

On March 20, 2020, City Manager Gregory Rose declared a State of Emergency for the City of University City due to the COVID-19 Pandemic. Due to the ongoing efforts to limit the spread of the COVID-19 virus, the January 10, 2022 study session be conducted via videoconference

STUDY SESSION
Gunshot Detection V5 System
VIA VIDEOCONFERENCE
January 10, 2022, at 6:00 p.m.

AGENDA

Requested by the City Manager

1. MEETING CALLED TO ORDER

At the Study Session of the City Council of University City held on Monday, January 10, 2022, via videoconference, Mayor Terry Crow called the meeting to order at 6:00 p.m.

In addition to the Mayor, the following members of Council were present:

Councilmember Stacy Clay
Councilmember Aleta Klein
Councilmember Steven McMahon
Councilmember Jeffrey Hales
Councilmember Tim Cusick
Councilmember Bwayne Smotherson

Also in attendance were City Manager, Gregory Rose; Attorney, John F. Mulligan, Jr., Captain Fredrick Lemons, and Chief of Police, Larry Hampton.

2. CHANGES TO REGULAR AGENDA

Mr. Rose requested that Item J (3); Kempland Bridge Surface Transportation Program (STP) Application, be moved from the Consent Agenda to the City Manager's Report.

3. GUNSHOT DETECTION V5 SYSTEM

Mr. Rose stated this is a presentation by Chief Hampton and Captain Lemons on the Gunshot Detection V5 System.

Chief Hampton turned the presentation over to Captain Lemons who has been spearheading this program.

Captain Lemons stated this is a technical program that assists the department with ways to combat crime in areas within U City that have had an increase in calls for shots fired.

Long-Term Effect on Gun Violence Victims Nationwide – Communities Pay in Treatment, Therapy, and Disruption

When it comes to how **American children are exposed to gun violence**, gunfire at schools is just the tip of the iceberg. Every year nearly **2,900 children and teens** are shot and killed and nearly **15,600 more are shot and injured**.

An estimated **3 million American children** are exposed to shootings per year. Witnessing shootings, whether in their schools, their communities, or their homes, can have a devastating impact. Children exposed to violence, crime, and abuse are **more likely to abuse drugs and alcohol**; suffer from depression, anxiety, and **posttraumatic stress disorder**; fail or have difficulties in school, and engage in criminal.

In an effort to continue to provide effective and innovative methods to protect the citizens of University City, the University City Police Department began evaluating the gunshot detection system software in 2019. The software and cameras included license plate reader technology, live streaming cameras, and a standalone gunshot detection system.

The police department has been extensively testing the usefulness and effectiveness of the V5 program from 01/2020 until 08/2021 and found it to be beneficial for the needs of U City.

- Gunshot detection software has the ability to protect patrol officers with increased tactical awareness such as the number of rounds and shooters as they approach crime scenes.
- It can connect investigators to the location of shell casings and other forensic evidence, while also improving police-community relations.

The Challenges of Implementing Gunshot Detection and Surveillance Outdoors

Studies in early gunshot detection software indicated that:

- **High false positives** drive inefficient use of manpower and reduce confidence and utilization of technology
- **No infrastructure** in outdoor areas where security is needed
- **Cost** of trenching for power & connectivity is extremely high; (*1 mile could cost up to \$250,000 a year*)
- **Time** to get permits for trenching and implementation can take months or years.

The V5 Accurate Acoustic Gunshot Detection and Outdoor Surveillance Award-Winning Technology

Creation of the world's first self-powered edge computing and security platform for the outdoors.

- Founded in 2014
- HQ located in Fremont, CA, with offices in Las Vegas, NV, Loves Park, IL, Nashville TN, Nizhny Novgorod, Russia, and Bangalore, India
- Securing BART, Veterans Affairs facilities, UCLA, San Jose State U, major US oil pipelines, among many other government and enterprise organizations
- First deployment in 2015 with Hayward PD, CA

How it Works

V5 triangulates the location of gunshots by using acoustic sensors that are placed in strategic locations.

- **Gunshot is Detected and Classified:** When the AI software coupled with edge computing detects and classifies a gunshot, the validated alert is pushed out in "real-time."
- **MSOC Verifies Non-Gunshot Sounds:** If a sound is not classified as a gunshot, V5 MSOC personnel will verify the sound, and if it is then classified as a gunshot, the alert will be pushed out at near real-time.
- **AI Continues to Learn Ambient Environment:** AI technology will continue to learn its environment over time enhancing accuracy and further sharpening performance.

Detailed Visual Information at Our Fingertips

When at least three OnSound units detect gunfire, they can share data and work together to triangulate the acoustic sound and pinpoint the precise location and direction of the shot.

- Acoustic Evidence
- Video Footage
- Exact Location On A Google Map

On Sound: Gunshot Detection Highlights

- **Multi-Sensor Approach:** V5 Systems multi-sensor approach allows intelligent video surveillance, license plate recognition, and acoustic gunshot detection solutions to gain real-time, quality, and type of crime information and collect critical evidence for investigations.
- **Real-time information:** Artificial Intelligence (AI) software running at the edge quickly delivers actionable alerts directly to users for faster response times. It is able to differentiate between fireworks, loud noises, and gunshots.
- **Customizable coverage:** Solar panels allow the flexibility to cover small areas like city parks or entire cities through the deployment of compact and portable units. Acoustic sensors receive the information which is simultaneously sent to the Company's dispatch center and the police department.

Customizable Notifications can be sent:

1. Directly to end-user
2. Dispatcher
3. V5 multi-sensor monitoring center
4. Combination of all three

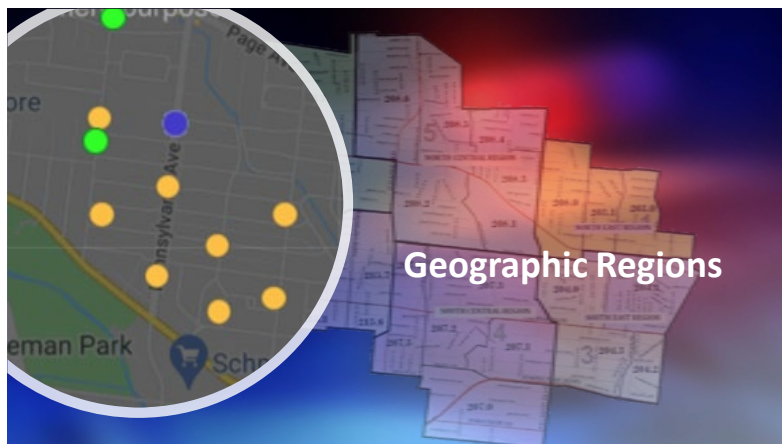
Or sent via:

1. SMS text message
2. Email
3. V5 dispatch call

Or can be viewed via:

Web-based user interface
Android or iOS app

The department chose a location that received the most calls for shots fired in 2019, which was the northeastern section of Ward 3. Sensors were installed within a quarter-mile radius.



Number of Gunshots Within U City and Hot-Spots

May 31, 2020, thru December of 2021

- Calls for Shots Fired = 208
- V5 detection calls = 71
 - V5 detections, 55 corresponded with a call for service, resulting in 3 arrests.
 - Average response time 1.9 minutes; (*1 minute faster than normal dispatch times.*)

Evaluation Pros and Cons


While the department does not own the software, it does own the equipment, which has saved money.



V5 SYSTEMS

Our Evaluation PRO's

- 1 Highly accurate, real-time alerts**
AI-driven platform yields its outstanding accuracy because it continuously learns ambient sounds in its specific environment. Coupled with edge computing enables alerts to be sent in real-time.
- 2 Self-powered and Portable**
Free from the electric grid via proprietary solar technology, battery, and power management system. Allows the ability to move the units as crime "hot spots" move or for special events (fair, celebration, presidential debate, etc.). UCPD owns the equipment.
- 3 Savings on time & money on deployment**
We can rapidly deploy units in under 30 minutes per unit vs. months to years (when permitting and trenching are involved. Trenching, on average, costs ~\$750K per ½ mile.



V5 SYSTEMS

Our Evaluation CON's

- 1 Inability to link with local cameras and recent technology advances.**
Although the software and interface is user friendly, current technology allows for detections to be linked to cameras in the area.
- 2 Service outages and technical support issues**
Throughout the evaluation period there were several outages that occurred. In the beginning, the company was responsive but that subsided during the evaluation period. This may have been in part due to their recent acquisition.
- 3 Company acquisition**
Since August of 2021, V5 Systems is in the process of being acquired by an outside this firm. This has limited use of the equipment due to the lack of employees still on staff.

Captain Lemons stated the department has found this system to be useful in helping to increase and lower response times, locating evidence, and receiving hits on shell casings that occurred in a separate incident.

Mr. Rose stated challenges nationwide with bringing new officers on board and trying to keep existing officers safe, will ultimately lead towards the use of more technology in policing.

Councilmember Clay posed the following questions to staff:

Q. What is the cost of this system?

A. (Captain Lemons): *Approximately \$75,000.*

Q. Is \$75,000 the cost of maintaining this system?

A. (Captain Lemons): *A one-year subscription is \$13,750.*

Q. At that price point, will the system cover the same geography, or can it be expanded?

A. (Chief Hampton): *With this vendor, the department has the ability to expand if the crime statistics start to shift.*

Chief Hampton stated \$75,000 is a fraction of the cost for other systems. Initially, one of the biggest hurdles with these systems was the power source. For example, the Shot Spotter's system was much more expensive and is powered by using Ameren's poles, which generates an additional cost. But since the V5 system is solar powered there is no extra cost, and it provides you with the flexibility to cover small areas like city parks or entire cities through the deployment of compact and portable units.

By Councilmember Clay:

Q. Do the three arrests represent people who actually fired shots?

A. (Captain Lemons): *Yes. One was a homicide; one led officers to a specific address, and the other led officers to a suspect who admitted firing the shots.*

Q. Has this department been able to use shell casings as evidence?

A. (Captain Lemons): *It has not happened with any of the incidents in U City, but it does occur quite often.*

Chief Hampton stated that is another reason why laws regarding the use of weapons are so important to law enforcement agencies. If they have a reason; like shell casings, to seize a weapon, that provides them with an opportunity to have the weapon tested and compared to open cases.

Councilmember Hales posed the following questions to Captain Lemons:

Q. Were any of the three arrests attributable to the V5 data?

A. *Yes, it helped with all three arrests.*

Q. Based on its current acquisition status, do you have any indication of what the future of V5 will be?

A. *We have been in talks with V5 representatives who think that the company will be fully acquired by the end of this month.*

Q. Is the City being compensated for any interruptions in service?

A. *V5 has indicated that the City will be compensated for any interruptions that resulted in the system not being fully utilized; which was from August to January.*

Q. How does real-time data work? What is the process from when the notification is received until it is relayed to the officers on duty?

A. *V5's dispatch contact's the City's dispatch to let them know shots were fired in a certain area. Supervisors receive the notification instantaneously and provide it to officers in the area.*

Chief Hampton stated V5 is being acquired by Edge Tech, and the plan is to incorporate all of V5's employees into their company.

Councilmember Smotherson posed the following questions to staff:

Q. Do you think you could have solved the incidents related to these three arrests without the V5 technology?

A. (Captain Lemons): *The department probably could have solved the homicide on its own. But the technology helped bring the case to a conclusion by telling the department where it occurred and where the evidence could be found. In another case, V5 directed officers to the house where the shots originated. So, V5 helps accelerate the process and provides officers with knowledge about the type of situations they are walking into.*

Q. How is this technology going to lower incidents of violence?

A. (Chief Hampton): *Any time you reduce your response time you increase the likelihood of solving a crime.*

Councilmember McMahon posed the following questions to staff:

Q. Did the 208 calls for shots fired come out of the same geographic region?

A. *That was city-wide.*

Q. Looking at the percentage, it's a good chance that many of those shots might not have occurred within U City. Is that one of the difficulties in investigating these incidents?

A. (Captain Lemons): *If the system is unable to triangulate a specific location, it provides a direction, so many of those calls occurred outside of U City's jurisdiction.*

A. (Chief Hampton): *You can stand in Heman Park and hear shots being fired from the Hodimont tracks, especially during the fall when leaves have fallen from the trees.*

Q. Can your department use that data to help residents better understand these occurrences that are happening outside of the City's jurisdiction? Because based on some of the posts I've read on NextDoor and Facebook, the assumption always seems to be that if they heard shots, then it's happening in their neighborhoods.

A. (Captain Lemons): *Yes sir.*

A. (Chief Hampton): *The department is not privy to postings on Facebook or NextDoor, so unless they get a phone call or an email they are unaware of the community's reaction. However, the administration is always made aware of anything of importance to make sure residents are informed.*

Mr. Rose stated he intends to resume this discussion with Council during a holiday work session. In the meantime, he will be working with the Chief to get a better understanding of their evaluations prior to making a recommendation.

The northeastern section of Ward 3 was selected to gauge the system's effectiveness because that's where the most calls were received. But from what he is hearing today, this system might be beneficial for the City from the perspective of solving cases, as well as keeping its officers safe.

4. ADJOURNMENT

Mayor Crow thanked Captain Lemons and Chief Hampton for their presentation and for keeping residents safe during these challenging times. He then adjourned the Study Session at 6:30 p.m.

LaRette Reese,
City Clerk