

Weapons Detection Pilots Updates Summary of the Activity and Preliminary Findings

System Security and Law Enforcement (SSLE) is piloting weapons detection technologies to evaluate their potential to reduce the presence of firearms in the transit system. The technologies can be broadly categorized into two groups: video analytics-based brandished weapon detection and concealed weapon screening. Staff have been collaborating with multiple vendors to organize cost-free pilots of their respective solutions and test their effectiveness. Initial pilots began in late August and will continue through December 2024.

Video Analytics-Based Weapons Detection

Staff tested four visual detection solutions in the Union Station West area, enabling 25 of the CCTV cameras to detect the brandishing of firearms. Visual detection systems leverage artificial intelligence (AI) and computer vision algorithms to scan existing CCTV video feeds in real-time, identifying threats and disseminating alerts to designated responders through pre-established channels.

Methodology

Staff conducted multiple rounds of testing of each of the four solutions to assess their detection capability and establish a baseline of performance.

Weapons Detection System	Scheduled Piloting	Test 1	Test 2	Test 3
Pilot A	September 2024	9/6/24	9/10/24	9/13/24
Pilot B	September 2024	9/16/24	9/24/24	9/26/24
Pilot C	September 2024	9/26/24	10/04/24	10/08/24
Pilot D	October 2024	10/08/24	10/11/24	10/14/24

The overall assessment of the solutions included evaluating the alerting mechanism, alert viewing platform or dashboard, frequency of false positives, and integration with existing or upcoming security infrastructure.

SSLE staff developed a uniform testing protocol, brandishing a selection of various inert and training replica firearms in different positions in view of cameras in different station areas. Staff tested each system during station closure hours.

Summary of Results

Following the completion of the four pilots, staff found:

- These solutions are incompatible with the existing CCTV systems on buses and train cars as they cannot provide constant video feed.
- Ample network bandwidth is necessary to handle the burden of processing additional video streams. Layering multiple video processing solutions, such as

CCTV viewing and recording and video analytics (such as weapons detection) systems, can overload network systems or exceed equipment specifications.

- Certain types of weapons, mainly large firearms and rifles, have a slightly higher rate of detection than smaller-sized weapons, such as revolvers and compact pistols.
- Detection capabilities varied widely between systems, but the testing results established a clear ranking based on performance, with one solution scoring higher than the rest. No system achieved total detection of all firearms brandished; however, the highest-ranking system was the only one to detect a replica M9 pistol in every position brandished, testing session, and camera tested.
- In systems without third-party verification, dedicated personnel resources are necessary to screen out false positives since the system can incorrectly identify everyday items as weapons. Staff witnessed wheelchairs, walking canes, bicycles, electric scooters, and other handheld items being identified as weapons.
- All systems disseminate alerts through multiple channels. Staff subscribed to receive alerts through all available channels. Overall, alerts are generated almost instantaneously once a firearm is identified. Third-party verification results in a delayed alert since the system requests human verification from operators at an off-site operations center.

Staff are confident that the solution implemented as part of Pilot A sets a benchmark in detection the other solutions cannot reach, in addition to the absence of false positives given that third-party verification is built into the system. Based on this conclusion, staff have made a high-level assessment of the requirements for systemwide implementation.

As previously mentioned, video-analytics-based systems require a continuous video stream from cameras, something that rolling stock is not able to provide. As for divisions, bus and rail stations, and other fixed facilities, an in-depth network engineering analysis is necessary to determine the extent to which this system can be currently deployed. There are locations where the system may be deployed without infrastructure changes because the facilities were recently constructed or upgraded. For other locations, an assessment must be made to determine the scope of capital projects necessary to upgrade the CCTV and network infrastructure to meet the required specifications. Determining the extent to which this solution can be deployed is far beyond the scope of the current effort.

Concealed Weapons Screening

Staff have also been organizing pilot demonstrations of concealed weapons screening technologies. These systems are designed to identify concealed weapons, such as firearms or large-edged weapons, using advanced sensors, AI, and other technologies. They offer a noninvasive screening method to detect and identify hidden threats without physical contact and eliminate the need to remove personal belongings.

Progress is ongoing on the implementation of pilots and testing. The current schedule is as follows:

Weapons Screening	System Setup	Scheduled Piloting/Testing	Scheduled Piloting/Testing <i>(subject to change)</i>	Progress
Pilot AA	Lane	Metal Detection	October/November 2024	Start date week of 10/21
Pilot BB	Pillar	Metal Detection	November 2024	Target start date week of 11/26
Pilot CC	Millimeter Wave	Millimeter Wave	November 2024	Coordinating Pilot Implementation

Status of Piloting and Testing

Pilot AA

Metro has received the vendor's weapons detection system. Staff previously conducted a demonstration of the single-lane system. During the demonstration, no passengers or members of the public were screened. Having gained valuable insight into the system's footprint, staff worked with the vendor to develop different screening procedures and establish the Concept of Operations (ConOps). Staff also worked closely with the County Counsel's office to substantiate the pilot's operating procedures with the legal basis and the agency's authority to conduct weapons screening.

This pilot began the week of October 21st in the mezzanine area of the eastern access to the B/D Line. Passengers are selected for screening using a predetermined interval and then subject to secondary screenings if alerts are generated and an appropriate course of action to be followed if a weapon is found. Metro Transit Security and law enforcement will provide the necessary personnel to direct passengers, conduct primary and secondary screenings when necessary, and intervene if a passenger refuses screening or is found to be in possession of a weapon.

Pilot BB

Staff is targeting to start the pilot the week of 11/26. The vendor will ship the units a few weeks prior. The ConOps for this pilot will be refined according to the type of screening technology and set-up.

Pilot CC

Staff continue to work with the vendor to secure an agreement for the piloting of the technology. Progress has been hampered based on the system's power and data connectivity requirements, as well as the hardware installation requirements, which, in an atypical environment such as the underground B/D Line station, represent a significant challenge.