response to comments concerning noise issues, aircraft fleet mix has a notable effect on the resulting environmental impacts. Thus, evaluation of impacts associated with a demand level would require the evaluation of the fleet mix associated with that demand. While current regulations mandate the phase-out of Stage 2 aircraft, little is precisely known about which specific aircraft will be flying in years beyond 2010. Estimates of fleet are possible, but their impact on the resulting environmental condition description are significant, and a slight change from one aircraft type to another could have significant ramifications on noise and air pollution conditions. Because of this variability, the resulting impact analysis would have little meaning. As a result, Appendix D achieves an objective of arraying the possible impacts that might occur in time frames beyond year 2010. See response to **comment 2-Q and 2-J**.

One commentor indicated that an EIS is required to use worst-case data, and thus should have used the FAA TAF. NEPA and SEPA do not require the use of worst-case conditions. However, in certain conditions, agencies encourage the use of worst case conditions, such as the air quality analysis. As a result, certain worst-case conditions were used in assessing the impacts of the Port's new forecast.

The Draft Supplemental EIS acknowledges that Master Plans are typically undertaken every 7-10 years, or for airports experiencing unforeseen growth, plans are undertaken every 3-5 years. Thus, it is anticipated that the Port would likely undertake a new Master Plan Update after the year 2000. As is also noted, the environmental review analysis is typically only valid for a 3-5 year period. Thus, future environmental evaluations would be expected to use any new planning assumptions (forecasts and/or new facility requirements).

Richard DeNeufville (in a paper prepared for MASSPORT titled "Understanding and Using Forecasts") noted:

> "Forecasts are necessary for planning, for decision-making, and for review and understanding of prospective choices. Planning, as a profession, focuses specifically on trying to deal constructively with possible futures. Decision-makers need a clear perspective on the likely consequences of their options. Discussions of alternative plans likewise routinely resolve into debates about whether the most appropriate forecasts were considered. Forecasts are basic. Unfortunately, however, forecasts are inevitably inexact and debatable. A prediction is not a fact that can be unambiguously measured. The number of passengers ten years hence at any airport is not something that anyone can know in advance, or can calculate in the same way we can compute the speed of a car or weigh its load on a bridge. All forecasts are estimates, based on expectations about other factors, derived from assumptions. Any forecast of future traffic is based on a logical house of cards. It can be criticized by using different assumptions, and coming up with a different forecast. And the new forecast in turn is equally vulnerable to criticism. No forecast can be proven to be right in advance..."

Page 2-2 of the Draft Supplemental EIS provides a similar characterization of the difficulties inherent in the preparation of aviation demand forecasts.

See also response to **comment 1-D**.

2-D. Do-Nothing/With Project Forecast and Capacity: Several commentors questioned how the Do-Nothing forecast was set and how the "With Project" was established. Others questioned why the "With Project" forecast did not represent the maximum capacity of the

Third Runway airfield, when the Do-Nothing forecast represented the maximum capacity of the existing airfield. Such comments were submitted by: Ms. Brown (52AB2,AB3,AB24, AB25,AB116,AB117), Mr. Klug (3L1), Mr. Hoggard (66SeaTacPg1,3-3,4-4), Mr. Rosen (70L6), Mr. Kirsch (69ACC,ES-1,Pg3.2,4.3), and Mr. Bader (67L3-8,4-2).

Response: Chapter 2 of the Draft Supplemental EIS provides a detailed description of the forecasts and their application to the Do-Nothing and "With Project" alternatives. The alternatives evaluated in the Final EIS and Supplemental EIS reflect the capability of the alternative in contrast to the demand. If the alternative is not capable of serving the demand, due to operating constraints (i.e., airfield limitations due to poor weather), the activity levels reflect those limitations. If the alternative can satisfy the demand, the activity level represents the demand.

The Final EIS and Supplemental EIS identify the theoretical maximum capacity of Sea-Tac's existing airfield as 460,000 annual operations. Thus, in time frames when the demand exceeds this capacity, the activity level reflects the constraint (i.e., 460,000 annual operations). If the capacity exceeds the demand, the activity that could be accommodated then represents the demand; Alternative 3 ("With Project") was evaluated using the forecast demand. Because demand is not expected to exceed the Third Runway capacity in a timeframe near the planning horizon, the ultimate capacity of the Third Runway was not used.

The capacity of the two alternatives were prepared based on the operating capability of the facilities and an examination of existing conditions at Sea-Tac and conditions at other major U.S. air carrier airports. As noted in Chapter 2, aircraft operating delay has reached 17-20 minutes per operation at airports such as Newark and JFK. This delay level, if allowed to occur at Sea-Tac with either the Do-Nothing and "With Project" airfields, would enable a certain level of activity. That level of activity was determined to be the operating capacity of that airfield alternative. See also response to **comment 2-Q** which also discusses the long-term operating capability of the Airport. It would not be reasonable to set the "With Project" activity level at its ultimate capacity (630,000 annual operations), as it is uncertain when the region would generate such demand for air travel; a linear extrapolation of the new forecast indicates that this could occur near year 2030 which is well beyond any reasonably foreseeable planning horizon.

The table below lists the activity levels associated with the two alternatives.

COMPARISON OF THE NEW PORT OF SEATTLE FORECAST
"With Project" to Do-Nothing

	With Project			Do-Nothing		
Operations	**2000**	**2005**	**2010**	**2000**	**2005**	**2010**
Annual	409,000	445,000	474,000	409,000	445,000	460,000
Peak Month	38,600	41,800	44,000	38,600	41,500	42,100
Peak Month/Avg Day	1,246	1,352	1,423	1,246	1,341	1,360
Avg Annual Day	1,121	1,219	1,299	1,121	1,219	1,260
Peak Hour	78	94	99	78	82	82

	With Project			Do-Nothing		
Operations	**2000**	**2005**	**2010**	**2000**	**2005**	**2010**
Enplaned Passengers						
Annual	13,700,000	15,700,000	17,900,000	13,700,000	15,700,000	17,900,000
Peak Month	1,540,000	1,730,000	1,940,000	1,540,000	1,730,000	1,940,000
Peak Month/Avg Day	49,500	55,700	62,400	49,500	55,700	62,400
Avg Annual Day	37,534	43,014	49,041	37,534	43,014	49,041
Peak Hour	5,210	5,740	6,300	5,210	5,460	5,930

Source: P&D Aviation, December 1996.

A commentor suggests that demand is lower during poor weather conditions, and implies that, as a result, delays will also be lower. In support of this argument, the commentor correctly points out that aircraft are routinely diverted to an alternative airport or flights are canceled to avoid poor weather delays. The fact that flights are canceled during poor weather conditions today is indicative of the need for the new runway. It is true that airlines use sophisticated techniques to consolidate passengers from canceled flights to other flights during periods of reduced arrival acceptance rates in an attempt to minimize passenger impacts. However, as passenger demand continues to increase, the airlines' ability to consolidate passengers will become increasingly difficult. As a result, without the proposed runway, flights canceled or diverted because of poor weather conditions in Seattle will continue to cause an increasing level of inconvenience and cost to the traveling public and the airlines.

Further, while the demand for air travel is based on several factors, including fare levels, population and income, it is not based on weather conditions, which vary from day to day. It is true that certain general aviation pilots will choose not to fly during poor weather conditions due to inadequate certification. However, commercial aviation demand is generally independent of weather except in extreme conditions. Therefore, even though more flights would be canceled without the proposed runway, the Draft Supplemental EIS appropriately defined the impact of delay based on unconstrained demand, which is independent from the effect of poor weather delays.

The City of SeaTac further asserts that infrastructure limitations will prevent the Airport from generating and accommodating the forecast demand. However, as is shown through the comparison of measures of efficiency, as described in Chapter 2 of the Draft Supplemental EIS, such infrastructure limitations have existed or exist at other airport locations. Surface transportation limitations are often overcome, through increasing use of HOV access, and passengers increasing their overall trip time.

2-E. Forecast Ranges: Mr. Bader (67L3-2,3-6,3-7) questioned if the forecasts represent ranges or hard numbers and why the Draft SEIS discusses a domestic air carrier load factor of 65.3% whereas other Port data indicates other load factors.

Response: The initial preparation of the forecasts during the Master Plan Update resulted in the development of a high, mid, and low forecast. The Master Plan Update high range forecast indicated that enplaned passengers could reach 19.4 million enplanements in 2010 and 25.7

million enplanements in 2020. The forecasts used in the Draft and Final EIS represented the mid-range forecast (15.3 million enplanements and 405,800 operations in 2010, and 19.7 million enplanements and 441,00 annual operations in 2020). The new Port forecast was not prepared as a range. A specific forecast was prepared based on 17.9 million annual enplaned passengers in 2010.

Mr. Bader contrasts the Airport's average domestic airline load factor of 65.3% with individual classes of airlines (i.e., commuter carriers) load factors. As is noted in the Master Plan Update, load factors vary according to the average of the domestic air carriers, the domestic commuter, and international operations. As was noted in the Draft Supplemental EIS, the domestic air carrier load factor was assumed in the new forecasts to remain constant at 65.3% based on 1995 actual conditions being about 65%.

2-F. TAF Availability: Mr. Bader (67L3-3,3-4,3-5) questioned when the TAF became available, if it makes a difference that the FAA forecast is based on fiscal year versus calendar year, and which forecasts were considered in the context of page 2-2 of the Draft SEIS.

Response: The 1996 TAF was placed on the internet by the FAA Washington Office of Policy and Plans in early 1996. However, the Northwest Mountain Region Office of the FAA did not become aware of the release of these forecasts until May 1996, as the historical process of releasing the data was to forward copies to the regional office by paper. Because the data was placed on the internet, the normal paper distribution was not conducted.

The FAA's TAF reflects annual passenger and aircraft operations levels based on a calendar year. The Supplemental EIS refers to the forecasts by fiscal year, as that date reflects the FAA's fiscal year in which the forecasts were prepared.

The questioned reference is in regard to the FAA's 1996 and 1997 Fiscal Year TAF's and thus the plural was appropriate.

2-G. Hotel Forecast: Mr. Caldwell commented that "Greater Seattle does not have the (hotel) rooms available nor under construction to support the claimed passengers." Ms. Stuhring (21L3) questioned the number of connecting passengers today and in the future that "stay overnight at airport hotels".

Response: The forecast of passenger traffic was prepared based on standard methodologies which identify what factors have a high correlation with aviation activity. The Master Plan Update showed that changes in passenger demand can be explained with over a 99% confidence based on three key variables: population, per capita income, and air fares. Contrary to one commentor's belief, the population of the region is influential in generating demand for air travel as evidenced by the strong correlation.

Of the 11,400,000 enplaned passengers in 1995, about 70% began or ended their air travel in the Puget Sound Region (7,900,000 enplaned O&D passengers). While the Puget Sound Region has

a substantial quantity of passengers that use the Airport for vacation/business meeting travel, not all passengers are visitors, and not all visitors use hotels/motels. Of the O&D enplaned passengers, about 4,700,000 are visitors (non-residents) to the Puget Sound Region (about 41% of all passengers).

2-H. Flight Plan Forecast: Mr. Abbott (50PSRC,1) commented that the new Port forecasts are 6% above the Flight Plan forecast for year 2010 and "slightly higher" when extrapolated to 2020. Mr. Abbott (50PSRC,1) also noted that the TAF reflects a 6% per year growth of international passengers.

Response: Comments acknowledged concerning the Flight Plan forecasts. The Draft Supplemental EIS reflects the correct average annual growth rate of international passengers of 0.6%.

g table lists the Flight Plan forecasts, confirming the comments submitted.

Flight Plan EIS - OPS too low

COMPARISON OF DEMAND FORECASTS
(Master Plan Update, FAA TAF, and new Port of Seattle forecast)

Unconstrained Aviation Demand Forecast Comparison

	1995	2000	2005	2010
Operations				
Flight Plan	**n/a**	**411,000**	**429,000**	**447,000**
Master Plan Update	n/a	379,200	392,500	405,800
FAA 1997 TAF	386,536	433,470	478,050	528,200
New Port of Seattle	386,536	409,000	445,000	474,000
Enplaned Passengers				
Flight Plan	**n/a**	**12,700,000**	**15,000,000**	**17,000,000**
Master Plan Update	n/a	11,900,000	13,600,000	15,300,000
FAA 1997 TAF	11,386,000	13,920,000	16,290,100	18,950,000
New Port of Seattle	11,386,000	13,700,000	15,700,000	17,900,000

N/A = Not available

2-I. Pavement Generates Demand: Mr. Kirsch (69ACC,Pg4.4) commented "There is empirical evidence that, all things being equal, airports with greater runway capacity will have higher levels of activity." This position was supported by the ACC's consultant Dr. Winston.

Response: On behalf of the ACC, a report prepared by Dr. Clifford Winston was submitted in comments on the Draft Supplemental Environmental Impact Statement disputing the aviation demand forecast assumptions. The central conclusion of the Winston paper is that the aviation demand forecast used in the Draft Supplemental EIS understates the effect that an additional runway at Sea-Tac would have on demand.

As is noted in the Draft Supplemental EIS, the forecast process began with the identification of the region's demand for air travel based on population, per capital income and air fares. As such, that forecast represents the forecast of activity that would be unconstrained by limitations in the airport system. Once the demand for air travel is defined, it is then possible to determine how airport constraints can limit the ability to serve the demand. As is stated in the Final EIS, the proposed improvements will not affect the variables that define demand: population, per capita income, and air fares. The unconstrained demand includes all of the economic activity and all of the air travel demand that would exist if the Airport could handle all flights and all passengers who want to use the Airport when they want to use it, without significant delay. In other words, even assuming that runway stimulate demand, all of that stimulated demand is included in the unconstrained demand forecast.

Dr. Winston's primary claim is that additional demand would be generated due to construction of the new runway. However, the building of additional capacity would not cause demand to exceed the level projected in the unconstrained forecast. The FAA forecast did not assume that future aircraft delay would limit demand, so it is not logical that a reduction in aircraft delay would increase demand.

The "New Port of Seattle" forecast presented in the Draft Supplemental EIS recognized airfield capacity as a physical constraint if the new runway is not built. While 14,000 fewer annual aircraft operations were forecast under the Do-Nothing alternative, the same level of annual enplaned passenger demand was forecast to be served. The airlines could accomplish the same passenger levels with fewer operations by utilizing larger average aircraft, higher load factors, or a combination of both. In fact, many of the flights served under the "With Project" scenario are those that would otherwise be canceled due to excessive delay under the Do-Nothing scenario.

Winston's report states that airline travel is influenced by air carriers' fares and their service time and that an important dimension of service time is the time it takes a passenger to get from their origin to their destination. It is doubtful that a significant number of passengers would change their travel plans solely on the basis of an expected increase in travel time, due to the unpredictability of weather conditions. Air passengers do not plan trips because the weather is good on a given day, neither would a reduction in travel time during poor weather encourage additional people to travel by air.

Dr. Winston concluded in his March 1997 report, that additional capacity could facilitate more competition, which would lead to lower fares and greater demand. Sea-Tac is currently served by all of the Major airlines (defined by the FAA as airlines with revenues over $1 billion), including the preeminent low fare carrier, Southwest. Material increases in competition are unlikely when all of the Majors currently serve the Airport.

Dr. Winston states that there exists a direct correlation between enplanements and operations. During the period 1970 to 1990, historical data bears this out. However, since the early 1990s, U.S. domestic carriers have fundamentally changed their air service patterns, by moving to smaller aircraft types with an emphasis on flight frequency. Load factors have dramatically increased in the last few years, disproving the direct correlation between increase in enplanements and increase

in operations. Airlines have reduced the size of their respective fleets, eliminating the excess capacity acquired in 1980s. In higher demand markets, replacement aircraft have more seats than the equipment being replaced. In markets where demand is "thin", airlines have either reduced scheduled frequencies or begun using equipment with fewer seats.

Dr. Winston developed demand models, including a model employing an independent variable reflecting the number of runways. He cited a 'statistically significant' positive effect on enplanements and operations and stated "Our findings constitute specific quantitative evidence that refutes the FAA's core assumption that capacity does not have an effect on demand." However, this analysis is highly questionable for two reasons. First, the number of runways at a given airport is only one component of airfield capacity. The length, separation, and configuration of the runways, in addition to airspace and air traffic control considerations, determine the effective capacity of the runway system at an airport. Second, Winston's use of a runway variable does not prove that new runways cause higher demand. It may demonstrate nothing more than that airports with higher demand subsequently built additional runways.

Dr. Winston's demand models used the regression models developed for the FAA Terminal Area Forecast with the addition of an independent variable representing the number of runways and whether the subject airport is a hub. Winston's regression for aircraft operations using the 100 airport sample is questionable because the sign of the coefficient for yield (average fare) is positive. A positive sign means the value of the forecast dependent variable will be larger as the value of the independent variable increases. For example, as the population of the area increases, demand for air travel will increase. The coefficient for yield should have an inverse relationship to air travel demand (i.e., as fares increase, air travel demand will decrease). In Winston's 100 airport operations regression the yield coefficient is positive, which means, as fares increase, demand increases. The same flaw is seen in the enplanement regression using the 50 airport sample.

The use of additional independent variables should only strengthen the correlation of the regression formula, but, in this case, the inclusion of the runway variable weakened the correlation. An important measure of the strength of the linear relationship between the independent and dependent variables is given by the coefficient of determination, R^2. The possible values of R^2 are between zero and one, with values closer to one expressing stronger relationships. The R^2 values for Dr. Winston's aircraft operations regressions are 0.415 and 0.668, respectively, for the 50 airport and 150 airport samples. The R^2 values for his enplanement regressions are 0.616 and 0.625, respectively, for the 100 airport and 150 airport samples. These R^2 values do not represent strong correlation. In contrast, the Port's forecast achieved an R^2 of 0.99, indicating a very strong correlation. This demonstrates that it is more accurate to forecast the number of aircraft operations using the variables of population, per capita income, and air fares, and not consider a variable regarding the number of runways.

2-J. Planning Horizon: Mr. Oebser (55RCAA,7A-1), Mr. Kirsch (69ACC,ES-2,ES-3,Pg 1.3,4.1-4.2, 4.9) requested explanation of the rationale for not evaluating through year 2020 and why 630,000 annual operations (the estimated capacity with the proposed Third Runway) was not considered.

Response: As is discussed in Chapters 1 and 2 of this Supplemental EIS, specific activity levels and their associated environmental impacts in the year 2020 were determined not to be reasonably foreseeable at this time. A number of reasons lead to this conclusion:

1. The aviation industry appears to be emerging from a decade of high volatility. These conditions appear related to the after effects of deregulation, with airline bankruptcies, airline consolidations, and vigorous air fare competition. These factors, combined with the economic conditions of the Puget Sound Region, have led to significantly greater growth in air travel demand than the nation's average. In a three year period, forecasts using virtually the same methodology, with varying base data, produced forecasts that varied by 17% for year 2010. This 17% variation (and the associated schedule acceleration of facilities) has resulted in the primary differences in environmental impact described in Chapter 5 of this document.
2. The evaluation of environmental impacts requires translation of the annual forecast into a detailed level of information concerning peak hour activity, fleet mix (including engine use), and distribution of activity. The environmental evaluation also requires the prediction of numerous other factors, including: emissions of automobiles and other vehicles, aircraft noise and air emissions factors, air traffic control technology, changes in land use in communities near the Airport, regional changes in roadways and mass transportation systems, and national changes in air transportation. Because these variables have a significant influence on the resulting environmental impacts, predicting beyond 2010 would require the forecaster to identify conditions that are not realistically predictable at this time. In addition, the variability in the results, would produce an impact evaluation that would have little relationship to probable actual conditions. The FAA and the Port know no credible scientific, statistical or other evidence which can predict the necessary variables in a reasonable way which will permit an analysis which is not highly speculative for the distant future years. However, to enable decision-makers to understand possible impacts through the year 2020, Appendix D was prepared for the Draft Supplemental EIS assuming a linear extrapolation from conditions in year 2010. Appendix D was provided in an attempt to test whether those impacts, were they to occur, would change the decision-makers determinations on the project and, in their decisions, the decision-makers will make that determination. However, it is probable that the impacts shown in Appendix D overstate the adverse impacts for the reasons set forth elsewhere in the EIS/SEIS. Stated differently, it is probable that the impacts would not be significantly greater than shown in Appendix D.
3. Although forecasts for near-term years may not match actual experience, typically those differences are relatively small. For more distant years, forecasting is much more uncertain. This uncertainty is inherent in the nature of forecasting and the nature of the air travel industry.
4. FAA guidance on the conduct of Master Plans states "the length of the short, intermediate and long-term activity forecasts should be decided. While 5-10-20 year timeframes are typical, there may be justification for using different time frames. In any event, the short-term forecast should support a capital improvement program, the intermediate-term a realistic assessment of needs, and the long-term a concept oriented statement of needs. The schedules of airport development that are directly related to forecast demand levels should be tied to such levels, rather than dates, because of the possibility of the forecasts being off target."[2/] The Master Plan Update for Sea-Tac was developed as recommended, with the schedule of development being related to demand. As a result, the new (higher) forecast shows that the schedule could be accelerated for certain airport improvements.

2005 + 20 = 2025

[2/] FAA Advisory Circular 150/5070-6A "Airport Master Plans", FAA, June 19[illegible]

5. Airport master plans are typically undertaken every 7-10 years. However, airports that experience large unforeseen growth, typically conduct master plans (or other significant airport planning efforts) sooner, ranging from 3 to 5 years. Therefore, it is anticipated that a new master plan for Sea-Tac will be initiated soon after the year 2000. That future planning effort would generate new aviation forecasts and define the parameters for accommodating forecast demand. As noted in the FAA guidance, the 1996 Master Plan Update has identified the Port's capital improvement plan, and provides a realistic assessment of needs for accommodating 15.7 million enplaned passengers, which is expected to now occur in year 2005. The plan also reflects the longer-term needs, associated with 19 million enplanements, in a more conceptual fashion.
6. Some of the environmental approvals identified by the Final EIS and this Supplemental EIS, may expire within the next 3-5 years. FAA Environmental Guidelines (FAA Order 5050.4A, Paragraph 102) states "Time Limitations for Environmental Documents b. With regard to approved final impact statements.....(1) If major steps toward implementation of the proposed action (such as the start of construction, substantial acquisition, or relocation activities) have not commenced within 3 years from the date of approval of the final statement, a written reevaluation of the adequacy, accuracy, and validity of the final statement shall be prepared...." The Clean Air Act Conformity rules specifically note that a conformity determination "lapses 5 years from the date a the final conformity determination is reported" (40 CFR Part 93.157(a)).
7. Additional planning will be undertaken at Sea-Tac in the future, encompassing facility requirements and environmental impacts, based on forecasts of short-term, intermediate and long-term conditions. If these efforts are undertaken around the year 2000, it is anticipated that aviation industry conditions could stabilize, making air travel demand less volatile and forecasting less uncertain.

See response to **comment 2-Q**.

Impacts associated with air traffic levels in excess of 600,000 annual operations were not evaluated, as there is no certainty of the timing in which that level of activity would occur. As was noted, if the forecast trend were extended in a linear fashion, this level of activity might possibly occur somewhere around the year 2030. The evaluation of key environmental issues, such as air quality and noise, require information concerning aircraft fleet, aircraft engine types, time of operation, ground vehicle use, airport and non-airport traffic use of roadways, etc. As aircraft fleet and ground vehicles are very sensitive to the time frame because of noise and air pollution emissions, it is not reasonable to assess the environmental impacts during such a distant time frame, where extreme uncertainty exists.

Information regarding the potential impacts in the year 2020 (or at 630,000 annual operations) is not essential to decisions regarding the Master Plan Update projects and is not essential to a reasoned choice among alternative courses of action. For the reasons stated above, the prediction of variables is so uncertain, and the results of the impact analysis are so speculative that this information is of limited value in the decision-making process. Also, as discussed in detail in the alternatives section of the EIS/SEIS and in other documents, even if the impacts of the Master Plan Update improvements are greater than anticipated (e.g., as shown in Appendix D), conclusions concerning these proposed improvements, relative to their alternatives, would not differ.

The Airport, other surrounding activities, aircraft and automobiles are all subject to existing environmental regulation, and such regulation is likely to continue in some form. As the Airport builds projects in later years, it will be subject to further reviews by the FAA, USEPA, and other agencies, all of which enforce the environmental laws as they exist at the time with respect to environmental impact analysis, air quality, wetlands protection and other factors. The Airport cannot serve 600,000 annual operations without further development which cannot proceed without further governmental approvals. The Final EIS/Supplemental EIS have gone as far as they can go responsibly, avoiding speculation about conditions which cannot be predicted for the period after 2010. See also response to **comment 2-S**.

As is discussed in the Draft Supplemental EIS (pages 2-10 through 2-12, and 2-27) studies of airport capacity showed that there are limits to the number of passengers that can be accommodated with the landside improvements contemplated in the Master Plan Update. Beyond 19 million annual enplanements, additional terminal and other landside facilities may be needed to avoid unacceptable levels of congestion and delay. The capacity of the Airport under existing conditions was considered and discussed in *Working Paper 2, Constrained Aviation Forecast Update, Forecast Update, Capacity Analysis and Landside Evaluation for Seattle-Tacoma International Airport.* A copy of this working paper is available for review at the FAA offices in Renton, Washington and the Port of Seattle offices at Sea-Tac Airport. This working paper is incorporated by reference in this Supplemental EIS.

Based on the analysis presented in Working Paper 2, a similar comparison can be made concerning the theoretical maximum number of passengers that could be accommodated after the Master Plan Update improvements are completed. The design capability of the Master Plan Update improvements, as identified in Master Plan Technical Report No. 8, is 38 million annual passengers (19 million enplaned passengers). Therefore, as activity increases beyond this level, congestion and passenger inconvenience would increase. However, like the existing facilities, more passengers could be processed, but with the growing congestion. Using the 400,000 passenger per narrow-body equivalent gate (and the number of gates that will be available upon completion of the Master Plan Update) as many as 48 million annual passengers (24 million enplanements) could be accommodated if extraordinary congestion was allowed. This level of passenger traffic, however, could be constrained by limitations in the roadway network and the availability of parking. Similar to the terminal system, the roadway system and parking facilities with the Master Plan Update are designed to accommodate 19 million annual enplanements. Thus, expansion or development of new public, rental car and employee parking facilities would likely be required soon when annual passenger levels reach 40 to 42 million annual enplanements.

2-K. Project Purpose - Mr. Rowe (HT 34/35), Ms. Brown (HT 52), Ms. Stuhring (21L13), Mr. McKnight (38L), Ms. DesMarais (34L16), Mr. Kirsch (69, ACCPg1.4,2.5,3.2), Mr. Bader (37L3-15,3-16,4-1,4-2,4-3,4-4), and Ms. Brown (52AB97a,AB97b,AB98,AB99,AB100, AB157) questioned the purpose, use and/or benefits of the Third Runway. Mr. Abbott (PSRC-2) stated "it is true that its purpose until approximately 2010 is to address delay. But the SEIS should distinguish between the benefits of the third runway before and after 2010." Mr. Hoggard (66SeaTac,3-4) commented "The DSEIS acknowledges that the revised forecast will alter the timing of impacts of the proposed action, but fails to

comprehensively summarize how such changes will correspond to the timing or relationship of proposed or anticipated improvements."

Response: See Chapter I of the Final EIS and Chapters 1 and 2 of the Supplemental EIS for a definition of the project purpose and need. The purpose of the Third Runway is "to improve the poor weather airfield operating capability in a manner that accommodates aircraft activity with an acceptable level of delay". As was described in the Final EIS and Supplemental EIS, the Third Runway will reduce aircraft operating delay and as a result, pay for itself in 3-5 years, depending upon the year completed, based on data prepared by the Capacity Enhancement Update. See also response to **comment 2-AC**.

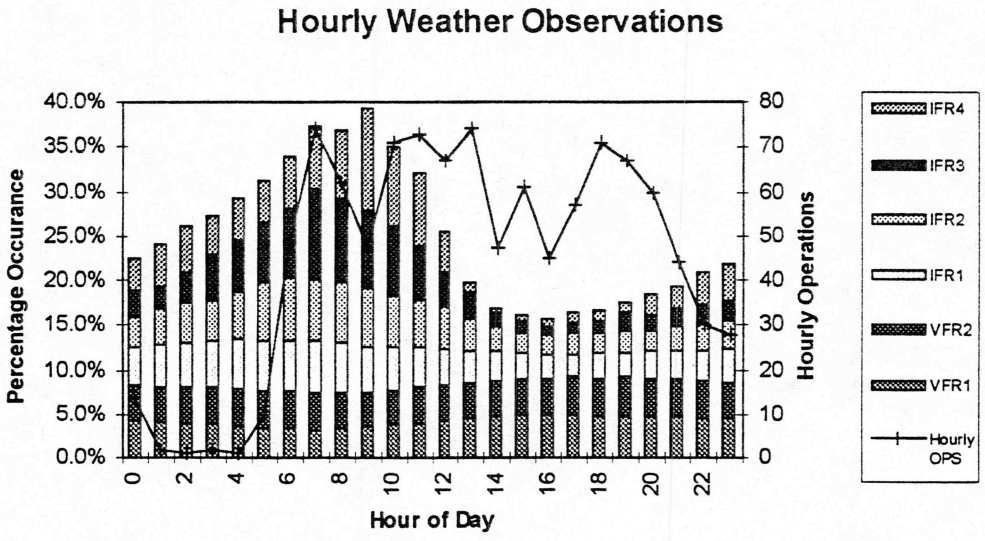
While the purpose of the Third Runway is to address poor weather operating constraints, these constraints affect the capacity of the existing airfield. When this constraint is relieved, added airfield capacity would be available, as demonstrated by the "With Project" scenarios being able to accommodate the forecast demand now anticipated to occur between 2008 and 2010.

Contrary to Ms. Brown's comments, the Supplemental EIS is correct in noting that 99% of the aircraft types using Sea-Tac Airport would be capable of using an 8,500 foot long runway, which is the proposed length of the Third Runway. Also the Master Plan Update benefits include the ability to have unrestricted service to the Pacific Rim, through the extension of 34R (see page 5-2 of the Supplemental EIS, which was incorrectly numbered 5-1 in the Draft Supplemental EIS). Ms. Brown also indicated that the delay costs were inconsistent between page 5-2 and pages 5-5-7 and 5-6-16. The data on page 5-2 represents delay cost savings from a Third Runway, whereas the other references to delay quantify the total cost of delay, including delay that would not be affected by the proposed improvements, such as those that are not related to poor weather (such as aircraft mechanical problems, etc.).

Contrary to the City of SeaTac's comments, the Supplemental EIS Chapter 2 contains a detailed discussion of how the new forecasts affect the timing of facilities. This chapter, coupled with the impact and mitigation discussed in Chapter 5 identify the timing of impacts and need for mitigation.

2-L. Weather need: Mr. Matthews (HT 58), Ms. Stuhring (21L13), Ms. DesMarais (34L16) questioned the percentage of time that poor weather occurred, indicating that most of the poor weather occurs at night. Weather concerns were also submitted by Ms. Brown (52AB28), Mr. Kirsch (69ACC,ES-1,Tab I - Hockaday)

Response: "Poor weather", defined as conditions with ceiling less than 5,000 feet and visibility less than 5 miles (abbreviated 5,000/5), represent conditions when Sea-Tac Airport is reduced to a single arrival stream (IFR and VFR2). Final EIS Volume 4, Appendix R Exhibit R-2 reproduced below, shows the distribution of weather conditions by hour of the day in contrast to the hourly level of aircraft operations, based on 10 years of weather data. This chart shows the percentage of each weather condition by hour of the day.



Only during IFR4 would some aircraft not be capable of operating during such poor weather (600 Runway Visual Range or lower). This condition occurs only 0.3% of the year.

During the early morning peak operation period, single approach conditions occur as much as 57% of the time. Average delays per operation during these conditions are higher than the 24-hour average since hourly demand is also higher. During the late evening peak, single approach conditions occur less often, and as a result, fewer delays are incurred. Nonetheless, while demand, weather conditions and average delay per operation do in fact vary by hour of the day and by month of the year, use of annual average statistics for calculating the annual average delay per operation is indeed an appropriate and reasonable methodology.

The ACC and other commentors suggested that the Draft Supplemental EIS weather analysis overstated poor weather because it was based on 11 winters and 10 summers of data. To verify the adequacy of the Draft Supplemental EIS weather analysis, additional analyses were performed using 26 years of historical weather data obtained from the National Oceanic and Atmospheric Administration. The 26-year average occurrence for each of the applicable weather conditions between 1964 and 1991, as shown in **Exhibit F-1**, is equivalent to the 10-year average occurrence of weather conditions defined in the Master Plan Update and Draft Supplemental EIS. Therefore, the analysis did not overstate the occurrence of poor weather conditions, even though it represented more than 120 months.

Commentors also suggested that the Draft Supplemental EIS assumed certain visual flight rule (VFR) weather conditions (between 2,500 and 1,000 feet ceiling and three miles visibility) are instrument flight rule (IFR) conditions. Contrary to the comments, the weather analysis used to support both the Final EIS and the Draft Supplemental EIS is based on those conditions that influence the use of either a single approach or a dual approach stream at Sea-Tac Airport. While Federal Aviation Regulations (FAR) define IFR as conditions in which the ceiling is less than 1,000 feet and the visibility is less than three statute miles for the purpose of general rules under

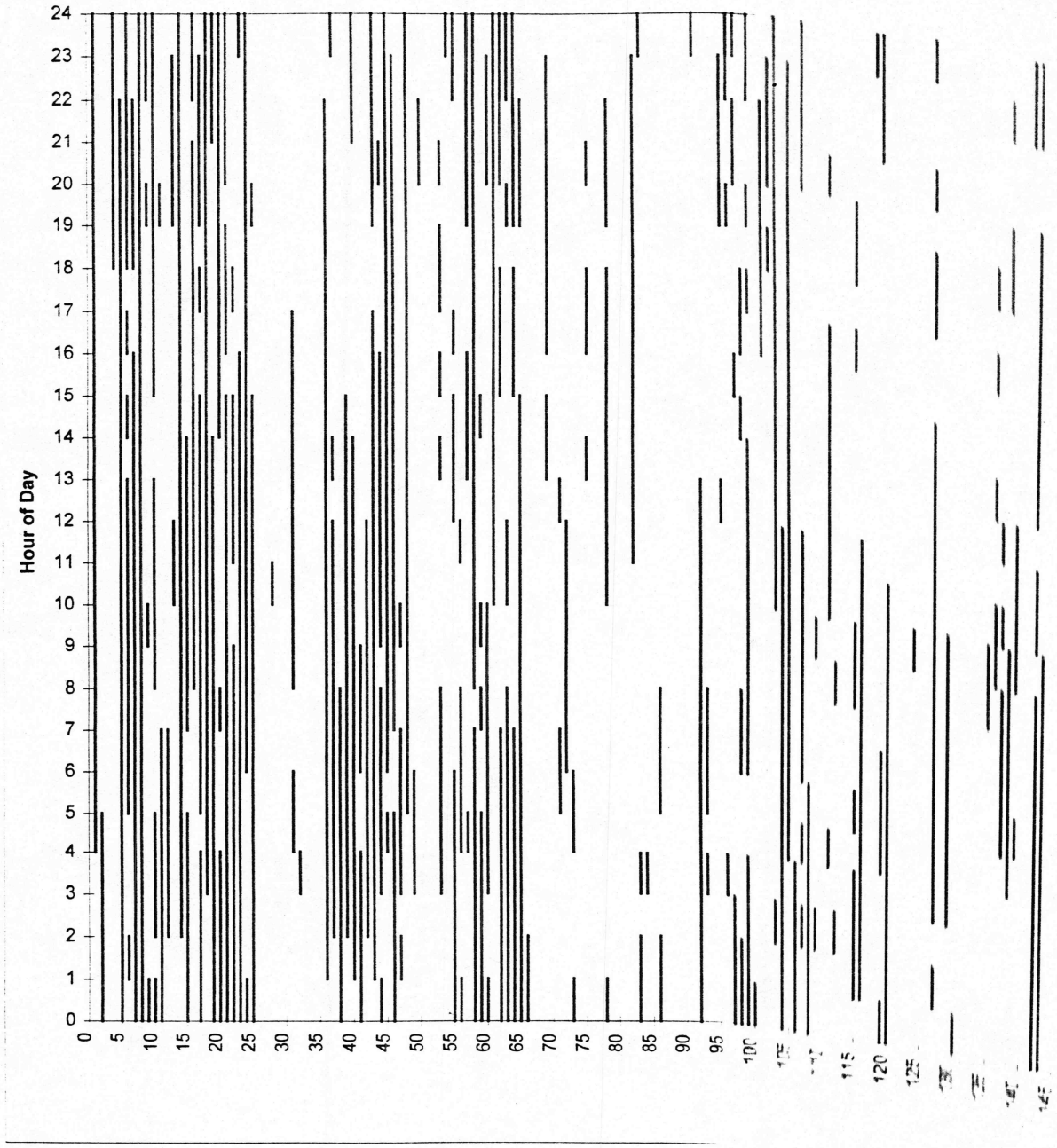
which aircraft are operated, local use of dual independent approaches (referred to as visual parallel approach procedures or VAPS) at Sea-Tac Airport requires a minimum ceiling 500 feet above the minimum vectoring altitude, or 5,000 Above Ground Level. Therefore, whenever the ceiling/visibility is below 5,000/5, arrivals are sequenced into the Airport on a single approach. The weather analysis used in the Final EIS and the Draft Supplemental EIS was performed based on the approach minimums associated with VAPS.

The analysis also recognized that when the ceiling/visibility is below 5,000/5 but above 800/2, air traffic controllers often instruct aircraft to perform a sidestep maneuver, whereby aircraft are sequenced to one runway, but then directed to "sidestep" to the parallel runway. While this procedure enhances operational efficiency relative to a single stream operation, it does not provide the benefit of dual dependent or independent approaches. The categories of weather minima defined in both the Final EIS and the Draft Supplemental EIS appropriately considered the actual air traffic control operating environment at Sea-Tac Airport.

Based on the review of 26 years of weather data, the year 1972 is most representative of average conditions during the 26 year period. **Exhibit F-2** shows the hourly occurrence of weather conditions during each hour of the year. In response to the comment that the Draft Supplemental EIS assumed IFR weather lasts for 24 hours rather than for short periods, a supplemental analysis demonstrates that 50% of all single approach conditions occur for six hours or more. This assumption has little impact on performance during nighttime hours, since hourly demand between 10 p.m. and 7 a.m. is well below the single approach acceptance rate. Unlike some airports where poor weather conditions occur for relatively short durations, poor weather at Sea-Tac Airport tends to last for an extended duration during daytime hours, often during peak operating periods. Moreover, aircraft operational delays often continue to occur even after the poor weather conditions subside, since it takes time to clear the system of aircraft that had been waiting either to land or to take-off. As a result, the methodology employed in the Master Plan Update Final EIS and Draft Supplemental EIS appropriately reflects the nature of poor weather conditions at Sea-Tac Airport.

Finally, commentors suggested that the average annual occurrence of poor weather does not appropriately reflect the distribution of weather during peak months and during peak hours. It is important to recognize that delays are incurred based on the relationship between hourly demand and hourly airport acceptance rate. During the winter months, single approach conditions occur as often as 60% of the time (see **Exhibit F-3**), which is well above the annual average of 44%. While demand during these months is less than the summer peak months, significant levels of aircraft delay are incurred. During the summer months, the occurrence of single approach conditions is reduced to 30-40% but hourly demand is higher. As a result, average delays during single approach conditions are much higher in the summer than in the winter, albeit such delays occur less frequently.

The air quality analysis notes that peak hour airport activity and worst case meteorology do not occur at the same time. For air quality purposes, worst case meteorology is not a reference to poor weather. Worst case meteorology refers to conditions that represent the worst air pollution



Source: NOAA hourly weather observations
at Seattle-Tacoma Airport (SEA)
From 1964 to 1991.

Prepared by: Landrum & Brown

Draft, 5/7/97

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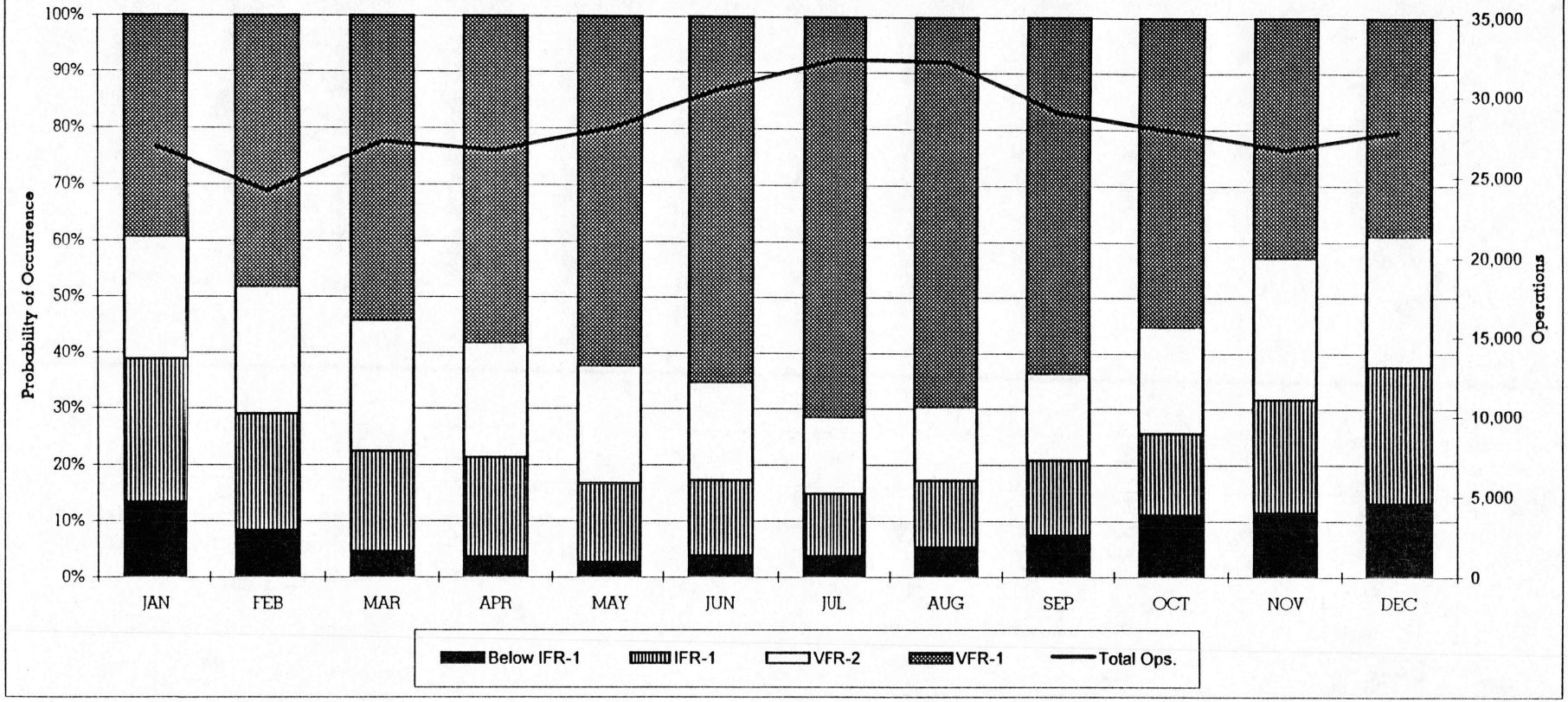
Sea-Tac International Airport

Monthly Weather Probability Distribution



Weather Categories:			
Categories	Ceiling (ft)		Visibility (sm)
VFR-1	>=5,000	and	>=5
VFR-2	>=2,500 & <5,000	or	>=3 & <5
IFR-1	>=800 & <2,500	or	>=2 & <3
Other IFR	<800	or	<2

Source: NOAA hourly weather observations
at Seattle-Tacoma Airport (SEA)
from 1964 to 1991 and
SEA 1993 Tower Counts.

Prepared by: Landrum & Brown
Draft, 5/7/97
H:\SEA\MRH\[SEA_MON.XLS]Monthly Charts

Expected Weather Occurrence by Month

Month	VFR-1	VFR-2	IFR-1	Below IFR-1	Total	1993 Total Ops.
JAN	39.3%	21.8%	25.4%	13.4%	100.0%	26,851
FEB	48.3%	22.7%	20.6%	8.4%	100.0%	24,099
MAR	54.2%	23.4%	17.8%	4.6%	100.0%	27,159
APR	58.2%	20.5%	17.6%	3.7%	100.0%	26,635
MAY	62.3%	21.0%	14.0%	2.7%	100.0%	28,014
JUN	65.2%	17.5%	13.4%	3.9%	100.0%	30,462
JUL	71.5%	13.6%	11.1%	3.8%	100.0%	32,337
AUG	69.7%	13.1%	11.8%	5.4%	100.0%	32,234
SEP	63.6%	15.6%	13.3%	7.5%	100.0%	29,071
OCT	55.2%	19.2%	14.4%	11.2%	100.0%	27,973
NOV	42.9%	25.4%	20.2%	11.6%	100.0%	26,757
DEC	39.0%	23.3%	24.5%	13.2%	100.0%	27,869
Average	55.7%	19.8%	17.1%	7.4%	100.0%	339,461

Sea-Tac International Airport

Monthly Distribution of Weather Categories

Exhibit F-3

conditions. Worst case Carbon Monoxide conditions typically occur during winter periods, yet peak airport activity occurs during the summer.

2-M. Airfield Capacity: Ms. DesMarais (34L2b) questioned why the Sea-Tac Communities Plan showed an airfield capacity of 260,000 annual operations. Ms. DesMarais (34L2b) questioned the capacity of Sea-Tac with a Third Runway and "why did the draft EIS make us believe that Sea-Tac could handle 525,000 annual operations when the SEIS now admits that no more than 460,000 is capacity".

Response: The SeaTac Communities Plan, completed in 1974, evaluated the capacity of the two runway airfield, based on technology (air traffic and aircraft fleet) that was present at that time. Based on early 1970s technology, the two air carrier runway airfield (the airfield at that time also included a general aviation 17-35 runway in addition to the 2 existing air carrier runways) at Sea-Tac was identified as having a capacity of 331,000 annual operations in 1973, which was expected to decrease to 278,000 operations by 1993 due to the increased use of "heavy jets" at the Airport.[3/] Since the 1970s, new technology has resulted in greater efficiencies, which lead the 1992 Flight Plan EIS to identify Sea-Tac's existing airfield capacity to be about 460,000 annual operations. The Flight Plan capacity was re-confirmed in preparing the Supplemental EIS. As is noted in the Final EIS, and the Supplemental EIS, no other technology exists other than an LDA (see response to **comment 3-E**) to reduce delay that occurs during poor weather conditions.

Contrary to the commentor belief, the Final EIS did not state that Sea-Tac could handle 525,000 annual operations. The Final EIS presents data considered during the 1995 Capacity Enhancement Update which evaluated two forecast activity levels (Future 1 - 425,000; and Future 2 - 525,000 annual operations). As were discussed in all past studies, processing increasing levels of activity through Sea-Tac's existing facilities will result in exponentially increasing levels of delay and congestion.

2-N. Delay: Mr. Abbott (PSRC-4) requested clarification of the ATOMS trend versus the delay costs. Mr. Kirsch (69ACC,Pg2.8-2.9) commented that "at 15 percent increase in activity levels, delay and associated costs have increased. This claim is directly contradicted by FAA Air Traffic Operations Measurement System ...data". Mr. Kirsch (69ACC,Tab I - Hockaday); and Mr. Bader (67L3-16,3-17,4-4,4-5) requested clarification of where delay is described in the Final EIS and Supplemental EIS and its definition.

Response: The Draft Supplemental EIS correctly notes that the FAA's Air Traffic Operations Monitoring System (ATOMS) data shows that delay is decreasing, when quantified by the number of operations delayed by 15 minutes or more. However, using other delay measurement tools, delay has increased at Sea-Tac Airport (see response to **comment 2-O**).

Dr. Hockaday alleges that the definition of acceptable delay has changed from 4-6 minutes in the Final EIS to 15-20 minutes in the Draft Supplemental EIS. This conclusion is based on an incorrect interpretation of the delay curve on Pages 2-9 of the Draft Supplemental EIS which

3/ *Sea-Tac Communities Plan*, Port of Seattle, April 1975

shows the relationship between average aircraft delay per operation and the number of annual operations. This graph demonstrates the FAA's definition of an airport's "practical capacity" according to the National Plan of Integrated Airport System (NPIAS), which occurs at the level of annual operations in which average delay per operation is five minutes. This is consistent with the 4-6 minute level of acceptable delay defined in the Final EIS. The graph also demonstrates that the theoretical maximum capacity at an airport can be defined at a level of annual operations in which the average delay per operation is 15-20 minutes. However, this does not suggest that delay levels of this magnitude are acceptable. To the contrary, because of the cost to the airlines and the inconvenience to the traveling public, delay levels of this magnitude are clearly unacceptable, which shows the costs and benefits of the proposed runway.

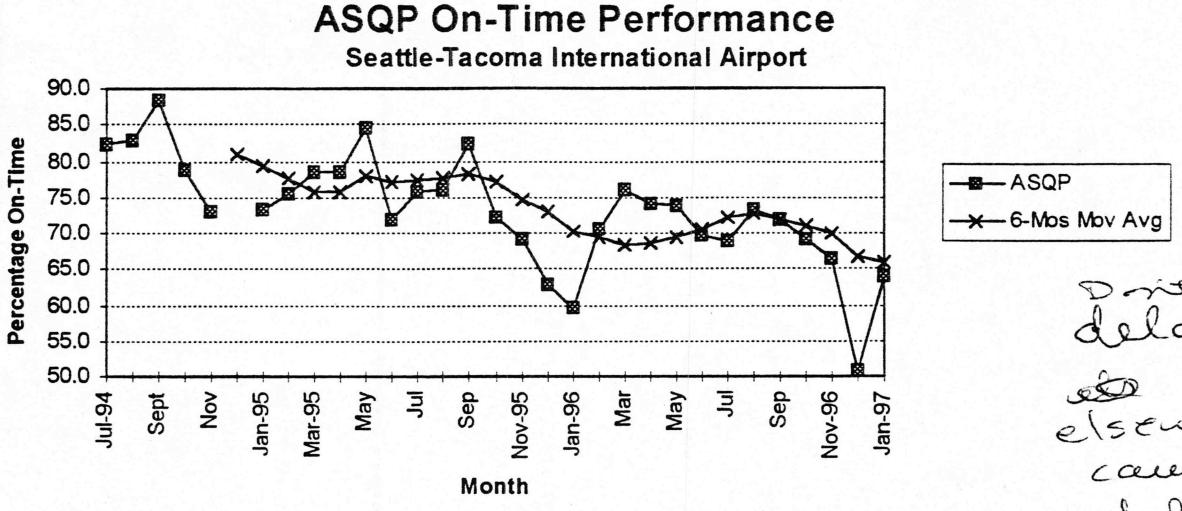
It should also be acknowledged that an annual average delay level of 15-20 minutes indicates a wide variation between the level of delay incurred between good and bad weather conditions (i.e., ceiling/visibility above and below 5,000 feet/five statute miles). While good weather delays would likely remain at acceptable levels, delays during poor weather conditions in which a single approach is used for arrivals would be well in excess of 20 minutes per operation. In fact, as demand grows a significant number of flights either would be delayed well into the nighttime noise abatement period or would be canceled. Passengers affected by flight cancellations would be accommodated on a later flight or would be rerouted through another city. In any event, poor weather delays would result in a severe inconvenience to the traveling public. As is evidenced by the new Port of Seattle forecasts, a divergence between the operating capability of the existing airfield and the Third Runway airfield is expected to occur around the year 2008. This divergence would result through flight cancellations as demand approaches the 460,000 annual operations. After the demand exceeds the operating capability, flight cancellations (with passengers consolidated on existing flights), and the spreading of peak hour operations would enable the passenger demand to be accommodated.

To further illustrate the impact of future delay, occasionally flights are canceled today during low visibility conditions. In most cases, load factors enable airlines to consolidate passengers of canceled flights onto other flights later in the day. However, this practice will become more difficult as passenger demand continues to increase. The "gap" in average delay per operation between good and poor weather conditions will continue to increase, and, as a result, on-time reliability will continue to worsen. Passenger demand would therefore continue to be served, albeit at a deteriorating level of service.

A definition and quantification of aircraft delay is discussed in numerous locations in the Final EIS, including Chapters I and II, as well as Appendix R (such as pages R-6 through R-13, and R-36 through R-33). Information concerning delay is also provided in the Supplemental EIS in Chapter 2. The sources of delay are noted in their specific locations. Airline Service Quality Performance (ASQP) delay is discussed in Appendix R of the Final EIS, as well as Chapter 2 of the Supplemental EIS.

2-O. On-Time Performance Ms. DesMarais (34L16) indicated that Sea-Tac was rated with a good on-time performance in 1995.

Response: Contrary to Ms. DesMarais' comments, over the last few years Sea-Tac's on-time performance rating has declined. The chart below shows the monthly on-time performance rating from July 1994 through January 1997.



6 Mos Mov Avg = Six month moving average

Don't delays elsewhere cause delays at Sea-Tac

As the chart shows, on-time performance at Sea-Tac has declined from above 80% of the flights being on-time to about 65% of the flights being on time during this period. Relative to the other 28 airports for which on-time performance is regularly recorded, Sea-Tac ranked 22nd in 1996, 20th in 1995, and 18th in 1994.

2-P. Wake Vortex Constraint Ms. DesMarais (34L20) stated "Page 2-10 discusses the wake vortex and says 82.5 operations per hour ... would be reduce by 2% to a newly enacted rule. (B) could you explain how one large aircraft takeoff every 22 seconds can occur at O'Hare with this same kind of rule in place."

Response: Page 2-10 of the Supplemental EIS discusses the fact that a change in aircraft separation requirements made during 1996 in response to safety issues associated with wake vortex turbulence was found to reduce Sea-Tac's capacity by about 2%. Comparisons between Sea-Tac's operational capability and that of Chicago O'Hare International Airport should not be made, because Sea-Tac's existing noise abatement procedures constrain the operating capability of the runway system. O'Hare accommodates over 900,000 annual operations on six intersecting runways (three sets of parallel runways, with the parallel runways located more than 800 feet apart), and does not operate with daytime noise abatement flight tracks and runway use. Because

aircraft can be turned immediately on departure from O'Hare, the operational capacity of O'Hare's six runway system is greater than that at Sea-Tac.

2-Q. Long-Term Development Needs - Ms. Brown (HT 39, 41L2) commented that the new forecasts indicate a need for more than one new runway. Comments concerning the longevity of the Third Runway were expressed by Mr. Carpenter (HT 104), Ms. Brown (52AB19), Mr. McKnight (38L), Mr. Oebser (55RCAA,7C-4), Mr. Rowe (63L2), Mr. Kirsch (69ACC,Pg1.4,4.2), and Mr. Bader (67L1-3,4-7,5-1). Mr. Abbott (PSRC-1) requested that "clear statement of the estimated capacity of the expanded Sea-Tac facility (be provided) if delay remains at the approximate level experienced today." Mr. Hoggard (66SeaTac, 4-7) requested clarification of the long-term surface transportation constraints.

Response: As is shown beginning on Page 2-25 of the Draft Supplemental EIS, the proposed Third Runway is anticipated to accommodate the forecast level of aviation demand well into the 21st century. Based on current technology, and anticipated growth in demand, the Third Runway would accommodate demand through the year 2030. New technology would be expected to increase that longevity. Terminal and landside constraints will likely arise soon after the year 2010, based on the new forecasts.

The long-term capacity of a Third Runway airfield at Sea-Tac, at 630,000 annual operations was identified based on the 20 minute existing delay level experienced at other airports such as Newark, LaGuardia. The level of delay experienced in 1995 at Sea-Tac Airport (about 10 minutes) would be experienced with a Third Runway and present technology, at about 540,000 annual operations. Extrapolating out the new forecasts, indicate that 540,000 annual operations would occur after 2020. This maximum is truly theoretical and could not be achieved without further actions by the Port of Seattle to addressing terminal and landside improvements which would require further governmental approvals accompanied by required environmental impact analysis. Future terminal and landside improvements and a future master plan would be subjected at that time to appropriate environmental impact analysis and compliance with applicable laws, such as SEPA/NEPA.

Mr. Kirsch indicated that the "Master Plan Update improvements are designed to accommodate a 'theoretical maximum' of 600,000 to 630,000 operations." is not a correct statement. A byproduct of correcting the existing poor weather operating deficiency is that the capability of the future airfield could enable about 600,000 to 630,000 operations, assuming the high delay levels at existing U.S. airports. However, page 2-27 of the Supplemental EIS also acknowledges that the terminal and landside facilities of the proposed improvements are designed to accommodate 19 million enplanements. Thus, future terminal and landside improvements would likely be needed soon after the year 2010. It is anticipated that a future Master Plan would address these needs. See also response to **comment 2-C and 2-J**.

As is shown in the Final EIS, Chapter IV, Section 15 "Surface Transportation Impacts" and the Supplemental EIS Section 5-1, the level of service afforded on many of the area roadways is expected to decrease in the future regardless of whether or not improvements are undertaken at Sea-Tac Airport. In addition, local jurisdictions have identified intersections in the Airport

vicinity that are exempt from level of service standards through their comprehensive plans, due to existing and projected low level of service (LOS E or LOS F). Because of growing surface transportation conditions region-wide, surface transportation conditions are expected to represent an increasing constraint on the Airport area.

2-R. Albuquerque: Ms. Brown (HT 90/91,52LPg5) and Mr. Oebser (55RCAA,7C-2c) commented that Albuquerque found that hauling the quantity of fill needed at Sea-Tac to be infeasible and that the 8,500 foot length is insufficient to accommodate all aircraft. Other concerns with the 8,500 ft length were submitted by Mr. Rowe (63L5).

Response: The purpose behind the runway development at Albuquerque is to expand the capacity of the Airport to satisfy forecast growth in aviation demand. To satisfy that need, two "With Project" alternatives were considered: improve an existing non-intersecting general aviation runway or construction of a new parallel runway. Improvements are proposed at Albuquerque to address a specific need (growth in air traffic demand). Based on this need, the development of a new runway was found not to be the preferred alternative, because of difficulty in acquiring the land needed for the runway; the land needed is actively being used by the Department of Defense. The questionable feasibility of obtaining the land, coupled with the amount of fill required, made this option not prudent.

Different conditions exist at Sea-Tac, and as a result, a different need is being satisfied. As is described in the Final EIS and the Supplemental EIS, the purpose and need being satisfied at Sea-Tac is associated with poor weather related arrival delay. As a result, unlike Albuquerque, the only prudent and feasible alternative is the development of the Third Runway. For arrivals, the length of the Third Runway (8,500 feet) is capable of accommodating 99% of all aircraft types.

2-S. Deferring the Runway: Mr. Abbott (PSRC-2), Mr. Oebser (55RCAA,7C-6/7/8), and Mr. Kirsch (69ACC,ES-1,Pg2.2-2.3) requested clarification for delaying the commissioning of the Third Runway and requested that the document identify potential consequences of the delay. Mr. Kirsch (69ACC,Pg2.3,2.6-2.7,3.2) stated "this re-ordering of priorities reveals the true impetus for the Third Runway: increasing capacity in all weather..."

Response: As is noted in other responses to comments, no change occurred in the proposed need for the Third Runway or other Master Plan Update improvements, as discussed in Chapter 2 of the Supplemental EIS. See also response to **comment 2-K** and **comment 3-A**.. As is acknowledged in the Draft Supplemental EIS, the Port is proposing to initiate construction of the Third Runway immediately, and to build the runway at a slower pace than was assessed in the Final EIS. This slower construction schedule was assessed, because with the higher demand forecasts, substantial terminal and landside improvements would be required which could not be undertaken simultaneously with an accelerated runway construction schedule. The Airport has many deficiencies, many of which require urgent attention. The faster growth in passenger demands is currently placing, and will continue to increase, pressures of congestion and passenger inconveniences on the existing terminal and landside facilities. In light of limited resources, and the disruptions and environmental impacts caused by major construction, the Port has revised the complex interrelated construction schedules. In addition, upon further examination, the Port

determined that it would not be possible to accelerate the construction to enable its use by year 2000.

As is discussed on page 2-21 of the Supplemental EIS, delaying the availability of the Third Runway will result in adverse consequences. Poor weather related arrival delay would not be resolved and as activity levels grow, the delay levels would be expected to increase. The Final EIS, and Table 2-4 of the Draft Supplemental EIS, summarize the delay conditions that will occur as demand increases and the poor weather condition is not relieved. By 2000, when activity is now anticipated to reach 409,000 annual operations, average all weather delay levels will have increased to about 11 minutes. By 2004, activity would reach 437,000 operations annual which would result in average all weather delay levels of over 23 minutes. Thus, during the period in which the runway is not available, the growth in air travel demand is expected to result in an increase in total average all weather delay by about 155%.

As delay increases without the Third Runway, operators might be encouraged to test operating at other existing airports in the region. However, as is noted in the Final EIS (page II-10) and the Supplemental EIS (page 3-5), other airport locations have found that demand must reach levels that do not currently occur in the Puget Sound Region for a second airport to be successful. However, when the test of a supplemental airport is not successful, all operations re-consolidate at the primary airport. As is noted in the Final EIS, several operators have attempted to provide service over the years from Paine Field. However, demand has not been great enough to enable service to be successful. See response to **comment 3-C** concerning the impact if this were successful.

The Supplemental EIS primary impact analysis is for the year 2010 and earlier, with additional analysis for the decade between 2010 and 2020. As the Supplemental EIS notes, forecasting for years beyond 2010 is uncertain, and the uncertainty grows after that. There are many variables that can not be predicted within a reasonable margin of error.

Analyzing environmental impacts for these distant years is complicated by the inability to predict the environmental context in which the Airport will exist. A valid, useful analysis requires speculation for these future years of numerous critical factors, including: emissions of automobiles and other vehicles, aircraft noise and air emission factors, air traffic control technology development and implementation, changes in land use in communities near the Airport, changes in roadways and mass transportation and changes in air traffic nationally and regionally. For example, emissions of vehicles are changing. Considerable industrial effort is currently being devoted to reducing automobile emissions and to development of practical alternatives to internal combustion engines, and it is reasonable to expect that those efforts will achieve some reductions in environmental impacts near the Airport.

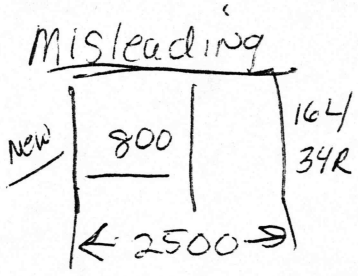
The Airport, other surrounding activities, aircraft and automobiles are all subject to existing environmental regulation, and such regulation is likely to continue in some form. As the Airport builds projects in later years, it will be subject to further reviews by the FAA, USEPA, and other agencies, all of which enforce the environmental laws as they exist at the time with respect to environmental impact analysis, air quality, wetlands protection and other factors. The Airport

cannot serve 600,000 annual operations without further development which cannot proceed without further governmental approvals.

The Final EIS/Supplemental EIS have gone as far as they can go responsibly, avoiding speculation about conditions which cannot be predicted for the period after 2010.

2-T. Location of the Third Runway - Mr. Eglin (HT10) stated "presently the runway is supposed to be over Avenue 12. Last week I read that they have to move it farther to the west...". Ms. Brown (52LPg7) asked "Why if the technology conference.... Concluded that there is 2500 foot spacing requirement between runways....is a Third runway that is only 800 feet from one of the present runways..."

Response: The preferred location of the Third Runway has not changed since issuance of the Draft and Final EIS. The runway is planned to be located about 2,500 feet west of existing runway 16L/34R, to enable dependent arrival streams. This location places it in the general vicinity of 12th Avenue South. The 2,500 foot separation refers to the distance associated with dependent parallel arrival streams.



2.U - moved to another location/comment number

2-V - moved to another location/comment number

2-W. Terminal Improvements: Mr. Bader (67L5-2,5-3,5-4,5-5) questioned the evaluation of terminal and landside facility needs.

Response: Chapter 2 of the Draft Supplemental EIS (beginning on Page 2-11) contains a detailed discussion of how the forecasts were prepared and their relationship to the terminal and landside improvement needs. As is noted, congestion and inefficiencies will continue to mount as passenger and surface traffic levels increase. These inefficiencies and congestion are the reason for undertaking the improvements.

2-X - moved to another location/comment number

2-Y. Temporary/Permanent Ramps: Ms. Montgelas (64L2) noted that the temporary interchanges will "require a temporary break in limited access which will need to be negotiated through the NW Region TransAid Section." and require other actions. Ms. Montgelas also questioned the listing of two new permanent ramps off-SR 518. Ms. Montgelas expressed concern with the ramps off SR-518. Mr. Hoggard (66SeaTac,7-4) indicated the City's support for the use of the construction only interchanges.

Response: Comments acknowledged. The Port would be expected to continue to coordinate with WSDOT concerning the acceptance of the temporary or permanent interchanges.

A commentor also asked how aircraft would taxi to the SASA area and how fueling would be completed. Aircraft would taxi from the existing runway system to the Master Plan Update improvements in the area known as SASA by way of the dual taxiway system to Runway 34R included in the Master Plan Update improvements. Fueling for users in this location are anticipated to occur through truck fueling (versus underground hydrants) that would be supplied through existing fuel trucking locations. Should fueling needs change, appropriate environmental processing would be undertaken.

2-AC. Project cost/benefits and Financing - A number of commentors submitted comments concerning the reliability of the cost estimates, magnitude of the cost of the project, the Port's financing capability and financing plan, and that the Final EIS used lower cost projections. Such commentors included: Mr. Caldwell (HT 18, letter), Mr. Oebser for Congressperson Keiser (HT 29), Ms. DesMarais (HT), Ms. Milne (HT 50), Mr. Newby (HT 81), Ms. McKeeman, Ms. Brown (52AB20,AB29), Ms. Brasher (54L), Mr. Rowe (63L1,L5), Mr. Anderson (71L), Ms. Shes (72L), Mr. Pugh (76L), Mr. Mediema (HT 19), Ms. Brown (HT 90,52AB30,52AB101), Ms. Bilz (61L), Mr. Oebser (55RCAA,4-8,7C-1/2/3), Mr. Bader (67L4-8,1-8c), and Mr. Kirsch (69ACC,ES-1,Pg 1.4).

Response: The Port has prepared a financing plan for the proposed improvements and determined that the improvements can be completed through use of funding from the Aviation Trust Fund, use of Passenger Facility Charges (the $3 ticket tax), and bond financing. The proposed financing plan does not rely on the Port's overall County tax levy, which has not been used at Sea-Tac Airport to finance past improvements.

The cost of the proposed Master Plan Update improvements presented in the Final EIS represented the cost of the project without escalation and taxes. The cost of the Third Runway was identified in the Final EIS as $450 million (acquisition, runway, and mitigation) while the entire Master Plan Update was estimated at about $1.6 billion. Since the issuance of the Final EIS, the Port has prepared its financing plan for the runway, representing the new construction schedule assessed in the Draft Supplemental EIS. With the new construction phasing, the Port was then able to estimate cost escalation and taxes, increasing the cost of the runway to $587 million. Included in the new cost evaluation is a 30% contingency, versus the 3% referenced by one commentor. Independently, the FAA has reviewed the cost estimates and determined that they have been formed using standard methods and reflect a reasonable planning level cost estimate.

The estimates used by the Port to identify the cost of importing the fill ranged from $3 to $12 per cubic yard of fill, depending upon the length of the haul. Information concerning the cost of fill was developed by the Port's 1995 Seattle-Tacoma International Airport Third Dependent Runway Preliminary Engineering Report (see Table XII-2). Additional information regarding the cost of fill was developed by the Port's 1996 Alternative Fill Material Delivery Study.

In February 1997, the Port of Seattle released a financing plan in response to Port Commission Resolution 3212. This financing plan for the Third Runway, including cost escalation,

contingency, and sales tax, reflect a project cost of about $587 million. Key elements of the financing plan are:

1. Port seeking maximum amount of Federal funding from the Aviation Trust Fund. This was estimated at $260 million that would be committed through a Letter of Intent (LOI) by the FAA and provide funds over a 10-year period beginning in 1998;
2. Port leveraging the Passenger Facility Charge, as many other airports have begun to do. Approximately $100 million of the runway would be funded in this manner;
3. Approximately $27 million from Airport retained earnings expected over the next five years;
4. Issuance of Airport revenue bonds to be paid back by the airlines operating at the Airport. Two bond issues are currently envisioned: $30 million in 1997 and about $170 million in 2001; and
5. No local real property taxes would be used and funds from the Port tax levy would not be used - such that all costs are paid for or recovered through airport user fees.

In evaluating the cost of airport improvements, one of the key factors considered is the airline cost per enplaned passenger (CPE). The Port has evaluated the cost of the improvements and determined that the improvements are financially feasible using airport revenue sources. A comparison of the CPE at Sea-Tac to other commercial airports is shown below. In 1996, the cost of maintaining and operating Sea-Tac was $4.50 per enplaned passenger, (reduced from the 1994 level of $6.13 per enplaned passenger). Construction of the Third Runway would increase the CPE $1.66 in the maximum year (to $6.16). In comparison, the annual cost per enplanement at other airports is as follows:

Airport	Cost per Enplanement
Detroit Metro (1994)	$ 5.14
Sea-Tac (1996)	$ 4.50
San Jose (1994):	$ 7.67
Orlando (1994)	$ 8.51
Chicago O'Hare (1994)	$ 8.85
Miami International (1995)	$ 8.94
Pittsburgh (1995 estimated)	$11.18
Honolulu	$11.64
New Denver International	$18.15

One commentor indicated that the increased costs from implementing the proposed Third Runway (and other Master Plan Improvements) would increase landing fees to airlines such that aircraft operations would decrease. The cost per enplanement includes landing fee charges and is a more comprehensive reflection of the costs of all improvements and maintenance. As is shown above, the costs are at the lower end of the cost per enplanement at several other comparable airports, and thus would not significantly affect passenger demand.

To consider the cost versus benefit of the runway, the Port prepared a Net Present Value evaluation based on the financing plan. A positive net present value accounts for the time value of money and quantifies the extent to which benefits outweigh the financial costs. Two worst-case scenarios were considered to determine alternate net present values – and both approaches result

in a positive net present value. Using delay costs reflecting only the airline operating costs (not including any passenger impacts) the net present value of the Third Runway is $673 million. If lower delay reduction projections were used, the net present value would be $44 million. Using all worst-case scenarios combined, the net present value is still a positive $10 million, showing that the Third Runway would be cost effective and produce benefits to the airfield system.

In accordance with the requirements of the National Environmental Policy Act and the State Environmental Policy Act, the Final EIS and Supplemental EIS presents the costs/impacts and benefits of the proposed Master Plan Update Improvements.

See response to **comment 2-Q** concerning the long-term capability of the Third Runway.

2-AD. Mitigation Costs - Mr. Stark (HT 44), Ms. DesMarais (HT 45), Ms. Milne (HT 51), Ms. Basareb (HT 77), Mr. Newby (HT 85), Mr. James (HT 108), Ms. Stuhring (21L14), Congressman Smith, Ms. Nordhaus (39L), Ms. Brasher (54L), Ms. Brown (52AB15, AB30,AB41,AB118), and Mr. Kirsch (69ACC,ES-5,Pg 1.4,4.27-4-30) commented that the cost of mitigation would be much greater than identified in the Final EIS or Supplemental EIS.

Response: The Final EIS and the Supplemental Environmental Impact Statement identify mitigation measures to address significant adverse impacts caused by the proposed improvements (see response to **comment 10-H**). The cost of mitigation associated with the proposed Master Plan Update improvements is about $60 million. The City of Burien, through funding from the State of Washington, commissioned a study to examine mitigation that the communities might desire above and beyond that identified by the Final EIS and Supplemental EIS. An initial draft estimated that that the cost of community mitigation might approach $3 billion. As is shown in response to **comment 4-J**, a review of that study indicates that such mitigation was not appropriately identified and evaluated.

2-AE. Safety: Mr. Caldwell, Ms. DesMarais (34L14), Ms. Stuhring (L14), and Mr. Akers (77L12) expressed concern with aircraft safety due to the proximity of Sea-Tac, Boeing Field, and Renton Airport. Ms. Brown (52AB10,AB11,AB12,AB152,AB153, AB154) stated "Isn't excluding Boeing Field impacts inconsistent with the cumulative impacts approach required by environmental regulations?" and indicated other cumulative impacts relative to Boeing Field. Ms. Brown (52AB102) requested clarification of "minimizes aircraft pushbacks and taxiing conflicts as flights enter and exit the terminal".

Response: The FAA's 1995 Capacity Enhancement Study Update computed the number of runway crossings that would result from the use of the proposed new parallel runway at Sea-Tac. The delay analysis presented in the Draft and Final EIS discusses the impacts to the system from the runway crossings. The Capacity Enhancement Study Update also examined the impacts associated with interaction between Sea-Tac and Boeing Field. Renton was not directly considered because there are no significant airspace interactions with that airport. However, the simulation analysis reflected the air traffic procedures that control traffic at all regional airports, including Renton. The interaction with Boeing Field was reflected in the analysis, as arrivals to

Boeing's Runway 13 would require a gap in the arrival stream to the proposed new runway at Sea-Tac during south flow operations. During north flow operations, the impact of the interaction of BFI is expected to be negligible. The FAA also performed a sensitivity analysis which demonstrated additional delay savings would result from eliminating the interaction between BFI and SEA.

It should also be acknowledged that, like most reliever airport operations in the United States, air traffic control procedures have evolved to minimize operational impacts of the primary commercial airport. In many cases, procedures are established so that the reliever airport is subservient to the primary airport.

The commentor suggests that the interactions between Sea-Tac and Boeing Field would be greatest during instrument meteorological conditions. However, the commentor also acknowledged that general aviation demand is often reduced during such conditions. As a result, it is likely that demand at Boeing Field would be greatly reduced during those periods in which the greatest impacts are expected to occur. The commentor therefore overstated the likely operational impacts to performance at Sea-Tac due to interactions with BFI.

One commentor requested a definition of "a lag in Boeing Field aircraft traffic". The context of this statement was not provided. However, it is presumed that the reference is to when the stream of traffic is not constant, where a gap is provided.

The Final EIS and Supplemental EIS provide the appropriate level of cumulative impact evaluation required by NEPA and SEPA. Boeing Field "impacts" were considered in the Master Plan Update and EIS for their cumulative effects relative to the Sea-Tac improvements, as noted above and in response to **comment 6-M and 7-O**.

The reference to "minimizes aircraft push-back and taxiing conflicts" refers to the terminal/gate improvements and taxiway improvements that would alleviate the issues identified, by enabling greater efficiencies. See also response to **comment 4-A**.

2-AF. JFK Cap Ms. DesMarais (34L19) requested clarification of the JFK cap discussed in Chapter 2 of the Supplemental EIS.

Response: In 1968, the Federal Aviation Administration issued Title 14 of the Code of Federal Regulations, Part 93, "The High Density Traffic Airport Rule." The rule was promulgated to provide a temporary solution to airspace congestion at several major busy airports in the nation. Part 93 established a limit on the number of movements that certain airports could actually efficiently handle. Limits were established for general types of aircraft activity such as Air Carriers and Scheduled Air Taxis and were based on capacity of the Airport during Instrument Flight Rule (IFR) conditions. Such conditions are considered to be "worst case" weather conditions and were assumed to exist 100 percent of the time. Only five airports in the United States were subjected to the Quota Rule and are also referred to as "slot controlled" airports. These airports are: John F. Kennedy, LaGuardia, Newark, Washington National, and O'Hare. Since the enactment in 1968, the rule has been revised several times to reflect the improvements

about 1 million enplanements a year or 10% of Sea-Tac's enplaned passengers. As described on Page II-10 of the Final EIS, when origin & destination enplanements are less at one competing facility, competition entices traffic to stay at the facility with the greater level of service. As a result, a supplemental airport site would not off load sufficient demand to address the current poor weather operating constraints at Sea-Tac. Therefore, the increased demand would not alter the conclusions concerning this alternative. See also response to **comment 3-C.**

The commentor claims that the Draft Supplemental EIS ignored the role of new technology as an alternative to the construction of a new runway. To the contrary, the Final EIS and Draft Supplemental EIS considered the entire range of technological initiatives on the horizon, including, but not limited to, the following:

- Airport Surface Capacity Technology
- Terminal Air Traffic Control Automation
- Precision Runway Monitor
- Microwave Landing System
- Traffic Alert and Collision Avoidance System
- Wake Vortex Avoidance/Advisory System
- Localizer Directional Aid (LDA) Approaches
- Global Positioning System
- Flight Management System

afternoon meeting at hotel across from airport?

Each of these technologies is designed to reduce the variance in spacing between successive arrivals and departures, thereby enhancing overall performance with and without a new runway. However, none of these technologies are capable of addressing the fundamental constraint -- the lack of a second approach during poor weather conditions. In fact, most of these technological initiatives offer a greater opportunity to improve performance with a Third Runway than without a runway. For example, FMS or GPS procedures could be developed to reduce the impacts of a Third Runway interactions with Boeing Field. Therefore, it is possible that the delay reduction benefits of the new runway as defined in the Draft Supplemental EIS are, in fact, conservative.

The Final EIS, and Supplemental EIS, considered the use of GPS (Global Positioning System) – see pages Supplemental EIS page 3-6 and Final EIS beginning on pages II-14. The Final EIS acknowledges that GPS will be increasingly used in the future to ease airspace congestion and efficiency. As that discussion shows, no technologies are available (or in the planning stages) to address wake vortex issues that occur with runway separations closer than 2,500 feet. See response to **comment 3-E** concerning technology, such as the LDA..

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3-C. Alternative Airport - Paine Field - Mr. Forrey (20L) commented that Paine Field is a viable alternative, as evidenced by "one commuter airline is beginning operations at Paine Field". Comments concerning other alternative airports, including Paine Field, were submitted by Mr. & Mrs. Nordhaus (37L), Mr. McKnight (38L), and Ms. Bilz (61L).

Response: In March 1997, Horizon Airlines announced that it was contemplating re-initiating commuter service at Paine Field with approximately 10 operations daily; Their February 1997

announcement indicated 4 to 5 flights. In the past, various commuter operators have attempted to initiate service at Paine Field, without success. Upon failure, the airline either ceased operating or consolidated its operations at Sea-Tac. The Final EIS considered the effect of a airline initiating service at an existing airport in the region. Horizon's initiation of 10 daily operations would represent less than 1% of Sea-Tac's existing total aircraft operations or passengers (about 3,650 annual operations and 135,000 annual passengers assuming the announced DHC-8 aircraft at 100% load factor). See response to **comment 3-B** above.

3-D. Non-SeaTac Alternatives: Ms. Brown (52aAB1,AB155), and Mr. Anderson (71L) asked why alternatives "outside of Sea-Tac (are not) being considered now that the FAA TAF forecasts indicate the Third runway does not provide adequate capacity but will cost more than building an average US Airport...". Mr. Kirsch (69ACC,Pg 2.9) commented that inadequate consideration was given to non-development actions.

__Response__: Chapter II of the Final EIS addressed the full range of alternatives to the Master Plan Update improvements. Consideration was given to the effect of the higher demand on the feasibility of non-Sea-Tac alternatives, as discussed in Chapter 3 of the Supplemental EIS. See response to **comment 2-Q** concerning the capacity with the Third Runway.

3-E. LDA: Mr. Oebser (55RCAA,6-4), and Mr. Kirsch (69ACC,Tab I - Hockaday) commented that the Supplemental EIS inaccurately considered the benefits of the Localizer Directional Aid (LDA).

__Response__: The commentors suggest that use of an LDA approach would provide an equivalent benefit to a new runway during certain weather conditions. As is noted in the Final EIS, the LDA was shown to only satisfy visual flight rule condition weather (VFR2). While VFR2 condition arrival constraints could be addressed by an LDA, the remaining half of poor weather (Instrument Flight Rule - IFR) would not be addressed. Use of the LDA approach would not solve the low visibility problem, and its use would be further restricted by the need to perform mixed operations (i.e., arrivals and departures) on the LDA runway which would limit its effectiveness in VFR2 conditions. Therefore, an LDA approach would not provide the same level of delay reduction during poor weather conditions as a new runway.

The commentor further suggests that ceiling minimums as low as 620-680 feet above airport ground level (AGL) are being achieved for simultaneous dual approaches with the LDA at St. Louis; therefore, he implies that similar minimums could also be achieved at Sea-Tac Airport. While the published single approach LDA ceiling minimums at St. Louis are, in fact, 1,200 MSL (or approximately 620-680 AGL), the St. Louis simultaneous dual approach minimums are 1,200 feet AGL. Because the Sea-Tac Airport's runways are spaced closer together than those at St. Louis, and because the north thresholds of the Sea-Tac runways are even, it is likely that the ceiling/visibility minimums for a dual LDA approach at Sea-Tac would be no lower than 1,500/5. Finally, it should be noted that use of an offset LDA approach to Sea-Tac Airport would increase the noise footprint to the west of the Airport because of the 4,300 separation required between arrival streams and thrust increase to turn into the existing runway.

→ CEO Alaska Airlines Smith Kelley and

TA Wilson Boeing live west of airport
Wilson died ~ 1998. Signed letter to Rigsby Sept 1998

3-K. Runway Length/Alternative Alignment: Mr. Kirsch (69 ACC, ES-2, Pg 3.6-3.7) commented "A shorter runway could satisfy the asserted need for increased poor weather arrival capacity." and suggested that a 5,200 foot long runway with either a 1,200 or 2,500 foot separation.

Response: During the Master Plan Update thorough consideration was given to commuter length runways, as is documented in the Final EIS (pages II-33 through II-34B). As is shown, most of the costs and environmental impacts would result from such a runway, but the benefits would be minimal, since fewer operations could be accommodated on a commuter-length runway than on an air carrier length runway. The commentor argues that a shorter runway designed to accommodate general aviation and commuter aircraft would meet the purpose and need while significantly reducing the project costs. This comment fails to recognize the process by which air traffic controllers sequence each aircraft from its destination to a runway via one of four radial fixes or "cornerposts." In essence, each arrival is routed over one of four navigational fixes located to the northeast, northwest, southwest or southeast of Sea-Tac Airport, based on the location of the flight's origin airport. This is done to avoid crossovers and provide the most efficient processing of aircraft to a particular runway. International arrivals from the Pacific Rim are typically routed over the northwest fix and then would be assigned to the new runway, whereas many commuter markets are routed over the southeast fix and would be assigned an existing runway. Consequently, most arrivals from the Pacific Rim, which require 8,500 feet, would be unable to use the new runway if it were only 5,200 feet long. Thus, considerably less than 31% of total commuter flights would be able to practically use the runway.

Assigning all commuter and general aviation traffic to the new runway would require air traffic controllers to segregate this traffic from all other traffic before reaching one of the four cornerposts. This increase aircraft flying times and delays, since aircraft would be forced to fly further to reach the appropriate fix. The increased aircraft flying time and delay would be significant and would be counter-productive to the efforts to reduce flying time and delay – as that is the fundamental benefit of the Master Plan Update projects.

cliff wall dangerous

It should also be noted that, although certain jets are capable of landing on a 6,000 foot runway during still wind conditions and dry pavement, it is likely that many pilots would refuse a runway of this length, given the availability of a longer parallel runway. This is especially the case during crosswind conditions, since no crosswind runway is available at Sea-Tac Airport, and during wet pavement conditions, which are frequent at Sea-Tac Airport. Any time a pilot refused the new runway due to length, additional delays and increased controller workload would result. The availability of an 8,500-foot runway provides the flexibility to accommodate virtually all arrivals, regardless of aircraft type and weather conditions, thereby enhancing the opportunity to reduce delays. As a result, a "short" runway option was not considered to be a reasonable alternative.

For more information, please see Master Plan Update Technical Report No. 6, "Airside Options Evaluation" dated September 1994, which is hereby incorporated by reference. A copy of this document is available for public review during normal business hours at the Renton, Washington office of the FAA and at the Port's Sea-Tac Airport offices.

Finally, the commentor states that "a runway parallel to BFI Runways 13-31 appears to offer the only opportunity for significant IFR runway capacity increases at Sea-Tac." This recommendation shows a lack of understanding of airport capacity, air traffic control operations and noise implications. A 13-31 runway at Sea-Tac would require either a converging approach or a diverging departure in only one direction. Such a converging approach would not enable dual approaches below IFR minimums, and therefore, it would not increase IFR capacity at Sea-Tac. Further, the noise impacts and the construction costs would likely be significantly higher than the proposed alignment. The alternative of a non-parallel runway was identified and discussed in the Final EIS, Chapter II.

3-L. Do-Nothing Alternative - Mr. Forrey (20L) commented that future conditions should be compared against the existing condition, instead of a Do-Nothing. Ms. Stuhring (L1) commented that "The Do-Nothing alternative will automatically trigger a DO-SOMETHING process at other airports in the state." The ACC's consultant (Smith Engineering) commented that a "With Master Plan but Without Runway" alternative should have been considered. Mr. Hoggard (66SeaTac,3-1) indicated that the impacts should be judged against existing conditions and mitigation provided to address these conditions.

Response: The EIS was prepared in accordance with the National Environmental Policy Act and the Washington State Environmental Policy Act, which calls for the comparison of the Build ("With Project") alternatives to the No-Build (Do-Nothing). To enable decision-makers to compare the future conditions with current conditions, an existing condition is presented. As required by these regulations, the Do-Nothing Alternative must represent the no-action alternative, which is characterized in the Final EIS, with the earlier forecasts, and the Supplemental EIS with the higher forecasts. "With Master Plan but Without Runway" would not have addressed the needs at Sea-Tac.

3-M. Do-Nothing: Ms. Brown (52AB94) questioned what would happen if the North Employee Parking Lot is not built.

Response: If any one or more of the proposed improvements is not undertaken as needed, the Do-Nothing condition for that element would result. In the case of the North Employee Parking Lot, greater pressure would be placed on off-airport parking locations as existing parking facilities are needed and will continue to be needed for passenger traffic. If this lot were not undertaken, alternative sites would continue to be explored. See also response to **comment 10-C**.

4. AFFECTED ENVIRONMENT

4-A. Cumulative Impacts: Mr. Oebser for Congressperson Keiser (HT 30), Ms. Brasher (54L), Mr. Oebser (55RCAA,7D-4/5), Mr. Hoggard (66SeaTac,1), and Mr. Stark (73L1) expressed concern that the cumulative impact of the Master Plan Update was not evaluated or were not evaluated adequately.

Response: The Final EIS and the Supplemental EIS provide an analysis of the cumulative impacts. Chapter III of the Final EIS, and Chapter 4 of the Supplemental EIS discusses the actions included in the cumulative impact evaluation. There appears to be some confusion relating to the sentence "However, until specific projects are proposed for these developments, the total cumulative impacts can not be identified". This statement refers to the anticipated, but not yet defined, development that is planned to occur in the vicinity of the Airport.

One commentor expressed concern that the impact of the SR 509 Extension/South Access was not addressed in the Supplemental EIS. Current plans call for the development of the SR 509 Extension/South Access between 2010 and 2020, with the roadway completed by 2020. The Final EIS presents the impacts of the proposed Master Plan Update improvements under two conditions, with and without the SR 509 Extension/South Access in year 2020. Because the Supplemental EIS analysis considered impacts in years 2000, 2005, and 2010 reflection of that regional roadway in the Supplemental EIS analysis was not applicable. Both documents discuss the generalized impacts of such a road, but note that the specific impacts can not be identified until a final alignment has been selected by the State and local jurisdictions.

4-B. Expert Panel: Ms. Brown (HT 52) stated "With regard to the expert panel back last spring, they basically found that the Port had not complied with the mitigation that they were supposed to..... and that they found that the noise modeling was not credible." Ms. Stuhring (L6) questioned what actions have the Port undertaken, and what is the timetable for implementation of the remaining actions. A similar comment was made by Mr. Rymsza (31L), Mr. Abbott (50PSRC-4) and Ms. Nordhaus (39L). Other concerns with the Expert Arbitration Panel were submitted by Mr. Rowe (63L5), Mr. Hoggard (66SeaTac,6-4), and Ms. Farley (79L2).

Response: Chapter 4 of the Draft Supplemental EIS summarizes the purpose and outcome of the Expert Panel. In its final order of March 27, 1996 relative to the noise issue, the majority of the Panel (two members, with one dissenting opinion) concluded that "although the Port of Seattle has scheduled, pursued, and achieved an impressive array of noise abatement and mitigation programs, the Port has not shown a reduction in real on-the-ground impacts sufficient to satisfy the noise reduction condition imposed by Resolution A-93-03" (Emphasis added). The Panel concluded "that the Port could have done more, and that, had it done so, the additional improvement probably would have made a material difference in real, on-the-ground noise impacts, turned a marginal improvement into a meaningful one, and therefore affected the final outcome of this proceeding." Contrary to several commentors belief, the Panel noted that Sea-

Tac's noise abatement program is one of the most comprehensive noise compatibility plans in the U.S. However, their finding was not that the Port had not complied with their commitments, but that the actions implemented had not achieved the specific standards of the PSRC resolution.
In conclusion, the Panel offered a list of recommended noise reduction measures to be considered. The following summarizes the status of implementing the Port's responsibilities under the recommendations:

Action	Status
A. Evaluate and upgrade its existing noise monitoring system to include the use of approximately 25 noise monitors, develop a schedule for completion by the end of 1998, and thereafter disseminate regular reports to the public using data from the new noise monitoring system to include DNL, SEL and Time Above metrics.	Noise consultant selected, system specifications under development. The consultants contract calls for the conduct of public coordination which will be initiated in 1997.
B. Work with the FAA and/or airlines to:	
1. Analyze the potential for reducing the use of thrust.	In process. Issue was discussed at the SeaTac Noise Advisory Committee meeting in September 1996
2. Voluntarily minimize the number of flights in the middle of the night (1:30-5:30 am.).	Plan to initiate in 1997
3. Continue to enforce Airport Rules and Regulations to minimize the number of variances for the Nighttime Limitations Program.	On-going. Letter was sent to all operators reminding them of the Stage 2 curfew.
4. Work with foreign air carriers to gain cooperation in ensuring that Stage 3 aircraft continue to be used for nighttime international flights.	Completed. Letter sent to international carriers. Currently all use Stage 3 aircraft at night.
5. Work with the owners/operators of Stage 2 aircraft under 75,000 pounds to voluntarily limit or eliminate their use.	Initiated in early 1997 with contacts to aircraft operators.
6. Continue to work to enforce Airport Rules and Regulations to minimize nighttime engine run-ups.	On-going
C. Modify its existing contract with noise experts to specifically include the need to review methods of mitigating the impacts of low frequency noise and vibration, and to supply such information to the Port.	Completed - Language was added to existing contract.
D. Design and implement a noise compatible land use plan for Port properties within its current acquisition zone.	In Progress. Evaluated Port and local jurisdiction visions and developed preliminary land use concepts.
E. Complete the "sensitive use" public buildings insulation pilot studies.	Port has completed insulation of 5 out of 21 Highline Community College classroom buildings Three pilot projects completed (a church, a private school, and a condominium complex) One additional church will be completed in 1997 One convalescent center is under design.

Panel was submitted erroneous data — neighborhoods + Highline Camps NOT INSULATED

Response: The Final EIS and the Supplemental EIS have addressed all issues appropriate to an Environmental Impact Statement. Relative to the Expert Panel, the PSRC has addressed these issues before finalizing its decision on whether to include the runway in the Metropolitan Transportation Plan. The purpose of the Congressional hearing was to enable the congressional members of the Aviation Subcommittee to hear directly from the interested parties their issues associated with the Third Runway. The conduct of the hearing enabled that purpose to be completed; no other issues applicable to the EIS arose from the congressional hearing.

4-D. Runway Vote: Ms. Brown (HT 92) stated "on the same day that they voted in the third runway there was a vote saying that they needed an alternative airport." Mr. Rowe (63L5,L6) indicated that the voters should get a chance to vote on the Third Runway.

Response: The only vote representing the voice of the Puget Sound Region has occurred before the Puget Sound Regional Council. As is summarized in the Draft Supplemental EIS, the General Assembly voted to amend the Metropolitan Transportation Plan to include the Third Runway. No votes were taken approving an alternative airport; to the contrary, the PSRC process concluded that an alternative airport is not feasible.

4-E. PSRC Re-Review: Mr. Bader (67L1-4,3-18d) commented that because of all the changes in the Master Plan Update, that it should be "re-submitted to the Puget Sound Regional Council for its re-examination...". A similar comment was submitted by Ms. Farley (79L2).

Response: No additional review is warranted in light of all of the information that is available. As is noted in response to **comment 2-H**, the Flight Plan considered forecasts that are about 6% less than the new forecasts. In addition, sufficient notification and awareness of the conduct of the Supplemental EIS occurred beginning in January 1997. Since that time, there has been no indication that the information that has become available would alter the conclusions of the general assembly's consideration of these issues.

This is an issue that has been raised in the Airport Communities Coalition and its member municipalities suit filed in King County Superior Court against the PSRC and the Port for "violations of the Growth Management Act (GMA), the State Environmental Policy Act (SEPA) and other laws governing governmental decision-making within the state of Washington", which is discussed in Chapter 4 of the Supplemental EIS. Thus, this issue will be determined by the courts.

4-F. Des Moines Creek Technology Campus (DMCTC): Ms. Stuhring (21L) asked why "plans were canceled for CTI".

Response: The plans for the Des Moines Creek Technology Campus, to be occupied by CTI were canceled in early 1996 based on the site development needs, mitigation requirements and costs.

4-G. VISION 2020: Mr. Abbott (50PSRC-4) noted the incorrect adoption date of VISION 2020 on page 4-6.

Response: Comment noted. The Final Supplemental EIS reflects the corrected date.

4-H. Des Moines Comprehensive Plan Appeal: Mr. Abbott (50PSRC-4) noted that the Supplemental EIS did not note the Port's appeal of the Des Moines Comprehensive Plan.

Response: Comment acknowledged. As the Port appealed the Des Moines Comprehensive Plan at the time the Draft Supplemental EIS document was being printed, it could not be acknowledged. The Final Supplemental EIS reflects this appeal.

4-I. Metropolitan Transportation Plan (MTP) Consistency: Mr. Abbott (50PSRC-4) commented that the statement "no amendments have occurred (to the local plan) to bring about transportation compatibility with the Airport, as directed by the Updated MTP." is not precisely correct.

Response: The commentor notes that as a result of the Updated Metropolitan Transportation Plan (MTP), the PSRC "sent a letter to jurisdictions alerting them to the amendments and to the need to assure that they were consistent with the MTP as amended." This is reflected in the Final Supplemental EIS.

4-J. Burien Mitigation Study: Mr. Oebser (55RCAA,5-4,5-5,5-6,5-7,7B-2), Mr. Anderson (71L), Mr. Kirsch (69ACC,ES-5,Pg4.27-4.31), Mr. Bader (67L6-4,6-5), Mr. Akers (77L8) commented that the results of the Burien Study should have been noted. Mr. Kirsch (69ACC) and Mr. Stouder (74Burien) submitted the report "Sea-Tac International Airport Impact Mitigation Study, Initial Assessment and Recommendations" as comments on the Draft Supplemental EIS.

Response: In late summer 1996, the City of Burien issued a preliminary draft report titled "City of Burien Seattle-Tacoma Airport Master Plan Update Studies Environmental Issues Mitigation" That document contained numerous incomplete sections and, based on the Port's review and comments submitted to the City of Burien, contained extensive mis-characterization and erroneous information. The Port of Seattle submitted comments on the preliminary draft report in a 3-page letter to the City of Burien dated November 25, 1996 (including a 14-page attachment). This letter (and attachment) are incorporated in this Supplemental EIS by reference. A copy is available for review during normal business hours at the Renton, Washington Office of the FAA and at the Port offices at Sea-Tac Airport. The Draft Burien Mitigation Report was then not issued until March 27, 1997.

Mr. Kirsch (69ACC) and Mr. Stouder (74Burien) submitted the Draft Burien Mitigation Study as comments on the Draft Supplemental EIS. As is noted on page 1-1 of this report, the purpose of the study "was to assess the projected impacts of the proposed Third Runway and to develop

same time frame "With Project". In the example of noise impacts, the Draft Burien Mitigation Report includes mitigation for all properties within the "With Project" 60 DNL noise contour and does not subtract the impacts that would occur if the Do-Nothing Alternative occurred. Therefore, the Draft Burien Mitigation Report includes as mitigation impacts that either currently occur or would occur in the future without the Third Runway.

Similarly, in evaluating surface transportation impacts, the Draft Burien Mitigation Report identifies the level of service standards adopted by local communities for local streets (see Table 8.02). While an increase in surface traffic, as a result of growth in airport traffic, is generically discussed and attributed to the Third Runway, no specific traffic levels are identified. As is shown in the Final EIS, and the Supplemental EIS, airport facilities are expected to accommodate the forecast growth in enplaned passengers with or without the proposed improvements through the reasonably foreseeable future and the proposed improvements are not expected to result in a significant adverse impact to local roads. Thus no mitigation is needed to address project-related impacts. Instead, the Draft Burien Mitigation Report does not identify future growth in surface traffic, and does not differentiate between airport and non-airport surface traffic demands. Thus, the level of service impacts, and the physical damage impact, identified by the Draft Burien Mitigation Report improperly attribute impacts to the Third Runway.

As is noted in the table above, a significant quantity of mitigation is associated with aircraft noise impacts and land use compatibility conflicts. The Final EIS and Supplemental EIS recommend mitigation for significant project-related noise impacts within the 65 DNL noise exposure contour, the standard used by the FAA for environmental impact studies and Part 150 Noise Compatibility Planning Studies. This is the noise exposure contour that has been used in the last two consecutive Part 150 Noise Compatibility Studies at Sea-Tac Airport. The Draft Burien Mitigation Report uses quieter noise levels, which fails to recognize ambient noise levels from other community sources, and lacks any basis in Federal noise policy. Such mitigation is identified for public facilities impacted by 55 DNL (impacts of which are not identified by the Draft Burien Mitigation Report, but mitigation is listed in Plate 7.6). As is shown in the Final EIS, surface traffic on area roads results in noise impacts in excess of these levels. However, the Draft Burien Mitigation Report does not include other noise sources that may equal or exceed the noise from aircraft overflight. In addition, the Draft Burien Mitigation Report uses two noise mitigation approaches (the 400 foot topographic line and the flight track corridors) that have no technical substantiation. The study does not define the technical merits behind selecting the 400 foot topographic line (as this is not a mitigation applied to any other commercial airport) or 5 miles. Further, the flight track corridor mitigation is identified as a noise impact [specifically page 7-9 refers to these impacts as "psycho-acoustic noise impacts (aircraft noise appears louder because the aircraft is visible)"]. As the flight track methodology gave equal consideration to turbo-prop corridors versus jet corridors, it is questionable how noise is reflected in the methodology, as turbo-props are typically substantially quieter than jets. Finally, these approaches do not differentiate between impacts that would occur without the proposed improvements or those associated with the project.

Not when they fly so low you think they are crashing into your house

Other non-standard approaches are used in evaluating impacts to resources such as endangered species. Despite the Final EIS containing a biotic assessment, including coordination under

Section 7 of the Endangered Species Act with respective agencies, the Draft Burien Mitigation Report includes recommended studies and development of "A preservation and protection plan" (page 7-38). Section 7.14 of the Draft Burien Mitigation Report includes stormwater runoff volume mitigation. The mitigation defined by the Draft Burien Mitigation Report is simply stated "Additional runoff volumes may result from a decrease in permeable surface within the drainage-shed. Further studies should be conducted to determine specific 'floodprone' areas." (Page 7-23) However, unlike the analysis presented in the Final EIS, the Draft Burien Mitigation Report does not quantify the amount of stormwater to be accommodated. As the Final EIS assesses the total quantity of stormwater runoff generated by the proposed improvements, it is questionable what additional mitigation is necessary. The Draft Burien Mitigation Report is not specific. Other similar examples exist throughout the Draft Burien Mitigation Report.

Other significant differences between the two studies relate to forecast activity levels. The Draft Burien Mitigation Report indicates that all activity over 380,000 annual operations is associated with the operation of the Third Runway. See responses to **comment 2-A through comment 2-I**. In light of the annual activity accommodated in 1995 and 1996, this element of the Draft Burien Mitigation Study has already been shown to be flawed. In consideration of the traditional environmental impacts (noise, air quality, water quality, wetlands, floodplains, etc.), the projections from the Final EIS were used. These projections were based on an identification of the Do-Nothing and "With Project" forecast of operations, with both alternatives being able to accommodate the demand of 441,000 operations that was projected in 1994 by the Master Plan Update. However, when considering the socio-economic conditions, a different forecast assumption is made – namely that it is not possible for existing airport facilities to accommodate more than the existing airfield's annual service volume (380,000 annual operations).

As was repeatedly noted to the consultants preparing the draft analysis, annual activity at Sea-Tac exceeded their theoretical cap in 1995 and 1996. The Draft Burien Mitigation Report concludes that any growth in activity above 380,000 operations (which was originally forecast to occur by year 2000) is associated with the Third Runway. Page 4-16 of the draft report states "As the ASV level after which airport improvements are required if future demand levels are to be accommodated, 380,000 operations is Sea-Tac's consensus threshold.....These activity levels *(above 380,000)* will not occur at Sea-Tac Airport without construction of the Third Runway, and related improvements" *(emphasis added)*. Annual activity accommodated at the Airport in 1995 and 1996 shows this to be an invalid assumption. Thus, use of this assumption inappropriately inflates the cost of mitigation.

In numerous places, the Draft Burien Mitigation Report indicates that inadequate consideration, if any, was given to the cumulative environmental impacts of the Master Plan Update improvements coupled with other planned regional development actions. However, the Draft Burien Mitigation Report's surface transportation evaluation notes that surface transportation impacts are understated because a cumulative impact evaluation was included. As was noted in the Final EIS, and elaborated upon in the Supplemental EIS, the environmental evaluation in both Master Plan Update studies reflected a cumulative impact evaluation. For many of these regional plans, project specific impacts are not known or are not reasonably foreseeable at this time. For instance, the location of a facility will determine if wetland impacts or other natural feature