

Carnarvon Park Pickleball Sound Study

Introduction:

On April 29th, 2024 the North Saanich Council, passed an unexpected motion to permanently close the hugely popular Wain Park pickleball courts. The reason given was to appease a few nearby neighbours over noise concerns. This motion was brought forward by Mayor Jones after Council received a Staff Report that concluded sound mitigation as the best option. In response, and to correct misinformation, on May 15, 2024 the Saanich Peninsula Pickleball Association (SPPA) and the Victoria Regional Pickleball Association (VRPA) undertook a joint sound study at Carnarvon Park in Oak Bay. The primary goal was to quantify the effectiveness of acoustic barriers, which could then be used to estimate their effectiveness if installed at Wain Park in North Saanich. The secondary goal was to evaluate the effect of quiet paddles on pickleball sound attenuation. To avoid any concerns about bias, Jordan Mikkers, Dip. Eng., Mechanical Designer was engaged to perform the sound study.

Rationale:

Carnarvon Park and Wain Park have several important physical similarities. Although not identical, the similarities allow inferences to be made as to the effectiveness of sound mitigation from one to the other.

Both parks are located on relatively flat terrain, the pickleball courts both are surrounded by 10' high chain link fences and are offset by single family homes. These conditions allow acoustic panels to provide "line of sight" relief between nearby residents and pickleball play, critical for effective sound mitigation. In addition, both are bordered on one side by an open field where sound can be funnelled away from nearby homes. The Carnarvon Park courts are located in a converted lacrosse box and are adjacent to a 5-court tennis complex (Figure 1). Wain Park is more rural and has more natural landscape surrounding the courts (Figure 2).



Figure 1. Carnarvon Park.



Figure 2. Wain Park

Carnarvon Park has Acoustifence panels installed on the west, north, and east sides. The south side, adjacent to the large field, is open and not protected by acoustic panels. Sound readings at Location 1 (Figure 1) therefore simulate current conditions at Wain Park, which has no sound mitigation. These are “worst case” conditions as Location 1 is in the direction where pickleball sound is being funneled by the acoustic panels installed on the other 3 sides.

Readings taken at Location 2 (Figure 1), which is behind acoustic panels simulates expected sound levels at Wain Park if similar panels were installed. These are also considered “worst case” conditions as the intervening ground at Carnarvon Park is hardscape tennis courts while at Wain Park it is primarily grass and vegetation, which assists sound attenuation.

Background:

Health Canada defines 55 decibels (dB) as the target maximum for sound levels (Guidance for Evaluating Human Health Impacts in Environmental Assessment: NOISE, Health Canada, 2017). Many municipalities, including Victoria, apply a more conservative target of 50 dB to account for the impulsive character of pickleball noise (Noise Planning Guideline for Outdoor Pickleball Courts, BAP, 2022).

The most problematic pickleball noise comes from the ‘popping’ sound as the paddle contacts the ball. Research has shown that this sound occurs at a frequency of roughly 1200 Hz.

For reference a list of common sounds and their associated decibel readings is included in Appendix 1.

Methods:

Location 1 is in the open field south of the pickleball courts and is not protected by acoustic panels. It is 50m away from the pickleball courts, the same distance as the nearest residence at Wain Park. Location 2 is on the north side of the courts, 42m away and is protected by acoustic panels. We were prevented from going the full 50m (to match the distance to Location 1) by the barrier fence around the tennis courts.

The equipment used to record the data was a Dayton Audio UMM-6 Calibrated Measurement Microphone. It was analysed using Room EQ Wizard (REW) software using the Real-Time-Analyzer (RTA) function. The data were recorded in multiple 15 – 60 second intervals to ensure there was enough time to include multiple “pops” of a pickleball hitting a paddle, while not including any louder nearby park noises (e.g. dogs barking, traffic noise). Data from the multiple intervals were combined and analyzed.

All sound measurements were taken with 16 pickleball players on four courts to simulate maximum play at Wain Park. Sound measurements were taken with all 16 players using regular pickleball paddles and again with all players using Owl quiet paddles.

Results:

a) Effect of Acoustic Panels;

Sound readings using regular paddles are presented in Figure 3. Data from Location 1 (Figure 1) are shown by the green curve. At an offset distance of 50m, the same as the nearest residence at Wain Park, sound levels varied from about 53 dB at the lower frequencies down to 45 dB at the higher end of the range. Except in the frequency ranges of 400 to 500 Hz and 1200 to 1300 Hz the data fall below the conservative threshold of 50 dB.

Moving to Location 2 (Figure 1), a similar distance away but behind the acoustic panels the sound readings were reduced dramatically to a peak value below 48 dB (400 to 500 Hz). At the most problematic frequency of 1200 Hz, the acoustic panels dropped the sound from 51.1 dB down to 43.8 dB, a reduction of 7.3 dB. **For context, a 10 dB drop equates to cutting the sound levels by half.**

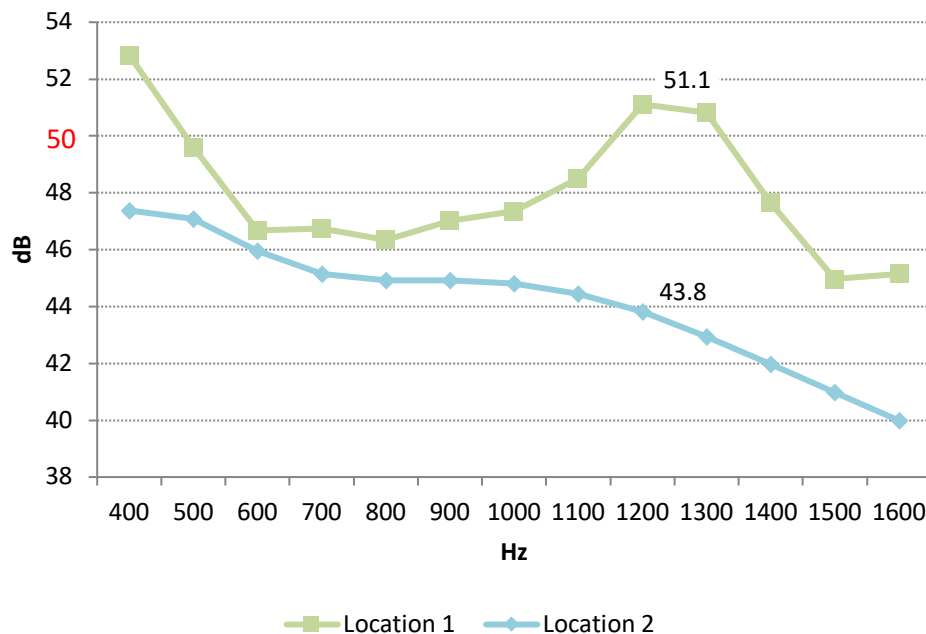


Figure 3. Comparison of Pickleball Sound Data at Locations 1 and 2

b) Effect of Quiet (Owl) Paddles;

The effect of the Owl paddle is best shown at Location 1 (Figure 1), where no other sound mitigation was present. The results are displayed in Figure 4. The blue curve represents regular paddle data and is the same sound data as was illustrated in Figure 3. Sound levels marginally exceed the 50 dB target threshold in the 400 to 500 Hz and 1200 to 1300 Hz ranges. Owl paddle data, shown in purple, had a dramatic effect across the entire frequency range. Sound levels were consistently between 43 and 44.5 dB, **over 5 dB lower than the target!**

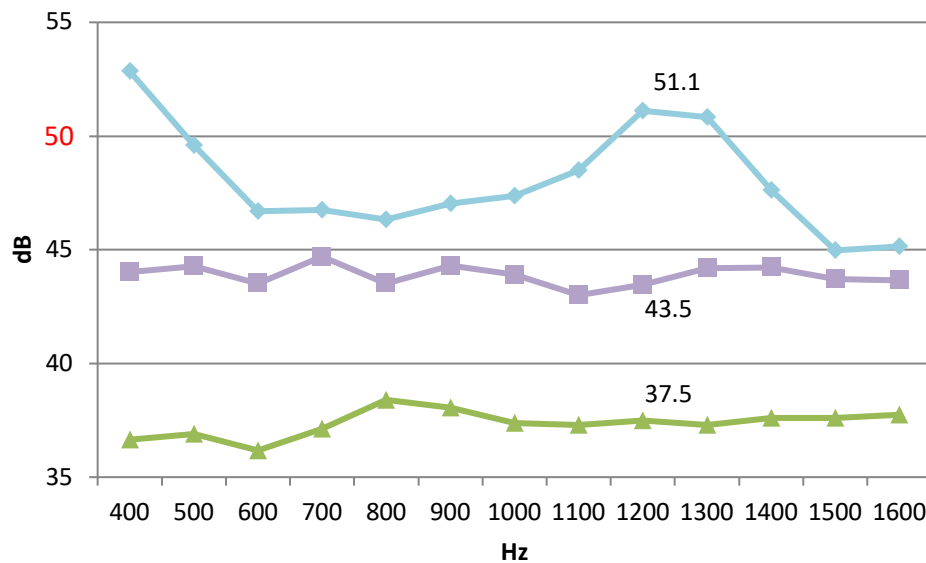


Figure 4. Comparison of Regular versus Owl Paddles at Location 1

— Regular Paddle — Owl Paddle — Background Noise

Summary:

The Carnarvon Park Pickleball Sound Study, undertaken in a joint effort between SPPA and VRPA demonstrates the effectiveness of both acoustic panels and the usage of quiet paddles. The data shows that without any sound mitigation, at an offset distance equivalent to the nearest residence at Wain Park, the unmitigated pickleball sound levels only marginally exceed the adopted threshold target of 50 dB. With acoustic panels, sound levels are brought down significantly below the threshold over the entire frequency range. At the most problematic frequency of 1200 Hz the reduction is 7.3 dB, a reduction of 1.7 times.

The usage of quiet paddles alone is very effective in bringing down sound levels to a consistent level of 43 – 44.5 dB across all measured frequencies, over 5 dB below the target threshold of 50 dB.

Conclusions:

Pickleball sound mitigation works! Sound readings at Carnarvon Park, a park very similar to Wain Park show that if acoustic panels were installed the sound levels at nearby residences would be brought down to well below what is commonly considered a reasonable threshold. The usage of quiet paddles alone is very effective in bringing down sound levels to a consistent level of 43 – 44.5 dB across all measured frequencies, over 5 dB below the target threshold of 50 dB. The quiet paddle is especially effective in reducing the louder 1200 hz frequency by nearly 8 dB, effectively cutting the noise by around 50 percent.

APPENDIX 1

Sound in Decibels(dB)	Sound Source
10 dB	Snowfall, rustling of leaves
20 dB	Light wind, ticking of a watch
30 dB	Whispering
40 dB	Refrigerator, quiet radio music
50 dB	Quiet brook, quiet conversation
60 dB	Normal conversation
70 dB	Loud conversation, passenger car
80 dB	Loud radio music, heavy road traffic