Sonic Heritage Study: FINAL REPORT

Sharon Temple, East Gwillimbury, CA

Allan Gardens, Toronto, CA

SITE SOUNDING
OFFICE

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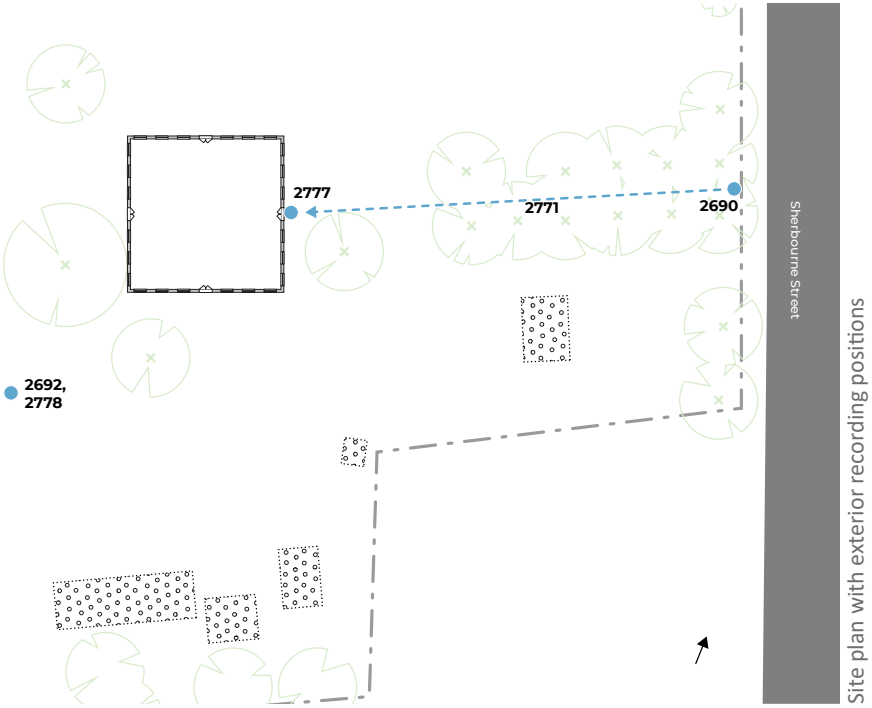
SHARON TEMPLE

The approach to sonic heritage investigation at the Sharon Temple was to identify the current sonic dynamics and build an understanding of how these were historically relevant, especially during its period of significance (1832-1889). Music and singing were an essential and unique part of the Children of Peace; these practices guided the architectural design of the structure by Ebenezer Doan and continue to be a primary interpretive focus at this national historic site.

The temple was designed as a literal beacon for the charitable works of the community and a gathering space for regular activities throughout the year (not including regular worship, which was conducted elsewhere). Large single-paned windows continue to flood the interior with light, allowing light from within to be seen easily at night from the exterior; along with the four doors, they also provide the interface where sound can infiltrate through the sashes and many window lites. The combination of glazed and wooden materials arranged in simple, rectilinear compositions creates a semi-reverberant interior. The bilateral symmetry of the floorplan results in bilateral symmetry of acoustic behavior on the interior, which can still largely be experienced today if exterior conditions are relatively quiet. Seating areas on the east experience slightly more exterior sound infiltration than other areas (with all doors closed) due to sound from Leslie Street further to the East. This reverberant interior, reinforced through its contrast to the exterior soundscape, forms the dominant sonic character of the building and is continuous from historic use.

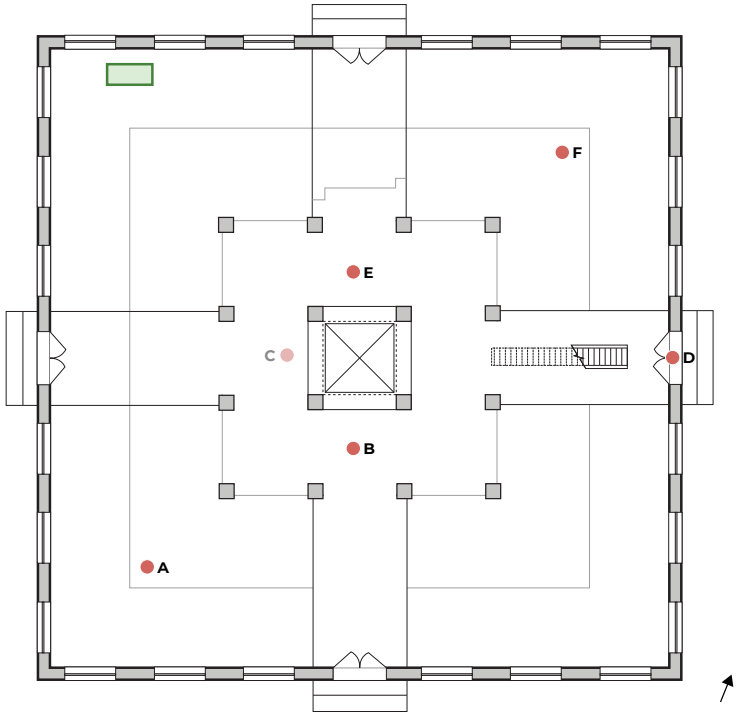
Despite the building's simple design, it contains two other important sonic zones from the above. It was observed that the vaulted ceilings under the gallery provide some reflective accentuation to sounds made directly underneath; individuals located underneath may hear this, but these effects do not extend more than a few feet into the rest of the room. Similarly, the vaulted ceilings do not accentuate sounds made from the gallery. The small model located in the center of the structure, immediately below the gallery opening, reflects some of the sound from the gallery out into the first floor, but these effects are also minimal. The columns that support this vaulted area serve as deflectors and can create a sonic barrier between inner and outer portions of the room in certain positions. Because there is no evidence that historic activities took place on the first floor in this area, this dynamic was not investigated further. However this central part of the building's first floor contains a second sonic zone of experience only available to people within it: the overall effect is that someone positioned in this area will hear their own speech, singing, or other sounds with more close-range reverberation. The sounds will seem louder to that person and more immediate, enveloping and more intimate.

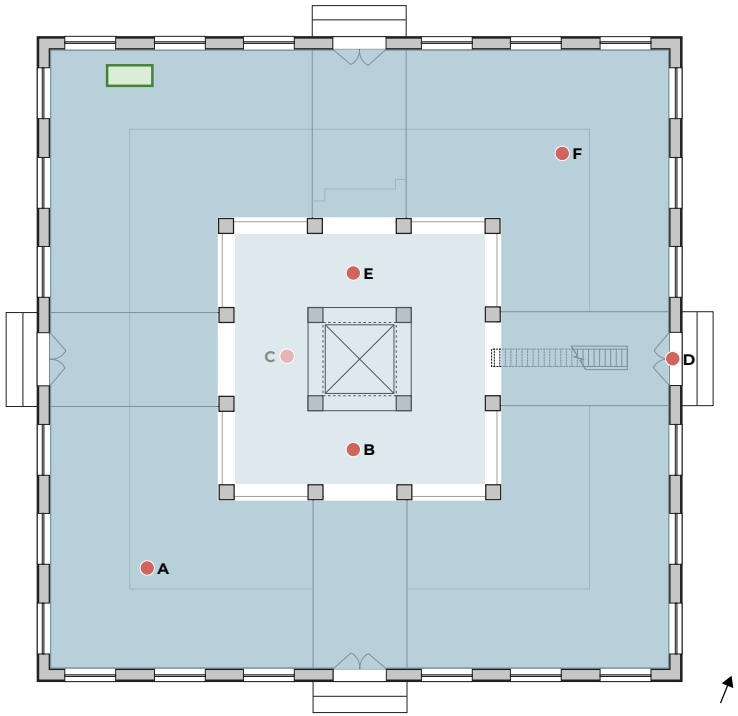


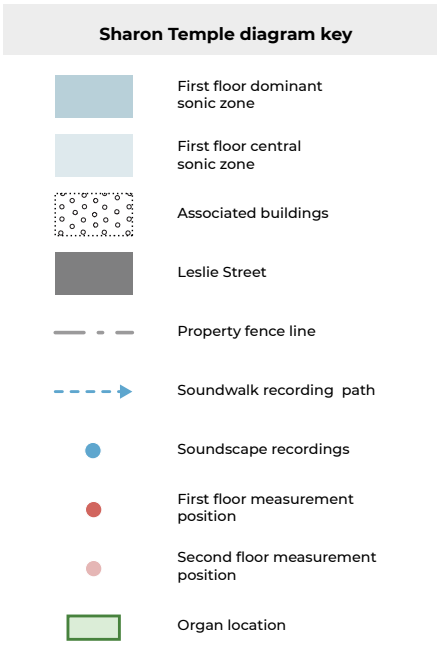
Site plan with exterior recording positions

Sharon Temple diagram key

- First floor dominant sonic zone
- First floor central sonic zone
- Associated buildings
- Leslie Street
- Property fence line
- Soundwalk recording path
- Soundscape recordings
- First floor measurement position
- Second floor measurement position
- Organ location







Another important sonic zone is on the second floor. The musician's gallery is surrounded by high window walls and has an opening to an open tower above. The floor is slightly tiered, as on the first floor, with high flat ceilings. The resonance of the room results from the reflective capacities of these windows, smooth wall and ceiling treatments, and floors – no accentuation (such as from a vaulted shape) was noticed. Sound is not channeled upwards or downwards by design, so most soundwaves that reach the first floor through the central opening are reflections from these surfaces. This gives the sound a distanced quality for listeners on the first floor, as some of the higher frequencies and resultant sharpness or crispness of sounds are absorbed in the Musician's Gallery. It should be noted that the type of music performed historically, which relied on longer notes and harmonies rather than crisp staccato percussion for instance, would work well in this setting. One position of interest was at the base of the Jacob's Ladder, where sounds were directly reflected down the ladder via the curved opening at the top of the ladder. These sounds are reflected to the eastern entry but are not perceptible beyond a few feet in radius from the base of the ladder. If doors were historically left open during musical activities, however, this could have created a node where music could be heard clearly on the exterior – a sonic invitation to those near the eastern entry.

Overall, the dynamics generated by the architectural design were a major source of study on the first floor and largely dictated the locations for study positions. One key difference from historic times is a mechanical sound source located at the periphery of the interior, likely an air supply. The high frequency sound of the system dominates moments of relative silence within and were out of place in the historic setting.

Original practices within the structure included hymns and music composed by and for the Quaker community, to be performed by singers and musicians stationed in the second-floor musician's gallery. The resulting music had very little visual component besides the performers' initial ascent by the Jacob's ladder; instead, it filtered down to the congregation seated below. A choir or the Civilian Band could thus be experienced as a single voice without the ability to identify the source of specific sounds, a subtle reflection of the community's focus on equality as well as the sacred effect of music for the Children of Peace. This sonic relationship remains intact and can still be experienced today; it was another focus of study by adding a study position in the gallery. For documentation that was keeping with historic practices, ERA employee Katie Lee sang a single phrase from the historic hymn "Relief*" from six consecutive research positions; this was recorded from the other five positions throughout the Temple.

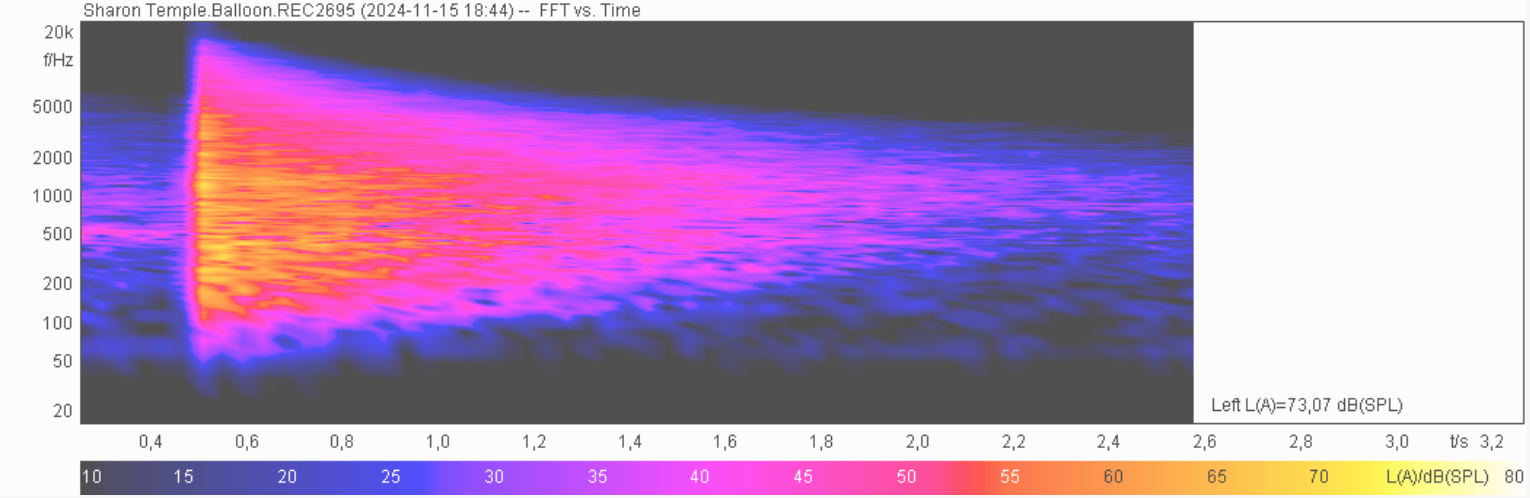
In addition, a bellows hand-pump pipe organ was designed and constructed for use in the temple, one of the earliest in Ontario. A reconstructed version of the original instrument was available for testing and also featured in recording tests. The same hymn phrase was performed by Katie Lee on the organ and recorded from multiple positions.

Image: Julie Fish, ERA Architects

Besides the sounding practices within the structure, the surrounding soundscape of the area features prominently in sonic experience. Surrounding deciduous trees in the wind add a subtle inclusion of the exterior to interior experience but are not so prominent as to interfere with audibility. However, though sited in a largely residential area today, Leslie Street/Route 12 on the eastern property line is a main access route; its frequent vehicular traffic (tire and engine) sounds and creates a dominant sound source for the entire property and can often be heard on the interior. This marks a key difference from historic times at the Temple and its influence on interior practices would bear future study. Select soundscape recordings were made on the exterior to mark the soundscape as it exists today and to investigate the intensity of the road sounds.

Lastly, a few sonic artifacts were recorded that typify interactions with the building – these were recordings largely made in motion so that listeners can experience the sonic transitions one experiences. They also provide recordings of the current boundaries between sonic conditions. For instance, the use of the door-latch to open, walk through, and close the door provides a key sonic artifact that has been continuously experienced from historic times while capturing the influence of the modern soundscape; the sound of footfalls as one walks across the wooden floorboards is likely similar from historic times (though modern footwear must be accounted for); a walk from Leslie Street, through the allée of trees towards the eastern entry, through the door and into the interior while the organ plays, provides a reenactment of historical entry to the building's interior (sonic) environment while also marking the modern sonic boundary between the street-based soundscape and the Temple soundscape.

* This piece was performed in a concert held at the Sharon Temple in 1981 and included in the vinyl recording "Music at Sharon : a celebration of 150 years, 1831-1981" (J. Beckwiith et al, 1982. see Toronto Public Library call number PHONO LP 13384).



Summary

The Sharon Temple interior is dominated by a warm, reverberant sonic character; the two-second decay time, as depicted above, can be consistently experienced throughout most of the first floor. This is in large part attributable to the intact material condition of the Temple and the lack of competing sounds, rendering the space quiet in comparison to its surrounding context. Sound infiltration from the exterior, predominantly within low and mid-frequencies from Leslie Street, poses the greatest threat to this condition; a small mechanical system on the interior also introduces disturbance at high frequencies. Mitigation strategies for both could enable greater visitor access to an uninterrupted contemplative sonic experience within the temple.

An essential strand of the building's legacy is the singular dynamic of musical experience on the first floor, especially when performed in the Musician's gallery. This study did not find any design feature that suggested intentional acoustic accentuation in this dynamic. In fact, it is the apparent lack of accentuation that creates what the character associated with the Temple: an experience of distanced, refracted sound from above.

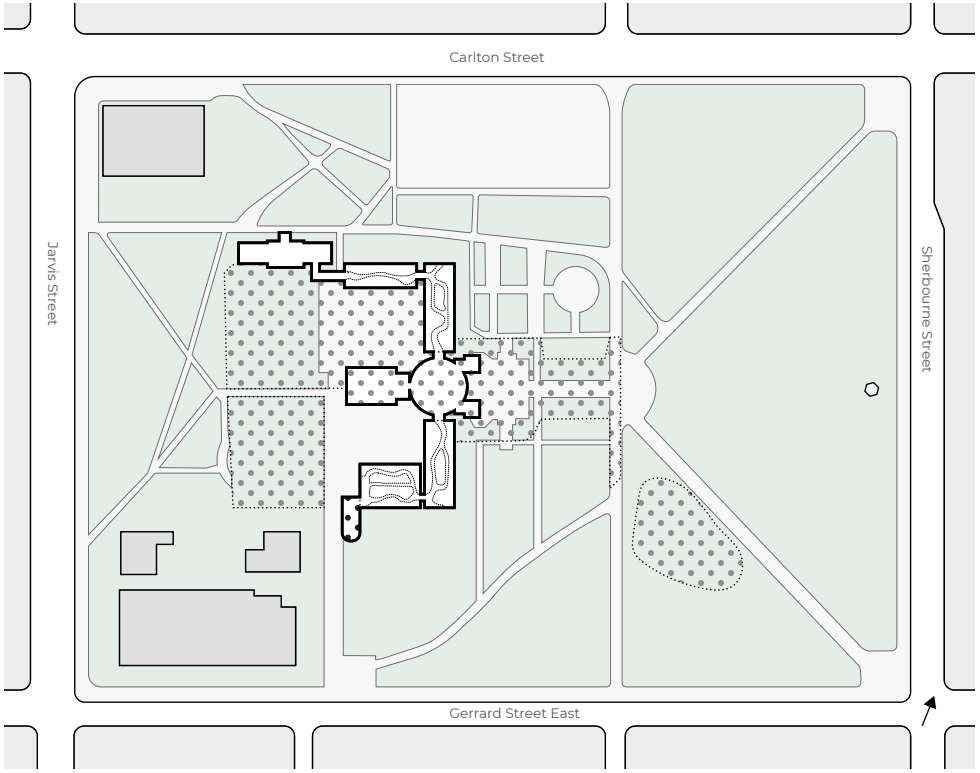
Future recommended investigations would include detailed research into historic practices on the interior, including speaking and musical practices, and with a particular focus on positions of sound soundmaking (i.e. where the organ was positioned, whether doors and windows were open, how audiences were positioned on the interior, etc.). A future noise study on the exterior would help to understand the intensity and detailed directionality of road sounds; it would include recordings over multiple days and times of day and at more recording positions distributed around the property.

ALLAN GARDENS

The approach to sonic heritage investigation at Allan Gardens was to identify the current sonic dynamics and build an understanding of how these express historical continuity over the park and conservatory's history since 1860. As urban density has increased around the park, sonic conditions have drastically changed since its initial years. To probe the interpretation of current dynamics, a noise study was conducted in the park and inside the conservatory, and a public soundwalk with survey was carried out.

Noise study of exterior and interior

The noise study was carried out in the early afternoon on three separate days. The average dB(SPL) levels were recorded over three minutes at each study location along with perceived loudness, measured in sone. These values were then averaged together over the three measurement days. The resulting values describe the park as encircled by a sound environment over 70 dB(SPL), consistent with the constant vehicular traffic and intermittent construction activities. The perceived loudness of this environment is also high. This 'loud peripheral' zone covers the entirety of the eastern third of the park, including point G. Such a finding indicates that the open areas of the park are likely compacted and relatively reflective, providing little reprieve from the streetscape on all sides. Though visually distinct, there is little sonic difference between the park and the sidewalks.

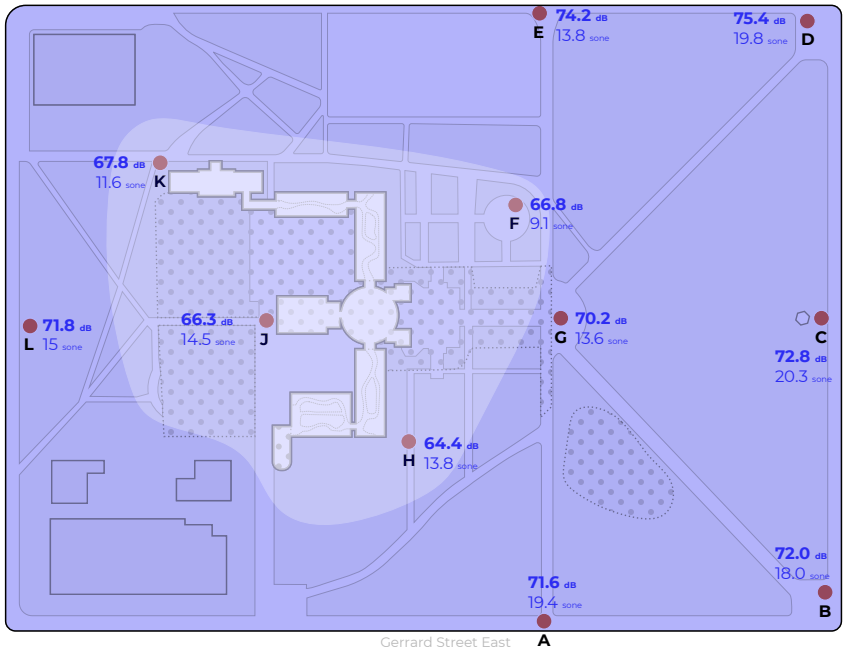


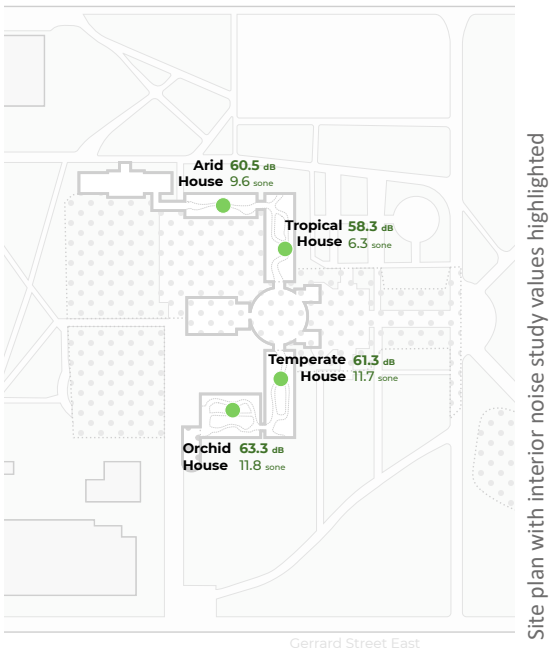
Site plan with inaccessible areas highlighted

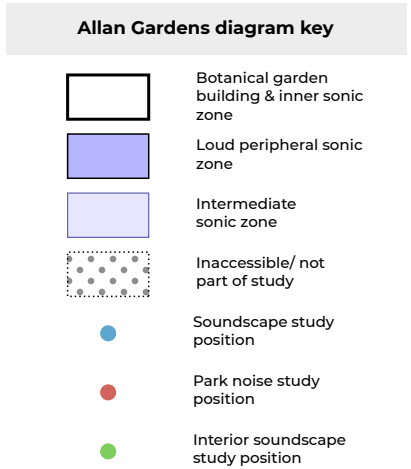
Allan Gardens diagram key

- Botanical garden building & inner sonic zone
- Loud peripheral sonic zone
- Intermediate sonic zone
- Inaccessible/ not part of study
- Soundscape study position
- Park noise study position
- Interior soundscape study position

Measurements further show that dB(SPL) levels drop in proximity to the conservatory building. This slight difference could be due to a simple reduction in the amount of sound one has access to since the building blocks sound from at least one direction. The reduction sets up a zone of transition, and "intermediate zone" between park and conservatory interior. Yet one's perception of this difference is nuanced; loudness (sone) levels do not have the same intensity of drop-off next to the building, and the sone measurements do not correspond to the intensity of all dB(SPL) measurements – compare points A and E, and especially E and J. The discrepancy suggests that the mixture of sound frequencies from surrounding streets and construction projects interact with the materiality of the park in different ways. Mitigation of sound from the streets, therefore, could not be solved with one solution all around the park.







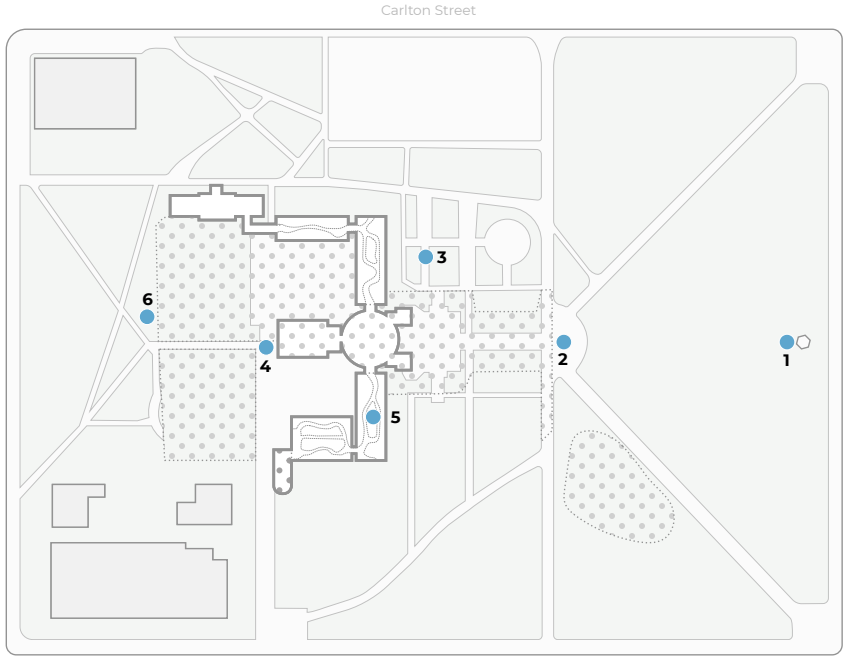
The zones as described above are not affected by localized sound sources within the park, such as activities around the Sacred Fire and encampments, the small and large dog park, a hangout spot at the display gardens, and the playground. The sounds from these areas provide some localized sounds that characterize the immediate area; at times, music played around the Sacred Fire or dog barking travels beyond the property boundaries and extend the sonic reach of the park into the surrounding neighborhood by a few hundred feet. But overall, sound (noise) infiltrates into the park not out of it.

On the interior of the conservatory building, all available rooms provided measurements around 60dB(SPL). This marks a distinctly different sonic environment with an average 10dB difference from the park setting outside, meaning sounds will seem half as loud inside compared to most of the park. Three of the open houses (tropical, temperate, and orchid) have water features, which provided some masking of exterior sounds that filtered through the windows. Depending on the intensity of the water sounds, they effectively shield the sonic environment from the outside. In the orchid house, the exterior was masked entirely; only the sounds of water splashing and the hum of a mechanical humidifier were noticeable. In contrast, the arid house provided no sonic shelter beyond the architectural envelope and the natural absorption of the sand-based planters; here, the park was perceived as distant but still present.

Considering the perceived loudness measurements from the conservatory, both the temperate and orchid houses have an average sone value similar to exterior conditions around the periphery of the building. This is very likely due to the sharp, high-frequency water sounds within. In comparison, the arid house had an average sone measurement similar to the display gardens outside, which reinforces the sonically porous interiority of this part of the building. Because the arid house introduces no masking sounds, the sonic environment stands apart in its relative stillness.

Soundwalk

The public soundwalk was conducted on a sunny fall Friday in the early afternoon. The scope of the walk included the east, north, and west side of the park as well as a point on the interior of the botanical garden; the south side was avoided due to police activity in the park. Priorities were to assess how individuals from different backgrounds (e.g. cultural, disciplinary) connected the current sonic environment to the park's history. The soundwalk incorporated a customized survey that was successfully completed by 21 participants. Ratings were given between 1 and 5 on 12 separate scales, with a 3 being a neutral response. Questions varied between descriptive, judgement-based, and feeling-based, with 4 questions asking about historical relationships to sound.



Site plan with soundwalk positions highlighted

The results are preliminary, given the number of participants and the study only being carried out in one iteration, but two trends are nevertheless identifiable:

- **Point # 5**: The clearest consensus of the group related to the interior soundscape of the Temperate House, which was also the last point studied in the soundwalk. More than any other position, this one was rated as most pleasant, appropriate, comfortable and constant; it was also found to be historically authentic and should be preserved. Interestingly, the perceived authenticity at this position did not instigate adjacent feelings of it being historically continuous. Historic authenticity and continuity were separable for participants.
- **Point # 1**: In contrast, the soundscape at the first position near the statue at the edge of the park boundary was found to be more artificial and changing in character. No meaningful historic connection was noted overall.

A fruitful conversation was shared between some participants and soundwalk researchers after the survey was completed; after more than an hour of intensive listening and walking, this indicated a high level of interest and engagement. The conversation was recorded; future iterations of the survey should record similar conversations for qualitative comparisons.

Summary

The park portion of Allan Gardens hosts an urban soundscape dominated by the sounds of passing traffic from all sides as well as construction activities in the immediate area. Some portions of the park have sonic characters partially defined by localized activities, such as the dog park or the Sacred Fire. There is little historical continuity from these elements; rather, they help define the park and its functions as understood in today's terms. The conservatory layout and interior sounds likewise have changed since their initial design and construction in 1909, presenting contemporary interpretations of horticultural presentation and education. However, the overall intention of these two areas—exterior and interior, park and botanical conservatory—has remained historically continuous. Moreover, the sonic character of these two areas of Allan Gardens have changed in their details and perhaps their intensities, yet the contrast between loud exterior and protected interior is likely in keeping with historical conditions as well. The conservatory still provides a remove and a respite from its external surroundings. As an evolving anchor of rapidly changing urban fabric, Allan Gardens presents a platform for rest from the density of surrounding urban experience; with sound mitigation and diversification strategies, the Gardens could provide much more of a sonic respite as well.

Allan Gardens		
Position	dB (SPL)	Loudness
Point A	71,6	19,4
Point B	72,0	18,0
Point C	72,8	20,3
Point D	75,4	19,8
Point E	74,2	20,5
Point F	66,8	9,1
Point G	70,2	13,6
Point H	64,4	13,8
Point J	66,3	14,5
Point K	67,8	11,6
Point L	71,8	15,0
Arid house	60,5	9,6
Tropical house	58,3	6,3
Orchid house	63,3	11,8
Temperate house	61,3	11,7
Soundwalk 1	72,7	18,6
Soundwalk 2	69,0	12,9
Soundwalk 3	65,7	9,7
Soundwalk 4	68,5	10,9
Soundwalk 5	61,3	13,5

Noise study averages at all research positions

Metric		Recording points				
		Point 1	Point 2	Point 3	Point 4	Point 5
1<----------->5		# 1	# 2	# 3	# 4	# 5
Restful	Enlivening	3,2	3,6	2,3	2,9	2,1
Contemporary	Historically authentic	2,5	2,5	3,2	2,6	3,7
Pleasant	Unpleasant	3,3	3,6	2,5	3,4	1,7
Appropriate	Inappropriate	2,6	2,8	2,5	3,0	1,7
Natural	Artifical	3,7	3,6	2,5	3,4	2,3
Should be preserved	Should be changed	3,4	3,5	2,9	3,2	1,5
Large/expansive	Small/close	2,6	2,8	3,2	3,1	3,5
Comfortable	Uncomfortable	2,9	3,5	2,3	3,3	1,7
Constant	Changing	3,8	3,5	2,6	2,9	1,8
Loud	Quiet	2,5	2,4	3,6	3,2	3,5
Historically relevant	No historic connection	3,4	3,6	3,0	3,5	2,6
Historically continuous	No historic relationship	3,0	3,6	3,2	3,2	2,9

Soundwalk survey results

An expansion of the soundwalk survey would be beneficial to gather more reliable data across a diverse group of participants. Future iterations would benefit from conducting the study repeatedly over multiple days with varying groups of people, changing the order of points to account for recency bias and sonic adaptation. It is strongly suggested to expand the noise study as well as the soundwalk to include the Palm House when the restoration works are concluded. Restoration efforts included sealing off a portion of the park grounds, and future iterations should investigate sonic dynamics in the park with the walled barriers removed.