



TALASKE
SOUND THINKING™

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Rick Talaske's planned 19 Jan 2021 presentation regarding sound matters.

Note: This draft replaces and corrects the December 2020 presentation materials regarding sound matters

Hello, I am Rick Talaske. I am an acoustician based in the Chicago area. I have a master of science degree in acoustics and I have been a practicing acoustical consultant for 40+ years, working nationally and internationally. For example, my firm provided the acoustic and audio design guidance for the new Mead Center for the Performing Arts at University and Lake on the UW campus. Furthermore, we have performed noise survey studies on dozens of other outdoor facilities and we have been hired by municipalities to assist them with the development of their local noise ordinances.

Two years ago, we were hired to perform an analysis of the expected noise associated with the Edgewood High School stadium. Details are:

- We performed background noise measurements using calibrated Type 1 and 2 sound level meters. Calibration is traceable back to national standards. Windscreens were used as required by your noise ordinance and is our standard practice.
- Measurements for two hours were performed at the three locations noted on Figure 1.
- Ambient noise levels ranged from 50.6 to 63.2 dBA.
- Peak sound levels ranged from 68.5 to 75.8 dBA.

This information is corrected from the version released in November 2020 to account for the changes made within the City of Madison Noise Control Regulation since our original study of December 2018.



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We have three perspectives to offer regarding the noise impact of the Edgewood HS stadium on the residents.

Perspective One: Per 28.08(3)(d), sporting events are exempt for the requirements of the Noise Control Regulation for the City of Madison.

Perspective Two: if you review the actual wording of the noise ordinance one can conclude:

- The Noise Control Regulation references that only “stationary” noise sources are applicable. Technically, the only stationary sources of sound will be the loudspeakers.
- A preliminary design for an audio system was developed with loudspeakers on poles facing the patrons and facing away from residential areas. Based on analysis of the design extrapolated to the residential areas, it was determined that a moderately-loud sound level can be presented to patrons within the seating bleachers (low-90's dBA) which limits the sound level to 65 dBA at the residential locations in a fashion consistent with the requirements within the Noise Control Regulation and under neutral weather conditions.
- The requirements of the the Noise Control Regulation can be met by keeping loudspeakers close to the stadium seating, by using directional loudspeakers to direct sound toward attendees and not directing sound toward the residences, and also by utilizing an electronic limiter to control the loudness of the audio system (much like a governor which limits the speed of a vehicle.)

Perspective Three: If you look beyond the exact wording of the ordinance you can raise the question “Is the overall noise exposure to the nearby residents excessive?” To answer this second question, we performed a very



sophisticated assessment of expected levels using SoundPLAN calculation software. SoundPLAN is one of the two leading computer-based noise assessment programs.

- Our study accounted for:
 - a. The terrain and buildings
 - b. The configuration of the stadium seating with various capacities of 150, 500, and 1000 attendees.
 - c. Pep band
 - d. Announcements over audio system
 - e. Football players
 - f. Ref whistle
 - g. Ambient noise
- Using results of these sound events sound level estimates were created and averaged over a one-hour period, or continuous football play for two quarters. It should be noted that community noise exposure is generally addressed over a period of time. For example, noise due to aircraft is generally averaged over 24-hour period using the L_{DN} metric.
- Near Edgewood HS, we calculated that sound levels at residences along Woodrow Street and Monroe Street averaged from 55dBA to 60 dBA during a football game. Other more distant residents will experience less noise.
- It is important to understand that these sound levels are not loud. There will be **much** less noise exposure near the stadium than, say, the music venue east of the Capital, which is near a residential community.



It is our professional opinion that these predicted sound levels for both stationary and non-stationary sources could be described as follows:

- Overall, when averaged over a one-hour period, the outdoor continuous noise exposure associated with a football game will be commensurate with , and only slightly louder than, the general ambient noise many residents are exposed to on a daily basis.
- The average sound level over a one-hour period will be less than 65 dBA, which we understand is the number referenced within the City of Madison Noise Control Regulations. Some non-stationary sound events will exceed this figure, but that is true with ambient conditions currently.
- The only stationary noise source is the audio system and this has been designed preliminarily to meet the requirements of the Noise Control Regulation.
- Overall, the indoor noise exposure during a football game (with windows closed) will be considerably less, will range from inaudible to barely audible inside homes, and be much lower than indoor noise standards set by Housing and Urban Development.
- If desired, a barrier can be constructed which would offer modest reduction in sound level for residents closest to the stadium.
- The levels are sufficiently low:
 - a. They are not deemed to be an excessive noise exposure per OSHA.
 - b. Windows will not rattle.
 - c. There are no annoying tonal components to the nature of the sound.
 - d. Interior noise levels (with windows closed) are expected to be less than HUD standards of 45 dBA.

Hence, we concluded that the overall noise exposure during sports events is not expected to be excessive.



There are comments by others that we understand have been circulating. Our opinions are:

- Noise measurements not made with calibrated precision sound level meters and taken without a wind screen should be assumed to be inaccurate. This is especially true with measurements made with iPhones, meters from Radio Shack, or similar uncalibrated equipment.
- The statements regarding undue stress, nightmares, excessive sound levels in their home are, in my professional opinion, not consistent with our predicted sound levels. The comments would be consistent with much higher sound levels with excessive low-pitched sound. Neither condition is the case here.

Regarding the Wise report:

- We understand that Waunakee HS confirmed that there were approximately 1200 attendees for the event where noise measurements were performed, not the 350 attendees that were reported. Hence, this comparison means predictions of sound levels for Edgewood are too high.
- We found no mention of wind direction for measurements performed at the Waunakee facility. If the measurement location was downwind of the stadium, levels would be higher than versus neutral conditions.
- If a noise exposure perspective is used by Wise, the full time period during the day (or at least 8 hours) is applicable. Note that the 20-minute measurement duration near the Waunakee facility is showing an average of (slightly) under 70 decibels. This means that any long-term average (8 to 24 hours) would be much lower, closer to the ambient levels.



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- A peak level of 80 dBA was identified and flagged as something significant. Note that a typical passby of an emergency vehicle with sirens operating can easily be 10 or 20 decibels louder.
- Page 6b identifies levels versus health effects. Note that these are averages “over a year.” We would estimate that the average impact over a year with stadium use versus no stadium use likely would be a miniscule difference.

Richard Talaske, FASA
Principal Acoustics Consultant
15 January 2021



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Supporting graphics:

Edgewood High School – Goodman Athletic Complex
Ambient Noise Measurements and Grandstand Noise Simulation Model
Professional Audio Designs, Inc.

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Figure 1 – Location of ambient noise level measurements.

The results of the ambient noise measurements are noted Figures 2 and 3. The results indicate L_{eq} values ranging from 50.6 to 63.2, with an average of 56.5 dBA. Peak levels measured ranged from 68.5 to 75.8 dBA, with an average of 72.5 dBA.



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Edgewood High School – Goodman Athletic Complex
Ambient Noise Measurements and Grandstand Noise Simulation Model
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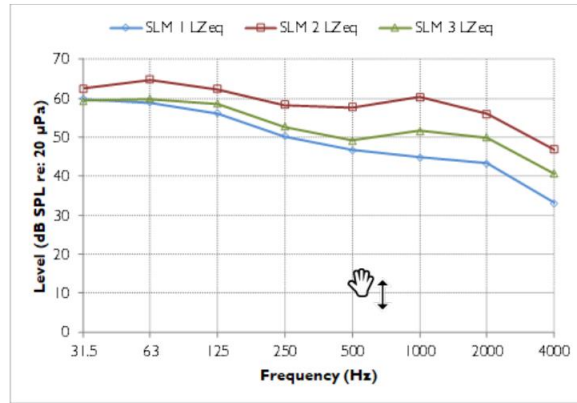


Figure 2 – Summary of average octave band ambient noise level measurements during late afternoon of 6 December 2018, presented as L_{eq} per octave band. The results indicate L_{eq} values ranging from 50.6 to 63.2, with an average of 56.5 dBA.

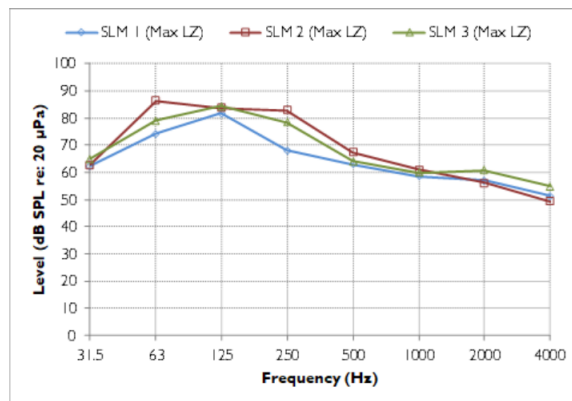
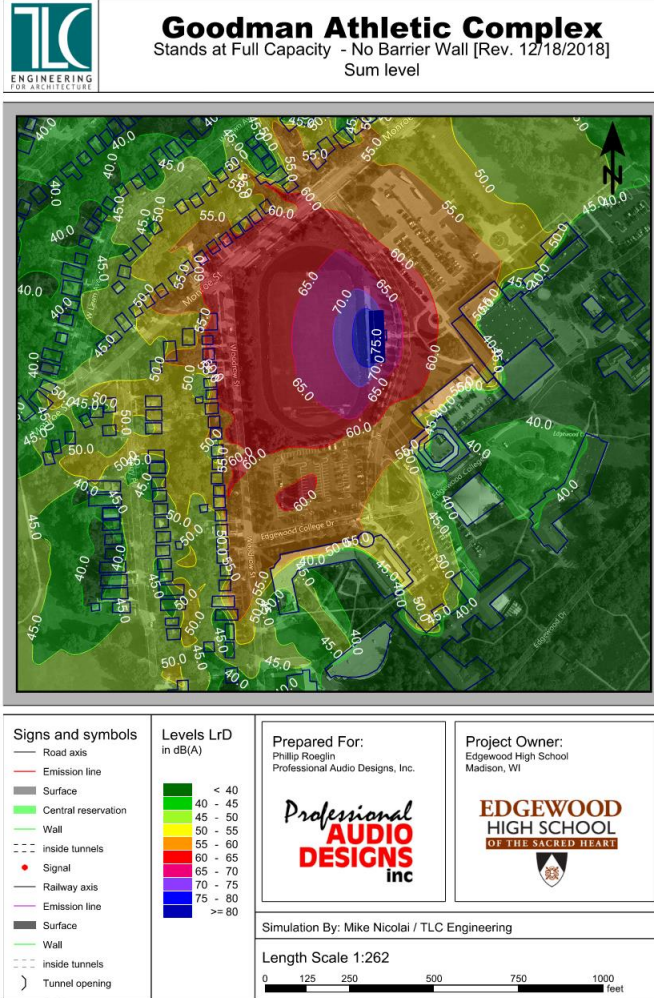


Figure 3 – Summary of maximum measured octave band ambient noise level measurements during late afternoon of 6 December 2018, presented as L_{max} per octave band. Peak levels measured ranged from 68.5 to 75.8 dBA, with an average of 72.5 dBA.



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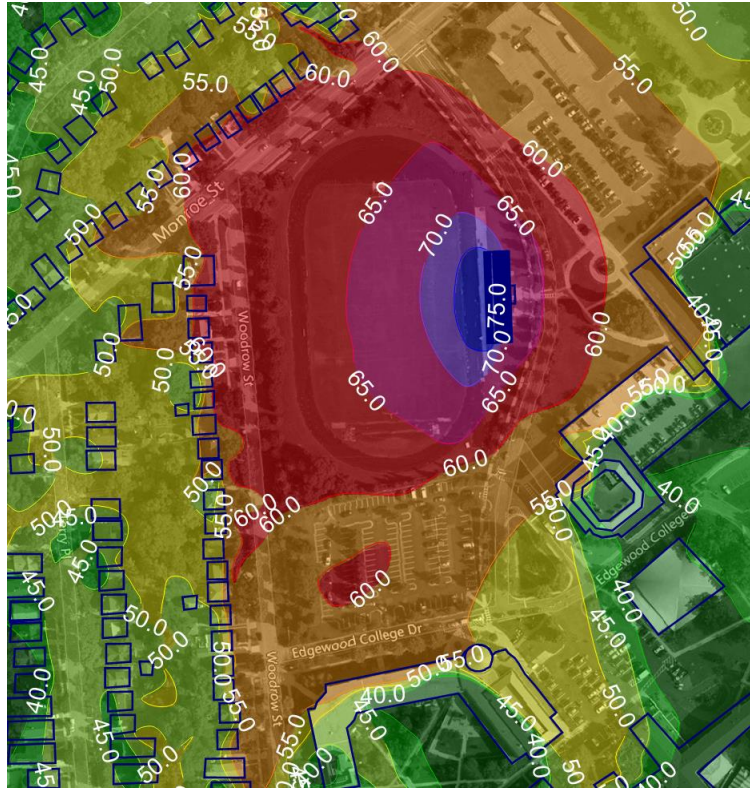


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Zoom in of previous SoundPLAN predictions.