

STATEMENT OF TECHNOLOGY

Automated Enforcement Safety Cameras in Cedar Rapids, IA

Under contract with the City, Sensys Gatso USA, Inc has installed four types of Automated Enforcement (“ATE”) Cameras in the City of Cedar Rapids. One is installed at selected intersections and a second on trusses above selected highways within the city limits of Cedar Rapids. Additionally, there is an ATE Camera installed inside a police vehicle providing a system which can be easily moved around the city and a hand held lidar device with built-in camera allowing an officer to enforce speeds virtually anywhere within the city.

A) Intersection Safety Cameras

At selected intersections across the City, Intersection Safety Cameras have been installed. These camera systems capture vehicles violating the red traffic light and/or speeding. The systems are housed inside stainless steel cabinets mounted to poles typically twelve feet above ground. Some systems utilize radar devices securely affixed to the camera pole twenty-five feet above the roadway. Other systems have a radar device built into the camera cabinet. An auto self-test is performed daily to ensure the system is operating properly. The radar validates the hardware and software parameters continuously even when no vehicle is being detected. If one of the verifications fails, the output of the radar will be set to zero and the signal will not be processed any further. No pictures will be taken. The radar will recover when a new self-test takes place with no issues found. An individual radar device installed over each lane of traffic monitored is used to detect vehicles and also measure speed. The status of the traffic signal is monitored via a wired connection from the camera system to the intersection traffic controller cabinet. A speed accuracy calibration test is performed annually using external test equipment.

1) Intersection Safety Cameras – Red Light Violation

One type of Intersection Safety Camera captures red light violations. For a red light violation to occur, the camera system must receive the proper traffic light sequence of green, yellow, and red from the traffic controller. The vehicle must travel past the white painted violation line (stopbar) while the traffic light is illuminated red. Vehicles which travel past the violation line on yellow or green will not activate the red light camera.

At minimum two color digital still images will be taken. The first image will display the violating vehicle behind the violation line with the traffic signal

illuminated red. The second image will display the vehicle past the violation line and into the intersection with the traffic signal still illuminated red. A supplemental video of the event is also produced.

Automatically created and attached to the still images at the time of violation is a databar. The databar contains all relevant data of the event including date, time, amount of yellow time, amount of red time, speed, and location.

The combined images and databars are encrypted using Advanced Encryption Standard and with the video are transferred via a Virtual Private Network (VPN) for processing.

Processing consists of a human viewing the images and video to determine if a red light violation occurred based on the Business Rules approved by the City. If an event meets the criteria for a violation, the license plate data is electronically sent to the National Law Enforcement Telecommunications Service (Nlets) for name, address, and vehicle information. Upon receipt of the registered owner information another review is made comparing the information to the vehicle in the images. Upon confirmation of a match, the violation event is electronically sent to the Police Dept for an officer to review. The officer will review the event and make the determination if a red light violation occurred. If yes, the violation is printed and mailed. If no, the event is held for a short period of time and then deleted.

2) Intersection Safety Cameras – Speed Violation

The second use for Intersection Safety Camera is for speed. At some intersections an individual radar device has been installed for each lane of traffic monitored to detect vehicles and measure their speed. At other intersections a single radar device capable of monitoring up to 6 traffic lanes is installed.

For a speed violation to occur, a vehicle must exceed the speed limit configured inside the camera system. This speed limit is determined by the Police Dept and is always several miles above the speed limit posted on signs prior to the intersection.

Two color digital still images will be taken. The first image will display the violating vehicle typically prior to the violation line. For speeding the status of the traffic signal light does not matter. It can be illuminated green, yellow or red. The second image will display the vehicle in the intersection. Automatically created and attached to the still images at the time of violation is a databar. The databar contains all relevant data of the event including date, time, speed, and location.

The combined images and databars are encrypted using Advanced Encryption Standard and with the video are transferred via a Virtual Private Network (VPN) for processing.

Processing consists of a human viewing the images to determine if a speed violation occurred based on the Business Rules approved by the City. If a violation has occurred the license plate data is electronically sent to the National Law Enforcement Telecommunications Service (Nlets) for name, address, and vehicle information. Upon receipt of the registered owner information another review is made comparing the information to the vehicle in the images. If an event meets the criteria for a violation, the violation event is electronically sent to the Police Dept for an officer to review. The officer will review the event and make the determination if a speed violation occurred. If yes, the violation is printed and mailed. If no, the event is held for a short period of time and then deleted.

B) Freeway Truss Mounted Cameras – Speed Violation

At selected freeway trusses along the I-380 highway, Truss Mounted Safety Cameras have been installed. These camera systems capture vehicles speeding. The systems are mounted to the sign trusses typically twenty feet above roadway. A self-test is performed daily to ensure the system is operating properly and annually a speed accuracy calibration test is performed using external test equipment. The radar validates the hardware and software parameters and settings every minute even when no vehicle is being detected. If one of the verifications fails, the output of the radar will be set to zero and the signal will not be processed any further. No pictures will be taken. The radar will recover as soon as the verification result is correct.

An individual radar device, camera, and flash unit are installed over each lane of traffic monitored. A radar beam is emitted across the lane it is monitoring.

For a speed violation to occur, a vehicle must exceed the speed limit configured inside the camera system. This speed limit is determined by the Police Dept and is always several miles above the speed limit posted on signs prior to the truss.

Two monochrome digital still images will be taken. The first image will display the violating vehicle a set distance from the camera. The second image will display the vehicle traveled further. Automatically created and attached to the still images at the time of violation is a databar. The databar contains all relevant data of the event including date, time, speed, and location.

The combined images and databars are encrypted using Advanced Encryption Standard and with the video are transferred via a Virtual Private Network (VPN) for processing.

Processing consists of a human viewing the images to determine if a speed violation occurred based on the Business Rules approved by the City. If an event meets the criteria for a violation, the license plate data is electronically sent to the National Law Enforcement Telecommunications Service (Nlets) for name, address, and vehicle information. Upon receipt of the registered owner information another review is made comparing the information to the vehicle in the images. Upon confirmation of a match, the violation event is electronically sent to the Police Dept for an officer to review. The officer will review the event and make the determination if a speed violation occurred. If yes, the violation is printed and mailed. If no, the event is held for a short period of time and then deleted.

C) Mobile Vehicle Camera – Speed Violation

The City operates a Mobile Safety Camera. This system is installed in a vehicle which is parked along a roadway anywhere in the City. This camera system captures vehicles speeding. An individual radar device, camera, and flash unit are installed in the vehicle. Three plus lanes of traffic can be monitored. A narrow radar beam is emitted across the lanes of traffic being monitored. Each day the vehicle is deployed a tuning fork test is performed on the radar by the deployment officer to ensure the system is operating properly. Annually a speed accuracy calibration test is performed by a NIST traceable independent laboratory.

For a speed violation to occur, a vehicle must exceed the speed limit configured inside the camera system. This speed limit is determined by the Police Dept and is always several miles above the speed limit posted on signs along the roadway.

Two color digital still images will be taken. The first image will display the violating vehicle a set distance from the camera. The second image will display the vehicle has traveled further. Automatically created and attached to the still images at the time of violation is a databar. The databar contains all relevant data of the event including date, time, speed, and location.

The combined images and databars are electronically signed and with the video are stored in the system. When the vehicle is returned to the Police Dept the storage system containing the violation events is removed from the vehicle by the operator and placed in a docking station inside Police Headquarters. Once docked the events are transferred via a Virtual Private Network (VPN) for processing.

Processing consists of a human viewing the images to determine if a speed violation occurred based on the Business Rules approved by the City. If an event meets the criteria for a violation, the license plate data is electronically sent to the National Law Enforcement Telecommunications Service (Nlets) for name, address, and vehicle information. Upon receipt of the registered owner information another review is made

comparing the information to the vehicle in the images. Upon confirmation of a match, the violation event is electronically sent to the Police Dept for an officer to review. The officer will review the event and make the determination if a speed violation occurred. If yes, the violation is printed and mailed. If no, the event is held for a short period of time and then deleted.

D) Hand Held Lidar Device with Built-in Camera – Speed Violation

The City operates a hand-held lidar based system with built in camera. For many years police officers have used both radar and lidar to guns to enforce speed limits. A vehicle detected by these devices caused an officer to chase down the vehicle to issue a citation. Often, traffic conditions did not allow for a safe pursuit to take place. New technology has married a digital camera to the lidar gun. This allows a trained officer to safely capture speeding vehicles from the safety of their vehicle. After a secondary review of the images by police a citation is mailed just as with the other ATE camera systems.

112719