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Andrew Crabtree
Community Development Director
City of Santa Clara
1500 Warburton Avenue
Santa Clara, CA 95050

Subject: Amendment to Norman Y. Mineta San José International Airport Master Plan
Draft Environmental Impact Report
City of San José PP 18-103, SCH #2018102020
Comments on Noise Section

Dear Ms. Higuera,

As requested, we have reviewed the following documents pertaining to the *Amendment to Norman Y. Mineta San José International Airport Master Plan Draft Environmental Impact Report*:

1. *Amendment to Norman Y. Mineta San José International Airport Master Plan Draft Environmental Impact Report*
City of San José PP 18-103, SCH #2018102020, November 2019 ("DEIR")

2. *Norman Y. Mineta San José International Airport Noise Assessment for the Master Plan Environmental Impact Report*
October 2019 ("Noise Assessment")

Wilson Ihrig has practiced exclusively in the field of acoustics since 1966. During our 54 years of operation, we have prepared hundreds of noise studies for Environmental Impact Reports and Statements. We have also peer-reviewed and critiqued many noise studies. Wilson Ihrig has one of the largest technical laboratories in the acoustical consulting industry, and we routinely utilize industry-standard acoustical programs such as Environmental Noise Model (ENM), Traffic Noise Model (TNM), SoundPLAN, and CADNA. In short, we are well qualified to prepare environmental noise studies and review studies prepared by others.

This letter presents our thoughts and comments on the DEIR with respect to potential noise impacts on the residents of Santa Clara, California.

1 DEIR Does Not Assess Impact of Additional Nighttime Flights on Sleep Disturbance

The DEIR utilizes two standards to assess the potential impact of aircraft noise [DEIR at p 276]:

> CNEL *Community Noise Equivalent Level* - This is a 24-hour, weighted-average noise level that is ubiquitously used in airport noise assessment.
>
> SEL *Sound Exposure Level* - This quantifies the noise exposure from a single noise event, in this case, an aircraft flyover. The value is different for different aircraft.[1]

The Noise Assessment does calculate CNEL levels around the airport for the future (2037) conditions and compares them with existing conditions, which is appropriate, although we make some comments about the CNEL assessment later in this letter.

With respect to the SEL, the DEIR states,

> Single-event noise exposure with implementation of the Project would be the same as that which occurs under existing/baseline conditions . . . [because] there would be no change in the SEL values in that the Project does not include any modifications to runway usage and/or flight tracks. [DEIR at p 278]

In other words, the DEIR considers the noise level from a single aircraft flyover without regard for the time of day.

Nowhere does the DEIR consider the potential impact of increased night operations on residents of Santa Clara as was found necessary by the California Court of Appeal, First District, Division 2 in *BERKELEY KEEP JETS OVER THE BAY COMMITTEE v BOARD OF PORT COMMISSIONERS*. As summarized by Westlaw:

> The environmental impact report (EIR) for an airport expansion failed to address adequately the potential disturbance to area residents resulting from increased nighttime air cargo operations and should not have relied exclusively on the Community Noise Equivalent Level (CNEL) regardless of the change in noise to quiet neighborhoods; the EIR contained no quantitative discussion of ambient noise levels in any nearby community and no meaningful analysis of noise levels over and above the existing ambient noise level at a given location and the community reaction to aircraft noise, including sleep disturbance, and the probability of being repeatedly awakened by multiple single-event sounds that could be calculated.[2] [emphasis added]

Although the subject DEIR did give passing consideration to the SEL metric, it did not do so in a way that assesses sleep disturbance and the possibility that Santa Clara residents may experience more

[1] This metric is incorrectly identified as the "Sound equivalent level" in the DEIR, but correctly identified in the Noise Assessment.

[2] 91 Cal.App.4th 1344, 111 Cal.Rptr.2d 598

awakenings due to individual aircraft during night operations under the future condition. This despite the fact that there will be 11 to 12 more nighttime operations under 2037 operating conditions than there are today.[3] We recommend that the DEIR Noise analysis be amended to include an analysis of the potential impacts of expanded nighttime operations.

2 DEIR Relies Solely on a Relative CNEL Increase Threshold of Significance

The primary aircraft noise impact criteria used in the DEIR is:

> CNEL: Changes in cumulative noise exposure in noise-sensitive areas where the existing/baseline noise exposure is 65 CNEL or greater are considered significant if the Project results in a change in CNEL of 1.5 dB or greater. Changes are considered significant in noise-sensitive areas where the existing/baseline noise exposure is less than 65 CNEL if the Project results in a change in CNEL of 3 dB or greater. [DEIR at p 276]

The stated bases for these criteria are that "The California Noise Standards have determined that 65 CNEL is the level of noise 'acceptable to a reasonable person residing in the vicinity of an airport'" and that that determination is consistent with FAA and HUD land use compatibility guidelines.

The fundamental problem with using a relative threshold of significance, e.g., a change in CNEL of 1.5 dB or greater, is that, over time, there will effectively be no limit. If the noise level today is 65.0 CNEL and an increase to 66.4 CNEL with this project is found to be a less than significant impact, then the next Master Plan project will take 66.4 CNEL as the baseline and an increase to 67.8 CNEL will be found to be a less than significant impact. Total increase would be 2.8 dB, which would be deemed a significant impact if it resulted from either project individually, but would probably not be in the two-project scenario because the baseline for the second project will be the noise level resulting from the first project.

While it is appropriate to use relative impact criteria, in order to keep noise levels from increasing continually without limit over time, absolute criteria should be considered, as well. For this project, given the citation of the California Noise Standards' determination that 65 CNEL is acceptable to a reasonable person living near an airport, 65 CNEL is also a reasonable absolute criterion.

Table 4.13-9 of the DEIR provides one clear instance of an area that is currently below 65 CNEL but which will exceed 65 CNEL in the future: the area around Washington School (Reference Grid Point No. 9).[4] The existing noise level in this area (which also includes residences on Oak Street, Edwards Avenue, and other local streets) is shown as 64.5 CNEL, whereas the future level is shown to be

[3] The Noise Assessment states that in 2037 there will be 42,067 more operations in 2037 than in 2018, that the time-of-day percentages are assumed to remain that same as in 2018, and that currently 10% of flights occur during the nighttime. [Noise Assessment at p 18] An annual increase of 42,067 operations implies a daily increase of 115 operations, 10% of which will be 11 or 12 flights.

[4] DEIR Table 4.13-9 indicates this area is in Santa Clara, but Table 10 and Figure 7 in the Noise Assessment make it clear that this is actually Washington Elementary School on Oak Street in San José.

65.6 CNEL. Because the project will cause this area to cross the limit put forth as reasonable for people living near airports, we believe the noise impact in this area should be determined to be significant even though it is less than the DEIR's relative thresholds of significance.

Although none of the tabulated data provides such a clear indication of an area crossing the 65 CNEL threshold in Santa Clara, a careful comparison of DEIR Figures 4.13-3 (Existing 2018 CNEL Contours) and 4.13-4 (Project 2037 CNEL Contours) shows that there is an area north of Noise Monitoring Station 110 that will also be enveloped by the 65 CNEL contour in the future, but which lies outside that contour today.

3 DEIR CNEL Data: Measured v Modeled

The DEIR utilizes the Aviation Environmental Design Tool (AEDT) produced by the Federal Aviation Administration (FAA) to model both existing and future CNEL noise levels. It also makes use of noise data measured by the Airport Noise and Operations Monitoring System (ANOMS) operated by Mineta San José Airport.

The chart below shows baseline 2018 DEIR CNEL values at seven locations at which CNEL levels were both measured and modeled for the DEIR. The CNEL levels shown are due solely to aircraft operations.

- Noise levels at all the locations in Figure 1 below were measured using ANOMS. These values come from Table 11 of the Noise Assessment and are shown in orange. [Noise Assessment at p 23]

- The DEIR provides modeled values at or near each of the seven ANOMS sites in Figure 1 in Noise Assessment Tables 10 and 11. [Noise Assessment at pp 22 and 23, respectively] The modeled values in Table 10 are at locations ("Reference Grid Points") that were specifically modeled for the Noise Assessment. The locations in Table 11 are where the ANOMS microphones are located, so the modeled values there are presumably to calibrate the AEDT noise model. The modeled values from Table 10 are shown in blue; the modeled values from Table 11 are shown in green.

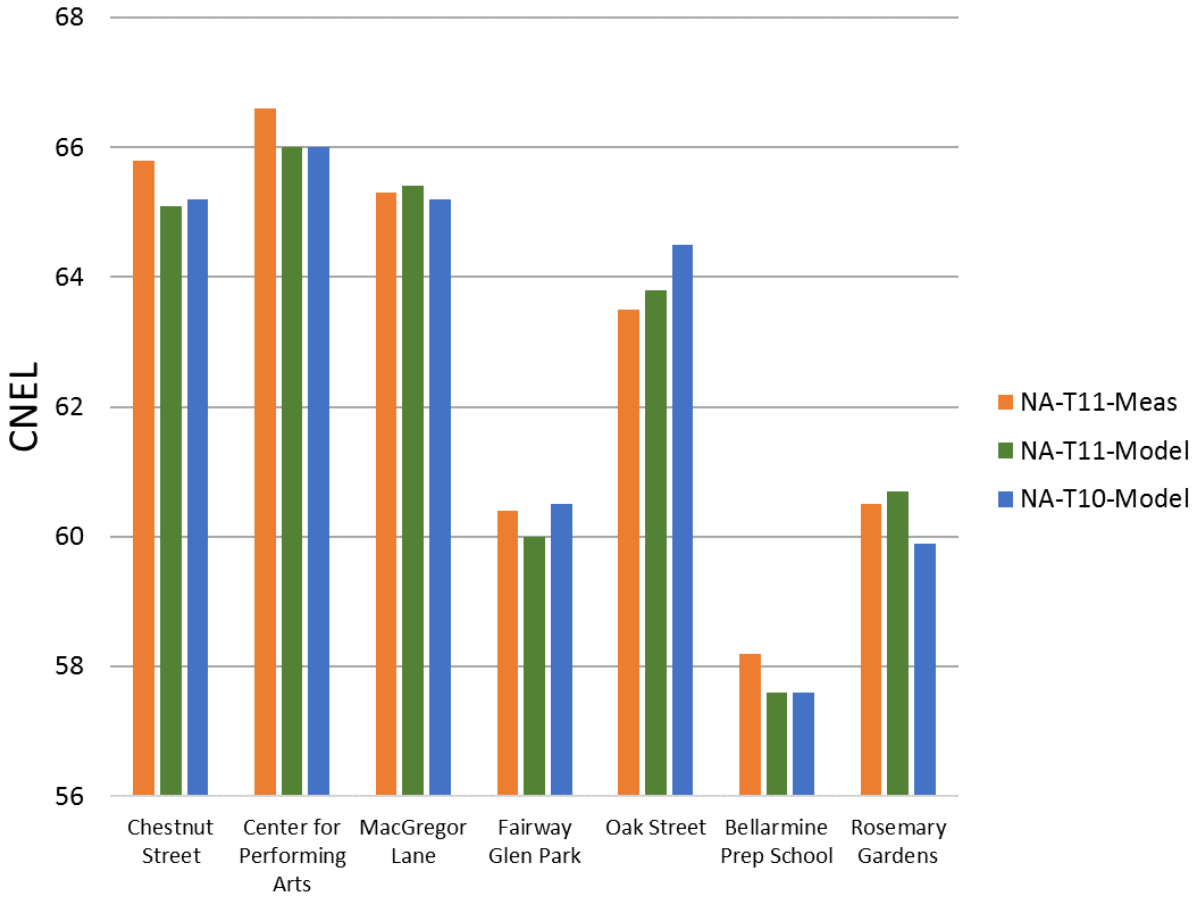

FIGURE 1: COMPARISON OF DEIR CNEL LEVELS
(Using ANOMS Names)

Questions:

1. Why don't the modeled values equal the ANOMS measured values, especially the modeled values from Table 11 which are purportedly at the precise ANOMS microphone locations and were presumably modeled to verify the accuracy of the AEDT model? At Chestnut, the CPA, and Bellarmine Prep, the modeled levels are 0.6 to 0.7 dB lower than the measured values.

2. Why don't the two modeled values match at all locations? To some extent, it's because the locations may not be exactly the same for all locations, but this speaks to the precision of the noise model. At the Rosemary Gardens location (RMS #105; near Bachrodt School, Reference Grid Point #15 in Table 10), the level model specifically for assessment purposes (Bachrodt School) is 0.8 dB lower than that modeled at the nearby ANOMS site.

While these differences are minor, the DEIR does calculate and report CNEL levels to the nearest 0.1 dB, and the adopted threshold of significance for areas that are already over 65 CNEL is 1.5 dB. Seen in that context differences of 0.6 to 0.8 dB may be consequential.

Additionally, if crossing the 65 CNEL threshold were also to be adopted, then the differences noted above may also be consequential because a number of locations have noise levels that are within 1 dB of 65 CNEL.

4 Supplement A-weighted (dBA) Analysis with C-weighted (dBC) Analysis

Typical human hearing does not respond equally to all frequencies. Rather, it spans the range from 20 Hz to 20,000 Hz, with peak perception in the mid-range where speech is concentrated. Above and below that range, a typical person's hearing is less acute. Most people know that humans cannot hear dog whistles which produce sound above 20,000 Hz.

Over the years, a number of "weighting curves" have been developed to enable the production of a single-number decibel reading that corresponds well with how humans perceive loudness. If two tones are played that produce the same overall sound pressure level, one at low-frequency and one in the mid-range, a human would typically rate the mid-range tone as being "louder" than the low-frequency tone. The use of the weighting curves captures this effect because the low-frequency tone's weighted decibel value would be less than that for the mid-range frequency.

The ubiquitously used weighting curve is called the A-weighting curve, and decibel levels that have been A-weighted are denoted by "dBA". Although this is ubiquitous for historical reasons, the weighting curve itself is based on hearing a low levels, and is not particularly suited for sounds in the "real world", and particularly not for aircraft noise which is not low level and which contains a lot of low-frequency energy where the deficiencies of A-weighting are greatest.

The most practical way to address the low-frequency sound levels on residents and other noise-sensitive receptors near Mineta Airport is to supplement the A-weighted analysis with a C-weighted analysis. The C-weighting curve puts much more emphasis on low frequencies, and is better suited to assessing high level, low frequency noise. Taken together, the A-weighted and C-weighted analyses would give the public and decision-makers a much better understanding of the noise impacts from aircraft operations.

5 Corroboration of Measured CNEL Levels

The City of Santa Clara operates several Noise Monitoring Stations (NMS) itself, three of which are near locations included in the chart above.

- The NMS near MacGregor Lane (108) is located at the intersection of MacGregor and Aberdeen in Santa Clara. This monitor was installed on December 20, 2019. The CNEL value shown at this location was calculated using data from December 20, 2019 to January 5, 2020, excluding December 25, 2019.

- One NMS near Fairway Glen Park (114) is by Hughes Elementary School near the intersection of Calle de Escuela and Avenida de Guadalupe. This monitor was installed in July 2017. The CNEL value shown at this location was calculated using data from every day in 2019.

- The other NMS near Fairway Glen Park (114) is on Avenida de los Arboles at the intersection with Avenida de Lago. This monitor was also installed in July 2017. The CNEL value shown at this location was calculated using data from every day in 2019.

The table below compares the measured CNEL data at these three locations:

TABLE I COMPARISON OF MEASURED CNEL LEVELS

RMS ID	RMS Location (ANOMS)	CSC Location	ANOMS	CSC NMS	Difference
108	MacGregor Lane	Aberdeen & MacGregor	66.9	68.3	+ 1.4
114	Fairway Glen Park	Hughes Elem School	62.1	64.6	+ 2.5
		Avenida de los Arboles		59.9	- 2.2

Figure 2 below show the locations of the noise measurement locations. As can be seen there, they are near each other, but not at exactly the same locations. Additionally, the locations shown for the ANOMS microphones are approximated by based on DEIR Figures 4.13-3 and 4.13-4. While the depiction of the locations in these figures are adequate for the DEIR, the scale is such that locating the microphones precisely is not possible.

All that said, we believe the ANOMS and CSC NMS CNEL values shown in Table I are in sufficient agreement to corroborate the ANOMS data which serve as the basis for the DEIR analysis.

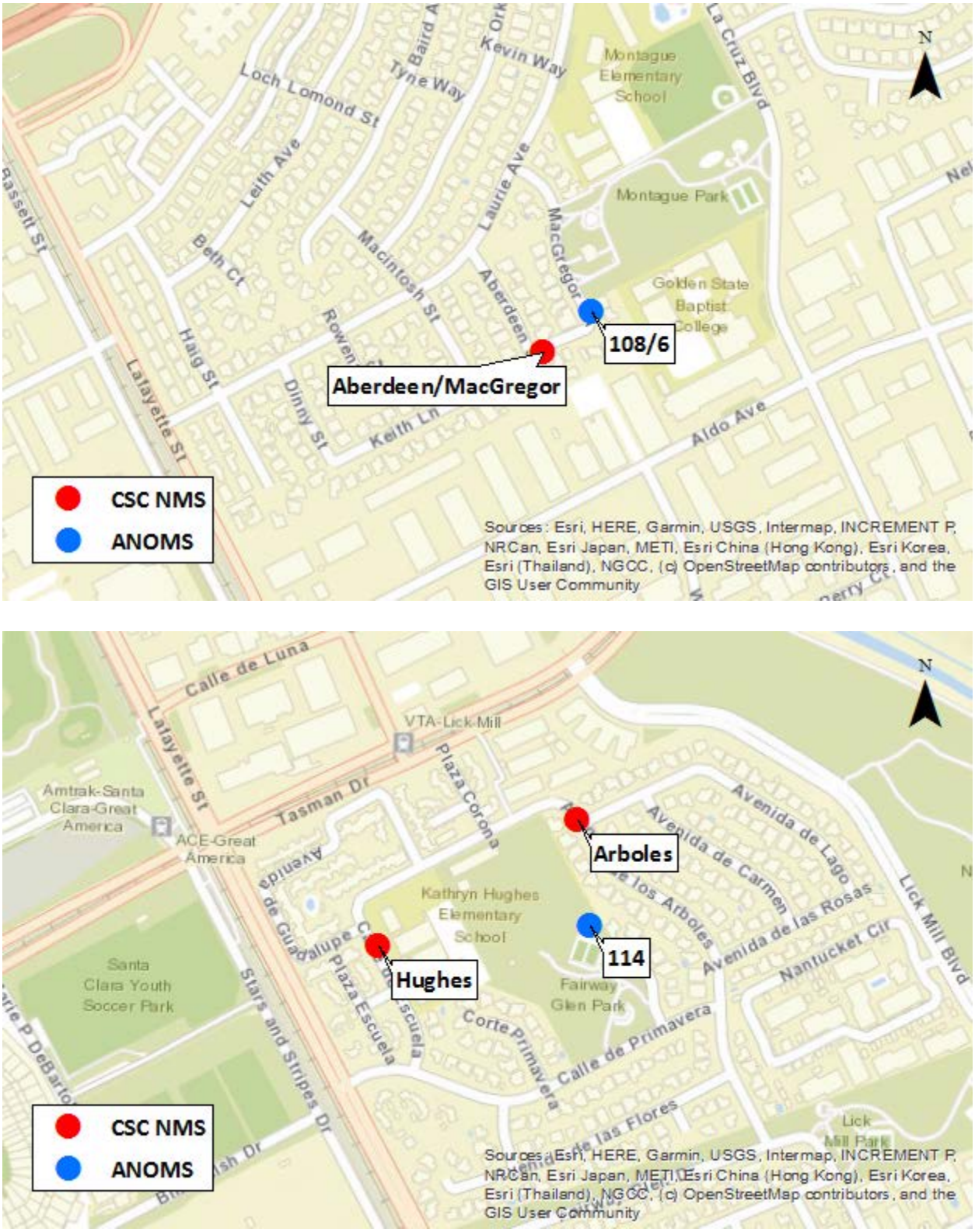

FIGURE 2: NOISE MEASUREMENT LOCATIONS

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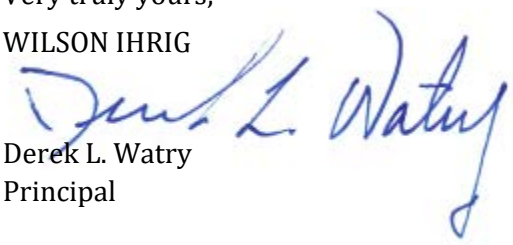
Please contact us if you have any questions about our comments on the Amendment to the Mineta San José International Airport Master Plan DEIR noise analysis.

Very truly yours,
WILSON IHRIG



Derek L. Watry
Principal

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