



COMMISSION MEMORANDUM

TO: Honorable Mayor and Members of the City Commission
FROM: City Manager Eric Carpenter
DATE: December 11, 2024
TITLE: DISCUSSION AND UPDATE REGARDING THE CITY'S IMPLEMENTATION OF THE NOISE METER AND CAMERA PILOT PROGRAM

RECOMMENDATION

The Administration will continue to work with Intelligent Instruments through the pilot phase and prepare a final report on the findings to be considered in future policy direction.

BACKGROUND/HISTORY

At the February 22, 2023 City Commission meeting, at the request of Mayor Steven Meiner (then Commissioner Meiner), the Mayor and City Commission discussed item R9 T and then referred it to the Public Safety and Neighborhood Quality of Life Committee ("PSNQLC") with direction to provide a monthly update at PSNQLC on the progress of the noise meter camera pilot program, its effectiveness, and data.

The item was subsequently heard and discussed at the May 22, 2024 PSNQLC meeting and unanimously moved to the full Commission with a favorable recommendation to urge the State to change legislation.

ANALYSIS

A Noise Meter and Camera Pilot Program was approved by the City Commission via Resolution No. 2022-32208. Subsequently, the Police Department arranged a pilot program with Intelligent Instruments of Southampton, UK utilizing three (3) noise meter camera systems for a four-month period. The cost was \$50,725. The goal was to test these systems under varying real-world conditions in their ability to clearly identify a vehicle as the source of excessive noise, provide actionable data for enforcement efforts, determine the true extent of excessive noise in a particular area, and determine whether pursuing a noise meter camera program at the conclusion of this pilot would be an effective solution for reducing excessive noise.

System Information

The noise meter camera system consists of a field enclosure box housing a computer and cellular wireless modem, mounted (strapped) to an upright streetlight or traffic pole, adjacent to a target roadway, and connected to 24-hour power. Attached to the enclosure are an armature with a microphone and two cctv-style video cameras. The system is activated when a sound pressure level threshold is triggered. This causes the sound and video from the two cameras to begin recording. The data for each incident is transmitted to the UK where the host company is located. The data is aggregated on a web-based platform accessible by the MBPD Tech Services Unit. The platform provides certain data in the form of a dashboard. The dashboard provides two tables for each site. One table shows the number of total activation events per day. The other shows a scatter chart of the sound pressure level of each activation by the time of day in which it was captured. These basic charts are marginally useful at best. The most important section of the

dashboard is where an operator can review and tag events. Here, an operator can open each event, which brings up the video and related data. Data captured by the system includes device name, location, date and time, highest Leq in dBA, highest Lmax,f in dBA, and highest Lmax,s in dBA. In addition to these automatically captured fields, the operator can enter the plate, notes, and check boxes for "foreign plate," "seen this vehicle before," and "event actioned." These fields must be entered manually upon the operator reviewing the video of each activation event. Options exist for zooming in, zooming out, and play, pause, and repeat of the video snippet.

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System Installation and Activation Dates

One system was installed in each area of Miami Beach – South (Area 1), Middle (Area 2), and North (Area 3).

- December 20, 2022 - Activated Area 1 and Area 3 sites.
- January 11, 2023 - Activated Area 2 Site (near 41st Street) – Deactivated February 16, 2023
- February 16, 2023 – Activated new Area 2 Site (near 29th Street)

One (1) system was initially installed near 41st Street in order to test performance near an intersection. However, testing revealed this location had several conditions which led to unfavorable results. This intersection is very complex as it has two dedicated southbound lanes, a dedicated westbound turn lane, two northbound traffic lanes, five east/west travel lanes, and is heavily traversed by pedestrians, trucks, busses, etc. After a few weeks of analysis, we determined we would not be able to ascertain high- quality, actionable data from this site. First, we note the pole currently available at this site is not tall enough to place the device at the correct height. Being below the ideal height resulted in problems identifying the offending vehicle and in capturing vehicle tags in the video. Also, the sheer number of traffic lanes resulted in many activations of vehicles outside of the video capture field (southbound/westbound). Further, a beach renourishment project underway was causing many activations by dump trucks routinely driving past the meter many times a day. And finally, this route is frequently used by Fire-Rescue and ambulances responding to Mt. Sinai Hospital, resulting in many non-actionable activations. Based on these observations, a decision was made in mid-February 2023 to move this site to a location with more favorable conditions for the remainder of the pilot program test.

In mid-February, 2024, thanks to efforts by Mayor Steven Meiner, Intelligent Instruments again agreed to upgrade their noise camera systems and extend the pilot program at no cost. This is the second major system hardware upgrade we have completed over the course of this pilot program. Over the next few weeks, the MBPD Technical Operations Unit unmounted the camera systems and prepared them for the camera, microphone, and system updates. The Tech Ops Unit received the hardware and performed the upgrades pursuant to instructions from the vendor's technicians. All the systems have been bench tested and appear to be operating correctly. Re-Mounting of the cameras was delayed as the Spring Break season pulled Technical Operations staff to other duties. Subsequently, the Tech Ops team has been engaged in a major project requiring their full attention on Washington Avenue. We are happy to report this project is nearly complete, at which point the Noise Monitoring Cameras will be re-mounted and activated. The Tech Ops team, working in conjunction with Intelligent Instruments and the Mayor's Office

have identified three new mounting locations. These locations were selected demonstrate how the systems will function in near-ideal conditions.

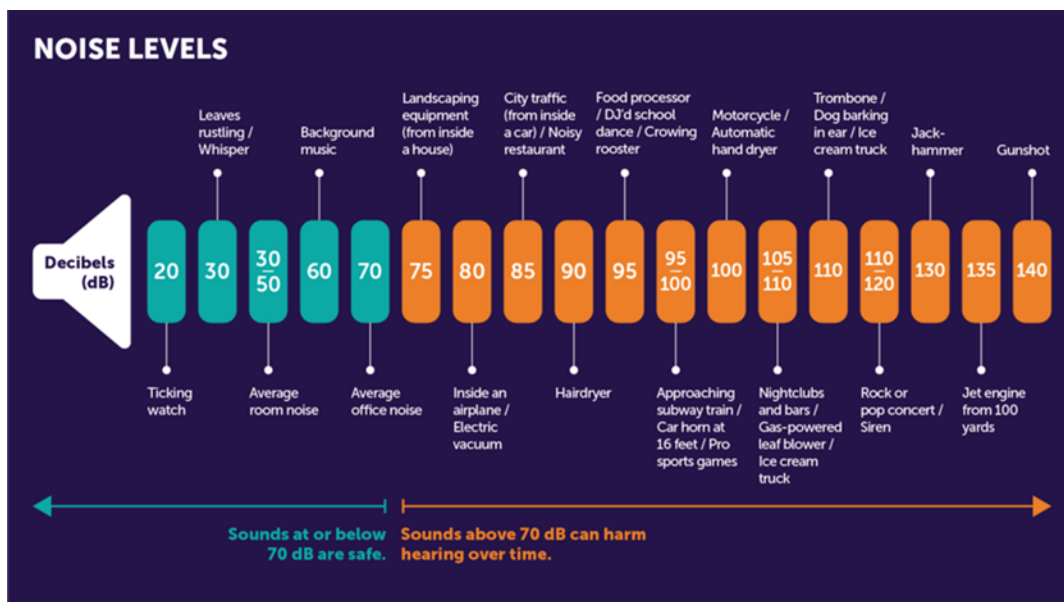
- Location 1 – 1200 Block of 71st Street (SR-934) (North side of the roadway directly in front of 1217 71st Street)
- Location 2 – Bay Rd just north of 16th Street (East side of roadway)
- Location 3 – 17th Street at Jackie Gleason Dr (just west of Washington Ave)

This will be the final phase of testing before the conclusion of the Pilot Program at the end of June 2024. At that point, MBPD will prepare a final report on the findings of the extended pilot program.

General Information on System Activations

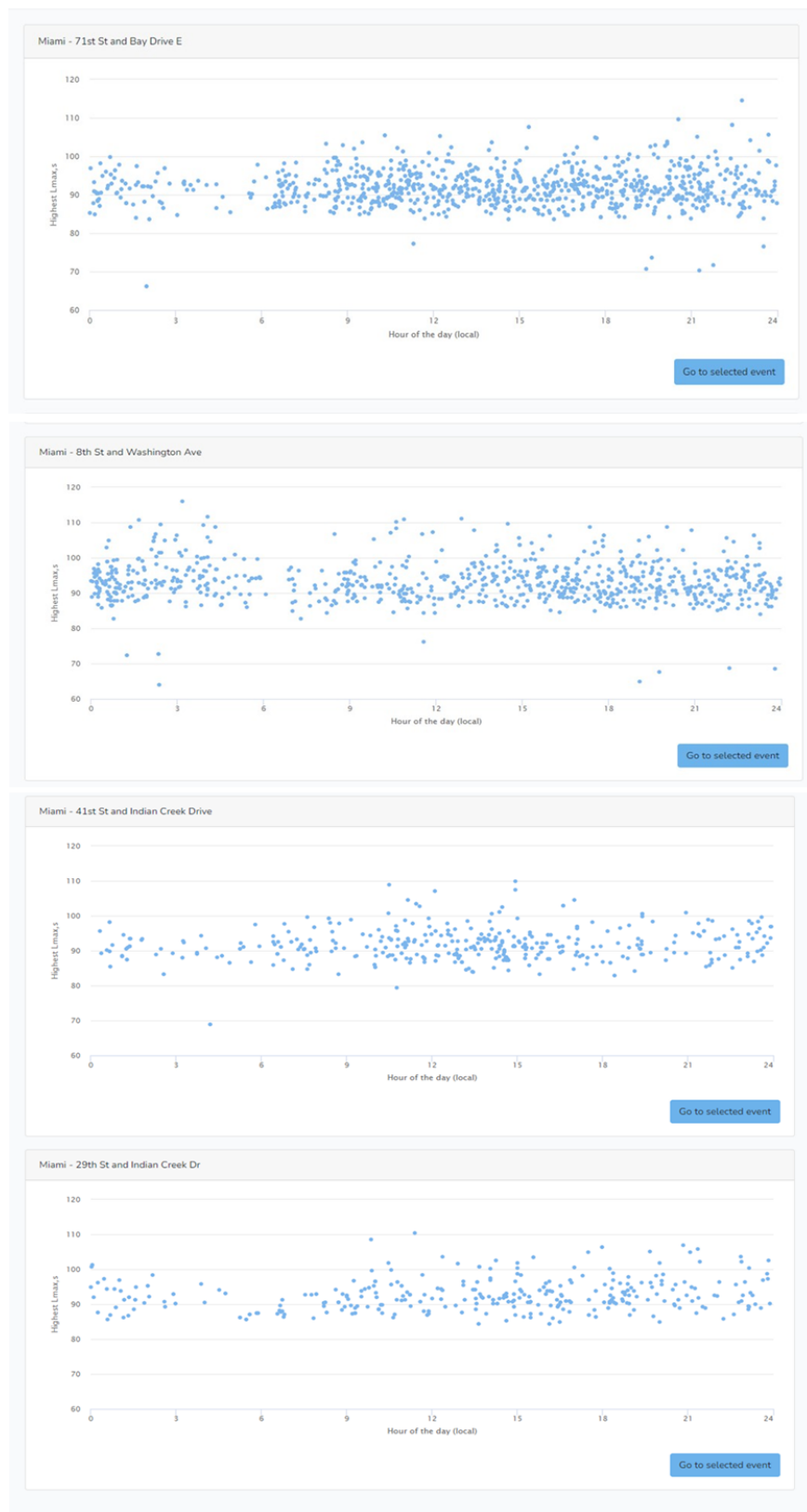
Analysis of all activations to date show that the system captured events within the range of 64dB Lmax,s to 117dB Lmax,s. For context, city traffic noise from inside a car is measured at approximately 85dB, riding on a motorcycle is measured at approximately 100dB and a thunderclap is approximately 120dB. In the case of our noise meter and camera system, the sensors are located adjacent to the roadways at a height of approximately 12 feet. This vantage point above the roadway generates a measurement which in most cases is generally unimpeded (no barriers) and relatively close to the source. Noise begins to dissipate as the distance to the source increases.

Below is a chart from the Hearing Health Foundation which describes some common dB measurements:



In our analysis, we provide data on total activations (over 64dB) and separate data on activations over 100Lmax,s, which we label as "excessive noise." When looking at the scatter charts, there was a clear natural dividing line at all four sites from what seems to be regular, everyday traffic noise at around 100 Lmax,s.

See examples:



Noise Meter Camera System Data Collected December 20, 2022 through March 16, 2023

Total activation incidents at all sites: 2,037

Area 1 Total Activations (Dec 20-Mar 16): 654

Area 2 Site A Total Activations (Jan 11-Feb 16): 331

Area 2 Site B Total Activations (Feb 16-Mar 16): 309
Area 3 Total Activations: 743

Analysis of TOTAL Incidents (over 64 Lmax,s)

| | Days | Total Incidents | Avg. Incidents/Day | Avg. Incidents/Hour |
|-----------------|------|-----------------|--------------------|---------------------|
| Area 1 | 86 | 654 | 7.6 | 0.32 |
| Area 2 (site A) | 36 | 331 | 9.17 | 0.38 |
| Area 2 (site B) | 29 | 309 | 10.66 | 0.44 |
| Area 3 | 86 | 743 | 8.64 | 0.36 |

Excessive Noise Events (over 100 Lmax,s): 138

Area 1: 65
Area 2 (cumulative over both sites): 44
Area 3: 29

Causes of Excessive Noise Events (over 100 Lmax,s)

Fire Department Vehicles: 21 (15%)
Honking Horns: 8 (6%)
Motorcycles: 30 (22%)
Motor Vehicles: 29 (21%)
Unable to determine: 50 (36%)

Analysis of EXCESSIVE NOISE Incidents (over 100 Lmax,s)

| | Days | Total Incidents | Avg. Incidents/Day | Avg. Incidents/Hour |
|-----------------|------|-----------------|--------------------|---------------------|
| Area 1 | 86 | 65 | 0.76 | 0.03 |
| Area 2 (site A) | 36 | 16 | 0.44 | 0.02 |
| Area 2 (site B) | 29 | 28 | 0.97 | 0.04 |
| Area 3 | 86 | 29 | 0.34 | 0.01 |

- Note on Motor Vehicles: Most excessive noise events attributed to motor vehicles (n=29) were exotic cars (Lamborghini, Ferrari, McLaren, etc.). These vehicles are unlikely to have modified exhaust systems, and if they do, would not likely be clearly identifiable to officers conducting enforcement without considerable examination of the vehicles and specific training. This factor must be considered as part of the overall results on effectiveness of this system.
- Note on Locations: There have been several discussions about the locations selected for this trial pilot program. We are undertaking this pilot program under real-world conditions and circumstances as they exist today. Any product will shine under "IDEAL" circumstances, but we would not get a true understanding of capabilities and limitations under artificially created perfect conditions. For this pilot program, we mounted the devices on existing upright poles that have 24-hour power and are in general areas of concern with high traffic volume. We selected different types of roads and different types of placements to test feasibility of each. We won't learn anything if we measure only under

perfect conditions that would not be realistic or practical without extensive additional costs. Every location we select, either in this pilot program or in a true deployment afterwards, will require some type of compromise. That could be the type of roadway (one-way, two-way single lane, two-way multi-lane, two-way divided roadway, etc.), the placement of the pole, microphone, and camera (median, side of the road, height of cameras and microphone on pole, physical obstructions, etc.), or any other variable which may or may not be under our control. Every location has some variable that requires a degree of compromise.

We know, for example, that we will not likely be given a permit to install these devices on State Roads under today's rules. We must behave as if this condition will remain in place and adjust our installations accordingly. We managed to have two installations on city property adjacent to State Roads which allow us to monitor those roads. This is the type of real-world workarounds we are attempting to test with the pilot program. Although these installations may not be "ideal" according to the manufacturer, this is the reality of conditions today. The cost of installing dedicated poles and running electrical power to those poles is extremely costly and would probably not be undertaken if we were to purchase noise meter cameras after the pilot. Most likely they would be installed on existing poles and be moved from time to time as needs changed. This is the reason we used existing upright poles for this test. The ability to function, be adapted to function, or provide useful information despite limited functionality is a reality of how they would be deployed and something we need to understand.

We also know that enforcement based solely on noise meter camera systems is not allowed under current law and even accessing the state driver information database may possibly be a violation of user agreements. We must also behave as if this will continue after the initial test period. This means we are undertaking and focusing our analysis on what information we CAN obtain from the system and how to use that information in a way that achieves the goal of reducing noise while still operating within the parameters of applicable Federal, State, and local laws. We are trying our best to find creative uses of the information that is provided by a system designed around enforcement. For example, we will see if statistically significant conclusions can be drawn from the time of day, day of week, season, or any other information that could inform police traffic enforcement deployments. We are trying to find value at every opportunity of this trial period

SUPPORTING SURVEY DATA

N/A

LOBBYIST DISCLOSURE

In accordance with Resolution No. 2023-32857, adopted by the City Commission on December 13, 2023, the following information has been provided by the Administration.

1. Was the Agenda Item initially requested by a lobbyist, which, as defined in code Sec. 2-481, includes a principal engaged in lobbying? No.

If so, specify name of lobbyist(s) and principals(s): Not Applicable

FISCAL IMPACT STATEMENT

No additional financial impact has been identified at this time.

CONCLUSION

The Administration has tested the first, second and third-generation Intelligent Instruments Noise Meter Camera System and has learned much about the capabilities and limitations of this system. Intelligent Instruments traveled to Miami Beach to update the systems, and the improved cameras

and microphones are able to pinpoint the source of noise as well as automatically recognize the tag of the offending vehicle. This is a major improvement over the previous iterations which automates many of the processes which must be otherwise completed manually.

To provide the Administration and City Commission with constructive and informed recommendations, the Miami Beach Police Department continues to work with Intelligent Instruments through various generations of their equipment as they continue to improve to learn how this system works under real world conditions and see how much actionable information can be drawn from the data provided.

Applicable Area

Citywide

Is this a “Residents Right to Know” item, pursuant to City Code Section 2-17?

No

Is this item related to a G.O. Bond Project?

No

Was this Agenda Item initially requested by a lobbyist which, as defined in Code Sec. 2-481, includes a principal engaged in lobbying? No

If so, specify the name of lobbyist(s) and principal(s):

Department

Police

Sponsor(s)

Mayor Steven Meiner

Co-sponsor(s)