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## **Environmental and Noise Impact Report Regarding 12 Pickleball Courts – Tucker Recreation Center, Tucker, Georgia**

I have been retained by neighbors of the project to offer findings and recommendations on the environmental noise impact of the proposed 12 pickleball courts at the Tucker Rec Center.

The purpose of this report is to assist the Tucker City Council in its decision-making process. The contents of the report represent the author's view of the facts and science, and not necessarily those of individual neighbors.

The author's experience and qualifications include:

1. Sitting on an HOA Board of Directors, we were sued for pickleball noise nuisance on our 13 courts
2. Presentation of three pickleball noise scientific papers at the Acoustical Society of America, Ottawa, Canada, May 2024
3. Continuing Legal Education presentation to the International Municipal Lawyers Association on Zoning and Permitting for Pickleball Courts, November 2024
4. Pro bono advice to City Officials through National Recreation and Parks Association
5. BS in Mechanical Engineering and Juris Doctor of Law Degrees
6. Registered US Patent Attorney with more than 40 years in technology law and litigation at a Fortune 500 company

7. Member of the Institute of Noise Control Engineers, the Acoustical Society of America, the National Recreation and Parks Assoc., USA Pickleball, and the Michigan Bar Association
8. Personal visitation to an Acoustiblok noise reflecting barrier installation in Carlsbad CA, and noise absorbing barrier installations in Palm Desert CA and Indio CA.
9. Study of noise reports, news reports, lawsuits, city council agendas, etc from around the US and Canada.

More detail on my education, experience, and published research is at the end of this report.

## **Project Summary**

The project proposes constructing 12 pickleball courts and 46-48 parking spaces in the open field play area just east of the existing recreation building. Access to parking will be from Lavista Road. A bathroom pavilion is in the plans.

The Arpeggio report states that the courts will be used from 8 am to 9 pm seven days a week. The plans include outdoor lighting.

## **Existing Recreation Center Usages**

### **Indoors**

The Rec Center is an older surplus elementary school building and hosts a range of activities for youth, adults and seniors. Gym hours on Tuesday, Thursday and Saturday include pickleball.

### **Outdoors**

The field to be converted to parking and pickleball is currently used as follows:

- 1 Soccer – nets are provided; some play is organized by leagues and some is drop-in. Regular practices held by the high school soccer team.
- 2 High School Sports – sports team and gym classes enter the field through the access path from Chamblee-Tucker Rd, leading to the high school.
- 3 Home Schooling activities – two different home school groups currently use the field for recreation and study groups, three days a week.
- 4 Nature study is also suggested on the Tucker website.
- 5 Dog walking, kite flying, picnicking and community members in general who value this rare and urban open green space.

## **Parking**

There is not sufficient parking at Tucker Rec for the existing uses. Accordingly, the city has a parking lease arrangement with adjoining Presbyterian Church.

## **Predictable Usage of the 12 New Pickleball Courts**

Many aspects of the noise problem are consistent around the country and can be predicted.

Pickleball is predominantly a drop-in sport, meaning that players arrive, often one to a car, and find playing partners at the courts. Many venues use a paddle stacking system in which players rack their paddles to display the order of play. Each game lasts about 15-20 minutes, with those players exiting and the next foursome rotating into the court. It is quite common to have as many players waiting for their turn as actively playing. Players typically spend 1.5 to 2.5 hours at the courts to play a number of games.

In some cities some courts are given over to private membership clubs. This lessens the management burden on the recreation department but can create an exclusive user group, generally with a long waiting list, and reduces availability for local users.

Considering the data for the Tucker indoor pickleball league, it can be predicted that outdoor players will be arriving from many Dekalb and greater Atlanta origins. Nationwide, players are willing to travel 15-30 minutes to find first class facilities like those proposed for Tucker.

The Arpeggio report indicates operating hours of 8 am to 9 pm. Due to the popularity of the sport and expected demand and the heat during the summer, there will be pressures for beginning earlier and ending later. For example, the 15 lighted courts at Newnan GA are open from 8 a.m. to 10 p.m., 14 hours a day.

Given the popularity of pickleball, many internet sources have been established to help the players find court locations. Pickleheads.com is used by USA Pickleball to share court locations. USA Pickleball has a nationwide network of over 2500 Ambassadors whose assignment is to grow the sport and upload location information into the Pickleheads.com court locator system. The players also have Facebook groups which promote new court locations. The Atlanta Pickleball Club Facebook Group has 6,100 members.

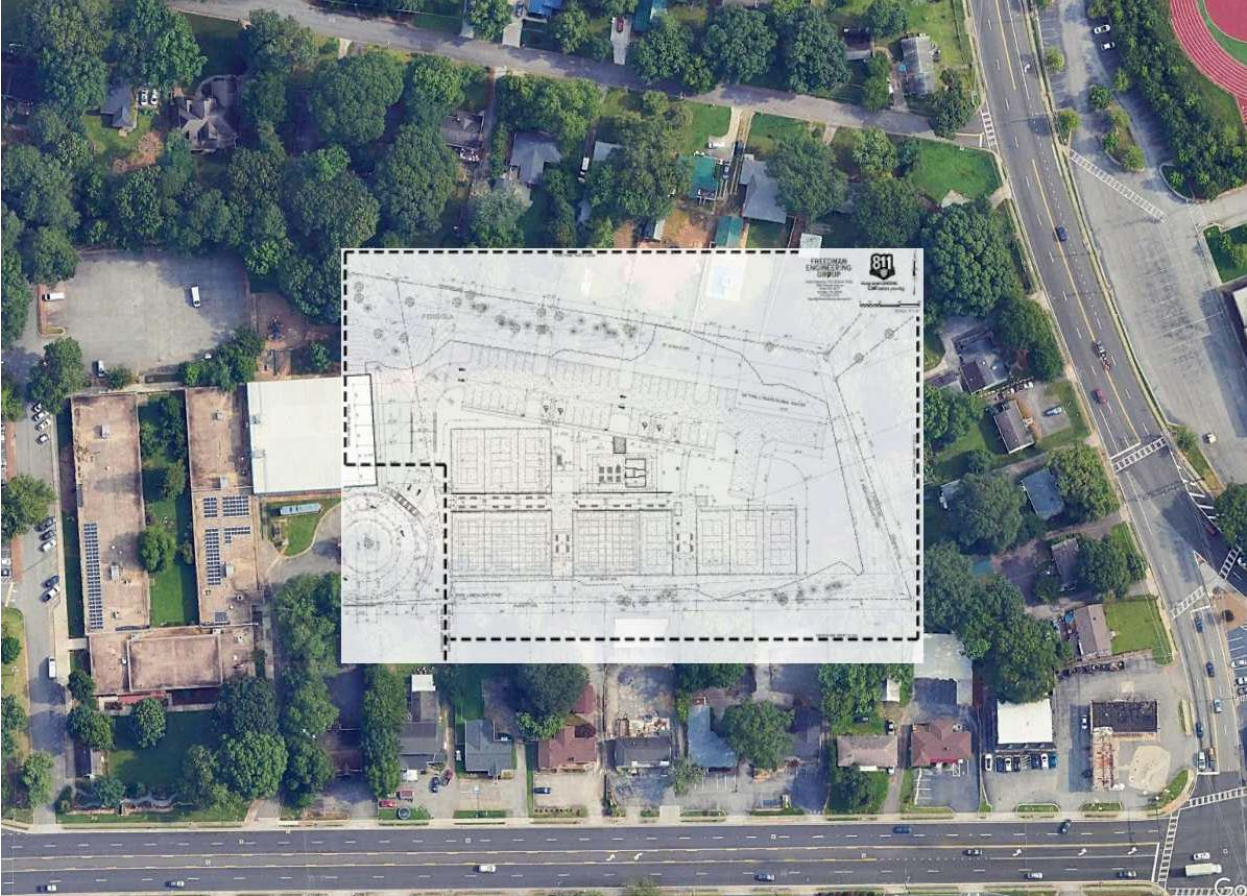
Lavista Road has its own exit off I-285 making travel and access easy from around the Atlanta Metro. The Tucker Rec Center is just 2.3 miles from I-285.

Appendix D is a map showing the geographic home locations of the registrants for the 2024 pickleball league. This map was created by a Tucker resident using zip code data obtained by official document requests to City of Tucker Parks & Rec. It displays the Metro-wide

origin of the Tucker Rec league players, spanning from Eatonton to Kennesaw to McDonough.

If you build it, they will come. Typical play for public courts will be very active during the morning and evening hours when most or all of the courts will be active. There is often less play during late morning and early afternoon.

**Figure 1 Proposed 12 Court Project**



**Comment on the Arpeggio Study**

**The Acoustiblok Recommendation**

Arpeggio concludes that 10-foot-tall Acoustiblok noise reflecting panels should be installed on the inside of the fencing. This is the most common and customary fix prescribed by acoustic engineers around the US and Canada.

Arpeggio recommends leaving the fences on the south side of the courts open, without the Acoustiblok panels. This is also a common recommendation and will avoid undesirable echoing of impact noises inside the courts which would annoy the players. Noise will be

reflected onto the Lavista Rd neighborhood where some of the commercial properties may also have housing units.

There appears to be some contradiction and ambiguity on the question of how much noise the neighbors will hear with the installation of the Acoustiblok. In some places, it is suggested that the pickleball noise will be less than the ambient noise, which seems to suggest it will not be heard at the residences. In other places it is stated that the noise will still be audible at the residences.

I agree with the statement on Page 1 of the Arpeggio report:

“With a noise barrier in place, the sounds of play should typically be below the ambient levels, but **would probably still be audible to a greater or lesser degree depending on the environmental noise at any given moment.**”

Based on my visits to courts at Poinsetta Park in Carlsbad CA that have the 10-foot Acoustiblok the popping noises will indeed be audible at the property lines and the residences.

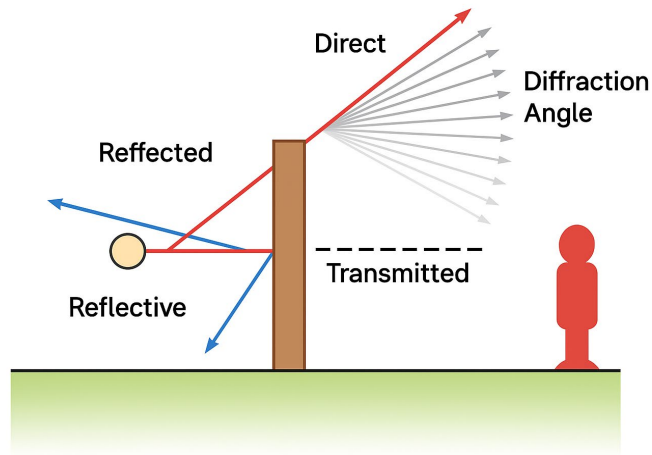
Acoustiblok is a tradename for a 1/8 thick sheet of mass loaded vinyl, with a density of 1 pound per square foot. The Acoustiblok product itself has a Sound Transmission Coefficient (STC) of 28, indicating its relative effectiveness at blocking the transmission of noise directly through the Acoustiblok material.

It is common for layman to visualize noise as you would visualize the travel of a bullet, and as such the Acoustiblok logically appears to stop the noise. However, the proper visualization of noise is a three-dimensional bubble arising from the noise source and then diffracting and bending over the top of the barrier as shown in Figure 2, below.

When a strong tall player swings the paddle overhead in an aggressive put away shot to win the game, the noise source is starting at 7 or 8 feet off the ground, and it is easy to visualize how a great deal of the noise simply passes over the top of the 10-foot barrier.

Arpeggio also recommends the planting of trees and hedges. This part of the recommendation is more controversial. Most noise consultants say that plantings provide little in the way of effective decibel attenuation but can be effective in shielding the courts from view and thereby provide some emotional comfort to the neighboring homes.

**Figure 2: Image of Noise Diffracting Over the Top of the Barrier**



### **The Arpeggio Study is a Decibel Study, Not a Comprehensive Noise Study**

Arpeggio is given the difficult task of fixing a serious noise problem after the fact, rather than being involved in the initial site planning of the project to anticipate and prevent the occurrence of noise problems.

Arpeggio made extensive decibel measurements of the existing soundscape. Arpeggio then used decibel data from other pickleball locations to create decibel predictions and computer models to impose the pickleball decibels onto the existing decibel soundscape surrounding the proposed courts. The Arpeggio study does not disclose the imported data or the computer models in sufficient detail to enable a fully informed review of those matters of decibels.

The principal problem with the Arpeggio noise study is that it is incomplete. It is a decibel noise study. It only looks at the noise through the lens of a decibel sound meter and computer decibel models. Decision makers are better served by a comprehensive plain language understanding of the total noise experience, including critical human annoyance factors such as impulsiveness, frequency, number of noise events created on 12 courts, the cumulative effect of long-term daily noise exposures over a period of weeks and years, etc.

It is only on the final page of the report, after an exhaustive decibel discussion and data displays, that Arpeggio drops a “Brief Note” mention of human annoyance:

#### ***“A Brief Note on Noise Annoyance***

*Context and character broadly describe factors that are relevant in assessing the potential for a given noise source to be considered an annoyance. Context refers to local environment and expectations of those impacted by a noise, while character refers to the nature of the sound.*

*Factors that impact the context of a noise include:*

1. *Time of day and duration that the noise is experienced, where noises that start early in the day, extend late in the day, and are present for extended periods having the greatest potential for being perceived as annoying.*
2. *Day of the week that the noise is experienced, with noise sources active on weekends having greatest potential for being perceived as an annoyance.*
3. *Expectation of quiet, with noises that impact residential land uses having the greatest potential for being perceived as annoying.*
4. *Whether the noise is long-term vs. short-term.*

*In terms of the character of the noise being a factor in noise annoyance, factors include the level relative to the local environment, whether a sound is continuous or strongly time-varying (e.g., rapidly rising and falling over time). Sounds that vary quickly are generally perceived to be more annoying. Other character factors include:*

1. *Impact of the noise level relative to the environment without the noise; the greater the difference between the level with the noise present as compared to the level without the noise, the greater the potential for the noise to be perceived as an annoyance.*
2. *Impact sounds, such as produced by dropping objects onto hard surfaces, slamming of doors, dropping roll-up doors, dropping of pallets, hammering or banging, etc.*
3. *Presence of tones, e.g., from vehicle alarms.*
4. *Presence of low-frequency droning sounds.”*

This report will address the question of human annoyance, which goes well beyond what a decibel meter hears.

## **The Predictable Noise Impact of Adding 12 Pickleball Courts on Top of the Ambient Noise Levels**

The addition of pickleball will be an abrupt and intensive addition to the existing ambient soundscape. Pickleball is a highly unusual noise in a residential neighborhood, with decibels being insufficient to describe the noise annoyance imposed on the neighboring properties.

Principal contributors to the additional noise burden on the neighborhood will be:

1. The sound of each paddle hitting a ball has an impulsive popping character, with an abrupt rise and fall of 1-2 milliseconds (.001-.002 seconds) followed by a reverberating tail of another 20 milliseconds. Impulsive noises are especially annoying. This is the popping noise described in the many news stories and lawsuits. By their very nature, impulsive noises (like nail guns, pile drivers, hammering on wood, distant pistol shots) rise abruptly above ambient noise and cannot be ignored. Impulsive noises are so different from the steady hum of background noise in parks and neighborhoods that they peak and spike above ambient noise in way that is not fully registered by the decibel meter. Impulsive noises are annoyingly audible at unexpected distances.

2. The loudness of a pickleball hit is about 20 decibels louder than a tennis hit. This is because the paddle and the balls are hard. In tennis the racquet has flexing strings and the ball is softer.
3. The impact between the ball and paddle induces a vibration within the paddles that creates a noise frequency distribution that is centered and most prominent at around 1250 Hertz. This is the frequency at which human hearing is most sensitive, and for that reason, the back-up warning signals on construction equipment are deliberately operated at this frequency to warn bystanders of danger.
4. Pickleball pace of play is faster than tennis due to the smaller court size. The smaller court allows players to quickly achieve competence and sustain volleys. Consistent with other locations around the country, each court can be predicted to generate about 15 popping noises per minute – that is, 900 of the popping impulsive sounds per hour. With 12 courts in action, the one-hour noise load can be more than 10,000 separately audible impulsive popping noises.
5. The decibel loudness and the frequency in Hertz will vary up and down depending on how hard the ball is hit. Each player brings their own paddle, and each paddle has its own decibel and frequency signature. With 12 balls in action the time spacing between noises is completely random and unpredictable. There is no hum like a dishwasher or uniform repetition like a grandfather clock that helps us habituate and ignore noises.
6. Lighting of the courts, and the proposed play for 13 hours (8am to 9pm) indicates potential daily noise impact for these neighbors of more than 100,000 noises a day at each residence. Acoustic engineers call this metric NNE, the Number of Noise Events.
7. Consistent with the shortage of public pickleball courts in the Atlanta region, play at this location will be very popular, with players driving in from distances and staying for 1.5 to 2.5 hours or more.
8. With Atlanta's infrequent snow accumulation, play can be expected on most days of the year, with some respite during rain. Play will be lighter at midday during periods of elevated extreme summer temperatures.
9. The neighbors will hear the most noise from pickleball during evenings, Sundays, and holidays when there is less ambient noise from other activities.
10. Player voices will be clearly audible to the neighbors, even with the proposed Acoustiblok on the fence. Pickleball is a more boisterous social activity than tennis and there will be 48 players on the courts with a large number waiting. Pickleball is a favorite of retirees who will arrive early and stay to socialize and make new friends. Younger people arrive after work and school and will hit the ball harder, creating louder impacts. Yelling, profanity, and music are common, especially in the evenings when the players skew younger, and alcohol is involved. Although no tables or seating shown in the plans, it is common for a facility of this size in an

underserved metro area to have players waiting for court time and thus additional noise.

## Findings

1. Pickleball will be the most intensive use at the Tucker Rec Center and immediately challenge the residential character of the neighborhood, particularly for neighbors on Morgan Rd and the commercial neighbors on Lavista Rd.
2. Popping noises will be audible to Morgan neighbors even with the 10-foot Acoustiblok. There is no attempt to shield the Lavista neighbors.
3. In a 24-hour period, with 13 hours of pickleball play, and 8 hours devoted to sleep, the neighbors will have only 3 hours a day for no pickleball noise exposure at their properties.
4. Tucker Rec Center is not a good candidate for pickleball courts due to proximity to residential property. Distances are normally measured from the closest player (the player hitting at the court line closest to the property line), rather than from the center of the court as done by Arpeggio in its estimation of 160 feet to the Morgan properties. This would place the distance to the Morgan properties as 138 feet. The proximity to Lavista is much less, with the Acoustiblok reflecting additional noise onto those properties.
5. Parking of only 46-48 spaces may lead to overflow parking at St. Andrews Presbyterian Church and on Morgan Rd, creating conflict with neighbors.
6. When noise mitigation is not successful, here is the range of responses occurring at other cities around the US and Canada:
  - a. Protests by neighbors and repeated appearances at public meetings
  - b. Adverse publicity in the local media
  - c. Contentious social environment in the neighborhood as neighbors and players interact over parking, loud music, public urination, etc.
  - d. Police calls over player behaviors, parking, and altercations with neighbors
  - e. Protest by players if city tries to limit hours or close courts
  - f. Retaliation against the complaining neighbors
  - g. Burdensome record requests by both neighbors and players
  - h. Possible nuisance lawsuit under Georgia law.

## Recommendations

1. A delegation of Tucker officials and neighboring residents should travel to actual Acoustiblok installations in person to judge its effectiveness at the relevant distances.
2. City should review the adequacy of parking for a 12-court regional destination.
3. Amplified music or announcements, as well as alcohol, should be prohibited as these add to the noise burden.
4. Full consideration should be given to alternative sites, including:
  - a. Considering land at other municipal facilities such as airports, water treatment plants, etc., where distance to homes may be more favorable
  - b. Locating pickleball indoors at vacant shopping centers or big box stores, having the advantage of year-round climate-controlled play and complete noise containment
  - c. Locating pickleball courts within an industrial park
5. City officials are strongly urged to consult with their counterparts in other cities that have attempted the Acoustiblok solution. Braintree MA, Mashpee MA, and Laguna Beach CA are good examples of Acoustiblok installations with ongoing controversies. In San Clemente CA the pickleball courts were recently closed. The Acoustiblok was not successful for homes at 350 feet, litigation ensued, and the courts are now closed.
6. Given the difficulty of finding municipal-owned sites with at least 800 feet of distance to enable natural decay of the noise, the city may decide that pickleball is best left to private sector developers who can make large capital investment in indoor facilities and provide the sport on a membership and fee basis.
7. Tucker should consider adopting the recommendation of the Denver Colorado Parks Department (Appendix A) to provide a disciplined process for future pickleball planning.
  - a. No pickleball allowed with 350 feet of residential property
  - b. Noise study and mitigation plan for courts 350 – 500 feet from residences

Although a 350-foot setback does not solve the noise problem itself, the adoption of a strict no-fly policy like this can improve prospects for success.

## Appendix A – Denver, CO Guidelines

[Pickleball: Planning & Advisory Group - City and County of Denver](#)

### Guidelines for Future Pickleball Locations:

With the rapid growth of pickleball in recent years, selecting locations for future pickleball courts will be carefully done to minimize potential conflicts while creating enjoyable opportunities for players. Denver Parks and Recreation is working with the Pickleball Advisory Group to evaluate these draft considerations for future court placement:

1. **Park Size & Location:** Pickleball courts should be located in parks or athletic complexes that can accommodate heavy usage and allow for adequate separation from residences. Pickleball courts should be at least 350 feet away from the nearest residence, and 500+ feet away whenever possible.
2. **Sound Studies:** All new pickleball court locations being considered within 350-500 feet from a residence should have sound studies conducted prior to full-scale design to ensure that noise violations do not occur in the future.
3. **Existing Amenities:** Pickleball courts should generally be constructed as standalone amenities and should not be placed adjacent to tennis or other sport courts in order to prevent conflicts with other park users. This is to prevent the scenario in which pickleball play extends onto other courts that may not have sound mitigation which could possibly cause noise violations.
4. **Other Possible Conflicts:** Existing amenities both within and outside the park should be considered to evaluate potential conflicts related to parking, other park uses, and impacts to adjacent neighbors.

## **Appendix B – Educational Materials – Available online**

New York Times

[Shattered Nerves, Sleepless Nights: Pickleball Noise Is Driving Everyone Nuts - The New York Times](#)

Training video by Pennsylvania Recreation and Parks Society and the Institute of Noise Control Engineers – youtube [Pickleball; the Sound and Fury](#)

Website <http://www.pickleballnoiserelief.com>

### **Partial List of Noise Nuisance Lawsuits Against Cities (many other lawsuits filed against Homeowners Associations and Country Clubs)**

Falmouth, MA – permanent injunction entered

San Clemente, CA – courts closed by city council

Lewes, DE – pending

Pittsburg, PA – pending

Lone Tree, CO – pending

Newport, RI - pending

### **Cities that have adopted zoning setbacks for pickleball courts**

Denver, CO

Park City, UT

Centennial, CO

Sagaponak, NY

Torrance, CA

Ross CA – under consideration

Nantucket, MA – under consideration

## Appendix C – Qualifications

Please contact me if you have any questions.

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Presentation of Continuing Legal Education to the International Municipal Lawyers Association, Nov 2024:

[2024-Nov-12-Charles-Leahy-Intl-Municipal-Lawyrs-Assn-3.pdf](#)

Presentations at the Acoustical Society of America, Ottawa Canada, May 2024:

[Pickleball Courts in a Legal Pickle #ASA186](#)

Publications

[Preliminary analysis of 79 pickleball noise consultant reports by 36 consultants | Proceedings of Meetings on Acoustics | AIP Publishing](#)

Memberships

Michigan Bar Association  
National Recreation and Parks Association  
Acoustical Society of America  
Institute of Noise Control Engineers  
USA Pickleball

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