

## MEMORANDUM

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**To:** Edgardo Caldera (City of Fullerton)  
**From:** James P. Cowan, INCE Bd.Cert.  
**Subject:** City of Fullerton Downtown District Noise Ordinance Evaluation  
**Date:** November 2, 2023  
**cc:** Mark Storm, INCE Bd.Cert., Sunayana Thomas (City of Fullerton), Guillermina Torrico (City of Fullerton), Taylor Samuelson (City of Fullerton)  
**Attachment(s):** Appendix A – Long-Term Monitored Data Charts  
Appendix B – Aerial Maps Showing Noise Data by Location

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It is our understanding that the City of Fullerton would like to update their noise ordinance (Chapter 15.90 of the Fullerton Municipal Code) to create an enforceable policy for commercial noise levels in the Downtown that also addresses outdoor entertainment and resident quality of life. These types of activities conflict with the current version of the noise ordinance, which is relevant to the entire city, including the Downtown District. Dudek has been retained by the City to evaluate the current noise environment in the C-3 (Central Business District, Commercial) Zone through sound measurements and observations, resulting in recommendations for noise ordinance stipulations that would provide minimal restrictions for businesses having outdoor entertainment permits while providing an easily enforceable and acceptable noise environment for local residents.

Since the term “noise” is defined as unwanted sound (and thereby a subset of sound), the words “noise” and “sound” are being used interchangeably in this memo.

### 1 Current Noise Regulation

The current version of Chapter 15.90 imposes exterior noise level limits of 55 dBA between 7:00 am and 10:00 pm and 50 dBA between 10:00 pm and 7:00 am in residential zones. The limits are increased by 5 dBA for a cumulative 30 minutes per hour, by 10 dBA for 15 minutes per hour, and by 15 dBA for less than 5 minutes per hour. These limits are incompatible with outdoor entertainment where there are nearby residences; however, the closest residential zones to the C-3 Zone are hundreds of feet away from any establishment having outdoor entertainment, and the current noise limits are practical for those areas. Of concern are isolated residences in the C-3 Zone that share building spaces with commercial businesses. The closest of those properties are roughly 50 feet away from any permitted outdoor entertainment.

## 2 Noise Monitoring Program and Results

After reviewing feedback that the City collected from public community meetings and members of City Council, the first step in this evaluation was to develop and implement a sound monitoring program to determine the baseline conditions. Outdoor ambient noise levels were monitored over a Thursday to Sunday period to determine the range of typical sound levels associated with outdoor entertainment and other background sound-generating sources in the C-3 Zone and surrounding communities.

### 2.1 Noise Descriptors Used

Since sound levels are constantly changing in the outdoor environment, noise levels are typically rated using various temporal and statistical values rather than instantaneous levels. The noise descriptors used in this analysis were chosen to represent the range of values present without emphasizing isolated, infrequent, and atypical events. They are all commonly used for rating sound pressure levels in standards, guidelines, and ordinances in California and across the country. The A-weighted decibel scale (dBA) is used for all sound levels, given its national acceptance as correlating with human hearing sensitivities at moderate sound levels. The following noise descriptors were used in evaluating the acquired data:

- $L_{eq}$  – the equivalent level over a specified time period, which is the constant sound pressure level associated with the same amount of acoustic energy as the actual time-varying signal level, thought of as an energy-average. The peak-hour  $L_{eq}$  is the highest hourly energy-averaged value over the course of a continuous 24-hour period.
- $L_{max}$  – the maximum instantaneous sound level occurring during a measurement period.
- $L_{min}$  – the minimum instantaneous sound level occurring during a measurement period.
- $L_5$  – the sound level exceeded for a cumulative (i.e., does not need to be a continuous period) five percent (5%) of the time during a specified time period (e.g., a total of 3 minutes out of an hour), which is thus an indication of the highest sound levels recorded while discarding isolated, infrequent events.
- $L_{25}$  – the sound level exceeded 25% of the time during a specified time period (e.g., a total of 15 minutes out of an hour).
- $L_{50}$  – the sound level exceeded 50% of the time during a specified time period (e.g., a total of 30 minutes out of an hour), which is an indication of the statistical median sound level recorded during a specified monitoring session.
- $L_{90}$  – the sound level exceeded 90% of the time during a specified time period (e.g., a total of 54 minutes out of an hour, or the quietest 10% of the time), which is an indication of the residual background sound pressure while discarding unusually quiet, short time periods.
- CNEL – community noise equivalent level, which is a 24-hour average level based on adding 5 dBA to sound levels occurring between the evening hours of 7:00 pm and 10:00 pm and adding 10 dBA to sound levels occurring between the nighttime hours of 10:00 pm and 7:00 am to account for the added sensitivity of

people to noise during the evening and normal sleeping times. CNEL is used in California to rate daily noise levels but most agencies across the country use  $L_{dn}$  (the day-night average sound level) for that purpose.  $L_{dn}$  values add 10 dBA to all sound levels occurring between 10:00 pm and 7:00 am as CNEL values do, but they do not adjust sound levels occurring during the 7:00 to 10:00 pm evening hours.

## 2.2 Noise Monitoring Process and Results

Noise monitoring was performed from Thursday, September 14 to Sunday, September 17, 2023. For each monitoring session, each sound level meter (SLM) was mounted on a tripod, equipped with an appropriate windscreen, and weather conditions were appropriate for reliable readings, with light winds and no precipitation. Photo logs and data summaries from all readings are stored in our project files and are available upon request.

Readings were taken at eight (8) unattended long-term (minimum 24-hour duration) locations (denoted with the “ML” prefix) and twenty-five (25) short-term locations (denoted with the “ST” prefix), as shown in Figure 1. Tables 1 and 2 list the addresses and closest businesses associated with the long-term and short-term monitoring locations, respectively. On Thursday, September 14, four (4) field- and factory-calibrated Soft dB Piccolo II SLMs were deployed to conduct unattended long-term monitoring for 72-hour durations at sites ML2, ML4, ML5, and ML6. These meters meet American National Standards Institute (ANSI) S1.4 Type 2 and Class 2 tolerance limitations (discussed in Section 3.2 of this memo). After the 72-hour long-term SLMs were deployed, investigator-attended short-term measurements were conducted in 15-minute intervals throughout the C-3 Zone at both ML and ST sites. Short-term measurements were taken in the C-3 Zone that had the highest levels of activity (with live bands performing outdoors and/or large crowds in or near bars or restaurants).

On Friday, September 15, two (2) unattended long-term Piccolo II SLMs were deployed at sites ML1 and ML7 for 48-hour durations and a long-term SLM was deployed at site ML3 for a 24-hour duration. Investigator-attended short-term monitoring began in the late afternoon during rush hour, and monitoring was focused on the north/northeast and south/southwest areas of Fullerton to capture peak activity levels near shopping centers and plazas. In the evening, the monitoring focus shifted to the C-3 Zone where activity levels were highest around the local bars and restaurants. This strategy was repeated on Saturday, September 16, when the 24-hour long-term SLM at ML3 was retrieved and redeployed for 24 hours at site ML8. On Sunday, September 17, the long-term SLMs were retrieved for data collection, and no further short-term monitoring was performed.

Measurements were not taken at some originally planned short-term monitoring sites – ST2, ST3, ST6, ST9, ST25, and ST31 – due to on-site observations at the time of monitoring, which suggested that activity levels (volume of foot and vehicle traffic, events and/or large gatherings) were low throughout the 4-day monitoring period. Therefore, other short-term monitoring sites were prioritized, such as those in the C-3 Zone or near high-activity shopping centers and plazas, to record the highest noise levels in the City.





Figure 1 – Sound monitoring locations in Fullerton’s Downtown (C-3) District

Table 1 – Long-term (ML) monitoring locations

Location ID	Address	Closest Business	Distance from Business (ft)	Distance from Closest Residential Zone (ft)
ML1	125 W Santa Fe Ave	Heroes Bar & Grill	100	285
ML2	124 W Commonwealth Ave	Garcia’s, Heroes	50	430
ML3	150 S Harbor Blvd	Bourbon Street Bar, Crawfish Cave	50	600
ML4	210 N Harbor Blvd	The Night Owl	50	530
ML5	116 ½ W Wilshire Ave	Ziing’s Nightclub, Roman Cucina	20	330
ML6	215 N Harbor Blvd	Ziing’s Nightclub, Roman Cucina	20	400
ML7	121 E Wilshire Ave	Fullerton Museum Center	50	340
ML8	310 N Harbor Blvd	Farolito of Fullerton	15	175

**Table 2 – Short-term (ST) monitoring locations**

Location ID	Address	Closest Business	Distance from Business (ft)	Distance from Closest Residential Zone (ft)
ST1	1027 N Harbor Blvd	Ralph's, Wingstop, Budget Car Rental	20	270
ST2*	800 N Harbor Blvd	Fullerton Car Wash, Havoline Xpress Lube	60	40
ST3*	701 N Harbor Blvd	Forte Strings Violin Shop	100	100
ST4	107 W Malvern Ave	Classic Tattoo Parlor, Fox Fullerton Theatre	250	75
ST5	119 E Chapman Ave	McDonald's	15	100
ST6*	398 N Malden Ave	Celebrity Paw Spa	100	35
ST7	444 N Harbor Blvd	Wahoo's Fish Taco, Citi Bank	30	125
ST8	301 N Pomona Ave	Fullerton Museum Center	20	265
ST9*	128 W Wilshire Ave	Les Amis Restaurant & Lounge	20	300
ST10	202 W Amerige Ave	R&R Smoke & Vape	80	150
ST11	107 W Amerige Ave	Revolucion Cantina & Mezcaleria, MADE Coffee, Hapa Cupcakes & Cakes	15	675
ST12	204 N Pomona Ave	Rutabegorz	130	60
ST13	218 W Commonwealth Ave	Pacific Premier Bank, Centinela Feed & Pet Supplies	20	460
ST14	136 E. Commonwealth Ave	Stubrik's Steakhouse, Bourbon Street Bar, Hopscotch Craft	10	580
ST15	229 E Commonwealth Ave	Qamaria Yemeni Coffee Co.	10	20
ST16	603 S Harbor Blvd	Chevron, California Car Company	50	130
ST17	900 S Harbor Blvd	Costco Wholesale	300	250
ST18	1375 S Harbor Blvd	Burger King	50	700
ST19	1401 S Lemon St	Best Buy	100	695
ST20	268 Imperial Hwy	Supercuts	50	180
ST21	2698 East Coyote Hills Trail	Krispy Krunchy Chicken	230	90
ST22	2920 Yorba Lina Blvd	Target	200	250
ST23	3330 Yorba Linda Blvd	Ralph's	50	350
ST24	505 N State College Blvd	Nick the Greek, Chipotle, Starbucks	50	230
ST25*	109 N Cornell Ave	Nick's Super Burgers	80	250
ST26	1415 W Commonwealth Ave	A1 Self Storage	15	175
ST27	111 N Euclid St	El Pollo Loco	20	175
ST28	901 W Commonwealth Ave	Patty's Cakes and Desserts, Community Auto Repair Service	50	80
ST29	701 W Commonwealth Ave	Patrick's Music School	50	165
ST30	600 W Commonwealth Ave	Maison Fox Natural Wine Bar	100	50
ST31*	1653 W Orangethorpe Ave	Fullerton Arirang Supermarket	250	235

**Note:** \* - reading not taken at this location due to lack of activity

Charts showing time histories of long-term monitoring sessions are included in Appendix A of this memo. These charts show readings in terms of both hourly and 5-minute intervals at each location to show general trends and short-term variations in sound levels. Appendix B shows aerial maps of the C-3 Zone with summaries of sound readings over the course of the 4-day monitoring program. Tables 3 and 4 summarize the results for the long-term and short-term readings, respectively. The focus of attention was the time period between 5:00 pm and midnight, when most of the C-3 Zone activities were at their peak.

**Table 3 – Long-term (ML) monitoring results (all values in dBA)**

Location	CNEL	Peak-hour Leq	Average Hourly Leq (5pm to 12am)	Average Hourly L <sub>25</sub> (5pm to 12am)	Average Hourly L <sub>5</sub> (5pm to 12am)	Dominant Noise Source
ML1	71	71	63	60	66	Traffic/People/Music
ML2	74	70	64	63	65	People/Music
ML3	71	68	64	63	66	Traffic/Music
ML4	69	71	62	61	64	Music
ML5	74	71	68	68	69	Music
ML6	78	78	71	71	76	Traffic
ML7	60	63	54	53	55	Traffic
ML8	78	80	73	72	77	Traffic
Overall average (5pm to 12am)			65	64	67	

**Table 4 – Short-term (ST) monitoring results (all values in dBA)**

Location	Address	Closest Business	Measured L <sub>eq</sub>	Measured L <sub>90</sub>
ST1	1027 N Harbor Blvd	Ralph's, Wingstop, Budget Car Rental	60.3	53.4
ST4	107 W Malvern Ave	Classic Tattoo Parlor, Fox Fullerton Theatre	67.7	61.5
ST5	119 E Chapman Ave	McDonald's	64.9	56.5
ST7	444 N Harbor Blvd	Wahoo's Fish Taco, Citi Bank	69.8	60.8
ST8	301 N Pomona Ave	Fullerton Museum Center	64.5	59.8
ST10	202 W Amerige Ave	R&R Smoke & Vape	56.5	51.0
ST11	107 W Amerige Ave	Revolucion Cantina & Mezcaleria, MADE Coffee, Hapa Cupcakes & Cakes	62.5	58.9
ST12	204 N Pomona Ave	Rutabegorz	55.7	49.5
ST13	218 W Commonwealth Ave	Pacific Premier Bank, Centinela Feed & Pet Supplies	63.5	52.4
ST14	136 E. Commonwealth Ave	Stubrik's Steakhouse, Bourbon Street Bar, Hopscotch Craft	68.3	61.7
ST15	229 E Commonwealth Ave	Qamaria Yemeni Coffee Co.	69.5	60.1
ST16	603 S Harbor Blvd	Chevron, California Car Company	64.9	57.5
ST17	900 S Harbor Blvd	Costco Wholesale	60.7	56.7
ST18	1375 S Harbor Blvd	Burger King	59.1	54.5
ST19	1401 S Lemon St	Best Buy	59.1	56.1
ST20	268 Imperial Hwy	Supercuts	70.2	63.3
ST21	2698 East Coyote Hills Trail	Krispy Krunchy Chicken	71.3	64.5
ST22	2920 Yorba Lina Blvd	Target	73.0	66.6
ST23	3330 Yorba Linda Blvd	Ralph's	68.7	60.3
ST24	505 N State College Blvd	Nick the Greek, Chipotle, Starbucks	67.7	62.0
ST26	1415 W Commonwealth Ave	A1 Self Storage	64.5	54.3
ST27	111 N Euclid St	El Pollo Loco	69.0	59.7
ST28	901 W Commonwealth Ave	Patty's Cakes and Desserts, Community Auto Repair Service	61.9	55.2
ST29	701 W Commonwealth Ave	Patrick's Music School	68.4	59.6
ST30	600 W Commonwealth Ave	Maison Fox Natural Wine Bar	64.3	54.5

Except for locations close to active outdoor music performances, the dominant noise source at all locations was road traffic. General trends in the data show  $L_{90}$  background levels in the 50s to mid-60s on the dBA scale during the peak evening times for outdoor nightlife of 5:00 pm to midnight, often dominated by road traffic noise. Where music dominated the noise environment, the maximum  $L_5$  levels were in the 65 to 75 dBA range 50 feet from the establishments (see the data in Appendix A).

## 3 Noise Ordinance Recommendations

Before discussing specific recommendations for the C-3 Zone of the City of Fullerton, it will be useful to review the types of stipulations that are typically found in noise ordinances along with their effectiveness limitations.

### 3.1 Typical Stipulations

Noise ordinance sound level restrictions in California and throughout the country generally fall into one of the following three categories – qualitative, quantitative with absolute limits, or quantitative with relative limits.

#### 3.1.1 Qualitative Restrictions

Qualitative noise restrictions typically use subjective terms such as “annoying,” “disturbing,” or “unnecessary” to describe a sound level that violates the stipulations of the ordinance. Some go farther to state that noise levels that qualify as “disturbing to someone with normal sensitivities” will violate the noise ordinance. These types of restrictions are difficult to enforce given their subjective nature.

Another relatively common qualitative restriction is a statement of audibility, such as stating that a sound source that is audible at a property line or at a specified distance from a source or a property line constitutes a violation of the ordinance. Each person has different hearing sensitivities and audibility at any location depends not only on the hearing sensitivity of the listener but also on the ability of the background sound to mask the audibility of the sound source in question. In other words, what may be audible to some may not be audible to others.

Qualitative noise restrictions are impractical because of their subjective nature and their resulting difficulty to enforce. An easily enforceable noise ordinance must have objective criteria to be met, against which measured decibels taken in the field can be readily compared to determine compliance or exceedance and help inform planning and implementation of practical and reasonable noise-reducing remedies.

#### 3.1.2 Quantitative Restrictions with Absolute Limits

Quantitative noise restrictions provide objective criteria and are thus much easier to enforce than qualitative noise restrictions. They use specified sound level limits, usually varying by land use and time-of-day, with the lowest limits imposed during nighttime hours (typically, 10:00 pm to 7:00 am). Quite often these limits are copied from other ordinances without regard to the unique conditions associated with each municipality or the history of when these ordinances were originally drafted. One of the most important aspects of these types of restrictions that is often not considered is that they need to be compatible with the inherent background sound levels in an area. For example,



a daytime limit of 55 dBA is commonly used in ordinances but if the background sound levels are already close to or above that limit, the ordinance is difficult, if not impossible, to enforce. This is because the sound level associated with the source of interest cannot be separated from the sound level associated with the rest of the ambient environment. For this type of stipulation to be easily enforceable, the source of interest must generate sound levels at least 10 dBA above the background. In that case, the sound level associated with the enforcement measurement can be attributed to the source of interest alone. Otherwise, the measured sound level would be attributable only to a combination of the background level and the level associated with the source of interest.

The rationale for the aforementioned 10 dB minimum difference between the source of interest and the background level is partially based on acoustic fundamentals and the decibel scale used to quantify sound levels. Two sound levels that are 10 dB apart represent an order of magnitude difference in actual sound pressures. Put another way, if a nearby sound source is measured to be 50 dBA when it is active, and the measured background is only 40 dBA when the nearby source of interest is inactive, the latter has no substantial contribution to the former on the basis of logarithmic decibel addition – the logarithmic sum of 50 dBA and 40 dBA is 50.41 dBA, meaning the dB difference between the sum and the higher of the two levels is only 0.41 dB, which is an imperceptible difference.

The other important aspect of these types of restrictions is that they must be practical for protecting the populace in each environment. An example of this would be using the common nighttime noise ordinance limit of 50 dBA in an inherently quiet area, where background levels can be 20 dBA less than that limit. A sound source generating 50 dBA at a receptor where the inherent background level is 35 dBA will be clearly audible and potentially intrusive to many people, especially if they are trying to sleep; however, if the noise limit is such that a sound source is not permitted to exceed 50 dBA, the source in this example would comply with the ordinance.

As discussed above, when the noise levels of concern generate more than 10 dBA above any background noise at a sensitive receptor location, these types of restrictions are the easiest to enforce because an enforcement officer would only need to see a sound level exceeding the limit on a sound level meter to confirm a violation. However, if these conditions do not exist, the practicality of this method for protecting the public is significantly compromised.

### 3.1.3 Quantitative Restrictions with Relative Limits

The most effective noise ordinance criteria for protecting the public are based on the premise of quantitative noise restrictions with relative limits. This involves defining a permissible limit based on an increase in sound level over the background level, which is most closely linked to annoyance potential. This method, however, can be a challenge to enforce, mainly due to the issue of how one defines the background sound level. Typical ordinances using this type of restriction permit an increase over the background level of 5 to 10 dBA, for which the sound source would be clearly noticeable.

This method is ideal for the situation for which there is a low to moderate steady background level with a transient signal emitted by a source generating sound levels of at least 10 dBA above the background. Background levels are typically variable, though, making it difficult to define a specific level for use as a baseline. This background level definition problem is either solved by the subjective judgment of the enforcement officer or by using statistical levels to define the background (which would require the enforcement officer to have a clear understanding of noise descriptors and the operation of a potentially complicated and expensive sound level meter).

This method works best when the background level is pre-defined by separate sound level readings and the sound level limit is defined as an absolute level based on an acceptable increase above the pre-defined background level,

thus making it a hybrid of a quantitative restriction with an absolute limit based on a quantitative restriction with a relative limit.

### 3.1.4 Descriptors

There is a wide variety of noise descriptors used in ordinances around the country, most commonly one or more of those listed in Section 2.1 of this memo. Beside  $L_{\max}$  and  $L_{\min}$  (which are instantaneous values that can be read directly from the screen of a sound level meter), the other descriptors need to be calculated by a sound level analyzer. Sound analyzers that calculate these kinds of statistical and average levels tend to be expensive and unintuitive to operate, thereby requiring the enforcement officer to be highly trained in its usage or taking the chance of the officer unintentionally misinterpreting the data.

The main key to an effective noise ordinance is the ease of measurements required for any non-technical enforcement officer to determine whether or not the stipulations in the ordinance are being violated. This requires a simple sound level meter along with simple sound level limits that can be easily documented.

## 3.2 Enforcement Equipment

In addition to the simplicity of the sound level meter, it's important that the meter itself provides accurate readings. The American National Standards Institute (ANSI), through Standard S1.4, offers "type" and "class" numbers that certify the accuracy of the sound level readings a meter is capable of recording. "Class" numbers are referenced in more recent versions of the ANSI standard but "type" numbers from earlier versions of the standard are used more often in the field. ANSI S1.4 type numbers are 0, 1, and 2. Type 0 meters are typically meant for laboratory types of measurements, where the greatest accuracy is required. Types 1 (with a general  $\pm 1$  dB accuracy) and 2 (with a general  $\pm 2$  dB accuracy) are considered by the professional acoustics community to be acceptable options for field readings, with Type 1 meters having greater accuracy than Type 2 meters, but the accuracy of Type 2 meters is generally accepted for field surveys. Any sound level meters that do not meet a minimum of Type 2 accuracy should not be used for the enforcement of a noise ordinance, not only for accuracy but due to legal considerations (if readings are contested).

## 3.3 Recommendations

The information in the sections above serves as an introduction to the reasoning behind the noise ordinance stipulation recommendations included herein. As mentioned in Section 1, the current version of Chapter 15.90 imposes exterior noise level limits at residences of 55 dBA between 7:00 am and 10:00 pm and 50 dBA between 10:00 pm and 7:00 am. These limits are not only incompatible with outdoor entertainment at 50 feet (where the closest residences are located), but they exceed the measured background sound levels in the C-3 Zone.

As is shown in Table 3, the average hourly  $L_{eq}$  measured in and around the C-3 Zone was 65 dBA during the peak entertainment hours of 5:00 pm to midnight, while the average hourly  $L_{25}$  value period was 64 dBA and the average hourly  $L_5$  value was 67 dBA during the same time period. Using the hybrid criteria mentioned in Section 3.1.3 along with the average measured levels during the peak outdoor entertainment activity period of 5:00 pm to midnight with a 10 dBA increase, the recommended sound pressure level limit for the C-3 Zone is listed in Section 3.3.1 at a distance of 50 feet from the property line of the business where the source of interest is located. As an alternative for enforcement officials, this translates to a limit at the property line of the business where the source of interest is located or at a distance of 25 feet from the source of interest, whichever is greater.

The recommendations provided below are based on measured background sound levels, measured sound levels with live outdoor bands, and the understanding (from City staff) that the current conditions have generated minimal complaints from residents. In addition, the City is planning to institute a curfew of 10:00 pm each night for outdoor music.

### 3.3.1 Sound Level Limits

Based on all of the information above, including the sound level readings taken throughout the C-3 Zone over a 4-day period of peak outdoor entertainment activities, the following sound level limits are recommended for the C-3 Zone of the City of Fullerton:

1. All limits are in terms of maximum instantaneous ( $L_{max}$ ) levels for ease of enforcement.
2. A limit of 75 dBA 50 feet from the property line of a commercial property between 5:00 pm and 12:00 am., and a limit of 65 dBA 50 feet from the property of a commercial property between 12:00 and 1:30 am., or
3. A limit of 80 dBA 25 feet from a sound source on a commercial property or at the property line of the commercial property, whichever distance is greater, between 5:00 pm and 12:00 am, and a limit of 70 dBA at the same location between 12:00 and 1:30 am.
4. A limit of 55 dBA at any residence between 1:30 and 7:00 am.
5. A limit of 65 dBA at any residence between 7:00 am and 5:00 pm.

These limits are comparable to the measured current conditions which, to our understanding, are acceptable to the community. The lowered limits between 12:00 and 1:30 am are due to outdoor entertainment being curtailed and heightened sensitivities at residential properties at those times. It is assumed that all C-3 Zone entertainment venues are closed after 1:30 am (with the recommended limit being 5 dBA higher than the current nighttime residential limit due to the higher background noise levels in the C-3 Zone), and the midday limit of 65 dBA is common for these types of environments with busy local roadways throughout (as was shown through the measurements taken for this evaluation).

### 3.3.2 Equipment Recommendations for Enforcement

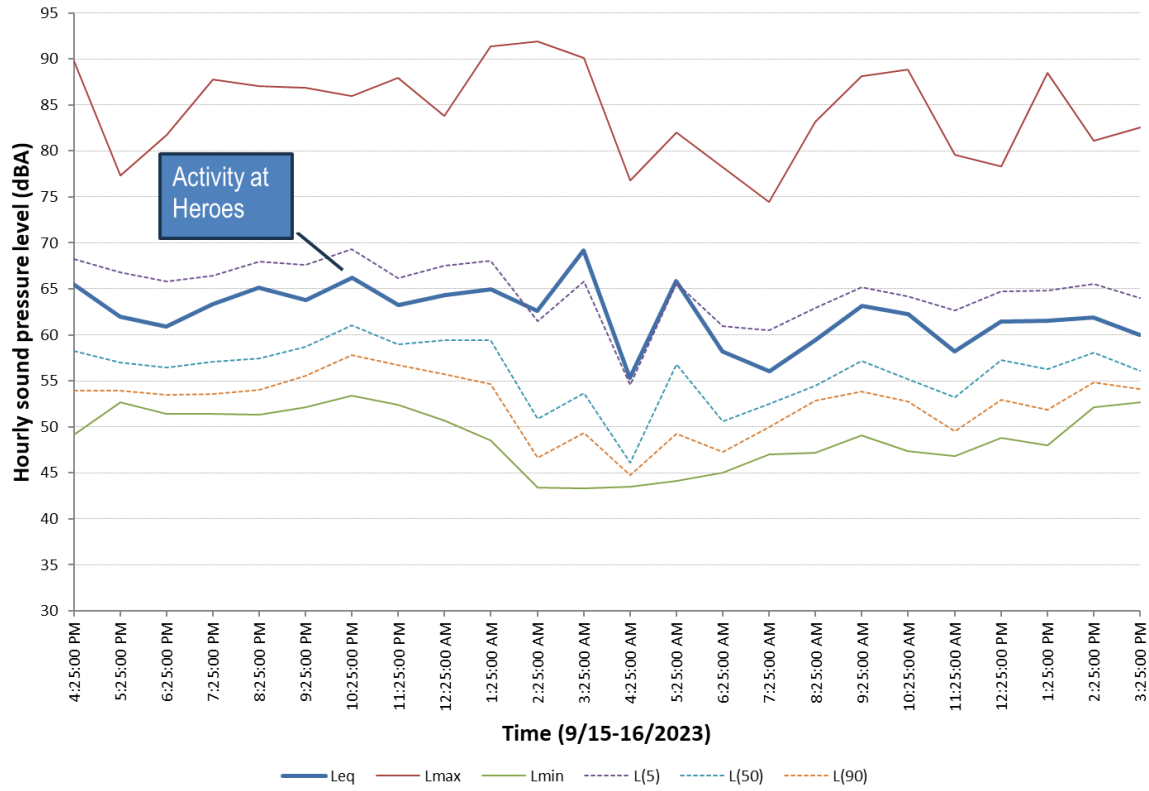
As is mentioned above, the key to effective noise ordinance enforcement is using a simple criterion that is easy to measure with a basic instrument that doesn't include statistical and averaging analyses. An ANSI Type 2 sound level meter with a field calibrator (to be used before and after each set of readings to ensure accuracy) should be used for all enforcement measurements. They should have a fitted windscreen covering the microphone (to minimize extraneous noise from air flow over the microphone) and a large digital screen that shows the live sound pressure levels in dBA. Even with a windscreen, however, readings should not be taken when wind speeds are higher than 15 miles per hour, which is the protection limit for most windscreens. Dudek can provide recommendations of specific sound level meters if so desired.

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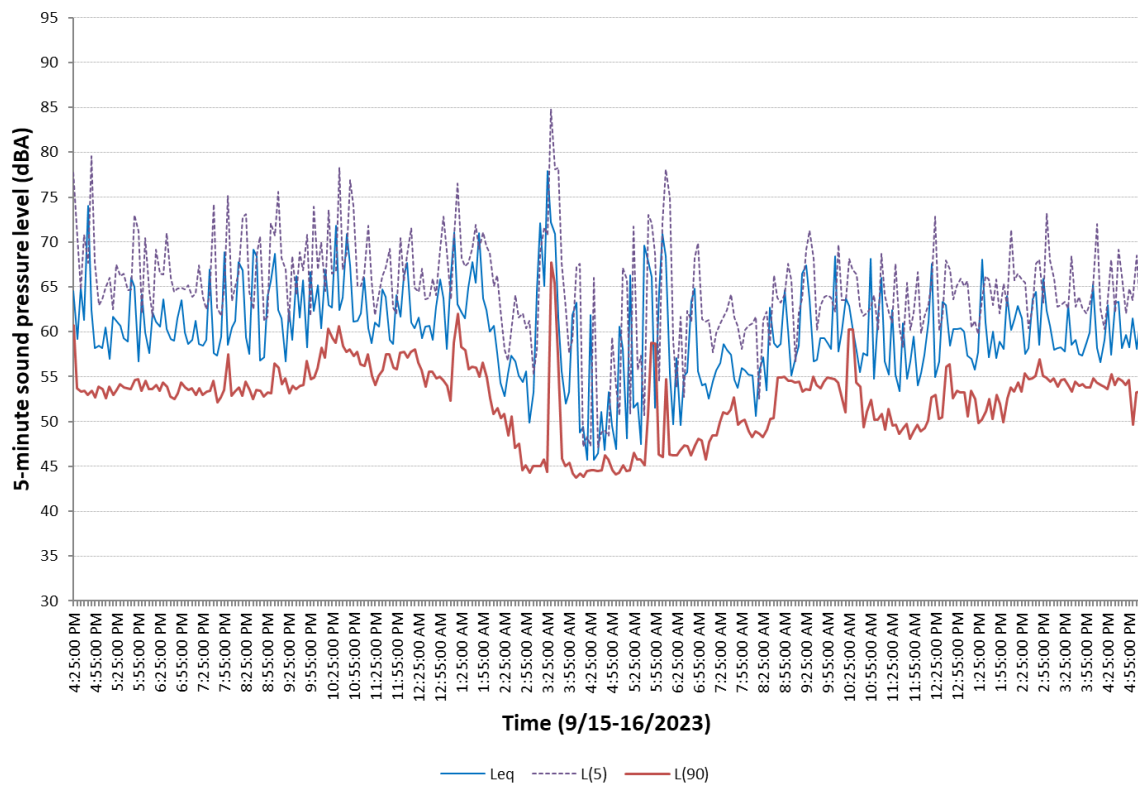
# Appendix A

## Long-Term Monitored Data Charts

### ML1 - 125 W. Santa Fe Avenue, 100 feet from Heroes

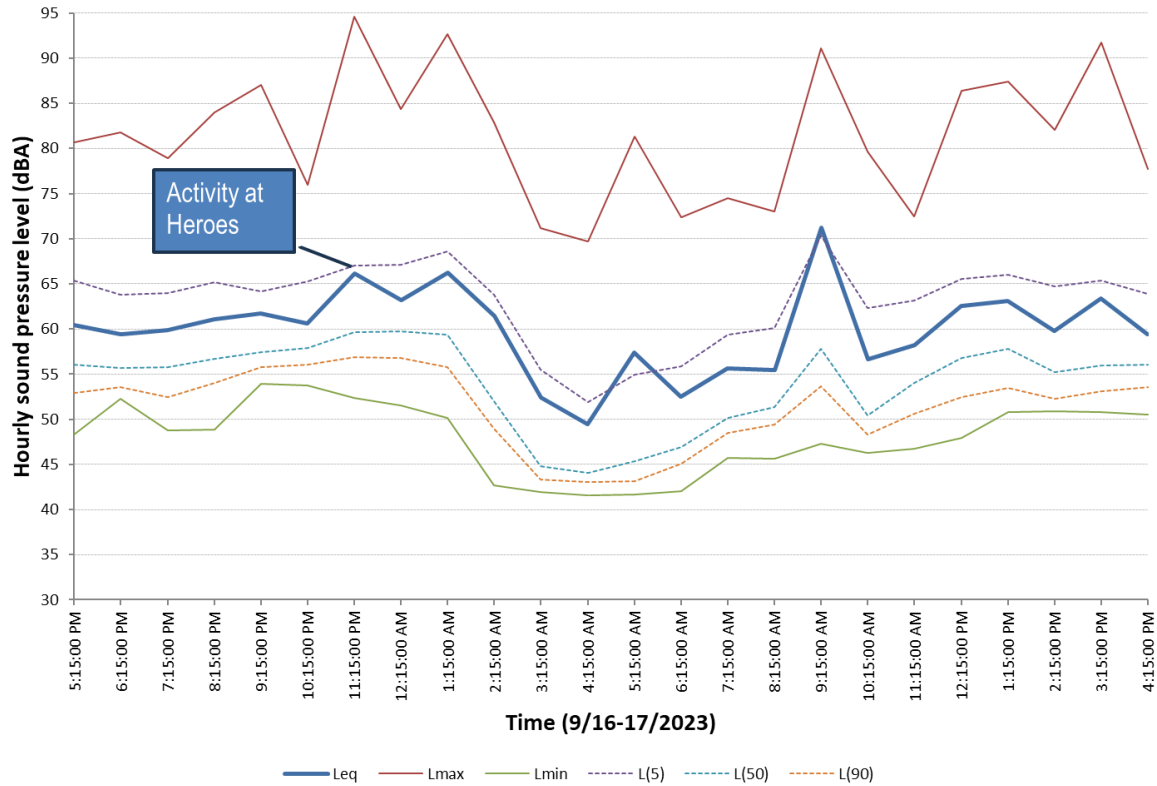


### ML1 - 125 W. Santa Fe Avenue, 100 feet from Heroes

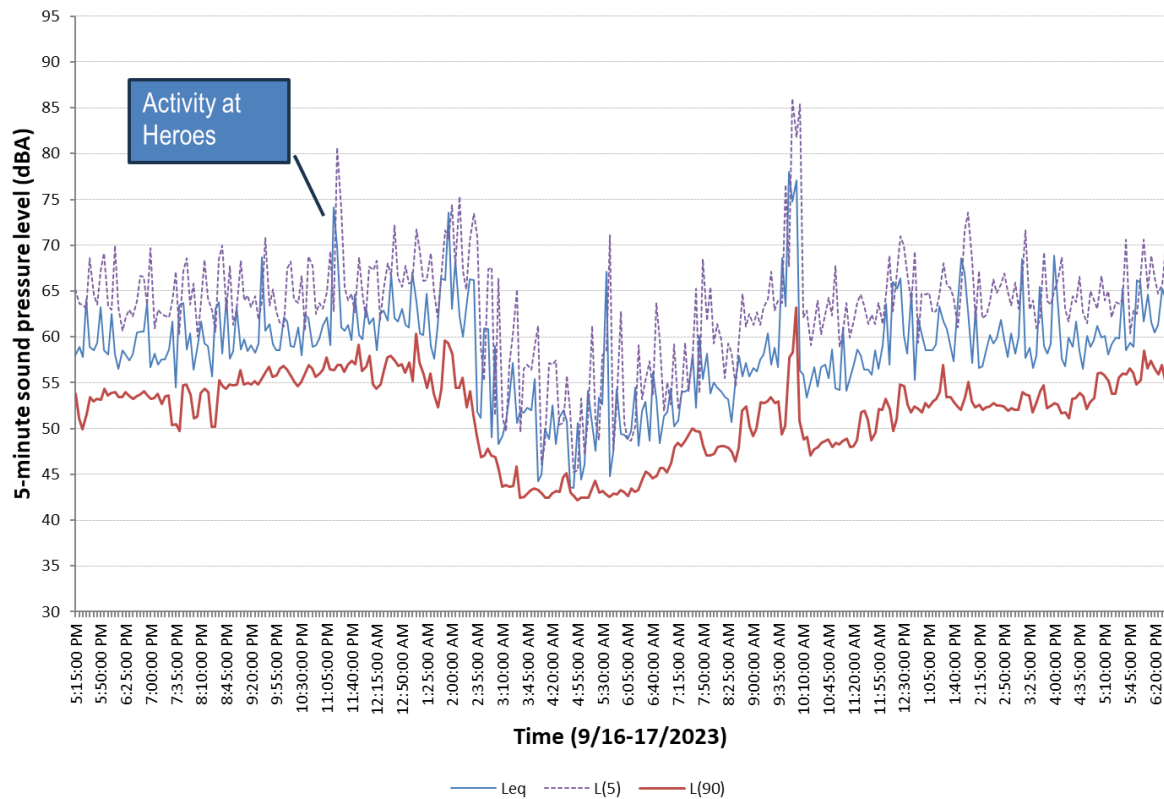




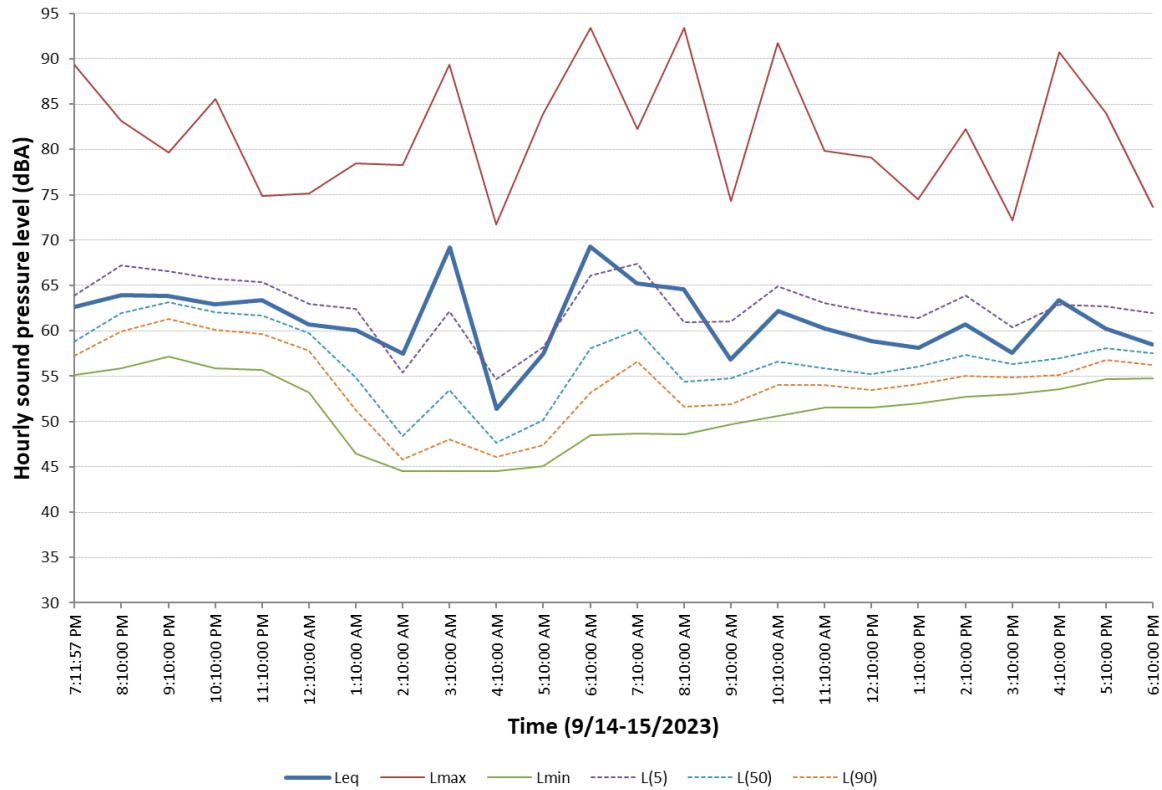
### ML1 - 125 W. Santa Fe Avenue, 100 feet from Heroes



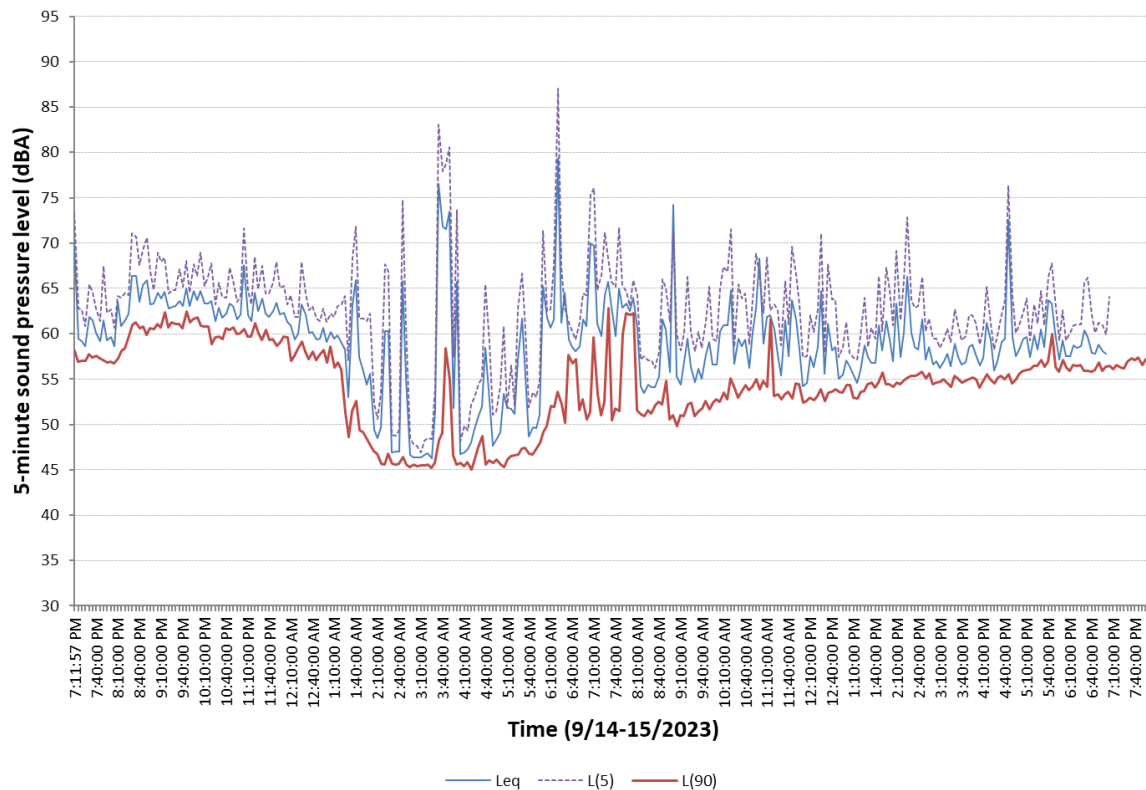
### ML1 - 125 W. Santa Fe Avenue, 100 feet from Heroes



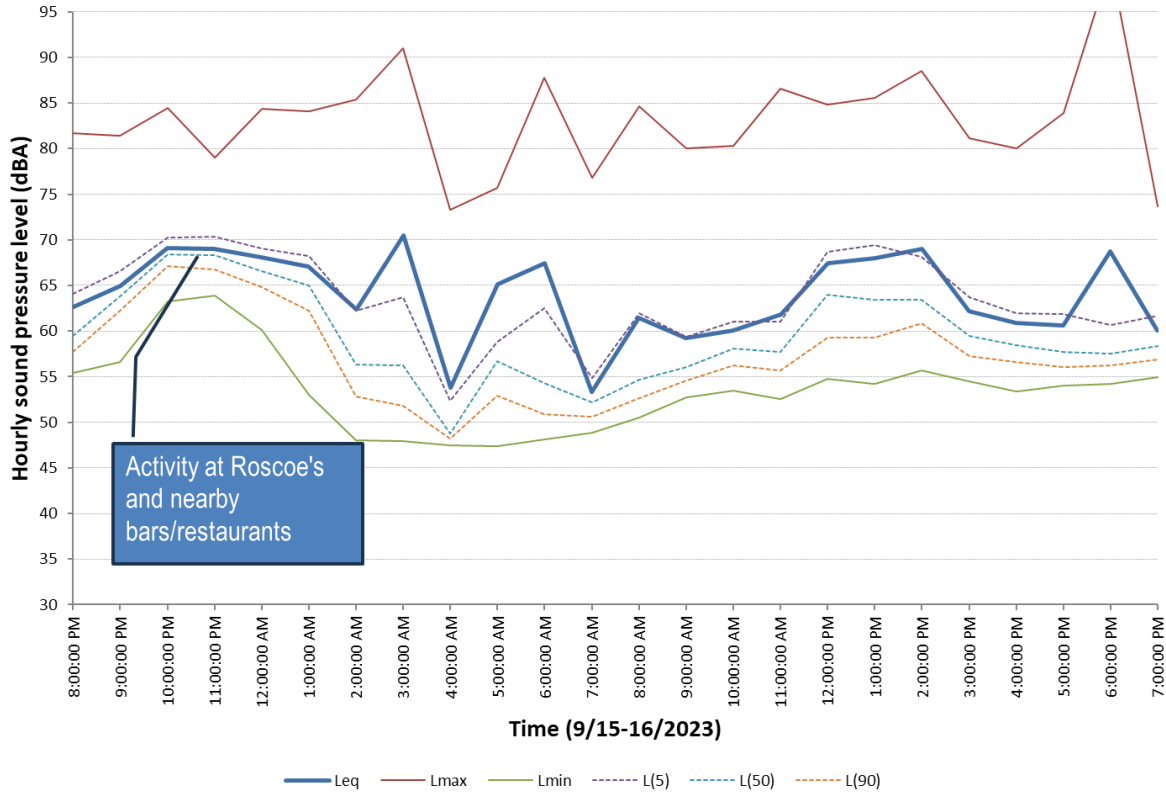
## ML2 - 124 W. Commonwealth Avenue, 50 feet from Garcia's and Heroes



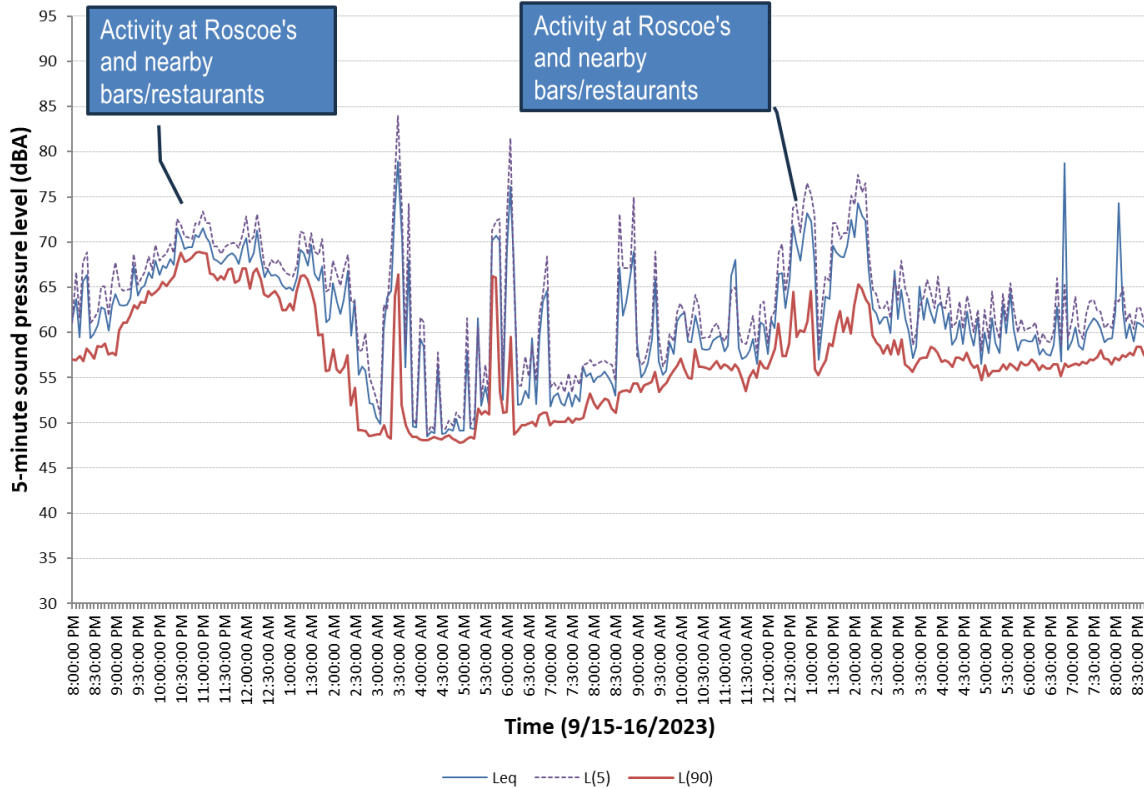
## ML2 - 124 W. Commonwealth Avenue, 50 feet from Garcia's and Heroes



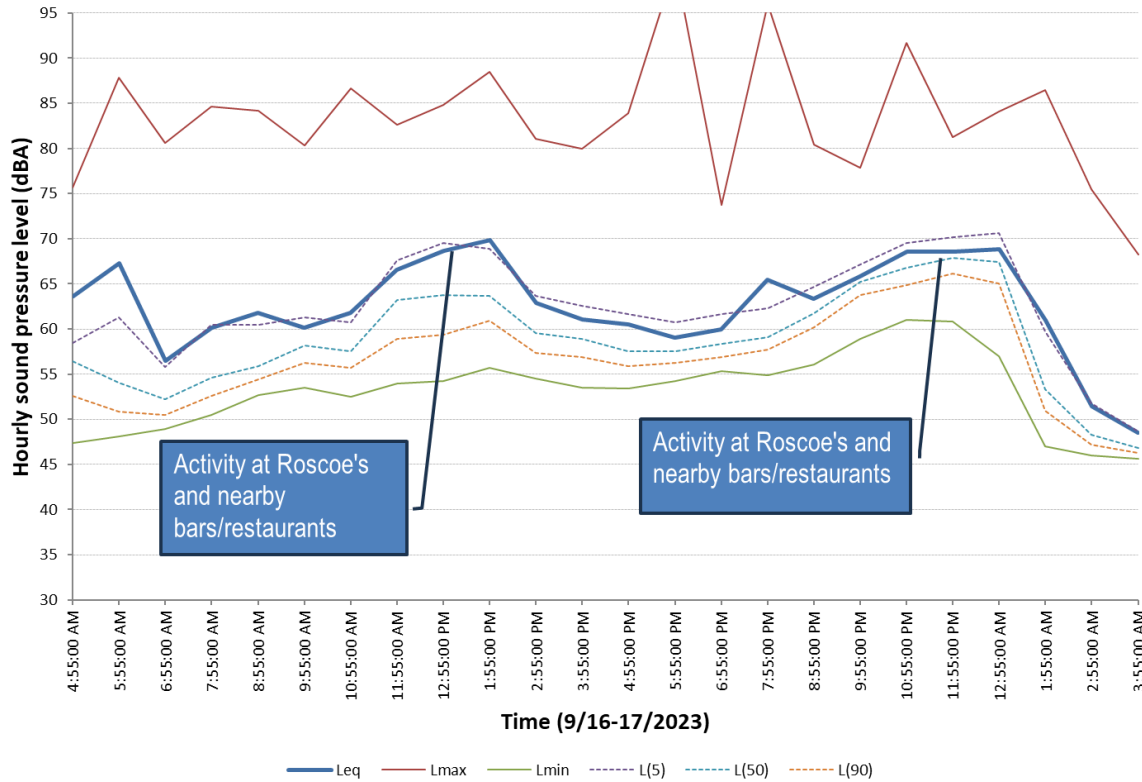
### ML2 - 124 W. Commonwealth Avenue, 50 feet from Garcia's and Heroes



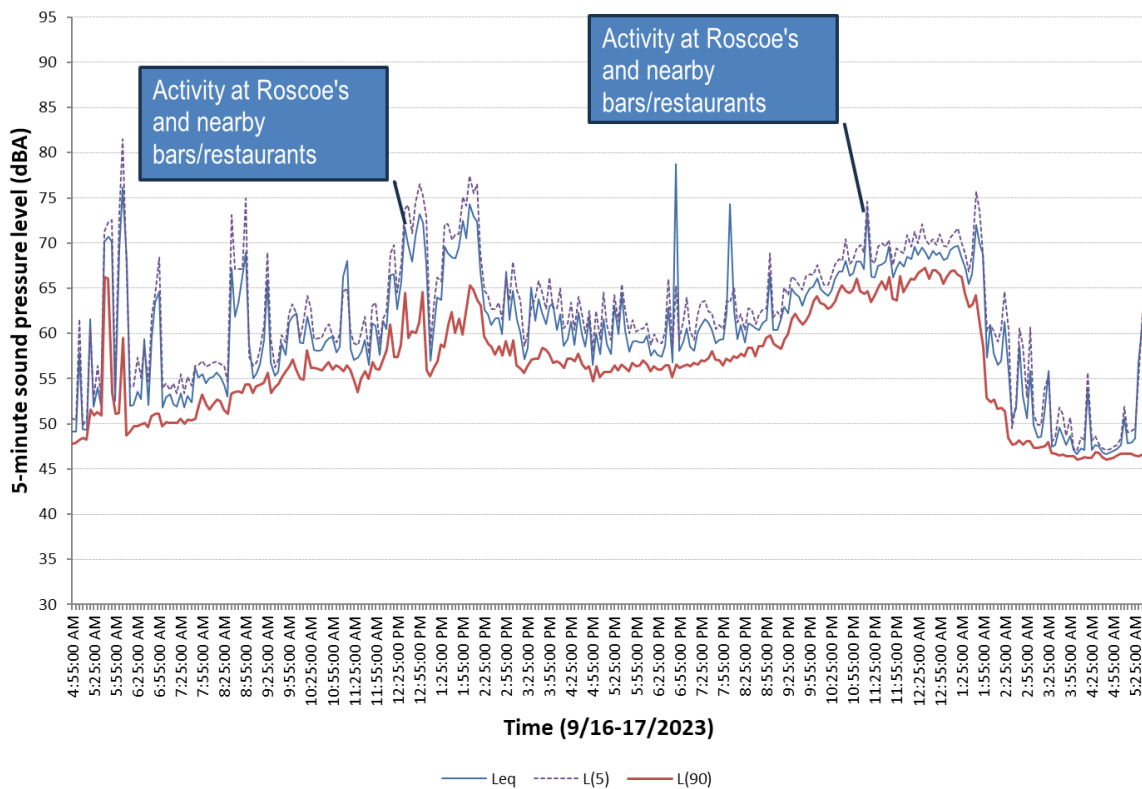
### ML2 - 124 W. Commonwealth Avenue, 50 feet from Garcia's and Heroes



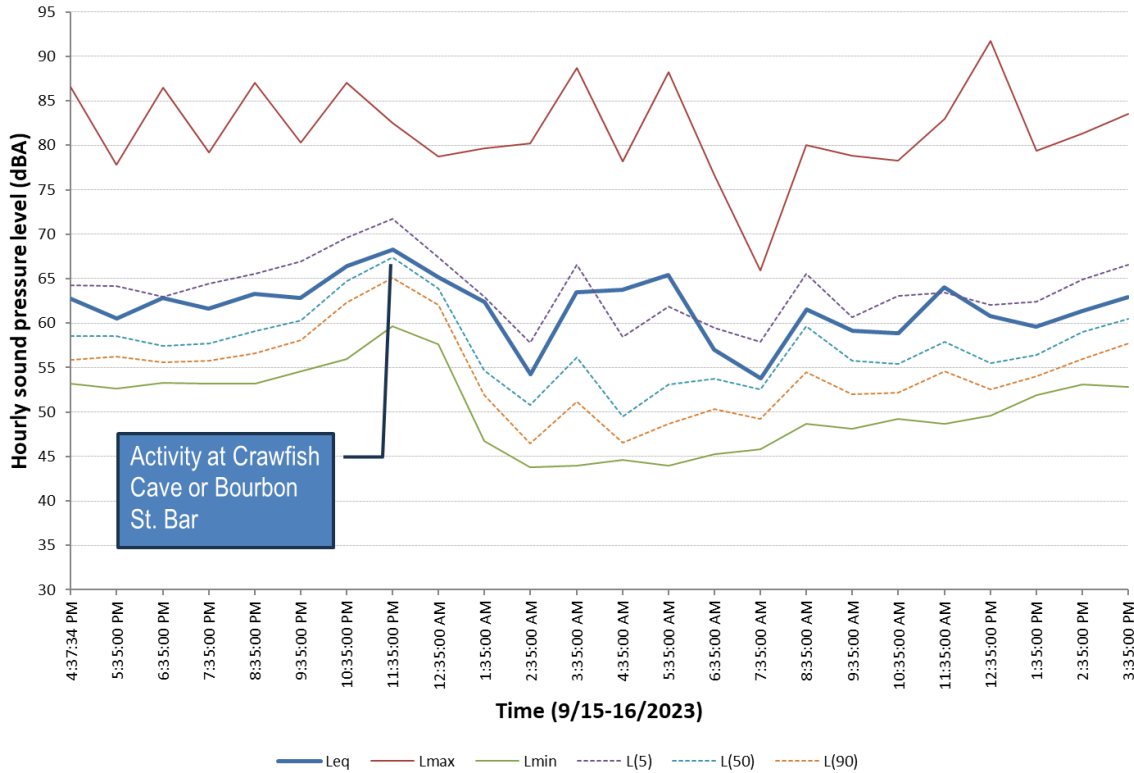
## ML2 - 124 W. Commonwealth Avenue, 50 feet from Garcia's and Heroes



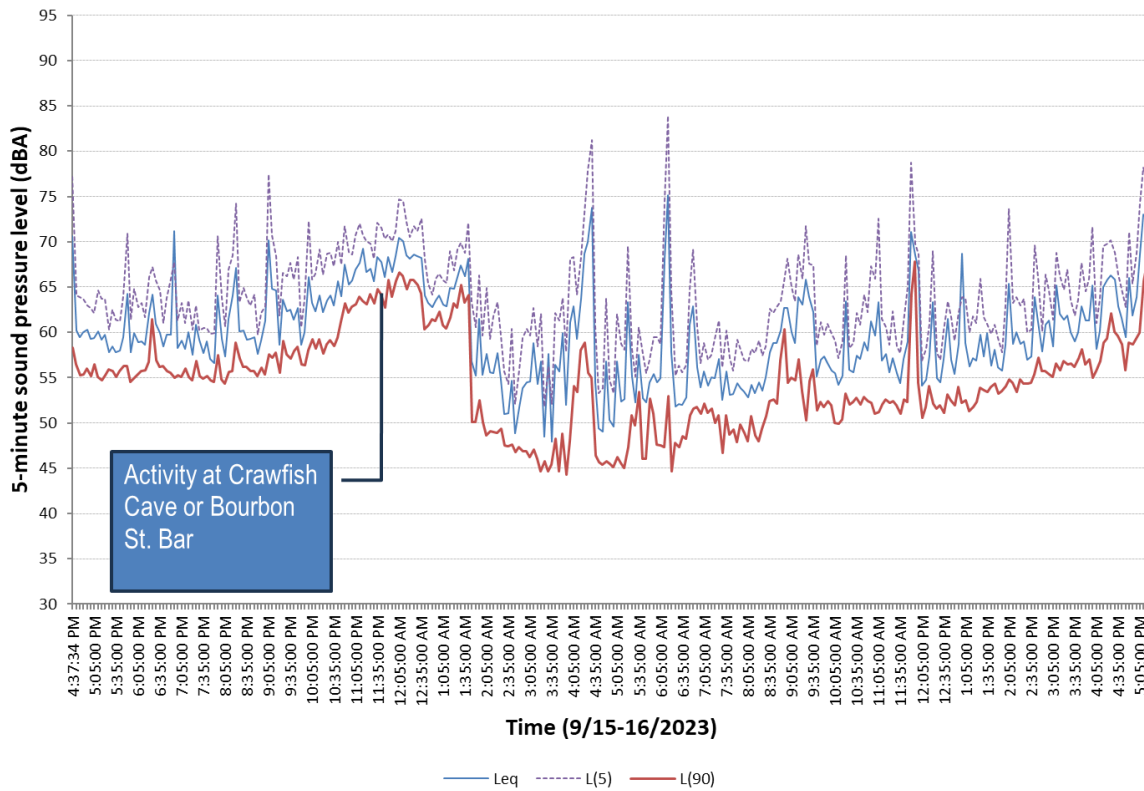
## ML2 - 124 W. Commonwealth Avenue, 50 feet from Garcia's and Heroes



### ML3-150 S. Harbor Blvd, 50 feet from Crawfish Cave/Bourbon Street Bar

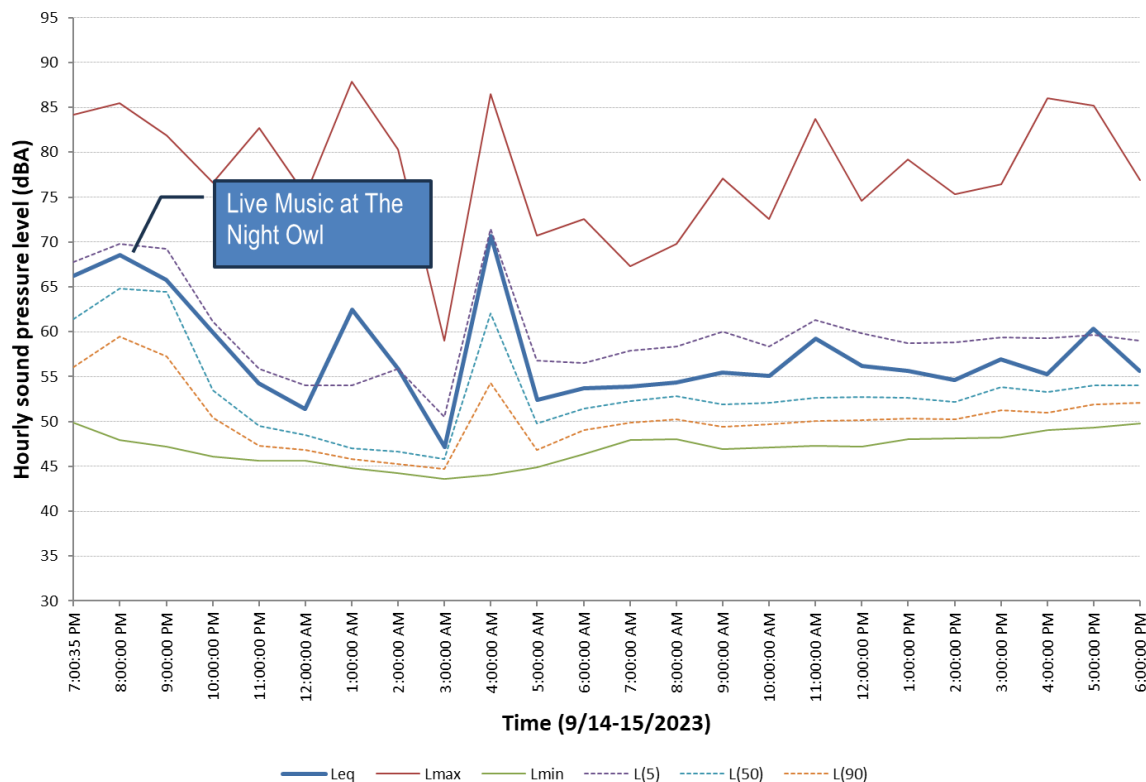


### ML3-150 S. Harbor Blvd, 50 feet from Crawfish Cave/Bourbon Street Bar

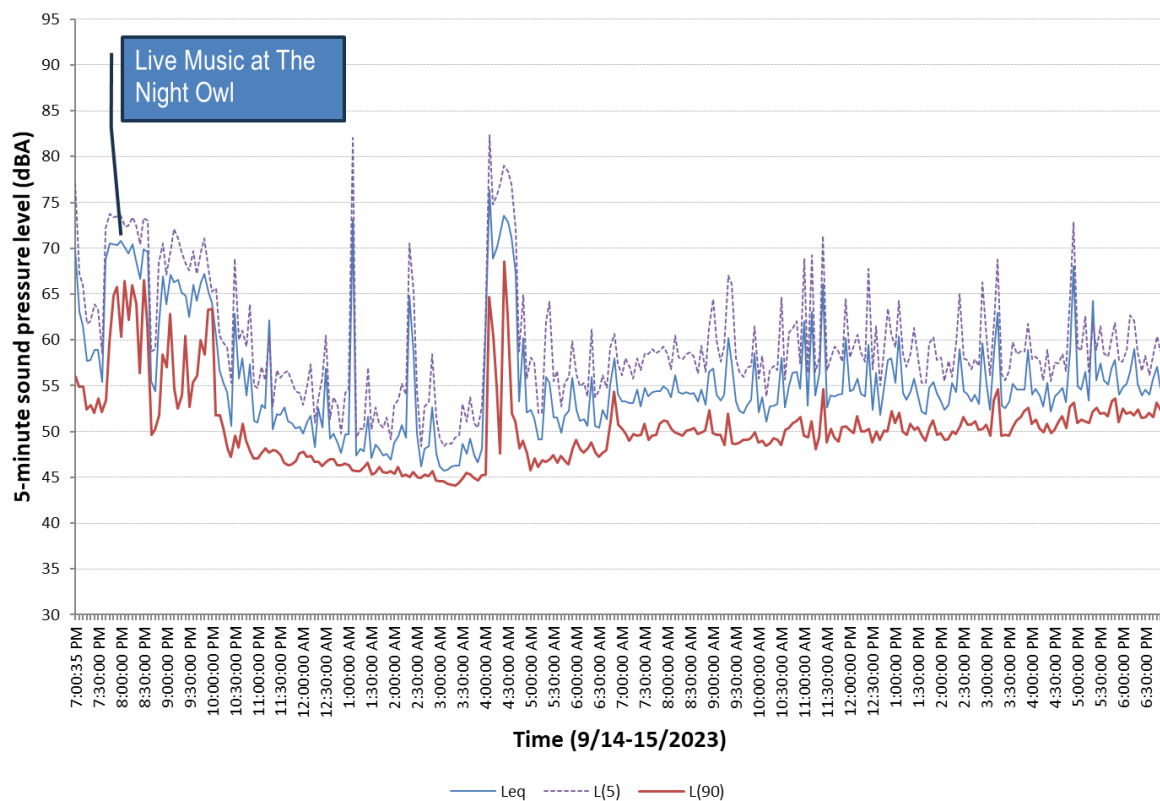




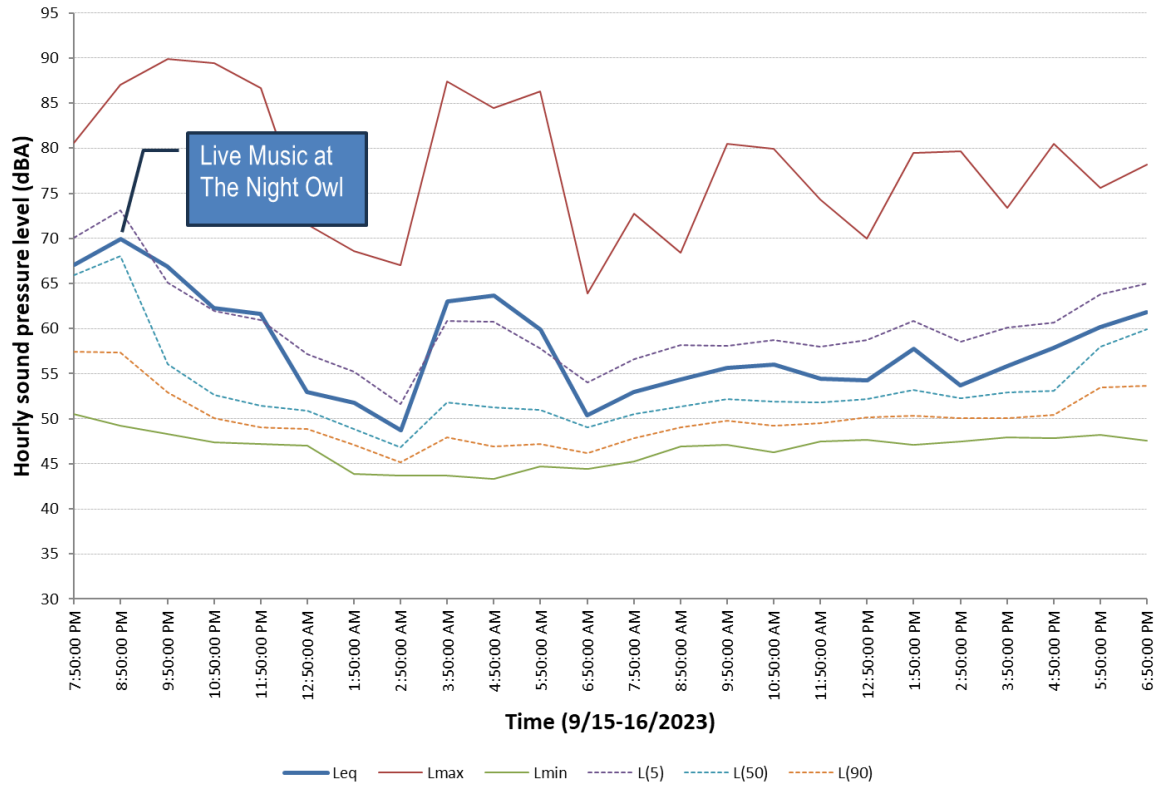
### ML4 - 210 N. Harbor Blvd, 50 feet from The Night Owl



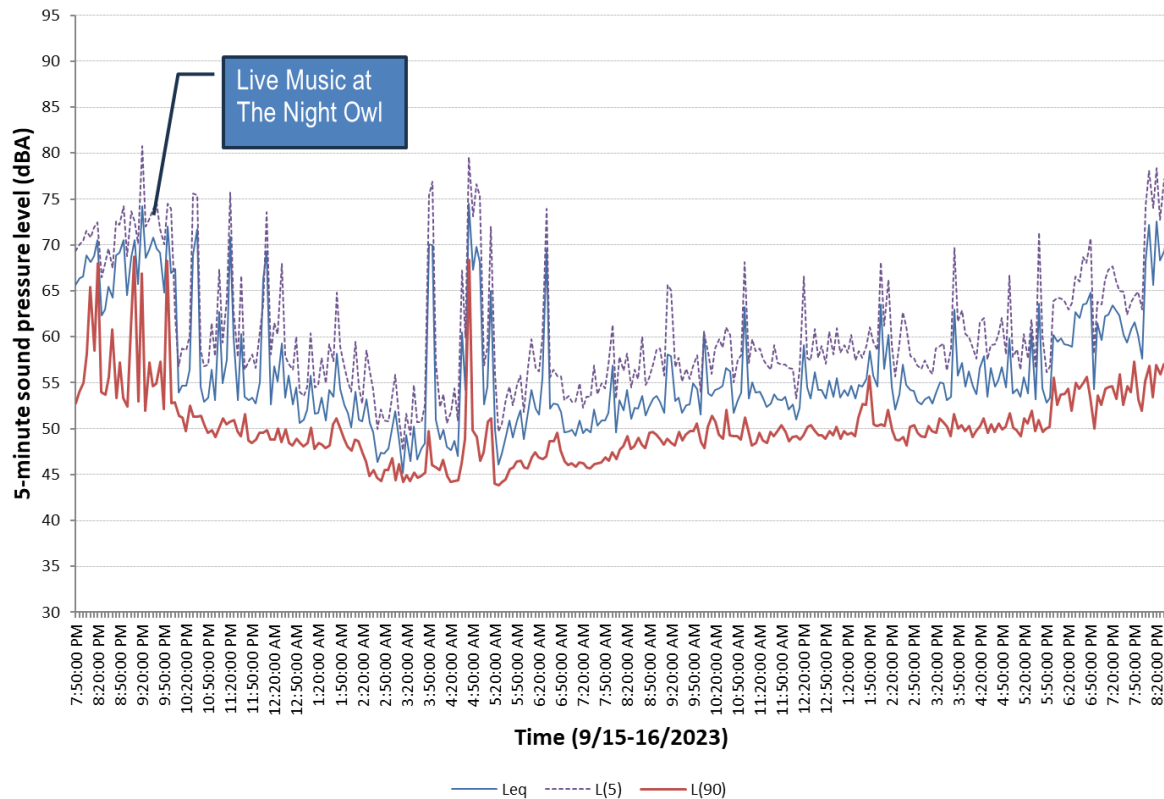
### ML4 - 210 N. Harbor Blvd, 50 feet from The Night Owl



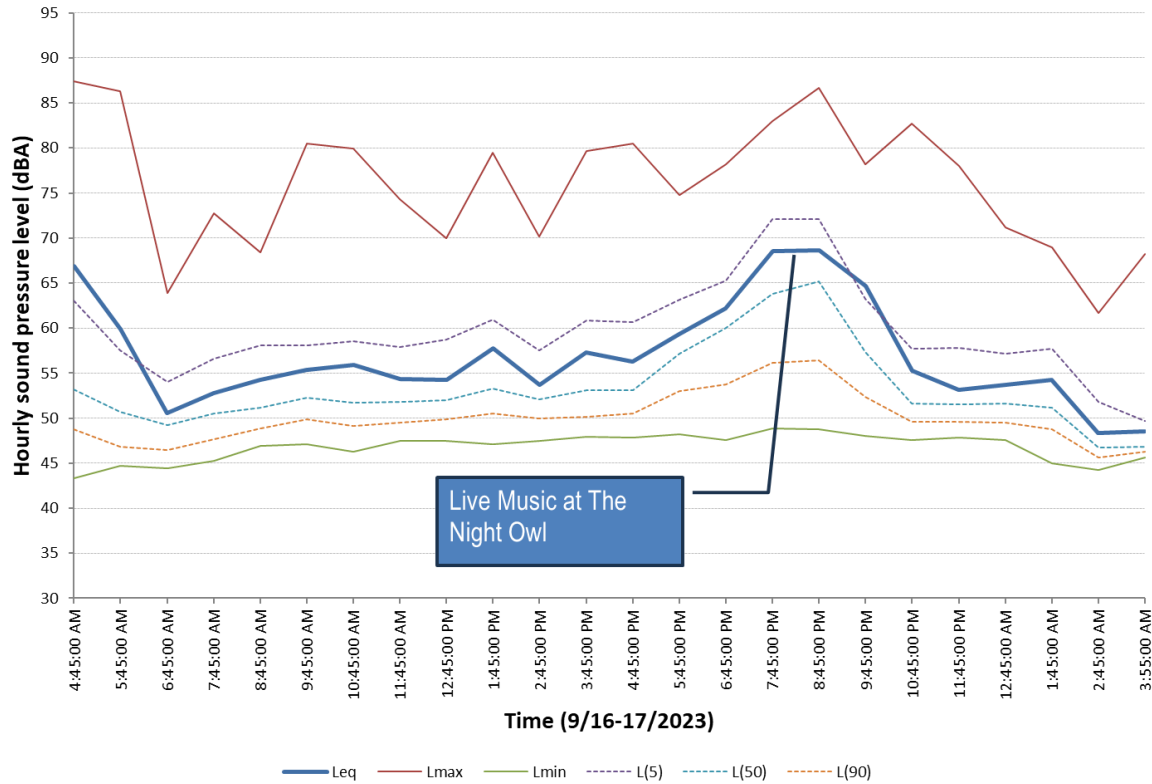
### ML4 - 210 N. Harbor Blvd, 50 feet from The Night Owl



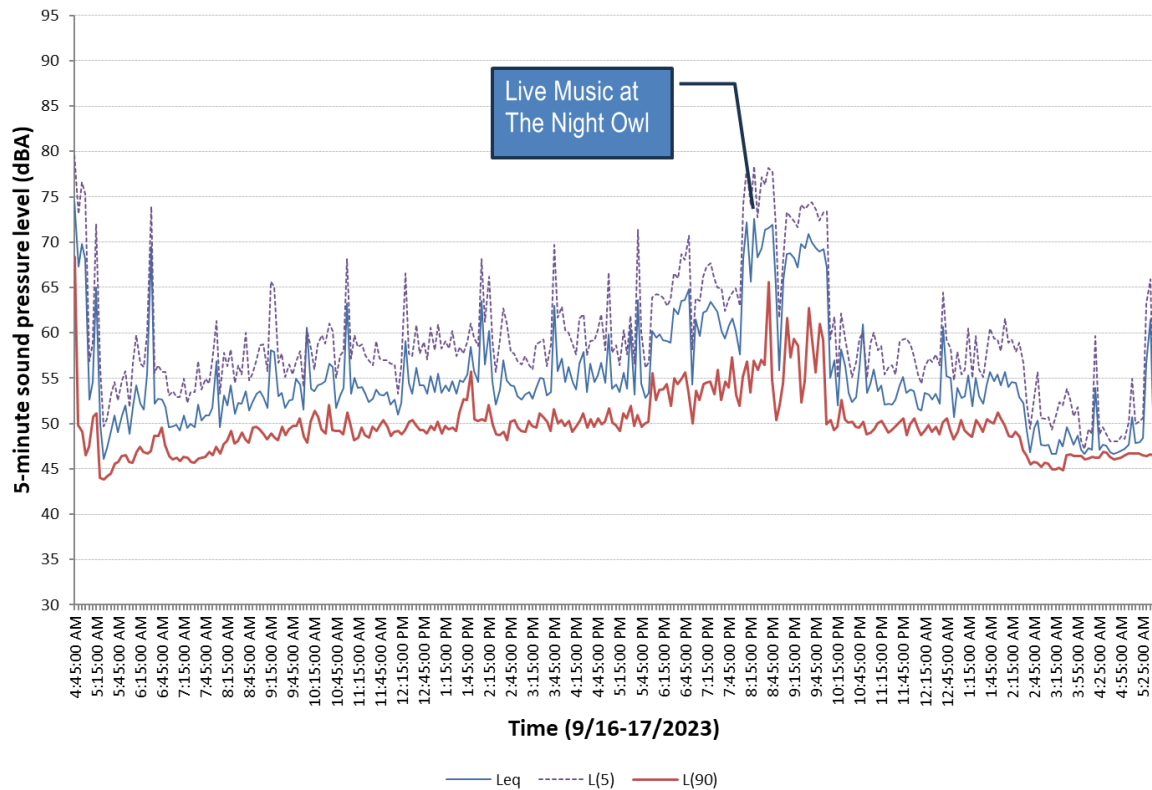
### ML4 - 210 N. Harbor Blvd, 50 feet from The Night Owl



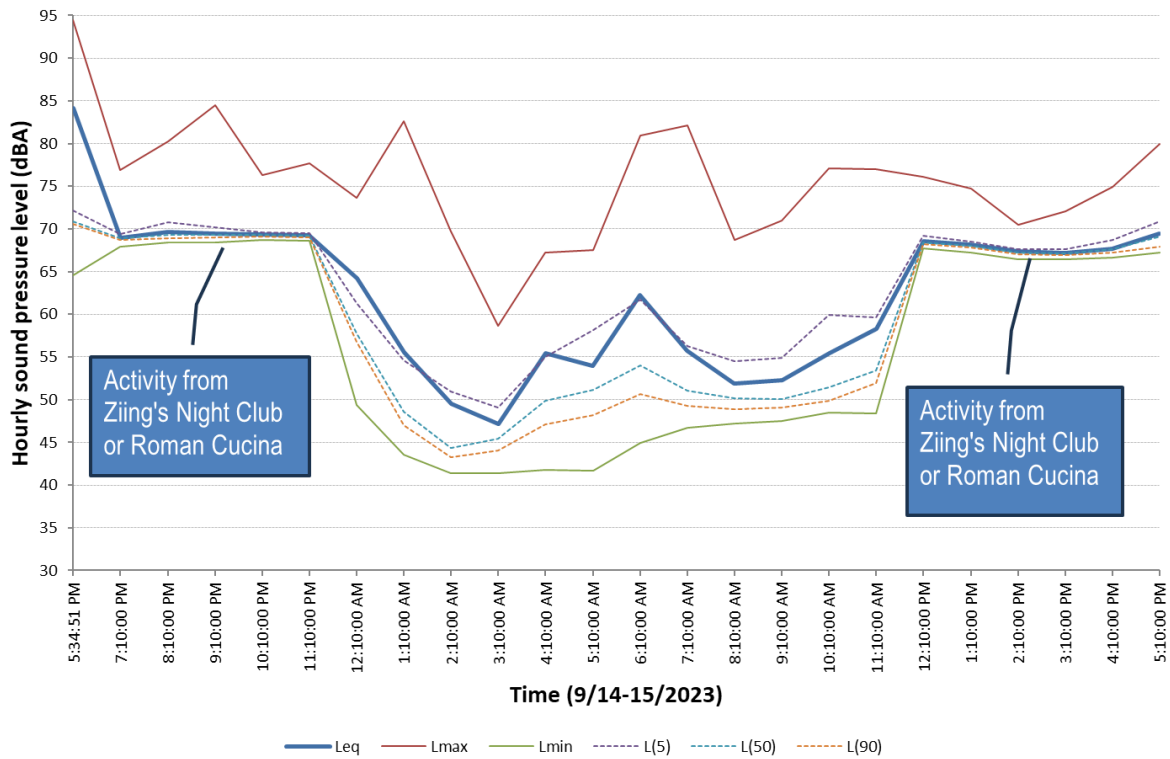
### ML4 - 210 N. Harbor Blvd, 50 feet from The Night Owl



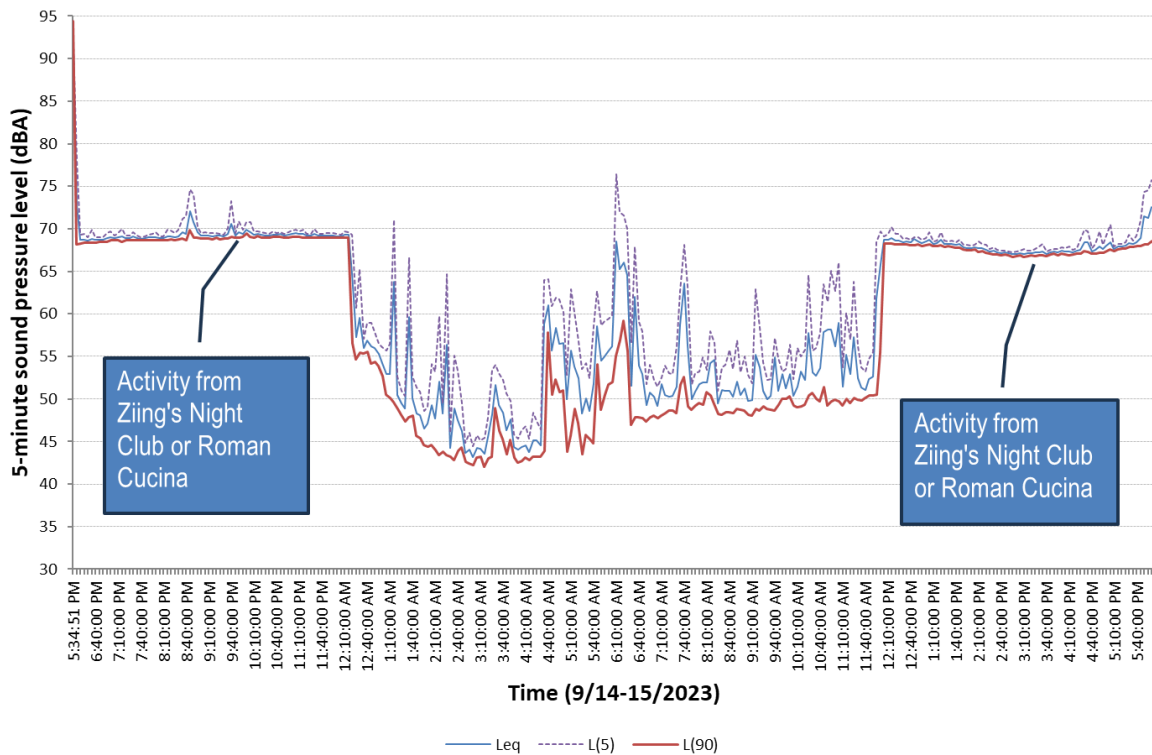
### ML4 - 210 N. Harbor Blvd, 50 feet from The Night Owl



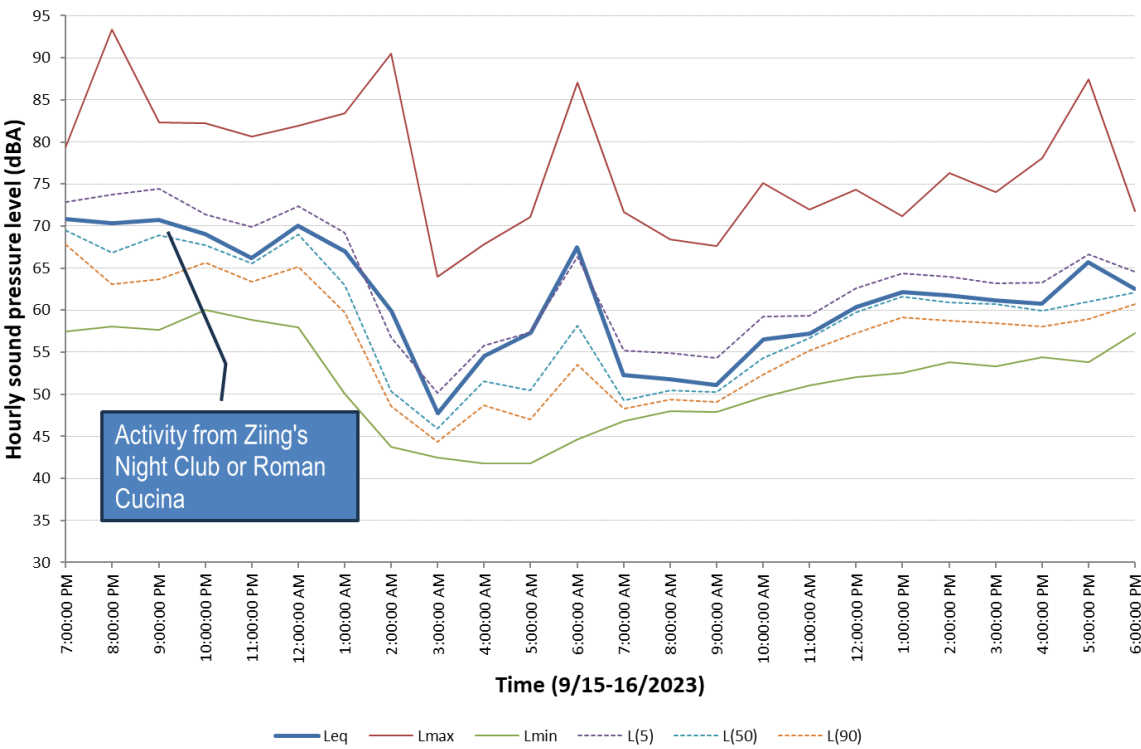
**ML5 - 116 1/2 W. Wilshire Avenue, 20 feet from Ziing's Nightclub/Roman Cucina**



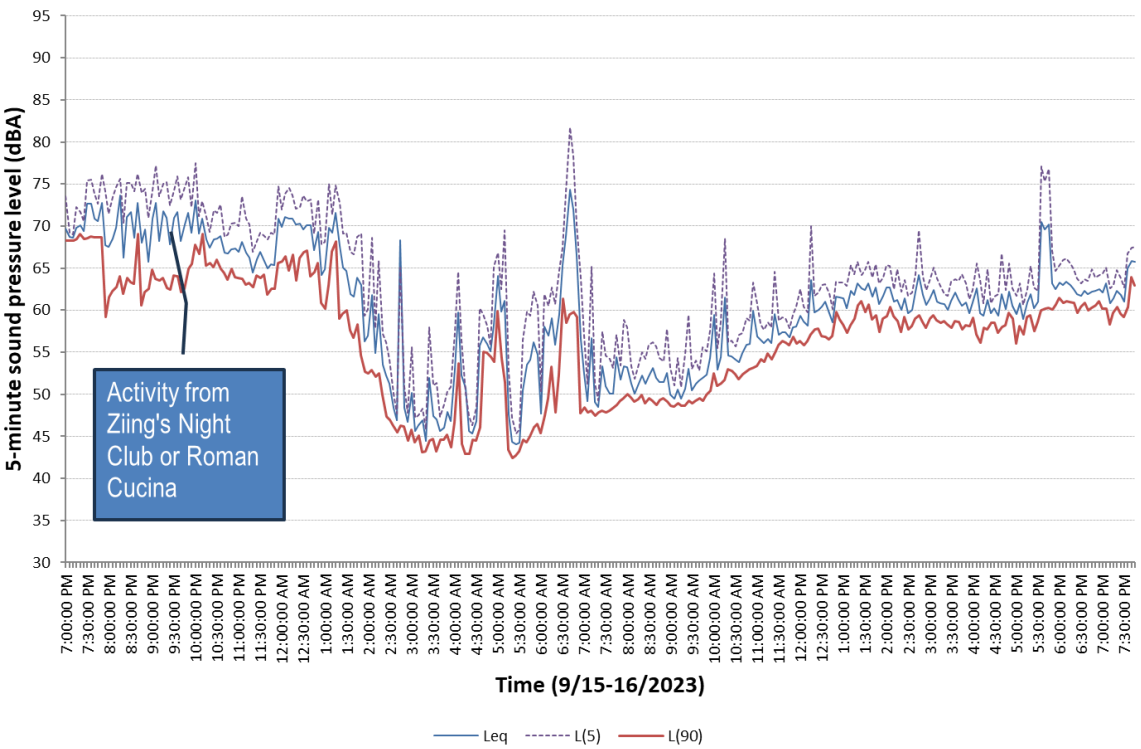
**ML5 - 116 1/2 W. Wilshire Avenue, 20 feet from Ziing's Nightclub/Roman Cucina**



ML5 - 116 1/2 W. Wilshire Avenue, 20 feet from Ziing's  
Nightclub/Roman Cucina

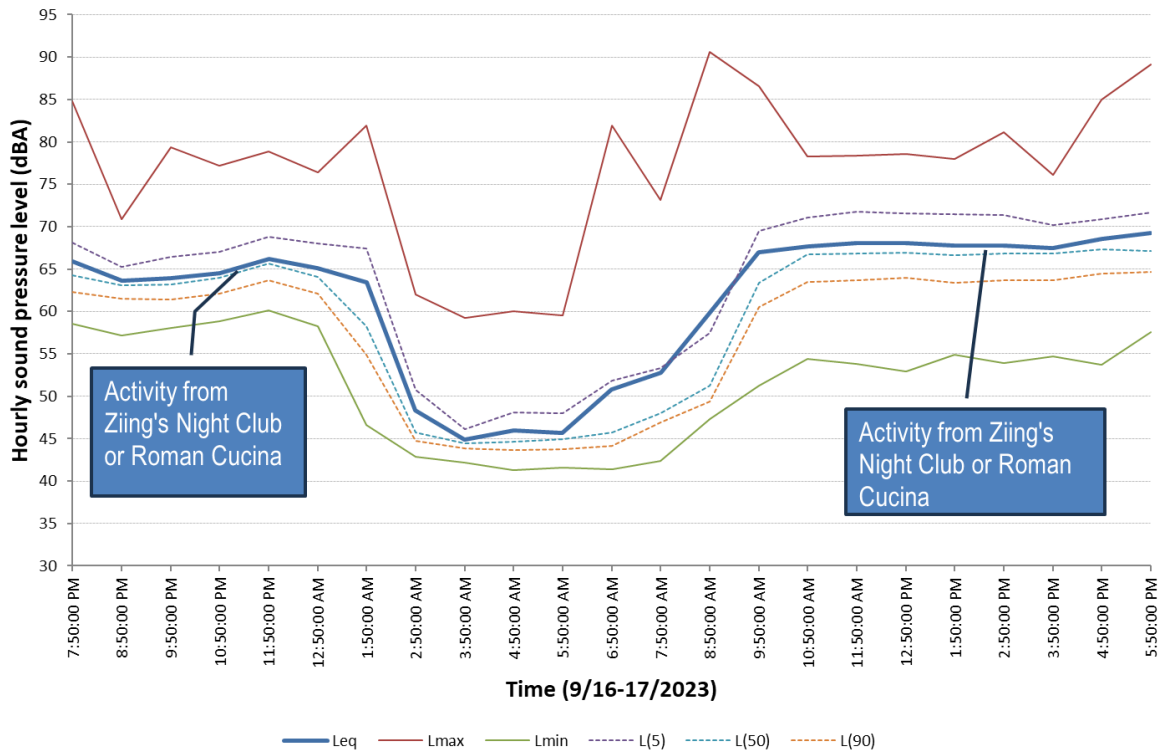


ML5 - 116 1/2 W. Wilshire Avenue, 20 feet from Ziing's  
Nightclub/Roman Cucina

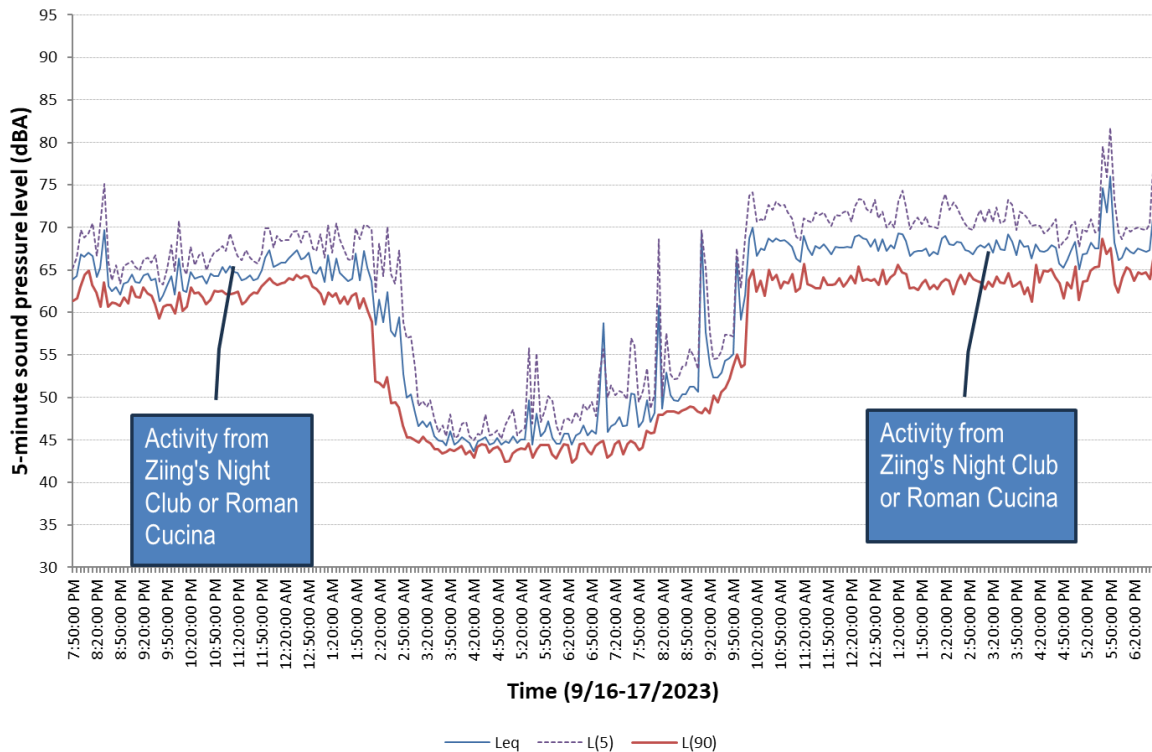




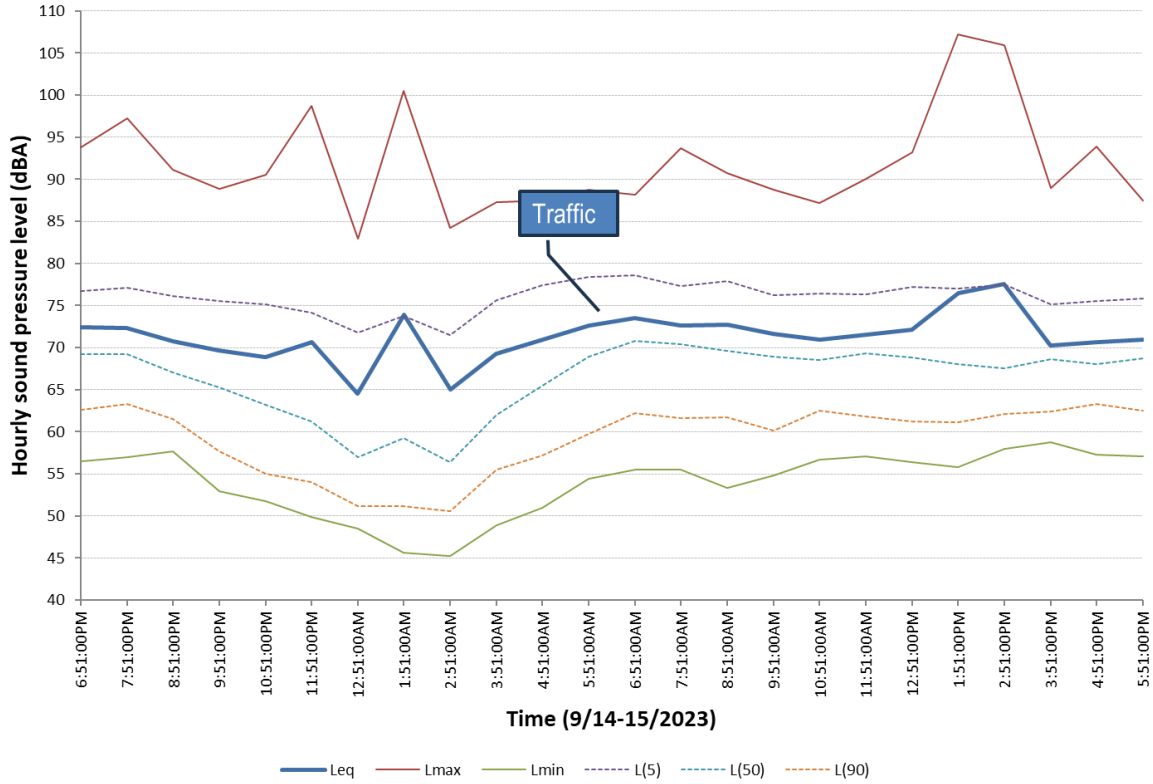
**ML5 - 116 1/2 W. Wilshire Avenue, 20 feet from Ziing's Nightclub/Roman Cucina**



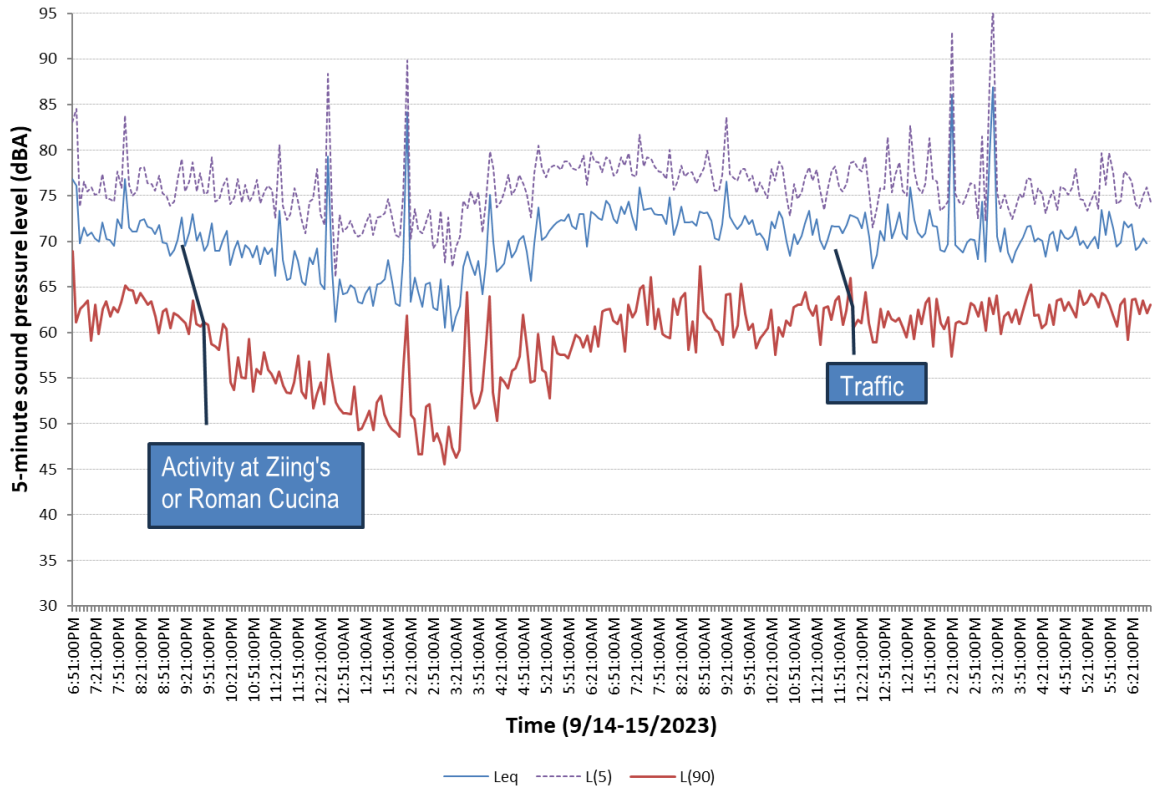
**ML5 - 116 1/2 W. Wilshire Avenue, 20 feet from Ziing's Nightclub/Roman Cucina**



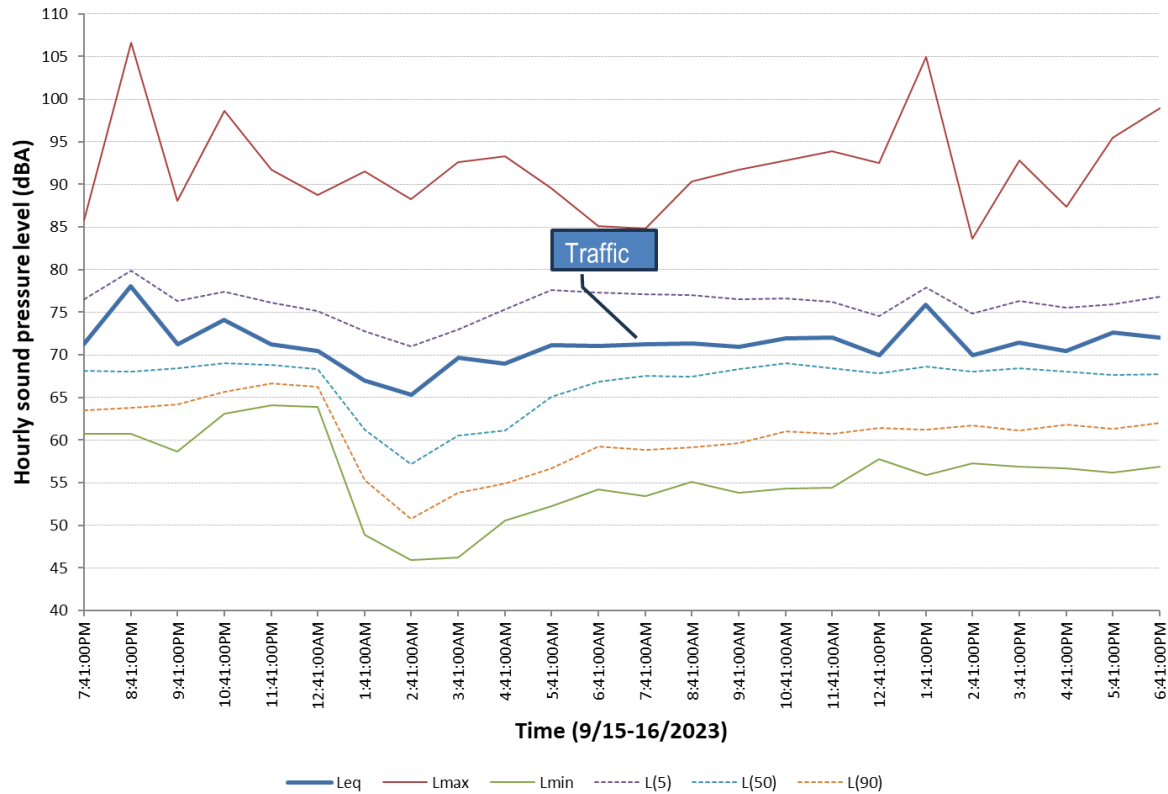
# ML6 - 215 N. Harbor Blvd, 20 feet from Ziing's Nightclub/Roman Cucina



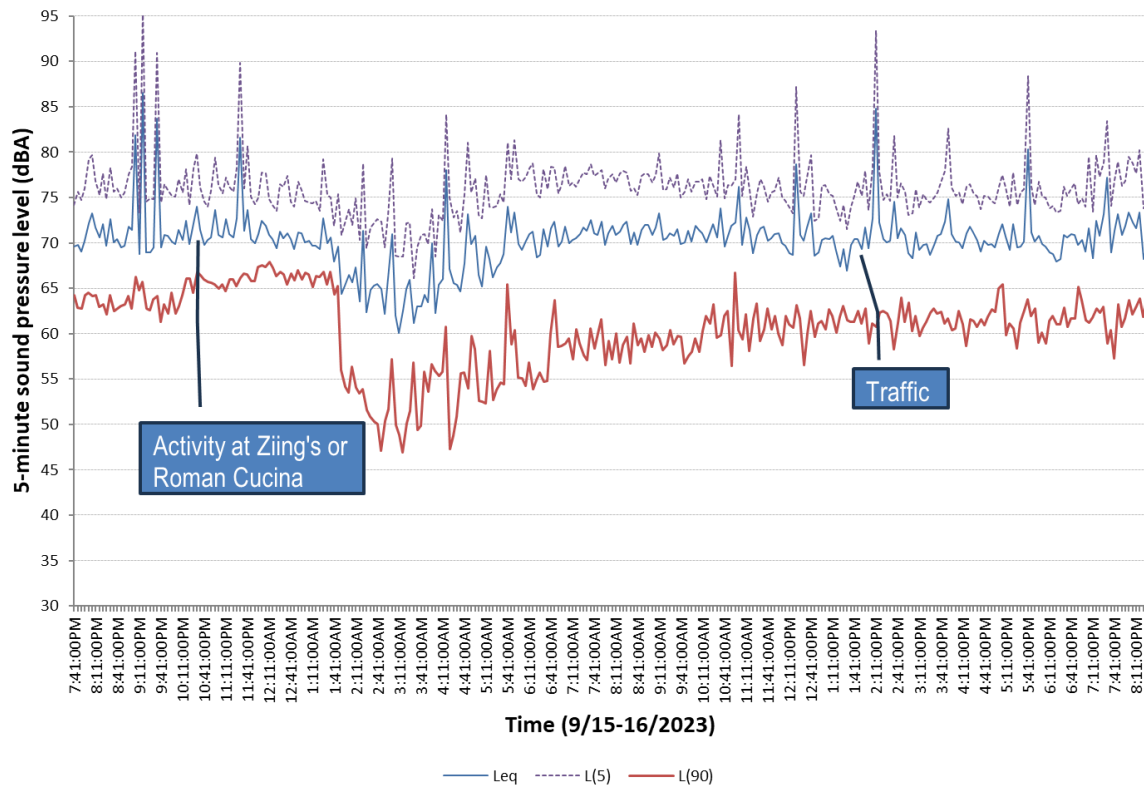
# ML6 - 215 N. Harbor Blvd, 20 feet from Ziing's Nightclub/Roman Cucina



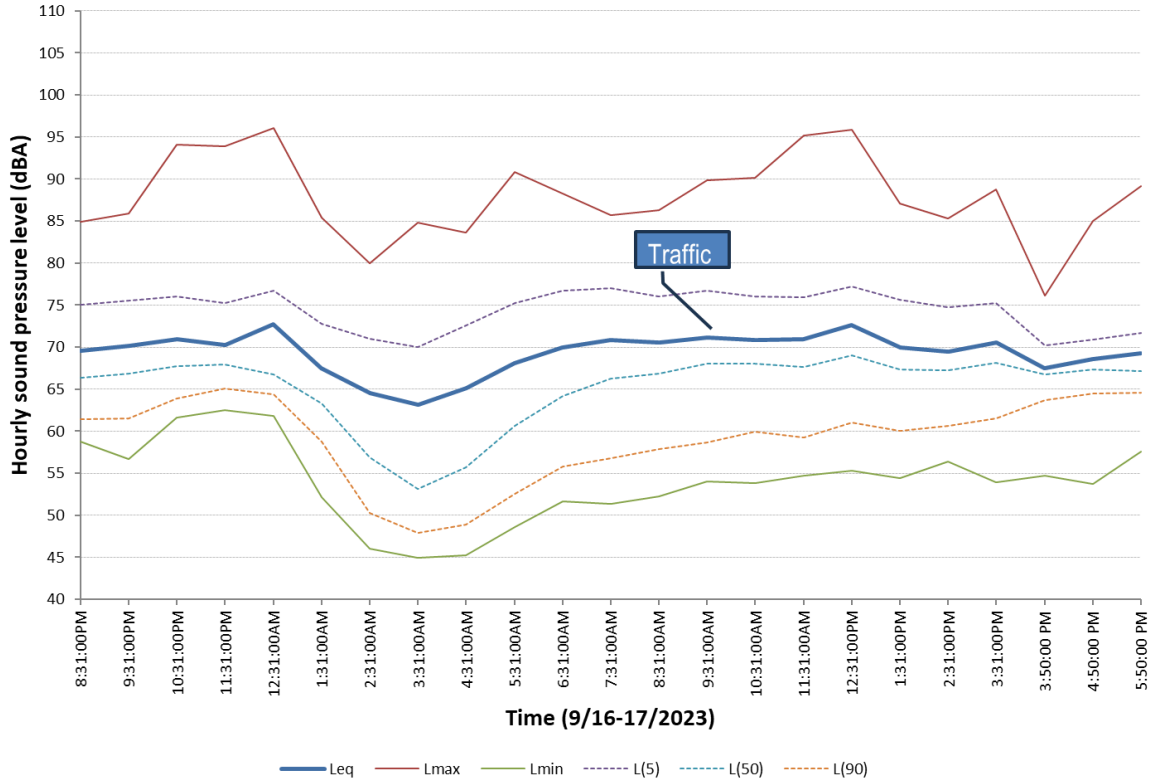
# ML6 - 215 N. Harbor Blvd, 20 feet from Ziing's Nightclub/Roman Cucina



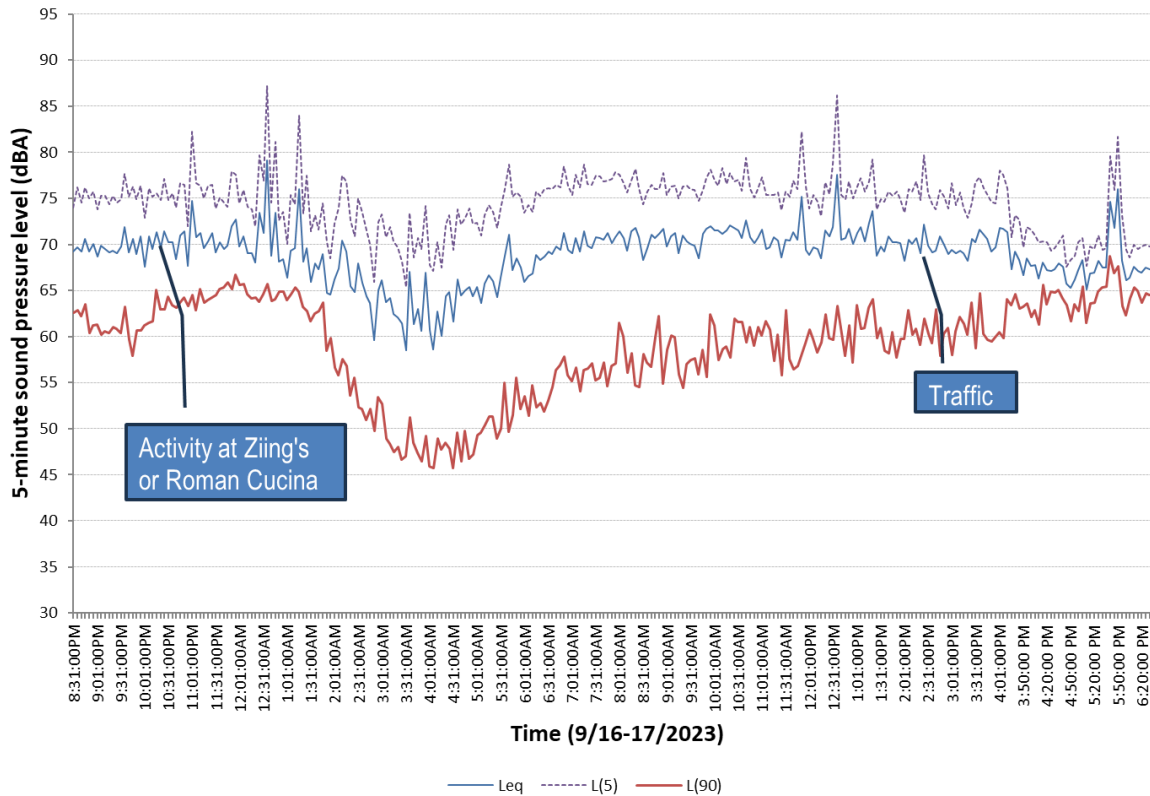
# ML6 - 215 N. Harbor Blvd, 20 feet from Ziing's Nightclub/Roman Cucina



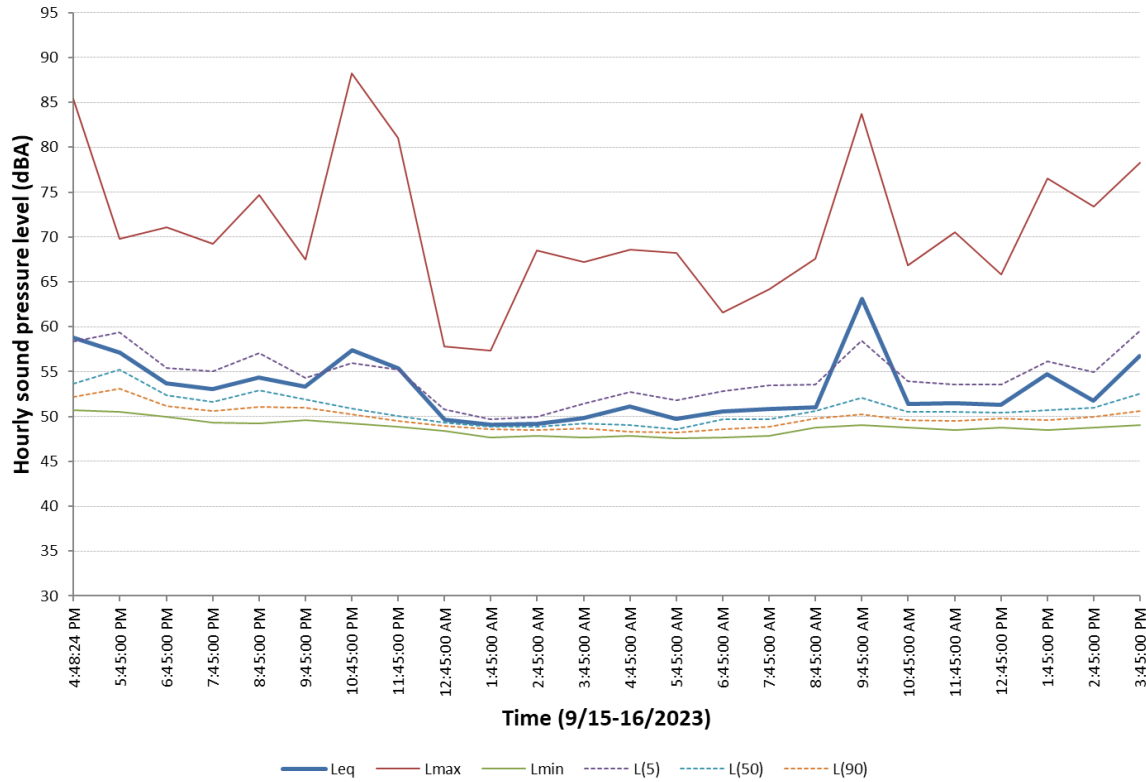
# ML6 - 215 N. Harbor Blvd, 20 feet from Ziing's Nightclub/Roman Cucina



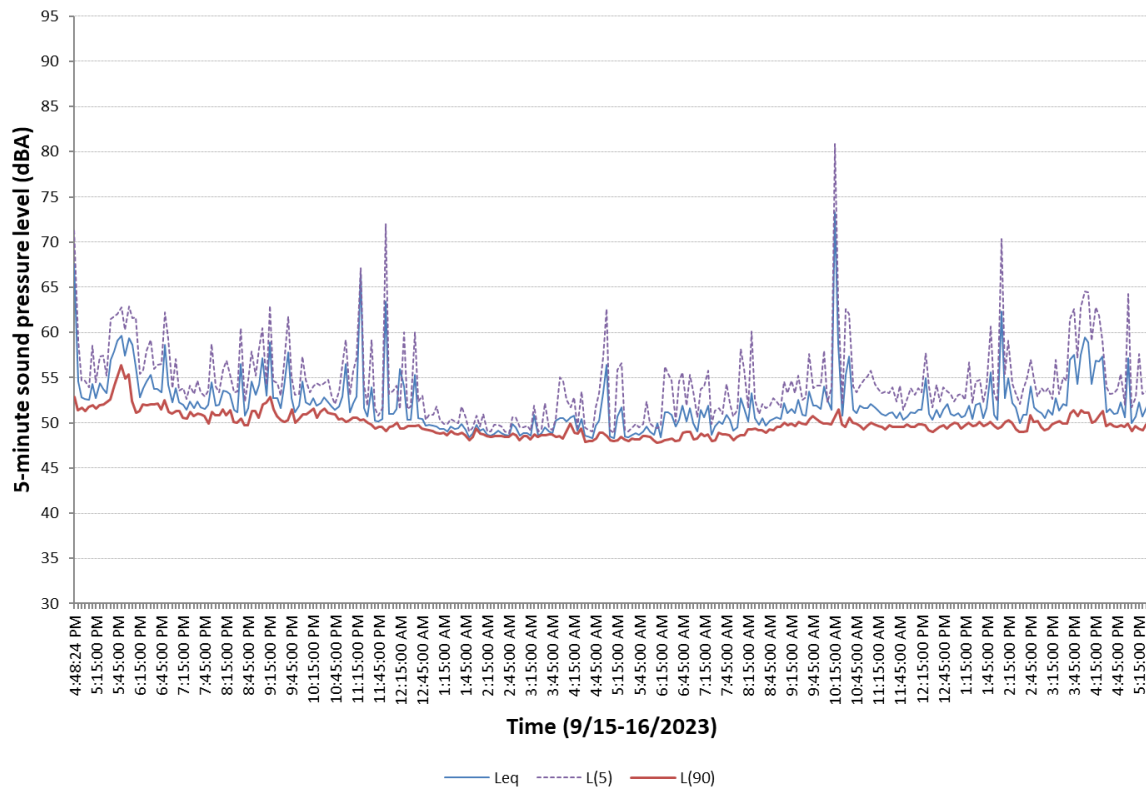
# ML6 - 215 N. Harbor Blvd, 20 feet from Ziing's Nightclub/Roman Cucina



### ML7 - 121 E. Wilshire Avenue, 50 feet from Fullerton Museum

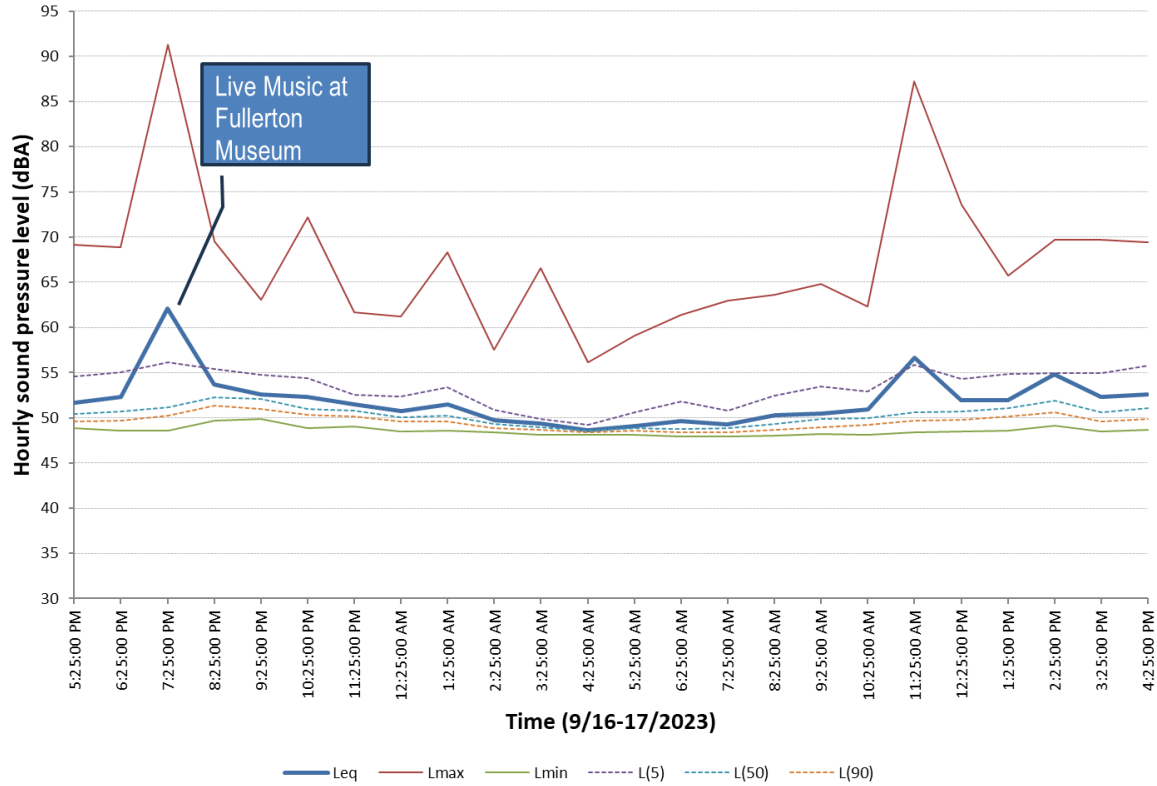


### ML7 - 121 E. Wilshire Avenue, 50 feet from Fullerton Museum

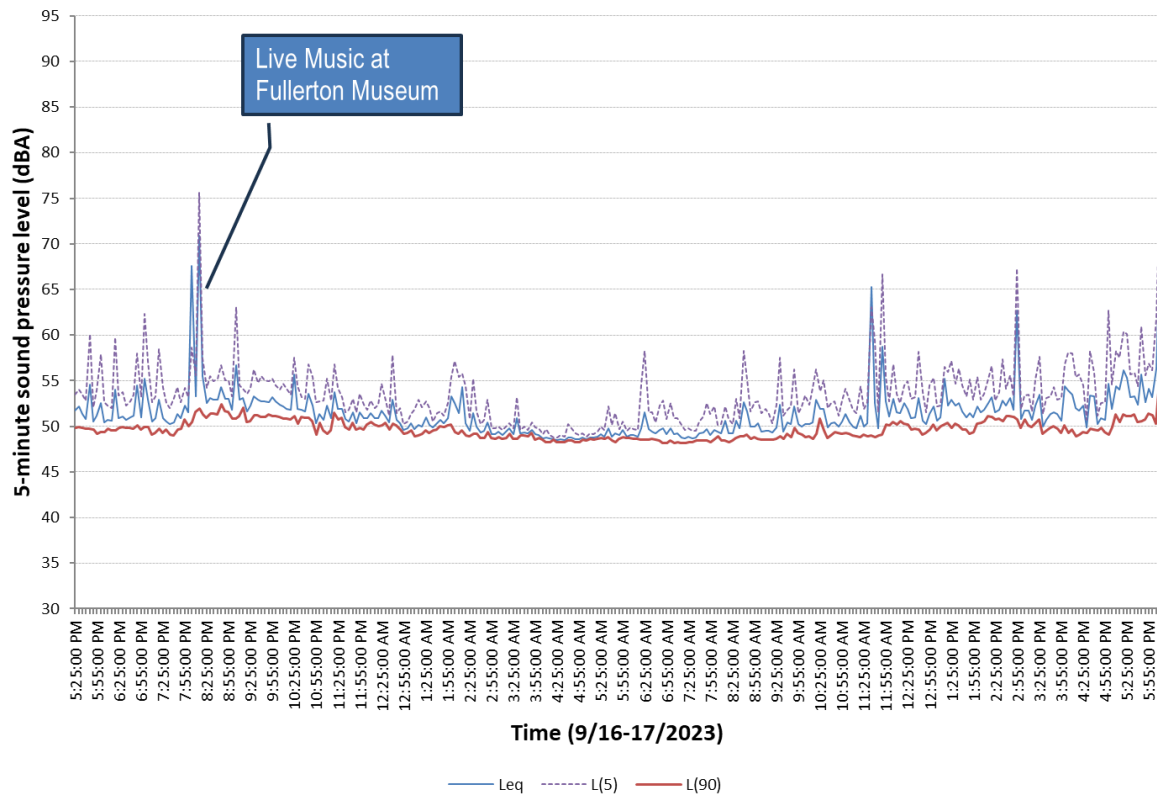




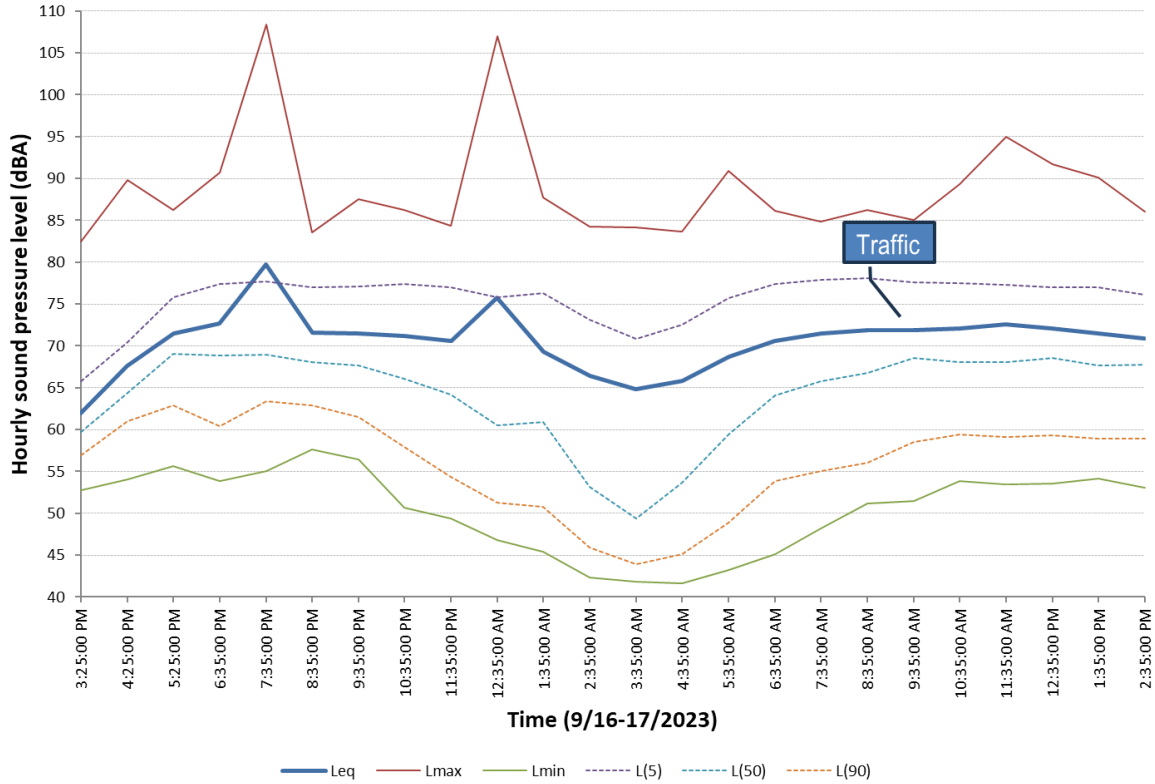
### ML7 - 121 E. Wilshire Avenue, 50 feet from Fullerton Museum



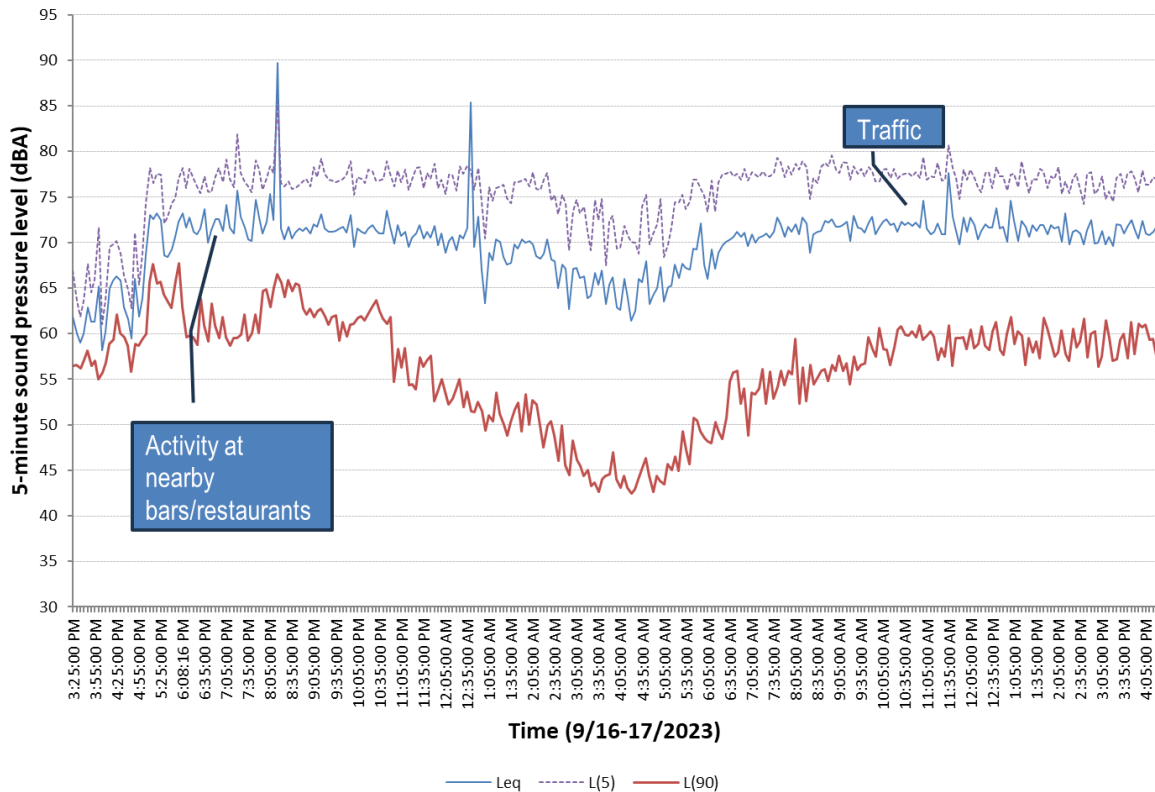
### ML7 - 121 E. Wilshire Avenue, 50 feet from Fullerton Museum



### ML8 - 310 N. Harbor Blvd, 15 feet from Farolito of Fullerton



### ML8 - 310 N. Harbor Blvd, 15 feet from Farolito of Fullerton



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## **Appendix B**

### Aerial Maps Showing Noise Data by Location





City of Fullerton Noise Monitoring and Mapping Project (Fullerton, CA)









SOURCES: Google 2023; City of Fullerton Noise Monitoring and Mapping; Dudek 2023



**FIGURE B3**  
**Downtown Fullerton Monitoring Locations and Monitoring Results (Friday, 09/15/23)**  
City of Fullerton Noise Monitoring and Mapping Project (Fullerton, CA)





SOURCES: Google 2023; City of Fullerton Noise Monitoring and Mapping; Dudek 2023



FIGURE B4  
Downtown Fullerton Monitoring Locations and Monitoring Results (Saturday, 09/16/23)  
City of Fullerton Noise Monitoring and Mapping Project (Fullerton, CA)