ITEM F

CITY OF LA VISTA
MAYOR AND CITY COUNCIL REPORT
APRIL 15, 2025 AGENDA

Subject:		Type:	Submitted By:
CENTRAL PARK SOUND STUDY UPDATE	◆	RESOLUTION ORDINANCE RECEIVE/FILE	CHRISTOPHER SOLBERG DEPUTY COMMUNITY DEVELOPMENT DIRECTOR

BACKGROUND

At the September 17, 2024 City Council meeting an agreement was approved with WJHW, Inc. to prepare an update to the sound study originally drafted within the "New Amphitheater Feasibility Study" completed by AECOM in 2017. WJHW was a sub-consultant to AECOM on the feasibility study, conducting the original sound study.

Since September WJHW has worked with staff to prepare a draft update to the sound study. A representative of the consulting firm presented the draft findings at the March 18, 2025 Council Meeting and answered any questions the Council had.

Revisions have been made to the draft study and the final version has been included in the packet for review. In general, the changes from the previous version provided to Council include:

- Development of an additional modeled scenario that lowers the speaker height 5ft. Through this scenario, the modeler notes a possible 3 dB reduction at the residences along the north end of Valley Road.
- Additional narrative related to the modeled scenarios that included verbiage about the feasibility of construction of the noise walls in the locations modeled.
- Additional narrative about the possibility of a "shroud" around the sides and backs of the speakers.

April 10, 2025

Mr. Christopher Solberg
Deputy Community Development Director
City of La Vista
8116 Park View Blvd
La Vista, NE 68128

VIA EMAIL: email@email.com

Re: **La Vista, NE - Astro Amphitheater**
DRAFT Concert Noise Measurements & Mitigation Recommendations

Dear Mr. Solberg,

This report summarizes the measured noise levels from concerts at the Astro Amphitheater in La Vista, Nebraska. Also included in this report are our initial recommendations to help mitigate the noise levels at the surrounding neighborhoods, based on computer noise modeling.

CONCERT NOISE MEASUREMENTS

Noise measurements were taken at a Seether & Skillet concert at the Astro Amphitheater on October 18, 2024 by WJHW acoustics staff. Measurements were taken at the mix position and at locations north of the amphitheater during the concert that evening, based on the locations where complaints had been issued over the previous year. Other measurements were made around the park and amphitheater itself in order to improve the computer noise modeling, discussed in the following section. Following the concert and the next evening, October 19, 2024, ambient noise measurements were taken at the city parks facility on Valley Rd.

Measurement Equipment

Three separate NTi XL2 sound level meters were deployed during the concert measurements. All meters were equipped with ½-inch microphones; the meter configuration meets the standards for class 1 measurement equipment per IEC 61672. Laboratory calibrations for these devices are current and available upon request.

One meter was set up at the mix position, approximately 100 ft. from the front of the stage, for unattended noise monitoring. The same meter was used for the unattended ambient noise measurements after the concert. The mix-position sound level meter was set to record LAeq (Equivalent Continuous Sound Level, A-weighted) with a 5-minute resolution during the concert measurements and the ambient noise measurements.

Two additional meters were used in the surrounding neighborhoods for attended noise measurements. The different locations used during the measurements were 6 positions along the rear concourse behind the audience seating area, 7 positions at residential buildings immediately surrounding the venue, and 6 positions throughout the surrounding neighborhoods including La Vista West Elementary School, Parkview Heights Elementary School, La Vista City Park, and Ralston Park. These meters were set to record LAeq with a 5-minute resolution. Each meter was set in position for 15 minutes during recording before being moved to the next position.

Site Conditions

Weather conditions during the event were as follows:
Friday October 18 (Concert, 6pm – 10pm)

- Temperature: 71 °F (6pm) - 62 °F (10pm)
- Wind Speed: 8 – 13 mph
- Wind Direction: S - SSE
- Humidity: 36% (6pm) - 44% (10pm)

Saturday October 19 (24-hour Ambient Measurements)

- Temperature: 57 - 78 °F
- Wind Speed: 8 – 16 mph
- Wind Direction: SE - SSW
- Humidity: 30% - 58%

Measurement Summary

Our measurements show an overall average sound level of 99 dBA at the mix position for the duration of the concert, including breaks between the acts. During the opening act, the loudest 5-minute average sound level was 98 dBA, and during the two main acts the loudest 5-minute average sound level was 103 dBA.

The following table summarizes the 15-minute sound levels (Leq, dBA) recorded at different positions in the surrounding neighborhood, as well as the concurrent level measured at the mix position. Also included is the average sound level (Leq, dBA) measured at 6-10pm the following night when no concert was occurring.

Position	***Measured Leq, dBA***	***Mix Position Leq, dBA***
1 Concourse	91	104
2 84th St Apartments	74	105
3 Valley Rd Residences	81	106
4 Parkview Heights Elementary	63	104
5 La Vista West Elementary	60	100
6 La Vista City Park Ballfields	60	99
7 Ralston Park Ballfields	61	98
8 No Concert Occurring, 6-10pm	46	-

Figure 1: Measurement locations surrounding the venue.

Subjectively, the concert was easily heard at all locations in the community measurements. Lyrics were understood at locations 2, 3, 5, & 6 (nearest to the amphitheater). In the locations further from the venue, such as the Ralston ball fields (7), we noted that passing cars were at the same loudness as the concert sound levels (approximately 60 dBA), and that a passing train was significantly louder (70-75 dBA). However, the sound level at that location between acts was 54 dBA, and when the second main act began playing the average sound level increased to 59 dBA.

The following tables show the average octave-band sound levels measured at the mix position and at different positions throughout the surrounding neighborhood for each act of the concert. This octave band data gives us the sound spectrum and an idea of the character of the sound; it is worth noting that there was significantly more low-frequency sound output during the Seether act than either the opener or Skillet acts. It is also worth noting that the low frequency sound is not as easily

dissipated at further distances as the high frequency sound; the levels at 63 Hz are relatively louder compared to the levels at 4000 Hz.

Opening Act – Royale Lynn (6-7pm)

	Octave Band Sound Levels, Average Leq, dBA							
Measurement Position	***63***	***125***	***250***	***500***	***1000***	***2000***	***4000***	***8000***
Mix Position	99	96	101	105	103	105	98	89
West Concourse	99	92	83	70	73	74	66	52
East Concourse	101	95	90	83	83	82	76	70

Main Act - Seether (7-8pm)

	Octave Band Sound Levels, Average Leq, dBA							
Measurement Position	***63***	***125***	***250***	***500***	***1000***	***2000***	***4000***	***8000***
Mix Position	103	103	109	111	111	114	107	96
Housing on SW corner of 84th and Park View Blvd	94	82	78	73	75	68	56	41
Parkview Heights Elementary School	72	73	62	57	54	50	45	42

Main Act - Skillet (8:30-10pm)

	Octave Band Sound Levels, Average Leq, dBA							
Measurement Position	***63***	***125***	***250***	***500***	***1000***	***2000***	***4000***	***8000***
Mix Position	102	99	110	111	113	112	108	100
Valley Rd	89	82	80	77	77	76	66	47
La Vista West Elem. La Vista City Park Ralston Park	75	69	62	61	58	49	43	41

Ambient Sound Levels (No Concert, 6-10pm)

	Octave Band Sound Levels, Average Leq, dBA							
Measurement Position	***63***	***125***	***250***	***500***	***1000***	***2000***	***4000***	***8000***
City Maintenance Shed, Valley Rd	54	59	59	64	66	59	60	42

COMPUTER NOISE MODELING

We understand the sound levels recorded during concerts has caused complaints at residences near the venue. Additionally, the City of La Vista does not have a prescriptive noise ordinance, but our understanding is that control of sound from the venue was previously established by providing a curfew for the venue.

To provide recommendations for reducing the sound transmission into the community, and therefore reducing the complaints at the venue, we are evaluating different mitigation options related to berms, noise barriers, or other architectural solutions using a 3D modeling software, SoundPlan.

SoundPlan is an industry standard environmental sound modeling software which calculates sound propagation using the methodology described in ISO 9613. This software analyzes environmental sound propagation using inputs such as sound sources and locations, exterior barriers (including buildings and walls), ground absorption, and other environmental factors. WJHW modeled the amphitheater design based on the design architectural model provided to WJHW in 2017, and amended based on our observations at the site, current grading from county GIS information, and current aerial images.

Excluded from the sound modeling were ambient sound levels, atmospheric variation, and foliage around the site. The ISO 9613 standard used for calculations assumes conditions favorable for sound propagation in all directions under winds up to 12 mph (a conservative approach to the noise modeling).

The sound sources for the amphitheater included two 12-box line arrays on either side of the stage to cover the seating areas. The mix position location and the sound spectrum were based on our site measurements. Results were compared to the measurements taken around the park; sound levels were within 3 dB of the measured levels.

MODELED SOUND LEVELS

The predicted sound levels around the venue are shown in the following figure. When normalized to a mix position sound level of 100 dBA (the average sound level during the main acts), sound levels along Valley Rd. were predicted to be 75 dBA. This is in excess of the average measured ambient sound levels on the evening with no concert (46 dBA). Along 84th street sound levels are predicted to be 70-80 dBA, but measurements along this location between acts at the venue indicate louder ambient levels from traffic.

RECOMMENDATIONS

The following recommendations for reducing the sound levels in the community, specifically along Valley Rd, should be discussed within the city and with the venue management. To see a significant improvement in the sound levels, we recommend at least a 5 dB reduction in anticipated sound level, with a noted improvement at a 10 dB reduction, which would be perceived as half as loud (although still greater than the measured ambient sound levels). Not all options need to be incorporated at the same time, but they can be staggered in their installation. We also recognize that not all of these options may be possible due to constraints on the site; rather, we want to illustrate what would be needed to reduce the sound levels.

Option 1: To control the sound from the venue, we recommend putting limits on the mix position levels, to be included within the rider from the venue. Having a limit is very common for touring acts, but lower noise limits may reduce the number of acts willing to play at the venue. Typically smaller sized venues, like the Astro Theater Amphitheater, can accommodate quieter noise limits than a stadium which also hosts concerts.

To see a significant decrease in the sound level in the community, we recommend discussing sound level limits of 90-95 dBA. This would be a noticeable decrease in level at the residences but would likely still result in complaints due to concert sound.

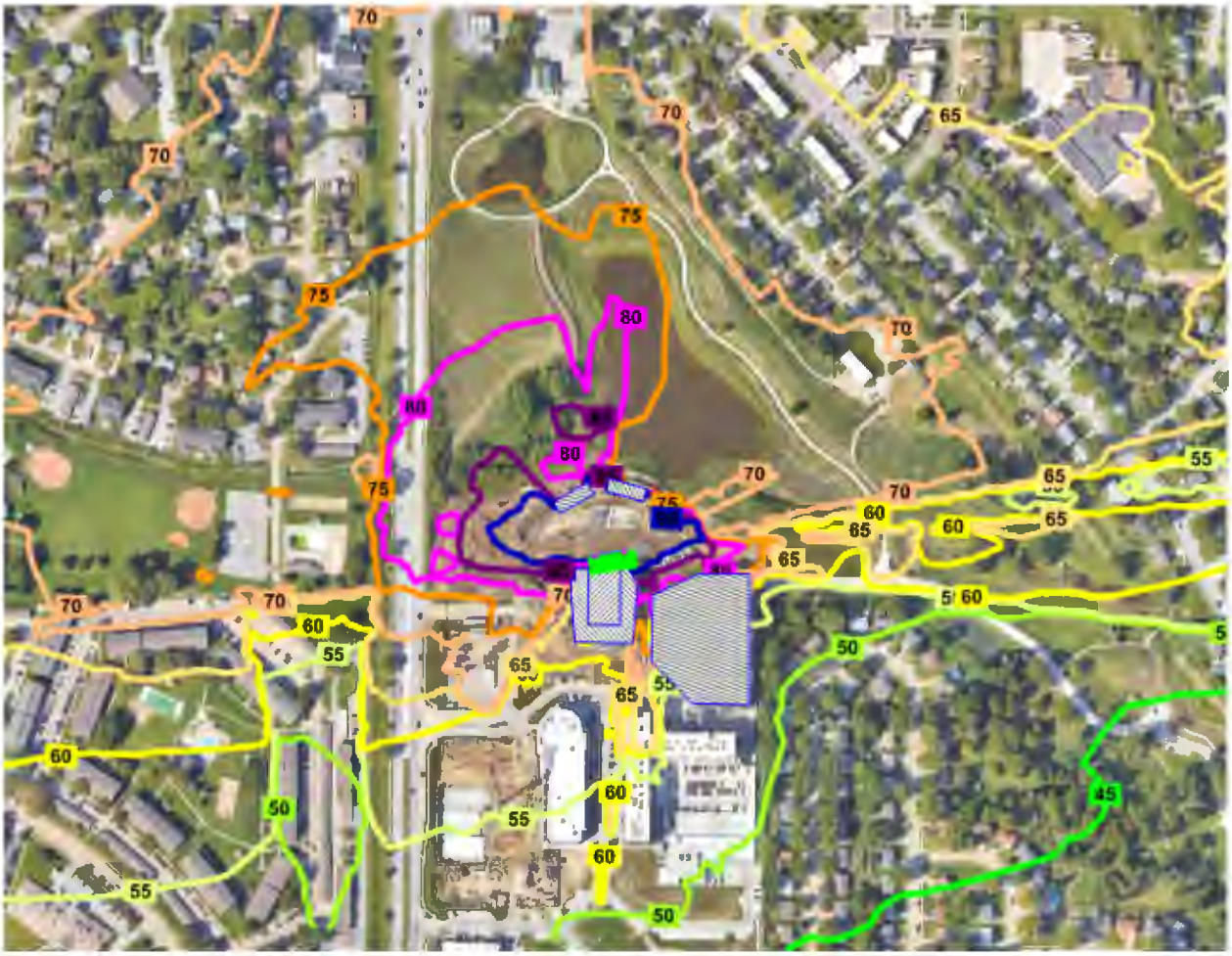
Option 2: Incorporating absorption along the rear and side walls of the amphitheater stage house could reduce the sound at the Valley Rd residences by just under 3 dB. While not a significant improvement on it's own, in connection with other noise mitigation this can be helpful to reduce the

sound levels in the community in addition to providing better sound quality within the venue. The material should be an exterior rated absorber, similar to MBIs Spectrum panels with the Cypress Cloth facing.

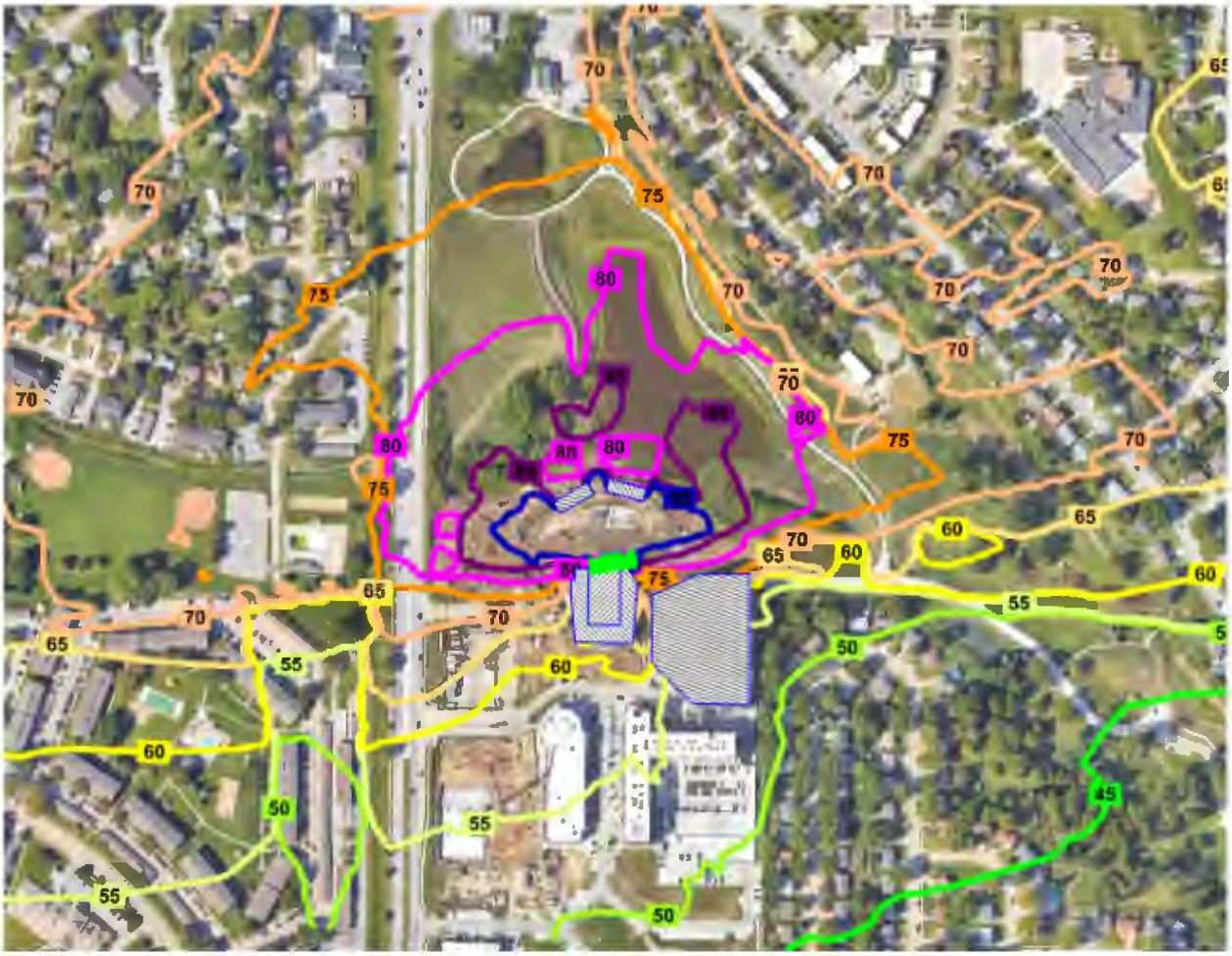
As an alternative to having material on the stage house and exterior structure of the amphitheater stage, a "shroud" could be built around the speakers with the absorptive material kept tight to the equipment. This would allow the material to be stored over winter, when the amphitheater is not in use for multiple months. The shroud would have a greater impact on the sound levels east/west of the venue than directly to the north.

Option 3: Lowering the speakers within the venue will reduce how far the sound is transmitted into the community, especially for the locations to the north of the amphitheater. This is because the concessions and restroom buildings at the north side of the venue begin to have a greater impact as a barrier element when modeled with speakers at 25 ft. above the stage (lowered 5 ft. from their original location), we see a 3 dB reduction at the residences along the north end Valley Rd., although the reduction in sound levels at the end of the cul de sac will be minimal.

Option 4: A barrier wall at the rear of the venue will have the greatest impact on sound levels the closer to the venue; to make at least a 5 dB reduction in sound level along Valley Rd, a minimum of a 30 ft. high sound barrier would be needed. To maintain vehicle access to the loading dock, as well as for food trucks and emergency responders, two walls were reviewed (shown below). Predicted sound contours with this "ideal" wall are shown in the following figure. However, this options is not feasible due to the wall height and its impact on the footings of the nearby buildings.



If a noise barrier wall were instead included along the top of the berm at the north side of the lake, that wall would only need to be 15 ft. tall to provide the same reduction at the nearest houses, although it would be less impactful for residents further away. For example, noise levels at the elementary school are anticipated to be unchanged. However, this option is not feasible as the Papillion NRD will not permit the installation of a noise wall in what is part of the dam structure. These contours are shown below.



Further discussion is needed to determine the correct mitigation strategy, including setting an acceptable level for sound in the community, and working with the venue to incorporate practical solutions. However, sound level reductions of at least 10 dB will need to incorporate both noise limits at the mix position and a physical barrier, constructed around the park.

I trust this information to you will be helpful. Please do not hesitate to reach out with any questions.

Best Regards,

WJHW, INC.

John Latta
Designer
CC: Emily Piersol *WJHW, Inc*