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February 16th, 2026

Hartville City Council
444 East Town Street
Hartville, NC 00000

Dear City Council,

Enclosed in this report are my analyses and final recommendations for addressing the issues that have arisen between the citizens of Hartville and Kramer Associates regarding the Four Oaks Pavilion. Included is both an analysis of the current issues regarding excessive noise levels and the disruptive behavior of concertgoers, as well as recommended solutions to address and mitigate these problems.

We propose that the City Council of Hartville authorize a rebuild of the existing noise barrier surrounding the Four Oaks Pavillion, establish increased security in and around the amphitheater, and work with construction contractors to construct a parking garage or large parking lot for out-of-town guests. We are confident that these solutions will be effective in addressing the most pressing issues and increasing the trust between the City and its citizens.

Please do not hesitate to contact me if you have additional questions, comments, or concerns.

Sincerely,

Jennings David Mas, Consultant, jenningsm@masandcompany.com

Distribution:

Mayor Jeffery Ashland, Sherri Clark, Tad Williams III, John Benson, Tom Carpenter, Cindy Gaunter, Joseph T. Orcutt, Roger Lamb

Mas & Company Consulting

Solutions for Noise Pollution at Four Oaks Pavilion

Prepared by Jennings David Mas
Consultant

Prepared for

The Hartville City Council

Report Distributed 2/16th/2026

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Executive Summary

The purpose of this report is to address the persistent issue of noise pollution due to concerts taking place at Four Oaks Pavilion. This report proposes several potential solutions to the issue that both reduce excessive noise and work to repair the damaged public relations between the Hartville City Council and the residents of Hartville. Utilizing independent research conducted by Mas & Company Consulting as well as recommendations from SMZ Engineering's acoustic study and information provided by Kramer Associates and the Hartville City Council, we have determined several possible improvements.

Primarily, we recommend the renovation of the existing earthen berm surrounding Four Oaks Pavilion, including an increase in height as well as the planting of trees with a high canopy density to absorb and redirect noise, as well as the installation of noise monitoring equipment to ensure concerts do not exceed a reasonable noise level. Additionally, increased security and increased parking capacity will alleviate issues caused by concertgoers illegally parking and/or causing damage to public and private property. Should these solutions fail to provide results for homes that may be lacking in proper noise insulation, we recommend a grant be issued to homeowners to install effective noise insulation at a reduced cost.

The immediate effect gained by improving the existing noise barrier will be effective at reducing excessive noise and providing the public with a measurable improvement that will go great lengths towards repairing public relations. After this, expanding available parking at Four Oaks and hiring public and private security will lead to a significant reduction in car accidents, damage to public and private property, theft and other potential crimes, and traffic on public roads. Finally, issuing insulation grants will go a long way towards repairing public goodwill and will eliminate excessive noise for residents whose homes may not be built to match current insulation standards.

We are confident these solutions will both eliminate the noise pollution issue as well as restore goodwill between the Council and the residents of Hartville. Please do not hesitate to contact Mas & Company Consulting for additional information or discussion.

Introduction

Since its construction, the Four Oaks Pavilion Amphitheater has been a resounding economic success for Hartville. Kramer Associates have successfully created a significant revenue stream for the town, leading to job creation and improved quality of life all around. However, this improvement has been stifled by persistent issues: noise, traffic, and disruptive guests.

The amphitheater was built with noise reduction in mind, with an earthen berm lined with pine trees implemented to reduce noise levels. However, many residents of Hartville have lodged formal complaints about the noise levels during performances reaching a disruptive level. In addition to this, traffic surges during concerts leading to frustration from commuters just trying to get around their town, and there have been several reports of property damage caused by concertgoers from outside of Hartville.

To ensure Four Oaks Pavilion's continued success, these problems must be addressed in the immediate or near future. This report outlines several issues affecting residents located near the amphitheater, as well as several solutions for those issues.



Figure 1: Four Oaks Amphitheater from above.

Problem Analysis

Noise.

Despite the construction of an earthen bream as well as the planting of pine trees to dampen noise, excessive noise is one of the most frequent complaints lodged against Four Oaks Pavillion. SMZ Engineering conducted an acoustics study which measured noise levels of up to 105 decibels (dB) during concerts. While this is a standard limit for most outdoor concerts, this level of noise is still disruptive to residents. Several residents have submitted complaints highlighting noise levels that reportedly keep themselves and their children awake late at night, and SMZ Engineering found that the noise could cause dogs to bark excessively, further exacerbating the issue. Additionally, this level of noise could be harmful to residents outside of their homes. According to Doctor Margaret Denison at Denison Hearing, decibel levels of 105 or above could lead to temporary or even permanent hearing damage after prolonged exposure.

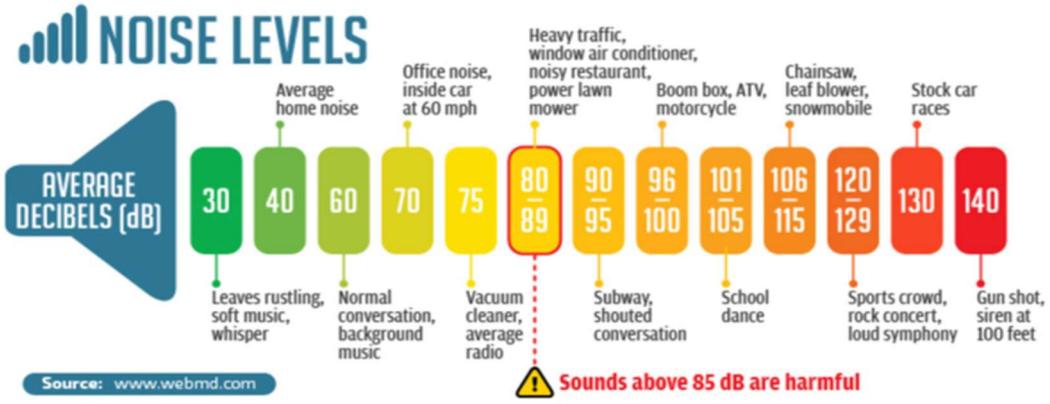


Figure 2, Chart showing dangerous levels of sound by dB.

The existing sound barrier has proven to be ineffective. SMZ Engineering reported that the pine trees used to block sound are too thin and do not absorb noise, and the earthen bream itself, while a good first step, needs to be supported by a secondary barrier for maximum effectiveness.

A contributor to the noise issue is also the poor insulation in some residents' homes. SMZ Engineering found that several homes were frame houses with very little insulation, which causes sound to easily bleed inside.

Disruptive Concertgoers

Several residents have reported disruptive activity from attendees of performances at Four Oaks Pavillion. There have been reports of attendees parking in private, residential driveways, damaging public and private property, and overall unacceptable behavior that is causing residents significant distress. This problem poses immediate danger for residents. Additionally, in the future, with the culture surrounding alcohol and drug use at concerts, the likelihood of dangerous incidents involving inebriated concertgoers is increased.

Parking and Traffic

The lack of parking has been a persistent issue. Many residents have submitted complaints about concertgoers parking in their driveways, and traffic has become a severe issue as concertgoers commute into Hartville for performances. This impacts Hartville locals who must now deal with increased commuting times to locations near the amphitheater, and the added traffic increases the likelihood of car accidents, which not only endanger the lives of residents and out of town guests, but further increase the severity of the traffic problem.



Figure 3, A traffic jam during an Ed Sheeran concert taken by Fox 6 News. https://www.fox6now.com/news/awful-traffic-backups-cause-thousands-of-ed-sheeran-fans-to-miss-part-of-milwaukee-concert

Proposed Solutions

Improve Existing Noise Barrier

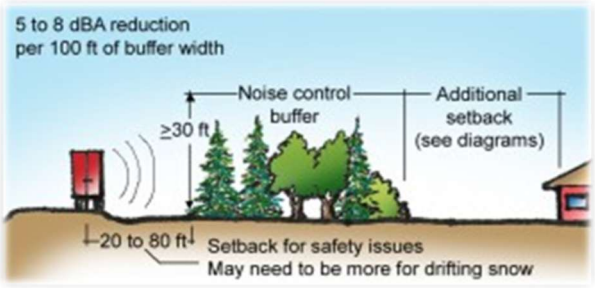


Figure 4, Diagram demonstrating noise reducing properties of dense tree lines (Arbor Day Foundation).

Renovate the existing noise barrier to increase the amount of sound absorbed and redirected during concerts. The height of the earthen bream should be extended to allow for more surface area to catch and redirect sound waves, and the pine trees on top of the bream should be replaced with less spindly trees with a high canopy density which are more effective at dispersing sound waves (Jain Lu et al.). According to Jian Lu et al., a tree with the proper characteristics, that being a dense canopy and thick trunk can individually result in a reduction of 2-3 weighted decibels (dBA), a decibel measurement adjusted to match the human ear's hearing, in noise levels. With these individual noise reducing properties in mind, the Arbor Day Foundation reports that an increase in tree line density to 100 feet wide could lead to up to a 15 dBA reduction when combined with the noise reflecting properties of the bream. This would be a significant reduction in noise that would eliminate the issue for many residents.

According to the U.S. Department of Transportation, in 2010 a berm constructed at a height of 30 feet or greater incurs material costs of 9 dollars per square foot. Adjusting for inflation, a bream would cost ~13 dollars per square foot. This price point makes expanding the existing bream a less costly option than changing the material, and it allows for the renovation of the noise-reducing tree line. Due to the time it takes for most trees to reach their full size, this solution would need an extended period to produce results, though it would be one of the most effective when completed.

Install Noise Monitoring Equipment

In keeping with SMZ Engineering's recommendation, install noise monitoring equipment in and around the Four Oaks Pavilion to ensure noise levels remain at a reasonable level. A second acoustic study may be needed to determine the optimal maximum noise level for Hartville. In the interim, a 105 dB noise limit would keep with standard maximum measurements observed at other concert venues which have been proven to be effective at reducing noise levels while not compromising the experience for guests.

Additional Parking

Construct additional parking lots near the Four Oaks Pavillion to reduce illegal parking and alleviate traffic problems. The primary motivator for concertgoers parking in residential neighborhoods without permission is the lack of convenient and accessible parking. Constructing

additional parking would alleviate this issue, allowing concertgoers to access a legal area to park. This solution would have to be executed in conjunction with an increase in security for maximum effectiveness.



Figure 5, Example of pay-by-plate regulations from WNBF News Radio. https://wnbf.com/binghamton-moves-to-pay-by-plate-parking-system/

Constructing a parking garage is the most space-efficient method to improve parking capacity but is also more costly than the construction of ground-level parking lots or the expansion of existing lots. This cost can be alleviated via paid parking, charging concertgoers for admission into the parking lot during periods of high traffic. This may involve hiring staff to manually enforce parking regulations or could be automated via a pay-by-plate system. A pay-by-plate system would allow guests to instantly park their cars and only pay when they leave, allowing for speedy access to parking and a greater reduction in traffic.

This solution would generate increased income for the pavilion, but additional research must be conducted into the ideal cost of parking as to not discourage concertgoers from using the parking garage. Overcharging could be a critical mistake that exacerbates the traffic problem and damages public relations.

Increased Security

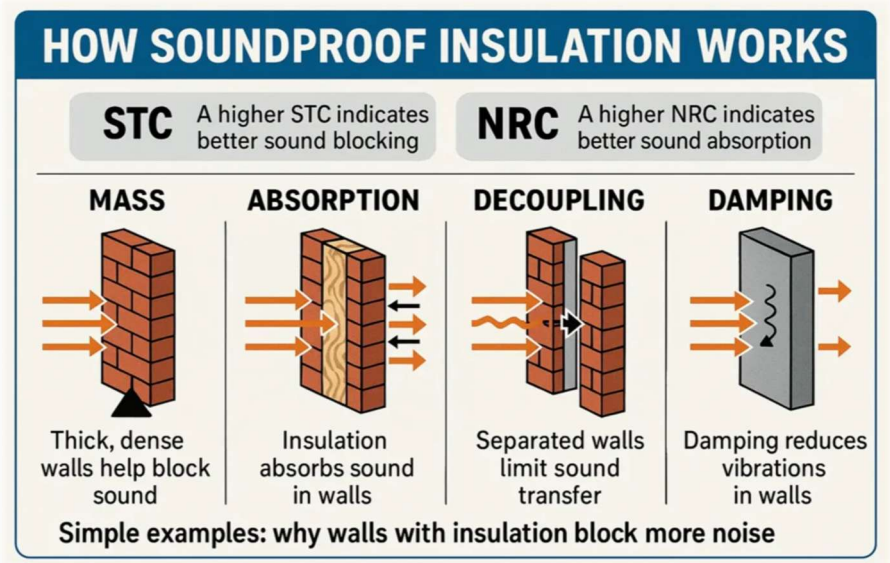
Increase the presence of city police officers at and around the Four Oaks Pavillion. Additionally, hire a private security firm to provide services such as drug and alcohol screening, security patrols, and assistance with parking management. An increase in security could lead to up to a 31% reduction in against-person crimes (crimes committed directly against a person), and a 22% reduction in theft-from-person crimes (theft, robbery, etc.) (International Security Ligue). This solution could be implemented faster than others via redirecting existing police units during concerts. Additional research and consideration should be undertaken to find a reputable and preferably local private security firm to hire if local police presence is not sufficient.

Home Renovation Grants

Implement a home renovation grant program for residents who are experiencing increased levels of noise due to poor home insulation. The U.S. Military has dealt with a similar noise pollution problem due to the excessive noise produced by Air Force bases, and in response they created the Community Noise Mitigation Program, a grant that allowed State governments and Native American Tribes to apply for funding to add noise-mitigating insulation to affected buildings. This program is estimated to have issued ~56 million dollars in funding to seven applicants. The insulation installed via this grant has been proven to be successful. A study conducted in the Journal of the Acoustical Society of America found that façade insulation, a commonly used type

of insulation involving the installation of insulating materials in between walls, has been proven to reduce indoor disruptive noise by up to 7 dB. This reduction could significantly improve the noise conditions of several homes in Hartville.

Figure 6, Types of soundproof insulation from Pure Eco Inc. https://www.pureecoinc.com/the-best-soundproof-insulation-materials/



Additionally, this grant would lead to an improvement in community relations. Investing in individual-level solutions to the noise pollution issue shows that the Hartville City Council is dedicated to maintaining a good quality of life for its constituents and is actively acting on a per-resident level to solve this issue.

This solution, while effective, is likely to be the costliest potential solution and should be implemented only if the renovation of the existing noise barrier fails to generate acceptable results. However, it also has the most potential for improving public relations due to its individualized nature.

Community Town Hall Meeting



Figure 7, An example of a town hall meeting. https://www.linkedin.com/pulse/how-run-town-hall-meeting-barry-horwitz/

Hold a town hall meeting where residents of Hartville can voice their concerns directly to the City Council and be informed of measures being taken to alleviate noise pollution. This solution should be implemented after one or more other proposed solutions are underway as an outlet to inform the public that their concerns are being addressed and that their complaints were heard and understood.

Final Recommendations

Our findings indicate that the most effective solution in the immediate future is to install noise monitoring equipment within Four Oaks Pavilion and renovate the existing earthen berm surrounding the amphitheater. Following this renovation, increased security should be implemented alongside the construction of additional parking. Should the berm renovation and noise monitoring equipment fail to alleviate the issue for homes with poor insulation, the Council should consider issuing insulation grants to homes constructed with insufficient insulation.

We recommend the Hartville City Council, SMZ Engineering, Kramer Associates, and Mas & Company Consulting further discuss these solutions in conjunction with a community town hall meeting to field additional concerns and ensure the public that solutions are being undertaken. After the implementation of one or more solutions, an additional town hall meeting should be conducted to determine if residents believe the issue has been solved.

We are confident that these solutions, if implemented, will significantly reduce noise pollution from Four Oaks Pavilion, and work to repair public relations between the Hartville City Council and its constituents.

Sources

The following sources were used to develop and support the findings of Mas & Company Consulting during their research:

Margaret Denison, *What are Unsafe Levels of Sound?,* Denison Hearing, 2023. https://drdenisonhearing.com/unsafe-sound-levels/

Jian Lu, Fanhua Kong, Haiwei Yin, Ariane Middel, Jian Kang, Zhihao Wen, Hongqing Liu, *Evaluating sound attenuation of single trees using 3D information*, Journal of Environmental Management, Volume 370. 2024. https://www.sciencedirect.com/science/article/abs/pii/S0301479724028044

U.S. D.O.T., *Summary of Noise Barriers Constructed by December 31, 2010,* US. D.O.T., 2010. https://www.fhwa.dot.gov/Environment/noise/noise_barriers/inventory/summary/stable712.cfm

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Amundsen, Astrid H et al. "The Norwegian Façade Insulation Study: the efficacy of façade insulation in reducing noise annoyance due to road traffic." *The Journal of the Acoustical Society of America* vol. 129,3 (2011): 1381-9. doi:10.1121/1.3533740 https://pubmed.ncbi.nlm.nih.gov/21428502/

Arbor Day Foundation, "*Using Trees and Shrubs to Reduce Noise"*, Arbor Day Foundation, 2010. https://www.arborday.org/perspectives/using-trees-and-shrubs-reduce-noise