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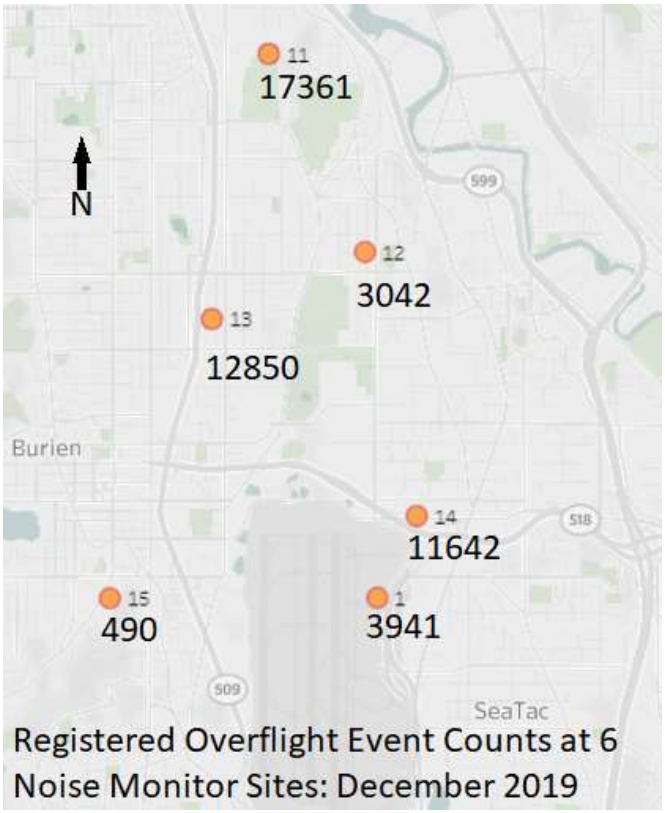
Dedicated to restoring the pre-NextGen dispersed arrival paths and more optimized profile descents at Seattle/Tacoma International Airport that had been in place since the introduction of commercial aviation to the Puget Sound region, many decades ago.

Oct 27, 2020

These written comment to the Port of Seattle Commission are intended to provide the detail and documentation behind David Goebel's spoken public comments on 10/27/20.

The layout of the runways and distribution of the noise monitors, specifically #11 and #12, are the central background information:



In Southflow, arrivals land on runways 16 L/C/R. Given their locations, monitor #11 is optimized for 16R and #12 for 16L. 16R has the large majority of arrivals in Southflow.

Due to this distribution of arrival runways, monitor #12 correlates many fewer overflight events in Southflow. For example, in December 2019:

	Runway (Southflow)		
Site	16L	16C	16R
SEA11	2344	306	31342
SEA12	4750	236	304

The flight correlation data has a variety of anomalies, including not just missed overflights, but single overflight events registering multiple correlations, and no, not go arounds. In this latter case the spurious correlations are a few seconds apart and have much lower intensity, combined with being few in number, mean they don't have a significant impact on the results, but do complicate the analysis process. In other cases, the wrong flight can be identified when there are parallel arrivals. These don't make a net change in LEQ, but again complicate analysis when trying to account for every single arrival.

Picking a random day in December with a small number of anomalies, Thursday December 5th, an analysis of the aggregate impact of the overflight events intentionally excluded from monitor #12 was undertaken. This day also had zero 16C arrivals, which are always relatively small in number, but having it zero makes the analysis easier.

On Dec 5th monitor #12 had 77 correlations (74 16L and 3 16R). In addition to the three 16R arrivals that *were* correlated **there were 532 16R arrivals which were intentionally excluded**. Each of these excluded 16R arrivals had much lower intensity than the 16L ones as measured by monitor #12. In order to approximate the noise level that each of these excluded 16R arrivals *would* have been on monitor #12, I used the 33 arrivals on December 5th that were correlated by **both** monitors 11 & 12 to judge what the noise intensity likely would have been. In these joint 16R correlations, the SELs (Sound Exposure Level) on monitor #12 were approximately 9 dB lower than the same overflight measured by monitor #11.

This is an approximation as I have a day job. A rigorous analysis would use a method called "Floating Threshold" to investigate every overflight event individually using the raw Time History data from the noise monitor. I would contend the approximation of using these 74 joint 16R correlations is sufficiently accurate.

Taking into account these 532 excluded 16R arrivals on Dec 5th, the LEQ for monitor #12 on that day goes from ~53.4 dB to ~56.7 dB, which is about a doubling of intensity.

I do recognize that FAA regulation 14 CFR Appendix A to Part 150 - Noise Exposure Maps: Part C - Mathematical Descriptions, Sec. A150.205(d) regarding the integration envelope for the Sound Exposure Level says:

> "The time interval should be sufficiently large that it encompasses all the significant sound of a designated event. The requisite integral may be approximated with sufficient accuracy by integrating LA(t) over the time interval during which LA(t) lies within 10 decibels of its maximum value, before and after the maximum occurs."

So, you "should" include all significant events but "may" exclude those without a 10dB swing. Even using this standard, as shown by my earlier produced video, overflight events with > 10dB swings are still excluded. I didn't study how many events were incorrectly excluded using the above "may" rule. It's entirely possible that sticking with the "may" rule and performing a Floating Threshold analysis would have resulted in a very similar LEQ deficit. I would ask the Commission to please have the Port's noise consultant, Vince Mestre, look at and comment on the specific numbers in this note, and not just generally comment on the nature of noise monitoring in the abstract.

Thank you,

David Goebel

President, Vashon Island Fair Skies