



November 23, 2017

David Goodwin
Director
Planning & Economic Development Department
City of St. Petersburg

Re: City of St. Petersburg

Dear Mr. Goodwin,

The following is the summary of Keane Acoustics' acoustical study for the City of St. Petersburg.

Introduction

Keane Acoustics was commissioned to undertake a noise impact assessment of neighborhoods within St. Petersburg city limits in an effort to better understand how to best protect citizens from excessive noise events. This document deals strictly with noise impacts from musical events in the following areas: Downtown Jannus Landing Block, along Beach Drive (north to 3rd Ave), and the Edge District (Central Avenue west to 13th Street).

Jannus Landing Block – This neighborhood is an area surrounded by a dense network of businesses. Many of these businesses host both live and prerecorded music events. It is understood that residents complain about noise emissions from these businesses in the late evenings and into the early mornings. The businesses investigated in this neighborhood are bounded by 1st Avenue North and Central Avenue to the north and south, and 2nd Street North and 3rd Street North to the east and west, respectively.

Beach Drive and Vinoy Park – This neighborhood is a historically quiet business neighborhood surrounded by busy streets. In recent years a surge in construction of businesses and residential condominiums along these streets has emerged, including numerous sidewalk cafes. Many of these businesses host mostly prerecorded music in the evenings with occasional music themed festivals.

Edge District – This location is a busy street with a fairly dense population of businesses. Construction of restaurants, bars, and mixed use buildings (with residential on the upper floors) has increased in the past several years, including numerous sidewalk cafes. Many of these businesses host mostly prerecorded music in the evenings. There are also a number of dedicated music venues on Central Avenue, some of which are fairly close to residential properties.

Noise Criteria

The results of this study will help inform the development of quantitative sound level (decibel) requirements for a proposed revision of the City Noise Ordinance.

No suggestions regarding proposed decibel levels will be discussed in this document.

Noise Monitoring

Noise monitoring was conducted on Saturday, November 11th, from approximately 9:00 pm - 1:00 am the following day.

Instrumentation

Measurement instrumentation for the ambient sound measurements consisted of two Bruel and Kjaer Type 2270 Hand Held Analyzers, Serial No. 3010767, and 3010848, which meet ANSI standards for Type 1 instruments. The calibration of the instruments was checked before and after measurements with a Bruel and Kjaer Calibrator Type 4231, Ser. No. 2545588.

Atmospheric Conditions

During the visit, the wind was blowing at 11-17 mph from the east and the temperature ranged from approximately 72 to 74 degrees Fahrenheit. Relative humidity was 79-90%.

Methodology

A running “logging” style measurement was conducted at 1 second intervals, measuring Leq (equivalent), maximum, and minimum values for each second. Both sound level data and digital audio were recorded during the measurements.

Sound level readings were taken at property lines of the noise source and when possible, the nearest receivers. Often the sidewalk measurement locations share both the property lines of the noise source and nearest receivers. When measuring at the nearest receiver wasn't possible, an alternate location with a similar distance and direct line of sight was used.

Sound levels were also measured in transit from location to location as the investigator walked. Sound sources were identified by Venue and notes were taken to determine the degree of audibility with distance (approximate distances verified with satellite maps).

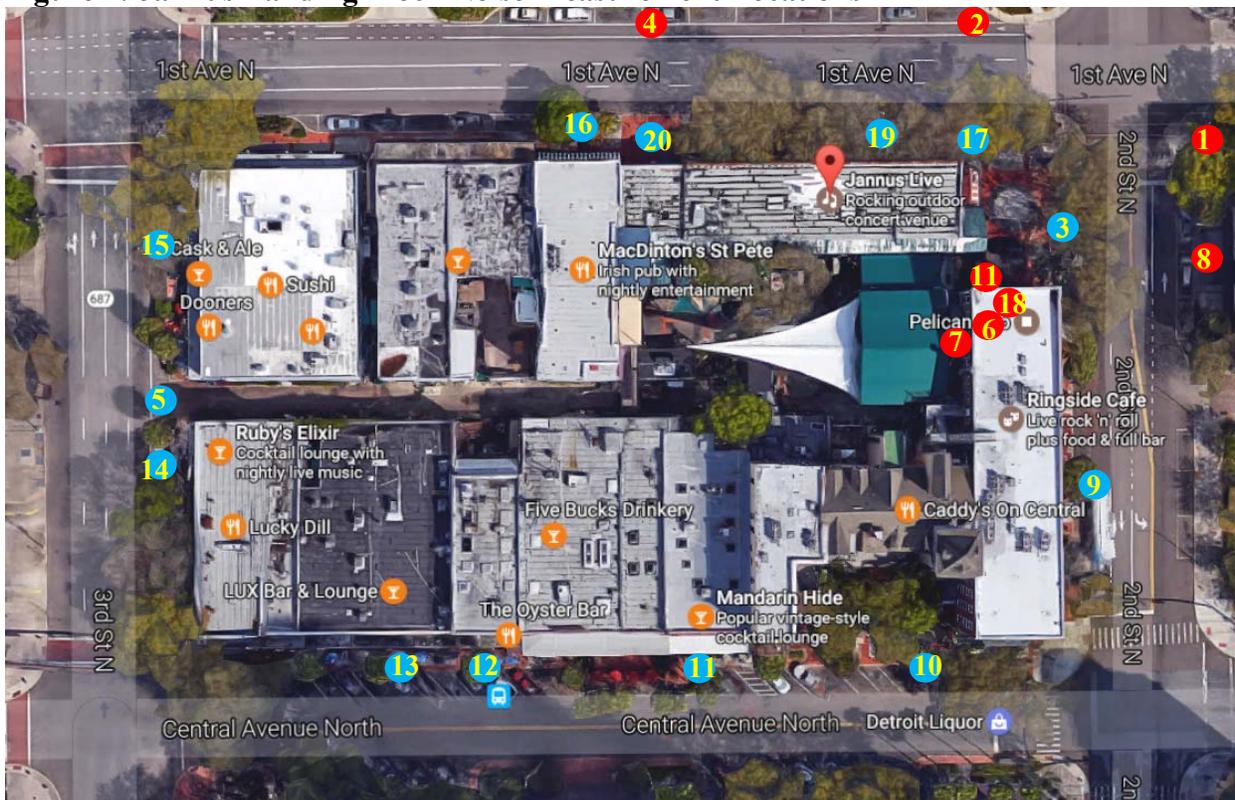
Jannus Landing Block

This is a mixed commercial/residential neighborhood hosting both live and prerecorded music events, along or nearby Central Avenue.

The following are some of the more popular music venues and the types of events hosted by each:

- *Jannus Live* – Live outdoor music
- *Ringside Café* - Indoor music - live and prerecorded
- *Caddy’s on Central* –Accessory outdoor music - live and prerecorded
- *Mandarin Hide* - Sidewalk café - prerecorded
- *Del Mar* - Sidewalk café - prerecorded
- *Lux Bar and Lounge* – Sidewalk café - prerecorded
- *Ruby’s Elixir* – Indoor music - live and prerecorded
- *Cask and Ale* - Sidewalk café - prerecorded
- *MacDinton’s* - Indoor music - live and prerecorded
- *The Landing* - Accessory outdoor music - prerecorded

Figure 1: Jannus Landing Block Noise Measurement Locations



Red dots = residential locations (existing, proposed and hotels) at which the noise measurements in this study were made.

Blue dots = sidewalk locations at which the noise measurements in this study were made.

Noise Monitoring

A site inspection was conducted to determine the nearest noise sensitive receivers for each venue.

Table 1 below presents the nearest “receiver” (either residential property line or public sidewalk) and distance to the noise source on the property. (Figure 1 above shows locations of these receivers.)

Table 1: Noise Sensitive Receivers – Jannus Landing Block

Music Venues	Sound Measurement Location {All distances are approximate}	Receiver Type
Jannus Live	1: Outside hotel, 143’ from stage 2: Future Condo, 154’ from stage 3: East opening, 53’ from stage 4: North opening, 175’ from stage 20: North opening, 5’ from gate 5: West opening, 306’ from stage 6: Detroit residence inside (windows closed) 7: Detroit residence outside 8: Hotel Conference Room (5 th Floor)	Residence Residence Sidewalk Residence Sidewalk Sidewalk Residence Residence Residence
Ringside Café	9: 5’ from front door	Sidewalk
Caddy’s on Central	10: on sidewalk	Sidewalk
Mandarin Hide	11: 5’ from front door	Sidewalk
Del Mar	12: 10’ from canopy mounted outdoor loudspeaker	Sidewalk
Lux Bar and Lounge	13: 10’ from wall mounted outdoor loudspeaker	Sidewalk
Ruby’s Elixir	14: 10’ from front door	Sidewalk
Rattle and Hum	15: 5’ from front door	Sidewalk
260 1st	16: 5’ from front door	Sidewalk
The Landing	17: on sidewalk directly below 18: inside residence window to the south	Sidewalk Residence
MacDinton’s	19: 5’ from front door	Sidewalk

Typical Ambient Noise Level

The ambient noise level defines the baseline of noise in a neighborhood. Readings significantly higher than the ambient noise level are considered noise events. Typical ambient noise levels (in absence of nearby noise events) during the survey ranged from 54 to 60 dBA and 69 to 75 dBC during the visit. These values were taken two blocks west of the Jannus block in order to measure without the influence of the music venues. In the immediate area of the Jannus block, the ambient sound is more of an average of the music venues. It is understood that this elevated ambient sound level often persists after midnight (confirmed evening of investigation – noise levels were only slightly lower from most Jannus Venues at 1am).

Non-Venue Noise Sources

Observations of non-venue noise sources include:

- vehicular noise (mostly slow moving vehicles)
- braking noise and occasional music from vehicles
- louder vehicles consisting of trucks, sports cars and motorcycles

Venue Noise Sources

The following table shows the typical sound level range measured the evening of the visit and the degree of impact for each venue observed during the visit:

Table 2: Impacts at Noise Sensitive Receivers – Jannus Landing Block

Music Venues	Measurement Location	Typical dBA¹ Range	Typical dBC² Range	Impact	Typical Plainly Audible Distance From Sound Source (feet)	
Jannus Live	1: Hyatt - outside	70-75	92-98	4	700+	
	2: future condo	84-86	90-94	4		
	3: east opening	73-77	100-106	4		
	4: north opening	70-73	91-98	4		
	5: west opening	79-83	85-90	3/4		
	<u>6: Inside Detroit:</u>					
	-windows open	87-90	95-105	4	N/A	
	-windows closed	70-77	85-90	4	N/A	
<u>7: Outside Detroit</u>		90-100	100-110	4	N/A	
8: Hyatt (5 th Floor)		50-52	72-75	1/2	N/A	
Ringside Café	9: sidewalk near door	88-90	95-100	4	100 (masked ³)	
Caddy's on Central	10: near stage	80-82	90-93	3	100	
Mandarin Hide	11: sidewalk	79-82	88-91	3	<50 (masked ³)	
Del Mar	12: sidewalk	84-87	92-95	3/4	75 (masked ³)	
Lux Bar and Lounge	13: sidewalk	74-80	87-92	3	60 (masked ³)	
Ruby's Elixir	14: sidewalk	76-83	92-98	3/4	100+ (masked ³)	
Rattle and Hum	15: sidewalk	75-80	85-90	3	<50 (masked ³)	
260 1st	16: sidewalk	80-82	90-92	3	<50 (masked ³)	
MacDinton's	17: sidewalk	84-88	88-92	3	<50 (masked ³)	
The Landing	18: sidewalk	75-81	85-90	4	<50 (masked ³)	
	19: inside residence					
	Window open	70-78	78-85	4		
	Window closed	50-55	67-73	4		

Impact Scale:

- 1) *No impact – sound emissions often masked by ambient noise or adjacent (louder) venues*
- 2) *Slight impact – sound levels exceed ambient noise on occasion by more than 5 dB*
- 3) *Moderate impact – sound levels exceed ambient noise on a regular basis and by more than 10 dB on occasion*
- 4) *Strong impact – sound levels significantly exceed ambient noise – often by a considerable amount (~10 dB or more)*

Note: The impact scale above takes account of the adjacent properties in conjunction with the overall sound levels to determine degree of impact (not just overall sound level).

¹ dBA refers to an A-weighted measurement where the decibel values of sounds at low frequencies are reduced, compared with unweighted decibels. This metric represents the way the human ear perceives the intensity of different audio frequencies from quiet to moderate sound levels.

² dBC refers to a C-weighted measurement where the decibel values of sounds at very low frequencies are only slightly reduced, compared with unweighted decibels. This metric is more commonly associated with loud music. The human ear hears most audio frequencies fairly evenly at loud levels commonly associated with music venues.

³ Masking is the inability to hear a given sound due to being drowned out or covered up by another (usually louder) sound. Music from several of the smaller venues on Central Avenue are masked by music from larger venues.

Regarding Sound Level Measurements and Distance

The sound level measurements above were conducted at the locations illustrated in Figure 1 (red and blue dots), which would be the likely sound measurement points for enforcement. Note some of these measurements are located at very close distances to the noise source (such as the sidewalk cafes) whereas other measurements are located further away (such as Jannus Live).

Buskers

Buskers were commonly observed throughout this location, with a stronger presence on Central Avenue. The musicians in this area tended to be playing wind instruments (such as saxophones). The loudest busker was a guitarist with an amplifier. Typical sound levels measured 65-80 dBA, and 75-88 dBC at short distances of 10-15 feet. The degree of audibility by distance depended upon the noise emissions from adjacent venues. Buskers were occasionally audible from over 100 feet.

Observations

In general, nearly all venues exceeded 90 dBC and multiple venues were well in excess of 85 dBA and 100 dBC at the property lines (commonly used to assess compliance with a decibel based noise ordinance) and were often plainly audible at distance of several hundred feet or more.

Often the “plainly audible” distance for the smaller venues is reduced due to noise masking from the larger venues (such as Jannus Live). Otherwise these venues would be audible from much further away.

It was noted that several of the sidewalk cafes investigated have loudspeakers pointing outward toward the sidewalks resulting in a high dBA and dBC measurement.

The noise emissions from the Landing were much lower than the previous visit and more in line with neighboring venues.

Hyatt Hotel

Low frequency sound from Jannus Live was plainly audible inside the new Hyatt Hotel in the 5th floor Conference room, despite the selection of robust sound blocking windows.

Sound was more clearly audible in the Hyatt Lobby (likely due to the revolving doors, which block less sound than the windows).

Detroit Residence

Sound levels from Jannus Live inside and outside a Detroit residential unit were excessive (with and without windows open). Discernable vibrations were detected as windows and doors rattled frequently.

Sounds from the live music venue at Ringside below were also clearly audible. It is understood that loudspeakers may be possibly hung from the ceiling directly connected to the floor assembly (this was not verified during the visit).

Beach Drive Neighborhood

The Beach Drive neighborhood appears to be transitioning from a quiet neighborhood to one that is shared with an increasing number of businesses. A growing number of cafes host mostly prerecorded music (some with DJs). The following are some of the more popular music venues and the types of events hosted by each:

- *Tryst* – Accessory outdoor music - live and prerecorded
- *Ale and Witch* – Accessory outdoor music - live and prerecorded
- *Stillwaters Tavern* - Accessory outdoor music - prerecorded

See Figure 2 below for a map of the neighborhood showing the noise monitoring locations corresponding to the above venues:

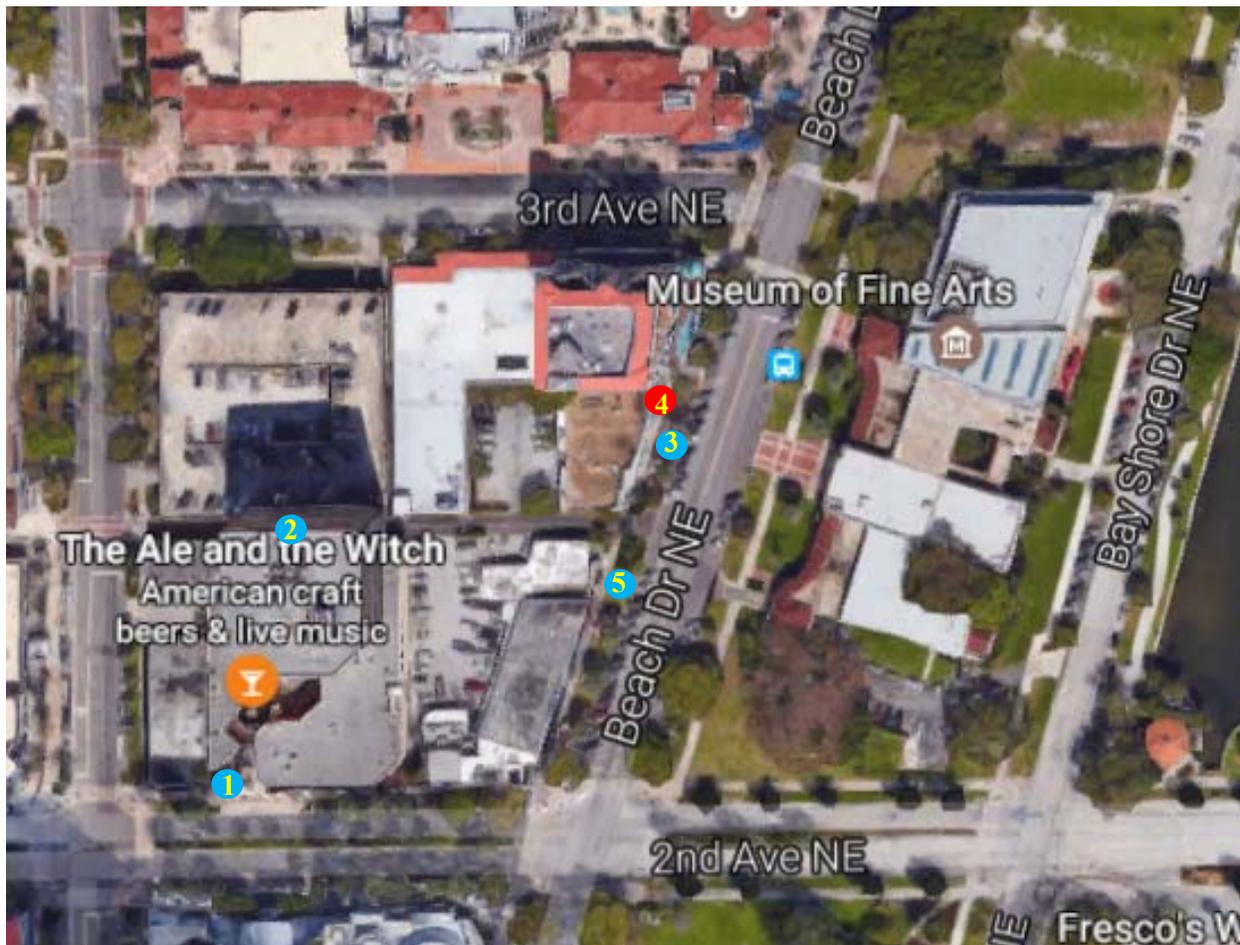


Figure 2: Beach Drive Noise Measurement Locations (South)

Red dots = residential locations at which the noise measurements in this study were made.

Blue dots = sidewalk locations at which the noise measurements in this study were made.

Noise Monitoring

Table 3 below presents the nearest “receiver” (either residential property line or public sidewalk) and distance to the noise source on the property. (Figure 3 above shows locations of these receivers.)

Table 3: Noise Sensitive Receivers - Beach Drive

Music Venues	Sound Measurement Location {All distances are approximate}	Receiver Type
Ale and Witch	1: 100 ft north of performance area 2: 100 ft south of performance area	Sidewalk Sidewalk
Tryst	3: 5ft from loudspeaker near tables 4: 15 ft to north at closest facade	Sidewalk Residence
Stillwaters Tavern	5: 10ft from loudspeaker near tables	Sidewalk

Typical Ambient Noise Level

The ambient noise level defines the baseline of noise in a neighborhood. Readings significantly higher than the ambient noise level are considered noise events. The typical ambient noise level (in absence of nearby noise events) during the visit survey ranged from 55 to 62 dBA and 65 to 72 dBC during the visit.

Non-Venue Noise Sources

Observations of non-Venue noise sources from both visits were as follows:

- Vehicular Noise – typically slow moving vehicles. Braking noise and occasional music from vehicles was observed. Louder vehicles consisted of trucks and motorcycles.
- Residential HVAC – the audible drone that helps set the background noise level. This sound was faintly audible on occasion near Beach Drive (typically when nearby vehicular traffic had momentarily subsided).

Venue Noise Sources

The following shows the degree of impact for each venue observed during the visit:

Table 4: Impacts at Noise Sensitive Receivers - Beach Drive North and South

Music Venues	Measurement Location	Typical dBA¹ Range	Typical dBC² Range	Impact	Typical Plainly Audible Distance From Sound Source (feet)
Ale and Witch	1: north courtyard 2: south courtyard	80-83 72-75	84-91 82-84	4 4	300
Tryst	3: sidewalk 4: residence to north	75-86 77-81	85-98 88-91	4	175-200
Stillwaters Tavern	5: sidewalk	63-70*	73-76*	1	<50

Impact Scale:

- 1) *No impact – sound emissions often masked by ambient noise or adjacent (louder) venues*
- 2) *Slight impact – sound levels exceed ambient noise on occasion by more than 5 dB*
- 3) *Moderate impact – sound levels exceed ambient noise on a regular basis and by more than 10 dB on occasion*
- 4) *Strong impact – sound levels significantly exceed ambient noise – often by a considerable amount (~10 dB or more)*

¹ dBA refers to an A-weighted measurement where the decibel values of sounds at low frequencies are reduced, compared with unweighted decibels. This metric represents the way the human ear perceives the intensity of different audio frequencies from quiet to moderate sound levels.

² dBC refers to a C-weighted measurement where the decibel values of sounds at very low frequencies are only slightly reduced, compared with unweighted decibels. This metric is more commonly associated with loud music. The human ear hears most audio frequencies fairly evenly at loud levels commonly associated with music venues.

One of the sidewalk measurements was dominated by speech, and thus the sound levels measured reflect more in terms of conversation than noise emissions from music (these are labeled by an asterisk in the dBA and dBC columns in table 6).

Buskers

Buskers were observed along Beach Drive, typically spaced in between Venues and Cafes. The musicians in this area tended to be singing and accompanied by guitars. Typical sound levels measured in the vicinity of 70 dBA and 80 dBC at short distances of 10-20 feet. The degree of audibility by distance depended upon the noise emissions from adjacent venues. Buskers were in this location were plainly audible from 30-40 feet, occasionally audible from roughly 50-60 feet, but rarely audible over 100 feet.

Observations

In general, the light music played at the sidewalk cafes (excluding Tryst), typically consisted of “background” music which was easily masked by the conversations of customers. Buskers in the area tended to limit their sound output such that it was usually masked by the sound from adjacent venues (either music, talking or both).

Several of the sidewalk measurements were dominated by speech, and thus the sound levels measured reflect more in terms of conversation than noise emissions from music (these are labeled by an asterisk in the dBA and dBC columns in table 4).

It is likely that the dBC levels from Tryst are propagating inside the residential building immediately to the north via the windows (which are typically poor at blocking bass).

Note the lower ambient noise in this neighborhood means impacts occur in a lower sound level range.

Edge District

The Edge District continues to grow with an increasing number of businesses. A growing number of businesses host mostly prerecorded music (some with DJs), whereas most live music venues have been established in the area for some time. The following are some of the more popular music venues and the types of events hosted by each:

- *Ferg’s* –Accessory outdoor music - live and prerecorded
- *Enigma* – Accessory outdoor music - live and prerecorded
- *Independent* – Accessory outdoor music - live and prerecorded
- *State Theater* – Indoor music - live and prerecorded
- *Fubar* - Indoor music - live and prerecorded
- *Local 662* - Indoor music - live and prerecorded

See Figure 3 below for maps of the neighborhood showing the noise monitoring locations corresponding to the above venues:



Figure 3: Edge District Noise Measurement Locations (South)

Red dots = residential locations at which the noise measurements in this study were made.
Blue dots = sidewalk locations at which the noise measurements in this study were made.

Noise Monitoring

Table 3 below presents the nearest “receiver” (either residential property line or public sidewalk) and distance to the noise source on the property. (Figure 3 above shows locations of these receivers.)

Table 5: Noise Sensitive Receivers - Edge District

Music Venues	Sound Measurement Location {All distances are approximate}	Receiver Type
Ferg’s	1: Sidewalk	Sidewalk
Enigma	2: Sidewalk	Sidewalk
Independent	3: On sidewalk near center of tables 4: Sidewalk across street under condo	Sidewalk Residence
State Theater	5: On sidewalk near front door 6: Sidewalk across street	Sidewalk Sidewalk
The Lure	7: On sidewalk near center of tables	Sidewalk

Typical Ambient Noise Level

The ambient noise level defines the baseline of noise in a neighborhood. Readings significantly higher than the ambient noise level are considered noise events. The typical ambient noise level (in absence of nearby noise events) during the visit survey ranged from 55 to 63 dBA and 65 to 73 dBC during the visit.

Non-Venue Noise Sources

Observations of non-Venue noise sources from both visits were as follows:

- Vehicular Noise – typically slow moving vehicles. Braking noise and occasional music from vehicles was observed. Louder vehicles consisted of trucks and motorcycles.

Venue Noise Sources

The following shows the degree of impact for each venue observed during the visit:

Table 6: Impacts at Noise Sensitive Receivers - Edge District

Music Venues	Measurement Location	Typical dBA¹ Range	Typical dBC² Range	Impact	Typical Plainly Audible Distance From Sound Source (feet)
Ferg’s	1: sidewalk	69-74*	72-77*	1/2	< 50 feet
Enigma	2: sidewalk	65-81*	72-83*	1/2	< 50 feet
Independent	3: sidewalk at tables	65-77*	80-85	3	100
	4: sidewalk (across street)	62-64	75-78		
State Theater	5: sidewalk (10’ from door) -open	75-80	92-97	4	100-150
	-closed	67-70	87-91		
	6: sidewalk (across street)	62-68	77-85	4	
The Lure	7: sidewalk (5’ from speaker)	75-78*	78-81*	1	30-40*

Impact Scale:

- 1) *No impact – sound emissions often masked by ambient noise or adjacent (louder) venues*
- 2) *Slight impact – sound levels exceed ambient noise on occasion by more than 5 dB*
- 3) *Moderate impact – sound levels exceed ambient noise on a regular basis and by more than 10 dB on occasion*
- 4) *Strong impact – sound levels significantly exceed ambient noise – often by a considerable amount (~10 dB or more)*

¹ dBA refers to an A-weighted measurement where the decibel values of sounds at low frequencies are reduced, compared with unweighted decibels. This metric represents the way the human ear perceives the intensity of different audio frequencies from quiet to moderate sound levels.

² dBC refers to a C-weighted measurement where the decibel values of sounds at very low frequencies are only slightly reduced, compared with unweighted decibels. This metric is more

commonly associated with loud music. The human ear hears most audio frequencies fairly evenly at loud levels commonly associated with music venues.

Several of the sidewalk measurements were dominated by speech, and thus the sound levels measured reflect more in terms of conversation than noise emissions from music (these are labeled by an asterisk in the dBA and dBC columns in table 6).

Buskers

Buskers were not observed in any significant quantities within the Edge District.

Observations

Several of the sidewalk measurements were dominated by speech, and thus the sound levels measured reflect more in terms of conversation than noise emissions from music (these are labeled by an asterisk in the dBA and dBC columns in table 6).

The State Theater was by far the loudest venue due to the live music and there was likely a side door open which may have impacted sound measurements. Sound from this venue was plainly audible across the street, but appeared to dissipate fairly quickly down Central Avenue due to fairly steady vehicular noise.

Summary

Keane Acoustics conducted a series of noise measurements at and around the Jannus Landing block, Edge District, and along Beach Drive on Saturday November 11th 2017. Sound levels from musical performances and related impacts have been presented in this report. This information will help inform any proposed revisions to the existing St. Petersburg Noise Ordinance.

Best regards,



Michael Keane, P.E