

**AGENDA**

**ROSSMOOR COMMUNITY SERVICES DISTRICT  
PARKS AND FACILITIES COMMITTEE MEETING**

**IN-PERSON**

**RUSH PARK**  
Auditorium  
3021 Blume Drive  
Rossmoor, CA 90720

**Tuesday, January 31, 2023  
6:30 p.m.**

---

**A. ORGANIZATION**

1. CALL TO ORDER: 6:30 p.m.
2. ROLL CALL: Directors Maynard, Searles
3. PLEDGE OF ALLEGIANCE: Director Searles
4. PRESENTATIONS: None

**B. PUBLIC FORUM**

*Any person may address the members of the Parks and Facilities Committee at this time on any subject within the jurisdiction of the Parks and Facilities Committee of the Rossmoor Community Services District.*

**C. REGULAR CALENDAR**

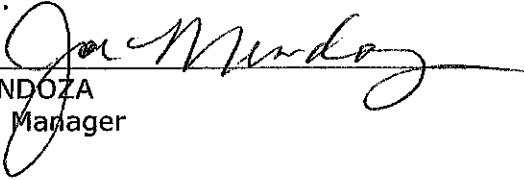
1. GENERAL MANAGER OVERVIEW OF PICKLEBALL EVALUATION PROCESS
2. PICKLEBALL SOUND ASSESSMENT REPORTS WITH RECOMMENDATION
3. DISCUSSION AND POSSIBLE ACTION REGARDING PICKLEBALL PROGRAM OPTIONS AND ESTIMATED COSTS

**D. ADJOURNMENT**

**CERTIFICATION OF POSTING**

I hereby certify that the attached Agenda for the January 31, 2023, 6:30 p.m., Parks and Facilities Committee Meeting of the Rossmoor Community Services District was posted at least 24 hours prior to the time of the meeting.

ATTEST:

  
\_\_\_\_\_  
JOE MENDOZA  
General Manager

Date: 1/25/2023

**ROSSMOOR COMMUNITY SERVICES DISTRICT**

**AGENDA ITEM C-1**

**Date:** January 31, 2023  
**To:** Parks and Facilities Committee  
Director Michael Maynard, Chair  
Director Nathan Searles  
**From:** General Manager Joe Mendoza  
**Subject:** GENERAL MANAGER OVERVIEW OF PICKLEBALL EVALUATION PROCESS

**RECOMMENDATION**

It is recommended that the Rossmoor Community Services District (RCSD) Parks and Facilities Committee receive and file this presentation.

**INFORMATION**

The RCSD Board and the Parks and Facilities Committee have been very diligent in their approach in considering adding pickleball courts for the Rossmoor community. Between June 2022 and now, this has been a community process that has given both tennis and pickleball players an opportunity to express their concerns and desires. This process has included the ability to make public comments at all Board and Committee meetings, as well as, during the agenda report presentation. In addition, the Customer Satisfaction Survey included a question about adding a pickleball amenity in Rossmoor.

The goal has been to be transparent in the approach when considering adding pickleball at either Rush Park or Rossmoor Park.

As a reminder, the *RCSD Policy 6050 Facilities – Tennis Courts* would need to be amended to allow for an alternative use should the Board decide to convert a tennis court into pickleball courts. If new construction of pickleball courts were directed, then a new policy for Facilities – Pickleball Courts would need to be written.

**BACKGROUND**

*Because this has been an ongoing discussion and work in progress, the following offers a summary of discussion at the various Board of Directors and Parks and Facilities Committee meetings (beginning with the most recent first):*

At the January 10, 2023 Board meeting, Consideration of Proposed Pilot Pickleball Program was placed on the agenda. The General Manager provided the Board with options for a pilot program at Rossmoor Park, transforming Tennis Court 1 into three pickleball courts. After considerable discussion and a number of public comments, the Board decided to wait on this decision so that the Parks and Facilities Committee could review the recent sound studies and costs analysis information.

At the December 13, 2022 Board of Directors meeting, a pickleball update was provided and a number of residents again spoke on this item – some in favor and some opposed. After much discussion, a motion to direct the General Manager to create a pickleball pilot program at Rossmoor Park to present to the Board for consideration at the next meeting. The motion passed.

On Monday, November 14, 2022, the onsite testing was done from 10 a.m. to 1 p.m. at Rossmoor Park. Court 1 was transformed into three pickleball courts and there were six to eight volunteer players playing pickleball to provide an opportunity for the consultant to measure sound from various areas around the park. A few residents observed. Key homes and sites on the park were selected as testing areas.

Testing was done at Rush Park from 1:30 p.m. to 2:30 p.m. The volunteer players used a grass area behind the Administrative Building to volley to create the paddle/ball sound for the consultant to record and take measurements from a variety of areas.

At the November 8, 2022 Board of Directors meeting, an update was provided by the General Manager and public comments were received regarding pickleball in Rossmoor. These included in-person comments, as well as emails that were received on the subject. The Board referenced having received the emails.

Further discussion took place by the Board regarding the selection of PSM LLC Pickleball Sound Mitigation to do a sound assessment report for the District. It was announced that the onsite study would be done on Monday, November 14, 2022 at both Rossmoor Park and at Rush Park. To obtain a second opinion, it was noted that Sound Media Fusion LLC would also be retained to do a simulated study. These studies have become very prevalent because technology will allow the simulation to provide precise results.

At the November 8 meeting, the Board and General Manager assured those in attendance that the District was being very diligent in approaching this subject and that they were taking the time necessary to hear from the community and to do the appropriate research and evaluations to make an informed decision.

A meeting of the Parks and Facilities Committee (Directors Searles and Rips) was held on November 2, 2022 at Rossmoor Park. USTA SoCal Director of Community Tennis Esther Hendershott requested an opportunity to make a presentation at a RCSD Board meeting regarding the impact of pickleball on tennis. Ms. Hendershott was referred to the Parks and Facilities Committee and made a presentation at their November 2, 2022 meeting. She outlined the concerns relating to adding pickleball adjacent to tennis courts and taking away a tennis court from the community.

Also on the Committee agenda was a report from the General Manager regarding the sound mitigation study and scope of work. While public comment at the Committee meeting voiced concern over the study process and the consultant selection, it was stated that those comments would be taken into consideration as the Board moves forward.

At the October 11, 2022 RCSD Board of Directors meeting, the Board directed the General Manager to retain a noise mitigation consultant to study the impact pickleball may have on the community. This included authorization to spend up to \$5,000 for consulting fees. Therefore, the General Manager researched and interviewed a few firms that had provided consulting services to municipalities. Two viable consultants were identified for further conversation and subsequently PSM LLC Pickleball Sound Mitigation was selected to do a sound assessment report for the District. The proposed Scope of Work included a site visit and evaluation of both

Rossmoor Park and Rush Park. PSM LLC would deliver an engineering report that predicts sound levels at identified sensitive locations if pickleball is played at Rossmoor Park or Rush Park. The Consultant is a professional engineer.

A Parks and Facilities Committee meeting was held on October 6, 2022 and reported out to the Board of Directors at their October 11, 2022 meeting. In summary, the Committee continued discussion about the fact that implementing pickleball for the community should be done with a thorough and systematic approach. The desires and concerns of entire community need to be considered.

At the September 13, 2022 RCSD Board of Directors meeting, it was reported that the General Manager and staff are still doing research on cost of converting an existing tennis court or constructing a new pickleball court, noise mitigation products, and hours of operation. Various Board members made comment on finding a long-term solution to offering pickleball in Rossmoor. They also discussed offering pickleball at Rossmoor Park on a limited basis until a final decision is made regarding pickleball. It was noted that the current policy designates that Rossmoor tennis courts are to be used for tennis only, therefore the policy would need to be amended to allow for an alternative use should the Board decide to convert a tennis court into four pickleball courts.

The Parks and Facilities Committee met on August 25, 2022 and discussed the Trial Pickleball Program that had been offered in July. They also reviewed possible revenue projections if pickleball was added for a fee at Rossmoor Park; discussed current use of tennis courts and scheduling; and reviewed other facilities (cities of Carlsbad, Cerritos, Long Beach and Seal Beach).

Discussion about pickleball took place at the August 9, 2022 Board of Directors meeting. Again, there were a number of residents who spoke about pickleball – some for and some opposed. As a result, the RCSD Board determined that this is a complicated issue and forwarded the item to the Parks and Facilities Committee for further study and to formulate recommendations for the RCSD Board to consider at a future meeting.

The items that were reviewed and studied by the Parks and Facilities Committee included:

1. The impact to tennis players and court availability;
2. Scheduling of the tennis pro lessons;
3. Impact on parking around the park;
4. Cost of converting an existing tennis court at Rossmoor Park into four pickleball courts;
5. Cost to build four pickleball courts at either Rossmoor Park or Rush Park;
6. Cost associated with hiring a consultant to prepare a negative declaration;
7. Noise level and impact to surrounding homes, as well as sound mitigation measures that could be implemented and the cost associated with them; and
8. Policy regarding use of tennis courts for tennis only.

At the July 12, 2022 meeting, the Board approved the temporary conversion of one tennis court (Court 1) into four pickleball courts at Rossmoor Park, from July 27-30, 2022. This trial period was to determine noise levels, impact on parking, and compatibility with the adjacent tennis courts. The most logical site to have trial pickleball courts was determined to be the Rossmoor tennis courts since the hard surface, fencing, and lighting were already in place.

### *Pickleball Trial at Rossmoor Park*

RCSD staff set aside Court 1 at Rossmoor Park from Wednesday, July 27 through Saturday, July 30, 2022 for the temporary pickleball courts to be available – 9 a.m. to 8 p.m. on weekdays, Saturday from 9 a.m. to noon. The following guidelines applied:

- Maximum of 4 players per court for doubles
- Maximum of 16 players on the 4 courts
- RCSD provided nets, paddles, and balls
- Neighboring households adjacent to Rossmoor Park were notified of the temporary pickleball courts and provided with the RCSD Office number for any questions or concerns during the pickleball trial.
- There was no charge for pickleball during the trial period

The trial pickleball program was well received by the Rossmoor community. Participants enjoyed playing the game of pickleball, as well as the social aspect of competing with one another. This program provided staff with the ability to receive comments, document participation and attendance at various areas of the park, including parking.

Staff monitored the tennis courts the week prior to the pickleball trial to establish a baseline with regard to attendance, court usage, noise levels, parking, etc. This allowed for a comparison with the data that was gathered during the pickleball trial.

At the June 14, 2022 RCSD Board meeting, a number of residents attended the meeting to speak during public comments about pickleball. The majority of the speakers spoke in opposition of having pickleball courts at Rossmoor Park, citing the noise that could be created, parking issues, and the proximity to the homes surrounding the park. Other residents spoke in favor of pickleball and said they would welcome this addition to the community so they would be able to play pickleball in Rossmoor, without having to travel to a neighboring city. Due to a number of residents requesting the ability to play pickleball in Rossmoor, the RCSD Board of Directors recognized that there is demand and directed staff to develop a plan to provide temporary pickleball courts at Rossmoor Park on a trial basis.

At the April 2022 Board of Directors meeting, during the Quarterly Recreation Report it was noted that a number of emails had been received regarding adding pickleball in Rossmoor. These emails were noted in the Minutes for that meeting.

### **ATTACHMENTS**

None

## **ROSSMOOR COMMUNITY SERVICES DISTRICT**

### **AGENDA ITEM C-2**

**Date:** January 31, 2023

**To:** Parks and Facilities Committee  
Director Michael Maynard, Chair  
Director Nathan Searles

**From:** General Manager Joe Mendoza

**Subject:** PICKLEBALL SOUND ASSESSMENT REPORTS WITH RECOMMENDATIONS

#### **RECOMMENDATION**

It is recommended that the Rossmoor Community Services District (RCSD) Parks and Facilities Committee receive and file this presentation.

#### **BACKGROUND**

Pursuant to the direction of the RCSD Board of Directors at their October 11, 2022 meeting, a sound consultant was retained to conduct onsite sound testing at Rossmoor Park and Rush Park relative to the impact pickleball may have on the community.

PSM LLC Pickleball Sound Mitigation was selected to do a sound assessment that included a site visit and evaluation of both Rossmoor Park and Rush Park on Monday, November 14, 2022. PSM LLC conducted the onsite testing from 10 a.m. to 1 p.m. at Rossmoor Park where Tennis Court 1 was transformed into three pickleball courts with volunteers playing to provide an opportunity for the consultant to measure sound from various areas around the park. Key homes and sites on the park were selected as testing areas. Testing was done at Rush Park from 1:30 p.m. to 2:30 p.m. The volunteer players used a grass area behind the Administrative Building to volley to create the paddle/ball sound for the consultant to record and take measurements from a variety of areas.

In addition, as a comparison measure, Sound Media Fusion LLC was retained to do a simple simulated study at Rossmoor Park. Simulated studies have become common because technology allows the simulation to provide precise results.

#### **INFORMATION**

##### **Sound Study Presentation**

At this evening's meeting, Professional Engineer/Electrical Engineer Robert Unetich, of PSM LLC Pickleball Sound Mitigation, will provide an overview of the onsite sound testing/assessment he conducted on November 14, 2022 at Rossmoor Park and Rush Park. He will participate in the meeting by Zoom. PSM LLC is an acoustics firm specializing in pickleball sound measurement and mitigation. Mr. Unetich's recommendations are also included in his report.

Mr. Unetich will also reference the simulated study prepared by Sound Media Fusion, LLC and discuss the two reports. He will also answer questions the Committee may have.

### **Summary of Results**

The evaluation in both reports determined that Rossmoor and Rush Parks are viable locations for pickleball. However, at both sites it was recommended that sound barrier material be installed to reduce the decibels (dBA). The sound barrier could be from 6 feet to 12 feet in height, and could drop the sound level to or near the average background dBA levels (51-58 dBA).

#### PSMLLC Pickleball Sound Mitigation (onsite testing)

*Rossmoor Park:* The background noise was 53 dBA at the beginning of the study. The closest home to Tennis Court 1 is approximately 250 feet away; during the testing, the sound measured 60 dBA. The installation of a sound barrier would lower the dBA to an acceptable level of 53 dBA.

*Rush Park:* The site used for measurement was near the Administration Building and Storage Room. From the closest home at 350 feet away, the measurement was 63.7 dBA, higher than Rossmoor Park. It was determined that by adding fencing and sound barrier material around the pickleball court would drop the dBA to an approximate (acceptable) level of 54.7 dBA.

#### Sound Media Fusion, LLC (simulated test for Rossmoor Park only)

*Rossmoor Park:* The first simulation shows the levels of noise from pickleball with no acoustic barrier to be 63 dBA at the edge of the park and 58 dBA at the homes directly facing the tennis courts off Hedwig Road. The simulation for courts with sound barrier material would be 57 dBA at the edge of the park and 53 dBA at the homes.

### **Orange County Ordinance**

The *Orange County Noise Ordinance Section 4-6-7 – Special Provisions* provides exemption for "Activities conducted on any park or playground, provided such park or playground is owned and operated by a public entity." The noise standards identified in the ordinance for all residential property are: 55 dBA, 7 a.m. to 10 p.m.; 50 dBA, 10 p.m. – 7 a.m. Although the RCSD is exempt from these standards, in good faith the District is considering adjustments to stay within acceptable noise levels.

### **ATTACHMENTS**

1. PSM LLC Pickleball Sound Mitigation – *Pickleball Sound Assessment Report with Recommendations for Rossmoor, CA* prepared by Robert M. Unetich P.E., December 15, 2022
2. Sound Media Fusion, LLC – *Rossmoor Park Pickleball Simulation Brief and Treatment* prepared by Gary Hardesty, November 5, 2022





**PSM LLC**  
Pickleball Sound  
Mitigation

**Pickleball Sound Assessment Report  
with  
Recommendations**

**for**

**Rossmoor, CA**

**by**

**Robert M. Unetich P.E.**

**December 15, 2022**

**Author Biography:**

*Robert M. Unetich is a registered professional engineer in Pennsylvania. A graduate of Carnegie Mellon's School of Engineering as an Electrical Engineer and has worked extensively in radio wave and sound wave propagation. He has published numerous articles about both topics including chapters in engineering handbooks and holds several patents.*

*He is the owner of PSM LLC (also known as Pickleball Sound Mitigation), an acoustics consulting company in Pittsburgh, PA and is a USA Pickleball Certified Referee.*

*Mr. Unetich administers the Facebook group Pickleball Sound Mitigation and is a member of the staff of Pickleball Magazine, where he writes a column for the magazine. He is a member of the Acoustical Society of America.*

1811 Woodlands Circle, Pittsburgh, PA 15241  
412-780-4575 [www.pickleballsound.com](http://www.pickleballsound.com)

## **Table of Contents**

Page 3	Executive Summary of the Field Test Data and our Recommendations
Page 4-5	Overview of the two sites under consideration
Page 6	A Description of Pickleball Sound Characteristics
Page 7	The Measurement of Pickleball Sound with Defined Parameters
Page 8	Field Test Results at Rossmoor Park with comments
Page 9	Field Test results at Rush Park with comments
Page 10	Pickleball Sound Mitigation Methods
Page 10-12	Predicted Sound Levels at Rossmoor Park using sound barriers
Page 13	Predicted Sound Levels Rush Park using sound barriers
Page 14	Recommendations
Page 15	The Author's CV
Page 16	Disclaimer

## Executive Summary

Rossmoor Park has four tennis courts; one court is being considered for conversion to three pickleball courts. Rush Park has a grass area that could be modified to accommodate one or two pickleball courts. Our firm was asked to study the likely sound levels that would be generated by pickleball play at both parks and to make recommendations.

On November 14, 2022, a site sound survey was conducted in the morning while pickleball was being played on two pickleball courts over-lined on a tennis court at Rossmoor Park. In the afternoon, pickleball play was simulated on an area next to the Rush Park building to permit the measurement of sound levels at nearby homes.

PSM LLC is an acoustics firm specializing in pickleball sound measurement and mitigation. Robert M. Unetich of PSM LLC met with Rossmoor staff and a group of six pickleball players at 10 AM at Rossmoor Park. He supplied one well characterized popular model and comparatively loud paddle the Paddletek Element, and four Franklin-X pickleballs. The Franklin-X is relatively hard, and, as a result, louder. These balls are often used in tournament play. The paddle was loaned to the identified harder hitter of this group. Selected paddles and balls are used in tests to ensure that the sound levels generated will represent the higher sound levels that may occur on public courts where enforcing lower sound level gear is difficult.

It is well known and understood that women players do not normally hit a pickleball as hard (or as loudly) as male players, so a correction factor was applied to the data during data analysis to take this into account. At Rush Park, the hitter was an athletic male who could hit as hard and as loud as is likely to be present on a court, so no correction factor was used to correct that data during data analysis.

Sound level measurements were done using a Dayton Audio calibrated microphone with digital output connected to a Toshiba laptop running Windows 10 and REW sound measurement software. This test setup provides the measurement of four standard ANSI sound parameters simultaneously: **Leq** or equivalent average sound level, **LAFmax** or the defined Fast Mode maximum sound level measured during the measurements sequence, **LAFmin** or minimum Fast Mode sound level measured and **LAPeak** or maximum instantaneous sound pressure level.

Sound levels vary with distance according to the laws of physics, and reflections off walls and the ground will impact the readings. Tests normally start at a short distance, such as 20 ft from the harder hitter and then at distant points, usually near homes that may experience louder pickleball sounds. This procedure was used at Rossmoor. The raw data and more information about measuring pickleball sound is provided later in this report but the conclusions are as follows:

### Rossmoor Park

The background noise at this park is usually dominated by traffic sounds (including air traffic) and the Leq was about 53 dBA while the lowest background noise levels (LAFmin) were about 45 dBA. Measurements were taken at 20 ft and near homes ranging from 250 ft away to 400 ft away. Raw sound levels measured were from 70 dBA at 20 ft to 60 dBA at 250 ft and 55 dBA at 400 ft. **Lowering these levels with a 6 to 8 ft high sound barrier would drop these levels to about the average background noise level of 53 dBA.**

### Rush Park

A single court could be built next to the park building. Locating next to a building will normally increase sound levels because of reflections about 3 dBA, in our experience. There are no homes close by and a modest sound barrier, or enforcing the use of quieter gear, could reduce the resulting sound levels to near the background noise level. The measured pickleball sound level at the closest home at 350 ft was 63.7 dBA, which is higher than measured at Rossmoor Park because of having a male hard hitter and because of the sound reflections off of the building walls. **Once again, a modest reduction of 8 or so dBA would drop this sound level to near that of average background noise.**

**Our recommendation, therefore, is that mass-loaded sound barriers, such as those provided by firms such as Insul-Quilt™ in Los Angeles and Acoustifence™ in Florida, be installed at the 6 or 8 ft heights before regular pickleball play is permitted at these sites. The analysis below will use a design tool that will calculate the likely sound levels resulting with either sound barrier height. The width of the sound barrier will need to be carefully selected to block the line-of-sight views from nearby homes to the courts.**

**Rossmoor Park Google Earth View with distances to nearby homes**



Players on court and test gear at 20 ft



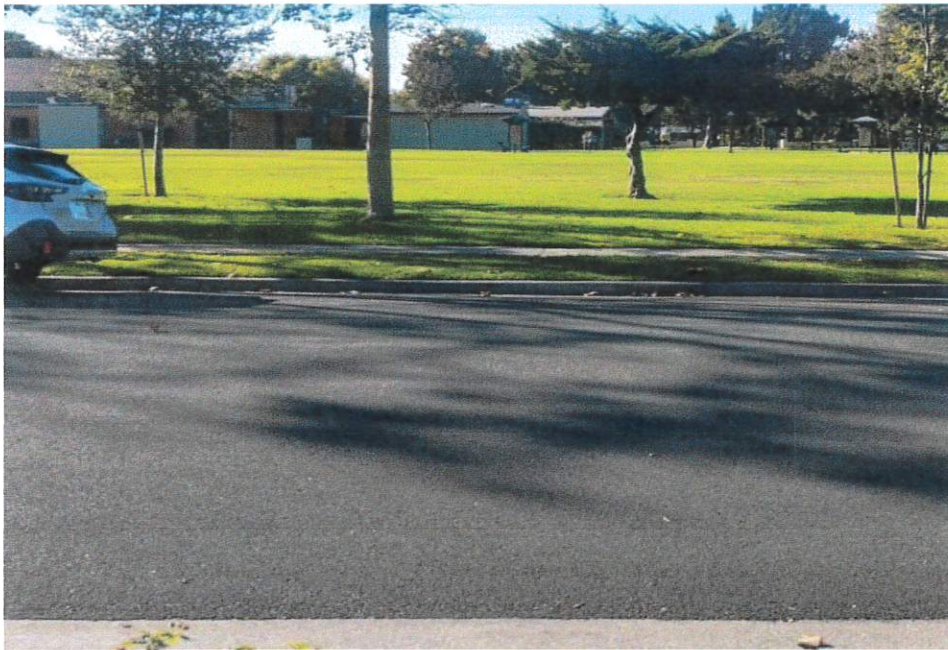
Test Location A 11192 Donnis and Hedwig. 290 ft from players



Rush Park simulated pickleball court location with one hard hitter



East of Rush Park sound level monitoring location



### **Summary of on Site Pickleball Sound Measurements**

The site visits provided a improved views of the sites over using Google Earth and Google Maps. As we have found during other site visits, the actual data collected depended on the particular players present. On-site testing also provides an improved understanding of sound reflections and echoes, since we can easily identify the local reflecting surfaces.

We used the close in data to adjust the sound power level used in our pre-sound barrier and post-sound barrier predictions. If Rossmoor selects a sound barrier vendor, we will work with them to include our calculations in their proposed sound barrier designs.

## **Pickleball Sound**

Pickleball is a game played with paddles, a ball, and a net on a court that is approximately one half the size of a tennis court. The paddles are made of wood, plastic, or composite materials, and the ball is made of plastic. The sound generated by pickleball is louder than the sound generated by tennis play, and it has a higher, more annoying, pitch. Homeowners in proximity to pickleball courts hear a louder sound than from tennis. At elevated sound level, pickleball sounds are considered as noise and become bothersome and intrusive.

### **Properties of Pickleball Sound**

Sound is generated when an object vibrates and excites the air molecules with which it is in contact. These vibrating air molecules create sound waves that radiate outward from the source of the sound at a speed of 1087 ft per second. As sound moves away from the source, it decreases in amplitude at a rate of 6 dB for each doubling of distance. The sound level or loudness is measured in decibels (dB). The louder the sound, the higher the dB level that is measured, and the more likely the sound will be an annoyance. The tonal quality is the combination of low frequency and high frequency components of the sound. Frequency is measured in cycles per second or Hertz (Hz). Most sounds include a combination of low frequency booming tones and high frequency shrill or sharp tones. Sound also varies with time. A steady state noise is continuous with little or no change in level or frequency content. Impulse noises have short duration and may or may not be repetitive and recurring.

### **Human Hearing and Annoyance**

The human ear is sensitive to a sound's level, its frequency content, and its duration. The higher the sound level, the greater the annoyance becomes. Each 10 dB increase in sound level is perceived as a doubling in the sound level, which is a 100% increase. Each 6 dB increase is perceived as a 50% increase and each 3 dB increase is perceived as a 23% increase. The human ear is more sensitive to high frequency sounds than to low frequency sounds. It is also sensitive to the duration of noise.

### **Typical Sound Levels**

Human hearing normally has a very large range of hearing capability, usually expressed in decibels above a selected sound pressure level of 20 micropascals and designated at zero dB. Human hearing has a lower sensitivity to low pitch sounds and readings of meters and sound software are usually adjusted to account for this by using the A scale. As will be seen on the chart below, a quiet library is usually about 40 dBA

This chart illustrates that sounds in the range of 60 to 75 dBA and comparable to the loudness of normal conversation and to the sound levels usually present in a busy restaurant. Pickleball sound at 100 feet is usually under 70 dBA with no sound barrier and under 60 dBA with a ten ft high sound barrier. The height of the barrier can be adjusted to achieve sound level reduction with a basic goal of having pickleball sound not frequently exceed normal background sound levels.



### The Measurement of Pickleball Sound Levels

Sound is simply a variation in air pressure over a period of time. A calibrated microphone connected to a device that measures the electrical output and records the peak sound pressure or averages the sound power over a defined period of time constitutes a sound measurement system. The measurements are generally done over time periods defined according to national measurement standards. In the US those standards are set by the American National Standards Institute or ANSI.

While ANSI defines a number of acoustics terms, pickleball has a usual time duration of about 10 to 20 milliseconds (ms). PSM LLC selects the Fast mode, or **LAFmax**, for measuring these short duration sounds, which has a 125 ms averaging period. Since background noise naturally varies over time, we select the term **Leq** for Equivalent Level for determining average sound level.


Background noise levels can be as low as 40 dBA but in areas with regular traffic, the average sound level will often be twice as loud or 50 dBA. While measuring these levels can be done accurately with a sound level meter, a more accurate method that measures multiple parameters simultaneously is to use a calibrated microphone connected to a computer running sound level measurement software.

A typical display during a sound level test indicated an Leq of 53.1 dBA



# Field Test Results in Rossmoor at two sites

## Rossmoor Park Raw Data:



**PSM LLC**  
Pickleball Sound  
Mitigation

1811 Woodlands Circle  
Pittsburgh, PA 15241  
412-780-4676

pickleballsound.com  
rmu@pickleballsound.com

**Pickleball Field Test Data**

Date: 11/14/20 Start Time: 10 AM End Time: NOON  
 Site Name: ROSSMOOR PARK  
 City: ROSSMOOR State: CA  
 Engineer: R. WERTCH  
 Client: ROSSMOOR CSD

Test Gear: REW Software Version: V6.20.13 Computer: TOSHIBA PORTAGE V.10  
 Microphone: Dayton Audio UMM-5 Mic Height: Above Surface: 5 ft  
 Court Name/Description: ROSSMOOR PARK TENNIS CT 1 Number of courts in use: 2  
 Number of players hitting: 6 # Men: 0 # Balls in Play: 3 Ball used: Franklin Xor  
 Paddle Model Used by Hard Hitter facing microphone: Paddletek Element or \_\_\_\_\_  
 Receiving Location Addresses: A: 11192 DONNIS & HED WIG B: 3251 HED WIG  
 C: 3271 HED WIG D: 11322 DONIVAN Wind Speed: CALM

DATA: Readings are LAFmax and Leq in dBA Readings Taken At 5 second typical intervals

Microphone	Location	Relative to	Loud Hitter	Facing Mic	In Feet
			A	B	C
Location					
Distance	20 feet	100 feet	290'	260'	400'
LAFmax					
	1		54.0	51.8	53.7
	2		56.8	60.2	52.0
	3		54.9	62.4	54.3
	4		56.1	59.5	54.8
	5		57.9	60.1	50.1
	6		53.2	57.1	49.7
	7		60.7	60.7	51.0
	8		58.6	61.5	48.5
	9		61.5	59.4	49.6
	10		57.8	58.3	50.1
Sum	698.4		571	598	514
Data Points	10		10	10	10
Average:	69.8 dBA		57.1	59.8	51.4
Max:	72.5		61.5	62.4	54.8
Leq:	56		58	57.3	53.0

Site Sketch With Receiving Locations

Court Elevation (ASL): \_\_\_\_\_ ft

Surface: HARD

Fence Height: 12' ft

Notes: DATA AT DISTANT LOCATIONS WILL INCLUDE BACKGROUND NOISE  
HAVING NO HARD HITTERS REQUIRES LAFmax ADJUSTMENT IN REPORT

Rev 5

Hitting Format:

Games:  MIXED

Volley Drills:

Hard Shot Drill: \_\_\_\_\_

The unadjusted sound max levels varied from 54 to 61.5 dBA. Adjusting for the fact that there were no male hard hitters and taking into account data taken at Rush Park and other locations where pickleball sound has been recorded, we are adjusting this upwards by 4 dBA to be conservative, making the max level **65.5 dBA at 250 ft.**



Rush Park Data



**PSM LLC**  
Pickleball Sound  
Mitigation

**Pickleball Field Test Data**

Date: 11/14/20 Start Time: 1:00 PM End Time: 2:30 PM  
 Site Name: RUSH PARK  
 City: ROSSMOOR State: CA  
 Engineer: R. UNEFICH  
 Client: ROSSMOOR CSD

1811 Woodlands Circle  
Pittsburgh, PA 15241  
412-780-4575  
pickleballsound.com  
rmu@pickleballsound.com

Test Gear: REW Software Version: V5.20.13 Computer: TOSHIBA PORTAGE W/10  
 Microphone: Dayton Audio UMM-6 Mic Height: Above Surface: 5 ft

Court Name/Description: GRASS NEXT TO PARK BLDG. Number of courts in use: 1 SIMULATED

Number of players hitting: 2 # Men: 1 # Balls in Play: 1 Ball used Franklin-X or \_\_\_\_\_

Paddle Model Used by Hard Hitter facing microphone: \_\_\_\_\_ Paddletek Element or \_\_\_\_\_

Receiving Location Addresses: A: INTERSECTION OF SILVER FOX AND TUCKER LANE

G: \_\_\_\_\_ D: \_\_\_\_\_ Wind Speed: CALM

DATA: Readings are LAFmax and Leq in dBA Readings Taken At 5 second typical Intervals  
 Microphone Location Relative to Loud Hitter Facing Mic in Feet

Location	20 feet	100 feet	A	B	C	D
Distance	20 feet	100 feet	350 ft			
LAFmax						
1	84.2		63.2			
2	85.5		62.1			
3	83.5		63.7			
4	85.4		61.4			
5	83.3		60.7			
6	85.5		59.0			
7	86.7		59.1			
8	83.5		61.1			
9	84.5		60.2			
10	84.3		59.1			
Sum	846.4		608.6			
Data Points	10		10			
Average	84.64		60.9			
Max	86.7		63.7			
Leq	57.0		54.3			

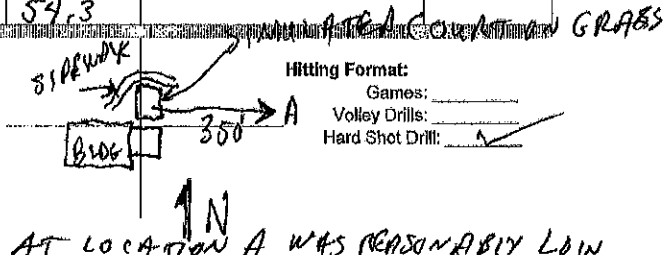
Site Sketch With Receiving Locations

Court Elevation (ASL): \_\_\_\_\_ ft

Surface: GRASS

Fence Height: NONE ft

Notes: BACKGROUND NOISE AT LOCATION A WAS REASONABLY LOW



Rev 5

At 350 feet, near a home, the measured level was 63.7 dBA maximum and 60.9 dBA average.

## **Pickleball Sound Mitigation Methods**

At private pickleball courts, the required use of quieter balls and paddles can mitigate the sound levels. At public courts, such as those in Rossmoor Park and Rush Park, this is normally difficult to enforce although at Rush Park, the court could be built with limited access and limitations on the permitted gear.

Limitations on the times that pickleball can be played are common. When homes are within 500 ft, it is not unusual for play to be limited to daytime only.

While an effective sound barrier near pickleball courts can reduce the existing pickleball sound levels, this requires the sound barrier to block the line-of-sight path.

Effective sound barriers are made of heavy material. That includes earth, concrete walls, very thick vegetation such as tall thick hedges and mass loaded vinyl. Barriers can be sound reflecting or absorbing; several companies manufacture hanging sound barrier materials of both types. Examples include the frequently used mass loaded vinyl sheets called Acoustifence™, supplied by Acoustiblok™ and quilted fiberglass layers attached to mass loaded vinyl sheets, like those offered by Insul-Quilt™, which also offers basic mass loaded vinyl.

Mass loaded vinyl that weighs about one pound per sq ft is durable and it is easy to hang on existing chain link fencing. To block the line-of-sight sound path, a barrier should be at least 6 feet high. Eight feet or higher is more effective. We use a program called Noise Tools to calculate the likely reduction in sound level for this type of barrier. We will use this tool along with sound power levels taken from our field test results to predict the sound levels with and without sound barriers of various levels

## Sound Barrier Predictions

### Rossmoor Park predicted sound levels with and without a 6 ft high barrier at Location B (250 ft)

Sound Propagation Level Calculator

[Interactive noise source-to-receiver diagram with barrier calculations](#)



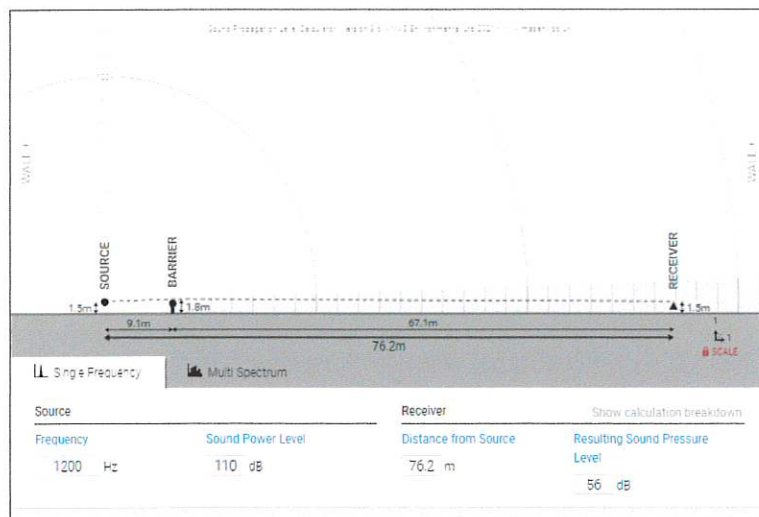
With no sound barrier in place and sound power levels representing adjusted ball striking levels, this tool predicts 63.9 dBA of sound at 250 feet. The background  $L_{eq}$  was 57.3 dBA, so this sound level is above the background noise level by about 7 dBAs.

#### With a 6 ft high effective sound barrier:

The max sound level predicted is now 56 dBA or slightly below average background noise level

Sound Propagation Level Calculator

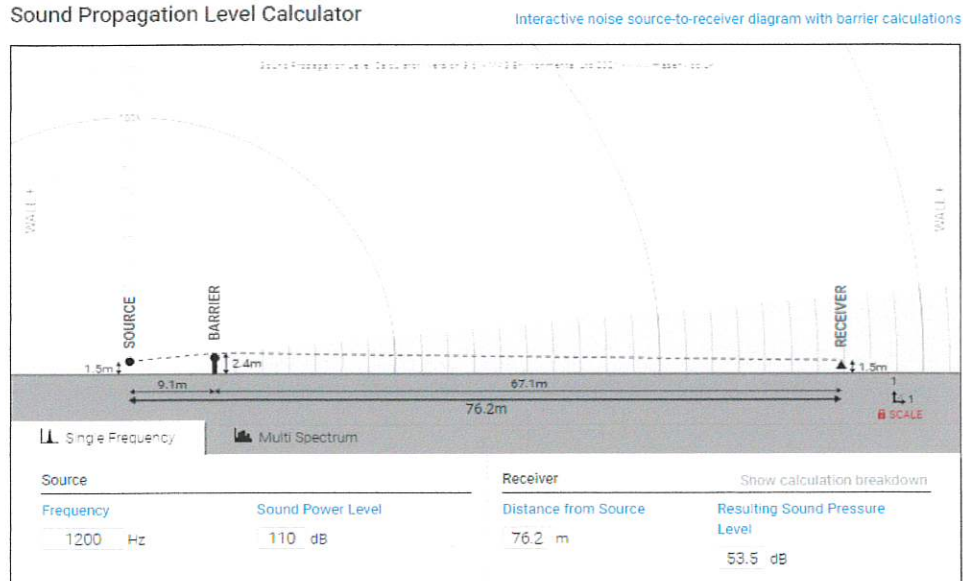
[Interactive noise source-to-receiver diagram with barrier calculations](#)



### With an 8 ft high sound barrier:

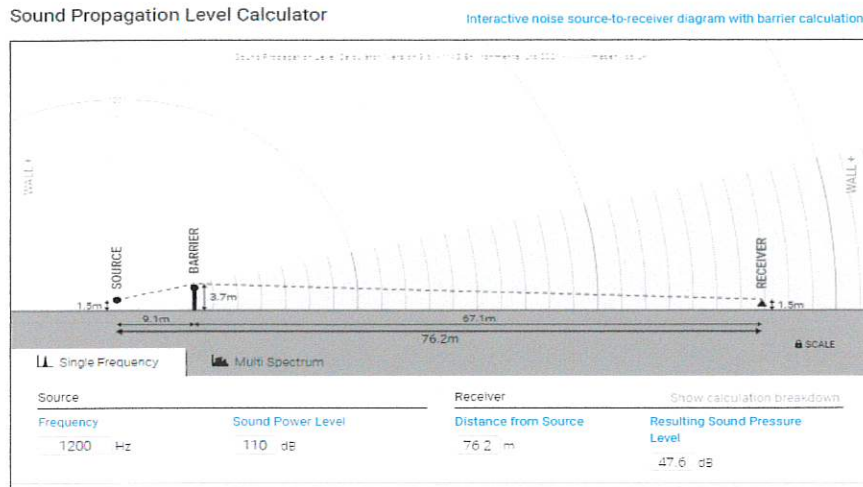
The predicted sound level of 53.5 dBA is several decibels below average background noise level but above the minimum noise levels measured, which were about 47 dBA

Increasing the height is possible and this could be done after a trial period. The fence is 12 ft high, so it is possible to install a 12 ft high barrier.



### With a 12 ft high barrier

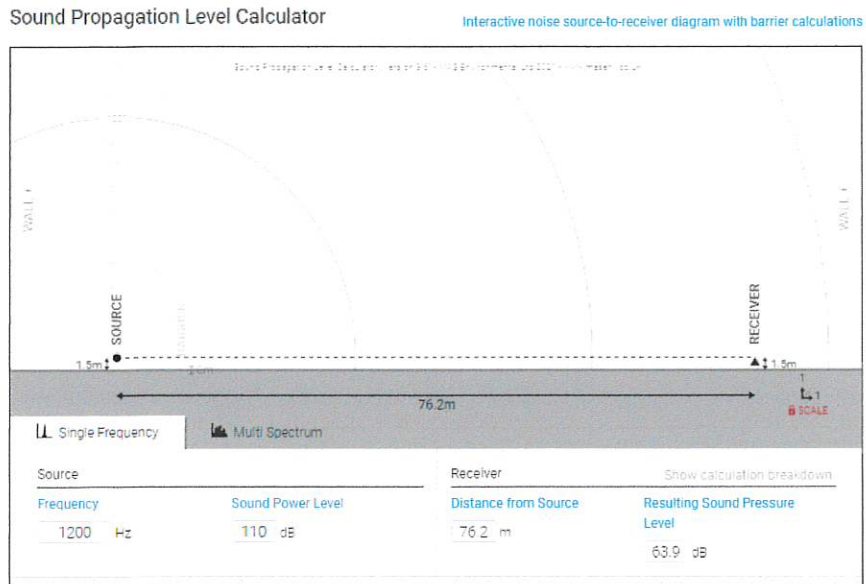
The predicted sound level is now 47.6 dBA or near the quieter noise levels recorded at this site.



This is the lowest sound levels that can be expected unless quieter gear is mandated or unless a higher barrier or another sound barrier, such as a row of hedges away from the courts, is installed.

## Rush Park Sound Level Predictions:

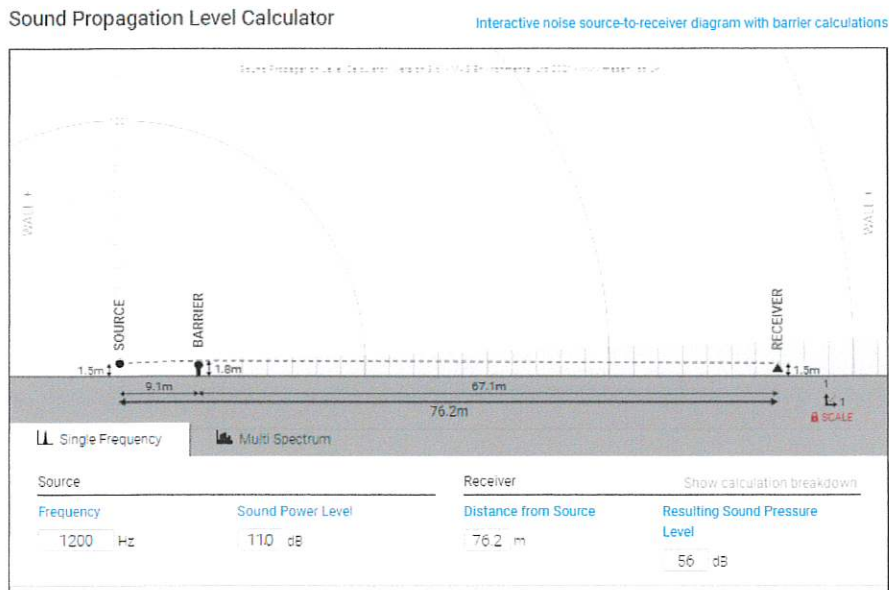
### At Location A, 350 ft from players:



Prediction: 63.9 dBA

With a 6 ft thick hedge providing about 4 decibels of attenuation, this drops to about 59.9 dBA, which is about 5 decibels above the average background noise level.

### With a 6 ft high mass loaded vinyl or other solid fencing sound barrier:



SPL Prediction: 56 dBA, which is below the average background noise level.

**We recommend that a six or eight ft high fence be installed with mass loaded vinyl sound barrier material. Adding hedges would further reduce the sound level.**

## Recommendations:

We recommended reducing the maximum sound levels at homes to, or near, the average background levels, which at these two parks ranged from about 51 dBA to about 58 dBA. A six ft high mass loaded vinyl sound barrier, like those offered by Acoustifence™ and Insul-Quilt™ could hang from the middle bar of the existing 12 ft high fence at Rossmoor Park and it could be installed on new 6 or 8 ft high fence at Rush Park. The width of this fencing would need to be determined on site, but it would need to block the line-of-sight views of all pickleball players from the area sensitive to pickleball sound.

That would include much of the fence at Rossmoor Park north of the courts. The sound levels at homes to the North-East and South-West (locations C and D in our documents) receive sound levels that are already reduced by trees, small structures and other vegetation. The average sound levels in those directions do not, in general, exceed average background noise levels, *so we do not currently see the need to install sound barriers on the east or west fencing.*

At Rush Park, a court could be installed at the location or near the location of our simulated pickleball play, but the resulting sound levels will exceed the average background noise levels at several homes, if no sound mitigation is installed. If a single court is built next to the building, it could have secure access and it may be possible to enforce the use of quieter balls and paddles at this location. Our firm publishes a list of quieter paddles and balls; this would be an alternative to permitting the use of any paddle or ball and with a sound barrier installed. An added advantage of this sound mitigation method is that there are new paddles and balls designed specifically to reduce sound levels, so the sound levels could drop further in the future by limiting the gear permitted at this location.

We recommend a 6 or 8 ft high fence be installed around the court or courts at Rush Park and that mass loaded vinyl be installed on the fencing, if no control of balls and paddles can be implemented. The mass loaded vinyl width should be as needed to block the view of the court or courts from homes within 400 ft of the players.

It is also reasonable to restrict the hours of play to daytime only and to selected times that may vary from day-to-day, such as further limitations on hours of play on Sunday. An 8 am start time and 6 or 8 pm end time is often used for this purpose.

Sound barrier materials should be mounted with no space under the barrier near the court surface. A structural engineer should be engaged to ensure that the fencing can withstand the potential wind loading of mass loaded sound barriers. Rossmoor may also consider shrubs and hedges outside of the court fencing. Tests indicate that thick hedges can provide about 4 dBA of sound reduction if no other sound barrier is installed. If there is a sound barrier, shrubs and hedges can be used to improve the appearance of a sound barrier.

Los Angeles has at least one supplier of sound barrier material in the area (Insul-Quilt™) We suggest that Rossmoor staff contact that firm for a quotation and for other suggestions on what type of barrier material to select, including what colors may be the best choices for both locations.

## Robert M. Unetich | Professional Engineer

1811 Woodlands Circle  
Pittsburgh, PA 15241  
Cell: 412-780-4575  
Email: rmu@pickleballsound.com.

### Professional Profile

---

An electrical engineer by training, active now as a consulting engineer specializing in pickleball sound mitigation.

Experienced in electronic product development and in sound barrier design with over 50 years of engineering experience. Licensed as a professional Engineer in Pennsylvania since 1976.

### Engineering and Management Career Summary

---

- |                |  |
|----------------|--|
| 2022 – Present | Founder of PSM LLC, also known as Pickleball Sound Mitigation, a firm specializing in reducing the impact of pickleball sound.   |
| 2004 – Present | Owner of GigaHertz LLC and RMU Engineering, electronic consulting firms located near Pittsburgh, PA. This business is now operating only for warranty support.               |
| 2004 – 2007    | Owner of Axcera LLC, a manufacturer of analog and digital radio frequency transmitters for television and wireless digital microwave services                                |
| 1998 – 2004    | Adjunct Professor of Electrical Engineering at Carnegie Mellon University<br>Work included teaching courses in business for engineers and entry level electrical engineering |
| 1982 – 1997    | President of ITS Corporation, a manufacturer of television transmitters, acquired by ADC Telecommunications in 1996.   |
| 1978 – 1982    | Engineering Manager of Broadcast Transmitters, RCA Corporation   |
| 1976 – 1978    | Engineering Manager of Television Transmitters, Harris Corporation   |
| 1970 – 1976    | VP of Engineering of EMCEE Broadcast Corporation   |
| 1968 – 1970    | Design Engineer for Honeywell Information Systems, Involved in the design of the early GPS system known as the Navy Navigation Satellite System                              |

### Education

---

1964 – 1968 BSEE from Carnegie Mellon University plus various graduate courses

### Patents

---

Six granted patents including a novel power supply design, a waveguide microwave filter and one in diathermy, plus another pending patent applications in the diathermy field.

### Publications

---

Extensively published in the field of television transmission and pickleball sound mitigation. Currently the author of Pickleball Magazine's Rules Guru Column and the administrator of the facebook group Pickleball Sound Mitigation.

### Other Credentials

---

Registered as a USA Pickleball Certified Referee  
Life Member of the Institute of Electrical and Electronics Engineers  
Member of the Acoustical Society of America

**Disclaimer:**

*The sound levels in this report are as measured or they are estimates of what levels should be expected. Actual levels will vary over time, and they are player and equipment dependent. Sound level is probabilistic, meaning that it has averages and other statistical characteristics including standard deviations and sound level probability distribution curves, but pickleball sound level has no exact single level.*

*This report makes no guarantee of performance of the sound mitigation methods described. In addition, it is not possible to determine what any person believes is an acceptable sound level. The measurements and estimates of background sound levels are also probabilistic in nature; these levels will vary from one neighborhood to another and from one measurement method to another over time.*

*Our recommendations for sound barrier types assume that the site will have proper structural support, designed by others. This should include an analysis of the wind loading limitations of fences and a plan to protect installed sound barriers from flood water.*



## Addendum A

### Applicability of the Orange County California Noise Ordinance to Pickleball Sound in Rossmoor, CA

#### Overview

Noise ordinances vary significantly from county to county and from city to city across the U. S. One reason for this is the age of the ordinances and the fact that the established standards of noise parameter definitions and measurement methods have advanced over the decades. Many noise ordinances were written before this evolution. The Orange County Noise Ordinances, first adopted in 1973 according to our research, are typical of this lack of updating.

These ordinances generally define terminology, establish measurement procedures, set sound level limits for day and night times and list exemptions.

**According to Wikipedia:** *Greater Los Angeles is the second-largest metropolitan region in the United States with a population of 18.5 million in 2021, encompassing five counties in Southern California extending from Ventura County in the west to San Bernardino County and Riverside County in the east, with Los Angeles County in the center and Orange County to the southeast.*

**For example, the city of Los Angeles has the following noise ordinance:**

*LOS ANGELES, CA  
CHAPTER XI  
NOISE REGULATION*

#### *ARTICLE 1 GENERAL PROVISIONS*

*Sec. 111.00 .....Declaration of Policy.*

*Sec. 111.01 .....Definitions.*

*Sec. 111.02 .....Sound Level Measurement Procedure and Criteria.*

*Sec. 111.03 .....Minimum Ambient Noise Level.*

---

These Provisions were adopted by LA in March of 1982 and have had some revisions since that date. Although it has been over 40 years since those ordinances were first adopted, they do establish relatively modern definitions for “Impulse Noise” (which applies to pickleball sound) and Measurement Procedures, which take into account the duration of various annoying sounds.

This is accomplished, in that ordinance, by specifying the use of Fast Mode measurements, as defined by the American National Standards Institute (ANSI) for impulse sounds. This is the method we used for our site visit. These provisions were found to be lacking in both Los Angeles County and Orange County ordinance wording, making the application of those regulations in Rossmoor difficult.

In addition, some ordinances have “Exemptions” listed, which may include *sounds originating in a public park*. This exemption is present in the Orange County Noise Ordinance. In our initial report, we concluded that Rossmoor Park and Rush park were, therefore, exempt from county noise regulations.

*It may be worthwhile for Rossmoor to consider establishing a guideline noise limit for impulse sound levels, if that is possible, sometime on the future.*

We now will now list the Orange County Noise Ordinance in detail and comment on its content:

---

## Division 6 - **NOISE** CONTROL (PSM note: with the important text in bold font)

### •ARTICLE 1. - GENERAL PROVISIONS[1]

#### **Footnotes:**

No. 2700, § 1, adopted Sept. 19, 1973, amended this Code by adding Div. 6, Art. 1, §§ 4-6-1—4-6-16 to read as herein set out.

#### •Sec. 4-6-1. - Declaration of policy.

*In order to control unnecessary, excessive and annoying sounds emanating from unincorporated areas of the County, it is hereby declared to be the policy of the County to prohibit such sounds generated from all sources as specified in this article.*

*It is determined that certain sound levels are detrimental to the public health, welfare and safety, and contrary to public interest.*

No. 2700, § 1, 9-19-73)

#### •Sec. 4-6-2. - Definitions.

*The following words, phrases and terms as used in this article shall have the meaning as indicated below:*

*Ambient noise level* shall mean the all-encompassing noise level associated with a given environment, being a composite of sounds from all sources, excluding the alleged offensive noise, at the location and approximate time at which a comparison with the alleged offensive noise is to be made.

*Cumulative period* shall mean an additive period of time composed of individual time segments which may be continuous or interrupted.

*Decibel (dB)* shall mean a unit which denotes the ratio between two (2) quantities which are proportional to power: the number of decibels corresponding to the ratio of two (2) amounts of power is ten (10) times the logarithm to the base ten (10) of this ratio.

*Dwelling unit* shall mean a single unit providing complete, independent living facilities for one or more persons including permanent provisions for living, sleeping, eating, cooking and sanitation.

*Emergency machinery, vehicle or work* shall mean any machinery, vehicle or work used, employed or performed in an effort to protect, provide or restore safe conditions in the community or for the citizenry, or work by private or public utilities when restoring utility service.

*Fixed noise source* shall mean a stationary device which creates sounds while fixed or motionless, including but not limited to industrial and commercial machinery and equipment, pumps, fans, compressors, generators, air conditioners and refrigeration equipment.

*Grading* shall mean any excavating or filling of earth material, or any combination thereof, conducted at a site to prepare said site for construction or other improvements thereon.

*Impact noise* shall mean the noise produced by the collision of one mass in motion with a second mass which may be either in motion or at rest.

*Mobile noise source* shall mean any noise source other than a fixed noise source.

**Noise level** shall mean the "A" weighted sound pressure level in decibels obtained by using a sound level meter at slow response with a reference pressure of twenty (20) micronewtons per square meter. The unit of measurement shall be designated as dB(A).

*Person* shall mean a person, firm, association, copartnership, joint venture, corporation or any entity, public or private in nature.

*Residential property* shall mean a parcel of real property which is developed and used either in part or in whole for residential purposes, other than transient uses such as hotels and motels.

Simple tone noise shall mean a noise characterized by a predominant frequency or frequencies so that other frequencies cannot be readily distinguished.

**Sound level meter shall mean an instrument meeting American National Standard Institute's Standard S1.4-1971 for Type 1 or Type 2 sound level meters or an instrument and the associated recording and analyzing equipment which will provide equivalent data.**

Sound pressure level of a sound, in decibels, shall mean twenty (20) times the logarithm to the base ten (10) of the ratio of the pressure of the sound to a reference pressure, which reference pressure shall be explicitly stated.

No. 2700, § 1, 9-19-73; Ord. No. 2870, § 1, 10-1-75)

(PSM LLC: the Ordinance establishes measurement methods and noise limits, generally from 1973 and 1975 and the ANSI standard referenced for a procedure is from 1971)

**Sec. 4-6-3. - Noise level measurement criteria.**

**Any noise level measurements made pursuant to the provisions of this article shall be performed using a sound level meter as defined in [section 4-6-2](#).**

(Ord. No. 2700, § 1, 9-19-73)

**•Sec. 4-6-4. - Designated noise zone.**

**The entire territory of Orange County, including incorporated and unincorporated territory, is hereby designated as "Noise Zone 1."**

(Ord. No. 2700, § 1, 9-19-73; Ord. No. 2870, § 1, 10-1-75)

**•Sec. 4-6-5. - Exterior noise standards.**

**The following noise standards, unless otherwise specifically indicated, shall apply to all residential property within a designated noise zone:**

NOISE STANDARDS

Noise Zone	Noise Level	Time Period
1	55 dB(A)	7:00 a.m.—10:00 p.m.
	50 dB(A)	10:00 p.m.— 7:00 a.m.

Finally, the Orange County Noise Ordinance has a list of exemptions under Section 4-6-7, Special Provisions :

**Sec. 4-6-7. - Special provisions.**

*The following activities shall be exempted from the provisions of this article:*

*Activities conducted on the grounds of any public or private nursery, elementary, intermediate or secondary school or college.*

*Outdoor gatherings, public dances and shows, provided shall events are conducted pursuant to a license issued by the County of Orange pursuant to Title 5 of the Codified Ordinances of the County of Orange.*

**Activities conducted on any park or playground, provided such park or playground is owned and operated by a public entity, and other activities listed.**

## **Measuring Pickleball Sound:**

Modern ANSI standard definitions for "sounds" generally fall into five defined categories:

1. Very brief, but potentially damaging to hearing, air pressure changes, as happens with gun shots and fire-crackers, measured with equipment have response times of under 100 microseconds
2. "Impulse" sounds that may not have extremely short duration, with measurement methods that have a 35 millisecond time constant response
3. Longer impulse sounds that are best measured with a time-constant of 1/8 second, defined by ANSI as the Fast mode. This is the method used by PSM LLC in data collection and it is the method called for in many more modern noise ordinances
4. Continuous tones and sounds, best measured, according to ANSI in Slow mode, with a time constant of one second. This Slow mode well represents to characteristics of older sound level meters with analog circuitry and mechanical meter movements. This is the mode called for in the Orange County Noise Ordinance (In Section 4-6-2, Noise Level)
5. Long term sounds which can be measured over any defined period of time, from minutes to hours or even days. One metric we use is called Leq, which is the general equivalent average sound power over periods we normally monitor of 5 to ten minutes.

Any of these methods can be employed to measure any sound source. Using the Slow mode averages the sound over 1 second, which is eight times as long as the Fast mode, so the average power of an impulse sound over the period of time will be 1/8 as high, which can be expressed as a 9 decibel difference.

Applying this correction to the limit set by the Orange County Ordinance of 55 dBA sets the Fast mode equivalent limit at  $55+9=64$  dBA for a single impulse sound. Conversely, if we convert our Fast mode data collected in Rossmoor to Slow averaging, which would reduce the average sound power by a factor of 8, our readings would drop by 9 decibels. The maximum sound level of pickleball measured at near by residences at Rossmoor park was 62.4 dBA (FAST mode max hold) and 63.4 dBA at Rush Park. Averaging these sound levels over one second instead of 1/8 second would result in readings of 53.4 dBA and 54.4 dBA, respectively, which is close to the sound level limit set in the ordinance (if the parks were not "Exempt").

Recognizing that these are typical levels and not the highest levels that might be generated by harder hitting players, we have recommended the use of sound mitigating barriers at both locations, with the objective of reducing the sound levels to below the measured average background levels we measured (Leq) in the range of 58 to 51 dBA during our on site visits.

This Addendum is intended to explain how the initial sound assessment report data, and our sound level estimates with and without sound barriers, relates to the Orange County Noise Ordinance. It was not included in the original report because we interpreted the public parks being considered for pickleball to be exempt under Section 4.6.7 of that ordinance. We are hopeful that this Addendum will provide an understanding of the existing noise ordinance.

PSM LLC remains convinced that sufficiently high and wide sound barriers can control pickleball sound to be under average background noise levels in Rossmoor. We are available to assist Rossmoor in establishing a sound level "guideline", if that is considered worthwhile and possible. We are currently working on a proposed "guideline" for another California community with an out-of-date noise ordinance at their request. We are working with USA Pickleball to establish a recommended sound level standard and measurement procedure for pickleball sound any place in the country, since there are many noise ordinances written long ago.

**PSM LLC**

# ROSSMOOR PARK PICKLEBALL SIMULATION BRIEF AND TREATMENT



**SOUND MEDIA FUSION, LLC.**

**-Celebrating 50 years of technical innovation-**

**GARY HARDESTY**

**November 5, 2022**

**[Audiomicro42@gmail.com](mailto:Audiomicro42@gmail.com)**

**+1 (818) 482-0193**

**Van Nuys, California 91406**

**Background of Sound Media Fusion, LLC.:**

This year we are celebrating 50 years of innovation by Gary Hardesty under his various companies and brand names- all currently under the 'Sound Media Fusion' brand.

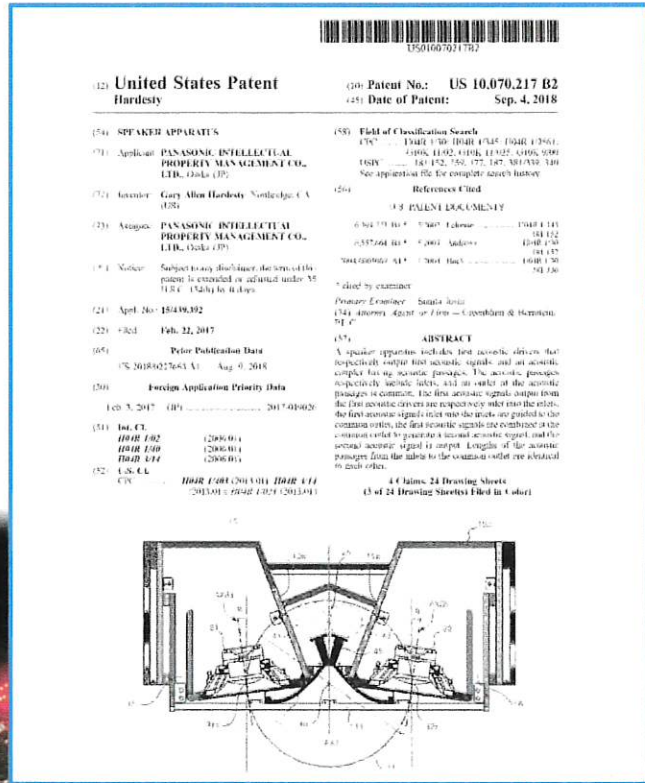
Our companies include:

-**7Shelter** (see 7shelter.com) which invents, designs and manufactures innovative means of pathogen elimination.

-**Track Marshall** (see trackmarshall.com) invents, designs and manufactures innovative means of electronic flagging systems for motorsports racing.

**-Sound Media Fusion, LLC:**

- Creates intellectual property and patents for large global companies such as Panasonic (in the areas of optical systems and acoustic products-recent patent for Olympic Games use):



- Act as technical managers and technical designers for the Olympic Games venues and Olympic Opening/Closing Ceremonies, globally, for more than 35 years including all audio and video systems, as well as broadcast infrastructure.

- Formula One racing- technical inventions in the areas of wireless telemetry and in-car video/audio transmission for broadcast:



- Design and implement video, acoustic and electro-acoustic (sound) solutions, globally, for theme parks, theaters, stadiums/arenas, amphitheatres, museums, for more than 45 years.
- Official sound designer for the Vatican and global World Youth Day celebrations.
- Past work includes Grammy Awards, Academy Awards, Golden Globes Awards, Superbowl halftime show, World Cup soccer and hundreds more.
- Acoustic design and noise/sound monitoring for a variety of venues, globally.
- Electronic design (analog and digital) for many global corporate clients.

This document serves to present a very brief acoustic simulation for the proposed use of the Rossmoor Park tennis court(s) as pickleball venues.

Pickleball noise consists of very brief and loud impulse noises, caused when the paddle hits the ball.

Multiple players in multiple areas increases the noise, as multiple paddles hit multiple balls.

In our testing and design of several pickleball courts in Newport Beach, we measured, at 100 feet, impulse noise as high as 85 dBA.

Impulse noises such as the paddle hitting the ball, are usually disturbing, in that they are not easily 'masked' by more usual ambient housing area noise, such as cars, planes, people, due to the brief/loud impulse type noise which is of an inconsistent nature and does not 'fit in' to the surround noise, which is more consistent and more 'pink' (like ocean noise, etc.).

Simulating the pickleball court noise is difficult due to the sporadic nature of the impulse noise.

We have not been in this area to monitor and witness existing ambient noise.

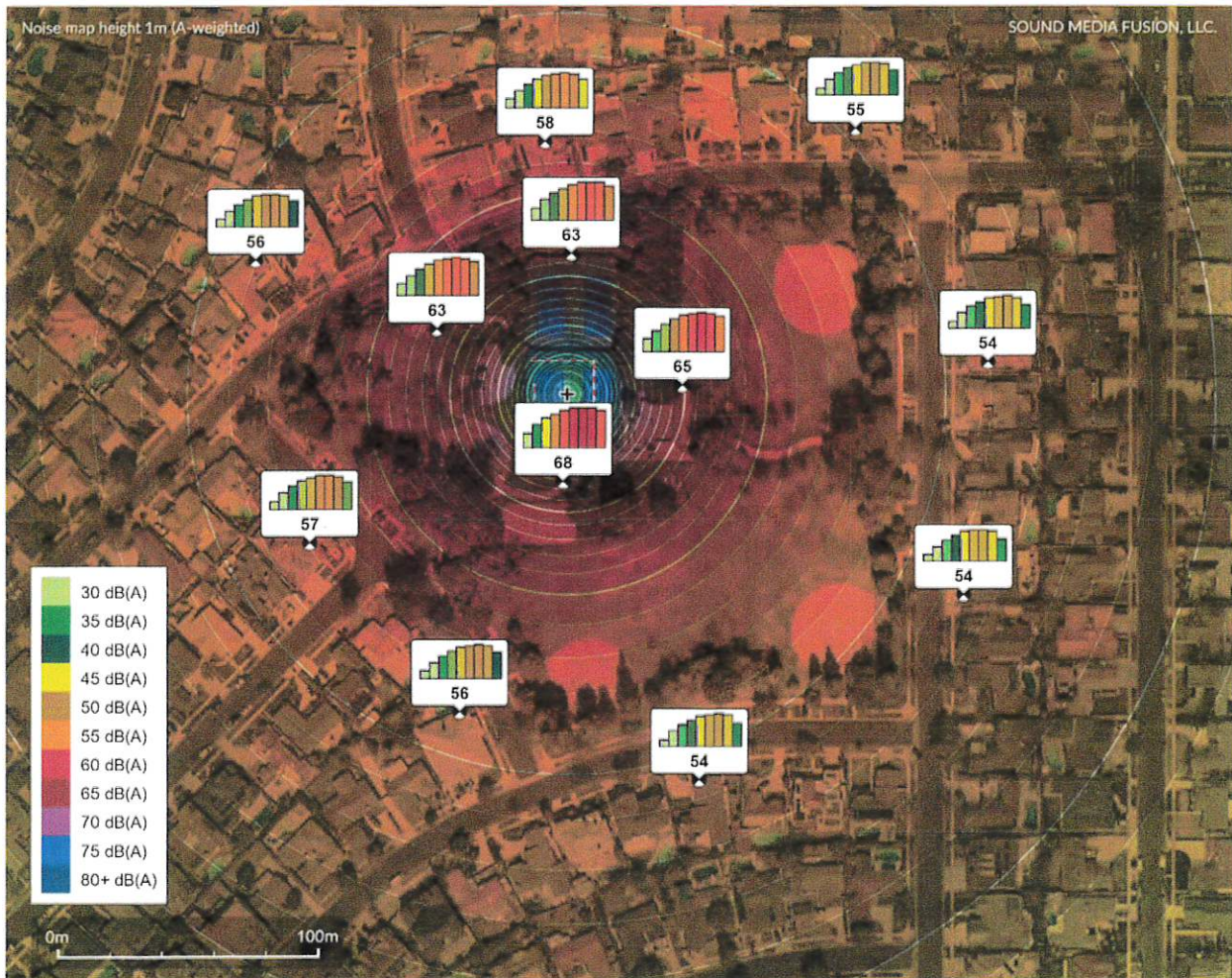
Acoustic simulations are good at a 'best guess' simulation of noise produced by an acoustic event, but are poor at simulating impulse noise.

Our simulations are based on:

1. Creating a constant noise source, producing broadband noise, that includes the frequency spectrum of the pickleball noise, but is producing constant noise, as opposed to impulse noise.
2. The level of our noise source roughly equates to the level one would experience with multiple pickleball players.
3. The primary purpose of the simulation is to provide a 'best guess' as to the possible attenuation of noise with an acoustic barrier in place. We did a best guess at a simple acoustic barrier that is approximately 11 feet tall and surrounds the pickleball court(s) area, with a single entrance.
4. The simulation shows the noise in the area, with and without a noise mitigation barrier.
5. There is no simulation of local ambient noise- all noise in the simulations are noise created by our noise source, placed on a tennis court and surrounded by an acoustic barrier.



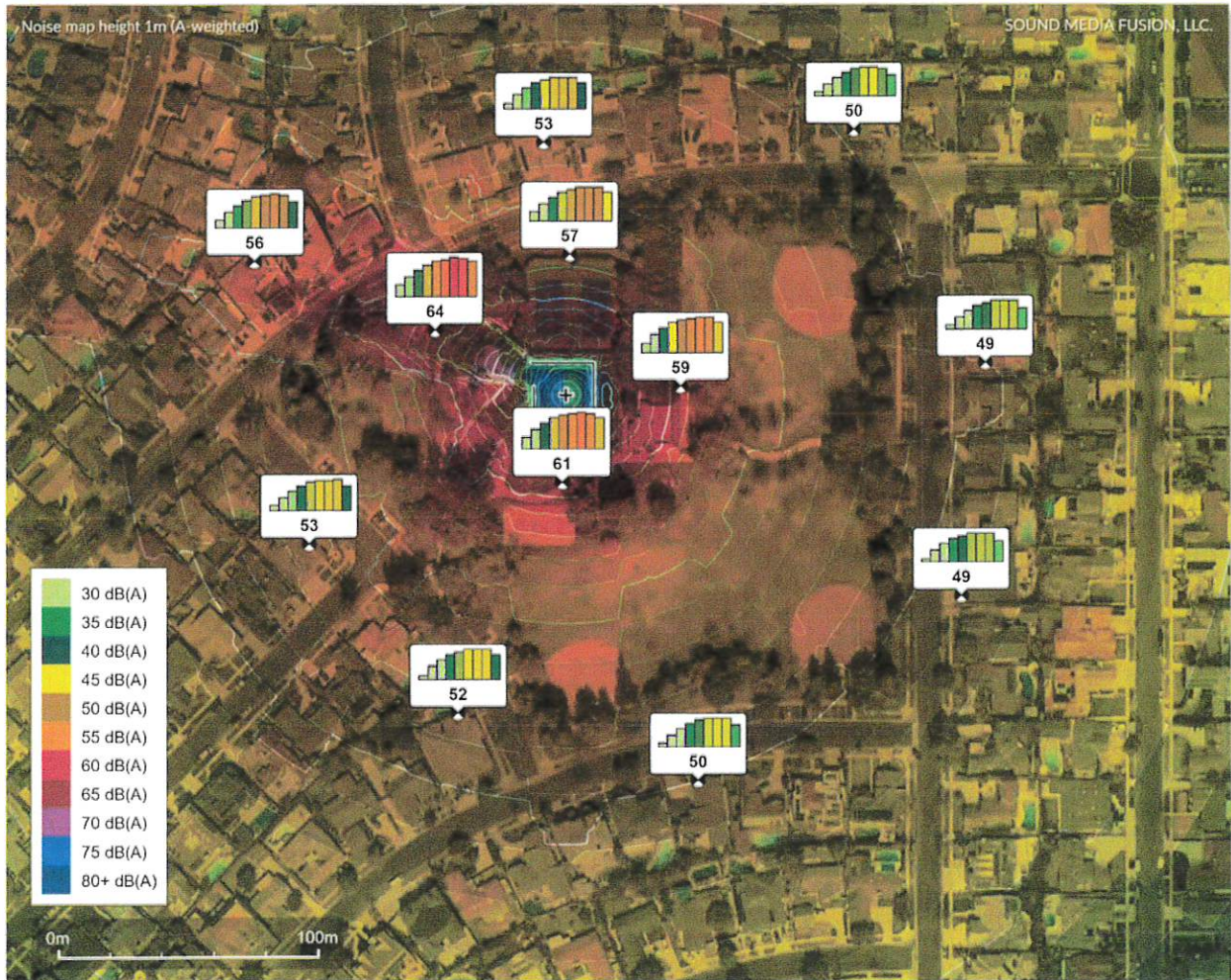
The first simulation shows the levels of our noise source, with no acoustic barrier:



Note that we have placed several measurement microphones at various places in the simulation, to indicate the received noise. Again, remember that these are continuous noise sources, not impulse noise sources. Note above, in housing areas, the noise would be hard to quantify.



Here is the area with our sound off and showing the barrier approximation.



Above is the simulation with the noise on, and enclosed in the barrier. The noise level is the same as in the first picture and shows an approximate 7 dBA of noise reduction- which is significant, and would correlate, as far as human hearing goes, to a reduction of approximately half of the noise level, and note that it indicates Code compliance in most areas as well.

Please note- these are simulations, using a 'pink' noise source, with a barrier in place which provides the approximate attenuation of the barrier we will recommend herein. It is impossible to predict actual results due to many variables. That said, the barrier will reduce the noise, but to what actual level we cannot predict.

The acoustic barrier we recommend is this product:

BBC-EXT-R-2 Noise Barrier/Sound Absorber Sound Blanket, from the Stop Noise company website:

[https://www.acousticalsurfaces.com/curtain\\_stop/sound\\_blanket.htm](https://www.acousticalsurfaces.com/curtain_stop/sound_blanket.htm)

The model number to be used is: **BBC-EXT-R-2**—2" thick, minimum.

The barrier needs to be a minimum of 11 feet tall- I believe your fence is 12 feet tall? If so, the barrier should be the same height- the higher, the better.

The barrier should have as few breaks (for entrance/exit) as possible, as all such areas will dramatically reduce the sound attenuation- ideally, gates need the barrier as well- with an overlap to reduce or eliminate coverage gaps.

All and any gaps in the barrier coverage will allow significant amount of sound to escape.

We do not have a relationship with the company, other than recommending their products at times. We receive no financial benefit from our recommendation.



**Gary Hardesty**

**Director**

**Sound Media Fusion, LLC.**

**ROSSMOOR COMMUNITY SERVICES DISTRICT**

**AGENDA ITEM C-3**

**Date:** January 31, 2023

**To:** Parks and Facilities Committee  
Director Michael Maynard, Chair  
Director Nathan Searles

**From:** General Manager Joe Mendoza

**Subject:** DISCUSSION AND POSSIBLE ACTION REGARDING PICKLEBALL PROGRAM OPTONS AND ESTIMATED COSTS

**RECOMMENDATION**

It is recommended that the Rossmoor Community Services District (RCSD) Parks and Facilities Committee:

1. Review and discuss the various options provided; and
2. Provide a recommendation to be presented to the RCSD Board of Directors and/or direct the General Manager as appropriate.

**INFORMATION**

Pickleball continues to be the fastest growing sport in the country. As such, there is a demand for pickleball courts to be added in the RCSD. Neighboring cities are experiencing the desire for more pickleball courts as well. Since this subject has been reviewed for several months, it is acknowledged that there are opposing opinions on this subject. There are tennis players who want to keep the courts intact and not be impacted by a reduction in courts and/or court time; there are proponents of pickleball who want to play in the District; and neighbors concerned with the noise, traffic and parking that the addition of pickleball may generate.

The District currently has four tennis courts that are available seven days a week from 8 a.m. to 10 p.m. Two instructors have designated hours to offer lessons on the courts. Attachment 1 shows the percentage of time each court was reserved last calendar year (tennis pro hours are included in the used hours totals; walk-ons are not included). Each court was used approximately 27% of the time for reservations last year. Therefore, using one court for pickleball is feasible without greatly affecting tennis use. It may create a demand for more tennis reservations in order to secure a court. Tennis generated \$65,000 last fiscal year; it is projected the revenue will drop to approximately \$60,000 due to the loss of one full-time tennis pro being replaced by a part-time instructor. General public reservations will continue to bring in approximately \$25,000 per year.

If the RCSD Board decides to add three pickleball courts, it is anticipated that each court would be reserved six hours a day at \$6/hour to generate approximately \$36 dollars a day per court for a total of \$108 x 325 days = \$35,000 annually.

Projected revenue for tennis and pickleball for the year would be approximately \$95,000.

Staff has researched various options for a pickleball program in the District for the Parks and Facilities Committee to consider. Please note that for fiscal impact, the numbers used are estimates based on research and information from other agencies and informal bids from contractors on their costs, however, should the Board move forward with any of the options requiring expenditures, staff would be going out to bid with specifications for our particular location.

**Option 1: No Addition of Pickleball**

Leave the tennis courts at Rossmoor Park as is; do not add pickleball.

Fiscal Impact: no cost to the District

**Option 2: Multi-Use Court for Pickleball and Tennis**

Convert Tennis Court 1 at Rossmoor Park into a multi-use court that would accommodate both tennis and pickleball. In addition to the existing tennis court lines, pickleball court lines would be added for three pickleball courts, with temporary movable nets, accommodating up to 12 pickleball players. The existing tennis net would stay in place.

Hours: Mondays, Wednesdays, and Fridays, 8 a.m. to 1 p.m.  
Tuesdays and Thursdays, 5 p.m. to 9 p.m.  
Saturdays and Sundays, 1 p.m. to 8 p.m.

At all other times, the court would be open for tennis on a reservation or first-come first-served basis.

The following guidelines will apply:

- The pickleball program will be offered by reservation at \$6/hour per court or for walk-on play
- Maximum of 4 players per court for doubles
- Maximum of 12 players on the 3 courts
- RCSD will provide portable nets that will be set up for the pickleball hours and then removed after hours
- Patrons will be required to bring their own paddles and balls
- Courts that are not reserved may accommodate walk-on play
- Courts will be unstaffed and the reservation system using the monitor at the Rossmoor Community Center will be utilized for reservation verification
- Outside of pickleball hours, Court 1 will be available for tennis open play (no fee) during designated tennis hours

Fiscal Impact:

\$7,500 to paint and resurface the court and add lines for three pickleball courts and one tennis court within the existing tennis court;

\$2,000 to purchase additional pickleball nets;

Sound barrier material\*:

Acoustifence (17 panels – each 10 feet high x 6 feet wide) = \$13,090; this is a reflective material, meaning that sound bounces off)

Insul-Quilts (26 panels – each 10 feet high x 4 feet wide) = \$8,328; this material absorbs the sound

*\*A structural engineer may be needed to evaluate if the existing fence can accommodate the weight of the sound barriers*

Estimated Cost: \$17,828 - \$22,590

### **Option 3: Permanent Conversion of Tennis Court 1 to Three Pickleball Courts**

Tennis Court 1 at Rossmoor Park would be permanently converted into three pickleball courts with permanent posts and nets.

Hours: Sundays – Saturdays (7 days), 8 a.m. to 9 p.m.

The following guidelines will apply:

- The pickleball program will be offered by reservation at \$6/hour per court or for walk-on play
- Maximum of 4 players per court for doubles
- Maximum of 12 players on the 3 courts
- Patrons will be required to bring their own paddles and balls
- Courts that are not reserved may accommodate walk-on play
- Courts will be unstaffed and the reservation system using the monitor at the Rossmoor Community Center will be utilized for reservation verification

#### Fiscal Impact:

\$20,000 to resurface, stripe and install six posts and three nets for pickleball;

Sound barrier material\*:

Acoustifence (17 panels – each 10 feet high x 6 feet wide) = \$13,090; this is a reflective material, meaning that sound bounces off)

Insul-Quilts (26 panels – each 10 feet high x 4 feet wide) = \$8,328; this material absorbs the sound

*\*A structural engineer may be needed evaluate if the existing fence can accommodate the weight of the sound barriers*

\$5,000 for bleachers

Estimated Cost: \$33,328 - \$38,090

### **Option 4: Construction of Up to Three Pickleball Courts at Rush Park**

New court construction at Rush Park for a 60' x 120' concrete slab, six posts, surfacing, striping, nets. No lighting would be installed. Fencing and sound barrier material would be necessary. The courts would be located on the turf adjacent to the Administration Building and Storage Room.

Hours: Sundays – Saturdays (7 days), 8 a.m. to dusk

The following guidelines would apply:

- The pickleball program will be offered by reservation at \$6/hour per court or for walk-on play
- Maximum of 4 players per court for doubles
- Maximum of 12 players on the 3 courts
- Patrons will be required to bring their own paddles and balls
- Courts that are not reserved may accommodate walk-on play
- Courts will be unstaffed and the reservation system using the monitor at the Rossmoor Community Center will be utilized for reservation verification

### Fiscal Impact:

Approximately \$120,000 - \$150,000 for new court construction at Rush Park for a 60 feet x 120 feet concrete slab, six posts, surfacing, striping, nets, permit fees

#### Sound barrier material:

Acoustifence (17 panels – each 10 feet high x 6 feet wide) = \$13,090; this is a reflective material, meaning that sound bounces off)

Insul-Quilts (26 panels – each 10 feet high x 4 feet wide) = \$8,328; this material absorbs the sound

\$5,000 for bleachers

\$15,000 - \$20,000 – the cost for fencing would depend on gauge, gate, material, height, etc. – all to be determined when the pickleball courts are designed

Estimated Cost: \$148,328 - \$188,090

### **POSSIBLE WAYS TO FUND A PICKLEBALL PROGRAM**

Funds could be allocated from the RCSD Reserve Account.

There is also Prop 68 grant funding remaining at approximately \$70,000. This includes the construction of a picnic shelter at Rossmoor Park (approximately \$40,000), and/or flooring at Rush Park Auditorium (approximately \$30,000). Therefore, one or both of these projects would have to be deferred if Prop 68 funds were used for pickleball.

Moving forward, depending on the option selected, there will be policies that will need to be changed or added. Additional staff may be needed to oversee some of the programming.

### **CONCLUSION**

In summary, it has been a long process to get to this point. The Board and Committee was committed to ensuring that public opinion was heard and they listened to comments and concerns throughout this review and evaluation period. Following the Committee's review of the information provided in this report, it is recommended that the Rossmoor Community Services District (RCSD) Parks and Facilities Committee:

1. Review and discuss the various options provided; and
2. Provide a recommendation to be presented to the RCSD Board of Directors and/or direct the General Manager as appropriate.

### **ATTACHMENTS**

1. Facility Utilization Report (RecDesk) – January 1, 2022 – December 31, 2022
2. Acoustifence - diagram of Court 1 fencing option and Product Data Sheet
3. Insul-Quilts - Product Specification Sheet



**Facility Utilization Report (RecDesk)**  
**January 1, 2022 – December 31, 2022**

Facility Name	Facility Type	Available Days	Available Hours	Used Days	Used Hours	Used Days (%)	Used Hours (%)	Check-Ins	Reservations
<a href="#">Tennis</a>	Tennis Court	365	5110	0	0	0.00 %	0.00 %	1	0
<a href="#">Tennis Court 1</a>	Tennis Court	365	5110	316	1296.5	86.58 %	25.37 %	0	711
<a href="#">Tennis Court 2</a>	Tennis Court	365	5110	321	1485.5	87.95 %	29.07 %	0	668
<a href="#">Tennis Court 3</a>	Tennis Court	365	5110	349	1220	95.62 %	23.87 %	0	928
<a href="#">Tennis Court 4</a>	Tennis Court	365	5110	336	1564	92.05 %	30.61 %	0	894
<a href="#">Tennis Pro - Berglund</a>	Tennis Court	365	5110	0	0	0.00 %	0.00 %	0	0
<a href="#">Tennis Pro - Molina</a>	Tennis Court	365	5110	0	0	0.00 %	0.00 %	0	0

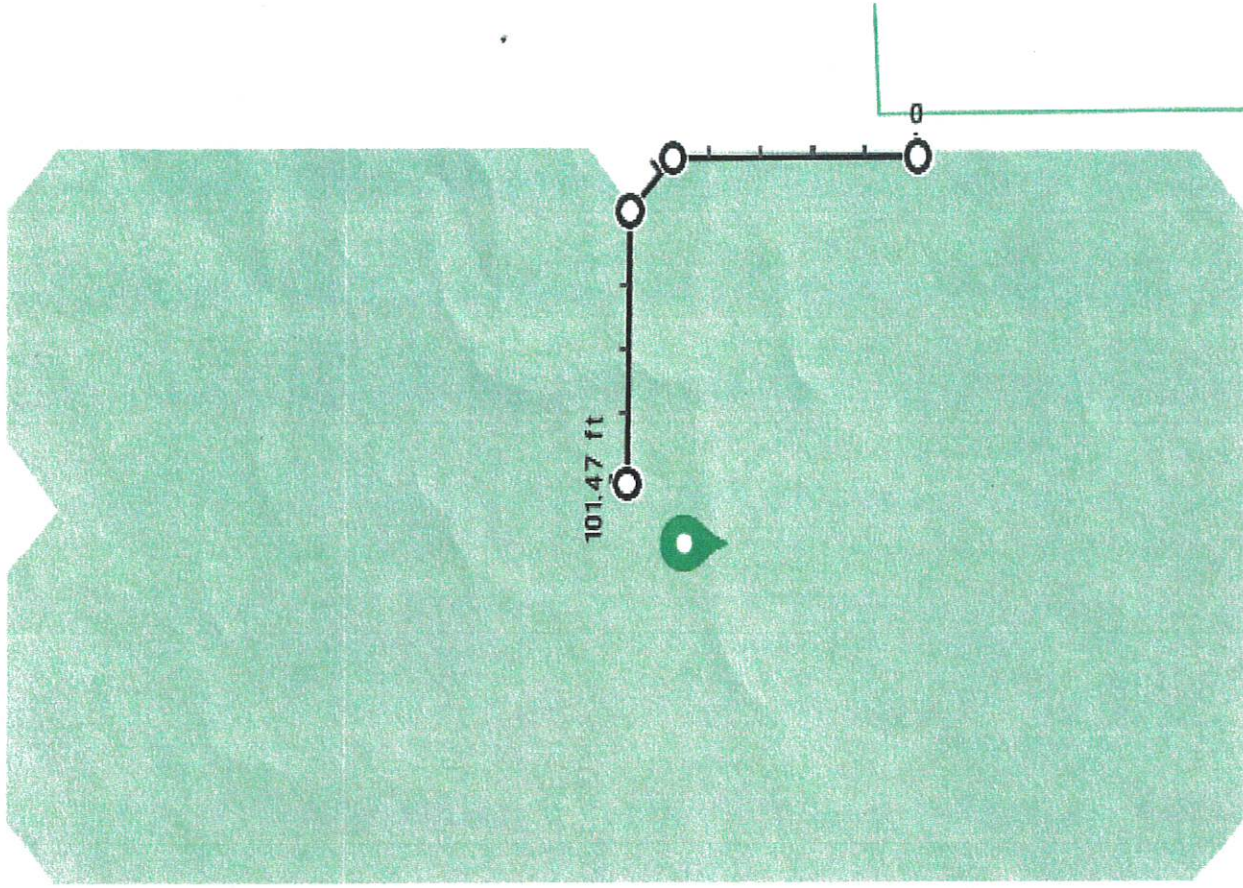
Foster Rd

**BLACK Patented 6' wide Pickleball noise curtains in the most popular sizes**

- 8' high - \$520 X 17 pieces = \$8,840
- 10' high - \$650 X 17 pieces = \$11,050
- 12' high - \$780 X 17 pieces = \$13,260

**NEW FOREST GREEN Patented 6' wide Pickleball noise curtains**

- 8' high - \$616 X 17 pieces = \$10,472
- 10' high - \$770 X 17 pieces = \$13,090
- 12' high - \$924 X 17 pieces = \$15,708



X

Measure distance  
Click on the map to add to your path  
Total distance: 101.47 ft (30.93 m)

## Product Name

**AcoustiFence® Noise Reducing Fences**

### For Manufacturer Info:

**Contact:**

Acoustiblok, Inc.  
 6900 Interbay Boulevard  
 Tampa, FL 33616  
 Call - (813) 980-1400  
 Fax - (813)849-6347  
 Email - [sales@acoustiblok.com](mailto:sales@acoustiblok.com)  
[www.acoustiblok.com](http://www.acoustiblok.com)

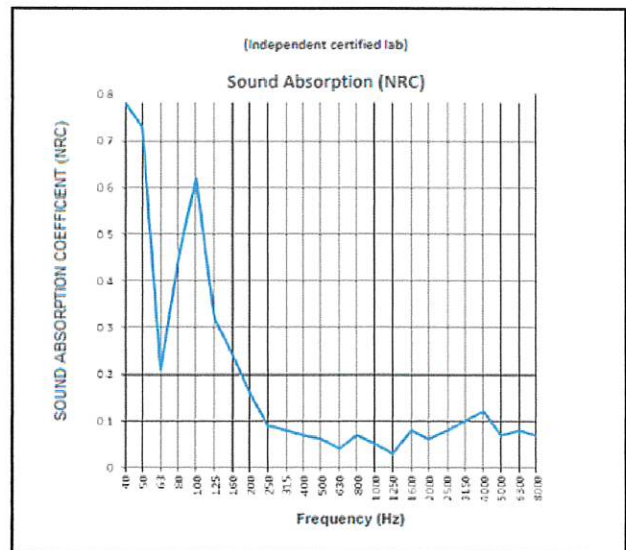
### Product Description

**Basic Use**

AcoustiFence was originally developed by Acoustiblok, Inc. for noise isolation on offshore oil rigs, but has since proven successful in many other demanding outdoor settings, such as construction sites, commercial/industrial facilities, and residential communities.

**AcoustiFence Noise Reducing Fences**

AcoustiFence is a unique, heavy-mineral filled, barium free, viscoelastic acoustical material that is made in the U.S.A. Unlike fences or shrubs, this material does extraordinarily well in blocking direct sound, and a unique characteristic of the material sets it apart from other sound barriers when dealing with very low frequencies.



**Sound Absorption Test Results**

### Benefits:

- Effectively reduces exterior noise
- Over 300 UL Classifications
- Easy to install
- Resistant to UV, dirt and water
- Resistant to corrosion, mold and mildew

## Product Name

### **AcoustiFence® Noise Reducing Fences**

#### **AcoustiFence Noise Reducing Fences continued...**

In frequencies of 50Hz and below, the heavy limp AcoustiFence material actually begins to vibrate from low frequency sound waves. In essence it is transforming these low frequency sound waves into mechanical movement and internal friction energy. Laboratory tests indicate that this transformation process inhibits these lower frequencies from penetrating AcoustiFence, reducing their level by over 60 percent relative to the human ear. In addition, AcoustiFence becomes an absorbent material in these frequencies with test results show an NRC (noise reduction coefficient) as high as 0.78 (with 1.00 being the max). As such it is clear that AcoustiFence not only reduces sound as a barrier, but also acts as an acoustical absorbent material in very low frequencies, as opposed to reflecting those frequencies back like most other barriers. It is worth noting that lead sheets (which are toxic) work in the same manner.

Green AcoustiFence has the same sound deadening properties and features as our original black AcoustiFence. In addition, this new version features advanced reinforced edging and stainless steel cable ties. Made and sourced in the USA, It comes in 6x30 foot sections and is one of the most effective first steps in reducing noise for industrial, commercial and residential projects.

#### **Green AcoustiFence**

One of Acoustiblok's most popular products, designed as an advanced sound barrier that easily attaches to most types of fencing, is now available in a new green shade that easily blends into the environment. This makes it ideal for landscaping projects, residential home use and any outdoor applications where blending into the natural foliage is a concern.

## Product Name

### AcoustiFence® Noise Reducing Fences

#### Sound Transmission Class (STC)

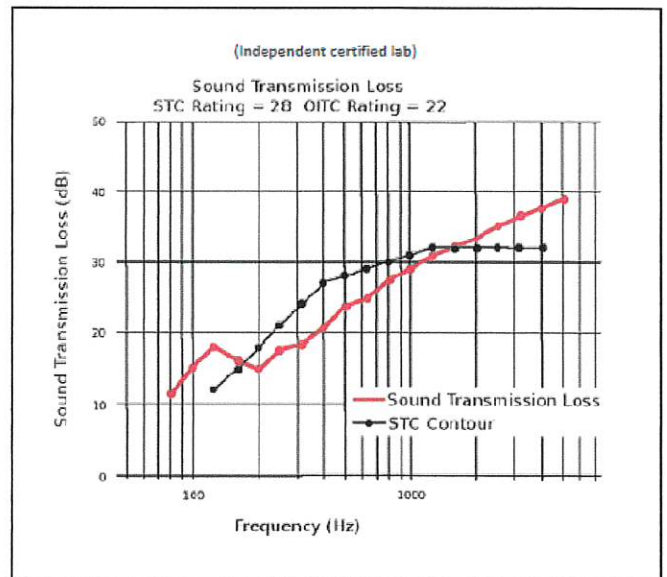
Sound Transmission Class (STC) is a single number that represents the sound blocking capacity of a partition such as a wall or ceiling.

STC numbers are often called out in architectural specifications, to assure that partitions will reduce noise levels adequately. For performance similar to laboratory test numbers, it is necessary to adhere closely to the construction materials and techniques used in the tested partition.

STC is calculated by comparing the actual sound loss measured when 18 test frequencies pass through a partition, with fixed values for each STC level. The highest STC curve that the measured sound loss numbers fit under, determines the STC rating of the partition.

STC calculations emphasize sound frequencies that match the human voice. A high STC partition will block the sound of human speech and block noise that interferes with human speech. To estimate high and low frequency performance, consult the Sound Transmission Loss graph included in STC test reports. Impact Insulation Class (IIC) measure transmitted impact noise and are specified for floor-ceiling assemblies only.

Acoustical test reports for numerous wall and floor/ceiling designs are available from Acoustiblok on request. All our test data is taken directly from independent 3<sup>rd</sup> party laboratories under NVLAP certification.



#### Sound Transmission Loss Test Results

## Product Name

### AcoustiFence® Noise Reducing Fences

## Physical Properties

- Barium free
- Minimum STC 28 per ASTM E90-02 & ASTM E413-87
- Minimum sound attenuation 24 dBA @ 100Hz & 16dBA @ 40Hz
- Size - 6 ft.(1.83m) x 30 ft.(9.14m) x 0.125 in. (.3mm) – 180 ft<sup>2</sup> (16.83m<sup>2</sup>)
- Color - black or green
- High UV resistance
- Heat tolerance: 200°F (93°C) for 7 days, less than 1% shrinkage with no deformation.
- Freezes at -40°F (-40°C). Do not unroll or flex frozen material. Properties not affected by freeze/thaw cycles.
- No fungal or algal growth and no visible disfigurement, per ASTM D3273 and ASTM D3274 (rating=10)
- Tensile Strength - min. 365 PSI
- Weight per section: 185 lbs. (84Kg)

#### Material Specifications – Part # “Acoustifence 6x30 Industrial”

Acoustical Rating	STC 28 / OITC 22
Size	6 ft. (1.83m) x 30 ft. (9.14m) x 0.125 in. (.3mm) 180 ft <sup>2</sup> (16.72m <sup>2</sup> )
Weight	185 lbs. (84Kg)
Fastening	Black brass grommets every 6 in. (152mm) along top edge with four grommets spaced along the bottom edge. Commonly installed horizontally.
Color	Black
(This is an industrial product and minor surface blemishes are a possibility.)	



6900 Interbay Blvd  
Tampa, Florida USA 33616  
Telephone: (813)980-1440  
[www.Acoustiblok.com](http://www.Acoustiblok.com)  
[sales@acoustiblok.com](mailto:sales@acoustiblok.com)

Disclaimer – This text will be replaced with canned disclaimer verbiage. This text will be replaced with canned disclaimer verbiage. This text will be replaced with canned disclaimer verbiage. This text will be replaced with canned disclaimer verbiage. This text will be replaced with canned disclaimer verbiage.

PRODUCT SPECIFICATION SHEET

**IQ-21 QUILTED SOUND BLOCKER BLANKET (STC 21)**

Quilted Blankets stop 21 db of sound while increasing sound absorption. Constructed of heavy duty UV and FR rated vinyl cloth, on both sides, the blankets are tough and will withstand abuse.

The multiple layers of sound insulation provide exceptional sound control, as well as being lightweight. IQ-21 is excellent for outdoor environments, such as construction sites. The blanket reduces sound in noisy areas and is a must around loud equipment. Blankets are cleanable and excellent in areas that are exposed to dirt, sunlight or chemicals. Blankets are constructed with all edges sewn and with grommets for attachment. Quilts can be free hung with both sides exposed for Interior/Exterior use.



TECHNICAL INFORMATION

Nominal Thickness
Standard Nominal Width
Standard Length
Weight
Flammability
UV Test

2.0" thick  
 48" wide  
 6'-16' long (custom lengths available)  
 .59 lbs. per square foot  
 Class B Fire Rated per ASTM E84-18b  
 Flame Spread: 50 · Smoke Density: 85  
 Passed per ASTM G154

ACOUSTICAL PERFORMANCE

SOUND ABSORPTION DATA

OCTAVE BAND FREQUENCIES (Hz)							
125	250	500	1000	2000	4000	5000	
.20	1.08	.92	.55	.33	.19	.16	.70 NRC
11	8	16	26	35	48	51	21 STC