

October 1970 US Department of Commerce Environmental Science Services Administration Weather Bureau "Air Pollution by Jet Aircraft at Seattle-Tacoma Airport" by Wallace Donaldson.

"The advent of the commercial jet aircraft attracted the attention of the public through the visible smoke plume and noise." (page 1)

"At local airports there were strong kerosene odors, soot fallout, and occasional occurrences of eye irritating smogs." (Ibid) Annual operations (takeoffs and landings) in 1960 were 55,000, 108,111 in 1969 with "Ninety percent of the total commercial traffic at the airport...jet-type aircraft" (page 5) and 178,000 in 1979. (table 3)

"The Seattle-Tacoma Airport was constructed in 1944 as an alternate airport to nearby busy Boeing Field. It was expected to be relatively fog-free due to its higher elevation, 400 feet above sea level as compared to near sea level at Boeing Field...The original terminal building was completed in late 1949 and most commercial carriers transferred their operations to the new location at that time." (page 2)

One of the very first studies on airport emissions was presented at the 62<sup>nd</sup> annual meeting of the Air Pollution Control Association in New York on June 26, 1968 titled "Jet Aircraft, A Growing Pollution Source", by R. E. George, J. A. Verssen and R. L. Chass, published June 1969. Much of the work done for that study was used for this 1970 report which found; "Carbon is an important particulate emission, which is found in the form of smoke, the major particulate emission in jet engine exhaust. Engine smoke is composed for the most part of fine particles of nearly pure carbon with diameters of 0.6 micron or less. The combination of size and composition gives substantial light-scattering properties to the exhaust plume. Aerosol emissions in the form of water droplets, unburned fuel, and soot particles are difficult to measure because of possible sampling variations." (page 2)

"Heavier aircraft pollutants were dispersed in a fan shaped area from each end of the main runway. Maximum distances from the end of the runway at which pollution was detected were 6 miles for take-offs and 12 miles for approaches." (page 6, see attached schematic)

Conclusions xx. "The operation of jet aircraft engines produces air pollution. This is a real problem to people who work at or reside near major airports...Progress in the solution of jet engine air pollution problems will not come overnight. Costs are high and new developments are slow. Unfortunately, high air quality is no longer free; it is one of the costs of doing business." (page 9) Note: The Port of Seattle has managed to externalize these acknowledged costs for decades as further study stalled. It is now evident the costs of healthcare from air pollution effects are in the billions of dollars annually when analyzed by WHO. No actual cost has been estimated to my knowledge of loss of work time, productivity, educational opportunity and health for individuals with higher hospitalization rates, asthma or lung illnesses as a result of these specific exposures. Educational impacts have been previously documented by the Highline School District and localized illness by doctors at Highline Hospital.

It is remarkable that the same pollution areas identified for impact from arriving jets in 1970 were virtually the same discovered recently by the UW and UCLA team at LAX (see attachment). Also of note is that the particulate emission of primary concern in 1970 was the focus of current attention. It is, in my opinion, of grave consequence that forty five years passed before any actual further scientific analysis was done, (1970-2015) especially in light of the high probability of particulate related lung

effects known and studied since at least the early 1990's by Harvard professor C. Arden Pope and et al. The statistically significant elevated lung illnesses including cancer found in airport community residents for years 1992-1995 by the State Department of Public Health with the highest elevation of outcomes within a five mile radius of the airport is a strong indicator of exposure and risk, enough at the conclusion of this particular study to task DOE with further study. A draft Air Quality analysis was prepared in 2001 by John Williamson of Ecology's NWRO before he retired in 2014 but now largely forgotten and shelved following 9/11/01.

Summer, 1971 Second runway opened.

The landscape had changed and now only 800 feet separated the homes to the west and the new second runway. Homes left intact between 16<sup>th</sup> and 14<sup>th</sup> Avenue South and SR 518 to the north and 160<sup>th</sup> to the south were bought by the Port of Seattle and turned into rental homes. The homes between 14<sup>th</sup> and 12<sup>th</sup> were privately owned homes, farms and businesses. People in these homes complained that the rental homes were being rented for rates far below market creating slums. Homeowners were also stuck, unable to sell their homes because lenders were unable to secure mortgage insurance.

Seattle PI reported on 12/9/1971 that nine "Zone 3" homeowners seeking a \$60 million dollar class action against the Port of Seattle for damages, representing approximately 8,000 residents claiming among other things, loss of use, enjoyment and value. The complaint alleged; "'Additional and expanded runways,' increased air traffic and new and different glide paths of jets have 'caused and continues to cause, deafening noise, intensive vibration and filthy smoke...'" The article also mentions that "In recent years, the Port of Seattle has paid out more than \$1 million on damage suits involving Sea-Tac operations, according to Dick Ford, legal officer." I do not have any records that predate complaints beginning in 1971 or any records of any noise buy-out program that began prior to June 1973. Another 175 owners to the south of the airport followed in filing suit in December 1972 "seeking damages because of noise, pollution and danger from aircraft using the north-south runway." (news article 12/21/1972)

On 6/13/73 the Port of Seattle announced receipt of the first FAA grant and would be purchasing and relocating 166 Zone 3 homes at a total cost of approximately \$50 million.

During summer 1973, an air pollution monitoring van sat in the driveway of a neighbor living on the west side of 12<sup>th</sup> Avenue South, at approximately 154<sup>th</sup> in a neighborhood which would remain at the perimeter fence of the airport until being bought by the Port of Seattle three decades later for the third runway project. This unique air pollution analysis found; "The predicted hydrocarbon levels near SEA-TAC exceed the Federal Standard over large areas. Part of this is caused by the generally high background levels which tend to be near the standard itself. The rest is due to the proportionately higher hydrocarbon emissions of aircraft...the HC standard is set to keep oxidant levels in an area from creating a health hazard." (Environmental Systems Labs "SeaTac Air Quality Final" 28 June 1973 page 5-5) "The high 6-9 a.m. average HC [hydrocarbon] concentrations occurred during September. (at the residence directly to the west of the airport on 12<sup>th</sup>). If all three sampling periods are combined, the 6-9 a.m. average concentrations exceeded the Federal Primary Standard 71 percent of the time." (ibid 2-15) "The trend is for total pollutants to increase following the dramatic increase in nitrogen oxide emissions." (page 6-8) "Accordingly, it would be desirable to reduce hydrocarbon emissions in the area as a means of controlling oxidant formation" (page 5-14) "Their recommendations; "Uses which permit

direct sources of air pollutants common to the airport should be avoided. Particular emphasis should be placed on eliminating sources of hydrocarbons, nitrogen oxides, and particulates. Examples are: Gasoline stations, solvent manufacture, manufacturing operations that consume large amounts of heating fuels, or process raw materials, milling and grinding operations and chemical process industry." (ibid 7-8) " "Around airports, land uses which are compatible with respect to noise may or may not be compatible with respect to air quality. The only serious air quality problem is associated with the high hydrocarbon levels which are the major source of complaints regarding odors and are potential precursors to oxidant formation." (ibid page 7-1)

These remaining private homeowners began to complain and at least three groups formed around 1972. NOISE (Neighbors Organized In Search of Equity) west of the airport were the subject of a story in the Seattle PI where reporter Gordon Kion wrote: "Exhausts of man's mighty machines churn the air and send jangling shockwaves low and wide across the land, assaulting life and limb. In the wake of its power, the noise consumes all. Voices, even shouts, become merely moving lips." (1/2/72 page A1) "...even airport officials agree that 'the strong smell of kerosene' in the backyards of airport-adjacent homes is not uncommon. Housewives say that the vibration of jet engines cracks their walls and windows and that jet fuel exhausts leave a yellow, oily film on drapes and other surfaces." (ibid page A14) There was another group organizing to the northwest at this time yet unnamed asking for a buffer of three miles to the north and south in flightpaths and a one mile buffer to the east and west of the airport. They claimed "noise and air pollution of jet planes have grown to a point that is no longer tolerable." (ibid page A14) In December 1973 another group of 175 homeowners to the south of the runways also filed a lawsuit for loss of use, enjoyment of property and safety.

History of legal action against the airport includes another large group who filed suit for diminution in the early 1990's following the four post plan implementation.

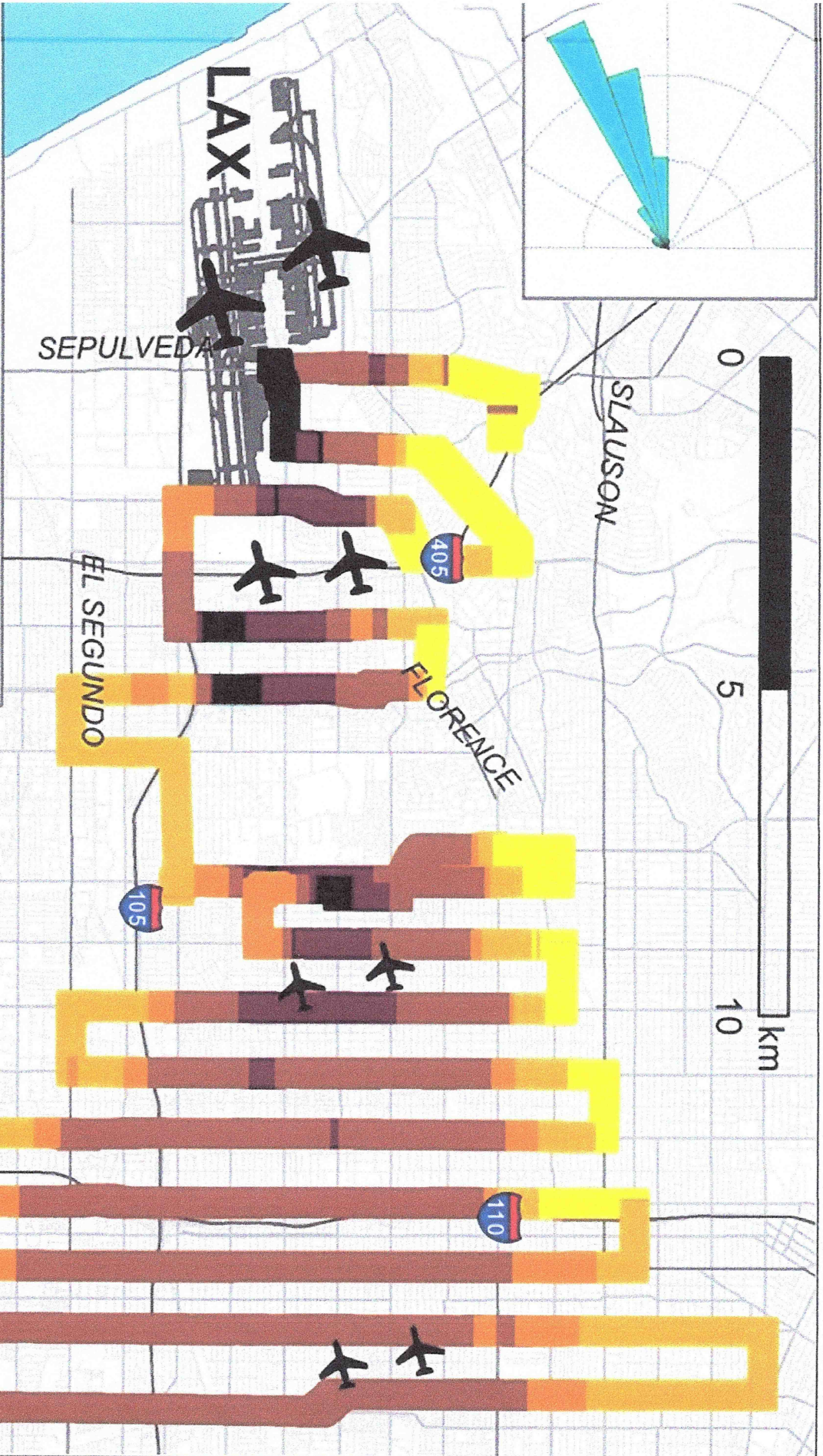
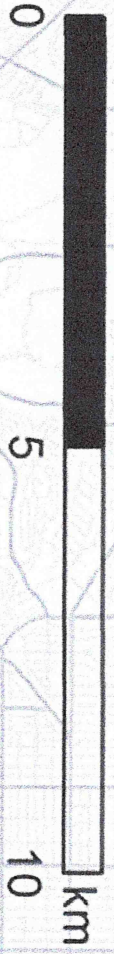
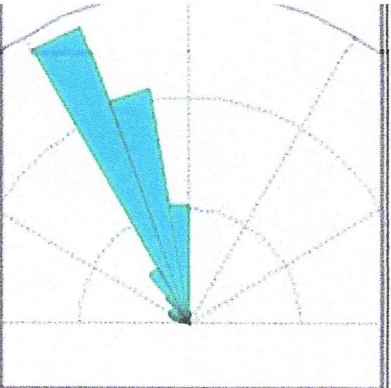
In 1991 in response to community pressure, Legislator Greg Fisher requested Department of Ecology estimate emissions at Sea-Tac using modeling. The report stated; "A 1979 FAA study determined that the composition of particulates emitted by turbine engines is essentially carbonaceous with extremely small diameters ranging from 0.04 to 0.12 microns for the three types of engines tested (TF30, JT8D, and JT9D). (Seattle Tacoma International Airport: Air Pollutant Contribution May 1991 Air Quality Program Department of Ecology page 6) "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." (ibid page 15) "EDMS predicted significantly high levels of nitrogen oxide (up to 28ppm on a one-hour average about 100 meters south of the runway in the worst case conditions." (ibid page 19) "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 154<sup>th</sup> street is located at the hot spot...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." (ibid page 20, 21) In a follow-up article Airport Planning Director Joe Sims said; It's an area we're interested in. We've focused a lot on noise, but the same thing we've tried to do with that, we can focus on air quality. This report is a good starting point. ***The airport wants to be a good neighbor.***" (emphasis added, The Times News 10/30/91 page A9)

Eight months later, residents were still waiting for answers and according to a follow-up news article nothing was happening.. "We want to find out exactly how bad the problem is, said Sen. Adam Smith D-Sea-Tac." (1/13/92 The Times South Bureau page E1) The original study concluded..."that under certain weather conditions, some neighborhoods around the airport may be subjected to high levels of benzene, nitrogen oxides, carbon monoxide and particulates. For example, the study predicted that a stretch of South 154<sup>th</sup> Street could be exposed to levels of particulates five times above federal standards. Particulates, which are microscopic particles produced, among other ways, by jet engines, are considered a health risk because they can lodge in the lungs, causing breathing problems and aggravating a variety of diseases." The annual tons per year of particulate was estimated to be 64 tons per year. "Michael Feldman, a port aviation planner, said the port will provide money and staff time to help with a study – but not just yet." "Officials at the Port of Seattle, which runs the airport, said they'd take direction from the state or federal government. State and regional officials said it was the Federal Aviation Administration's responsibility. FAA officials said it was up to the port to address any pollution." Department of Ecology said it had its hands full trying to get the region into attainment of the Federal Air Quality Standards, the port was busy with Flight Plan and Sen Smith said "it would be tough to convince legislators who don't live near the airport to support his proposal" (Senate bill to mandate a study).

The acceptable source impact level (ASIL) is a guideline used by Puget Sound Clean Air Agency to permit point sources like smokestacks. Any industry with predicted emission levels above the ASIL will be required to install equipment to scrub out any air contaminants found to be above the allowable levels. In 1993, the Port of Seattle commissioned an air quality survey to measure actual levels of certain chemicals in the neighborhoods around Sea-Tac. During four different days for eight hours, high quality equipment took measurements and found benzene, formaldehyde, acrolein, acetaldehyde, hexaldehyde, tetrachloroethene among others in some neighborhoods in some cases 50 times higher than the ASIL. At around the same time this study was taking place, which would later be called only a screening and not representative of the year round conditions, another study by EPA of risk was being conducted near Midway Airport in Chicago. The results of that particular study were surprising, again, risk was considered to be very high for developing cancer for 1,3 butadiene, a chemical not studied at Sea-Tac. The Midway analysis also included an annual inventory of particulate, primarily from jets at Midway at 50 tons per year.

In 1996, the Environmental Impact Statement for the third runway project estimated the jets were producing -0- tons per year of particulate. Shortly after the Midway analysis, the FAA found that the particulate emissions in the model were inaccurate so they deleted all the data. This is the same model that was used by DOE in 1991 to estimate Sea-Tac emissions and by EPA in 1993 for Midway airport emissions estimates.

Viewer



**Particle Number Concentration**

- Normal Background
- 1 - 1½ x Normal
- 1½ - 2 x Normal
- 2 - 4 x Normal
- 4 - 6 x Normal
- 6 - 8 x Normal



TAX  
 APPLICATION  
 FORM 1041  
 1996  
 U.S. DEPARTMENT OF THE TREASURY  
 INTERNAL REVENUE SERVICE  
 9 X 10 INCHES  
 100% RECYCLED PAPER