Table 1

SUMMARY OF FORECAST OF AVIATION DEMAND
SEA-TAC INTERNATIONAL AIRPORT: 1980-2000

	Actual	Forecast		
	1980	1985	1990	2000
Annual Aircraft Operations				
Air Carrier/Air Taxi	183,698	174,430	186,050	218,870
General Aviation - Itinerant	27,693	29,300	32,600	40,200
General Aviation - Local	1,662	1,500	1,400	1,200
Military	551	550	550	550
Total Operations	213,604	205,780	220,600	260,820

	Estimate	Forecast		
	1980	1985	1990	2000
Peak Hour Operations[1]				
Aircraft Operations: VFR				
Air Carrier/Air Taxi	47	47	48	51
General Aviation - Itinerant	7	7	7	8
General Aviation - Local	0	0	0	0
Military	0	0	0	0
Total Operations	54	54	55	59
Aircraft Operations: IFR				
Air Carrier/Air Taxi	47	47	48	51
General Aviation - Itinerant	5	5	5	6
General Aviation - Local	0	0	0	0
Military	0	0	0	0
Total Operations	52	52	53	57

[1]Peak hour of the average day of the peak month

Source: The Port of Seattle

Comparison of Forecasts of Annual Operations

Exhibit 2 presents the Airspace Study forecast along with the three most recently prepared forecasts of annual operations at King County International Airport (Boeing Field). The Washington State Department of Transportation (WSDOT) forecast was prepared for the Washington State Airport System Plan (October 1980) and used as a basis for the Airspace Study forecast. The Federal Aviation Administration (FAA) forecast was prepared for the FAA Aviation Forecast--Seattle-Tacoma (December 1979). Both the WSDOT and FAA forecasts were prepared during a period of high and increasing levels of aircraft operations. Projections of high levels of aircraft operations resulted. The Puget Sound Council of Governments (PSCOG) forecast was prepared for the Draft Regional Airport System Plan 1980-2000 Central Puget Sound Region (November 1980). This forecast was prepared in the period after the level of operations at Boeing Field had begun to decline. Projections of lower levels of aircraft operations resulted.

ANNUAL OPERATIONS FOR SEA-TAC INTERNATIONAL AIRPORT

The five-, ten-, and twenty-year forecast of annual operations for Sea-Tac International Airport (Sea-Tac) is based on the forecast of aviation demand presented in the Sea-Tac International Noise Exposure Update (revised forecast, February 1982). This forecast was selected because of the corresponding forecast years and its recent completion. The Airspace Study forecasts of annual operations and associated rates of growth at Sea-Tac are presented in Table 9.

Table 9
FORECAST OF SEA-TAC
ANNUAL OPERATIONS AND GROWTH RATES

		Forecast		
	Actual 1980	1985	1990	2000
			182,050	218,870
Air Carrier/Air Taxi	183,698	174,430	~~185,210~~	~~219,880~~
(Growth rate in % per year)		(-1.0%)	(~~1.2%~~)	(~~1.7%~~)
			1.3%	1.6%
General Aviation - Itinerant	27,693	29,300	32,600	40,200
(Growth rate in % per year)		(1.1%)	(2.2%)	(2.1%)
General Aviation - Local	1,662	1,500	1,400	1,200
(Growth rate in % per year)		(-2.0%)	(-1.4%)	(-1.5%)
Military	551	550	550	550
(Growth rate in % per year)		(0.0%)	(0.0%)	(0.0%)
			220,600	260,820
Total Operations	213,604	205,780	~~219,760~~	~~261,830~~
(Growth rate in % per year)		(-0.7%)	(~~1.3%~~)	(~~1.8%~~)
			1.4%	1.7%

Source: The Port of Seattle

(Note: Total 1980 general aviation operations and military operations identified in Table 9 are from Federal Aviation Administration Air Traffic Records. Total 1980 general aviation operations and military operations used in the Sea-Tac Noise Exposure Update are from Sea-Tac Operations and Traffic Reports.)

The proportion of operations by category is presented in Table 10.

Table 10
FORECAST OF SEA-TAC
PERCENT OF ANNUAL OPERATIONS

Categories	Actual 1980	Forecast 1985	Forecast 1990	Forecast 2000
Air Carrier/Air Taxi	86.0 %	84.8 %	84.3 %	84.0 %
General Aviation - Itinerant	13.0 %	14.2 %	14.8 %	15.3 %
General Aviation - Local	0.8 %	0.7 %	0.6 %	0.5 %
Military	0.2 %	0.3 %	0.3 %	0.2 %
Total Operations	100.0 %	100.0 %	100.0 %	100.0 %

Source: The Port of Seattle

Air Carrier/Air Taxi Category

For the air carrier/air taxi category, separate projections are made for the operations of commercial passenger aircraft (including commuter airlines), all-cargo aircraft, and air taxi operators (excluding commuter airlines).

Commercial Passenger Aircraft Operations

Commercial passenger aircraft operations are derived from projected passenger levels developed from the methodology and approach presented by the Puget Sound Council of Governments in Air Carrier Demand Forecasts: Central Puget Sound Region (October 1980).

Projections of passengers begin with projections of passenger originations (i.e., passengers commencing transport by air at Sea-Tac). Originations are based on the historical relationship between passenger originations, regional personal income per capita, and average revenue per passenger mile. Historical data are presented in Table 11. The equation derived from this historical data is as follows:

$$Orig = -15.8 + 1.35\ (I) - 1.54\ (R)$$

where Orig = natural logarithm of annual adjusted originations per capita
I = natural logarithm of regional personal income per capita in 1967 dollars
R = natural logarithm of average revenue per passenger miles in 1967 dollars

- Between 1980 and 1985 -

  1. decrease in share of four-engine, narrow-body seats allocated to two-engine, wide-body
  2. decrease in share of three-engine, wide-body seats allocated to two-engine, wide-body
  3. decrease in share of three-engine, narrow-body seats allocated to two-engine, wide-body, two-engine, narrow-body, and medium prop

- Between 1985 and 1990 -

  1. decrease in share of two-engine, narrow-body seats allocated to two-engine, wide-body
  2. decrease in share of three-engine, narrow-body seats allocated to two-engine, narrow-body and medium prop
  3. decrease in share of small prop seats allocated to medium prop

- Between 1990 and 2000 -

  1. decrease in share of three-engine, narrow-body seats allocated to two-engine, narrow-body, two-engine, wide-body, and medium prop
  2. decrease in share of small prop seats allocated to medium prop

Application of the operations' formula resulted in projections of annual operations by aircraft category (i.e., groups of aircraft identified by number of engines and width of fuselage) and by sector/stage length. A summary of the forecasted operations is presented in Table 16. Appendix B of the Sea-Tac Noise Exposure Update presents the results for the forecast years of 1985, 1990, and 2000 in their entirety.

Table 16
FORECAST OF SEA-TAC
PASSENGER AIRCRAFT ANNUAL OPERATIONS

		Forecast		
	Actual 1980	1985	1990	2000
Air Carrier Airlines	130,298	129,860	138,780	161,440
Commuter Airlines	46,095	36,060	38,110	46,820
Total Operations	176,393	165,920	176,890	208,260

Source: The Port of Seattle

Table 28
FORECASTS OF PEAK HOUR AND ANNUAL AIRCRAFT OPERATIONS BY AIRCRAFT CLASSIFICATION
SEA-TAC INTERNATIONAL AIRPORT: 1980-2000

Aircraft Classifications	Peak hour, average day, peak month								Annual operations			
	VFR operations				IFR conditions							
	1980**	1985	1990	2000	1980**	1985	1990	2000	1980**	1985	1990	2000
Air Carrier/Air Taxi												
Class* A	-	-	-	-	-	-	-	-	-	-	-	-
B	13	11	11	12	13	11	11	12	51,611	42,090	44,730	54,830
C	26	23	22	19	26	23	22	19	100,472	85,210	87,010	80,750
D	8	13	15	20	8	13	15	20	31,615	47,130	54,310	83 900
Total	47	47	48	51	47	47	48	51	183,698	174,430	186,050	218,870
General Aviation-Itinerant												
Class* A	2	2	2	2	2	1	1	2	9,139	9,370	10,270	10,850
B	4	4	4	5	3	3	3	3	14,400	15,240	17,110	21,710
C	1	1	1	1	-	1	1	1	3,323	3,810	4,240	6,430
D	-	-	-	-	-	-	-	-	-	-	-	-
Rotorcraft	-	-	-	-	-	-	-	-	831	880	980	1,210
Total	7	7	7	8	5	5	5	6	27,693	29,300	32,600	40,200
General Aviation-Local												
Class* A	-	-	-	-	-	-	-	-	166	150	140	120
B	-	-	-	-	-	-	-	-	420	330	330	280
C	-	-	-	-	-	-	-	-	818	660	540	380
D	-	-	-	-	-	-	-	-	258	360	390	420
Total	0	0	0	0	0	0	0	0	1,662	1,500	1,400	1,200
Military												
Class* A	-	-	-	-	-	-	-	-	-	-	-	-
B	-	-	-	-	-	-	-	-	-	-	-	-
C	-	-	-	-	-	-	-	-	367	370	370	370
D	-	-	-	-	-	-	-	-	-	-	-	-
Rotorcraft	-	-	-	-	-	-	-	-	184	180	180	180
Total	0	0	0	0	0	0	0	0	551	550	550	550
Total	54	54	55	59	52	52	53	57	213,604	205,780	220,600	260,820

*Aircraft classifications defined in Exhibit 1.
**1980 estimates of distribution between aircraft classifications within aircraft categories

Source: The Port of Seattle

D/060/25C - 02/24/82

Table 32
FORECAST OF SEA-TAC TRAFFIC MIX
PERCENT OF VFR AND IFR PEAK HOUR OPERATIONS BY AIRCRAFT CATEGORY

Aircraft Category	Estimate 1980	Forecast 1985	1990	2000
Air Carrier/Air Taxi				
Class A	-	-	-	-
Class B	27%	24%	24%	24%
Class C	55%	48%	47%	38%
Class D	18%	28%	29%	38%
Total	100%	100%	100%	100%
General Aviation - Itinerant				
Class A	33%	32%	31%	27%
Class B	52%	52%	53%	54%
Class C	12%	13%	13%	16%
Class D	-	-	-	-
Rotorcraft	3%	3%	3%	3%
Total	100%	100%	100%	100%

Source: The Port of Seattle

Table 33
FORECAST OF SEA-TAC TRAFFIC MIX
VFR AND IFR PEAK HOUR OPERATIONS BY AIRCRAFT CATEGORY

Aircraft Category	Estimate 1980	Forecast 1985	1990	2000
Air Carrier/Air Taxi (VFR and IFR)				
Class A	-	-	-	-
Class B	13	11	11	12
Class C	26	23	22	19
Class D	8	13	15	20
Total	47	47	48	51
General Aviation - Itinerant (VFR)				
Class A	2	2	2	2
Class B	4	4	4	5
Class C	1	1	1	1
Class D	-	-	-	-
Rotorcraft	-	-	-	-
Total	7	7	7	8
General Aviation Itinerant (IFR)				
Class A	2	1	1	2
Class B	3	3	3	3
Class C	-	1	1	1
Class D	-	-	-	-
Rotorcraft	-	-	-	-
Total	5	5	5	6

Source: The Port of Seattle