underway in 1997. A third phase is anticipated to be undertaken in 1998. Further planning activities and discussions are occurring concerning the 28/24th South improvements.
- *Regional roadway projects*, such as SR 509 Extension and Southern Airport Expressway - a programmatic EIS has been prepared for this project, as referenced in the Final EIS and Final Supplemental EIS.

The planning efforts from these other regional developments were reviewed in preparing the Final EIS and Final Supplemental EIS.

(1)

STIA Ground Water Study

Henry J. Frause
411 S.W. 186th
Normandy Park, WA., 98166-3959

To: Mr. Roger Nye,
State of Washington Department of Ecology,
NorthWest Regional Office
3190 - 160th Ave. S. E.
Bellevue, WA., 98008-5452

To: Mr. Dennis Ossenkop
Federal Aviation Administration
Northwest Mountain Region
1601 Lind Avenue Southwest
S.E. Renton, WA. 98033-4056

CC: Ms. Christine Gregoire Attorney General
High/Licenses Building
P.O. Box 40100
Olympia, WA., 98504-0100

Ref.: (1) National Environment Policy Act (NEPA).
Section 1503.4 (5).
(2) Federal Register Docket No._____

Subject: Response to the Port of Seattle's Ground Water Study, Prepared by the Washington Department of Ecology, Relative to the "Agreed Order # 97TC-N122.

Dear Sirs: (Mr. Nye/ Mr. Ossenkop),

The following comments are submitted in response to the subject "Ground Water Study". Please be aware of the impact that this study has relative to the final Decision of Record. My comments, herewith, do not address the "ground Water Study" per se. They do , however, apply to the total packaging procedure related to the FEIS. The FEIS along with the Final-Rule summary cannot exist in any Supreme Court decisions without a Federal Docket No. to show the full continuity of the FEIS.

The composition of any item, according to mathematics, is the sum total of all its parts. an automobile, for instance; a house; an apple or an orange; a Walla Walla onion... You get the idea? Each one is complete in itself.

The Final EIS controls the engineering procedures that shall be applicable to the 3rd runway of the Port of Seattle's STIA, [Seattle Tacoma International Airport]. The Study, like the other examples noted above, is a total entity.

The equation, therefore, must be followed...in order to receive the State's Certification.

Equation. A = [B + C + D + E + F] (A) is the Final EIS.
It consists of (B) the Draft EIS +
(C) the Final EIS with [Docket No.] +
(D) the Draft Supplemental EIS +
(E) the Final Supplemental EIS with [Docket No.] +
(F) the "Ground Water Study" with [Docket No.].

STIA Ground Water Study

Gentlemen, here are the facts. Both of you took an oath of allegiance that you would perform the duties of protecting the Nation and "We The People" from any invasion of our privacy and/or our Bill of Rights in accordance with the Constitutional statutes of the United States.

- How do you justify the fact that you are now participating in an illegal marriage known as Municipal Corporation? The term "Municipal Corporation" is nothing more than a title of a treatise written by Mr. John Forrest Dillon as a necessary requirement to receive his Doctor of Law degree from the Univ. of Iowa. During his term as a Federal circuit judge In 1872, he and his printer published his book entitled Municipal Corporations.

What has happened in recent years is that the marriage known as Public/Private has been replaced by another marriage known as Municipal Corporation. The State of Washington is deeply involved with this marriage via the Justice System. Take a look at any law suit involving a municipality and you will see that it reads as follows: "....the City of Burien.....a Municipal Corporation". In this grammatical form, the word Municipal is merely an adjective modifying Corporation. It has no legal meaning at all. The antecedent of Municipal Corporation is not "Municipality". A Municipality is not a Municipal! or visa versa.

On the other hand, the State of Washington Legislature authorized the Port of Seattle to be a separately constituted municipal corporation (* one agency) with unlimited authority; followed later by a declaration from the governor that the State no longer could or would interfere with the decisions of a quasi-government operating under Corporational by-laws.

Even as I am writing this letter the illegal marriagaes are prevalent in the subject "Ground Water Study" and other EIS Studies. There's the governmental agency (DOE) married to the Port of Seattle; the Port is married to the (FAA); The Port is married to the (EPA). These agencies are Constitutionally protected as long as they are not controlled by the Port of Seattle. To do otherwise places the Port of Seattle in an authoritive position above that of the President of the United States and thereby categorizes him along with us as "We The Slaves" thus removing him also from his civil rights and his bill of rights.

- I need an authorative rendition of Dillon's Rule. I'm quite sure that it is not an acceptable legal definition. We are not to be subjected to the level of slavery at the expense of Million aire CEO's hiding behind the term Corporations that provide us with an empty bag with the words "Economic Development" silk-screened on it.

When I am satisfied with just what the administrative procedures are that we are being subjected to will I be able to address the "Clean Water Study". I have never yet seen any STUDY brought to a conclusion. Studies seem to be an ongoing thing and each study costs the taxpayers a lot of money; yet, they are not getting anything in return for their assessments.

The last day to turn in comments is June 6th. Therefore, it becomes mandatory that an answer is submitted to me as soon as possible. I remain,

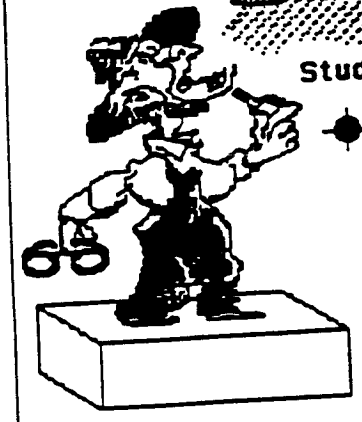
Yours truly,

Henry J. Frause (PH. 242-0950)

May 21, 1997

FOR YOUR INFORMATION

A MESSAGE FROM—— GUESS WHO



Study?.....Humbug!

To: Ms. Christine Gregoire
From: Henry J. Frause

Subject: Port of Seattle's... Ground Water Study

I'd appreciate a response from all addressees, Thank you.

Christine,

The attached letter is the one I sent to Mr. Roger Nye, State of Washington Department of Ecology, Northwest Regional Office, 3190 - 160th Ave. S.E., Bellevue, WA., 98008-0100, in response to a Public Hearing held last night at the Burien Library. I'm sending it to other VIPs as well.

My comments were focused on the packageing procedure. I intend to submit additional comments related to the Study itself, but I am searching for administration procedures that I think need to be addressed before the Port of Seattle establishes any kind of corporational by-law directives that will override the Department of Ecology's findings.

I feel that it is highly improper that the Port holds a heavy hand over the State Agency and presents its own private inputs as a means of reducing its overall costs.

The Port was given authority by the Legislature to operate an airport only. The Port was given no authority to operate and conduct a Scientific Research Laboratory nor to act as a Municipal Corporation under Justice Dillon's Rule.

If the Port intends to apply any of its quasi controls and overrides Constitutional Agencies...it will be demonstrating a degree of contempt that smacks of and smells like a possible conspiracy.

ublic/Private suggests cooperation between 260 million inhabitants and certain Corporations. This identifier was changed to read Municipal Corporation. Dillon also identified it as a marriage, and it also has been called a partnership.

No matter how thin you cut it, it still is bologny; and no amount of marketing can sell bologny mixed with mustard. It won't work. Mixing Governmental Agencies with Private Corporations can lead to Treason. So I need your answer, please. Thank you.

SENDER:
Henry J. Frause
411 - SW. 186th
Normandy Park, WA., 98166

File: A Message...

May 22, 1997

John F. Hayden
Corporate Vice President
Government &
Community Relations

The Boeing Company
P.O. Box 3707 MS 14-49
Seattle WA 98124-2207

May 23, 1997

The Honorable Paige Miller, President
Port of Seattle Commission
P.O. Box 1209
Seattle, WA 98111

Re: Resolution 3245, Seattle Tacoma International Airport
Supplemental Environmental Impact Statement

BOEING

Dear President Miller and Commission Members:

The Boeing Company has reviewed the May, 1997 Seattle Tacoma International Airport Supplemental Environmental Impact Statement (EIS), the most recent study of the Master Plan to increase capacity at the airport. Based upon the comparison of new data to the original Final EIS dated February, 1996, and an EIS addendum by the Puget Sound Regional Council dated May, 1996, we agree with the conclusions of this Supplemental EIS.

Our support for increased capacity at SeaTac continues, and is unchanged from previous study outcomes. Increased numbers in new forecasts have not changed the recommended alternative for accommodating growth. Timing of implementation will obviously change to some degree.

As a major user of this airport for world wide travel to conduct our business we encourage you to adopt the findings in the Supplemental EIS and move ahead with implementation before conditions begin to worsen at SeaTac. Our business, and the region, will be negatively impacted if air traffic delays become excessive.

Thank you for this opportunity to comment on the newest revision to the EIS. Any questions may be directed to me at 655-3640.

Sincerely,

John Hayden

cc: Mr. Dennis Ossenkop

June 16 1997

(3)

Dear Donna,

Why is the FAA and the Port of Seattle still ignoring the questions + comments of the people who are most affected by the Port's operation of Sea-Tac Airport? What do we need to do to make you see that expanding operations at Sea-Tac can only make air + water quality much worse than ever?

We have lived in Des Moines long before the airport ever existed. It should never have built the 2nd runway. Promises made to this community have not been kept. No major metro-area in the U.S. has only one airport + that

[illegible] among thousands & thousands of people.

How can we find out how a wetland can be moved from one area to another? Who made that determination? Will our drinking water be safe from airport produced contaminates?

Sincerely,
Margaret & Glenn Farrell

Glenn E. Farrell
21220 4th Place South
Des Moines, WA 98198-3619

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(4)

June 19, 1997

VIA OVERNIGHT MAIL

Mr. Dennis Ossenkop
Federal Aviation Administration
Northwest Mountain Region
1601 Lind Avenue, S.W.
Renton, Washington 98055-4056

Ms. Barbara Hinkle
Health, Safety and Environmental Management
Port of Seattle
P.O. Box 68727
Seattle, Washington 98168

Re: Comments on the Final Supplemental Environmental Impact Statement for the Proposed Master Plan Update Development Actions at Seattle-Tacoma International Airport

Dear Mr. Ossenkop and Ms. Hinkle:

On behalf of our clients, the cities of Burien, Des Moines, Federal Way, Normandy Park and Tukwila, Washington and the Highline School District, individually and collectively as the Airport Communities Coalition (the "ACC"), we submit these Comments on the Final Supplemental Environmental Impact Statement ("Final SEIS") For The Proposed Master Plan

Update Development Actions at Seattle-Tacoma International Airport ("Sea-Tac" or "Airport").[1] The Final SEIS, which was issued in mid-May 1997, was prepared jointly by the Federal Aviation Administration ("FAA") and the Port of Seattle ("Port").

As you are aware, the ACC submitted extensive comments on the Draft Supplemental Environmental Impact Statement ("Draft SEIS").[2] We do not repeat those detailed comments, but instead call to your attention the fact that the Final SEIS has not corrected the fundamental flaws which were present in the Draft SEIS. Those same flaws continue to pervade and contaminate the analyses in the Final SEIS. The Final SEIS does not, therefore, satisfy the legal requirements of the National Environmental Policy Act ("NEPA"),[3] the Washington State Environmental Policy Act ("SEPA")[4] and other state and federal requirements applicable to this project.

Significant inadequacies which have not been remedied in the Final SEIS include the following:

- The Final SEIS is methodologically flawed, because it contains inaccurate and implausible assumptions about the number of passengers and operations which will use Sea-Tac if the expansion program is implemented, in comparison with the Do-Nothing alternative. These assumptions permeate all of the

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[1] U.S. Dep't of Transp., Fed. Aviation Admin. and Port of Seattle, Final Supplemental Environmental Impact Statement for the Proposed Master Plan Update Development Actions at Seattle-Tacoma International Airport (May 1997).

[2] Airport Communities Coalition, Comments on the Draft Supplemental Environmental Impact Statement for the Proposed Master Plan Update Development Actions at Seattle-Tacoma International Airport ("Draft SEIS Comments") (Mar. 1997).

[3] 42 U.S.C. §§ 4231-4370d.

[4] Chapter 43.21C RCW.

environmental analyses which are critical to the preparation of an adequate environmental impact statement as required by NEPA and SEPA.

- The Final SEIS continues to rely on the data and analyses prepared for the 1996 Final EIS[1] which are out-of-date and largely irrelevant in light of the fact that the FAA and the Port (1) now project that substantially more passengers and operations will use Sea-Tac in the future; (2) have made major, significant changes in the proposed expansion project; and (3) implicitly have changed the avowed purpose and need for the project.

- The Final SEIS does not provide sufficient detail about each of the actions to be undertaken, particularly those actions which will involve the construction of major new terminal facilities, parking garages and roadways; filling and grading activities; and creek relocation projects, among others. Without proper definition of the projects, the impacts to transportation, ground and surface water, air quality and other resources cannot be determined.

- The Final SEIS does not examine reasonable alternatives. For example, the FAA and the Port do not review and reevaluate reasonable alternatives based upon (1) their revised projections of the numbers of passengers and operations which will use the expanded Airport; (2) the change in the sequence of project actions which significantly alters the Preferred Alternative; and (3) the implicit changes in the purpose and need for the project.

- The Final SEIS does not adequately consider reasonable mitigation and summarily dismisses the analyses and conclusions of a year-long state sponsored and funded study of mitigation measures necessary to address the adverse impacts of the expansion of Sea-Tac.

- The Final SEIS fails to describe or analyze properly the significant environmental impacts of the third runway and the other Master Plan Update development actions.

    - The Final SEIS fails to examine the real extent of the destructive effects – on local and regional roads, on schools and on the community – of thousands of daily trips by large truck/trailer dump trucks transporting millions of cubic yards of fill six days a week for at least five years. For example, the Final SEIS suggests that transporting fill dirt over a five-

[1] U.S. Dep't of Transp., Fed. Aviation Admin. and Port of Seattle, Final Environmental Impact Statement for Proposed Master Plan Development Actions at Seattle-Tacoma International Airport (Feb. 1996).

year period will be less intrusive and disruptive than transporting fill dirt for three years. Moreover, the Final SEIS does not provide an accurate calculation of the amount of fill dirt likely to be needed to construct the third runway, and substantially underestimates the number of trucks and truck trips which will be required to transport the fill. By underestimating the number of trucks, and the amount of fill, the Final SEIS fails to disclose the true level of adverse impacts that the project will have on air quality, the local and regional road network and traffic congestion.

◊ The Final SEIS does not contain sufficient detail regarding the actual construction of the proposed new runway, and it fails to analyze impacts from critical aspects of the construction project, such as (1) how more than 26 million cubic yards of fill dirt will be transported, unloaded, placed and compacted to create the massive embankment required for the third runway; (2) how and where fill material would be stockpiled; (3) how material excavated from the construction site or from Port-owned property would be disposed of if it is unsuitable for use as fill; (4) how the fleet of off-road construction equipment (e.g., bulldozers, backhoes, front loaders, graders, scrapers, compactors and water trucks) required for the project would be transported to the construction site or how they would maneuver around the site once construction is underway; or (5) how, and by which routes and vehicles, materials and construction workers will be transported to and from the construction site.

◊ The Final SEIS does not adequately consider the measures that will be required to mitigate the effects of the massive construction project envisioned by the Port, including, but not limited to, appropriate mitigation measures and plans for site rehabilitation of the borrow pit locations.

◊ The Final SEIS understates the extent to which the development actions contained in the Master Plan Update would violate the requirements of the Washington State Growth Management Act ("GMA"),[6] because these actions are inconsistent with the GMA comprehensive plans and development regulations which previously have been adopted by surrounding jurisdictions. Moreover, the Final SEIS does not consider mitigation measures which would be required to achieve consistency with the GMA comprehensive plans and development regulations of the surrounding jurisdictions.

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[6] Chapter 36.70A RCW.

- The analysis of noise impacts in the Final SEIS is faulty, because it continues to rely upon 1994 noise contours to define "existing" noise levels. Based on these out-of-date noise contours, the Final SEIS makes the erroneous statement that the area exposed to noise of DNL 65 dB or greater is expected to decline in the future regardless of new development and increased operations at the Airport.

- The Final SEIS contains an inadequate analysis of air quality impacts and does not provide a reasonable basis upon which the FAA can make a determination of conformity as required by the federal Clean Air Act of 1990.[2] The analysis of air quality is based on erroneous assumptions about the number of passengers and aircraft operations which, in turn, have resulted in the dubious finding that the Airport expansion would reduce emission of a number of major air pollutants (e.g., carbon monoxide, nitrogen oxide, and volatile organic compounds).[1] Expert reports previously submitted to the FAA and the Port concluded that the proposed expansion of Sea-Tac is likely to have significant adverse environmental effects on air quality in the Airport environs and raised serious questions about the validity and credibility of the underlying modeling methodology in the Final SEIS. Moreover, comments submitted to the FAA by the U.S. Environmental Protection Agency, the Washington Department of Ecology and the Puget Sound Air Pollution Control Agency repeatedly have expressed reservations about the FAA's conclusion that the project would result in *de minimis* levels of additional emissions of carbon monoxide and/or oxides of nitrogen.

- The analysis of impacts on surface transportation in the Final SEIS is flawed because (1) it assumes that there will be no significant impact on the surface transportation network attributable to the substantial increase in the number of passengers using an expanded Sea-Tac; (2) it contains an inaccurate analysis of freeway operating conditions; and (3) it is based on the unfounded assumption that a number of improvements will be made to the surface transportation system.

- The Final SEIS inadequately considers the adverse effects of an expanded airport on the housing stock in communities surrounding Sea-Tac, and it disregards the ripple effect of decreased housing values

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[2] 42 U.S.C. § 7506(c).

[1] The ACC is submitting separate comments on the FAA's Final Conformity Analysis and General Conformity Determination.

on the schools.

◊ The Final SEIS ignores the existence of suitable sites for wetlands replacement within the affected drainage basin, and it lacks consideration of the cumulative effects of the additional loss of wetlands in the Miller and Des Moines Creek drainage basin.

◊ The Final SEIS does not adequately consider the water quality impacts, because it dismisses the effects of greatly increased stormwater runoff resulting from the addition of many acres of new paved, impervious surfaces, and it ignores the current fragile condition of Des Moines and Miller Creeks.

- The Final SEIS postpones assessment of the impacts of increased operations to future Master Plans "likely needed soon after the year 2010," and, thus does not adequately evaluate or consider mitigation for impacts of the projects beyond the year 2010.

The issues listed above merely highlight the defects in the Final SEIS. Additional defects are detailed in our comments on the Draft SEIS,[2] which are incorporated herein by reference, and in the administrative appeal filed by the ACC challenging the Port's adoption of the Master Plan Update and the Final SEIS which is attached to these comments as Exhibit A. The following additional documents in support of our comments are also attached hereto as Exhibits B through D, respectively:

Gary W. Evans, Staffan Hygge, and Monika Bullinger, *Chronic Noise and Psychological Stress*, 6 Psychological Science 333 (1995).

Gary W. Evans & Lorraine Maxwell, *Chronic Noise Exposure and Reading Deficits: The Mediating Effects of Language Acquisition*, Environment and Behavior (forthcoming 1997).

[2] Draft SEIS Comments.

Dr. Clifford Winston, *Reply to Comments by the FAA and the Port of Seattle on "Review of the FAA's Revised Aviation Forecasts for Seattle-Tacoma International Airport,"* (June 1997).

Sincerely,

Perry M. Rosen

Perry M. Rosen

COPY

BEFORE THE HEARING EXAMINER OF
THE PORT OF SEATTLE

THE CITY OF DES MOINES, THE CITY OF BURIEN, THE CITY OF FEDERAL WAY, THE CITY OF NORMANDY PARK, THE CITY OF TUKWILA, HIGHLINE SCHOOL DISTRICT NO. 401 and THE AIRPORT COMMUNITIES COALITION, Petitioners v. THE PORT OF SEATTLE, THE COMMISSIONERS OF THE PORT OF Seattle and BARBARA HINKLE, THE RESPONSIBLE SEPA OFFICIAL FOR THE PORT OF SEATTLE, Respondents.	APPEAL OF DECISION ON THE LEGAL ADEQUACY OF THE SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR PROPOSED EXPANSION OF SEATTLE-TACOMA INTERNATIONAL AIRPORT

A. PRELIMINARY STATEMENT

1. The Cities of Des Moines, Burien, Federal Way, Normandy Park and Tukwila, the Highline School District No. 401 and the Airport Communities Coalition (collectively, "Petitioners" or the "Coalition"), hereby appeal the decision of Ms. Barbara Hinkle, the responsible official ("Responsible Official") of the Port of Seattle ("Port") and the Port Commission of the Port of Seattle ("Commission") determining that the Supplemental

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Environmental Impact Statement ("SEIS")[1] prepared by the Port and the Federal Aviation Administration ("FAA") for Proposed Master Plan Update Development Actions (the "Master Plan Update") at Seattle-Tacoma International Airport ("Sea-Tac Airport") is adequate and was prepared in accordance with the Washington State Environmental Policy Act ("SEPA"), Chapter 43.21C RCW. Port Commission Resolution 3245 § 1.

2. Pursuant to Port Commission Resolution No. 3211, Petitioners bring this appeal to challenge the Port's finding that the SEIS is adequate and meets the requirements of SEPA. As explained in Petitioners' extensive comments submitted on the draft Supplemental Environmental Impact Statement for the Master Plan Update and again in this appeal, the Port's environmental review is based on faulty assumptions and contains a number of environmental deficiencies that run contrary to SEPA's requirements. Specifically, the environmental analyses in the SEIS are impermissibly biased and methodologically flawed:

- The SEIS is based on inaccurate and implausible assumptions about the number of passengers and operations which would use Sea-Tac Airport if the expansion program is implemented.
- The SEIS continues to rely on the analyses prepared for the 1996 Final EIS which are out-of-date and largely irrelevant in light of the fact that the Port has made major, significant changes in the proposed expansion project and implicitly has changed the avowed purpose and need for the project.
- The SEIS fails to examine the true extent of the destructive and intrusive effects on the region of thousands of daily trips by large truck/trailer dump trucks transporting millions of cubic yards of fill six days a week for at least five years.
- The SEIS summarily dismisses the analyses and conclusions of a year-long state sponsored and funded study of mitigation necessary to address the adverse impacts of the expansion of Sea-Tac Airport.

[1] The SEIS consists of the Draft and Final SEISs and all Appendices attached thereto.

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These deficiencies have denied the Port Commissioners and the public an accurate evaluation of the seriousness of the negative environmental effects that will result from the Master Plan Update projects, particularly in light of new projections of the significantly increased number of passengers and aircraft operations that will use Sea-Tac Airport. Petitioners will demonstrate that the Port's SEIS failed to examine alternatives adequately or to disclose the adverse impacts that the proposed expansion of Sea-Tac Airport would have on the quality of life in the central Puget Sound region, and particularly on the residents of south King County. Specifically, Petitioners will show that the SEIS did not adequately study and disclose the extent of impacts on air quality, water quality, noise levels, land uses, the roadway network and wetlands that will result from the projected major increase in the number of operations and passengers using Sea-Tac Airport, and further that it failed to examine and recommend mitigation measures sufficient to address these adverse effects.

B. PARTIES

3. The City of Des Moines is an optional municipal code corporation of the State of Washington, organized pursuant to the provisions of state law and located in King County, Washington.

4. The City of Burien is an optional municipal code corporation of the State of Washington, organized pursuant to the provisions of state law and located in King County, Washington.

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5. The City of Federal Way is an optional municipal code corporation of the State of Washington, organized pursuant to the provisions of state law and located in King County, Washington.

6. The City of Normandy Park is a second class municipal corporation of the State of Washington, organized pursuant to the provisions of state law and located in King County, Washington.

7. The City of Tukwila is an optional municipal code corporation of the State of Washington, organized pursuant to the provisions of state law and located in King County, Washington.

8. Highline School District No. 401 ("Highline School District") is a school district in the State of Washington, organized pursuant to state law and RCW 28A.320.010, and located in King County, Washington.

9. The Airport Communities Coalition (the "Coalition") is a voluntary association of local governmental entities created and established by Interlocal Agreement pursuant to the provisions of state law and Chapter 39.34 RCW. The Coalition is composed of the Cities of Des Moines, Burien, Federal Way, Normandy Park and Tukwila and Highline School District No. 401.

10. The Port of Seattle is a port district and municipal corporation of the State of Washington, organized pursuant to state law and Chapter 53.04 RCW, and located in King County, Washington. The Port owns and operates Sea-Tac Airport. Ms. Barbara Hinkle, also a named party, is the Responsible SEPA Official for the Port of Seattle.

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11. The Commission of the Port of Seattle is the executive body of the Port of Seattle, authorized to exercise all delegated powers and decision-making authority of the Port concerning actions involving Sea-Tac Airport.

C. STANDING

12. Petitioners have standing to bring this appeal because their interests are within the zone of interests protected by SEPA, and the approval of a legally inadequate EIS will cause them injury-in-fact.

A. Petitioners' Interests Are Within the Zone of Interests Protected by SEPA.

(1) SEPA recognizes that "each person has a fundamental and inalienable right to a healthful environment . . . ." RCW 43.21C.020(3).

(2) Among SEPA's primary purposes are: "(1) [t]o declare a state policy which will encourage productive and enjoyable harmony between man and his environment; (2) to promote efforts which will prevent or eliminate damage to the environment . . . ." RCW 43.21C.010.

(3) In enacting SEPA, the legislature declared that "it is the continuing policy of the state of Washington, in cooperation with federal and local governments, and other concerned public and private organizations, to use all practicable means and measures . . . to: (a) Foster and promote the general welfare; (b) to create and maintain conditions under which man and nature can exist in productive harmony. . . ." RCW 43.21C.020(1).

(4) SEPA sets forth procedures to ensure that governmental agencies conscientiously and systematically consider environmental values and consequences in their

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decisionmaking processes, and that governing bodies take into account the environmental consequences of an action, consider reasonable alternatives to the action and mitigate the impacts of the action to the extent feasible.

(5) SEPA requires all branches of government -- including municipal and public corporations (e.g., the Port) -- to "[i]nclude in every recommendation . . . significantly affecting the quality of the environment, a detailed statement" of the environmental impacts of the proposed action; adverse environmental effects which cannot be avoided; and alternatives to the proposed action. RCW 43.21C.030(2)(c).

(6) Petitioner cities are municipal governments responsible for advancing the health and welfare of their citizens, for protecting public ways and critical areas within their respective jurisdictions and for providing adequate services and infrastructure within municipal boundaries. See, e.g., RCW 35.22.280, .570; 35A.11.020, .70.010, 36.70A.060(2), (3), .170(1)(d), .172.

(7) Petitioners' interests are within the zone of interests protected by SEPA because their residents are affected by decisions of neighboring jurisdictions and government agencies and districts, particularly decisions of the magnitude of the proposed expansion of Sea-Tac Airport which, if built, will result in significant environmental impacts in the area and the region.

(8) Petitioners are entitled by SEPA to have those neighboring jurisdictions and government agencies, including the Port, provide accurate information about the probable adverse environmental impacts of major actions and how those impacts will affect their cities.

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(9) SEPA also entitles Petitioners to be informed by neighboring agencies such as the Port about all reasonable alternatives to its proposed action, all reasonable mitigation measures and any significant environmental impacts which the Port will not or cannot mitigate.

B. The Port's determination that the SEIS is adequate and meets SEPA requirements will cause Petitioners injury-in-fact.

(1) Because of their proximity to Sea-Tac Airport, Petitioners, their residents, school children, businesses and commercial enterprises are constantly exposed to noise, airborne pollutants and other detrimental aspects of daily operations at Sea-Tac Airport.

(2) The development actions proposed under the Master Plan Update – particularly the construction of a third runway at Sea-Tac Airport – will result in substantial additional impacts on Petitioners, school children, businesses and commercial enterprises.

(3) In addition, Petitioners are injured by an inadequate SEIS because it will result in the Port undertaking development actions without having a complete picture of the true environmental impacts on surrounding communities. Specifically, the environmental impact statement prepared by the Port failed to provide the Port Commissioners with accurate or complete information on the extent to which the expansion, inter alia, will adversely affect the air and water quality in Petitioner cities; will expose the Petitioners' residents, school children, businesses and commercial enterprises to increased noise levels; will subject the surrounding area to increased traffic and congestion; will severely damage the road surfaces on highways, streets and roads within Petitioner cities; will adversely impact the property values and the tax base of the Petitioner cities and school district; and will adversely affect the ability of Petitioner cities to

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provide adequate services and infrastructure, including, but not limited to, properly maintained and functioning roads, responsive police, ambulance and fire services and proper settings for the education of Petitioners' school children.

(4) Failure of the SEIS to provide an adequate analysis of adverse effects will injure Petitioners by preventing them from being informed of, protecting against, or planning for those impacts.

(5) Failure of the SEIS to adequately examine alternatives to the construction of an 8,500-foot third runway at Sea-Tac Airport will injure Petitioners by preventing the Port Commission from adopting an alternative plan which would minimize the adverse environmental impacts on Petitioners and their citizens.

(6) Failure of the SEIS to examine thoroughly, recommend and commit to appropriate levels of mitigation will exacerbate the detrimental effects of the Port's approval of the SEIS.

D. JURISDICTION

14. The Hearing Examiner has jurisdiction over this matter pursuant to Port Resolution 3211 § 1.7 and Port of Seattle Hearing Examiner Rules of Practice and Procedure § 2.03.

E. FACTS

15. Sea-Tac Airport is one of the twenty busiest airports in the United States, in terms of both commercial passenger and cargo operations. Although Sea-Tac Airport is owned and operated by the Port, it is physically located primarily within the municipal boundaries of the City

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of SeaTac and surrounded on all sides by Petitioner cities of Des Moines, Burien, Federal Way, Normandy Park and Tukwila. Sea-Tac Airport also sits within the boundaries of the Highline School District. The City of SeaTac is a separate optional code municipal corporation of the State of Washington, organized pursuant to the provisions of state law and located in King County, Washington.

16. In 1989, the Port and the Puget Sound Council of Governments ("PSCOG") entered into an interagency agreement creating a regional airport planning task force, known as the Puget Sound Air Transportation Committee ("PSATC"). The Port and PSCOG charged PSATC with developing and evaluating alternatives and presenting recommendations for meeting the Puget Sound region's long-term air transportation needs.

17. In January 1992, the PSATC issued a report referred to as the "Flight Plan Study." The Flight Plan Study recommended as a preferred alternative a phased, multiple airport system which would include three primary components: (1) construction of a third dependent runway at Sea-Tac Airport; (2) initiation of scheduled airline service at Paine Field near Everett in Snohomish County before the year 2000; and (3) identification of a site for a supplemental commercial airport in central Pierce County, or alternatively, Thurston County, to be developed no later than the year 2010. The Study also determined that any Sea-Tac Airport alternative, by itself, should not be studied further.

18. In October 1992, the Port and the Puget Sound Regional Council ("PSRC") (successor agency to PSCOG) issued a nonproject (programmatic) Final Environmental Impact Statement for the Flight Plan Project ("Flight Plan EIS") which purported to analyze

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environmental effects which would result from certain airport systems. The Flight Plan EIS did not identify an agency-preferred alternative.

19. In November 1992, the Port Commission passed Resolution 3125, which adopted the PSATC recommendations to add a third runway at Sea-Tac Airport, but which also called for a regional solution to include reconsideration of a fast rail system linking Portland, Oregon and Vancouver, British Columbia airports; the diversion of all cargo-only carriers to an alternative airport; and a multiple airport system. Port Resolution 3125 § 1(a).

20. Resolution 3125 also directed the Port staff to work with the FAA to conduct studies and prepare plans and a site-specific environmental impact statement ("EIS") for a third runway at Sea-Tac Airport. Port Resolution 3125 § 1(b).

21. In 1993, the Port initiated the Master Plan Update to consider expanding the capacity of Sea-Tac Airport.

22. Pursuant to the National Environmental Policy Act ("NEPA") and SEPA, the Port and the FAA initiated preparation of a joint EIS to analyze development actions contemplated by the Master Plan Update.

23. In February 1994, Petitioner cities submitted extensive, detailed comments to the Port and the FAA on the proper scope of the EIS under SEPA and NEPA. Petitioners' representatives also presented oral testimony at a scoping hearing.

24. In April 1995, the Port and the FAA issued a draft EIS for the proposed Master Plan Update development actions, calling for a third runway, an extension of an existing runway and other capacity-enhancing development at Sea-Tac Airport. The avowed purpose and need for a third runway is to "improve the poor weather airfield operating capability in a manner that

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accommodates aircraft activity with an acceptable level of delay." The avowed purpose and need for the extension of the existing second runway is to "provide sufficient runway length to accommodate warm weather operations without restricting passenger load factors or payloads for aircraft types operating to the Pacific Rim."

25. Petitioners -- and almost 400 others -- submitted extensive written comments on the draft EIS.

26. The Port and the FAA issued a Final EIS in February 1996. It identified as the preferred alternative a series of improvements that included, inter alia, the construction of a third parallel runway with a length of up to 8,500 feet (as well as corresponding taxiways and utilities); the extension of an existing runway to 12,500 feet; the development of a new air traffic control tower; the expansion of existing terminal facilities; and the addition of new terminal, parking, cargo, maintenance and support facilities. Petitioners and others submitted comments to the Port and the FAA detailing inadequacies of the Final EIS

27. On August 1, 1996, the Port Commission adopted Resolution 3212 which approved the Master Plan Update -- including the construction of a third runway and other projects expanding Sea-Tac Airport -- and determined that the Final EIS was adequate and met the requirements of SEPA. Port Commission Resolution 3212 § 1.

28. Immediately after (if not before) approving the Master Plan Update and finding that the Final EIS "is adequate and meets the requirements of [SEPA]," the Port and the FAA began to reevaluate the adequacy of the Final EIS in light of higher than expected aircraft operations and passenger enplanement data and forecasts.

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29. After months of study and analysis, the Port and the FAA announced in December 1996 that "both the FAA and the Port have determined that the forecasts of aircraft activity and enplaned passenger used in the . . . draft and final [EISs] . . . did not adequately account for the actual growth which has taken place at Seattle-Tacoma International Airport in the past year nor the potential for faster growth rates than expected in the EIS's [sic]." 61 Fed. Reg. 68,327 (Dec. 27, 1996).

30. In the notice, the Port and the FAA indicated that a Supplemental EIS was needed because (1) "significant new information . . . relevant to environmental concerns" existed; and (2) the Port would make "substantial changes in the proposed action . . . relevant to environmental concerns." Id.

31. As a result of the Supplemental EIS process, the Port substantially changed the proposed development actions by accelerating the construction of landside facilities, such as the terminal and related roadways, by as much as ten years (compared to the proposal adopted by the Port in August 1996), and by markedly increasing the construction time of the third runway and postponing its expected completion date until 2005.

32. The Port and FAA released a draft Supplemental EIS in February 1997. The Petitioners and dozens of other local, state and federal agencies and members of the public submitted comments to the joint lead agencies on or about March 31, 1997. On or about May 13, 1997, the Port and the FAA released the SEIS.

33. On May 27, 1997, the Port enacted Resolution 3245, again purporting to adopt the Airport Master Plan Update for Sea-Tac Airport and to authorize construction of the third

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runway and other airport development actions. The Port also found that the SEIS is "adequate and meets the requirements of [SEPA] . . . ." Port Commission Resolution 3245 § 1.

34. Together, the third runway and other expansion projects would result in an airport that is markedly larger, and as a result, capable of handling and attracting a significant amount of additional aircraft, passenger and surface traffic.

35. The expansion of Sea-Tac Airport would create substantial adverse environmental impacts on the Coalition communities, the City of SeaTac and other communities in the area and the region, including, but not limited to, additional air, noise and water pollution; surface traffic congestion; damage to the region's roadways; deterioration of the socio-economic fabric of long-standing residential neighborhoods; loss and degradation of wetlands; and interference with the instruction of school children within Petitioner cities.

F. BASIS FOR APPEAL

The Responsible Official Erred in Determining that the SEIS is Adequate Under SEPA.

36. Petitioners allege that the SEIS is legally inadequate for the following reasons:

A. The SEIS is methodologically flawed and fatally contaminated with inaccurate and implausible assumptions about the number of passengers and operations which will use Sea-Tac Airport if the expansion program is implemented, in comparison with the Do-Nothing alternative. These assumptions permeate all of the environmental analyses which are critical to the preparation of an adequate environmental impact statement as required by SEPA. RCW 43.21C.030(2)(c)(i)-(v).

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B. The SEIS relies on out-dated and irrelevant analyses prepared for the 1996 Final EIS, notwithstanding the fact that the proposed Sea-Tac Airport expansion project reviewed in the SEIS is substantially different than the project reviewed in the 1996 Final EIS. The project reviewed in the 1996 Final EIS emphasized the immediate need for a third runway. The project reviewed in the SEIS delays construction of the third runway for an additional five years and emphasizes the need for immediate landside improvements, such as a new terminal, parking facilities and interior roadways. The shift in the timing of the proposed development actions implicitly reflects a change in the avowed purpose and need for the project. A different purpose and need requires a *de novo* evaluation of alternatives.

C. The SEIS fails to examine the effects – on local and regional roads, on schools and on the community – of thousands of daily trips by large truck/trailer dump trucks transporting millions of cubic yards of fill dirt for five years. For example, the SEIS suggests that transporting fill dirt over a five-year period will be less intrusive and disruptive than transporting fill dirt for three years. SEIS at 1-10.

D. The SEIS fails to discuss adequately those mitigation measures that might be required. For instance, it summarily dismisses the recommendations of a year-long state sponsored and funded study of mitigation necessary to address the impacts of the airport expansion.

37. Petitioners' also allege that the SEIS is inadequate and does not comply with the requirements of SEPA for the following reasons:

A. Inadequate Description of Construction. SEPA requires a project-level EIS to describe the objective(s), proponent(s) and principal features of the action, the location of

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the action and phases of the proposal and their timing. WAC 197-11-440(5)(c). The SEIS fails to meet this requirement because it does not contain sufficient detail regarding construction of the proposed new runway, and fails to analyze impacts from critical aspects of the construction, such as (1) how more than 26 million cubic yards of fill dirt will be transported, unleaded, placed and compacted to create the massive embankment required for the third runway; (2) how and where fill material would be stockpiled; (3) how material excavated from the construction site or from Port-owned property would be disposed of if it is unsuitable for use as fill; or (4) how the fleet of off-road construction equipment (e.g., bulldozers, backhoes, front loaders, graders, scrapers, compactors and water trucks) required for the project would be transported to the construction site or how they would maneuver around the site once construction is underway.

B. Inadequate Consideration of Construction Impacts. SEPA requires the impacts analysis in an SEIS to "[s]uccinctly describe the principal features of the environment that would be affected, or created, by the alternatives including the proposal under consideration . . . ," and "[d]escribe and discuss significant impacts that will narrow the range or degree of beneficial uses of the environment or pose long term risks to human health or the environment . . . " WAC 197-11-440(6)(c). The SEIS fails to meet this requirement because it provides only a cursory analysis of the potential impacts related to construction of the new runway. Examples of this cursory analysis include, but are not limited to:

(1) The SEIS fails to provide an accurate calculation of the amount of fill dirt that is likely to be needed to construct the third runway. As a result of its unreasonable assumptions and erroneous and incomplete calculations, the SEIS substantially underestimates the number of trucks and truck trips which will be required to transport the fill. By underestimating

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the number of trucks, and the amount of fill, the SEIS fails to disclose or consider the true level of adverse impacts that the project will have on air quality, local and regional road network and traffic congestion.

(2) The SEIS fails to describe adequately or accurately the enormous impacts of extracting, transporting, dumping and compacting between 20 and 30 million cubic yards of dirt over a period of at least five years. For example, the SEIS mentions in summary fashion that on-site borrow source areas 1 through 4 are located in close proximity to Des Moines Creek Park, but it never examines the extent or consequence of the impacts to the park of the development of significant strip mining facilities on adjacent land. SEIS at 5-4-11, 5-4-12.

(3) The SEIS fails to explain fully the potential impacts on surface transportation, roads or intersections of the more than 2,000 daily trips by large truck/trailer dump trucks transporting the fill dirt across and throughout the four-county Puget Sound region for at least five years – instead of three years as projected in the February 1996 Final EIS. Moreover, the SEIS only briefly mentions, but fails to investigate or analyze, the feasibility of alternative fill transport options that could minimize impacts on local communities. The SEIS also does not consider the distinctions between the types of environmental impacts associated with truck transport (e.g., air quality and surface traffic) and those which might be associated with alternative transport methods (e.g., water quality impacts associated with a conveyor belt along Des Moines Creek).

(4) The SEIS proposes measures for mitigating the effects of construction truck traffic on roadways and traffic patterns which may not be possible to implement. For example, the SEIS specifically calls for the construction of two temporary

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interchanges – one from SR 518 near 24th Avenue S. and the other from SR 509 near S. 176th Street – as a purported means of mitigating the effects of airport construction traffic on local roads and traffic patterns. SEIS at 5-4-9, 5-4-10. The Washington State Department of Transportation has cautioned the Port that a temporary interchange off of SR 518 "will create operational problems due to merging and weaving vehicular movements" and that "WSDOT . . . feel[s] that it is extremely doubtful the proposed connection off SR 518 will be approved." Letter from Renée Montgelas, Director, Office of Urban Mobility, Washington Department of Transportation, to Dennis Ossenkop, Environmental Specialist, FAA Northwest Mountain Region, at 4 (Mar. 27, 1997).

C. Inadequate Consideration of Mitigation Measures. SEPA requires that an EIS discuss reasonable measures that would significantly mitigate the identified impacts, indicate what the intended environmental benefits of mitigation measures are for significant impacts and discuss their technical feasibility and economic practicability. WAC 197-11-440(6)(c)(iii), (iv). By summarily dismissing a year-long state sponsored and funded mitigation study, the SEIS fails to adequately consider and evaluate available measures necessary to mitigate the enormous impacts of the airport expansion.

D. Inadequate Consideration of Land Use Impacts. SEPA requires an EIS to describe significant impacts on both the natural environment and the built environment, including significant environmental impacts upon land and shoreline use. WAC 197-11-440(6)(e). SEPA also requires an EIS to summarize existing plans and zoning regulations applicable to the proposal, and how the proposal is consistent and inconsistent with them. The SEIS fails to comply with SEPA because it grossly understates the extent to which the Master Plan Update

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development actions would be inconsistent with the plans and regulations of surrounding jurisdictions, contrary to the requirements of the Washington State Growth Management Act, Chapter 36.70A RCW.

E. Inadequate Consideration of Noise Impacts. SEPA requires that an EIS analyze the significant noise-related impacts of a project. WAC 197-11-440(6)(e), WAC 197-11-444(2)(a)(i). The SEIS fails to meet this requirement because it continues to rely upon 1994 noise contours to define "existing" noise levels, and, based on these out-of-date noise contours, it states that the area exposed to noise of DNL 65 and greater is expected to decline in the future regardless of new development at Sea-Tac Airport. SEIS at 5-3-1.

F. Inadequate Consideration of Air Quality Impacts. SEPA requires that an EIS analyze the significant air quality impacts of a project. WAC 197-11-440(6)(e), WAC 197-11-444(1)(b)(i). The SEIS fails to meet this requirement because its analysis of air quality is based on erroneous assumptions about passenger traffic and aircraft operations which have resulted in the dubious finding that the airport expansion would reduce emissions of a number of major air pollutants (e.g., carbon monoxide, nitrogen oxide and volatile organic chemicals).

(1) Expert reports submitted to the FAA as part of Petitioners' comments on the FAA's draft conformity determination concluded that the proposed expansion of Sea-Tac Airport is likely to have significant adverse environmental effects on air quality in the Sea-Tac Airport environs and raised serious questions about the validity and credibility of the underlying modeling methodology in the SEIS.

(2) Comments submitted to the FAA by the United States Environmental Protection Agency, the Washington Department of Ecology and the Puget Sound

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Air Pollution Control Agency have repeatedly expressed reservations about the FAA's conclusion that the project conforms to the Washington State Implementation Plan – as is required by the federal Clean Air Act – because of errors in the emissions inventory and in the calculations used for modeling.

G. Inadequate Consideration of Impacts on Surface Transportation. SEPA requires that an EIS analyze the significant effects of the project on transportation, including vehicular traffic. WAC 197-11-440(6)(e), WAC 197-11-444(2)(c)(ii). The SEIS fails to meet this requirement, because it contains a flawed analysis of the effects of the project on surface traffic. Examples of such flaws include (A) the assumption that there will be no significant impact on the surface transportation network attributable to the increase in the number of passengers using Sea-Tac Airport, because continued regional population growth will impact the surface transportation system in the vicinity of Sea-Tac Airport regardless of the improvements undertaken at the Airport; SEIS at 5-1-1; (B) inaccurate analysis of freeway operating conditions; Id. app. C at C-32 to C-52; letter from Renée Montgelas to Dennis Ossenkop at 5; and (C) the unfounded assumption that a number of improvements will be made to the surface transportation system. SEIS at 5-1-21, Ex. 5-1-5. According to the Washington State Department of Transportation, there are no commitments from any state or local agency to make such improvements, for example improvements at the SR 518/SR 99 interchange. Letter from Renée Montgelas to Dennis Ossenkop at 4.

H. Inadequate Consideration of Impacts on Schools and Housing. SEPA requires that an EIS analyze the significant effects of the expansion of Sea-Tac Airport on community resources such as housing and schools. WAC 197-11-440(6)(e), WAC 197-11-

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444(2)(b)(ii), (2)(d)(iii). The SEIS fails to meet this requirement because it dismisses the adverse effects of an expanded airport on the housing stock in communities surrounding Sea-Tac Airport and it disregards the ripple effect of decreased housing values on the schools.

I. Inadequate Consideration of Wetlands Mitigation. SEPA requires an EIS to discuss the impacts of a proposed action, and the alternatives thereto, on wetlands. WAC 197-11-440(6)(e), 197-11-444(1)(d)(i). The SEIS fails to meet this requirement because it fails to acknowledge the existence of suitable replacement wetlands within the affected drainage basin, and it lacks consideration of the cumulative effects of the additional wetlands losses in the Miller and Des Moines Creek drainage basin which already has lost a high proportion of wetlands habitat over the past twenty years as a result of development by the Port and others.

J. Inadequate Consideration of Water Quality Impacts. SEPA requires that an EIS analyze the significant effects of the expansion of Sea-Tac Airport on stormwater runoff and the movement, quality and quantity of surface water. WAC 197-11-440(6)(e), WAC 197-11-444(1)(c)(i), (ii). The SEIS fails to meet this requirement because it dismisses the effects of greatly increased stormwater runoff resulting from the addition of many acres of new paved, impervious surfaces, and it ignores the current fragile condition of Des Moines and Miller Creeks.

K. Inadequate Consideration of Alternatives. SEPA requires an EIS to discuss reasonable alternatives to the proposed action that could feasibly attain or approximate a proposal's objectives, but at a lower environmental cost or decreased level of environmental degradation. RCW 43.21C.030, WAC 197-11-440(5). That analysis must be reasonably detailed, and provide a useful comparison of the alternatives. Weyerhaeuser v. Pierce County, 124 Wash. 2d 26, 873 P.2d 498 (1994). The SEIS fails to meet this requirement because it summarily

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concludes that neither the higher demand levels forecast by the Port and FAA nor the major changes in the sequencing of the development actions in the SEIS constitute "new significant information . . . that would alter the finding associated with alternatives," or "alter the conclusions concerning the feasibility of alternative airfield options." SEIS at 3-1, 3-5. The SEIS does not provide a useful comparison of the alternatives to the third runway and their impacts. As examples, (A) the SEIS inappropriately gives no serious consideration to demand and system management alternatives; (B) the SEIS fails to consider adequately alternatives that contemplate shorter runway lengths; (C) the SEIS fails to consider off-airport alternatives, and (D) the SEIS fails to consider use of technology that could reduce poor weather arrival delays. Moreover, the SEIS fails to consider that the major change in the sequence of development actions which will delay the construction of the third runway suggest a range of landside alternatives which might be developed – without a third runway – to meet the needs of the increased numbers of passengers projected to use Sea-Tac Airport. The SEIS also fails to acknowledge that there has been a change in the project's objectives which requires an entirely new evaluation of alternatives.

G. RELIEF REQUESTED

38. Petitioners request that the Hearing Examiner find that the Responsible Official erred in her determination that the SEIS was legally adequate, and to direct the Responsible Official to take the following actions:

A. Declare the Port's SEIS inadequate as a matter of law;

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B. Remand the SEIS to the Port to be revised to include the following additional information: (1) a complete and accurate analysis and discussion of the construction of a third runway and associated impacts; (2) a complete and adequate discussion, comparison and evaluation of alternatives; (3) revised analysis on the air quality – using the FAA's updated Emissions and Dispersion Modeling System ("EDMS"), traffic, noise, wetlands and socio-economic impacts of the Master Plan Update and an evaluation of those impacts; (4) a complete and adequate analysis of all reasonable mitigation measures; and (5) other revisions as appropriate;

C. Require the Port to recirculate a revised SEIS for additional review and public comment;

D. Prohibit the Port from taking any action to implement the Master Plan Update until the additional required environmental review is completed; and

E. Provide such other and further relief that the Hearing Examiner deems just and appropriate.

DATED June 11, 1997.

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Research Article

CHRONIC NOISE AND PSYCHOLOGICAL STRESS

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Abstract—*This article illustrates the value of incorporating psychological principles into the environmental sciences. Psychophysiological, cognitive, motivational, and affective indices of stress were monitored among elementary school children chronically exposed to aircraft noise. We demonstrate for the first time that chronic noise exposure is associated with elevated neuroendocrine and cardiovascular measures, muted cardiovascular reactivity to a task presented under acute noise, deficits in a standardized reading test administered under quiet conditions, poorer long-term memory, and diminished quality of life on a standardized index. Children in high-noise areas also showed evidence of poor persistence on challenging tasks and habituation to auditory distraction on a signal-to-noise task. They reported considerable annoyance with community noise levels, as measured utilizing a calibration procedure that adjusts for individual differences in rating criteria for annoyance judgments.*

Since the early 1970s, psychologists have contributed insights to the analysis of environmental problems (Ittelson, 1976). Current concerns focus on human perceptions of environmental risks (Vaughan, 1993; Wandersman & Hallman, 1993) and the role of the physical environment in human health and well-being (Baum & Fleming, 1993). The concept of psychological stress has proven a useful heuristic to conceptualize human responses to suboptimal environmental conditions (Cohen, Evans, Stokols, & Krantz, 1986; Evans & Cohen, 1987). The present article provides evidence that chronic noise exposure is associated with psychophysiological, cognitive, motivational, and affective indices of psychological stress.

Laboratory studies have shown that acute noise degrades complex task performance (Smith & Jones, 1992) and elevates neuroendocrine and cardiovascular markers of psychological stress (Evans & Cohen, 1987). Chronic noise is associated with elevated cardiovascular functioning among children (Cohen et al., 1986) and is consistently correlated with reading deficits among elementary school children (Evans & Lepore, 1993). Experimental exposure to uncontrollable noise produces learned helplessness (Glass & Singer, 1972; Seligman, 1975), and long-term exposure to community noise may contribute to helplessness among children (Cohen et al., 1986).

The present study extends these earlier findings in several respects. This is the only study to examine neuroendocrine indices of chronic stress among persons exposed to community noise. Without neuroendocrine markers, it is difficult to interpret children's elevated cardiovascular reactions to chronic noise exposure as evidence of stress (Grunberg & Singer, 1990; Krantz & Falconer, 1995). Furthermore, although resting cardiovascular levels are an important indicator of health, cardiovascular reactivity to acute stressors may contribute more to the etiology of coronary heart disease (Krantz & Manuck, 1984).

Several measures of human performance were also assessed in the present study. Speech perception was examined because of its relevance to noise and its potential role in reading acquisition (Mann & Brady, 1988). We also examined two attention tasks, choice reaction time and visual search. There is some evidence of deficits in both working memory (Hamilton, Hockey, & Rejman, 1977) and long-term memory (Hygge, 1993) during acute noise exposure. No research has examined the generalizability of these types of findings to persons chronically exposed to noise.

Many prior studies have uncovered associations between ambient noise levels and reading deficits (Evans & Lepore, 1993). Unfortunately, all of these studies have relied on archival reading achievement scores, thereby confounding chronic and acute noise exposure. We administered a standardized reading test under carefully controlled, quiet conditions.

Children chronically exposed to noise (Cohen et al., 1986) and to crowding (Rodin, 1977) suffer increased vulnerability to learned helplessness. We designed a conceptual replication of these earlier findings, adapting Glass and Singer's (1972) aftereffects paradigm for use with children. Numerous acute stressors reliably decrease persistence on challenging puzzles presented immediately after stressor exposure (Cohen, 1980; Glass & Singer, 1972). This paradigm, to our knowledge, has never been adapted for children or been used to examine chronic stress and motivation.

Although adults living in noise-impacted communities react with annoyance (Evans & Cohen, 1987), very little is known about children's affective responses to noise. We investigated this issue in two ways. First, we examined children's annoyance to a series of standardized auditory stimuli, as well as to community noise sources. This procedure enabled us to examine both raw and calibrated annoyance ratings. Calibration may enhance the sensitivity of annoyance scales given large individual differences in response criteria for assessing annoyance (Berglund & Nordin, 1990). The second way we investigated children's affective reactions to chronic noise exposure was by assessing quality-of-life ratings. Quality of life can be assessed accurately in young children (Bullinger, von Mackensen, & Kirchberger, 1994), indexing perceived physical, psychological, social, and daily functioning.

Summarizing, we employed the concept of psychological stress as a heuristic to conceptualize human responses to suboptimal environmental conditions. Our analyses focused on psychophysiological, cognitive, motivational, and affective processes in relationship to chronic noise exposure among young children.

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METHOD

Subjects

Participants were 135 third and fourth graders (mean age = 10.78 years) living either in a high-noise-impact urban neighborhood (24-hr Leq = 68.1 dBA; peak = 79.8 dBA) surrounding the Munich International Airport or in a quiet urban neighborhood (24-hr Leq = 59.2 dBA; peak = 69.0 dBA) in Munich. An increase of 10 dBA is experienced as approximately twice as loud. Leq is an unweighted average of sound pressure intensity. Children in the quiet, comparison areas were matched to the children in the noise-impacted area according to socioeconomic status. Households did not differ in type of occupation, $\chi^2(4, N = 116) = 4.96$; parental education, $t(122) = 1.58$; or family size, $t(122) = 1.10$. All of the children in this study first passed an audiometric screening to ensure that none had hearing loss.

Dependent Measures

Psychophysiological

Blood pressure was measured with an automated blood pressure monitor (A&D Digital, UA 751) while the child was seated comfortably. Twelve-hour overnight urinary epinephrine and norepinephrine were assayed with high-performance liquid chromatography with electrochemical detection (Riggin & Kissinger, 1977), and cortisol was measured with a radioimmune assay, iodine^{125} (Baxter Travenol Diagnostics, Cambridge, Mass.). Sample volumes were determined, and a small amount of urine was randomly extracted and frozen at −70 °C. Half of the extracted urine was also pH adjusted to further inhibit oxidation of catecholamines. See Grunberg and Singer (1990) and Lundberg (1984) for more details on utilizing urinary neuroendocrine measures as indices of chronic stress.

Cognitive

Cognitive measures included indices of attention, memory, and reading.

Attention. A signal-to-noise measure assessed speech perception against a noise background. Each child listened to a story at his or her preferred volume. This volume level defined continuous background noise (road traffic, aircraft, or broadband) played throughout the story. At fixed, random intervals, the storyteller's voice dropped 10 dBA, and the child readjusted the story volume to a comfortable listening level.

An embedded figures task required the children to search for any one of five target figures contained within complex line drawings.

In a simple choice reaction time task, the children were presented with random sequences of red and green lights and were instructed to press the key labeled "red" or "green" to indicate the color of each light. Two 8-min sequences were run. The first session was conducted in silence and the second one in aircraft noise (80 dBA Leq).

Memory. Each child read an interesting text. Random, intermittent broadband noise bursts (peak dBA = 80) were presented throughout the 12-min period. A day later, the child's long-term recall for the text was assessed.

Working memory span was assessed by presenting consonants at the rate of one per second. At random intervals, the sequence was stopped and the child was requested to recall, in order, as many consonants as possible. Accuracy was defined as correct recall of the consonants in serial position (Hamilton et al., 1977).

Reading. Children read paragraphs as well as word lists on the Bigtmaier (1969) Reading Test (a valid and reliable German standardized test) under quiet conditions. Standardized scoring criteria were applied to each subscale.

Motivation, annoyance, and quality of life

Motivation. After reading the long-term memory text under noisy conditions, the children were given two line-tracing puzzles adapted from Glass and Singer's (1972) aftereffects paradigm. The puzzles consisted of animal names connected together by lines. Children "traveled" to each animal via the connecting lines but without lifting their pencils or retracing any line. They attempted the first puzzle until they solved it or gave up, and then moved on to the second puzzle. The initial puzzle was insoluble, and the index of motivation was the number of attempts to solve this puzzle. The second puzzle was soluble. The order of the two puzzles was deliberately fixed so that each child would experience success following initial failure on the first puzzle. All children solved the second puzzle. The task lasted 10 min. Attributions for failure on the initial puzzle were also assessed. These data are not included here because of space limitations.

Annoyance. The children provided magnitude estimates of noise annoyance (0 = *not at all annoying;* 100 = *the most noise one could withstand without putting one's hands over one's ears*) by moving their fingers along a vertical graphic scale. They were trained how to use this scale by first jumping as far as possible, which was designated as 100. They then jumped distances equivalent to magnitudes of 50, 25, 75, and 10.

Four-s noise bursts were randomly presented over headphones at 42, 54, 66, 78, and 90 dBA Leq. Broadband noise, aircraft noise, and road traffic noise were presented in separate sets. The annoyance rating for each noise burst was indicated on the vertical graphic scale from 0 to 100. The children also indicated how annoyed they were with community noise levels. Both Bandura and Schunk's (1981) original scale development and our own pilot work indicate high reliability for this magnitude estimation procedure with young children.

Nine uncalibrated noise ratings were summed to provide the community noise rating for each child. Calibrated scores were individually adjusted by the slope of the regression line fitting each child's annoyance ratings of the broadband-noise standard stimuli to his or her community noise estimates. For more details on calibration scoring procedures, see Berglund and Nordin (1990).

Quality of life. Quality of life was assessed by the KINDL, a valid and reliable index of the four principal domains of qual-

ity of life (physical, psychological, social, functional daily life; Bullinger et al., 1994).

Procedure

Testing occurred in a climate-controlled, sound-attenuated trailer at the children's school. Forty-eight-hr outdoor noise levels were monitored at the trailer 6 m above ground with a B&K Model 4426 Sound Meter.

Experimental tasks were conducted in fixed order on 2 consecutive days. Children were run individually in booths, with an experimenter sitting across a small table from each child. On Day 1, each child was first taught the magnitude estimation procedure (jumping), as described. Then an initial blood pressure reading was taken, and the child completed a brief mood scale. Then the following tasks occurred: noise annoyance; audiogram; blood pressure; mood scale; signal-to-noise measure; blood pressure; long-term memory text with noise, accompanied by blood pressure readings every 4 min; Glass and Singer aftereffects measure (line-tracing puzzles); and blood pressure. Total testing time for Day 1 was 85 min.

At the end of Day 1, parents were given a urine specimen bottle and instructions for collecting the 12-hr overnight sample. Parents were requested to collect in the container all urine the child voided that same night and the next morning between 20:00 and 8:00. This container was kept refrigerated and contained a preservative.

On Day 2, parents brought back the urine specimen container. Testing began with an initial blood pressure reading, followed by a mood scale and then a brief interview, a blood pressure reading, recall of the prose text from the day before, the standardized German reading test, a blood pressure reading, the embedded figures task, the test of working memory, another blood pressure reading, and finally the reaction time task, accompanied by blood pressure readings every 4 min. The child was then given a gift and provided the opportunity to ask questions about the study. Total time for Day 2 was 87 min.

The KINDL was administered at home prior to the laboratory testing.

RESULTS

Psychophysiological

Neuroendocrine

Overnight resting levels of urinary catecholamines were significantly different between the children chronically exposed to aircraft noise and those unexposed: $t(120) = 2.89$, $p < .025$, for epinephrine and $t(120) = 3.43$, $p < .001$, for norepinephrine. (All statistical tests are two-tailed unless otherwise indicated.) As shown in Table 1, resting, baseline adrenomedullary neuroendocrine levels were elevated in association with chronic exposure to high levels of community noise. There was, however, no significant relationship between chronic exposure to aircraft noise and cortisol levels, $t(120) < 1.0$.

Baseline cardiovascular

There was a marginally significant relationship between noise exposure and baseline systolic blood pressure, $F(1, 109) = 3.03$, $p < .08$. (Degrees of freedom vary throughout because of missing data and in the case of blood pressure readings, because some readings were clearly incorrect.) Baseline diastolic blood pressure was unrelated to noise exposure, $F(1, 109) < 1.0$. Baseline measures were calculated by taking the average of three resting indices from Day 1 and three resting measures from Day 2. On each day, an initial resting blood pressure reading was taken to help desensitize children to the procedure. This initial reading is not included in the results reported here. The blood pressure analyses include a covariate (ponderosity) for body fat.

Cardiovascular reactivity

There was significantly lower reactivity in systolic blood pressure among children chronically exposed to aircraft noise in comparison to their quiet-community counterparts, $F(1, 109) = 15.62$, $p < .001$ (see Table 1). Diastolic reactivity was unrelated to chronic noise conditions, $F(1, 109) < 1.0$. Cardiovascular reactivity was calculated by subtracting the resting baseline index from the initial blood pressure reading during the prose reading for the long-term memory task.

Cognitive

Attention

As shown in Table 2, children from noisy communities chose a lower signal-to-noise ratio than did those from quiet communities, $t(103) = 1.78$, $p < .05$ (one-tailed). The type of background noise (road, aircraft, broadband) did not interact with the main effect of community noise level. Noisy children's habituation to auditory distractors generalized across different types of noise. Preferred volume level for the signal (story reading) under quiet conditions was equivalent between the two groups, $t(103) < 1.0$. The two noise groups did not differ in

Table 1. *Psychophysiological measures*

Variable	Quiet communities	Noisy communities
Epinephrine	368.62 ng/hr	526.36 ng/hr
Norepinephrine	766.22 ng/hr	1,108.82 ng/hr
Cortisol	3.62 µg/hr	3.75 µg/hr
Resting diastolic blood pressure	63.56 mm Hg	63.39 mm Hg
Resting systolic blood pressure	100.73 mm Hg	102.65 mm Hg
Reactivity diastolic blood pressure	−0.71 mm Hg	−0.34 mm Hg
Reactivity systolic blood pressure	1.66 mm Hg	−3.31 mm Hg

Table 2. *Cognitive measures*

Variable	Quiet communities	Noisy communities
Signal/noise	10.87 dB	6.81 dB
Embedded figure (number correct: 0–12)	5.60	6.10
Reaction time (quiet conditions)	440.7 ms	450.0 ms
Reaction time (noisy conditions)	438.0 ms	454.0 ms
Long-term recall (number correct: 0–25)	5.76	4.54
Reading (number of errors)		
Text	41.30	50.80
Word recognition	4.57	7.10

performance on the embedded figures task, $t(131) < 1.0$, nor in reaction times either under quiet ($t[108] < 1.0$) or under noisy ($t[108] < 1.0$) testing conditions.

Memory

On the long-term recall task, children from noisy communities performed worse than their counterparts, $t(130) = 2.13$, $p < .05$. There were slight reductions in working memory span among children chronically exposed to noise. Only one of these differences was statistically significant (the fifth serial position from the last item presented).

Reading

As shown in Table 2, children from noisy communities had significantly more errors on the text subscale of the German standardized reading test than children from quiet communities, $t(127) = 2.02$, $p < .05$. On the word list subscale, children from the noisy and quiet areas differed on the most difficult section of the test, $t(125) = 2.10$, $p < .05$. The two groups did not differ on the easy and intermediate portions of the test. Children from the two groups completed equivalent portions of both the prose and the word list tests.

Motivation, Annoyance, and Quality of Life

Motivation

Children from noisy communities persisted less than children from quiet communities on the insoluble puzzle in the aftereffects task, $t(130) = 2.35$, $p < .02$ (see Table 3).

Annoyance

Children living in noisier areas were significantly more annoyed by the noise in their communities, as indexed by calibrated community measures, $t(132) = 2.17$, $p < .05$. The raw, uncalibrated scores showed the same trend.

Quality of life

As can be seen in Table 3, trends on the KINDL index were generally in the expected direction, but only the difference on the psychological subscale proved statistically significant, $t(124) = 2.47$, $p < .01$.

DISCUSSION

This article demonstrates the value of integrating psychological principles into the environmental sciences. Psychophysiological stress processes linked to coronary heart disease; central cognitive processes, including speech perception, memory, and basic reading skills; motivation; and emotional affect are all associated with chronic exposure to noise among children.

Our data reveal a link between chronic exposure to noise in the community and elevated neuroendocrine markers of stress along with marginally increased resting levels of systolic blood pressure. Similar small increments in blood pressure have been noted previously (Cohen et al., 1986), but these are the first to document effects on neuroendocrine markers of chronic noise exposure. We also reveal differential cardiovascular reactivity in response to task demands as a function of chronic environmental stress. Our pattern of psychophysiological stress findings (elevated baseline indices, diminished reactivity to challenge) is potentially quite important to consider in light of theories about stress and disease. Chronic stressor exposure, particularly exposure to stressors unamenable to instrumental control, may deplete coping capacity, rendering the organism less able to mobilize resources when needed to respond to acute challenges (Lepore & Evans, in press). At the same time, chronically elevated baseline indices of neuroendocrine and cardiovascular functioning

Table 3. *Motivation, annoyance, and quality-of-life measures*

Variable	Quiet communities	Noisy communities
Motivation (number of attempts to solve insoluble puzzle)	6.77	5.48
Calibrated annoyance (broadband noise equivalents)	62.49	67.47
Quality of life[a]		
Psychological (11–55)	30.20	27.85
Physical (9–45)	26.88	26.91
Social (9–45)	26.42	26.06
Functional (11–55)	30.04	29.33

[a]The higher the score, the higher the quality of life.

can cause physical damage directly via changes in hemodynamics and arterial tissue structure and indirectly via suppressed immune functioning (Cohen, Kessler, & Gordon, 1995).

Several cognitive processes are associated with community noise levels. Prior studies have shown correlations between ambient noise exposure and reading levels (Evans & Lepore, 1993). We demonstrated this association with a standardized reading test administered under quiet, controlled conditions. All prior studies have utilized archival reading records of tests administered under ambient testing conditions in school and thus have confounded chronic levels of noise exposure with acute levels during the testing periods. An important policy question raised by our data is, once children fall behind in reading skills because of noise exposure, do these deficits persist, or continue to widen, with continued noise exposure? We also do not know whether noise-related reading deficits are reversible should children change their residence or if extensive sound attenuation is installed in buildings where the children spend most of their time (i.e., school, home).

The cognitive data reveal a mixed pattern of results. Long-term memory was worse among the schoolchildren from noisy communities. Asked to recall information from an interesting text they had read the day before, they performed less accurately than children from quiet communities. Similar trends have been shown in laboratory research on acute noise (Hygge, 1993). Chronic noise exposure may diminish working memory span, although the effects appear quite small.

Neither the embedded figures task nor the reaction time task revealed any associations with noise exposure. Both of these results replicate studies of acute noise (Broadbent, 1979; Smith & Jones, 1992).

Children chronically exposed to noise were less sensitive to distracting, background noise during a speech perception task than were children from quiet neighborhoods. The noise-exposed children consistently chose a lower signal-to-noise ratio when readjusting a speaker's voice against noisy background conditions. Moreover, this perceptual adaptation generalized across different noise sources. Broadband noise, road traffic noise, and aircraft noise all revealed the same pattern. Under quiet conditions, preference for volume level of the speaker's voice was the same for children from quiet and noisy neighborhoods. These perceptual adaptation findings are consistent with prior work suggesting that children cope with chronic noise exposure by tuning out auditory stimuli (Cohen et al., 1986).

Overall, the cognitive data add to the growing list of studies indicating selective impairments in cognitive functioning among children reared under poor environmental conditions. In young children, more complex, higher order skills, such as reading, problem solving, and comprehension of difficult materials, appear vulnerable to adverse environmental conditions (Cohen et al., 1986; Evans & Cohen, 1987; Wachs & Gruen, 1982). The perceptual adaptation findings also raise important questions about the long-term consequences of children's coping mechanisms. Children may cope with adverse environmental conditions by developing cognitive strategies (e.g., tuning out ambient noise) that have consequences for language acquisition and speech processing.

We adapted Glass and Singer's (1972) stressor aftereffect paradigm to measure potential motivational impacts of chronic stressor exposure on the children. Children from noisy communities exhibited less persistence in task performance when challenged. These data conceptually replicate earlier findings utilizing a different paradigm to assess motivational deficiencies in children chronically exposed to crowding (Rodin, 1977) and to noise (Cohen et al., 1986). The potential role of adverse physical or psychosocial conditions in early motivational development is an important and largely neglected topic of psychological inquiry.

Children living in noisy communities find the levels of environmental noise where they live annoying. Both raw and calibrated, the magnitude estimations of annoyance indicate this trend. These children also rated the quality of life, particularly psychological, in their communities as poorer than did the children from quiet communities.

Although we demonstrated that the noisy and quiet communities were similar with respect to socioeconomic status, the correlational design of our study precludes causal conclusions. Nonetheless, our preliminary evidence warrants more intensive follow-up, utilizing prospective, longitudinal field studies of chronic environmental stressors and children's health and well-being.

To summarize, our results reflect a general pattern of adverse psychological stress reactions associated with chronic exposure to noise among elementary-school-aged children. The children who were studied showed no apparent auditory damage during standard audiometric examination. Both neuroendocrinological and cardiovascular indices of chronic stress were elevated; long-term memory, speech perception, and standardized reading test scores indicate deficits; and children living proximate to a major airport reported more annoyance and a lower quality of life than did children in quiet communities. These data are sobering when one considers that more than 10 million American schoolchildren are exposed to comparable noise levels and that worldwide population exposure to noise is escalating exponentially with accompanying industrial development (Suter, 1991). Psychological principles have much to offer to the conceptualization and analysis of environmental problems.

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C

Chronic Noise Exposure and Reading Deficits:
The Mediating Effects of Language Acquisition

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Abstract

First and second grade school children chronically exposed to aircraft noise have significant deficits in reading as indexed by a standardized reading test administered under quiet conditions. These findings indicate that the harmful effects of noise are related to chronic exposure rather than interference effects during the testing session itself. We also provide evidence that the adverse correlation of chronic noise with reading is partially attributable to deficits in language acquisition. Children chronically exposed to noise also suffer from impaired speech perception which, in turn, partially mediates the noise exposure-reading deficit link. All of these findings statistically controlled for mother's education. Furthermore, the children in this study were pre-screened for normal hearing by a standard audiometric examination.

Chronic Noise Exposure and Reading Deficits: The Mediating Effects of Language Acquisition

Numerous studies have uncovered associations between ambient noise exposure and reading deficits among elementary aged school children. The primary objective of the present study is to determine whether this relation between noise exposure and reading is caused by deficits in language acquisition. To address this question, two language acquisition processes, speech perception and phoneme comprehension, are examined among elementary school children exposed to aircraft noise. We examine the hypothesis (see Figure 1) that the reason why chronic noise exposure interferes with the development of reading skills is because it disrupts language acquisition. There is abundant psycholinguistic evidence that reading acquisition is strongly language based. Problem readers have delayed language acquisition, and prospective studies have shown that language acquisition is a critical precursor to the development of reading skills (Mann & Brady, 1988; Wagner & Torgesen, 1987).

Insert Figure 1 about here

A secondary objective of this study is to ascertain whether the link between noise exposure and reading deficits is the result of chronic or acute noise exposure. Prior studies of chronic noise exposure and reading have relied upon archival indices of reading achievement. Standardized reading test scores

emanate from testing sessions that have occurred under ambient acoustic conditions. Therefore children from elementary schools located in noisy areas completed these standardized testing batteries under noisy conditions (e.g., while airplanes were flying overhead). Thus we cannot determine whether the positive associations uncovered between ambient noise exposure and reading in prior studies were the result of acute interference during the actual testing sessions, or whether the noise-related deficits in reading resulted from altered cognitive processing strategies due to chronic exposure to noise.

Numerous studies have uncovered associations between noise exposure and reading deficits (see Evans & Lepore, 1994, for a review). These findings include a dose response function between noise exposure and reading deficiences (Green, Pasternack & Shore, 1982) and a noise-reduction intervention in a school that eliminated previously found deficits in reading ability (Bronzaft, 1981; Bronzaft & Mc Carthy, 1975). Household noise has also been correlated with basic cognitive abilities among one year olds (Wachs & Gruen, 1982). Furthermore, the negative impacts of school noise levels on reading acquisition were exacerbated by home noise exposure (Cohen, Evans, Stokols & Krantz, 1986; Lukas, DuPree & Swing,1981) and appeared more severe among children with poorer reading aptitudes (Maser, Sorensen, Kryter, & Lukas 1978).

In the most thorough study of noise and reading to date, Cohen, Glass and Singer (1973) measured reading and auditory

processing among children living on different floors of an apartment building located over a busy highway. The higher the floor level children resided on (i.e., lower noise levels), the better their reading scores. Furthermore, the longer the duration of noise exposure, the wider the gap in reading scores. Children residing in quieter apartments also more accurately discriminated between similar sounding words (e.g., goat - boat) than their noise exposed neighbors. Of particular interest to the present study, Cohen and colleagues investigated whether the noise-related reading deficits could be explained by auditory discrimination ability. After statistically controlling for parental education and income levels, they found that the noise - reading linkage was largely explainable by auditory discrimination. To our knowledge this is the only study to directly test an underlying mechanism for noise-related deficits in reading abilities. Cohen and his colleagues reasoned that children chronically exposed to loud noise would cope with the interfering and annoying impacts of noise by learning to tune out auditory stimuli. Although this coping strategy is adaptive on the one hand, it could become maladaptive if overlearned. What if children learned to not only tune or filter out unwanted sounds such as transportation noise but also developed a more generalized strategy of ignorring auditory stimuli, including important information such as speech? Consistent with Cohen et al.'s (1973) test of the tuning out hypothesis, Cohen et al. (1986) found that noise-exposed children relative to their quiet

area counterparts had more difficulty determining the optimum signal to noise ratio in a listening task in which a story was embedded in white noise. Evans, Hygge and Bullinger (1995) also found that noise-exposed children were less accurate in adjusting background, broad band noise to maximize clarity when listening to a story. Although these findings all point toward the potential role of auditory discrimination in accounting for the noise-reading linkage, only Cohen et al (1973) directly tested this relation. However, the two studies by Cohen and colleagues confounded chronic and acute noise exposure in assessing reading performance, since archival indices of standardized reading test batteries were employed as the reading ability index.

The psycholinguisitic literature indicates that auditory discrimination is a relatively minor component of learning to read. Much more important is speech perception (Brady, Shankweiler & Mann, 1983) generally, and phoneme recognition specifically (Mann & Brady, 1988; Wagner & Torgesen, 1987). Brady and colleagues (1983), for example, showed that the recognition of speech significantly discriminated between good and poor, third grade readers. Children listened to words that had been masked with digitally matched signals. Good readers were significantly better at this task than were poor readers. Words presented without a mask did not discriminate between good and poor readers. Of particular interest to the present study, sound perception did not discriminate between good and poor readers. In the sound perception task, the same sample of children

listened to sounds that had been masked. Instead of words, however, the auditory stimuli were common environmental sounds (e.g., door closing, dog barking). Performance on this task was unrelated to the child' reading status. These results are important because they specifically point toward the processing of speech as opposed to more general, auditory information processing as the key element in the reading acquistion process.

Additional psycholinguistic work has focused on specific elements of speech, critical to the acquisition of early reading skills. A particularly promising area of inquiry has been phoneme processing. Phonemes are the basic unit of spoken language, represented by consonant and vowel-sized segments. Words are composed of sequences of phonemes that must be recognized in order to understand language. The word 'cat' consists of three phonemes that must be processed in order to recognize this word. Phonological recognition performance predicts subsequent reading ability; phonological training enhances reading acquisition; and reading performance is partially mediated by phoneme recognition (Mann & Brady, 1988; Wagner & Torgesen, 1987).

In the present study, we incorporated two language acquistion processing paradigms from the psycholinguistic literature that have been shown to be robust in accounting for reading acquisition. Children from noisy and quiet schools were asssessed on a phoneme recognition task and on a speech processing task, along with a sound processing, control

condition. We also incorporated the methodological strategy of assessing children's reading skills with a standardized test under carefully controlled, quiet conditions. Given the importance of knowing whether chronic or acute noise exposure is responsible for the well established positive association between ambient noise exposure and reading ability, this methodological issue is important.

We hypothesized that chronic noise exposure would be positively correlated with reading deficits and that this association would, in turn, largely be accounted for by underlying deficiencies in language acquisition (see Figure 1). We also predicted, consistent with the psycholinguistic literature, that the expected adverse impacts of chronic noise exposure on reading skills would be specific to speech and not accounted for by general auditory processing. Speech and phoneme perception, respectively, and not sound perception would be significantly correlated with chronic noise exposure.

Method

Subjects

One hundred and sixteen first and second graders (53% female) from two elementary schools participated in the study. The median household income of the sample was $30,000. Mother's educational level ranged from grade school to some graduate work with the average being high school completion. Father's education level was not included in the analyses because of insufficient data. Preliminary analyses substituting mean father education

levels for missing values did not alter any of the conclusions herein. Department of Labor standard occupational codes (single digit) were utilized to classify mother and father's occupation. Chi square analyses revealed no differences in the proportion of mothers who were professional, clerical/sales, service workers, transportation workers or unemployed X^2 (4, n=74) =6.99. Father's occupation was not included because of insufficient data. Both schools are predominandly Black (82% noise school; 97% control school). Only children whose first language was English were included in the sample. The average years in residence did not differ between the noise ($\bar{x}$=6.28 years) and control schools ($\bar{x}$=7.47), t (112) < 1.0.

Procedures

An elementary school within the 65 Leq flight contour of a major New York Metropolitan airport was selected as the target school. Leq represents the average sound pressure level measured in one second intervals over a specified time period (24 hours in this case).[1] An Leq of 65 means that the average level of sound intensity for this geographic area over a typical 24 hour period was 65 decibels (A scale). Leq is a widely utilized metric for assessing chronic noise exposure in the ambient environment. Peak dBA during frequent overhead flights exceeded 90 decibels. The number of overflights during school hours averaged one flight per 6.6 minutes. A control school located in a quiet neighborhood was selected with the assistance of the New York City Board of Education. All of the children attending the noisy school in our

sample also resided in the 65 Leq or louder contours. None of the children attending the quiet school lived within a 65 Leq or louder noise contour.

The control school was closely matched to the noise exposed school on percentage of children receiving subsidized school lunches, ethnicity, and the percentage of pupils with English as a second language.

All participants were initially screened by a certified audiologist to ensure normal auditory thresholds. All testing occured under quiet conditions. Each child was tested individually while wearing Telephonic TDH-39P headphones fitted with Audiocups. This configuration achieves substantial sound attenuation exeeding 20 decibels. A normal speaking voice at typical conversation distance is barely discernable when the headphones and audiocups are worn.

All children were tested in one, 20 minute testing session. They were tested individually by a female college student in their school. Children wore the headphones and Audiocups throughout the testing procedure. Following participation each child was given a small gift and praised for her/his performance.

Dependent measures. Reading skills were assessed with two subscales of the Woodcock Reading Mastery Test (1987). Word Identification requires the child to identify isolated words. As the child moves through the test, the words become less and less common. Examples of early words include: cat, stop, come; with the next group including play, sun, blue, and the most difficult

set including words like: heterogeneous, cygnet, expostulate. For an answer to be scored correct, the child must produce a natural reading of the word within five seconds. The level acquired is determined until six consecutive items are failed. Word Attack requires children to read nonsense words. This test measures ability to apply phonetic strategies to realistic, yet unknown letter combinations. Letter combinations advance from simple consonant-vowel combinations (e.g., dee ift poe) to eventual, multisyllabic nonsense words (e.g., cigbet, bafmotbem, quiles). The test continues until the child misses six nonsense words in a row. The test administrator was trained on an audiotape supplied with the Woodcock test.

Each of the Woodcock reading subscales has undergone extensive psychometric development and has American normative data available. Children's raw scores were transformed to standardized scores based on Woodcock grade norms. Reading ability was operationalized as the sum of the two standardized scores. These two particular subscales were chosen because they are valid indicators of reading ability (Woodcock, 1987) and because of their use in psycholinguistic research to distinguish between good and poor readers (Brady et al., 1983).

Language acquisition processes were assessed by two paradigms. Speech perception was measured by exposing children to 12, high frequency words (Carroll, Davies, & Richman, 1971), half of the words began with stop consonants (e.g., /b/) and half with frictives or affricates (e.g., /s/). The words were recorded by

a phonetically trained male speaker. The words were then noise-masked by multiplying the digitized waveform of the stimulus by the digitized waveform of another, randomly chosen word. This technique preserves the time varying amplitude of the speech signal. Each digitized word and its amplitude matched mask were added linearly to yield a 0 dB signal to noise ratio (Schroeder, 1968). The masked words were presented at a comfortable, listening volume. Each word was experienced as the correct sound embedded in thick static. Each response was scored as correct or incorrect. These masked speech stimuli were part of a larger testing battery used by Brady and colleagues (1983) in their study of language processing and reading. Brady and colleagues found the most discrimination between good and poor readers utilizing the high frequency, noise-masked speech perception stimuli.

Each participant was instructed to repeat the word he/she heard. Children were instructed to guess if unsure. The test sequence was preceded by two practice trials in which feedback was given. During the test no feedback was given. The twelve test words were child, sleep, breath, knife, speech, road, crowd, scale, front, chance, plant, and clouds.

In order to determine whether ambient noise exposure produces problems specific to speech or more general auditory processes, a control condition consisting of noise masked sounds was also included (Brady et al., 1983). Twelve familiar environmental sounds were recorded, digitized, and then masked.

Because the sound characteristics of nonspeech differed in significant ways from speech, a broad band mask (0 - 10kHz) was utilized. The 0 dB signal to noise mask employed for speech did not sufficiently mask the stimulus whereas a -2 dB, signal to noise ratio did. See Brady et al. (1983) for more details. The sounds presented were a piano, clock chime, door shutting, artillary guns, cat meowing, orchestra, train whistle, dog barking, whistle, drums, baby crying, and wedding music.

Sound perception was scored as in Brady et al. (1983) with 0 assigned if the response bore no relation to the stimulus; 1 if the response reflected the nature of the sound although wrong in detail (e.g. coughing for talking); 2 if the response was accurate but nonspecific (e.g., "music" for an organ playing the wedding march), and 3 was assigned when the correct response was given.

Finally, an embedded phoneme test (Fowler, 1990) was given to each participant. The child was presented with an initial target word (e.g. "fan") and asked to choose one of three words following that had the same initial sound located some place in the word (e.g., "camera", "dinosaur", "butterfly"). Pictures accomplanied the target and comparison words to ensure that phoneme perception and not short term memory was involved in the task. The ten target words were wig, chair, van, up, run, game, ice, tie, leg, and juice. Feedback was given on a practice trial, and then the test items were presented without feedback. Each response was scored as correct or incorrect.

Results

Analytic Strategy

Our analytic strategy was designed to address two principal questions: (i). Is there a relationship between chronic noise exposure and reading skills among young children? (ii). Assuming an affirmative answer, can we explain why/how noise impacts reading? Specifically, we hypothesized that noise interferes with language acquisition which, in turn, will account for the expected negative association between noise exposure and reading ability (Figure 1). In order to examine the relations among ambient noise exposure and reading, and language acquisition, respectively, several steps are necessary. First, the zero order correlations are depicted among the relevant variables along with potential statistical controls (e.g., parental education). In order to evaluate the main and intervening effects of noise on reading and language acquisition, respectively, a series of regression equations are calculated (Baron & Kenny, 1986; Evans & Lepore, in press). The initial analysis regresses reading scores onto the control variable(s). This test is the same as a correlation coefficient or a t test, since noise/quiet is dummy coded as 0 or 1. In the second equation, reading scores are regressed onto noise, controlling for potentially confounding background factors such as mother's education. In the third equation, we investigate the potential mediational status of language acquisition. Equation 2 is replicated, except a hypothetical mediator is forced into the equation prior to noise.

The mediating role of language acquisition would be shown by the previously significant association between noise and reading (Equation 2), becoming either nonsignificant (full mediation) or significantly smaller (partial mediation) in Equation 3.

Simple Correlations and Descriptives

Inspection of Table 1 reveals several important facts. First, the principal hypothesis of this study is supported. Chronic noise exposure is significantly correlated with reading scores ($r=-.58$, $p<.001$). Second, speech perception meets two necessary prerequisites to function as a mediator of the chronic noise - reading linkage. Chronic noise exposure is correlated to speech perception ($r=-.33$, $p < .001$), and speech perception and reading ability are also correlated ($r=.27$, $p < .01$). Table 1 also indicates that sound perception, which was a control measure to show that the noise effects are specific to speech and not to general auditory functioning, operated as expected. Sound perception is not correlated to noise levels ($r=.11$, n.s.) or to reading ability ($r=.15$, n.s.). Unexpectedly, the embedded phoneme task is unrelated to either noise levels or to reading scores. Therefore the embedded phoneme test cannot be operating as a mediator of the noise-reading linkage.

Insert Table 1 about here

Data shown in Table 1 also indicate the need to statistically control for mother's education in the inferential

analyses below. Note the mother's educational levels are correlated both with noise exposure and with reading ability. It should also be noted that income is not correlated to noise exposure or to reading. The former was expected since the quiet community was selected to match the noise-exposed community on income levels. Our matching procedure was apparently successful.

The means and standard deviations for reading, speech perception, sound perception, and embedded phonemes are shown in Table 2. Consistent with the zero-order correlations, higher noise levels are associated with poorer reading and speech perception but are unrelated to sound perception or embedded phoneme performance.

Insert Table 2 about here

Mediational Analyses

Table 3 depicts the results of three regression equations. Line 2 in Table 3 shows that the linear association between noise exposure and reading found in Table 1, is not attributable to the confounding factor of mother's education. Noise remains as a significant predictor of reading scores after statistically controlling for mother's education. This is shown in Line 2 of Table 3 by the F test for delta R squared for noise. Noise significantly increases the amount of variance explained in reading ability over and above that explained by mother's education. Noise levels are a significant predictor of reading

ability in elementary school children, independently of mother's educational levels.

Insert Table 3 about here

Line 3 in Table 3 indicates that speech perception functions as a partial mediator of the noise-reading effects. Some of the covariance between noise exposure and reading, after controlling for mother's education, can be accounted for by speech perception. To put it differently, noise exposure affects speech perception which, in turn, affects reading ability (see Figure 1).

Evidence for partial mediation is based upon a comparison of the raw beta weight for noise in Line 2 to the raw beta weight for noise in Line 3, of Table 3. The reduction in the magnitude of the raw beta weight (39.44 - 24.44) is greater than one standard deviation of the original, raw beta weight. Partial mediation is calculated by taking 1.65 times the standard error of the zero order beta weight (1.65 X 5.79). This total is exceeded by the shrinkage in the beta weight for noise when speech perception is forced into the regression equation prior to the noise term. Noise when residualized for speech perception predicts significantly less variance in reading in comparison to when noise alone is utilized as the predictor. As expected, speech perception is significantly related to reading scores, $b=4.86$, $p < .01$, after controlling for mother's education. For

further reading about partial mediation see (Evans & Lepore, in press; Waldron & Lye, 1990).

Noise remains, however, as a significant contributor to reading even after partially out speech perception. Total mediation would have been indicated by noise no longer having any significant, independent effect on reading. Clearly this is not the case as the delta R square for noise in Line 3 of Table 3 remains significant, even after partialling out speech perception. Language processing in the form of speech perception significantly contributes to the impairment of reading skills among children chronically exposed to noise. Nonetheless, other factors in the link between chronic noise exposure and reading impariments remain unspecified.

Discussion

Children chronically exposed to aircraft noise have poorer reading skills than children attending elementary school in a quiet neighborhood. This finding replicates several previous studies showing an association between chronic noise exposure and reading acquisition (Evans & Lepore, 1994). The present study makes two additional contributions to the literature on noise and reading. First because children were given a standardized reading test under carefully controlled, quiet conditions, we have shown that the association between noise exposure levels and reading is due to chronic exposure and not acute interference by noise during the actual testing session. Only one prior study of noise and reading has also included this important methodological

control (Evans et al., 1995). Chronic noise exposure is linked to reading deficits among children. This association has been demonstrated in two different studies, utilizing two different reading test batteries. Evans et al. (1995) study was conducted in Germany and utilized a different reading evaulation instrument.

The second important contribution of the present study is our investigation of language acquisition as an underlying, intervening mechanism to account for the noise - reading deficit link (see Figure 1). We find partial support for our hypothesis. Ambient noise exposure is associated with impairments in speech perception which, in turn, are correlated with reading development. As shown in Tables 1 and 3, speech perception functions as a mediator of the relation between noise exposure and reading development. Results from the control protocol of sound perception also indicate that this intervening effect of speech perception is language based. Speech and not sound perception mediates the relation between ambient noise exposure and reading acquisition among young children.

This intervening process, however, only reflects partial mediation. Speech perception does explain a significant amount of the covariation between noise exposure and reading deficits, but a significant amount of that covariation remains unaccounted for (see Table 3). In other words, speech perception explains some but not all of the relation between noise exposure and reading development in early readers.

We chose to examine speech perception as a mediator of the relation between noise and reading for two reasons. First, prior research and theorizing had suggested that perhaps the reason why noise exposure is harmful to reading acquisition is because noise-exposed children, in their efforts to cope with ambient noise, learn to indiscriminantly tune out auditory signals, including speech (Cohen et al., 1973). Second, psycholinguistic research had indicated the critical importance of speech perception in reading acquisition (Brady et al., 1983). Our findings that speech but not sound perception help account for the noise-reading link are consistent with the psycholinguistic research. Our results also raise questions about the overgeneralization or tuning out hypothesis (Cohen et al., 1973). Children chronically exposed to noise do appear to have altered auditory processing, but the effects seem specific to language based stimuli, not auditory stimuli in general. As shown in Tables 1 and 2, there is no association between noise exposure and sound perception. Recall also that good and poor readers do not differ in general, auditory processing skills--speech but not sound processing discriminates between good and poor readers (Brady et al., 1983; Mann & Brady, 1988).

The finding of partial mediation also raises the question of what other underlying factors might intervene between ambient noise exposure and reading. In addition to showing that auditory perception in general is not a major intervening factor, our data suggest that phoneme recognition is unaffected by chronic noise

exposure and therefore does not function as an underlying mechanism that could account for the association of chronic noise exposure with reading deficits. We are not confident about this latter conclusion, however, since phoneme recognition was also unrelated to reading (see Table 2). This finding contradicts several previous studies linking phoneme recognition with reading (Mann & Brady, 1988; Wagner & Torgesen, 1987). We utilized a subset of an embedded phoneme test developed by Fowler (1990) that significantly discriminated between good and poor readers. Conceiveably our shorter test was less sensitive than the original, although our scale had good internal consistency (α=.78), indicating adequate reliability of measurement. In any case, we think it prudent to keep the question open whether phoneme recognition is a significant intervening process that might also explain the noise-reading deficit relation.

Another important limitation in this field study is the lack of random assignment of children to schools which precludes complete confidence in attributing the differences uncoverd to noise alone. The possibility always remains with a static, correlational design that some other variable(s) are behind the apparent noise-reading relationship shown. Although the most plausible self-selection alternatives (income, education) have been eliminated, our results need to be replicated in a prospective, longitudinal design.

Although our focus and other theoretical explanations of noise and reading have emphasized cognitive processes, we believe

interpersonal, social processes should also be considered. For example, several studies have documented that in noisy schools actual teaching time is disrupted (Bronzaft & Mc Carthy, 1975; Crook & Langdon, 1974). Moreover, teachers in noise-exposed classrooms report considerable annoyance and cumulative fatigue from their efforts to instruct under the difficult, interefering conditions created by ambient noise. One could also imagine that parents residing in noisy neighborhoods might be less apt to read aloud to their children, and perhaps the frequency and/or duration of oral communications are curtailed. Thus the behaviors of primary caregivers might shift in reaction to chronic noise exposure. Noise is also a documented irritant, straining interpersonal relationships and on occasion elevating overt hostility and aggressive behaviors (Cohen & Spacapan, 1984). Any one of these social psychological adjustments to ambient noise conditions, let alone in combination, could have unintended but adverse consequence on children's development. Thus in considering how suboptimal, physical environmental conditions adversely impact development, we need to also consider more complex pathways that might include alterations in the micro environmental systems of children (Bronfenbrenner, 1979).

Although the primary health concern with chronic noise exposure is hearing damage, a growing body of literature, highlights an array of nonauditory effects of chronic noise exposure, especially among children. Psychophysiological changes indicative of chronic stress, elevated annoyance and irritation,

motivational deficits related to learned helplessness, and alterations in cognitive development and reading achievement, have now all been well documented (Cohen et al., 1986; Evans & Lepore, 1994; Evans et al., 1995). It is important to recognize that these advances in knowledge of the probable effects of chronic noise exposure on children have been accompanied by exponential increases in worldwide, ambient noise levels that are an unfortunate byproduct of economic development, particularly prevalent among economically underdeveloped countries (Suter, 1991). This research area is now at a stage where more rigorous, prospective longitudinal studies are necessary, along with more analyses of underlying cognitive and social processes than can account for the adverse effects of chronic noise exposure on human health and development.

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NOISE
LANGUAGE ACQUISITION
READING

Figure Caption.

Figure 1. Schematic representation of the language acquisition mediation hypothesis.

Table 1. Zero order correlation results.

	Noise	Reading	Speech Percep.	Sound Percep.	Embed. Phon.	Mother Educ.	Income
Noise		-.58***	-.33**	.11	-.05	-.37**	-.12
Reading			.27*	.15	.15	.41**	.23
Speech percep.				.14	.07	.12	.18
Sound percep.					-.17	.05	-.14
Embed. phon						.10	.03
Mother educ.							.52***

*p < .05, **p < .01, ***p < .001

Table 2. Means (standard deviations) of dependent measures

	Noise (n=58)	Quiet (n=58)
Reading	191.2 (31.4)	235.1 (30.5)
Speech perception	1.5 (1.6)	2.7 (1.9)
Sound perception	21.1 (3.4)	20.0 (5.3)
Embedded phonemes	5.8 (1.9)	5.9 (1.7)

Table 3. Mediational analyses of noise and speech perception on reading scores.

Variable	ΔR^2	F for ΔR^2	Raw Beta	Standard Error Raw Beta
Mother ed	.07	9.11* (1,115)	6.29	3.58
Noise	.27	46.46** (2,114)	-39.44	5.79
Noise with additional control for speech perception	.22	37.41** (3,113)	-24.44	6.11

*p < .01, ** p < .001

1.Leq=10 $\log_{10}$ 1/n ($\sum_{i=1}^{n} 10^{Li/10}$). Log is base 10. i=1 is the first second, i=n is the last second. L is the sound pressure level of each one second interval during the 24 hour time period.

REPLY TO COMMENTS BY THE FAA AND THE PORT OF SEATTLE ON "REVIEW OF THE FAA's REVISED AVIATION FORECASTS FOR SEATTLE-TACOMA INTERNATIONAL AIRPORT"

Dr. Clifford Winston
June 1997

The FAA and the Port of Seattle have responded to my critique of their report. My critique focused on issues that were empirically refutable and, indeed, I developed my own statistical model to test whether airport demand was influenced by capacity. I found that airport demand was influenced by runway capacity and that the FAA's failure to account for this relationship caused their forecasts of aircraft operations and passenger demand at Sea-Tac with the new third runway to be underestimated. The FAA and the Port have not tried to respond to my work by developing their own statistical model which could be evaluated. Instead, they make empirically unsubstantiated statements to support their work and purport to refute my model based on erroneous technical criticisms.

The FAA and the Port first claim that they have already accounted for the demand that would be stimulated by an additional runway. This is simply not true. Their position continues to be that an additional runway will not stimulate demand. Indeed, they attempt to explain why demand will not be affected by an additional runway. They assert -- without providing empirical evidence -- that passenger demand will not be significantly affected by an increase in travel time. They assert -- without providing empirical evidence -- that competition at Sea-Tac is at its maximum level and would not be increased if additional capacity were available for carriers to increase their operations. They assert -- without providing empirical evidence -- that the correlation between enplanements and operations has broken down since the early 1990s.

These are testable assertions, but the heart of the matter is still whether an additional runway will increase passenger demand and aircraft operations. The FAA and the Port do not offer their own test of this proposition. Instead, they claim that my finding that runway capacity does have a positive effect on operations and passenger demand simply reflects the fact that airports with higher demand build additional runways. However, I anticipated this criticism in my initial report

and pointed out that there is a lag time between runway construction and demand, and, therefore, that the correct direction of causality is that capacity causes demand.

The FAA and the Port conclude their comment with two technically misleading criticisms of my analysis. They first claim that my findings are suspect because I find that average fares have a positive effect on demand and operations, and that this is the incorrect sign (fares should be inversely related to demand and operations). In fact, we do find that fares bear an inverse relationship to demand and operations for our largest and therefore most reliable sample of 150 airports, and find that this effect is statistically significant. The positive relationship we find is for our smaller and thus less reliable samples (50 and 100 airports), and moreover this effect is statistically insignificant -- implying that it is misleading to place an interpretation on the sign of the coefficient. Second, the FAA and the Port claim that the coefficient of variation (R-squared) for our model, which includes the number of runways, is much lower than their original model, which does not include the number of runways. This comparison is statistically improper. Our model is a *cross-section* model of airports. The R-squared we obtain for our cross-section model is quite good. *Time series* models, like the one prepared by the FAA and the Port, obtain notoriously high R-squares simply because one can do a good job of explaining the present by the past (this is not possible to do in a cross-section model). The time series model used by the FAA and the Port, however, is not able to analyze the relationship between runway capacity and demand. We must, therefore, use a cross-section model for this purpose. The R-square for our cross-section model will be increased (by definition) because we have added the number of runways to our specification.

The FAA and the Port have not come to terms with my original statistical analysis by conducting their own analysis or developing technically valid criticisms of my work. Thus, none of the comments that they have made attack the fundamental validity of my analysis or alter any of my original conclusions.

RCAA
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(5)

June 23, 1997

Mr. Dennis Ossenkop
Northwest Mountain Region FAA
1601 Lind Avenue Southwest
Renton, WA 98055-4056

REC'D ANM-610
PLAN; PGM, & CAP BR
JUN 23 1997
ANM-610

By Hand Delivery

Dear Mr. Ossenkop:

Please find attached the original of the replies of the Regional Commission on Airport Affairs (RCAA) to the responses of the Federal Aviation Administration and Port of Seattle to our organization's comments on the draft Supplemental Environmental Impact Statement (SEIS) for the pending Master Plan Update for the Seattle-Tacoma International Airport.

We are advised that these replies may properly be filed with you (despite the statement in the final SEIS that only replies dealing with the air quality conformity analysis were acceptable).

Please continue to send us copies of all the official environmental review documents as they are issued.

Sincerely,

Len Oebser, President
RCAA

Introduction

These are the replies of the Regional Commission on Airport Affairs (RCAA) to the responses of the U.S. Federal Aviation Administration of the U.S. Department of Transportation (FAA) and the Port of Seattle (POS), to the comments of RCAA on the draft Supplemental Environmental Impact Statement (dSEIS) for the Seattle-Tacoma International Airport Master Plan Update (MPU) (which is to say the third runway & related expansion projects). The referenced responses are found in Appendix F, 2 Final Environmental Impact Statement (13 May 1997) (hereafter referred to as fSEIS).

General comments (Part I) will be followed by a listing & brief discussion of RCAA comments that were ignored in Appendix F (Part II), and a discussion of responses that missed the thrust of specific comments, together with comments on particular responses (Part III). These Parts are followed by a Conclusion., in which the significance of the unasnswered and misanswered comments & accompanying responses will be drawn together, under major topic headings.

In briefest summary, our review of the fSEIS & the official responses to our prior comments leads to the conclusion that the fundamental flaws in the dEIS, FEIS, & dSEIS persist in the fSEIS. None of these documents, and not all of them taken together, provide an accurate or reliable survey of the important environmental impacts that can reasonably be expected to occur during construction or during operation. Impacts having been analyzed incompletely, mitigation measures suggested in the FEIS & fSEIS are also insufficient.

A note about abbreviations, terms of art, & citation style: First, we appreciate the extended glossary in the fSEIS, found at 1 fSEIS 6-7; absence of glossaries is a recurring problem in environmental reviews (like absence of indices). We adopt the usages of this fSEIS glossary. Second, we deviate from the abbreviations used in the fSEIS (see 1 fSEIS 6-1 - 6-5), as follows: DEIS means the draft environmental impact statement for the pending Master Plan Update for the Seattle-Tacoma International Airport; dSEIS means the draft supplemental environmental impact

statement for the same project; FEIS means the final environmental impact statement for the Master Plan Update for the Seattle-Tacoma International Airport; fSEIS means the final supplemental environmetal impact statement for the same project; LDN refers to noise metric referred to in the fSEIS as DNL; MPU means the pending Master Plan Update for Seattle-Tacoma International Airport; NEM means noise exposure map; RCAA means the Regional Commission on Airport Affairs. Our citation style to the various EISes is the familiar legal style: volume/name-of-document/page number, followed as need dictates with a more specific reference. Thus "1 fSEIS 6-7" refers to vol. 1 of the Final Supplemental Environmental Impact Statement at p. 6-7.

Part I – General Comments

General comment 1: The comments of the Regional Commission on Airport Affairs were misrepresented in Appendix F, fSEIS, as being only the personal comments of Len Oebser. Authorship should have been attributed to the organization, not to the officer who signed the transmittal letter covering the organizational comments in his representative capacity.

We notice that the same trivializing technique was employed in Appendix F with respect to several other organizational comments, such as those of the Highline School District, the City of SeaTac, the Seattle Community Council Federation (misleadingly represented as being no more than the personal comments of Jorgen Bader, the President of that group), the Airport Communities Coalition (repeatedly), &the North-East District Council.

The public should be aware that the commenters whose comments might seem critical were in more than a few instances responsible & well-established organizations, including governmental bodies. (This is to take nothing away from either the bona fides or hard-won expertise of individual commenters.) It is inappropriate for the FAA & POS to try to make it seem that on the uncritical side of airport expansion are the solid organizations, with nothing but a scatteration of named individuals raising potentially troublesome questions. How petty! How unworthy of the government of the United States of America.

General Comment 2: The organization of the responses to the comments on the dSEIS was much more helpful than the comparable organization in the FEIS. The index of comments, pp. F-4 through F-6, begins to approach the definition of an index., and by specifically referring in each topically-organized response to the commenters that addressed that topic, the author(s) much facilitated the tracking of comment and response, something impossible to do in the FEIS. We appreciate the care taken in this respect, while regretting that requests as far back as the Scoping Comments for true indices were not complied with in earlier documents in this long series. (See our comment 7(D)-6, found at 3 fSEIS G-213.) The appearance in the FEIS of a one-page alphabetized table of section

headings, mislabelled as an index, without inclusion of comments on the dEIS or the FAA/POS responses thereto, referred to Response 1-G, 2 fSEIS F-11, did not satisfy the definition of, or requests for, an index. (One is reminded in this particular of Mr Lincoln's riddle: Mr L. If you call a dog's tail a leg, how many legs does a dog have? A bystander. Five. Mr L. Wrong! A dog has only four legs and calling a tail a leg doesn't make it one. The same principle applies to the non-index in the FEIS.)

General Comment 3: For no stated reason, Appendix F failed to address numerous comments of this organization, which will be discussed in some detail below. Something is amiss when more than a score of comments is simply left unaddressed. It is suggestive that the fSEIS failed to disclose such failures.

General Comment 4: As will appear below, in more than a few instances, the printed responses failed to meet the thrust of the comments. We cannot, of course, say why this happened. It is suggestive that in every instance the failure thus left unaddressed a critical comment.

General Comment 5. It would have been better to have taken more care in presenting comments in proper page order. The opening pages of our comments were presented in Appendix F in this order: 1, 2, 3, 4, 8, 5, 6, 7, 9, 10, 11. Most readers will not have been prepared for so eccentric an ordering & will have found the pagination a significant distraction.

General Comment 6. In our considered judgement, there is something very seriously flawed in the approach taken to documentation in the FFA/POS environmental impact statements.

• The EISes do not present the materials to support he sweeping and conclusory statements that so often are found when the going gets tough (so to speak). The EISes do not contain bibliographies. The authorities deemed controlling are almost never published materials but instead are closely-held documents prepared by paid consultants or Port staff for the specific purpose of justifying this project. The FEIS for the MPU, for example, rests upon a host of technical reports not distributed to the public or to organizations with known interest in the matter. Those technical reports are not included in the FEIS (though in our judgement

they should be), and in at least some instances were not printed up and available until after the EIS document had been issued. We believe that in some instances the technical reports did not become available till after the expiry of the announced comment period.

* As another example of the fast-and-loose use of documents, we point to Response 2-AC, which talks about three different important documents that in truth are integral parts of the environmental-review process but are not generally distributed or available. The existence of one of these documents did not come to our attention until perusal of the cited Response. These documents, all of which should be published in some or another final EIS are: Seattle-Tacoma International Airport Third Dependent Runway Preliminary Engineering Report (POS: 1995), POS financing plan (February 1997), and a POS "Net Present Value evaluation", date not given.

It seems that every time that one gets close to the base line on an issue, a question, there suddenly appears some other, previously-unknown, document that supposedly gives the necessary detail, or which was officially accepted way-back-when (without public involvement) and now constitutes the unchallengeable basis for action, or which now interprets things in a new way.

The release of the actual documents to interested persons, the lodging of these documents in public libraries (the level of performance here is miserably poor), the revelation of their actual existence, all is grudgingly done, all belatedly, all incompletely. The people in charge seem to have forgotten that this is supposed to be a public process. We cannot help but think how difficult all this must be for persons without organizational support, how frustrating this begrudging process must be to responsible public officials who are trying to understand what is to be done to their cities, their schools, their hospitals, and who surely are much inconvenienced by being required to trudge, hat in hand, to Renton to read (but not to be allowed a copy of their own) the semi-secret documents that the EISes rely on. The situation is not improved any by having most of the serious work done by paid (& privily-instructed) consultants, from other jurisdictions, unavailable for private consultation except on a per-fee basis, who produce unreviewed papers, usually without authorship ascribed.

Part II – RCAA Comments Ignored in fSEIS

(A) Failure to address general comments

None of the general comments submitted by RCAA was specifically addressed. They were not submitted idly nor do they address trivial or irrelevant subjects.

* For example, we called attention in the second paragraph of those general comments, once again, to the improper practice of the official third-runway partisans in presenting projections as hard numbers rather than (1) presenting ranges of possible future numbers or (2) expressing probabilities.

* We are particularly distressed & aggrieved at the failure of the respondents to deal with the questions raised in our fourth paragraph of general comments as to commitments by the promoters of this project to mitigation of third-runway impacts. If mitigation measures are not addressed in environmental-review documents, when will they be addressed?

(B) Individual comments ignored

The following individually numbered comments received no response or other mention in the Comments portion of the fSEIS (Appendix F, 2 fSEIS). To assist the reader, the general nature of the individual comments is suggested, by inclusion of the title of the Part of our Comments in which those individual comments appear.

Part 1: Construction Impacts

1-3

1-4

These two comments asked for per-hour and per-day truck-trip date for representative dates.

1-7 We sought a description of noise from the fill-hauling trucks. No response was given, but the subject is discussed at 1 fSEIS 5-4-14, and some mitigation is proposed

1-8
1-9
1-10
1-11
1-12

Comments 1-10 through 1-12 asked for mapping of areas predicted to be impacted by construction noise. No response, no maps.

1-14(a), (b) We asked for clear schedules, including proposed hours of operation, for fill-hauling activity on the various routes under consideration, & suggested that construction not occur at night.

1-15 We suggested that the proposed, soon-to-be adopted US EPA standards for emissions of particulate matter between 2 & 10 microns be taken into account in assessing construction impacts. In response to a similar comment on general air-quality issues , we were told that the FAA & POS do not have to concern themselves with probable future regulations. See Comment 2-1(d) in Part III below.

1-16 We asked for quantification of social-impact data in the fSEIS version of dSEIS section 5-4(F). No response, no quantification.

1-17 We called attention to inadequacies in the proposed program for mitigating construction impacts, and made a suggestion for improvements.

Part 2: Air Quality

2-1(c) We asked about health consequences of pollution from SeaTac aircraft in this and related comments (as did others). This particular subcomment was not referred to specifically in the responses, but was in fact covered. The subject of the responses to our air-quality comments will be discussed in Part III.

Part 3: Noise

3-1(a) We asked for the scientific basis for establishing the 65 LDN metric.

3-1(b) (a repeat of our unaddressed dSEIS comment IV-1-7) We asked again for the scientific literature supporting the 65 LDN as the threshold of noise impacts

3-1(c) Health impacts of noise.

3-1(g) Sought copies of any interlocal agreements setting up funding commitments for noise mitigation. (Seemingly, there are no binding noise-mitigation commitments from the Port to any local governmental body)

3-9 This comment was in fact not answered, but it is referred to in Response 7-P& will addressed further in Part III, below.

3-22 Noise exposure maps should be provided that show noise from other airports, and the respective LDNs should be combined

3-28 We asked for inclusion of a copy of the POS agreement with Highline School District, re school-insulation, to carry out recommendation of Expert Arbitration Panel & 'requirement' of PSRC. (No response -- a response would have revealed that the Port had done nothing to carry out that highly-important mitigation recommendation.)

3-31 Is local residential construction typically 'cold-weather' construction (said to provide superior noise-proofing), as asserted in the DEIS? No direct answer but see discussion in Part III, Comments 31, 32.

Part 4: Wetlands & Water Quality Impacts

4-2 JARPA, §404 application, creek relocation plans, should have been included.

4-6 Asks for specific discussion of Miller Creek.

4-9 Lost-opportunity costs should be discussed.

Part 7: Other Comments

7(C)-6
7(C)-7
These two comments focussed on the rationale for delaying start of third-runway construction. Though they were not responded to specifically, the fSEIS now confirms our suggestion in our Comment 7(C)-7 that the compelling reason for delay of construction is the lack of financial resources. See 1 fSEIS 2-21, in section A, second indented paragraph

7(C)-8 Contigency plans should be set out in the fSEIS, especially a contingency plan should construction money for the third runway not be available at the hoped-for time.

Because the foregoing comments are already a matter of record (in Appendix G, 3 fSEIS), readers are asked to refer to that source for more details. Further remarks on the overall significance of these failures to respond will be found in the Conclusions, below.

Part III: – Comments Misunderstood, Not Fully Responded to, Answered Inaccurately, &c.

It is beyond the scope of these replies to give a full critique of the fSEIS or even a full critique of the official responses to our comments. However, many of our comments were so inadequately or misleadingly answered, or so grossly misunderstood or misinterpreted, that replies to such responses are warranted here. We will address these instances in the order of our comments rather than the order of the responses. Comments that are here summarized or paraphrased will be set off by ( ) unless the context unmistakeably indicates a paraphrase; comments without () are quoted as submitted; portions of comments that are quoted as submitted are off by double quotes. The relevant response is also cited.

Construction impacts: Part 1 of our Comments

Comment 1-6, Response 8-F. (We asked if the fill-hauling was to be accomplished by trucks only, or by truck-trailer combinations.) Response 8-F states that it replies to this comment, but it does not. So, we still do not know the type of fill-hauling equipment that the planners expect to deploy.

Comment 1-13. Is it accurate to assume, as does [the dSEIS] that there is no impact from truck noise if there is pre-existent aircraft noise? Isn't noise cumulative. Response 8-M says "aircraft overflights are expected to overshadow noise from construction activity". So noise is no longer cumulative? We find this confusing & misleading.

Comment 14 (b). We wrote "The fSEIS should present clear schedules ... for the fill-hauling activity on the various routes under consideration, to permit all concerned to understand the full impacts of this massive activity." Response 8-D interpreted this as a question as to whether affected parties would have a change to challenge and comment on the final choices.

Air-quality issues: Part 2 of our Comments

Comment 2-1 and Responses 6-G, 6-R. (We asked about particulate matter expected to occur at the Airport through year 2020, the pending change of the PM standards by US EPA, and proposed changes in US EPA standards for ozone.) None of these questions was addressed in Response 6-G. The excuse was that the proponents did not have access through the FAA and EPA to updated data on aircraft particulate emissions. Considering that we asked specifically for a literature search on this point, it is interesting that the proponents seem not have bothered to do any literature research, let alone commission their own studies. In Response 6-R, the reviewers averred that they do not have to pay any attention to standards not yet adopted. Surely, an environmental review ought to examine the effects of future regulations, when at present those regulations are under active consideration & are far advanced in the enactment process. In the case of the PM_2 standard, there seems to be universal agreement that the draft regulation, or something very, very like it, will be adopted, despite considerable opposition.

From the point of view of the fSEIS , the soon-forthcoming ozone and soot regulations from US EPA will be a problem for future State regulators, who will be faced with a fait accompli. What the fSEIS doesn't mention is that at present commercial aircraft are in effect immune from regulation, so that reductions in PM_2 & ozone will have to made by non-aircraft users in order for future State Implementation Plans to succeed. Here is an indirect, or induced, socio-economic adverse effect that cries out to be addressed in the fSEIS. If it is not addressed, seemingly the public will just have to suffer the health consequences. Could this fairly be described as bureaucratic callousness?

Comment 2-3 and Response 6-C. (We asked about fuel dumping, its frequency, its health consequences, &c.) The official position is that fuel dumping almost never occurs, which will be news to people who have experienced it personally. However, the inquiry did shake loose the name of an official who is charged with receiving complaints about dumping: – Tom Davidson, FAA Air Traffic Manager, Seattle Tower.

Comment 2-5 and response 6-I. (The dSEIS seemed to take the position that a letter from the Director of the Department of Ecology constituted the mandatory certificate by the Governor under 49 USC 47106(c)(1)(B). We asked about the authority for the substitution.) The Response threw out a bewildering barrage of citations to irrelevant State statutes. But the true authority is apparently a phone conversation from someone in Ecology claiming that the Governor delegated this (non-delegable) duty. We still would like to see (1) the authorizing statute and (2) the written instrument of delegation. Normally in this State questions like this are put to the Attorney General for definitive opinions. It is interesting that that was not done here. We suspect that there was no purported delegation & that if delegation was attempted it is without authority in law. But no-one can tell from the Response. And the proper certificate is a necessary precondition for this project to move forward.

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Noise issues: Part 3 of our Comments

Comment 3-2, Response 7-U (We asked for SEL contours maps comparable to the 65 LDN contour maps in the dSEIS, for SEL contours 80, 90, & 100 dB.) The Response states that the fSEIS presents SEL information at 1,290 sites. A careful perusal of the relevant portion of the fSEIS, section 5-3, discloses no reference at all to SEL. The request for SEL contour maps is not understandable -- the Response says that five such were prepared but they are not in the fSEIS text.

Comment 3-4, Response P. (We asked that the current computer program for processing raw noise data, INM 5.1, be used for noise modelling.) The Response was that noise contours generated by the new program "would be expected to be virtually the same between the two versions of the noise model". No authority was cited. We are not so confident of this "virtual" equality in result. What would have been the harm in finding out, by honoring our simple comment/request?

Comment 3-5, Response 7-V. (We pointed out the absence of a statement of the modelling assumptions used in producing the noise-contour maps in the dSEIS, & asked that the fSEIS include a variety of important details.) The Response was that the prepares had used "industry accepted procedures" (not stating where those procedures have been published) The Response adds that the modeling "complies with the FAA's intended use of the model", which is at best an ambiguous remark, & at worst, ominous. It is claimed that "[t]he document contained a summary of the specific input assumptions" What document? No such details were in the dSEIS, and we are unable to find any in section 5-3 of the fSEIS, though that section refers vaguely to Appendix C-3. If these details are in 2 fSEIS Appendix C-3, the Response (& the text of the fSEIS) ought to have indicated where in the 220-pages of the Appendix readers should turn. There are, regrettably & predictably, no table of contents or index for that Appendix. Are the modelling assumptions hidden in there somewhere? Could it have hurt for the Response to have guided readers to them, if they are there? And if they are there, a valid Response would have indicated which of the 16 assumptions that we asked about were covered & which were not. We note in passing that the POS refused to provide a statement of those assumptions earlier in this process. See Comment 3-5(b) – characteristically not responded to.

Irrelevantly, the Response claims that "[a]ctual data files input to the noise models are available from the FAA" – that's good to know now, though it's a bit late for this process, but it is of no help in understanding the assumptions used to process those raw-data files.

Comment 3-6, Response 7-A. (We asked that the fSEIS maps of noise exposure (NEM) show 1996 noise conditions, in light of the increase in Airport activity from 1994 to 1996. This work was not done, in reliance on a guess – could it be called a self-serving guess? –that a 5 percent decrease in operations by aircraft in the Stage 2 category would more than offset the increased noise induced by growth in number of operations. Maybe, maybe not. We would have thought that since most of the 'heavy lifting' in preparation of NEMs is done by computers, it would be better to have the computer generate the requested maps rather than to guess as to what the maps would show.

Comment 3-7, Response 7-W. [Readers are requested to follow this discussion with care, while considering what the Response indicates about the official mind-set involved.] (Following up on a suggestion in the official 'User's Guide' for INM ver 5.0, we asked for NEMs depicting seasonal noise exposure.) The Response concedes that this work could have done, & might be 'interesting', & that Sea-Tac Airport does indeed experience seasonal variations in activity. But such data "would not be useful in examining land-use impacts".

This assumption rests on the persistent, fallacious, & damaging notion that people's perceptions of overflight noise, & the difficulties that they experience from it, stem solely from the adjusted annual average of that noise. Quite to the contrary: It is widely recognized (& we could find indications of official agreement for this in the earlier environmental review papers if we had the time to look) that aircraft noise is perceived as significantly more annoying in the warm-weather months. We respectfully suggest that it is precisely the noise in warm-weather-months that has such a deleterious impact on residential property, & the values thereof – a critical component of the land-use impact question. It is also widely recognized (except by FAA) that single, very noisy events (which is what the SEL metric measures) are particularly disturbing. This matter of warm-weather single-event noise becomes a more significant factor as night-time noise (another key annoyance) declines not only on a LDN basis but more importantly on an SEL basis, as Stage 2 aircraft are phased out, thanks in part to the Port's regulations restricting night-time operations of those aircraft. (Of course, for those affected by noise from King County International Airport, the shift of Stage 2 aircraft from Sea-Tac to KCIA is a dubious gain.)

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Given the importance of SEL, it would be not only 'interesting' but also useful to know if there are variations in SEL contours between the cold-weather and warm-weather months.

Comment 3-8 (We requested deletion of erroneous comment that 65 LDN is "a relatively low environmental noise level"). The response (7-S) talked about health effects of noise & the necessity of only using LDN as a noise metric. In explanation of our request, we reminded the FAA/POS team of the substantial body of medical literature discussing adverse health effects from noise in the 65 - 75 LDN range (a computer search of such literature– done on our behalf by an outside researcher – produced 400 or so references. The literature references were included in our comments on the DEIS, but were not responded to.) In response to our reminder, it was asserted that "Chapter IV, Section 7 'Human Health' presents (emphasis added) the impact of aircraft noise on various activities in addition to potential impacts on human health". The cited section in FEIS ignored the medical literature presented by us & can only be said to mispresent the impacts of overflight noise on human health.

Comment 3-9, Response 7-P. (This comment asked for correlation of noise exposure maps with POS data from its remote noise-monitoring stations, & also for analysis showing statistical correlation between predicted INM contoures & noise measurements from the monitoring stations.) The Response cites Comment 9 but does not address it in any way. This is one way to avoid answering difficult questions, but it smacks of partisanship, not the objective review required by the statutes.

Comment 3-10, Response 7-U. (In a follow-up to Comment 3-2, we asked for a comparison of SEL noise as measured and SEL noise as computer-modelled., pointing out that the INM models were not designed for single-event noise. We called specific attention to an FAA stricture, in the INM User's Guide, that comparisons between observed data and modelling results must be considered when modelling SEL.) The Response declined to provide the information, on the ground that

> **"the intent of an Environmental Impact Statement is to identify the impacts of a proposed improvement relative to doing nothing".**

The inaccurate characterization of the purposes (plural) of environmental review is amazing, which is why we have called attention to it typographically. As to our comment, we are at a loss to find any connection between this Reponse & our request. We pointed out to a likely source of error when considering the impacts of noise measured & computed on the SEL basis. The fSEIS blandly declines to consider dealing with that possible type of error. Members of our team who follow noise issues suggest that the requested information would have revealed shortcomings in the computer modelling of SEL (understatement of the noise impacts).

Comment 3-11(a), Response 7-X. (We pointed out a serious inconsistency between the proposed utilization pattern for the new runway (very low) and the asserted economic justification for it, asking for the long-promised cost/benefit analysis, & referencing a particular pattern of projected future runway utilization found in dSEIS Table C-3-16.)..The request for the cost/benefit analysis was ignored (again). Will the public ever see this work?

The particular runway-utilization questions were not addressed specifically. Instead, a summary table (far less detailed than dSEIS Table C-3-16 & thus not responsive to the comment) was presented. The thrust of the Response was that, with the runway usage evaluated in the fSEIS, annual savings of $146 million in delay costs to the airlines will be achieved by year 2002, thus compensating for the cost of construction in less than five years. Of course, they're not planning to have the runway operational in 2002. The assumptions underlying the claim of savings are not set forth,

& no computations are displayed, either in the Response, or where they should appear in the main text (Chap. 2, sec. 2 "Purpose and Need". For all that we can tell, the $146 million figure is another of those plucked from thin air by the project's proponents; it certainly seems highly improbable,.on its face.

Comment 3-11(b), Response 7-X (Concerns similar to those in Comment 3-11(b) were expressed for a different group, with the same lack of response.)

Comment 3-11(c), Response 7-X (Concerns with the third group of runway-usage patterns, similar to those in (b) & (c) were raised, with similar lack of response.)

Comment 3-13, Response 7-V & 7-N (A detailed inquiry as to the methods used for deriving estimates of numbers of affected people within various LDN contours.) The Response is worthy of being quoted in full: "Information concerning the population affected by aircraft noise levels is presented in the Draft Supplemental EIS based on political jurisdiction. See response to **comment 7-N** [typographical error for **Response 7**] for census related information."- Response 7-N discusses the environmental-justice issue, not methods used to derive estimates of affected population.

So, what <u>were</u> the methods used to estimate affected populations? What <u>are</u> the margins of error, &c., in those estimates? How did the estimators arrive at <u>future</u> population numbers? Why is the reference to the dSEIS, & not to the fSEIS? Where in the dSEIS is the reader supposed to look for the material referred to in the Response? Is this another area where a complete answer would be embarrassing to project proponents?

Comment 3-14, Response 7-Z. (We asked for noise exposure maps including ground noise; we pointed out a study that reported ground noise far outside the contours contained in the POS' 1990 NEM; we asked for the data assumptions used to model run-up & taxiway noise in the INM noise exposure maps published in the fSEIS.) The Response says that Exhibit C-12 shows noise concerns for ground movement noise only; our copy of the fSEIS contains no Exhibit C-12 – the numbered Exhibits in

Appendix C rather oddly begin with number C-18. Table C-6 supposedly shows the run-up activity. There is no Table C-6. There is a Table C-3-6, at p. C-3-16 – but it turns out to be a table of the (missing) INM assumptions. If Table C-3-12 was meant instead of Exhibit C-3-12, then we have to report that there are no Tables between Table C-3-8 on p. C-3-20 and Table C-3-15, on the next page, C-3-21. Is this deliberate obfuscation?

Comment 3-16, Response 7-G. (We suggested noise barriers, mentioning the berms approved by FAA for Paine Field in Snohomish County.) The response indicates that noise barriers have not been evaluated but nonetheless have been found to be of limited benefit. How can one make a finding without first doing some sort of evaluation? As to berms in particular, they apparently work well enough in Snohomish County to be useful, but not in King County. Perhaps some people will believe that.

Comment 3-17, Response 2-C. (Re Port forecast of future traffic v. FAA's TAF. We asked for noise-exposure maps in the fSEIS utilizing the TAF, which, it will be recalled, showed usage levels about 10% greater in year 2010 than the Port's numbers. That would have been more consistent with worst-case analysis.) This request was ignored.

In passing, we note that on p. F-16, it would have been better to spell out the "certain worst-case conditions [that] were used in assessing the impacts of the Port's new forecast"

Comment 3-18, Response 7-P. (We suggested that "[e]vidence including tower orders, adoption of standard or NADP operations for departures by the scheduled air carriers, radar data, etc. should be provided to corroborate that operational assumptions used to predict noise exposure in the NEMs are actually being followed ... at Sea-Tac". Also requested was publication of NEMs showing alternative noise contours under specificed conditions & of other specific data.) The Response asserts that the "INM has been found to correlate accurately with actual noise measurements", citing a table located somewhere in Appendix R of the FEIS. The Response declined to discuss the question of whether

Noise Abatement Departure Profiles (NADP) had been approved for use in the INM. None of the requested data were provided.

It is interesting to note that the table in Response 7-P shows variations between modelled & 'measured' (computed from actual measurements) LDNs ranging from -0.8 dBs (station 7) to +3.6 dBs at two locations. A + measurement means that the average sound level calculated from measurements at the station was larger than the prediction in the INM modelling. In no case did modelling match measurement; in 9 out of 11 instances the measured readings were louder than the modelling. All of the stations lie within measured 65 LDN contours: it is a little hard to trust contours that do not include readings from outside the area of interest, leading lay observers to wonder just how far the measured 65 LDN contours really run.

It is important to note that the proponents are aware, as is shown by Response 7, that the noise contours produced by their modelling understate noise, as measured by the 65 LDN metric. **Why, then, does the fSEIS only publish contour maps that understate the extent of 65-LDN noise?** At the very least, maps showing contours derived directly from the actual noise measurements at the 11 monitoring stations should have been presented. It would have been more candid to have noted in the text of the fSEIS (section 5-3) that the contour maps actually contained therein understate actual LDN.

Comment 3-21, Response 7-V. (We asked for the same information relative to reliability of local use of the INMs that had been sought, unsuccessfully,by the PSRC's Expert Arbitration Panel.) The Response is incoherent. See discussion of Comment 3-2, above, for details.

Comment 3-23, Response 7-AA. (We asked for modelling of contours on maps with topographical features, as use of the INM ver. 5.0 permits.) This was not done, on the basis that the maps that were used "provide better geographic references for public readability". The maps that were provided (sec 5-3) are nothing to boast about when it comes to readability. A hand lens is almost mandatory, & the cross streets used on the map are not always the important cross streets in the area. (Example: use of So. Edmunds in the Columbia City area of Seattle -- the actual cross

streets of consequence are So. Alaska and So. Genesee. Farther to the north, So. McClellan is a major cross-street, not identified. The two major North-South arterials, Rainier Ave. So. And Martin Luther King Way So., are not identified, & are hard to find, given the poor quality of base map, as reproduced.) So, the readability argument is unpersuasive. We did not ask for the topographical maps instead of maps with identifiable major streets & highways. It might have been much more helpful to have provided both.

Comment 3-24, Responses 7-AB & 4-B. (We asked about noise-abatement departure corridors and profiles, mentioned favorably by the Expert Arbitration Panel, in their remarks following the operative part of their final order on noise). We were referred to the lengthy response 4-B, containing a multi-page matrix of requests made by PSRC to POS to do something about noise (instead of adhering to its commitment to act on the basis of the Panel's final order). Where in that matrix are we to find the answer to the question in Comment 3-24? We haven't been able to locate it – but of course we were not the ones who prepared the matrix. A specific inquiry should have been given a specific response.

Comment 3-25, Responses 7-AB & 4-B. (We asked about preferential runway usage, per a suggestion from the Expert Panel.) Same non-response as to Comment 3-24, equally unsatisfactory.

Comment 3-26, Response 7-AB & 4-B . (We asked about a Part 161 study.) Same non-response.

Comment 3-27, Responses 7-AB & 4-B. (We asked about the social surveys recommended by the Expert Panel in their dicta.) Same non-response. That subject clearly is not included in the matrix in Response 4-B. Apparently that part of the Panel's recommendations did not find official favor with the POS?

Comment 3-29, Responses 7-AB & 4-B. (We asked about sensitive-buildings insulation programs, a significant part of noise-mitigation work, endorsed by the Expert Panel. In particular, we asked about financial commitments from the Port to this endeavor.) Same non-response. This

is particulary interesting, because this program IS specifically included in the matrix in Response 4-B (Item E, p. F-54). Perhaps we can properly conclude that the Port'd non-responsiveness indicates that the Port HAS NO COMMITMENT to this program.

Comment 3-30, Responses 7-AB, 4-B, 2-V, & 7-D. (We asked about progress on the Panel's recommendation that an expanded residential acquisition program be considered.) Being referred to four different responses suggests that a separate response should have been provided. Response 7-AB itself provides no information on the subject. Residential properties do not seem to be included in the matrix in Response 4-B (though why commenters are required to do the respondents' work by locating the cross-references, we cannot understand.) Referring to Response 2-V, we find "moved to another location/comment number", but we are not told where! Some response to a serious comment! "Your information is at such-&-such address" & when you inquire, your inquiry comes back, marked "Moved. Left no forwarding address." Response 7-D says nothing about the Expert Panel, PSRC, or an expanded residential acquisition program (bear in mind that this is all about remedying problems from second-runway noise).

Comments 3-31, 3-32, Reponse 7-J. (The DEIS took the erroneous position that single-family residences in the area are typical cold-weather [Mid-Western] construction & thus do not on the whole need much insulation against noise. We challenged that assumption, to be told in the FEIS that now the experts estimated only 10% of the homes to be of masonry or brick construction. But no new estimates on insulation needs resulted from the shift of position. In the latest comment, we asked for re-evaluation of the numbers and for more careful distinction between brick construction and brick veneer. There are in fact very few stone masonry homes in the area and almost no brick ones. Apartment houses, on the other hand, we might have noted, are often poured masonry.) The Response to the comment was that this is all irrelevant because conventional temperate-weather construction provides sufficient insulation and the proponents ignore all this anyway in their insulation programs. Then why was this raised in the DEIS? It was convenient there to misrepresent the type of construction in the area, but when the

misrepresentation was pointed out, the fSEIS abruptly declares FAA/that actual construction methods are irrelevant!

Wetlands & water quality: Part 4 of RCAA comments

Comment 4-1, Response 9-O. (We asked how the Port proposed to relocate Miller Creek in light of a settlement agreement in Superior Court in which it undertook not do anything of the kind.) The response talks all around the Miller Creek situation but does not address the question.

Comment 4-3, Responses 9-M & 9-N. (We asked how the proponents intended to replace wetlands lost in one drainage basin by substitution in another, in light of apparent legal bars to such action, & we asked for citations to the local ordinances that would permit such substitution.) Our comment was not cited in Response 9-N, but it applies. The first response was, as we read it, that the FAA is not bound by such trivialities and the second, in effect, was that the proponents have not yet bothered to inform themselves about the legality of their proposed actions. The FAA may not be bound by local law, but the Port is. It is really strange to read in an environmental impact statement that two huge bureacratic organizations propose taking actions regulated by environmental law without concerning themselves with the legality of their proposed actions.

Comment 4-4, Responses 9-R & 9-E. (We asked why the silence in the dSEIS about the Port's Airport Storm Drainage System Comprehensive Plan, & asked for specific comparison of that plan and the December 1996 Miller Creek Relocation Plan.) We received no response to the latter inquiry. As to the former, it appears that there was no co-ordination between the preparers of the Comprehensive Plan and the preparers of these EIS papers, & so the dSEIS came out just before the Plan, & without reference to it. The result is that there are at least three different, current Port plans affecting Miller Creek, & no understandable co-ordination amongst them. Who can tell what the Port has in mind for the Creek, faced with such a muddle? Don't people at the Port read each other's monthly activity reports, to know what's going on?

Comment 4-5, Responses 10-B, 10-C, 10-D. (We noted the silence of the dSEIS re the aquifers underlying the Airport site.) The Responses remind us of the discussion in the FEIS & its Appendix Q-A, & provide some information about an aquifer of concern to the Seattle Water Department, and about the Highline aquifer. Both discussion are quite restricted, being limited in the case of the Seattle aquifer to a parking lot and to construction/relocation impacts in the other case. There is no comprehensive discussion of the possible overall impacts from the increased level of operations predicated by the dSEIS and fSEIS, to say nothing of the even-more-increased levels predicted by ACC and the H-O-K study team (which are more credible).

Comment 4-7, Responses 9-S & 9-D. (RCAA expressed a concern about the failure of the dSEIS to spell out means of meeting its professed goals for preserving fish habitat. The goals are found at 1 fSEIS 5-5-20 (not 5-3-20, as our submitted comments stated, owing to our typographical error). The Response refers readers back to an appendix to the FEIS & forward to engineering plans to be developed some time in the future, which may or may not be reviewed in various permitting processes. The reader knows no more about plans to preserve fish habitat than he did at the outset. Response 9-D says that it will all be taken care of in the Miller Creek relocation. But the relocation of Miller Creek is forbidden as the result of the settlement of the Kludt lawsuit. See Comment 4-1.

Comment 4-8 . (A comment about the useful life of the third runway. The Responses are discussed below in connection with Comment 7(C)-4, & the reader is referred to that discussion.

Socio-economic impacts: Part 5 of RCAA comments – discussion of H-O-K study

Comments 5-4 through 5-7 & Response 4-J. (Here, we asked in detail about a variety of socio-economic impacts on communities near the Airport, based on the preliminary draft of the H-O-K study funded by the State.)

Our comments, and Response 4-J, sharply highlight major disagreements between the project's proponents & the project's local critics, & reveal, on analysis, the fundamental errors in law, practice, procedure, logic, & fact that underlie the proponent's position on mitigation matters. Therefore, we will discuss these comments and Response 4-J in considerable depth.

The principal attack of the Port and the FAA on the H-O-K study is found in Response 4-J. It is beyond our scope to defend that study in detail, but not beyond our scope to point out: (1) failures of the FAA and POS to address legitimate concerns raised by the study and (2) misinterpretations and misrepresentations of the study by the author(s) of Response 4-J

Response 4-J addresses our questions and the comments of several others on the subject. In short, the response presents a conclusion, not based on any cited study or other publication, that the adverse impacts described in the H-O-K study do not exist: "The [study] did not identify any new significant adverse environmental impacts associated with the proposed improvements that have not already been identified or addressed in the Final EIS and Supplemental EIS." This is a breath-taking assessment.

Below are listed some of the impacts identified in the preliminary study, about which we asked specifically, which are NOT addressed in either EIS so far as we can learn . The Response does not refer to any of them, as it surely would (or should) if any were discussed in the main text of the fSEIS. The appropriate place to find discussion in the main text would be section 5-4, which is silent on any of these topics.

* Consequences of acquisition of single-family properties, apartment houses, and business
* Residential displacement
* Business displacement
* Disruption of existing communities
* Disruption of planned developments
* Changes in community demographic profiles
* Changes in employment patterns
* Impacts on public schools resulting from changes in demographic profiles

* * * * *

We suggested in our Comment 5-4(b) that the fSEIS should take into account the final, published version of the study, and asked for an explanation should the fSEIS not so do. That comment was not responded to. For our purposes, then, we consider that the final H-O-K report in play, as well as the preliminary draft issued for comment.

1. Disproportionate balance between impacts and benefits. Appendix A of the final H-O-K report spells out in detail the imbalance between benefits and adverse impacts for the multi-city area surrounding the Airport. The Response explicitly admits the fact of disproportionality. 1 fSEIS F-59. The Response then asserts that the Master Plan Update, FEIS, and fSEIS dispute "the specifics of the nature and substance of impacts". As to the Master Plan Update and FEIS, this is a neat trick, for both were published before the preliminary H-O-K report was issued. As to the fSEIS, if it disputes anything found in the final H-O-K report, it does not do so in the appropriate place (Chapter 5) – unless silence is to be taken as a "dispute"

2. What are 'significant adverse environmental impacts'? The official position is hard to discern. Response 4-J asserts that the POS and FAA, having reviewed the draft H-O-K report, conclude that that the FEIS and fSEIS "have identified all significant adverse environmental impacts from the proposed improvements in accordance with FAA Orders 1050.1D and 5050.4A and applicable NEPA and SEPA requirements". This is typical opaque bureaucratic writing. Is the average reader to understand that the referenced FAA Orders define the term "significant adverse environmental impacts"? Or do these Orders only define the official FAA process for environmental review? And what are the impacts identified by the H-O-K team that the FAA/POS team think are not appropriate to consider? Apparently, the continuous interruption of educational activities in classrooms by third-runway-induced aircraft-overflight noise is not a significant impact, for there is no proposal to mitigate it suggested by FAA/POS, though the final H-O-K report covers this subject in considerable detail.

3. Fundamental error in regard to land-use planning. The Response, at p F-60, states that mitigation measures proposed by H-O-K were "not followed by an evaluation of land use planning policies to complement these actions and therefore does not indicate that such mitigation is warranted". This analysis is fundamentally flawed in seveeral particulars.

(1) The first error is to assume that the communities impacted by the Airport are required to engage in retroactive land-use planning as a matter of law, generally, or as a condition of being granted mitigation. We call upon the FAA and POS to cite competent legal authority for these propositions.

(2) The second error is to assume that retroactive land-use planning will as a practical matter lessen the burden of mitigation that ought to fall on the sponsors of this project. An example will clarify: The Highline School District's numerous schools are all shown by the final H-O-K report to lie in areas that will be adversely impacted by third-runway noise, needing mitigation. If the various land-use planning jurisdictions throughout the District's area were to enact rules forbidding the construction of schools or the continued use of schools in the future impact zone (which is what the fSEIS seems to suggest should happen), then the School District would be obliged (if the courts upheld such a land-use

restriction) to find new locations outside the District for all of its schools, and to provide for transportation of its pupils to these new outside locations. Under this scenario, instead of closing 9 schools and insulating 25 more against noise, the District would need to close 34 schools – all its schools – and build new replacement facilities outside the District. (Or are the Highline pupils to double-shift with pupils in already-existing buildings owned by near-by districts, such as Kent, Tukwila, Bellevue, and Seattle?) Rebuilding outside the District will increase the dollar burden of mitigation enormously. Thus we see that retroactive land-use regulations will not help with the schools problem. The same is true for many other mitigation measures proposed by the H-O-K team.

(3) The third error is to assume that the final H-O-K report does not take land-use changes into account, where appropriate. The report's recommendation is to buy out and convert to other uses substantial sections of the neighboring cities: four entire neighborhoods in the City of Des Moines, for example. Converting these evacuated neighborhoods to uses compatible with future airport noise will result in major land-use changes. The Response ignores both the recommendations themselves and their obvious effect to adapt future land use to future noise levels.

(4) The fourth error is to assume that, where techniques such as insulation are insufficient to mitigate impacts, the suffering neighbors should change their land-use patterns to accomodate the Airport, without compensation. This error rests on a companion error, which is to assume that the newcomer, the Airport (or more precisely, the Airport's new noise) has so high a priority over other, pre-established uses that it need not compensate for harm that it does. Only if the existing residents, businesses, institutions, and governmental bodies first adjust their use of their land to the Airport's present and future needs, without compensation, will the Airport be held accountable. But of course on that basis, the Airport is never held accountable. The argument proves too much.

Lurking behind this discussion is the notion, often stated orally, but rarely committed to print by FAA or POS, that those who moved to south-west King County decades and generations ago should have known that in the 21st Century an airport would create very serious noise problems. The fact is that the communities and the schools were on the ground before Bow Lake became Sea-Tac Airport. Public-school

construction began in the Nineteenth Century. Major schools now in use in the Highline District were built in the 20s and 30s, long before Sea-Tac Airport (or Bow Lake Airfield) "was a gleam in anyone's eye". It is also worth recalling that the existing land-use patterns in the area are consistent with the Sea-Tac Communities Plan, adopted in 1976 by the County and POS. On the assurances of that plan, local jurisdictions went about their business. Now, according to the FAA and POS, those same jurisdictions are in the wrong and must endure third-runway impacts without mitigation. This is particularly ironic when one recalls that the Sea-Tac Communities Plan rested on the Port's assurance that there would NOT be a third runway at Sea-Tac, & that when Sea-Tac outgrew its existing configuration, a new airport would be built. There is an unwelcome tone of blame-mongering in the official environmental-review papers. The bureaucrats suggest that the communities should have guessed correctly that the Port would not live up to its no-third-runway commitment, would violate its commitment to building a new airport when Sea-Tac reached capacity. The communities should have guessed what future noise would be, should have known that Sen Kennedy would, for still-unfathomable reasons, become the ardent and successful champion of airline deregulation, with the resulting boom in air travel. Having failed to guess correctly, the communities deserve no mitigation. The facts are that when the second runway was built no-one foresaw deregulation, let alone its consequences. No-one foresaw, we believe, the capacity-devouring growth of low-capacity commuter airlines. Those who sited the Bow Lake airfield never supposed that it would reach its present size, nor did those in charge of land-use planning, nor was there anyone in the civil-aviation establishment who had better forevision. No useful purpose is served by attempting to apportion blame among the local actors for failure to foresee unforeseeable national and world-wide trends – certainly not when the ostensible purpose is to define adverse impacts of a particular project and to plan mitigation of them. If blame were to be assigned, we would point to — but it is wiser to forbear.

(5) It is also an error for the the FAA/POS team to shift the burden of mitigation analysis from itself to the H-O-K team (& the impacted communities) on the basis of a disagreement about land-use planning. This point is not obvious, so some explanation is required. The FAA/POS team appears to take the position in Response 4-J that no official

environmental review is required of suggested mitigation measures that might (on their view) require companion land-use measures, unless those who point out the problem impacts and suggest mitigation **also** suggest land-use changes that are satisfactory to the proponents. See numbered paragraph 2, 1 fSEIS F-60. This an error, because the burden for evaluating adverse impacts of a proposal rests by law entirely on the proponent(s) of the project. In this case, that means that the burden rests upon the FAA and POS (with PSRC as a background player, who should in truth be a co-signer on the FEIS and fSEIS). That the Legislature was willing to pay $500,000 for a study supplementing the work of the proponents should be regarded by the proponents as a welcome contribution to a difficult task. However, the supplemental study does not relieve the proponents from the necessity of taking a hard look at all problems; the H-O-K team has not become the official environmental reviewers. Nor is this a battle of competing EISes, analogous to contending briefs in court, where the better brief prevails -- however inadequate it may be. The burden of the proponents is NOT to do a marginally better job of environmental analysis than someone else: their burden is to do a complete job.

(6) Disagreements, if any, about future land-use regulations do not alter the need for mitigation or the duty of the fSEIS to recognize impacts. Let us suppose that some of the mitigation measures proposed by the final H-O-K report should, in the view of the project proponents, be accompanied by land-use changes not spelled out in the report. It does not follow that the adverse impacts reported by the H-O-K team can therefore be disregarded. Rather, it then becomes the duty of the proponents to suggest the land-use changes that they think should accompany the mitigation. Again, the burden of this process rests exclusively on the proponents. And the burden is to do a full, complete job of analyzing environmental impacts (and of proposing appropriate remedial measures). Just by analyzing the responses to our comments based on the work of the H-O-K team, it is clear to us that the burden has not been met.

4. The use of 65 LDN as the sole criterion for mitigation of noise impacts is erroneous. The Response rests heavily on the continued use of 65 LDN contours as the only basis for recognizing adverse impacts. We and others have commented at length, & often, about the inaccurate characterization of that metric by the local FAA. But misrepresentation persists. See 1 fSEIS 5-3-2, sec. 5-3-2: it is there asserted that the 65 LDN metric was "established" as the critical level for the determination of noise impacts, on the basis of scientific surveys and analysis. This is flummery. If there was any science involved, the involvement was accidental. The number at best was chosen because highway engineers were already using it for a very different type of noise impact, and that's not a scientific way to do things. True, 65 LDN is convenient, because with annual averages actual noise can be smoothed away. To use a method that we learned from the FAA/POS team, we incorporate by reference all our previous comments on this subject.

It is also not true, as the Response suggests, that noise outside the 65 LDN contours must be ignored for FAA purposes. We call attention to a memorandum from the FAA's manager of its Community and Environmental Needs Division, dated 25 July 1995, debunking the "misconception ... that the FAA cannot approve mitigation measures in a Part 150 program that go below the DNL 65 dB noise contour". The manager, Lynne S. Pickard, plainly states "This is not the current FAA policy, as established in the January 1989 Report to Congress 'Eligibility of Noise Abatement Proposals to Grants-in-Aid Under the Airport Improvement Program". Reference is also made to a change in (FAA) Order 5100.39, paragraph 710. Pickard's memo. confirms the 1989 FAA document cited in our Comment. We suggest that even the Northwest Region is bound by FAA policies.

And, even if the FAA were unable or unwilling to provide grants-in-aid to the POS, the POS has its own obligations, which are not so circumscribed.

The root error here is to suppose that an adverse impact need not be recognized, nor mitigation considered, unless the mitigation is to be funded by the FAA or some other source. There is no warrant for that approach. An impact is an impact, regardless of "Federal noise policy". If a project required a crew to use chainsaws in a residential neighborhood in

the middle of the night, there would be an impact, even though there is (hopefully) no Federal chain-saw-usage policy.

Important purposes of environmental review, we understand, include calling attention of such impacts as may be found, for which needful mitigation has not been provided, or which cannot be mitigated, for whatever reason. Only if the full spread of adverse impacts is fairly presented can policy-makers even hope to make reasonable decisions as to whether projects should go forward. The present approach subverts these important purposes of the review process.

5. Response 4-J suffers from yet another fundamental flaw. It confuses Part 150 reviews of existing conditions (and future, near-term conditions) with State and Federal environmental review of proposed new projects. .See second full paragraph, 1 fSEIS F-61. The purpose of Part 150 studies is simple: set up the parameters for using Federal funds channelled through the FAA for noise mitigation, in accordance with the rather narrow constraints of the regulation (Part 150) & the underlying frant-in-aid legislation. In a Part 150 study, expenditure of Federal money can only be authorized in accordance with Federal policy. This is not in any sense an environmental review; environmental reviews are mandated by entirely different statutes, including a State statute. Environmental review of airport expansion is in no way limited to noise issues or the peculiar constraints of Federal funding for noise mitigation.

6. Moving to another problem in Response 4-J, rendering the Response unresponsive to our comments: consider the property-devaluation concern raised by the H-O-K study. This is dismissed by the expansion proponents on the basis that "[j]ets have operated at Sea-Tac since the early 1960s. As based on the cited research [none is cited] the primary adverse effects on property values would have been experienced at that time." 2 fSEIS F63. The Response asserts that the preliminary H-O-K report "appropriately notes that such effects were typically felt when the airport first began jet service". Our research team has perused the relevant portions of the preliminary report time & again, & finds no such comments. The Response fails to note that the study shows <u>increasing</u> devaluation as noise expands, fails to note how few jet aircraft overflights there were in the early days of jet usage at Sea-Tac, fails to note how the fleet mix has changed from an occasional jet in a mass of turboprops (early 60s) to today's jet-engine domination of the fleet mix, fails to note how the

jets have grown larger & heavier, &, thus, noisier, with resultant extension of property-devaluing overflights farther and farther to North & South, with resultant noiser climb-outs. One of our team vividly recalls his young daughter asking him about tiny lights visible on the far horizon from her South-facing bedroom window in Seattle's Mt Baker neighborhood. These lights would strangely twinkle out after being seen for a few seconds. Those were commercial aircraft departing Sea-Tac, inaudible, evanescent. Now the young daughter is a mother, & a Ph.D. candidate. Now those jets roar (with lights on) over most of Seattle night and day. No-one's young daughter need to ask what those roaring monsters in the sky are. In neighborhoods as far North in Seattle as Broadview (at the northern city limits), youngsters can identify overflying aircraft from their insignia, so large & so low are they. In a nutshell, the noise has gotten worse & worse, beyond anyone's imagination 25 years ago, & even the simplest mind must concede that the greater the noise & the wider its spread, the more the devaluation.

It may also be noted that the impact is not a one-time thing. Let's suppose, against common sense and experience, that the full range of devaluation noted by the H-O-K folks actually occured in the early 1960s, as Response 4-J suggests. Now, purely hypothetically, let us suppose that by some miracle jet noise from Sea-Tac were to cease – some marvel of engine technology, some EPA ban on jet airplanes, a decision by the Port to move the jets elsewhere & convert the real-estate to more productive uses, whatever. Is it not evident that property values around Sea-Tac would rebound rapidly & sharply, soon reaching the levels of the comparable properties in the Shoreline area, once the public became convinced that the jet noise was a thing of the past? Without doubt

But of course the property devaluation predicted by H-O-K for the period from the opening of the third runway (2000 in the preliminary report, relying on the FEIS), has not yet occurred, and the report is very careful to distinguish between existing conditions & future conditions. See preliminary report, p. 34 & seq. 'Socio-Economic Impact Analysis' section. Curiously, the Response claims that the preliminary report says that noise exposure impacts declined 52% between 1991 and 1994, citing p. 2-8 of the preliminary report. Our team took the trouble to look up that page: it is a merely a prefatory recitation of the claims made in the FEIS. On the

following page, one finds that the study authors are concerned about the failure of the FEIS to consider the noise metrics SEL and TA. The source document (FEIS) & the H-O-K study both are misinterpreted by Response 4-J: the diminution in noise impacts claimed in the FEIS does not reflect a quieter environment but only a removal (buy-out) of people formerly living very close to the facility. Everyone else still receives about the same noise as before, however measured. See second full paragraph, 1 fSEIS F-61.) And this has nothing at all to do with property devaluation, as the FAA/POS team ought to have known.

As a matter of interest, readers may wish to compare the alleged 52% decline with the statement in Response 7-G that the project will result in "an 11% greater noise exposure population ... in the year 2010". We all may be sure that that number is not overstated.

7. Another misconception in 4-J is that property-value losses would not occur if the localities were to tinker with their land-use rules. (Third unnumbered bullet point, 1 fSEIS F-63.) The faulty underlying assumption is that there is time to change land usage by regulation. WRONG! The cities are already there, as fully built up as Seattle or Tacoma, or Paris if you like, and as resistant to change by retroactive decree as any other fully-built-up area. Only if people are to be physically expelled from their homes and businesses can land-use regulations alter the property-valuation problem. (That would be a stupid thing to attempt, not only because it would be politically impossible in a democratic society, but also because someone would still be liable for the lost property values – in this case, the localities, acting as the unwilling agents of the FAA & POS, instead of those entities directly. But this would be a meaningless difference in terms of dollar losses to the owners & occupants.) We challenge the runway enthusiasts to suggest the land-use measures that should now be put into effect to cure the property devaluation that is predicted to occur after the third runway goes operational.

(This completes our discussion of the mitigation matter & the H-O-K study.)

Comment 5-8 and Response 7-N (Environmental Justice executive order). The Response sloughs off the evident disproportionate impact of new Sea-Tac noise and air pollution from the third runway by statistical sleight of hand: a majority of the census tracts impacted (per the unsatisfactory 65 LDN metric) have populations whose non-white population is less than the county average. So what? Obviosuly the correct statistical measure would be comparison of percentages of total populations (not percentages of census tracts.)

And what about the other protected classes defined in the Order?

Alternatives: Part 6 of RCAA comments

Comment 6-1 and Response 3-H. (We pointed out that the Washington Department of Transportation had presented an utterly negative report on high-speed rail possibilities to the Expert Arbitration Panel, and then, immediately after the Expert Arbitration Panel accepted that negative evaluation, the Department had a change of heart and began a big publicity blitz seeking support for its brand-new (??) plan for short-term implementation of high-speed rail. We asked for a re-evaluation of the high-speed alternative in light of that change of heart on the part of the Department.) The Response, relying on its own summary paraphrase of a WSDOT plan of April 1996, concludes that the Department is calling for "small investment" (how much was that in dollars? And for what?) "which will not enable a significant off-load of air passengers". This will scarcely do as a serious re-evaluation, lacking as it is in any specifics.

(We also asked, in Comment 6-1(d) that the fSEIS explain in detail the impact of the five-year delay in opening the new runway upon the utility of the rail alternative.) The Responses are silent on this point, though it seems obvious that if the State gains another five years for implementation of significant rail improvements, and for customers to become used to using rail, then there will be a reduction in demand for regional (commuter) air travel. We continue to regard incremental reductions in demand to be disproportionately beneficial when they divert operations at that critical point in the delay curve where delay suddenly becomes very great as the result of a very few more operations. This is

the "edge" effect about which we have commented before, with no response.

(In the balance of Comment 6-1(d) we asked that the fSEIS address specifically various described possible transportation alternatives.) There was no response, though the alternatives are patently reasonable.

(In Comment 6-1(f) we asked for a more factual analysis of the telecommunications alternative.) The response, 3-B, acknowledged that the question has been raised, but proceeded to disregard it entirely. The Comment further asked for an analysis of the "savings in dollars, including annual totals, of the 9% reduction in air travel associated with the use of new telecommunications technologies". No response. We submit that a 9% reduction is significant, and should be factored into the decision equation.

Comment 6-2. (With regard to the possible alternative of one or more other airports being used, we commented at length that the EIS' non-acknowledgement of potential sponsors for other facilities was without merit. We asked for the legal authority for the converse proposition in dSEIS at p 3-4, Part III (B) 1.) Of course, that legal authority was not cited. Instead, the nonsensical proposition was put forward (Response 3-B) that there are no alternatives because "no party or group intervened during the Flight Plan Study, Major Supplemental Airport Study or in any forum since." (1) The notion of 'intervention' in an entity's environmental review of its own proposal is a novel one. Perhaps a lawyer wrote this response, mistakenly thinking that environmental review is a quasi-judicial proceeding, in a 'forum'? Who would grant a party leave to intervene, and what would it mean to have intervened? (2) The Response overlooks the fact that the Port's ground rules for this entire planning process specifically restricted consideration of alternatives to the PSRC area, although everyone knows that the potential 'green grass' sites, with strong local support, are all located outside the PSRC area: the proceedings were plainly labelled, "NO OUTSIDERS NEED APPLY".

As for the argument that there is no identified source of funds for alternatives, several points come to mind: (1) This is an environmental review, not a feasibility study – its scope is much broader. (2) the identified sources of funds for THIS project are (a) quite insufficient as to the 'sticker price', (b) quite insufficient as to the financing costs (still not disclosed), (c) subject to official approvals not yet given, (d) dependent on the major scheduled airlines agreeing to underwrite $200 million in bonds (just for the runway) – and those airlines have been conspicuously uncommitted, at the best. (3) Where in the relevant statutes is it written that alternatives should not even be examined on the basis of an a prion determination that, if examined, no sponsor would be found or no source of funds would appear in advance? (4) A good alternative might – should – timpel, if necessary, a search for the sponsor. (5) There is no sponsor for the Do-Nothing alternative or for any of the other alternatives that the FAA/POS team chose to examine. There is no rational basis, sustainable under the relevant statutes, for the exclusion of some alternatives & inclusion of others in this review process.

Admittedly, the situation in this particular case is somewhat unusual. Perhaps the most common case is one in which there is fairly broad agreement that a project should go forward, & the choices are between various ways of accomplishing the goal, always checked against the Do-Nothing alternative, more or less as a matter of form. Another common case is the one in which the proponent wants to proceed but there is opposition, which relies on the Do-Nothing, or status quo, situation as the opposition's preferred alternative. This is a typical situation with real-estate developments & it is frequently observed in the City of Seattle & King County.

There are very rarely competing proposals from competing interests for some project on the same ground or seeking to achieve the same end. But here that is close to the case. The proposal from the Port seeks to settle a complex group of State-wide transportation issues by putting forward a proposal entirely under its control, & designed to achieve the business purposes of the Port, quite without regard to other interests, other policies, other policy-makers' responsibilities, other needs, & the interests of other parties in the State-wide transportation puzzle.

The Port, staunchly supported by its ally the local FAA establishment, seek to solve the State-wide and even region-wide transportation problem by its one-note solution – more, more, MORE air travel, all at the Port's one, in-city, airport. Under these circumstances, it is understandable why the Port and FAA decline to consider the full consequences of the transportation solution that they wish to impose on everyone else, and why they refuse to look at the alternatives to the policy issues that this proposal seeks to decide. Where possible physical developments (e.g., high-speed rail) might meet some of the professed need but would result in a policy decision contrary to the Port's assumption, then (it seems to us) environmental review requires that the policy alternatives not be excluded, how ever far from the proponent's preferred alternative the physical work might be. In short, this is not a review of possible choices for airport configuration. It is a review of a proposal that would greatly impact on an otherwise unresolved, ongoing policy debate, & the scope of alternatives to be reviewed should reflect the very broad issues involved.

Readers wishing to pursue this matter further are requested to read our Comment 6-2 and Response 3-B with critical care. Please note the hard questions left unanswered. Please note the utter absence in the Response of any citation to any authority at all for the dogmatic assertions found therein. How can credence be given to such anonymous, unsupported assertions on matters of fact? Where would one find the POS and FAA studies referred to in the last sentence of part 2 of the response? And how shall interested persons reconcile the PSRC's finding that supplemental subregional airports are needed and would meet the need (if they could be found) with the new finding by POS and FAA that they would not? Are readers supposed to have forgotten that the the PSRC work was half paid for by the POS and was controlled by it throughout? What a way to back off from one's earlier fully-reviewed work! Just announce in response to an EIS comment that one has studied the matter (not that one has re-studied it) and in an unpublished, uncited review, one has reached a particular conclusion, never conceding that one has made a 180-degree change of course on a major subregional planning issue, without benefit of any public process at all, or any consultation with the subregional planning agency (PSRC).

Comment 6-3 and Response 3-F. (Here, the issue is demand management. We protested the misrepresentation in the dSEIS of the findings of the Expert Arbitration Panel on demand management. questioned the propriety and legality of disregarding demand management as an alternative (as has been done in this instance) on the basis that the project proponents don't wish to manage the demand. This comment was ignored, or perhaps considered to be a suggestion limited to a change in the "airline basic agreement process typically related to pricing policies". The Response returns to the earlier idea that "legal issues" might be raised (what issues?) and so on, without addressing our comments on these lack-lustre arguments. Of course, the FAA has the power to regulate: if it chooses not to regulate, then that is a decision to ignore an alternative. What would be the case if the FAA used its powers to reduce the number of flights by regional carriers whose Sea-Tac flights constitute 38 to 40% of all operations, for the accommodation of about 7% of the passengers? This is a concern that will not go away just by ignoring it. The reference in the Response to "yield management" (by the major carriers) (1) shows that demand management can help but (2) ignores the disparate usage of the Airport by the two markedly different types of carriers: the big majors flying lots of travellers long distances in capacious aircraft and the little regional carriers flying every half hour with a handful of passengers to destinations near-by.

Comment 6-4 and Response 3-E. (We pointed out the error in the dSEIS with respect to the utility of Localizer Directional Aid (LDA) technology: the dSEIS says it can only be used in the poor-weather condition known as VFR2. We cited a study previously submitted by us, which shows that LDA technology has been widely adopted for IFR (even-poorer weather conditions). We also pointed out that the PSRC Expert Arbitration Panel had indicated that LDA would be useful at Sea-Tac.) The response fails to address either the study or the Expert Arbitration Panel's finding. The resulting position is this: Perfectly competent outside experts say that LDA could be used at Sea-Tac to good effect, both in VFR and IFR conditions; the proponents of Sea-Tac expansion pretend that those expert opinions do not exist.

Comment 7(C)-1(c) Is this huge earth-fill work practical? [Referring to the fill required for the proposed new runway] We are aware that the 1994 EIS [error – it was an environmental assessment, not an EIS] for improvements at the Albuquerque Municipal Airport concluded that an [sic] runway extensions with up to 150 vertical feet of fill required – closely comparable to the Preferred Alternative for Sea-Tac – was impractical.

Response 2-R misinterpreted the foregoing language as raising a question about the feasibility of hauling the quantity of fill required, and as suggesting that an 8500 foot runway wasn't long enough.

What explanation can there be for such grotesque misinterpretations of plain English?

The simple fact is that the Albuquerque environmental assessment found that the proposed construction – closely comparable to that which is proposed here – was impractical. We quote from the assessment, prepared by Coffman Associates, Inc., for the airport operator, the City of Albuquerque, discussing the alternative of a new runway on fill: "[It] could require as much as 150 feet of fill over seventy to eighty percent of the runway length. This magnitude of earthwork is too significant to justify the development." The Response ignores that finding & suggests instead that the real reason for not proceeding with expansion at Albuquerque was that there was no need – which is not the issue. Indeed, it is irrelevant whether Albuquerque did or did not go forward with some other expansion scheme.

The question was: Is this earthwork practical? Of course you can haul any amount of dirt if you want to take the time and incur the expense. Again, that's not the issue: the issue raised in Comment 7(C)1-(c) is the practicality of the construction technique. Can a safe, useable all-purpose runway actually be built on 150 feet of fill? We asked. The Port & the FAA chose not to answer.

If it is suggested that our Comment was read as raising a question of cost-effectiveness (& perhaps it could be so read), then where is the discussion of cost-effectiveness in the Responses? No heading for this topic will be found in the (non-alphabetical) index, 2 fSEIS F-4 - F-6, yet comments on this topic were submitted.

Comment 7(C)-1(c). (In the first part of this comment, we suggested that no engineers have been involved in the planning for this massive fill

operation.) This was ignored. We ask again: Are there any engineers working on this? (And if so, who?)

Comment 7(C)-4, FAA/POS response 2-Q (What will happen when the capacity of the third runway is reached in a few years? What are the plans for a fourth runway?) The Response denies that the third runway will reach & exceed capacity in a few years, & fails to answer the inquiry about the fourth runway. The Response posits the third runway accommodating demand 'through the year 2030'. This response is at odds, we suggest, with common sense, all prior forecasts, & the main text of the fSEIS. We note the following: (1) The new official demand forecasts that are presented in Tables 1-1 and 1-2, 1 fSEIS 1-2 and 1-3 only extend to the year 2010, supposedly because of the problems in forecasting any further ahead; (2) the companion table, 2-2, at 1 fSEIS 2-3 presents forecasts only through the year 2010, for the same reason; (3) The text discussion of demand at 1 fSEIS 2-2 frankly concedes – a welcome though overdue concession – "Aviation demand forecasting is often incorrectly perceived as a science, where all variables are predictable and known. However, as is shown by comparing any forecast to conditions that actually occur during the period that was forecast, forecasting is more an art than a science. As a result, precise forecasting for specific future years, particularly more than 10 years in the future in the volatile air travel industry, is very difficult." (emphasis added); (4) unsurprisingly, the updated activity forecast presented in Table 2-5, 1 fSEIS 2-13 only extends to the year 2010; (5) impacts of the expansion proposal are forecasted in the fSEIS only to the year 2020 (see Appendix D, 2 fSEIS D-1 & seq., especially at p. D-2, stating that "year 2020 has been determined to not be reasonably foreseeable" (emphasis added). We can but agree with the fSEIS author(s) as to the difficulties of such forecasting. Six different official forecasts for the year 2010 range from about 400,000 annual operations (the Master Plan Update FEIS) to about 675,000 (1987 PSCOG draft EIS).

So, it is a mystery how, if demand cannot be forecast by the POS and FAA past the year 2010, the POS and FAA can then say that demand in the year 2030 will not exceed the capacity of the expanded airport. The matter becomes even more mysterious when one considers that the impossiblity of forecasting more than a few years ahead is advanced as an excuse for ignoring all adverse impacts of the project past

the year 2010. See our Comment 7(A)-1, and response 2-Q. Stripped of verbiage, response 2-Q asserts that the future impacts will be dealt with in environmental reviews of future master-plan updates, and don't matter anyway (because no specific year can be assigned to the date of the potential impact). The Response suffers from a serious methodological flaw. It assumes that future adverse impacts will be tied directly to "air traffic levels in excess of 600,000 annual operations". This assertion has been plucked out of thin air.

Careful comparison of the comment and the Response will show that the direct questions posed to FAA/POS were left unanswered.

While response 2-Q asserts that the fSEIS beginning at 1 fSEIS 2-25 "show[s] [that] ...the proposed Third Runway is anticipated to accommodate the forecast level of aviation demand well into the 21st century . ... the Third Runway would accommodate demand through the year 2030", in fact, the materials beginning at p. 2-25 do not support the interpretation placed on them in Appendix D. The discussion deals with three different issues. The relevant discussion is found in section (A), "Airfield capability with a third parallel runway" (meaning the particular third runway under discussion). The entire discussion of airfield capacity beyond the year 2010 is found in two sentences. The first posits a Theoretical Maximum Capacity at 600,000 to 630,000 annual operations (emphasis added). The second says this would likely occur after year 2030 "[u]sing a linear extension of the updated forecasts". A linear extension? A **straight-line** extension?!? Surely if anything is clear from Sea-Tac Airport's history it is that at no time (at least since deregulation) has the level of operations grown on a straight-line basis. See, e.g., Exhibits 2-4 and 2-5, 1 fSEIS 2-16. Indeed, straight-line growth is the least likely forecast of growth rate that could be made. (Further, we question how a linear extension is to be plotted, for the newest forecasts do not yield a straight line from 1995 through 2010.)

Further, the discussion at Response 2-Q (2 fSEIS F-35) and at p. 2-25 of the main text is fatally flawed by its reliance on "theoretical maximum capacity" as the test of airfield overload. This is described elsewhere (1 fSEIS 2-9) as "an extreme capacity" – meaning grossly excessive levels of delay. The ostensible purpose of the third runway is to prevent delay (however defined) from reaching levels deemed "unacceptable" Surely,

grossly-excessive delays, operations at "extreme capacity", are "unacceptable". The response suggests that if average delays are no greater than 20 minutes, then the third runway has not exceeded its appropriate capacity. Sea-Tac reached a delay figure of 7.7 minutes when annual operations reached 345,000 (Table 2-4, 1 fSEIS 2-8), and for purposes of justifying a third runway, that amount of delay is deemed unacceptable. We are still waiting for a clear explanation of how much delay, & of what sort, is or is not acceptable. Apparently slight delay justifies a third runway but gross delays after that runway is built are of no concern.

While the official papers (such as the FEIS and the fSEIS) are extraordinarily obscure on the point, it seems possible that the unacceptable level of delay is the "severely congested" level as defined in the NPIAS: Sea-Tac has reached that level now (see Exhibit 2-2, 1 fSEIS 2-9) and now is the time that a replacement runway is said to be needed to fix "delay". Exhibit 2-7, 1 fSEIS 2-28, shows the airport reaching the same level of unacceptable delay at a level of 530,000 or 535,000 annual operations. Our extrapolation shows that level being reached shortly after the year 2020 (not after 2030). Another, more likely, definition of "unacceptable" level of delay may be the "practical capacity" of the airport, also as defined by the NPIAS. Under that measure, Sea-Tac is in trouble at 350,000 operations per annum (which the fSEIS seems to support). See Exhibit 2-2. The new Sea-Tac by that measure will have outgrown itself at about 445,000 operations per year (see Exhibit 2-7), or the year 2005 (see Table 2-6, 1 fSEIS 2-14). The year 2005 is the projected first year of operation of the new runway, per Table 22-7, 1 fSEIS 2-22.

All efforts to understand these issues are complicated by the unwillingness of the project's proponents to settle on one definition of "delay", to apply that (or any) definition consistently throughout discussion of all the various aspects of this issue, to apply that (or any) definition, to the poor-weather delays, and to interpret the delay figures, and the need for expansion, to the poor-weather conditions that supposedly drive the proponents' zeal for the project. Instead, the proponents flash annual operations numbers (whereas the only relevant operations number would be annual operations during curable poor-weather conditions), ill-defined delay figures, which muddle in good-weather numbers with poor-weather numbers, and otherwise provide confusion where clarity is essential.

Useful-life issues were also raised in our Comment 4-8, which can properly be discussed here, out of order, so as to present all discussion of this general problem together. In that comment, we asked for "total amount of costs of the project, including capital costs, mitigation costs,, a well as accrued financing and amortization costs". We also asked for "the cost per year of the runway's useful life" (pointing to the NPIAS service levels mentioned above), and we also sought "an analysis which derives the rate of return on investment" for the project. Only an updated raw-cost number for the nominal cost of the third runway and a grossly inaccurate & understated figure of $1.6 billion for all Master Plan Update features were provided. (Where DID they come up with that $1.6 billion number?) The response to Comment 4-8 totally ignores the useful-life issue. As to the cost-benefit ratio, readers are referred to "the Final EIS and Supplemental EIS .[which] presents the costs/impacts and benefits of the proposed Master Plan Update Improvements" Where? In the absence of any genuine index to the FEIS and to the fSEIS main text, one would turn to the tables of contents to find these materials. These subjects are not referred to in the tables of contents. We asked to be provided with them. They were not provided, and if they exist at all, they are lost in the murky depths of the hundreds of pages of the main texts of two different documents. If this isn't an evasion,.what is it?

We stand by our original conclusion: using the same levels of delay that supposedly justify (require) construction of the third runway, that runway will need to be supplemented somehow or other on the hypothetical day in 2005 that it becomes operational. The FEIS and fSEIS themselves show that by the assessment techniques used to justify a third runway, the new runway will be obsolete when opened and 'way over capacity almost immediately thereafter.

Comments 7(D)-(1) , -(2), and -(3). (Important documents were 'incorporated by reference' in the dSEIS, which means that they were NOT actually in the document.) (Response 1-I) Apparently, the only copy of each such document was hidden away in Dennis Ossenkop's office at the new FAA facility in Renton (of all places), and it was expected that everyone (including the Port Commissioners) wishing to work with such documents would have to do so at Mr Ossenkop's workplace -- if they were fortunate enough to know that the documents were lodged there. It's

probably a good thing that the public did not know that Mr Ossenkop's work space was also a library, for we would have falling all over each other, trying to use the materials in that cramped space. If the document is important enough to 'incorporate' in the SEIS, it should actually BE in the SEIS, where people can actually read & use it. This stricture of course does not apply to standard works in the literature that are available through normal channels. It is one of the problems of the airport-expansion business that it relies on non-standard publications, which are not available in public libraries, are not commercially published, are not even GPO documents -- they are, in effect, unpublished in-house documents, proprietary to particular airports, consultants, or agencies. It is hard to locate such obscure publications (just as it is hard to give them credibility). It is hard to take seriously the 'public' part of the environmental review process, when the base materials are so difficult to find, so tightly held by a handful of insiders, &, in fact, so lacking in the normal indicia of reliability (publication in recognized journals or by recognized publishing houses, peer review, identification of the author(s), adherence to normal documentation practices).

(Comments on air-quality issues discussed in the DEIS were submitted in considerable number. The responses to those comments were published in Appendix R of the FEIS along with all the other comments on all other aspects of the DEIS. The dSEIS deals with some of those issues by incorporating Appendix R in its entirety -- "by reference".) But there was (& is) no index to Appendix R; the air-quality comments and responses are scattered throughout the Appendix; & the reader has no way of knowing what is supposedly included in the dSEIS by the off-hand reference to an Appendix. No reasonable person would suppose that a reader (if lucky enough to receive a copy of that Appendix -- many commenters did not) would work through the two-hundred-plus pages of Appendix R, trying to glean what the FAA/POS team thought was relevant for the SEIS. This problem was not addressed in the response (1-I) & to this day, readers still do not know what particular responses were referenced.

Comment 7(D)-4 and Comment 7(D)-5: Response 4-A (the comment addressed the failure of the dSEIS to study cumulative impacts

of other projects known to be planned for the immediate Sea-Tac area, taken together with impacts from the MPU projects. We asked that the various projects be identified specifically, "one by one" [7(D)-4(a)], and the present state of planning for each set forth. We asked if it were not true that ranges of possible impacts for the projects could be forecasted and considered.) The Response misleadingly says that an analysis of cumulative impacts was provided in the FEIS and fSEIS. One would not know it from the Response, but ch. 4, section 4 of the fSEIS ("Cumulative Impacts"), while indeed listing seven projects in the area, provides no details as to the state of planning for any save the Des Moines Creek Technology Campus, which seems to have stalled, if one reads the text correctly. However, the actual impacts of these projects are in fact NOT discussed in the "Cumulative Impacts" section or in the formal response in Appendix F. This is a very serious non-response. We will be calling specific attention to it in our discussions with parties litigating with the Port and FAA about the environmental-review process.

Comment 8(E) (Hearing on March 4 was scheduled for maximally inconvenient time & place). The response (1-A) was that this maximally inconvenient time & place were selected to make it possible for people working various shifts to attend, which is absurd.

Part IV: Conclusions

Summary

Our review of the fSEIS & the official responses to our prior comments leads to the conclusion that the fSEIS, like the earlier environmental-review papers in this series, does not meet the burden placed by law upon the proponents – to present a full, fair, dispassionate environmental review, containing an accurate & complete project description, a valid statement of the need (with full cost/benefit analysis), a discussion of alternatives (whether preferred or sponsored by the proponents or not), & a full, comprehensible description of possible adverse impacts together with proposed measures of mitigation of those impacts, recognizing any impacts that cannot be mitigated.

The fundamental flaws hither to seen in the dEIS, FEIS, & dSEIS persist in the fSEIS. None of these documents, and not all of them taken together, provide an accurate or reliable survey of the important environmental impacts that can reasonably be expected to occur during construction or during operation. Impacts having been analyzed incompletely, mitigation measures suggested in the FEIS & fSEIS are also insufficient. The 'Purpose & Need' statement remains inadequate in terms of need (from a transportation-planning perspective) & in terms of cost effectiveness. Conflicting projections of future usage of the Airport are presented, casting doubt on all such projections & on the conclusions drawn from them as to future impacts, necessary mitigation, future benefits, & useful life of the proposed improvements.

Construction impacts

Construction impacts are understated. Important details remain unaddressed. The mitigation proposals for built-up areas are vague & inadequate. Most of the RCAA comments on this subject, aimed at inducing the proponents to provide sufficient detail so that the impacts could be assessed independently, were ignored. So much is left out that a further environmental review will surely be necessary when the proponents settle on routes & methods for hauling fill. Of all the areas where mitigation needs examination in this project, more is known about, & more mitigation techniques exist for, large-scale construction than any other. It is particularly odd that the proponents have so little grasp of the damage that massive dirt-hauling will have on freeways and city streets around the Airport.

Air-quality concerns

In their responses to our comments, the proponents announced their refusal to consider two major regulatory air-quality changes that are in the pipeline – greater restrictions on ozone emissions and on particulates.

The focus of the air-quality work reported in the FEIS and fSEIS has been modelling of ground-traffic air pollution. This provides masses of impressive but not particularly valuable table in EISes, but does not deal

with pollution from aircraft. The implications for human health from aircraft-generated pollution are significant, but ignored by the proponents

Noise issues.

The noise data presented in the fSEIS are incomplete.
The noise data presented in the fSEIS are unreliable.
The noise data presented in the fSEIS are inadequate.
The forecasts of future impacts from the third runway are therefore unreliable.

Much more adequate, complete, & reliable noise data, & impact estimates, could have been presented in the fSEIS had our suggestions, found in Part III of our comments, been heeded.

Despite the ready availability of more adequate integrated noise models (INM) for use in producing charts & contour maps of noise levels, & our request (Comment 3-4)) that the most recent version of the INM be used, the fSEIS continued to use the outdated INM ver. 4.11. The fSEIS does not present data for all of the relevant LDN levels, leaving out, as it does, 55, and the intervals above 75. Data are not presented for noise metrics other than the outmoded 65 LDN (annual average with unequal treatment of night-time noise). The estimates of future noise impacts lack credibility because they are prepared on the sole basis of contour maps of the 65 LDN noise metric; the maps themselves, no matter how colorful, are not credible because the computer-modelling program used to prepare them is not the state-of-the-art program. As used at Sea-Tac, the older computer-modelling program is known to understate 65-LDN noise systematically. In short, the specious tables and contour maps in section 5-3 of the fSEIS rest on flawed assumptions & fail to present an accurate picture of future (or present) noise levels.

It is difficult to understand the choices made by the POS & FAA in estimating future noise impacts without imputing unworthy motives: from our comments, from the Expert Arbitration Panel's final order on noise issues, from a host of citizen and local-government comments, from

advisory materials from the US EPA, from other sources, the third-runway proponents were well aware that their noise-measuring techniques were substandard. In addition, they have systematically ignored the FAA's own official position on remediation of noise impacts in areas outside 65 LDN contour lines (areas receiving less noise per that metric). Each questionable choice made in this work was always in the direction of understating the noise experienced on the ground.

Any independent efforts to replicate the work, either with INM ver. 4.11 or ver. 5.0 were blocked by the refusal to provide a statement of the assumptions used by the the FAA/POS team in processing data from the Port's noise monitors. Only now, far too late in the process, is it claimed that those assumptions are available – somewhere undefined.

In consequence of the flaws in the noise-modelling work, the mitigation suggested by the fSEIS is without valid basis, & is certainly insufficient. The proponents' mitigation program suffers two more, equally fatal, flaws. (1) it is generally limited to work that can be funded in whole or part by the FAA under the so-called Part 150 program. (Requests in our comments for details of spending of non-FAA funds by the Port were ignored.); (2) then the limitations of the Part 150 program were once again misapplied, with the result of excluding possible (& in our view, essential) mitigation with Federal funds outside the questionably-drawn 65 contours.

Wetlands & water quality

It is hard to believe that the proponents can be so indifferent to the water-quality implications of this project, or so unresponsive to sensible comments. Fortunately, the water-quality issues are not resolvable by the say-so of either the FAA or the POS. Fortunately, also, the proponents are now thoroughly of record as providing inconsistent information to various participants.

Socio-economic effects

One can understand the reluctance of the proponents of Sea-Tac expansion to deal realistically with socio-economic effects, or comments relating thereo, especially if based on the recent H-O-K study. If one were to take the official position, including responses to comments, as a true indication of the state of mind of the responsible officials in the expansion camp, one would have to conclude that there is absolutely no comprehension of the problems that the third runway will cause. But it is obvious to the discerning reader that the H-O-K study has much exercised the minds of those whose task it is to move this project through the environmental review without damaging its prospects. The responses & non-responses to our comments on this general subject clearly show that there are no significant objections to the methodology or results of the H-O-K study – but also no disposition to do realistic assays of probable socio-economic impacts or of measures to mitigate them. The indifference to the plight of the Highline schools is noteworthy. Fortunately, wiser heads are prevailing at higher levels, and the Port Commissioners are now willing to enter into serious negotiations with the School District. But still unfaced are the major issues of property devaluation, consequent loss of tax base, change in demographic profiles, and the like. Our comments on this point brought forth responses (& non-responses) demonstrating the unwillingness of the proponents to face up to these issues.

Alternatives – still ignored

Our comments & the responses to them demonstrate that the proponents are still unwilling to look at obvious alternatives in a comprehending way. A five-year delay in the third runway going operational poses many opportunities for implementation of alternative measures that have a good potential for obviating the need (if there is indeed a need) for many years to come.

Planning horizon

The proponents are unable to explain how they choose a near-term planning horizon for expansion but a far-term one for mitigation, especially in the face of instructions from higher authorities to go long-term. A far-term horizon, of course, sweeps more negative impacts into the equation. The short-sighted planning horizon renders it possible to pretend that the third runway has a long useful life – one just doesn't look far enough ahead to see the day of obsolescence. The risk is that with this approach the planning horizon will soon have to be closer in time than the start of construction!

Cost

The proponents are working hard to avoid giving an understandable, factual cost/benefits analysis, no matter how often we ask for it. Their use of "delay" as the driving factor suffers (or benefits) from constant shifting from one definition of delay to another (or no definition at all on some occasions), a practice that they fail to correct, despite comments on the matter. Cost justifications are cloaked in a second numbers game, using one level of operations to show unacceptable delay that mandates a third runway, but a much higher level of operations to show unacceptable delay that would render the third runway obsolete – exceeding capacity. The reluctance to deal forthrightly with our comments on these matters exposes the unreliability of the rudimentary cost/benefit justification.

Washington State Senate

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33rd Legislative District

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June 23, 1997

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REC'D ANM-610
PLAN; PGM. & CAP BR
JUN 24 1997
ANM-6[illegible]

Mr. Dennis Ossenkop
Federal Aviation Administration
Northwest Mountain Region
1601 Lind Avenue S.W.
Renton, WA 98055-4056

Ms. Barbara Hinkle
Health, Safety, and Environmental Management
Port of Seattle
P. O. Box 68727
Seattle, WA 98168

Re: Comment on the Final Supplemental Environmental Impact Statement for the Proposed Master Plan Update Development Actions at Seattle-Tacoma International Airport

Dear Mr. Ossenkop and Ms. Hinkle:

On behalf of my constituents in the 33rd Legislative District, which includes a large portion of the affected area, I would like to express my concerns regarding the Final Supplemental Environmental Impact Statement (Final SEIS) for the Proposed Master Plan Update Development Actions at Sea-Tac Airport. This mammoth project, if ever completed, will destroy the very character and nature of the communities that I represent.

The final SEIS does not fully analyze the significant environmental impacts of the third runway and other Master Plan Update development actions. It does not examine the real impacts on the local and regional roads, on schools and on the community of thousands of daily truck trips transporting millions of cubic yards of fill dirt six days a week for at least five years. This will be extemely disruptive to the local communities and businesses; and the schools, whose buses must compete for space with these trucks to safely transport its students.

The impacts of noise on the community are not completely analyzed. It is difficult for even a lay person to swallow the idea that although operations will increase, that noise from the airport will continue to decrease. The Expert Arbitration Panel on Noise stated in its Final Decision that any reductions in noise that have already been achieved will be erased and noise will increase with increasing operations at the airport.

It is also difficult to accept that with increasing operations the number of major air pollutants will decrease, that water quality will not be affected by a large increase of storm water runoff resulting from the addition of many acres of new paved, impervious surfaces. The Final SEIS ignores completely the concerns of the communities of the loss of wetlands and the effect on the Des Moines and Miller Creek drainage basin.

I am extremely concerned that the Final SEIS did not address reasonable mitigation for the affected communities. The state of Washington recently sponsored and funded a year-long study of mitigation measures necessary to address the adverse impacts of the expansion of Sea-Tac Airport. This study shows the mitigation costs to be almost # Billion, and the study is not complete. It does not include the City of SeaTac and surrounding impacted unincorporated areas, nor does it contain a complete tally of the costs. When completed, the mitigation study will show costs much greater than $3 Billion.

This project will have a devastating impact on the Airport's surrounding communities. These communities have waited 25 years for mitigation from the second runway, and are extremely concerned that they will have to wait another 25 years for mitigation from the third runway. I sincerely hope that the FAA and the Port will address the concerns that I hold and that my constituents hold in the development of a third runway and other actions at the Airport.

Sincerely,

Julia Patterson

Julia Patterson
State Senator
33rd District

APPENDIX E

APPENDIX E

COMMENTS ON THE FINAL AIR CONFORMITY ANALYSIS.

This appendix of the Record of Decision (ROD) summarizes the comments received concerning the *Final Supplemental Environmental Impact Statement for Proposed Master Plan Update Development Actions at Seattle-Tacoma International Airport* dated May 13, 1997, including the Final Conformity Analysis. Letters numbered A-1 through A-10 reflect comments received concerning the air quality analysis and the Final Conformity Analysis. Appendix D contains responses to comments received concerning non-air quality related issues.

A-1 **State Representative Rod Blalock**, P.O. Box 40600, Olympia, WA 98504-0600 May 27, 1997

1. Construction emissions violate the de minimis threshold for NOx. No mitigation is provided nor is there a mention of the violation.

Response: The conformity analysis presented in the Final Supplemental EIS reflects the requisite analysis mandated by the Clean Air Act general conformity regulations. As this analysis shows, construction activity will generate emissions while the proposed improvements will result in a reduction in air emissions. While construction related emissions were examined, by regulation they cannot be considered in isolation of other project impacts. As required, the air quality evaluation must consider all direct and indirect emissions, and thus requires that the project identify increases in emissions from the project as well as air emission reduction benefits.

2. Measurements per the Memorandum of Agreement (MOA) are not complete, and should be complete "before the Final Conformity Analysis is approved."

Response: While existing conditions are of interest in understanding the context of future conditions, those conditions are not relevant to the conformity analysis. The conformity analysis was based on modeling that uses conservative assumptions to predict worst case conditions. The monitoring that has been conducted to date under the MOA confirms that the modeling results substantially overpredict air pollutant concentrations. See also letters numbered A-7 through A-9 from the U.S Environmental Protection Agency (US EPA), Puget Sound Air Pollution Control Agency (PSAPCA), and Department of Ecology (Ecology) concerning the adequacy of the conformity analysis. The three regulatory agencies with jurisdiction over air issues (US EPA, DOE and PSAPCA) have agreed that the de minimis finding was adequately supported.

A-2 **State Representative Karen Keiser**, P.O. Box 40600, Olympia, WA 98504-0600 June 16, 1997

The commentor suggested that "The Final Conformity Analysis should be delayed" and should include the following be incorporate in the Final Conformity Analysis:

1. "Complete study efforts to address Nitrogen Oxides and ground level residue/particulates from jet fuel and other toxic substances."

Response: As noted in Final Supplemental EIS Appendix B, the Port of Seattle has entered into a Memorandum of Agreement to measure existing air pollutant conditions in the vicinity of Sea-Tac Airport. During the winter 1996/97, measurements of Carbon Monoxide were completed showing concentrations to be less than the ambient air quality standards. During 1997/98 measurements of NOx and particulates will be conducted. While existing conditions are of interest in understanding the context of future conditions, those conditions are not relevant to the conformity analysis.

2. "Provide a clearly defined mitigation plan for" mitigation for construction emissions that exceed the de minimis.

The conformity analysis presented in the Final Supplemental EIS reflects the requisite analysis mandated by the Clean Air Act general conformity regulations. While construction related emissions were examined, by regulation they can not be considered in isolation of other project impacts. As required, the air quality evaluation must consider all direct and indirect emissions. Because the de minimis levels are not exceeded, and because the pollutant concentrations "With Project" are either less than the standard, or for modeled exceedances, the "With Project" concentrations are less than the Do-Nothing, no mitigation is required. See also letters numbered A-7 through A-9 from the U.S EPA, Puget Sound Air Pollution Control Agency (PSAPCA), and Department of Ecology concerning the adequacy of the conformity analysis.

A-3 **Cutler & Stanfield**, June 20, 1997

1. "FAA has fixed only the most obvious errors in data input. More extensive and far-reaching flaws in the analysis, identified by the ACC and other commentors, were left unchanged" (Pg 2)

   Response: The air quality and conformity analysis presented in the Final Supplemental EIS reflect revisions based on issues raised with the Draft Supplemental EIS analysis. Comments on the Draft Supplemental EIS identified issues which were corrected, and also raised questions concerning appropriate and correct analysis data. Appendix F of the Final EIS responds to those issues.

2. "The Final Conformity Determination achieves this anomalous result in large part by offsetting increases in emissions associated with expansion of the airfield with decreases attributable to landside improvements -- particularly expansion and upgrading of parking and terminal access roads." (Pg 2)

Response: The conformity analysis presented in the Final Supplemental EIS reflects the requisite analysis mandated by the Clean Air Act general conformity regulations. As required, the air quality evaluation must consider all direct and indirect emissions.

3. "... the FAA opted to rely on the admittedly inaccurate modeling results already available. According to FAA, the omission of construction equipment is canceled out by the previous overestimate of truck emissions from haul activities. The Final Conformity Determination is based on this conjecture, without any attempt to verify its validity.... In short, the air quality analysis of construction impacts remains fundamentally flawed, and should not serve as the basis for a conformity determination." (Pg 3)

   Response: Issues associated with the evaluation of construction emissions are addressed in the Final Supplemental EIS, Appendix B and Appendix F.

4. "Neither the FAA nor its consultants have yet produced an explanation for their assertion that aircraft emissions of nitrogen oxides (NOx) will decline even as operations increase. This result defies common sense as well as basic scientific principles." (Pg 4)

   Response: See response to comments 6-Q and 10-Q in Appendix F of the Final Supplemental EIS.

5. "By arbitrarily confining its analysis to a 13-year planning horizon, the Final Conformity Determination fails to comply with the Clean Air Act requirements that air quality impacts be evaluated for the year in which direct and indirect emissions will be the greatest." (Pg 4)

   Response: The Clean Air Act requires the consideration of reasonably foreseeable emissions. As has been documented in the Final Supplemental EIS, emissions beyond 2010 are not reasonably foreseeable. While emissions were determined to be reasonably unforeseeable beyond 2010, Appendix D of the Final Supplemental EIS examined alternative forecasts and considered impacts post 2010. Appendix B of the Final Supplemental EIS presents the analysis of greatest year emissions.

A-4 **Debi DesMarais , CASE**, 19900 - 4th Avenue SW, Normandy Park, WA 98166 June 20, 1997

1. Commentor indicated that it is not clear what changes were made in issuing the FSEIS - more detail is requested.

   Response: A detailed listing of all changes made in the air quality analysis is provided in the Final Supplemental EIS in Appendix B, Attachment E. As was noted in Appendix B, a more detailed listing of the changes is available for public review in the FAA reference documents.

2. Commentor noted that no changes were made to the main text, despite numerous questions. Concerns with the responses relate to:
   - Increase in peak hour departures
   - 2,500 ft separation between runways be modeled -- FAA used same time and distance data in the Do-Nothing and With Project
   - modeling has not included dual simultaneous departure capability
   - Emissions from SASA not included
   - Cumulative impact analysis was not completed

- Concerns with particulate emissions
- State conformity rule was ignored
- Requested all reasonably foreseeable emissions
- Aircraft activity levels and NOx emissions
- Conduct a transportation and general conformity determination for CO, O3, and PM
- Prepare and present a mitigation strategy

Response: Each of the issues raised by this commentor have been addressed in responses to comments in Final EIS, Volume 4 Appendix R (see response to comments R-10-1 through R-10-68) and Final Supplemental EIS Volume 2 Appendix B and Appendix F (responses 6-A through 6-AB). Based on the issue and the responses noted, only appropriate changes were made to the main air quality text in either Chapter IV of the Final EIS or Section 5-2 of the Final Supplemental EIS.

A-5 **A. Brown**, 239 SW 189th Place, Seattle, WA 98166 June 23, 1997

1. Commented that the models are grossly inadequate and that the analysis is invalid.

   Response: The models used in the air quality conformity analysis are EPA approved models. As noted in the Final Supplemental EIS and conformity analysis, these models are conservative and are intended to predict worst case conditions. Recent monitoring experience for Carbon Monoxide confirms that the models used significantly overpredict actual concentrations. See also letters numbered A-7 through A-9 from the U.S EPA, Puget Sound Air Pollution Control Agency (PSAPCA), and Department of Ecology concerning the adequacy of the conformity analysis.

2. "It did not provide substantive answers to substantive questions."

   Response: Final EIS Appendix R and Final Supplemental EIS contain detailed responses to comments concerning air quality issues.

3. ".. the costs, and the amount of fill continue to escalate while the probable useful life of the 'Third' runway dwindles to zero."

   Response: All comments concerning the cost of the project, amount of fill, and the useful life of the project were responded to in the Final Supplemental EIS, Appendix F.

4. "The air pollution estimates need to consider the pollution from construction traffic, mining and road repair based on the real amount of fill that's needed ...."

   Response: The conformity analysis presented in the Final Supplemental EIS reflects the requisite analysis mandated by the Clean Air Act general conformity regulations. As required, the air quality evaluation considered all direct and indirect emissions, including construction and fill related activity.

5. "The SEIS conclusions defy physics and are inconsistent with the area's wind patterns."

Response: The conformity analysis presented in the Final Supplemental EIS reflects the requisite analysis mandated by the Clean Air Act general conformity regulations. The technical analysis was developed in consultation with local air agencies and has been approved by the agencies with jurisdiction over air quality (US EPA, DOE, PSAPCA). As required, the air quality evaluation considered all direct and indirect emissions. In accordance with EPA modeling guidelines, the worst case concentrations were identified based on an examination of historic wind conditions.

6. "A realistic cumulative air pollution impact assessment using theoretical capacity operations is needed."

Response: The conformity analysis presented in the Final Supplemental EIS reflects the requisite analysis mandated by the Clean Air Act general conformity regulations. As required, the air quality evaluation considered all direct and indirect emissions.

A-6 **Marie Feckley**, 15721 - 4th Ave. SW, Burien, WA 98166

1. Commentor questioned that the predominant air pollution source in the Airport area is surface transportation vehicles.

Response: See response to comment R-10-5 in Appendix R of the Final EIS. As is shown, based on an equivalent distance traveled, automobiles create greater emissions.

2. Commentor noted that an airline is instituting penalties for their flights that are late and that Sea-Tac is recognized for low-visibility. She indicated that this "should be reasons to be considered for not adding another runway..."

Response: The commentor noted that United Airlines was beginning a practice of canceling seat assignments on flights were passengers do not check-in within 20 minutes before departure and that TWA had announced awarding passengers extra frequent flyer mileage for late flights. While Sea-Tac has been recognized for its low-visibility operating capability, this capability relates to the ability to safely move aircraft while on the ground. These factors would not obviate the need for a Third Runway at Sea-Tac, as they would not alter the poor weather single arrival constraint.

A-7 **Dennis McLerran, PSAPCA**, June 23, 1997

- "PSAPCA finds that the emission inventory data and analysis provided in the FSEIS, including the associated air quality technical memoranda, provide a sufficient technical basis to conclude that the de-minimis threshold will not be exceeded."

Response: Comments acknowledged.

- In that the project sponsors conducted a conformity determination that was not legally required anyway, PSAPCA notes that the FSEIS charts and figures concerning carbon

monoxide ... should be clearly labeled as 'modeled' concentration data to avoid confusion with CO levels recently monitored to be within the federal standard in the Sea-Tac area."

Response: Comment acknowledged.

A-8 **Joseph Williams, DOE**, June 23, 1997

- "Ecology has reviewed and concurs with the final Conformity conclusion contained in the FSEIS that the project will not result in emissions that would equal or exceed the applicable de minimis threshold rates, nor be considered regionally significant with regard to air pollutant emissions, and that it is consistent with the State Implementation Plan (SIP) for air quality."

Response: Comment acknowledged.

A-9 **Anita Frankel, US. EPA**, June 23, 1997

- "Based on our review of the FSEIS, our concerns have now been adequately addressed and the de minimis thresholds have not been exceeded for general conformity under the CAA."

Response: Comment acknowledged.

A-10 **Julia Patterson, State Senate**, P.O. Box 40482, Olympia, WA ,June 23, 1997

1. "It is quite illogical to state, however, that moving millions of cubic yards of fill dirt by double dump trucks for five years and the construction equipment needed to place the fill dirt will not impact the air quality in and around the airport."

Response: The conformity analysis presented in the Final Supplemental EIS reflects the requisite analysis mandated by the Clean Air Act general conformity regulations. While construction related emissions were examined, by regulation they can not be considered in isolation of other project impacts. As required, the air quality evaluation must consider all direct and indirect emissions, and included projected construction emissions. Because the de minimis levels are not exceeded, and because the pollutant concentrations "With Project" are either less than the standard, or for modeled exceedances, the "With Project" concentrations are less than the Do-Nothing, no mitigation is required. See also letters numbered A-7 through A-9 from the U.S EPA, Puget Sound Air Pollution Control Agency (PSAPCA), and Department of Ecology concerning the adequacy of the conformity analysis.

2. "I find it hard to believe that the dramatic increase in operations at the Airport will not impact air quality."

Response: The conformity analysis presented in the Final Supplemental EIS reflects the requisite analysis mandated by the Clean Air Act general conformity regulations. As required,

the air quality evaluation considered all direct and indirect emissions, including a detailed evaluation of traffic related emissions under the "With Project" and Do-Nothing alternatives.

3. "By cutting off the analysis at 2010, even through operations are expected to increase beyond the 2010 projected level and surface traffic will increase accordingly, the FAA will force the Puget Sound Region into non-attainment and worsen air quality."

Response: As is noted in the Final Supplemental EIS, forecasting demand beyond year 2010 presents such uncertainties concerning activity, and the context in which the Airport will operate, that these projections would have little meaning. With the exception of aircraft noise exposure impacts, Federal and state regulations will require that significant adverse impacts not occur in future time frames. As is shown in Appendix D of the Final Supplemental EIS, while emissions are not reasonably foreseeable beyond 2010, the generalized analysis indicates that emissions post 2010 would not likely result in significant adverse impact. Recognizing the issues associated with aircraft noise, the FAA is requiring a future assessment of noise, as documented in Section V.D of the ROD.

STATE REPRESENTATIVE
33rd DISTRICT
ROD BLALOCK

State of Washington
House of Representatives

TRANSPORTATION POLICY & BUDGET
ASSISTANT RANKING MINORITY MEMBER
CRIMINAL JUSTICE & CORRECTIONS

May 27, 1997

A-1

Mr. Dennis Ossenkop
ANM-611
FAA Northwest Region
Room 540
1601 Lind Ave. SW
Renton, WA 98055-4056

Dear Mr. Ossenkop:

I am writing to comment on the Final Conformity Analysis for air quality for the proposed Master Plan Update Development Actions at Seattle-Tacoma International Airport.

Two concerns with the Final Conformity Analysis are detailed below.

1.) Appendix B, Attachment E-3 of the Final SEIS contains a chart listing the projected construction emissions for CO, NOx and VOCs for four alternatives. The two most likely alternatives, Alternative A and Alternative C, both contain violations of the *de minimis* threshold for NOx. No mitigation plan is listed for this violation, nor is there any mention of efforts to avoid a violation.

2.) The Memorandum of Agreement between the Port of Seattle, Department of Ecology and Puget Sound Pollution Control Agency for an Air Quality Monitoring Program is not complete. Only the first part of the study dealing with CO is complete. No action has been taken on the remainder of the study dealing with NOx, Ground level residue deposition associated with aircraft fuel and Ground level residue-related toxic substances. It is my understanding that the Port of Seattle has not yet released the money to complete this study.

I believe a mitigation plan for the *de minimis* violations for NOx and completion of the Memorandum of Agreement on Air Quality Monitoring Program are necessary before the Final Conformity Analysis is approved.

Respectfully Yours,

LEGISLATIVE OFFICE: 322 JOHN L. O'BRIEN BUILDING, PO BOX 40600, OLYMPIA, WA 98504-0600 • (360) 786-7834
HOTLINE DURING SESSION: 1-800-562-6000 • TDD: 1-800-635-9993
HOME PHONE: (206) 824-3541

Rod Blalock
State Representative
33rd District, Position 1

cc: U.S. Congressman Adam Smith
Sen. Julia Patterson
Ms. Debi DesMarais, RCAA
Ken Reid, ACC
Joseph R. Williams, Air Quality Program, DOE
Dennis J. McLerran, Puget Sound Air Pollution Control Authority
Chuck Clarke, United States Environmental Protection Agency

STATE REPRESENTATIVE
33rd DISTRICT
KAREN KEISER

June 16, 1997

State of
Washington
House of
Representatives

APPROPRIATIONS
EDUCATION
FINANCIAL INSTITUTIONS
& INSURANCE

A-2

Mr. Dennis Ossenkop
ANM-611
FAA Northwest Region, Room 540
1601 Lind Ave. S.W.
Renton, WA 98055-4056

REC'D
PLAN; PGM
JUN 18 1997
ANM-610

Dear Mr. Ossenkop:

I am requesting that the following suggestions be incorporated into the Final Conformity Analysis for air quality under the proposed Master Plan Update of Sea-Tac Airport.

The air quality testing conducted to date is inconclusive and incomplete in that it fails to provide remedies for the impacts of Nitrogen Oxides. I am requesting that the Port of Seattle, in conjunction with the Department of Ecology and Puget Sound Air Pollution Conrol Agency per its Memorandum of Agreement with these two agencies, take the following actions:

1) Complete study efforts to address Nitrogen Oxides and ground level residue/particulates from jet fuel and other toxic substances.

2) Provide a clearly defined mitigation plan for Alternative A and Alternative C which both exceed minimum thresholds for Nitrogen Oxides. The absence of a mitigation plan where the emissions exceed minimum thresholds is unacceptable.

The Final Conformity Analysis should be delayed until the completion and subsequent report is issued on these results.

Sincerely,

Karen Keiser
State Representative
33rd District

KLK:se

LEGISLATIVE OFFICE: 321 JOHN L. O'BRIEN BUILDING, PO BOX 40600, OLYMPIA, WA 98504-0600 • (360) 786-7868
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CUTLER & STANFIELD, L.L.P.
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A-3

ELIOT R. CUTLER
JEFFREY L. STANFIELD
SHEILA B. JONES
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PETER J. KIRSCH
BARRY CONATY
STEPHEN M. KAPLAN*
PAIGE E. REFFE
BYRON KEITH HUFFMAN, JR.
SARAH M. ROCKWELL*
KATHERINE S. ANDRUS
MARC R. BRUNER
FRANÇOISE M. CARRIER
CHRISTOPHER M. KAMPER*
WILLIAM G. MALLEY
DANA C. NIFOSI
BARBARA PALEY
W. ERIC PILSK
TIM A. POHLE
JOHN E. PUTNAM
THOMAS B. ROTH
*NOT ADMITTED IN DC

June 20, 1997

VIA FACSIMILE TRANSMISSION

Mr. Dennis Ossenkop
Federal Aviation Administration
Northwest Mountain Region
Airports Division
1601 Lind Avenue, S.W.
Renton, Washington 98055-4056

Re: Comments of the Airport Communities Coalition on the FAA's Final Air Quality Conformity Determination for the Proposed Expansion of Seattle-Tacoma International Airport

Dear Mr. Ossenkop:

On behalf of the cities of Burien, Des Moines, Federal Way, Normandy Park and Tukwila, Washington and the Highline School District, individually and collectively as the Airport Communities Coalition (the "ACC"), we are submitting the following comments on the Federal Aviation Administration's final general conformity determination for the proposed expansion of Seattle-Tacoma International Airport ("Sea-Tac" or the "Airport").[1] As you are aware, the communities which make up the ACC are located in the immediate vicinity of the Airport and would be directly affected by this massive construction project which will, if

[1] Fed. Aviation Admin. and Port of Seattle, Final Supplemental Environmental Impact Statement for Proposed Master Plan Update Development Actions at Seattle-Tacoma International Airport ("FSEIS") (May 1997), Appendix B - Final Air Quality Conformity Determination.

approved, ultimately result in hundreds of thousands of additional aircraft operations and related surface traffic.

The ACC has submitted extensive comments on the air quality analysis previously prepared for this project.[2] We will not reiterate those comments. In light of the wholly unsatisfactory responses we have received to date from the FAA and the Port of Seattle, we emphasize that our previous criticisms remain in effect.

The Final Conformity Determination purports to have "corrected" the air quality analysis, and therefore claims to have addressed the concerns raised by comments on both the initial draft conformity determination and the March 1997 "revised" draft. In fact, even a cursory review of the "response" to comments reveals that the FAA has fixed only the most obvious errors in data input. More extensive and far-reaching flaws in the analysis, identified by the ACC and other commenters, were left unchanged. Not coincidentally, the corrections which the FAA and its consultants deigned to make did not disturb their implausible conclusion that the airport expansion will have only a *de minimis* impact on air quality in the Puget Sound region.

The Final Conformity Determination achieves this anomalous result in large part by offsetting increases in emissions associated with expansion of the airfield with decreases attributable to landside improvements – particularly the expansion and upgrading of parking and terminal access roads. In so doing, the FAA masks the environmental cost of the largest component of the Master Plan Development Actions – the construction of a third runway – and creates the false impression that this project would be environmentally beneficial in comparison with the "No-Action" scenario. In addition, the conclusions in the Final Conformity Determination are infected by the fundamental flaws discussed below.

A. The Final Conformity Determination Perpetuates Errors in the Analysis of Construction Impacts

The Final Conformity Determination trivializes the air quality impacts which will inevitably result from construction of the third runway by systematically underestimating the time and the equipment required to excavate, transport, and put in place more than 26 million

[2] These comments, and the expert reports appended thereto, are incorporated by reference in this letter. See Letter from Perry Rosen to Dennis Ossenkop re: Comments of the Airport Communities Coalition ("ACC") on the FAA's Updated Draft Air Quality Conformity Determination for the Proposed Expansion of Seattle-Tacoma International Airport (Mar. 1997); Letter from Perry Rosen to Dennis Ossenkop re: Comments of the Airport Communities Coalition ("ACC") on the FAA's Draft Clean Air Act General Conformity Determination for the Proposed Expansion of Seattle-Tacoma International Airport (Mar. 18, 1996); Letter from Thomas D. Roth to Dennis Ossenkop re: Additional Comments of the Airport Communities Coalition on the FAA's Draft Clean Air Act General Conformity Determination for the Proposed Expansion of Seattle-Tacoma International Airport (June 6, 1996).

cubic yards of dirt. The inadequacy of the FAA's analysis of air quality impacts was exposed by the U.S. Environmental Protection Agency, which called attention to the fact that emissions from construction equipment were not specifically identified and were therefore inappropriately excluded from the calculations of total emissions.[3] This omission is particularly significant because peak earth movement and construction haul activity for the third runway is projected to coincide with terminal and landside construction.[4]

Rather than correcting this error (and thereby risk changing the result of the previous analysis), the FAA opted to rely on the admittedly inaccurate modeling results already available. According to the FAA, the omission of construction equipment is canceled out by the previous overestimate of truck emissions from haul activities.[5] The Final Conformity Determination is based on this conjecture, without any attempt to verify its validity. Neither the Clean Air Act nor its implementing regulations allow this kind of guessing game to substitute for a scientific analysis of air quality impacts.

Furthermore, this *post hoc* justification rests on a number of suspect and entirely unsupported assumptions. First, it is not at all apparent that the scenario in "Case C" overestimates the number of trucks needed to transport dirt or the duration of the haul period.[6] Second, not all construction-related emissions are equivalent. Suggesting that emissions from on-road dump trucks are identical in kind and amount to off-road diesel construction equipment strains credulity. Third, the FAA's claim that Case C "reflects the highest emissions *of any case evaluated*" and therefore represents a worst case analysis[7] begs the question of whether the cases initially evaluated accurately represented the emissions likely to result from these activities. In short, the air quality analysis of construction impacts remains fundamentally flawed, and should not serve as the basis for a conformity determination.

---

[3] Letter from Chuck Clark, Regional Administrator, U.S. EPA Region X, to Dennis Ossenkop re: DSEIS for Sea-Tac Master Plan Update (Mar. 31, 1997) at 3.

[4] FSEIS, Appendix B at B-7.

[5] FSEIS, Appendix B at B-12 ("By substantially overestimating the fill related emissions, this case already incorporates worst case assumptions without specifically accounting for 'other construction' equipment.").

[6] See ACC. Comments on the Draft Supplemental Environmental Impact Statement (Mar. 31, 1997) at § 4.5.1.

[7] FSEIS, Appendix B at B-13 (emphasis added).

B. The Final Conformity Determination is Based on an Implausible Analysis of Aircraft Emissions

Neither the FAA nor its consultants have yet produced an explanation for their assertion that aircraft emissions of nitrogen oxides (NO_x) will decline even as operations increase. This result defies common sense as well as basic scientific principles. The FAA's response to comments raising this issue manages to evade the central paradox in its conformity determination.

First, the FAA acknowledged that, if aircraft operations were held constant, NO_x emissions would slightly increase due to noise reduction technology and more efficient combustion in newer aircraft.[1] Next, the FAA concedes that activity is not expected to remain constant, that it will in fact increase. The FAA then concedes that the time each aircraft can be expected to spend in landing, climbout and takeoff modes would be the same for both the "With Project" and the "Do-Nothing" alternatives.[2] Since NO_x emissions are produced primarily during take-off and climb-out, the inescapable conclusion is that any significant increase in operations under the "With Project" alternative would produce a corresponding increase in NO_x emissions. Yet the FAA continues to insist that an increase of 14,000 annual operations in 2010 will produce a decrease in NO_x emissions.

C. The Final Conformity Determination Ignores the True Extent of Air Quality Emissions Resulting from Construction of the Third Runway

By arbitrarily confining its analysis to a 13-year planning horizon, the Final Conformity Determination fails to comply with the Clean Air Act's requirement that air quality impacts be evaluated for the year in which direct and indirect emissions will be greatest. The FAA has acknowledged that operations will be constrained in the absence of airfield expansion, while with the third runway, operations are projected to continue to increase beyond 2010. It is entirely foreseeable that the third runway will be used beyond 2010, and it is self-evident that the gap between "No-Action" and "With Project" environmental impacts therefore will widen in the future. The FAA and the Port of Seattle have sought to minimize this gap by cutting off their analysis in the year 2010, and have attempted to assuage critics of this approach with vague promises to conduct additional planning and analysis in the future.[10] The reality is that once the runway is built, it will be difficult, if not impossible, for either the Port of Seattle or the FAA to limit the number of aircraft using the airport, and therefore nearly impossible to limit aircr

[1] FSEIS, Appendix F at F-84.

[2] FSEIS, Appendix F at F-84.

[10] See, e.g. Fed. Aviation Admin. and Port of Seattle, Draft Supplemental Environmental Impact Statement for Proposed Master Plan Update Development Actions at Seattle-Tacoma International Airport (Mar. 1997), Appendix D at D-1 to D-2.

emissions. This likely will occur in the face of increasingly strict air quality standards,[11] making it all the more difficult for the Puget Sound Region to maintain its hard-won maintenance status under the Clean Air Act. In failing to assess the long-term implications of this proposal for air quality in the region, the FAA has consigned the region to worsening air quality.

D. The FAA Cannot Approve the Sea-Tac Expansion Project Unless and Until a Legitimate Conformity Determination is Made

The Clean Air Act prohibits the FAA from "supporting in any way" a project unless it can determine that the project will not cause or contribute to violations of air quality standards.[12] The analysis conducted thus far, based as it is on faulty assumptions, unsupported hypotheses, artificially constrained predictions and unabashed guesswork, simply fails to prove that the direct and indirect emissions associated with the massive construction project and the increased number of passengers, automobiles and aircraft using an expanded airport will not be cause for concern. For the reasons stated here and in our previous comments, the FAA should refrain from approving this project until such a time as the conformity analysis can provide assurance that air quality will not inexorably worsen as a result of the FAA's actions.

Sincerely,

Perry M. Rosen

cc: Ms. Barbara Hinkle, Port of Seattle
EPA, Region X
Puget Sound Regional Council

[11] For example, U.S. EPA currently is engaged in rulemaking which would significantly tighten air quality standards for ozone and fine particulate matter. See 61 Fed. Reg. 65715.

[12] 42 U.S.C. § 7506(c).

June 20, 1997

A-4

NW Mountain Region FAA
Mr. Dennis Ossenkop
1601 Lind Avenue Southwest
Renton, WA 98055-4056

RE: Comments on the Final Supplemental Environmental Impact Statement and Air Quality Conformity Determination

Dear Mr. Ossenkop:

Please consider these comments as an addition to all previous comments I have made regarding the Air Quality (AQ) Conformity Determination and include all my comments on this issue into the Record of Decision including those submitted for the first AQ Conformity Determination period ending 6/6/96, the draft Supplement including all my comments on the draft EIS AQ section and final EIS.

These comments are being submitted as per the FAA notification of an additional public comment period extended on the draft AQ Conformity Determination and include comments regarding other issues in the Final Supplemental Environmental Impact Statement (FSEIS) that have either not been covered, comments that have not been answered, not addressed, not incorporated into text as changes, not considered as viable alternatives to the proposed action, not supported as answers by credible documentation, not considered or not properly referenced as answers to comments and etc.

Conformity and the Clean Air Act (CAA)

1) I am thoroughly disgusted by the FAA's lack of identifying and admitting to real known air quality (AQ) violations that have been pointed out by agencies with knowledge and ability that far exceeds FAA's ability in this area. If EPA, DOE and PSAPCA say the AQ doesn't conform to the SIP and that de-minimus thresholds are exceeded, then the FAA should defer their final analysis to these air regulatory agencies' expert judgment.

FAA conducted what they say is a quality assurance or control check on their AQ analysis and found the data to be reliable with only a couple of exceptions. I do not know what these exceptions are. It is not clear in the FSEIS where the corrections were made. What and where are they? Can FAA provide more details of the methods and results of the QA/QC check?

2) It does not appear that any changes were made to the AQ section of the FSEIS although there were numerous commentors who requested changes and corrections to the data input such as:

a) Request was to increase the number of aircraft operations in the peak hour without adjusting the fleet mix. This has not been considered even though requested in the draft EIS, final EIS, draft AQ Conformity Determination and draft SEIS.
No valid reason has yet been given to the commentors as to why this has not been conducted.
b) Increase the taxi distance/time in mode to include the third runway.
c) Produce emission modeling for SASA.
d) Conduct a cumulative impact analysis considering all projects named in my previous comments.
e) Consider all projects in the immediate vicinity including 509/South Access as additive to future increases in transportation related impacts.
f) Consider reasonably forseeable emissions within the jurisdiction/control of the agency.
g) Give logical modeling results for NOx considering future prediction of increase.

FAA has dismissed these concerns and many other similar comments in every instance where the public has had opportunity to comment. Why?

I requested that the number of 63 peak hour operations departing in the future scenario be increased to at least 75 which is the number included in the article I enclosed with my comments on the draft SEIS. This many departures, according to control tower personnel, occurs in the existing condition during the morning peak hour. FAA did not increase the number above 63 in the FSEIS. Additionally, the 63 was an increase from 43.9 in the draft EIS in response to EPA's request to increase peak numbers. However, the 63 included a completely unrealistic number of light and general aviation aircraft. This adjustment in the fleet mix misrepresents operations that normally occur at Sea-Tac.

I contend that if the numbers were increased to represent the airfield capability and including a more jet oriented fleet mix, that the AQ violations would be greater and that there would be more of them as I stated in my comments on the draft SEIS AQ Conformity Determination.

I have also previously requested that the 2500 foot seperation taxi distance between the third runway and easternmost runway (16L34R) be added into the model. This adjustment has not been done for future scenarios and should be done. This extra distance of taxiing and time-in-mode will produce greater CO and HC emissions over the no-build scenario. The FAA has utilized the exact same distance and time for the third runway as for the second. The model was also not adjusted for the idle time that will occur as arriving and departing aircraft wait to cross two active runways to depart or arrive on the third runway. This is another gross oversight that must be corrected.

The modeling also has not incorporated the dual-simultaneous departure capabilities of the first and third runways that the FAA Advisory Circular allows with a 2500 foot seperation. Modeling should incorporate a peak-hour scenario that utilizes worst-case departure

situations which would include dual-simultaneous departures with increased temporal aircraft numbers above 75. This scenario will produce increased NOx and HC emissions. The FAA should revise the modeling in the final AQ Conformity Determination to refect these data input considerations.

Emission modeling for the automobile, aircraft traffic and engine testing that will be performed at SASA has never been produced. The SASA final EIS was approved by the FAA, but still must be certified for compliance to all air and water quality standards by the Governor. Without a model to show what the emission inventory might cumulatively add to the local airshed, and without a tons per year inventory to understand whether de-minimus levels are exceeded or a dispersion analysis to show what potential hot-spots and/or AQ violations might occur, it is impossible to approve this part of the ALP although it is incorporated into the Master Plan Update final SEIS. It should be seperated and a more thorough AQ analysis presented to the public in the form of a SASA addendum.

The FAA has insisted that they have conducted a cumulative impact analysis. I enclosed a letter I sent to Chuck Clark of EPA in my comments on the draft SEIS AQ Conformity Determination comments which quoted the draft and final EIS' examination of cumulative analysis. The letter and the quotes clearly indicate that FAA has not conducted a cumulative analysis and that it may be questionable as to whether FAA even understands the meaning of the word or has read the NEPA definition although reprinted for their convenience by EPA.

FAA has removed all particulate data from the standard airport model, the EDMS. Haul truck PM_{10} violations predicted to occur along haul-routes specified in the draft SEIS, when added to particulate emissions from departing and arriving aircraft could produce toxic particulate and is expected to produce exceedances of the federal 24 hour standard. Haul vehicles will produce 70 tons per year of particulate matter. Without mitigation, PSAPCA Regulation on fugitive dust emissions will undoubtedly be violated.

FAA needs to consider all other projects in the immediate vicinity of the airport, including 509/South Access, International Boulevard Phase II, 28th/24th Arterial, Enplane Drive Improvements and the Parking Garage Expansion in their modeling and conformity determination. These emissions are considered reasonably foreseeable and meet the criteria for transportation conformity. These emissions can then be added to SASA, the existing International Boulevard CO inventory and etc., then incrementally increased for future scenario based upon known increased use of local roadways and airport. Mitigation measures can be offered that will offset any future increases in vehicle emissions which are then predicted to violate the federal standards. Note: 509/South Access is a Federal Project since FHWA is co-lead agency. FHWA is also obliged to perform a transportation conformity analysis.

The state conformity regulations mirror the federal, yet the Port and PSRC have ignored their site-specific responsibility to these requirements.

The FAA should include in their modeling, all reasonably foreseeable emissions within the control, jurisdiction, land or land the agency can exert some control over. In my comments on the draft SEIS AQ Conformity Determination I requested that this be produced. This information is required by the conformity provisions of the Clean Air Act. The FAA has not produced a detailed analysis of reasonably foreseeable emissions within the scope of this requirement, neither have they given reason as to why this request has been ignored.

FAA's modeling of nitrogen oxides gave indication that the results were inconsistent and illogical in comparison to several known facts. First of all, larger aircraft increased use at Sea-Tac will produce greater NOx overall. Larger aircraft will be a greater portion of the future fleet mix at Sea-Tac. There will be a greater jet fleet mix at Sea-Tac in the future which will produce more NOx. The larger engines with their high-bypass, high ratio fuel consumption will produce more NOx. Every one of these issues has been addressed by the draft and final EIS as that which is expected to occur. Yet the modeling data shows no significant increased NOx in the future which is illogical. Please refer to the tables I produced as comments on the draft SEIS AQ Conformity Determination. Those tables represent many hours of work to produce reasonable results using the FAA's own assumptions, statements and data previously presented. FAA's illogical and erroneous conclusions regarding de-minimus thresholds and NOx must be revised. EPA contends that if the data were corrected, these thresholds would be exceeded.

Conclusion

There has not been an honest evaluation, modeling input or results given to the agencies and public so far. FAA has failed in their duty to present truthful and forthright data. I believe FAA is witholding information from the public, and purposely minimizing the impact analysis, because they do not know how to or realize nobody can afford to mitigate the problem of AQ violations either at Sea-Tac or other busier airports across the country which also might be affected by the results of a honest approach here. However, the law is written to protect the public health and welfare and the environment. By minimizing and failing to report real world, worst-case scenarios, FAA may be knowingly creating the situation where the public good, health and welfare will be jeopardized. There is far too little to gain and too much at stake to not produce an honest EIS.

Please consider answering my comments on the previously presented AQ Determinations to:

1) Produce an accurate modelling
2) Include all emissions, both direct and indirect, reasonably foreseeable and cumulative
3) Give logical increases in NOx emissions considering all previous admissions
4) Conduct a transportation and general conformity determination for CO and O_3 and PM
5) Prepare and present a real mitigation strategy for known AQ violations and de-minimus threshold exceedances with timeline for implementation and funding commitment.

A-5

A. Brown
239 SW 189 Place
Seattle, WA 98166
23 June 1997

To: Federal Aviation Administration (FAA)
NW Mountain Region
1601 Lind Ave SW
Renton WA 98055-4056
Environmental Protection Specialist Dennis Ossenkop, ANM-611

Subject : Comments on Air Conformity in the Sea-Tac Airport SEIS due 23 June 1997

Reference: Supplemental Environmental Impact Statement for the Proposed Master Plan Update Development Actions at Seattle-Tacoma International Airport, May 1997.

The referenced SEIS is based on grossly inaccurate models and is invalid. It did not provide substantive answers to substantive questions even when requester, be they an individual or an engineering consultant firm, provided compelling data to support their position. Didn't any engineers review the questions or data ?

I took a one week vacation to prepare my DSEIS comments because you refused to extend the short review period. Between the various EISs, I've spent over 1000 hours of engineering effort that you have continued to ignore. Many of my comments have been corroborated by consulting firms and by Congressional expert testimony, yet you continue to ignore the facts and questions. Some items continue to get worse. Namely, the costs, and the amount of fill [1] continue to escalate while the probable useful life of the "Third" runway dwindles to zero [2].

The air pollution estimates need to consider the pollution from construction traffic, mining and road repair based on the real amount of fill that's needed and taking into account the amount to be excavated from the Sea-Tac Airport area. This is not a standard practice construction job and its pollution will linger for years. Removing the two seismic anomalies will increase air pollution but still isn't addressed.

The Master Plan Project clearly violates the Clean Air Act and any modeling that does not show that is so seriously flawed that it should be audited. The SEIS conclusions defy physics and are inconsistent with the area's wind patterns. **A REALISTIC CUMULATIVE air pollution impact assessment using theoretical capacity operations is needed ! !**

The review periods were too short for the public or EPA to fully respond.

Please include this with your Record of Decision along with copies of my Draft EIS, Final EIS, and Draft SEIS comments.

Sincerely,
A. Brown

A. Brown Pager (206) 654-1533, Home (206) 431-8693

1 See University of Florida's SEIS comments
2 "Severely congested" upon opening using FAA TAF estimates in SEIS

OssEnt06.doc

6) Respond to comments according to the federal regulations and give reason as to why these and previous comments have not been addressed considering the substantive nature of the information provided and the AQ agency concurrence.

Sincerely,

Debi L. DesMarais

Debi L. DesMarais, President
C.A.S.E.
19900 4th Avenue Southwest
Normandy Park, WA 98166\
(206) 824-3120

via facsimile 6/20/97
received per Dennis phone conv.

June 20, 1997

Mr. Dennis Ossenkop
Federal Aviation Administration
1601 Lind Ave S.W.
Renton, Wa. 98055-4056

A-6

REC'D ANM-610
PLAN; PGM. & CAP BR
JUN 23 1997
ANM-610 _____

Re: Final Supplemental EIS
Appendix B

Dear Sir:

In this appendix. it is stated that the "predominate air pollution source in the Airport environs are surface transportation vehicles" and that "carbon dioxide could be exceeded regardless of whether improvements at Sea-Tac Airport due to high volume of surface traffic on International Boulevard".

In my Encyclopedia of Common Diseases in a study done on air pollution says: "The take-off of one commercial jetliner emits pollutants equivalent to 10,000 cars".

A heavily-laden aircraft, jetliner or cargo, emits a stream of exhaust fumes as they gain power to become airborne. The flightline is closely parallel to International Boulevard and gets the blunt of this first thrust of power-gaining fuel exhaust. These fumes are forcefully blown downward into homes, schools, and businesses, and onto highways, along the flightpath, and only decreases when the plane is levelling off.

To say that pollution from airplanes is insignificant as compared to surface transportation in the very eye of the storm at Sea-Tac, is a stretch of credulity.

The Port of Seattle "Forum" for June, 1997, says that "Sea-tac is one of the four busiest airports in the Region, and one of the most technically advanced in the nation, especially, as a protype for low-visibility operations. For such a busy and complex airport to get this rating is remarkable and extremely rare".

Another enlightening bit of information occurred in the Seattle-Post Intelligencer of May 30, 1997, under the heading "TWA, United move to curtail tardiness of airplane flights".

It says: Trans World Airlines will penalize itself for late arrivals and is going to give away extra bonus miles to frequent fliers if its flights are late- the first U.S. airline to adopt such a policy".

"United Airlines will penalize late-arriving passengers, so the passengers are going to have to show up a little earlier if they want to have a pre-assigned seat".

With technical advances for low-visibility and the airlines taking more responsibility for late arrivals, it seems to me that these improvements should be reasons to be considered for not adding another runway for all-weather purposes.

Bad weather flying enhances the sound of the planes as well as keeps the exhaust fumes closer to the ground as they are slower to dissipate, a very distressing situation for the school children as they are so closely situated to the impacts. People are awakened at night with loud planes, even in insulated houses-not much fun. With the prospect of a 2,500 acre airport becoming obsolete in the next century, it is foolhardy to put out $3-billion on one runway.

Only allowing one year for the settling of the dirt in the runway construction could cause many problems to develop as the heavy planes bounce onto the runway. Cracks would become apparent and our heavy rainfalls would cause pollutants and harsh chemicals used around such a large commercial operations to reach the ground-water and our precious water source. We should not take those inherent possibilities lightly.

Sincerely yours,

Marie Feckley

Marie Feckley
15721 4th Ave. S.W.
Burien, Wa. 98166

PUGET SOUND AIR POLLUTION CONTROL AGENCY
KING COUNTY - KITSAP COUNTY - PIERCE COUNTY SNOHOMISH COUNTY

A-7

June 23, 1997

Mr. Dennis Ossenkop
Environmental Protection Specialist
Federal Aviation Administration
NW Mountain Region- Airports Division
1601 Lind Avenue SW
Renton, WA 98055

Dear Mr. Ossenkop:

SeaTac International Airport Master Plan Final Supplementary Environmental Impact Statement: Comments on Air Quality Conformity Analysis

Thank you for the opportunity to review and comment upon on the final air quality conformity analysis (Appendix B) prepared for the SeaTac International Airport Master Plan Final Supplementary Environmental Impact Statement (FSEIS).

PSAPCA, the project sponsors and other interested regulatory agencies have for the past year or more devoted considerable time and energy to resolving technical issues with air pollutant emission inventories, modeling procedures and the adequacy of draft air quality conformity determinations. We commend all parties involved for their professionalism and attention to detail in assuring the methodological soundness of the air quality analyses, the accurate interpretation of results, and compliance with state and federal clean air legislation.

PSAPCA finds that the emission inventory data and analysis provided in the FSEIS, including the associated air quality technical memoranda, provide a sufficient technical basis to conclude that the de-minimis threshold will not be exceeded.

In that the project sponsors conducted a conformity determination that was not legally required anyway, PSAPCA notes that the FSEIS charts and figures concerning carbon monoxide (CO) (pp.B19-B27) should be clearly labeled as "modeled" concentration data to avoid confusion with CO levels recently monitored to be within the federal standard in the Sea-Tac area.

110 Union Street, Suite 500, Seattle, Washington 98101-2038 (206) 343-8800 (800) 552-3565 FAX:(206)343-7522

Substantial changes to the Master Plan's original phasing schedule are primarily responsible for the de minimis finding presented in the FSEIS. In the future, should additional air quality environmental analyses and/or conformity determinations be required due to unforeseen implementation delays or plan revisions, PSAPCA looks forward to providing project sponsors with up-to-date technical information and expertise.

Thanks again for this opportunity to comment.

Sincerely,

Dennis J. McLerran
Air Pollution Control Officer

DJM:ls

cc: Tom Fitzsimmons, Ecology
Chuck Clark, EPA-Region 10
Joe Williams, Ecology-Air Programs

FAA8197.doc

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
P.O. Box 47600 • Olympia, Washington 98504-7600
(360) 407-6000 • TDD Only (Hearing Impaired) (360) 407-6006

A-8

June 23, 1997

Mr. Dennis Ossenkop
Federal Aviation Administration
Northwest Mountain Region
1601 Lind Ave., S.W.
Renton, WA 98055-4056

Dear Mr. Ossenkop:

The Department of Ecology (Ecology) has reviewed the Final Supplemental Environmental Impact Statement (FSEIS) for the Proposed Master Plan Update Development Actions at SeaTac Airport. This letter comments on the air quality and general conformity aspects of the project. Comments on other environmental concerns are being provided in another letter from Ecology. The Air Quality Program has been coordinating its review and comments with the Environmental Protection Agency and Puget Sound Air Pollution Control Agency.

Ecology has reviewed and concurs with the final Conformity conclusion contained in the FSEIS that the project will not result in emissions that would equal or exceed the applicable de-minimis threshold rates, nor be considered regionally significant with regard to air pollution emissions, and that it is consistent with the State Implementation Plan (SIP) for air quality. We note that this conclusion is the result of significant modifications of the project. Particularly important modifications include earlier construction of terminal and landside improvements such as the North Unit Terminal and associated roadways and parking facilities, and improvements to intersections to eliminate increased air emissions.

We also note the extension of the fill activity from three years to five years. This could help mitigate the impacts. Given the magnitude of the fill and the variety of options for sources and haul routes it is important that continuing review of this construction activity occur to ensure protection of air quality and to minimize impacts upon communities and the transportation system.

Thank you again for the opportunity to comment on this project and your willingness to discuss the issues. Ecology wants to ensure that the project conforms to the SIP, there is appropriate mitigation, and the air quality around the airport is not endangered. If you have any questions, please contact Doug Brown at (206) 649-7082.

Sincerely,

Joseph R. Williams
Program Manager
Air Quality Program

JRW:PC:kll

cc: Bonnnie Thei, EPA
Dennis McLerran, PSAPCA
Barbara Hinkle, Port of Seattle
Doug Brown, Ecology
Paul Carr, Ecology
Elizabeth Phinney, Ecology

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

JUN 23 1997

A-9

REC'D ANM-610
PLAN; PGM, & CAP BR
JUN 24 1997
ANM-610

Reply To
Attn Of: OAQ-107

Mr. Dennis Ossenkop
Federal Aviation Administration
Northwest Mountain Region
1601 Lind Ave, S.W.
Renton, Washington 98055-4056

Re: Final Supplemental Environmental Impact Statement for the Proposed Master Plan Update Development Actions at Seattle-Tacoma International Airport

Dear Mr. Ossenkop:

The Environmental Protection Agency has reviewed the subject environmental impact statement (FSEIS) in accordance with our responsibilities under Section 309 of the Clean Air Act (CAA) and the National Environmental Policy Act. The FSEIS assesses the impact of development of a third parallel runway as well as other airport improvements.

Over the past two years, we have worked with the Federal Aviation Administration (FAA), the Port of Seattle (POS), the Washington State Department of Ecology (Ecology), the Puget Sound Air Pollution Control Agency (PSAPCA) and local citizen groups to attempt to resolve issues of concern primarily regarding air pollution and noise impacts from airport development options. While the process has been time consuming, we believe the collective efforts of the agencies have resulted in meaningful disclosure of these environmental effects.

In our March 31, 1997, comments on the *Updated Draft Air Quality Conformity Determination*, we raised questions about the air quality analysis for the transportation conformity determination. Some of our questions related to the modeling of mobile source emission factors and annual aircraft operation emissions. We also expressed concern about the calculations of the construction emissions. Based on our review of the FSEIS, our concerns have now been adequately addressed and the *de minimis* thresholds have not been exceeded for general conformity under the CAA.

If you have any questions about our review, please contact me at (206) 553-2963, Claire Hong of my staff at (206)553-1813, or John Bregar at (206) 553-1984.

Sincerely,

for Anita Frankel, Director
Office of Air Quality

cc: Doug Brown, Ecology
Barbara Hinkle, POS
Dennis McLerran, PSAPCA

APPENDIX E

Washington State Senate

Olympia Office:
405 John A. Cherberg Building
PO Box 40482
Olympia, WA 98504-0482

Senator Julia Patterson
33rd Legislative District

(360) 786-7604
Toll-Free Hotline: 1-800-562-6000
TTY: 1-800-635-9993
e-mail: patterso_ju@leg.wa.gov

June 23, 1997

A-10

REC'D ANM-610
PLAN; PGM, & CAP BR
JUN 24 1997

Mr. Dennis Ossenkop
Federal Aviation Administration
Northwest Mountain Region
1601 Lind Avenue S.W.
Renton, Washington 98055-4056

Re: Comments on the FAA's Final Air Quality Conformity Determination for the Proposed Expansion of Seattle-Tacoma International Airport

Dear Mr. Ossenkop:

On behalf of my constituents in the 33rd Legislative District, which includes a large portion of the affected area, I would like to express my concerns regarding the Final Air Quality Conformity Determination for the Proposed Expansion of Sea-Tac Airport. This mammoth project, if ever completed, will greatly impact the air quality in the communities surrounding the airport and the entire Puget Sound Region.

I am no expert in air quality, nor do I purport to be an expert. It is quite illogical to state, however, that moving millions of cubic yards of fill dirt by double dump trucks for five years and the construction equipment needed to place the fill dirt will not impact the air quality in and around the airport. It is extremely difficult to swallow that air quality will not be affected by the construction of the third runway and the terminal and landside construction that will take place at the same time.

The expansion of Sea-Tac will no doubt result in more operations and more surface traffic to and from the airport. I find it hard to believe that the dramatic increase in operations at the Airport will not impact air quality. The FAA cannot sensibly assert that an increase in operations and surface traffic will result in a reduction of the amount of major air pollutants.

In a time when air quality standards are tightening, expansion at the Airport will make it

extremely difficult for the Puget Sound Region to maintain its maintenance status under the Clean Air Act that it worked so hard to obtain. By cutting off its analysis at 2010, even though operations are expected to increase beyond the 2010 projected level and surface traffic will increase accordingly, the FAA will force the Puget Sound Region into non-attainment and worsening air quality.

I sincerely hope it fulfills this duty and withholds approval of the Sea-Tac expansion project until assurances can be made that air quality will not worsen as a result of the expansion project. The FAA has a duty to protect the residents of the surrounding communities and the Puget Sound Region.

Sincerely,

Julia Patterson

Julia Patterson
State Senator
33rd District

APPENDIX F

1996 Master Plan Update Improvements - FEIS/FSEIS MITIGATION

Impacts	Mitigation
The following nine public facilities or historic sites could experience significant increased noise impacts (i.e. an increase of 1.5 DNL or more) in the year 2010 in comparison to the Do-Nothing alternative: • Sea-Tac Occupational Skills Center; • Woodside Elementary School; • Sunnydale Elementary; • Albert Paul House; • Homer Crosby House; • Sunny Terrace Elementary School; • Brunelle Residence; • Coil House; and • Bryan House.	Mitigating Significant Noise Impacts on Public Facilities and Historic Sites: The Port will mitigate interior sound levels at these locations through the use of acoustical treatment (sound insulation) in a manner would allow their uses to be compatible, as defined by FAR Part 150 guidelines, with projected noise levels associated with the proposed Master Plan Update improvements. Because of their historic value, the five residences and Sunnydale School (locally significant historic facilities) the Port will attempt to coordinate with the property owners to avoid significant alteration of the architectural style. In pursuing sound insulation of these structures, the Port's Noise Remedy Office will work with a historian to preserve such characteristics.
Residential Impacts of 65 DNL or greater: • Residences already within the existing Noise Remedy Program Boundary that were insulated prior to 1992 may need additional directional soundproofing to mitigate noise generated from a new flight path from the operation of the Third Runway • About 170 of these homes within 65 DNL would be exposed to 1.5 DNL or higher noise levels as a result of the proposed improvements and are not already subject to the Port's existing Noise Remedy Program	Provide Directional Soundproofing: To mitigate noise caused by the proposed airport improvements, the Port will conduct audits and, if warranted, sound insulate these facilities. Sound insulation of residences affected by 1.5 DNL or greater within 65 DNL noise exposure: The Port will develop an implementation strategy to sound insulate these 170 additional homes within 65 DNL as part of the Part 150 Noise Compatibility Plan study effort that will be initiated in 1997. The purpose of delegating finalization of the implementation approach for this action to the Part 150 is to ensure that consideration is given to the proposed Approach Transition Area acquisition and the relationship of that area to the existing Noise Remedy Program boundary, as well as the westerly expansion of the Noise Remedy Program to accommodate this added insulation.
In Port Resolution No. 3125 dated November 1992, the Port indicated its commitment to insulate homes through "Port staff is also directed to develop and implement a plan to insulate up to 5,000 eligible single family residences in the existing noise remedy program included on the waiting list as of December 31, 1993, before commencing construction of the proposed runway. The remaining eligible single family residences on the waiting list are to be insulated prior to operation of the proposed runway. In addition, the Port commits to complete insulation of all single-family residences that become eligible for insulation as a result of actions taken based on the site-specific EIS and are on the waiting list as of December 31, 1997, prior to commencing operations of said runway."	For the purpose of the Resolution, the FAA has determined the term "eligible" to be all single family properties located within the Noise Remedy Boundary, as established by the Port's 1985 Part 150 Study, with the exception of homes built after appropriate building codes were enacted. Therefore, the Port will insulate these single family residential areas regardless of the existing or future noise exposure.

1996 Master Plan Update Improvements - FEIS/FSEIS MITIGATION

The standard Runway Protection Zone (RPZ) dimensions do not always provide sufficient buffer to the satisfaction of nearby residents. FAA guidance, indicates that concerns with low overflight can occur in an area "up to 1,250 feet laterally from the runway centerline, and extending 5,000 feet beyond each end of the primary surface."[1] Based on the configuration of current airport land, local streets, and residential development patterns, the approach and transitional area for the Third Runway could include the standard Runway Protection Zone and a rectangular extension of the RPZ outward another 2,500 feet (called the Approach Transition Area). Residences in the northern Approach Transitional Area include 82 single-family residential parcels, 2 apartment buildings (with 28 units), and 2 mobile home parks, with 96 units. The southern ATA includes, 71 single-family residential parcels and 6 apartment buildings (with 32 units). Specific airport activity levels, environmental impact, and airport context conditions were determined to not be reasonably foreseeable at this time for years beyond 2010. However, as the Third Runway would enable activity levels to be accommodated in excess of the capacity of the existing airfield, Appendix D of the FSEIS showed that noise impacts would be greater in year 2020	Acquisition in the Approach Transitional Area: The Port will acquire all residential uses, and any vacant, residentially zoned properties, within this area both to the north and the south of the new runway end. Commercial and industrial land uses, which make up most of the eligible area to the south, will not be acquired. Input from the affected residents and local jurisdictions is necessary to design and initiate an acceptable relocation program. The Port will develop the appropriate implementation program for this action during the forthcoming Sea-Tac Airport FAR Part 150 Update, which the Port initiated during 1997. The implementation plan will include coordination with eligible resident concerning their desires to participate, and will establish relocation objectives, timing and funding priorities. Beyond 2010 Impacts: Following commencement of operations on the new runway but prior to the year 2010, the FAA in cooperation with the Port will undertake a further supplemental evaluations of noise and land use impacts anticipated to occur through the year 2020. That supplemental evaluation may be conducted in accordance with FAR Part 150 guidelines. Following completion of that evaluation, if additional significant adverse noise impacts are found, the Port will be required to adopt further noise and land use mitigation measures designed to minimize any significant adverse effects found in that evaluation. This conditional approval will be enforced through a special condition included in future Federal airport grants to the Port.
Existing and future noise impacts were predicted reflecting the existing noise abatement and land use compatibility program.	Continue Existing Noise Program: The Port will continue to implement the existing noise abatement program: • Noise Budget • Nighttime Limitations Program • Ground Noise • Flight Corridorization • Flight Track and Noise Monitoring
The preferred alternative would displace up to 391 single family, 260 condos/apartments, and 105 businesses.	Acquisition Compensation: The Port will comply with the provisions of the Uniform Act concerning acquisition required for the Master Plan Update improvements. Of the 105 businesses identified by the FEIS, 88 are located in the Runway Protection Zone (RPZ). While the FAA prefers airport sponsors to have control the land in the RPZ, exceptions to property ownership can occur as long as the use of the land does not represent a hazard to aircraft operation. The Port has surveyed these property

[1] FAA Memorandum, Action: Land acquisition — eligible Runway Protection, Object Free Area and Approach and Transitional Zones, April 30, 1991

1996 Master Plan Update Improvements - FEIS/FSEIS MITIGATION

	owners and their use and will continue to coordinate with the FAA concerning the need for acquisition versus the purchase of easements to ensure the appropriate land use control is provided. The remaining 17 businesses are identified to the west of the existing airfield. The Port will examine the possibility of retaining these businesses if their location does not conflict with the development of the Master Plan Update improvements.
The air conformity analysis showed that the Master Plan Update improvements will not exceed the de-minimis levels established by the Clean Air Act conformity rules. [40 CFR 93.153(b)(2)] This conformance was based on reasonably foreseeable construction emissions.	Air Quality: • To ensure that construction emissions do not exceed the air conformity de-minimis levels, the Port will ensure that annual construction-related truck haul traffic does not exceed 280,700 round trips by Heavy Duty Diesel Vehicles during the peak construction year. • To minimize construction related particulate emissions, the Port will implement construction Best Management Practices (BMPs) as noted in Table 5-4-8 in the Final Supplemental EIS.
The proposed improvements will result in a significant amount of construction activity that has the potential to create adverse construction impacts, ranging from erosion and sediment, air pollution, noise, hazardous material spills, surface traffic congestion, etc.	Construction Erosion and Sedimentation Control Plan. Prepare a construction erosion and sedimentation control plan for the construction of the new runway. The plan shall require use of Best Management Practices (BMPs) including but not limited to the following: • Erosion control measures such as use of mulching, silt fencing, sediment basins, and check dams that are properly applied, installed, and maintained pursuant to agreements with contractors. • Spill containment areas to capture and contain spills at construction sites and prevent their entry into surface or ground waters. Install proper temporary fuel storage areas and maintenance areas to reduce the potential for spills and contamination. • Phasing of construction activities to minimize the amount of area that is disturbed and exposed at any one time during wet weather conditions. • Where feasible, use of temporary and permanent terraces for fillslopes and cutslopes to reduce sheet and rill erosion and reduce transport of eroded materials from the construction site. • Install gravel and wheel wash facilities on construction equipment access roads or encourage covering of loads to minimize sediment transport onto nearby roads.

1996 Master Plan Update Improvements - FEIS/FSEIS MITIGATION

The proposed improvements are expected to increase the quantity of impervious surface at the Airport, and possibly increase stormwater runoff	Stormwater Management Plan. Prepare a stormwater management plan for the new runway that includes the following: • Detention criteria should be based upon Department of Ecology standards limiting 2-year peak flow rates from the developed portions of the site to 50% of the existing 2-year rate, limiting the developed 10-year rate to the existing 10-year rate, and limiting the developed 100-year flow rate to the existing 100-year rate. • Design stormwater facility outlets to reduce channel scouring, sedimentation and erosion, and improve water quality. Where possible, flow dispersion and outlets compatible with stream mitigation will be incorporated into engineering designs. • Maintain existing and proposed new stormwater facilities. Stormwater management facilities will be maintained according to procedures specified in the operations manuals of the facilities. NPDES Permit Requirements. Comply with the requirements of the National Pollution Discharge Elimination System permit for the airport dated June 30, 1994, as may be revised from time to time.
Development of the North Employee Parking Lot will be completed in a wellhead protection area.	Ground Water. Because of concerns with possible ground water/aquifer contamination, the Port has entered into an agreement with the City of Seattle Public Utilities. This agreement is incorporated by reference.
The proposed Master Plan Update improvements will affect the following quantity of wetlands: Project Element — Acres Runway impacts Embankment — 5.46 Borrow Source impacts — 1.92 Runway Safety Areas 16L/R — 2.34 Runway 34R Extension — 0.00 Terminal/Landside N. Employee Parking lot — 0.81 Development in SASA — 1.70 Total — 12.23	Wetland Mitigation: In December 1996, the Port submitted an application to the Army Corps of Engineers for a permit to fill wetlands at Sea-Tac Airport associated with the Master Plan Update improvements in compliance with the Clean Water Act, Section 404. To mitigate for the unavoidable impacts to wetlands, the Port will create new wetlands in Auburn, Washington in accordance with a final approved 404 permit.
The proposed Master Plan Update improvements will result in the relocation of about 3,700 feet of Miller Creek and its tributaries, and about 2,200 feet of Des Moines Creek.	Creek Relocation: In relocating Miller and Des Moines Creek, the Port will provide compensatory mitigation, including an equivalent or greater amount of floodplain storage.

1996 Master Plan Update Improvements - FEIS/FSEIS MITIGATION

Public services and utilities would require minor changes based on the residences, businesses, and facilities displaced by development. Major utilities that would be relocated or protected in-place are the Southwest Suburban Sewer District, Miller Creek Interceptor, Seattle Water Department trunk line, Washington Energy Services (formerly Puget Power) third electrical service metering point, and US West trunk lines entering at S. 176th Street.	Public Services and Utilities: The Port of Seattle will work with the service providers to minimize disruption during construction.
The FEIS identifies two seismic hazard areas on the site of the new runway, referred to as "relatively small areas of loose shallow sediment".	Earth Stabilization: The Port will implement the following: • The Port will remove the sediment and replace it with compacted fill, or use other appropriate engineering approaches to stabilizing these areas. • Prepare a landscaping plan for the new runway area, including plans for seeding and planting of vegetation to stabilize areas of fill that will not be covered by impervious surface.

APPENDIX G

Memorandum

U.S. Department of Transportation
Federal Aviation Administration

Subject: ACTION: Seattle-Tacoma International Airport Benefit-Cost Analysis

Date: JUL 3 1997

From: Manager, Systems and Policy Analysis Division, APO-200

Reply to Attn. of: GCarnaroli: x77550

To: Manager, Airports Financial Assistance Division, APP-500

We have reviewed the Port of Seattle's draft application for an Airport Improvement Program Letter of Intent designation from the Federal Aviation Administration for the Third Runway Project at Seattle-Tacoma (Sea-Tac) International Airport (May 21, 1997). We find the proposed project to be cost-beneficial, based on the Port's projections of life-cycle costs and delay reductions and FAA-APO allowances for other benefit parameters. A summary baseline worksheet of our analysis is attached.

For the purpose of the benefit-cost analysis, the only other alternative considered was a course of no action. According to Sea-Tac's application, extensive reviews of various approaches to reducing delay were conducted over the course of seven years, including regional airport capacity planning, evaluation of supplemental airport sites, use of demand management techniques, and construction of the third runway. All alternatives were dismissed in the early stages of the evaluation, leaving construction of the third runway as the only viable option. The preferred location is a runway west of Runway 16R-34L, with a 2,500-foot separation from Runway 16L-34R, allowing for two dependent arrival streams. Other location alternatives were a parallel runway west of Runway 16L-34R with a 1,500-foot separation, or with a 3,300-foot separation (with or without a Precision Runway Monitor). The first option was discarded because the delay savings were not sufficient due to the proximity of the two runways. The second option was discarded because of the excessive costs of land acquisition and noise mitigation objectives.

We appreciate having had the opportunity to review the proposed project. If you have any questions, please contact Mr. Giovanni Carnaroli of my staff at 267-7550.

Ward L. Keech

Ward L. Keech

Attachment

SEATTLE-TACOMA INTERNATIONAL AIRPORT

File: SEATAC2.XLS

Project: Construction of Third Runway (RWY 16X/34X)

Recommended?	Yes
B/C ratio	5.53
Time Frame	[illegible]
Base Year	1997
Discount Rate	7.00%
Present Cost	$587,400,000
Annual Maint. Cost	$11,748,000
AC Operating Cost/	$1,604
Value of Time/hr	$28.16
Passengers Per AC	96

Assumption: [illegible]

	Operations	Delay Hrs	Delay Hr/Added Op
	0	0	0.0802[illegible]
Less than Base	345,000	17380	0.82215
Base Operations	425,000	91122	2.21968
Future 1	525,000	312880	2.21968
Future 2			

BENEFIT STREAM

Year	Total Ops	Red. Delay Hrs.	Operating Savings	Passenger Savings	Total Savings
1996			$0	$0	$0
1997	386,900		$0	$0	$0
1998	394,000		$0	$0	$0
1999	401,800		$0	$0	$0
2000	408,000		$0	$0	$0
2001	416,200		$0	$0	$0
2002	423,400		$0	$0	$0
2003	430,600		$0	$0	$0
2004	437,800		$0	$0	$0
2005	445,000	135,436	$217,211,615	$221,117,726	$438,329,342
2006	450,900	148,287	$237,821,986	$242,098,706	$479,920,695
2007	456,800	161,137	$258,432,300	$263,079,686	$521,511,986
2008	462,400	173,988	$279,042,647	$284,060,664	$563,103,311
2009	468,300	186,838	$299,652,981	$305,041,644	$604,694,636
2010	474,000	199,660	$320,263,336	$326,022,623	$646,285,960
2011	479,800	212,541	$340,873,679	$347,003,602	$687,877,281
2012	485,600	225,392	$361,484,023	$367,984,581	$729,468,606
2013	491,400	238,343	$382,094,367	$388,965,561	$771,059,928
2014	497,200	251,094	$402,704,711	$409,946,540	$812,651,251
2015	503,000	263,945	$423,315,066	$430,927,519	$854,242,574
Total Benefits			$3,522,898,687	$3,586,248,851	$7,109,148,538
Discounted Total Benefits			$1,337,424,609	$1,361,475,482	$2,698,900,091

PROJECT COSTS

	Investment	Maintenance	Total Cost
1996	$2,600,000		$2,600,000
1997	$25,000,000		$25,000,000
1998	$70,700,000		$70,700,000
1999	$100,600,000		$100,600,000
2000	$118,600,000		$118,600,000
2001	$98,300,000		$98,300,000
2002	$74,300,000		$74,300,000
2003	$61,000,000		$61,000,000
2004	$34,300,000		$34,300,000
2005		$11,748,000	$11,748,000
2006		$11,748,000	$11,748,000
2007		$11,748,000	$11,748,000
2008		$11,748,000	$11,748,000
2009		$11,748,000	$11,748,000
2010		$11,748,000	$11,748,000
2011		$11,748,000	$11,748,000
2012		$11,748,000	$11,748,000
2013		$11,748,000	$11,748,000
2014		$11,748,000	$11,748,000
2015		$11,748,000	$11,748,000
Total Project Cost	$587,400,000	$129,228,000	$716,628,000
Discounted Total Project Cost:			$488,008,587

AR 041400