Comments on FEIS dated 6/6/96

Attachment to the Environmental Protection Agency Air Quality Comments On the Proposed Master Plan Update Development Actions at Seattle-Tacoma International Airport

General Conformity

The conformity provisions of the Clean Air Act mandate that any federal agency proposing to conduct a project in a non-attainment or maintenance area make a determination that its project would not:

> (i) cause or contribute to any new violation of any standard in any area;
> (ii) increase the frequency or severity of any existing violation of any standard in any area; or
> (iii) delay timely attainment of any standard or any required interim emission reductions or other milestones in any area

Through Section 176(c) of the Federal Clean Air Act, Congress established a higher test for federal agencies and the expenditure of federal money than is the case for non-federal public or private entities. The conformity provisions require a federal agency to affirmatively find that its actions will not worsen air quality conditions in areas that have previously violated the National Ambient Air Quality Standards (NAAQS). EPA recognizes that the modeling used to determine carbon monoxide impacts at intersections is for screening purposes to predict worst-case scenarios. However, the conformity provisions require that federal agency ensure that worst-case pollutant impacts with its project are no worse than the worst-case pollutant impacts without such a project.

The general conformity rules establish certain public notification and comment procedures that a federal agency must follow when making a conformity determination (58 FR 63214, November 30, 1993). The conformity determination contained in the Final EIS is the draft conformity finding, and implies that it may be modified after the public comment period. The FAA has stated that the final conformity determination will be included in the Record of Decision for this EIS. While the draft conformity analysis does not support a conformity determination, the final determination could, based upon a corrected emissions inventory and commitment to appropriate mitigation measures.

Mitigation Measures

Section 93.160 of the general conformity rule sets forth the requirements for enforceable mitigation measures that must be taken when an increase in the frequency or severity of exceedances is modeled. This section states:

> (a) Any measures that are intended to mitigate air quality impacts must be identified and the process for implementation and enforcement of such measures must be described, including an implementation schedule containing explicit timelines for implementation.
>
> (b) Prior to determining that a Federal action is in conformity, the Federal agency making the conformity determination must obtain written commitments from the appropriate persons or agencies to implement any mitigation measures which are identified as conditions for making conformity determinations.

DesMoines Creek Business Park, the Federal Detention Center, the Seatac Hotel, the City of Seatac improvements to three miles of International Boulevard near Seatac Airport, the proposed CTI campus and the 28/24th Arterial.

We noted several inconsistencies in projected air quality for the same intersections in the EIS's for the aforementioned projects. This variability underscores the need for additional coordination between project leads. The inconsistences are as follows:

1) The modeling results for air quality in the Seatac final EIS conflict with those from the draft EIS for the SR 509/South Access Road Corridor Project at two intersections (both EIS's used the same models). The two EIS's model conflicting results for existing conditions and future action alternatives at South 188th and International Blvd., and South 200th and International Blvd. for the average CO concentrations indicated on page 4-7 in the SR 509 EIS, as compared with the same analyses on page IV.9-11H in the Seatac final EIS. Both analyses model CO violations for existing conditions, but for future action alternatives the Seatac analysis shows modeled CO violations where the SR 509 analysis does not.

2) Modeled air quality impacts at South 200th and International Blvd. are shown in the South Aviation Support Area Final EIS (pages 4-106 to 109 and 112), the 28/24th Street Arterial Final EIS (page 3.22) and the CTI Final EIS (page 4-7, 8). The results vary for each project ranging from 5.0 to 13.3 parts per million CO.

The ROD should clearly indicate that the FAA has taken all of these local projects into consideration when modeling air impacts. The data from modeling should be available to other agencies so that their analyses will be consistent with FAA's. Data sharing will contribute to a better overall air modeling analysis that will also assure a more comprehensive cumulative impacts presentation.

Seattle - Tacoma International Airport
Environmental Impact Statement

EMISSION INVENTORY
TONS/YEAR

2020 Do-Nothing

SOURCES	CO	VOC'S	NOx	SOx	PM10	TOTAL
Roadways	16,984.00	1,475.10	2,106.50	1.87	12.44	20,579.91
Parking Lots	286.55	21.41	18.26	0.02	0.11	326.34
Heating Plants	3.25	0.53	13.00	0.06	0.28	17.12
Surf. Coating	0.00	4.30	0.00	0.00	0.00	4.30
Tank Farms	0.00	39.31	0.00	0.00	0.00	39.31
Grnd. Sup. Equip.	635.58	139.70	134.97	2.97	8.67	921.89
Aircraft	1,874.40	580.36	2,047.10	70.14	0.05	4,572.04
TOTALS	19,783.78	2,260.71	4,319.83	75.06	21.54	26,460.92

2020 Alternative 2

SOURCES	CO	VOC'S	NOx	SOx	PM10	TOTAL
Roadways	16,830.00	1,463.00	2,094.40	1.86	12.38	20,401.64
Parking Lots	268.73	20.32	16.97	0.01	0.10	306.13
Heating Plants	6.53	1.07	26.11	0.11	0.56	34.39
Surf. Coating	0.00	4.30	0.00	0.00	0.00	4.30
Tank Farms	0.00	35.19	0.00	0.00	0.00	35.19
Grnd. Sup. Equip.	623.37	136.95	132.33	2.92	8.50	904.06
Aircraft	1,838.10	574.09	2,007.50 Less	68.66	0.04	4,488.39
TOTALS	19,566.73	2,234.91	4,277.32	73.57	21.57	26,174.10

2020 Alternative 3

SOURCES	CO	VOC'S	NOx	SOx	PM10	TOTAL
Roadways	16,797.00	1,458.60	2,074.60	1.85	12.27	20,344.31
Parking Lots	184.36	13.81	11.73	0.01	0.07	209.97
Heating Plants	6.49	1.07	25.95	0.11	0.56	34.17
Surf. Coating	0.00	4.30	0.00	0.00	0.00	4.30
Tank Farms	0.00	35.19	0.00	0.00	0.00	35.19
Grnd. Sup. Equip.	623.37	136.95	132.33	2.92	8.50	904.06
Aircraft	1,832.60	573.98	2,006.40	68.50	0.04	4,481.52
TOTALS	19,443.82	2,223.89	4,251.01	73.38	21.43	26,013.52

2020 Alternative 4

SOURCES	CO	VOC'S	NOx	SOx	PM10	TOTAL
Roadways	17,006.00	1,474.00	2,076.80	1.85	12.31	20,570.96
Parking Lots	190.63	14.53	11.97	0.01	0.07	217.21
Heating Plants	7.17	1.18	28.66	0.12	0.61	37.73
Surf. Coating	0.00	4.30	0.00	0.00	0.00	4.30
Tank Farms	0.00	35.19	0.00	0.00	0.00	35.19
Grnd. Sup. Equip.	623.37	136.95	132.33	2.92	8.50	904.06
Aircraft	1,853.50	578.38	2,008.60 Less	68.88	0.04	4,509.40
TOTALS	19,680.67	2,244.52	4,258.35	73.79	21.53	26,278.86

Source: Emission Dispersion Modeling System (EDMS) Version 944, Landrum & Brown Inc., March, 1995.
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not possible
more planes
Landings/t/o adds jets
greatest NOx reduces light aircraft
n. intaul!

III. CONCLUSIONS AND RECOMMENDATIONS

A. Results and Conclusions

EDMS calculated emission rates for all the criteria pollutants plus hydrocarbons for Sea-Tac Airport's typical activity on an annual basis. Those emission reported in figures 2 through 8 and in Appendix 4.

After calculating emission rates, EDMS was used to calculate ambient concentrations during peak-hour activity. This dispersion output was contoured with an interpolating and plotting package called SURFER. The interpolating technique used was Krigning. The results obtained from the plotting exercise are shown in figures 9 through 22 found in Appendix 5, and, although they serve the purpose of providing a graphical illustration of the results, they must be used with caution. Because of the low density of points in certain data sets, some contours were not completed. Other contours contain waves and other artifacts that are not a true reflection of the data, but rather reflect weaknesses of the interpolating algorithm in handling the steep gradients in regions with few data points. Practical considerations relating to computer run time precluded using more calculation points.

1. Sea-Tac Airport is a major indirect source of air pollutants. It contributes approximately 8% of the carbon monoxide and 5% of the nitrogen oxide emissions in King County. Refer to Figure 2.

2. The emission inventory obtained for Sea-Tac Airport shows that the boilers, tank farms, and training fire are minor, even insignificant, sources compared to aircraft and motor vehicles which together comprise 99.9% of the emissions.

Refer to Table 1 and Figure 3. Note that Figure 3 depicts the airport's hydrocarbon emissions in a logarithmic scale. Appendix 4 contains Sea-Tac's emission inventory in more detail.

The tank farms contribute only hydrocarbons from evaporation loses. The training fires take place quarterly, at night, and particular run EDMS predicted a concentration of 19 ppm NO_2 in a receptor location right on 154th street. With the wind blowing directly from the north (0 degrees) the Tyee Golf Course can be getting as much as 12 ppm NO_2 one-hour average during worst-case conditions.

6. Predicted maximum one-hour concentrations of carbon monoxide during worst-case conditions are about 20 ppm in the terminal area, due almost entirely to traffic, and range up to 59 ppm at the runway, rapidly decreasing to about 15 ppm one kilometer downwind of the maximum concentration. In the case where the wind direction is zero degrees, the plume spreads out around the queuing area, and 1 km south of the queue the impact is still about 10 ppm. In figure 9 an island of zero concentration is located next to the 2 ppm contour. As expected, due to the meteorology chosen and the nature of the source, there is a steep gradient in the east-west direction and a more moderate one along the north-south axis. In the 345 degree case illustrated in figure 11, a one-hour average contribution to the housing development immediately east of the Tyee Golf Course, Angle Lake School and Seattle Christian School of approximately 9-5 ppm was predicted.

The one-hour standard for CO is 35 ppm. It is predicted that the maximum one-hour concentration of CO due to aircraft alone is about 20 ppm, or 57% of the standard, in an area of public access during a peak hour and low-dispersive meteorological conditions.

7. EDMS revealed localized hot-spots of particulate concentrations in the range of 800 micrograms per cubic meter, particularly in the 170 degree case illustrated in figure 22. Note that 154th. Street is located at the hot spot. At approximately 1 km north of the runway, the concentration has decreased to 157 micrograms per cubic meter.

The 24-hour standard for fine particulate matter (PM-10) is 150 micrograms per cubic meter. Measurements have shown that all of the particulate matter from aircraft exhaust can be classified as fine, ranging in diameter from 0.03 to 0.1 micrometers.[17]

dangerous level of small particulates

8. The airport is also a significant source of hydrocarbons contributing up to 5 ppm worst-case, ground-level concentrations. The housing development around Seattle Christian School and the school itself may get around 4 ppm of hydrocarbons as illustrated in figure 14, the 345

degree case. From a toxics standpoint that may be quite significant depending on the actual composition of the hydrocarbons. For example, assuming that 4% (based on the Radian estimates) of the hydrocarbon emissions are benzene, the benzene contribution to the hourly average from the airport would be of about 0.16 *parts per million* (or 24000 *parts per trillion* annual average). As a point of reference, the acceptable source impact level (ASIL) for new sources proposed in WAC 173-460 is 0.063 *parts per trillion*.

9. The contribution of traffic to sulfur oxide pollution is minimal. A high of 0.5 ppm SO_2 was predicted on the runway in the 0 degree case on figure 18 decreasing to 0.1 ppm 1 km south of the queuing area, in the vicinity of 200th Street. A one-hour average national standard for SO_2 does not exist, Washington's one-hour average standard is 0.4 ppm.

10. It is important to mention the conclusions that the FAA/EPA team reached in their 1980 report *Impact of Aircraft Emissions on Air Quality in the Vicinity of Airports* mentioned earlier. This report compiled both monitoring and modeling analyses of airports throughout the country: Washington National, Los Angeles International, Dulles International, Lakeland, John F. Kennedy, and Chicago O'Hare. They summarized their conclusions in the following manner:

" * Maximum hourly average CO concentrations from aircraft are unlikely to exceed 5 ppm in areas of public exposure and are thus small in comparison to the NAAQS of 35 ppm.

* Maximum hourly HC concentrations from aircraft can exceed 0.25 ppm over an area several times the size of the airport.

* While annual average NO_2 concentrations from aircraft are estimated to contribute only 10 to 20 percent of the NAAQS limit level, these concentrations, when averaged over a one hour time period are estimated to produce concentrations as high as 0.5 ppm if one assumes that all engine produced NO is converted to NO_2 by the time these emissions reach public exposure. This value is at the upper end of the concentration range being considered for the short term NO_2 standard presently under review and cannot be ignored."

The above excerpt identifies nitrogen oxides and hydrocarbons as two pollutants to be concerned about at airports; however, this screening study of Sea-Tac's emissions showed that the airport's contribution to ground-level pollutant concentrations is higher than expected.