

# Acoustic Associates, Ltd.



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## Noise Assessment of the Proposed Experior Logistics Facility in Schaumburg

August 10, 2021 (Revised 1/17/22)

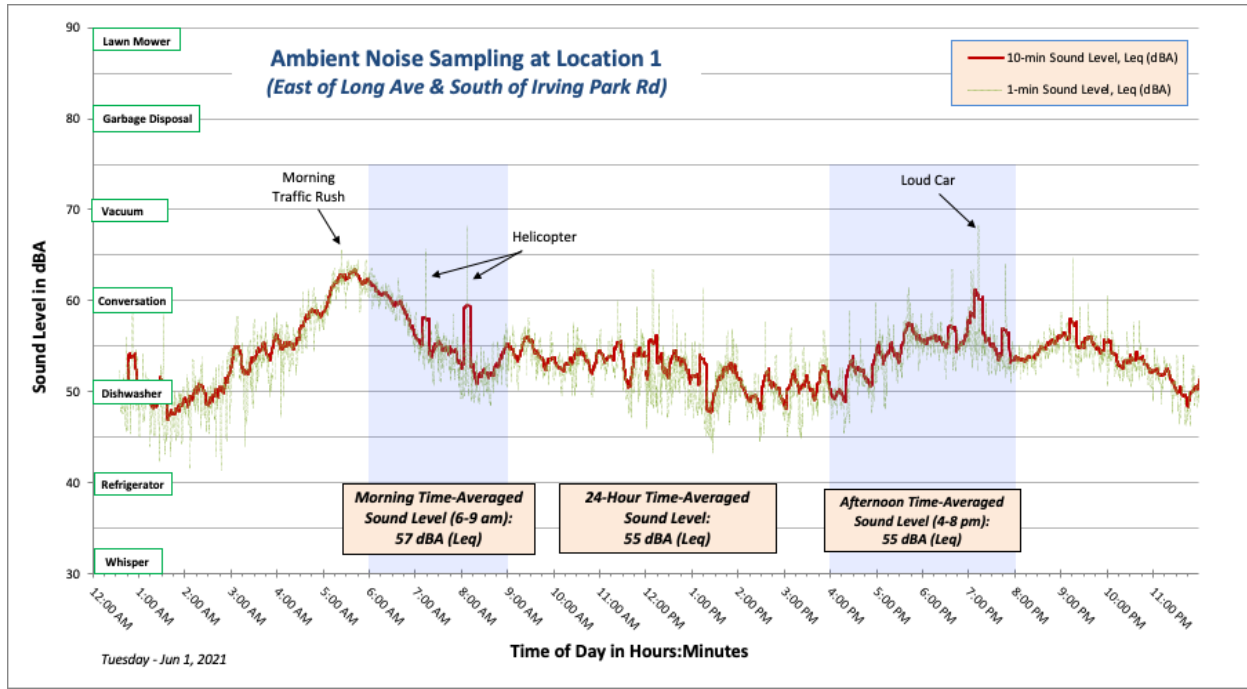
This report summarizes our assessment of noise from the logistics facility as proposed for the corner of Irving Park Road and Rodenburg Road in Schaumburg, IL. To investigate this, we used a well-respected and internationally recognized software program (SoundPlan™) to project the noise from truck movement at this development to areas beyond the site. We compared these projected sound levels with the ambient noise already in the area due to road traffic as modeled by the same software. This program takes into consideration the propagation of sound based on the local terrain, vegetation, large parking lot, natural barriers, and reflectors. For the ambient noise model, we used the traffic count data from the State of Illinois and the topographical features found on the satellite views from Google Earth. We modified some of these input features based on our field inspection on Tuesday, June 1, 2021.

During our field visit, we conducted sound recordings to sample 24 hours of ambient noise at a location south of Irving Park Road as noted in **Figure 1**. This data was used to tweak the input parameters to ensure a well-calibrated sound model. In our study, we first evaluated the existing ambient noise levels in the nearby communities and the projected noise levels due to the logistic operations. Our analysis was done using the overall, A-weighted sound level, which is the metric normally used for environmental noise assessment because it correlates well with the human perception of noise.

**Figure 2** shows the results of our ambient noise sampling. The thin, green line shows the variation in the ambient noise using a 1-minute time-averaged level (called the equivalent level or Leq). The thick, red line shows the 10-minute time-averaged level to show the central tendency of the ambient noise. As can be seen in the chart, the highest ambient noise is 64 dB and occurs in the 4:30-7:00 AM period. A secondarily high ambient level occurs in the 5:30-8:00 PM period at about 55 dBA. Both of these maximum levels occur around the morning and evening “rush” periods. Since the trucking facility operations would be concentrated in the 6-9 AM (morning) period and the 4-8 PM (evening) period (as highlighted in **Figure 2**), the focus of our analysis was on these two periods.



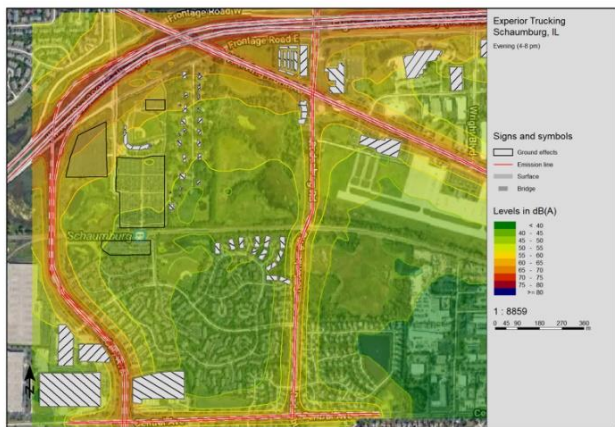
**Figure 1 – Sampling location for field verification of the computer model.**



**Figure 2 – Ambient noise sampling at the site showing the variation in sound level over a 24-hour period.**

To estimate the ambient sound levels in the area, we used traffic data for I-390, its frontage road, and Irving Park, Rodenburg, Gary, and Central Roads. We also entered topographical features as well as some important building features that might act as a barrier or reflector. The sound level contours (in 5 dB gradients) generated by the model are shown in **Figures 3-6** (a larger version is reproduced below). **Figures 3 and 5** specifically show the ambient sound level contours due to the ambient noise from major roadways in the evening and morning periods, respectively. We did not model the noise from short-term sources due to passing trains and overhead aircraft. While such noises are considered part of the “ambient” noise in the area, we sought to determine the “background” ambient level, that is, the ambient noise due only to continuous sources in the area, not the transient events. This is not to say that trains and airplanes don’t impact an area, only that people judge the ambient noise during periods between these high-level transient events.

To estimate the sound levels in the area resulting from the truck noise added to the existing ambient, we modeled the truck parking area along with the warehouse and refueling station. The model is based on 160 trucks leaving in the morning and the same number arriving in the evening. Also, 20% of these trucks will travel to the warehouse or fueling station. The resultant contours are shown in **Figures 4 and 6** represent the projected contours when the new trucking noise is added. When reviewing these contours, note from the legend that the projected sound level varies by 5 dB within each color.



**Figure 3 – Ambient Noise Only - Evening**



**Figure 4 – Noise with Logistics Facility - Evening**

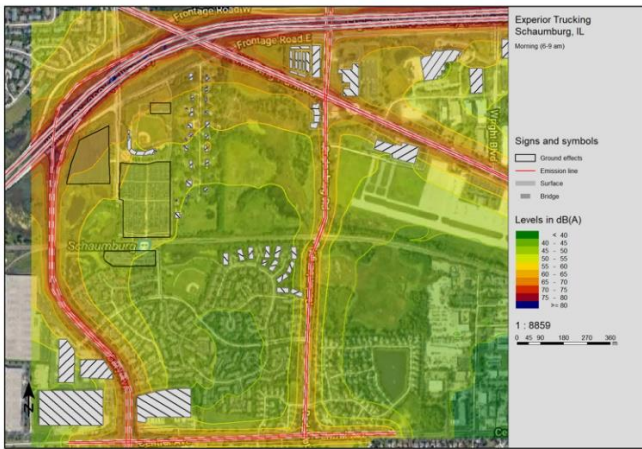


Figure 5 – Ambient Noise Only - Morning



Figure 6 – Noise with Logistice Facility - Morning

Table 1 – Noise levels as generated by computer modeling

Zone	Ambient Noise Morning	Ambient Noise Evening	Increase With 160 Trucks	Increase With 140 Trucks
Long Ave – North	54-58	52-57	0-1 dB	0 dB
Long Ave – South	47-52	45-50	2-3 dB	1-2 dB
South of Tracks	43-46	43-44	0-1 dB	0-1 dB

We extracted sound level data from the computer model for eight different locations and grouped them into three different receiver zones as shown in **Figure 7**. The range of sound levels determined by the model for the current ambient noise environment is given in **Table 1**. In general, the ambient noise in a zone is higher the closer that zone is to I-390, the Elgin-O’Hare expressway, which is the dominant noise generator in the area - not only because of its high traffic volume but also because of its elevation across Irving Park and Springinsguth Roads. Also, as seen in **Figure 2**, the ambient noise is a bit higher around the morning and evening rush periods because of the higher traffic volumes during these times.

**Table 1** shows the increase in noise level based on 160 trucks moving around in the lot. Recent data collected at Expor’s Alsip facility revealed there would be less than 140 trucks in operation. For 140 truck movements in each period, the difference in noise would be only 1 dB. **Table 2** shows the perceptual difference for any given decibel increase.

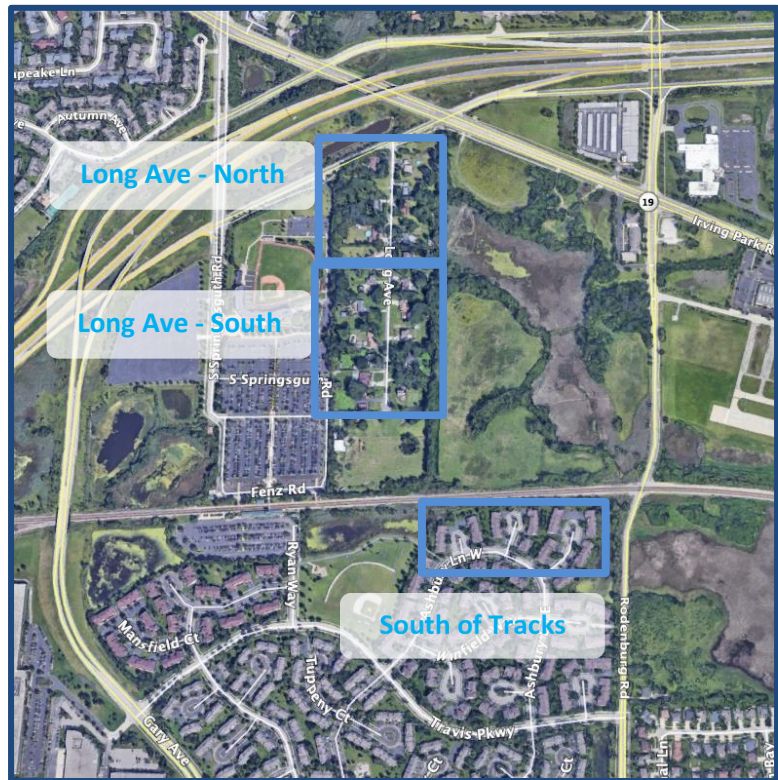


Figure 7 – Representative zones for summarizing results.

## State Noise Code

Since the project area encompasses multiple municipalities, the applicable noise code for this project is the State of Illinois code (*Title 35: Environmental Protection, Subtitle H: Noise, Chapter 1: Pollution Control Board*). As a logistics facility, the land use is classified as Class C. The residential areas are classified as Class A. Based on Section 901.102, "Sound Emitted to Class A Land" from Class C land, the State's daytime limit is a 1-hour Leq of 61 dBA. The State's nighttime limit is a 1-hour Leq of 51 dBA.

The State's definition of "nighttime" is the period between 10:00 PM and 7:00 AM. Under this definition, the 6-7:00 AM hour of trucking operation would fall under the State's definition of "nighttime." However, as can be seen in **Figure 2**, the ambient noise in this area starts to rise after 3:00 AM and peaks at 57 dBA at 5:30 AM. We have seen this numerous times in the Chicago suburban area such that it calls into question, what is "nighttime?"

This report refers to the "morning" period as truck movement from 6:00 – 9:00 AM, which overlaps 1 hour with the State's definition of nighttime. **Figure 2** shows that the time-averaged level of the ambient noise in this morning period is 57 dBA, 6 dB higher than the State's nighttime limit. Ultimately, what is at issue is not so much whether the project will exceed an arbitrary numerical limit, but what impact is expected. "Impact," in turn, is determined by the level of audibility and the character of the noise. **Table 1** indicates that the level of audibility is none to minimal compared to the existing ambient noise. In addition, since this parking lot would be a logistic center for long-distance trucks, there would typically be no backup beepers that might cause an adverse tonal character.

## Conclusions

Based on our analysis, here are our conclusions:

- 1) **The northern zone of Long Avenue:** With no increase in overall noise, there would be no impact on the homes in this area. This is because this area has high ambient noise levels due to its proximity to the I-390 expressway.
- 2) **The southern zone of Long Avenue:** Homes in this zone have a slightly lower ambient noise level (due to its greater distance from I-390) and are slightly closer to the trucks as they move through the parking lot. As expected, the computer model reveals only a slight increase in noise compared to the northern zone. As given in **Table 2**, a 1-3 dB increase would not be a noticeable change compared to the noise that exists at this site now.
- 3) **Homes to the south of the train tracks:** The modeling software predicts there would be no impact on these homes.

Note that temperature inversions and wind direction can affect the propagation of sound. This means that during certain weather conditions, the sound from the logistics facility could be slightly more - or even slightly less – audible than the results of our analysis on any given day. In addition, the values expressed in **Table 1** represent a time-averaged level of the ambient noise. This means that truck maneuvering would be slightly more audible in the 8:00 AM hour when, as seen in **Figure 2**, the ambient sound level drops to its lowest level in the 6:00-9:00 AM period.

Sincerely,



Stephen Thunder, BSE  
Acoustical Engineer

Tom Thunder, AuD, INCEE  
Principal

**Table 2 – Perceptual difference as a function of the decibel increase.**

Decibel Increase	Perceptual Difference
1-2 dB	Negligible
3-4 dB	Just Noticeable
5-6 dB	Clearly Noticeable
7-8 dB	Strongly Noticeable
9-10 dB	Doubling in Loudness

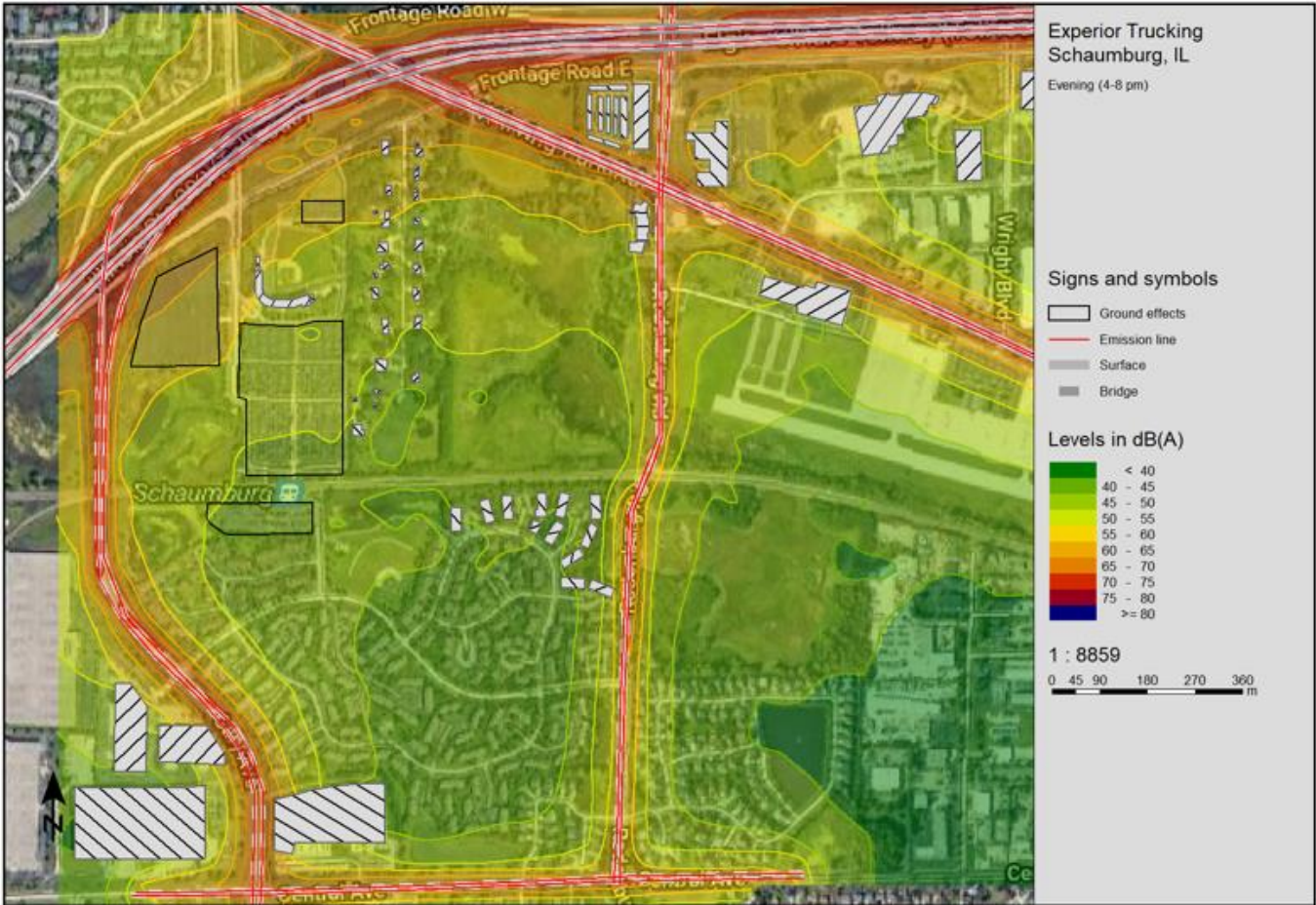


Figure 3 – Ambient Noise Only - Evening



Figure 4 – Noise w/ Trucking Facility - Evening

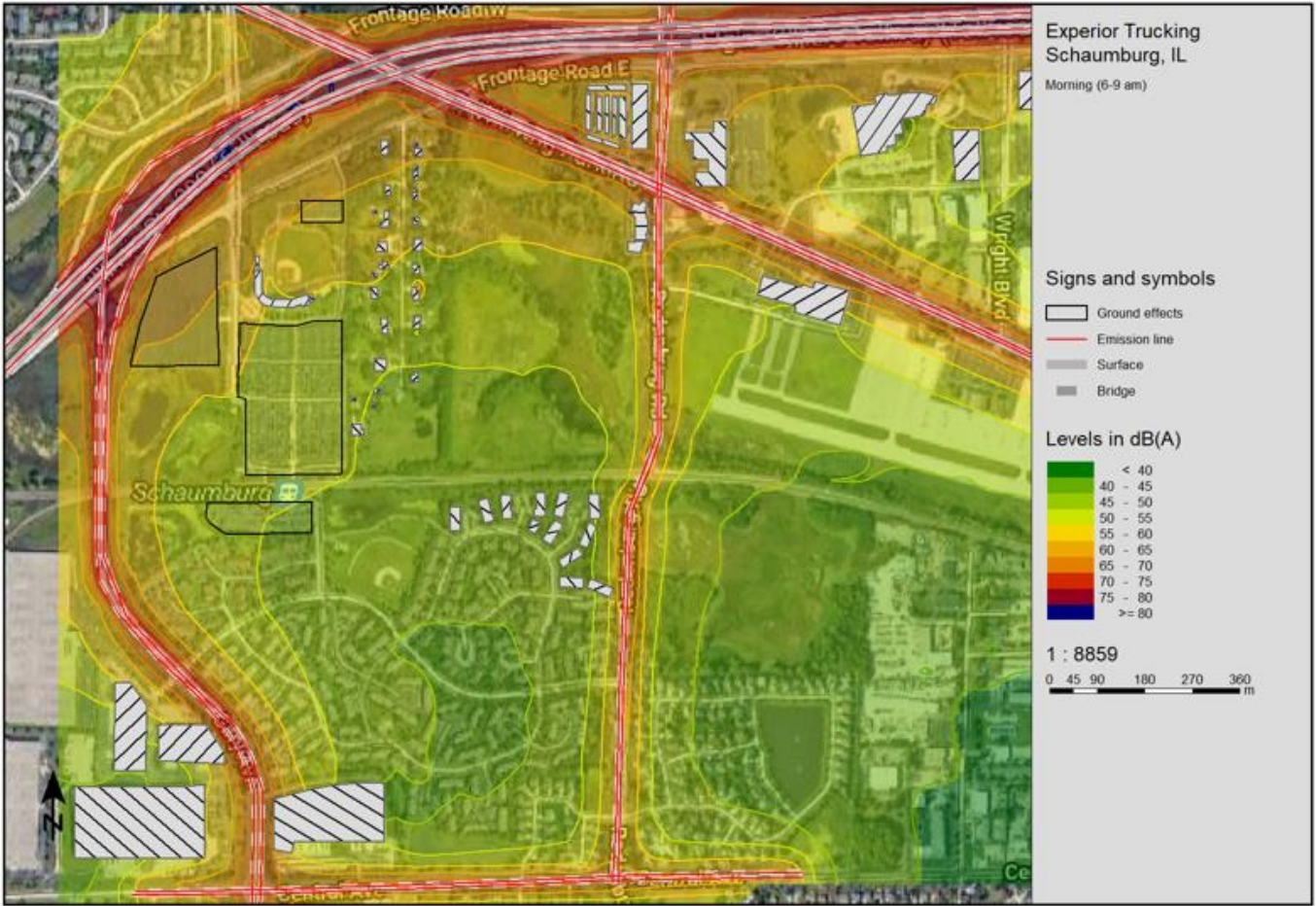


Figure 5 – Ambient Noise Only - Morning

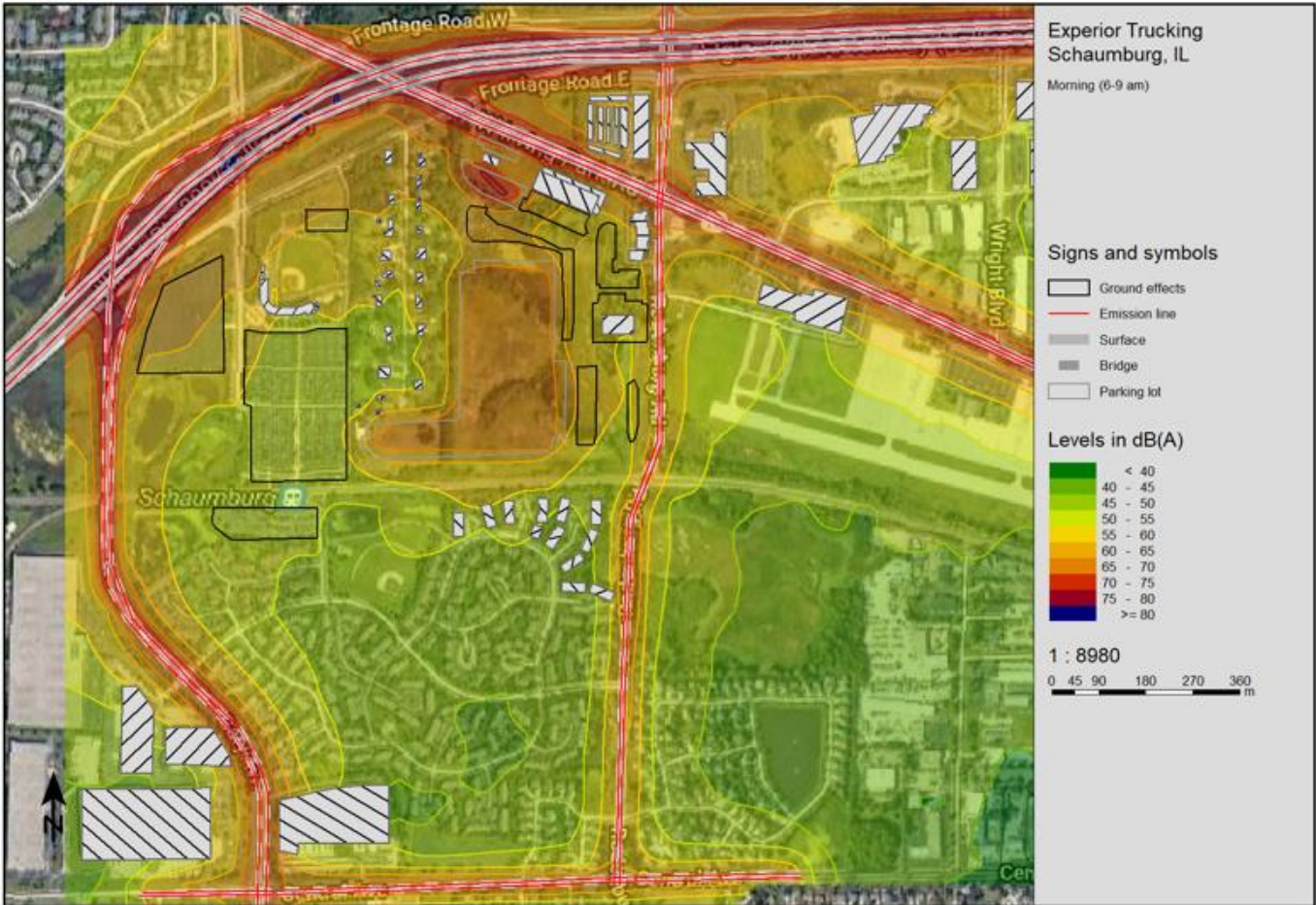


Figure 6 – Noise w/ Trucking Facility - Morning