



TRAFFIC VIOLATION MANAGEMENT SOLUTION



URBAN TRAFFIC CHALLENGES

Urban areas all around the world are constantly growing in size and population, while also attracting a large number of daily commuters as well. This increased traffic volume generates a constant pressure on the infrastructure of cities.

Large traffic volume engenders a greater number of violations, accidents and traffic jams that make urban traffic less efficient. It is therefore vital to equip modern cities with a traffic violation management system that works efficiently and reduces traffic issues.

The Logipix Traffic Violation Management solution was created for cities to automatically capture the largest number of traffic violations, and consequently to achieve a safe and accident-free environment.





THE LOGIPIX TRAFFIC VIOLATION MANAGEMENT SOLUTION

The aim of the Logipix Traffic Violation Management solution is to ensure safety and mobility, and to make traffic **violation detection** and **law enforcement** procedures **more efficient**. The Logipix solution ensures a **city-wide system** that is able to detect different types of traffic violations at different spots of the city. The **end-to-end system**

covers the entire workflow and performs its tasks automatically from **violation detection** through **vehicle data collection** to compiling a **detailed violation report** which can be sent to local authorities. The acquired data and footage can be used as **irrefutable evidence** during investigation and in court.



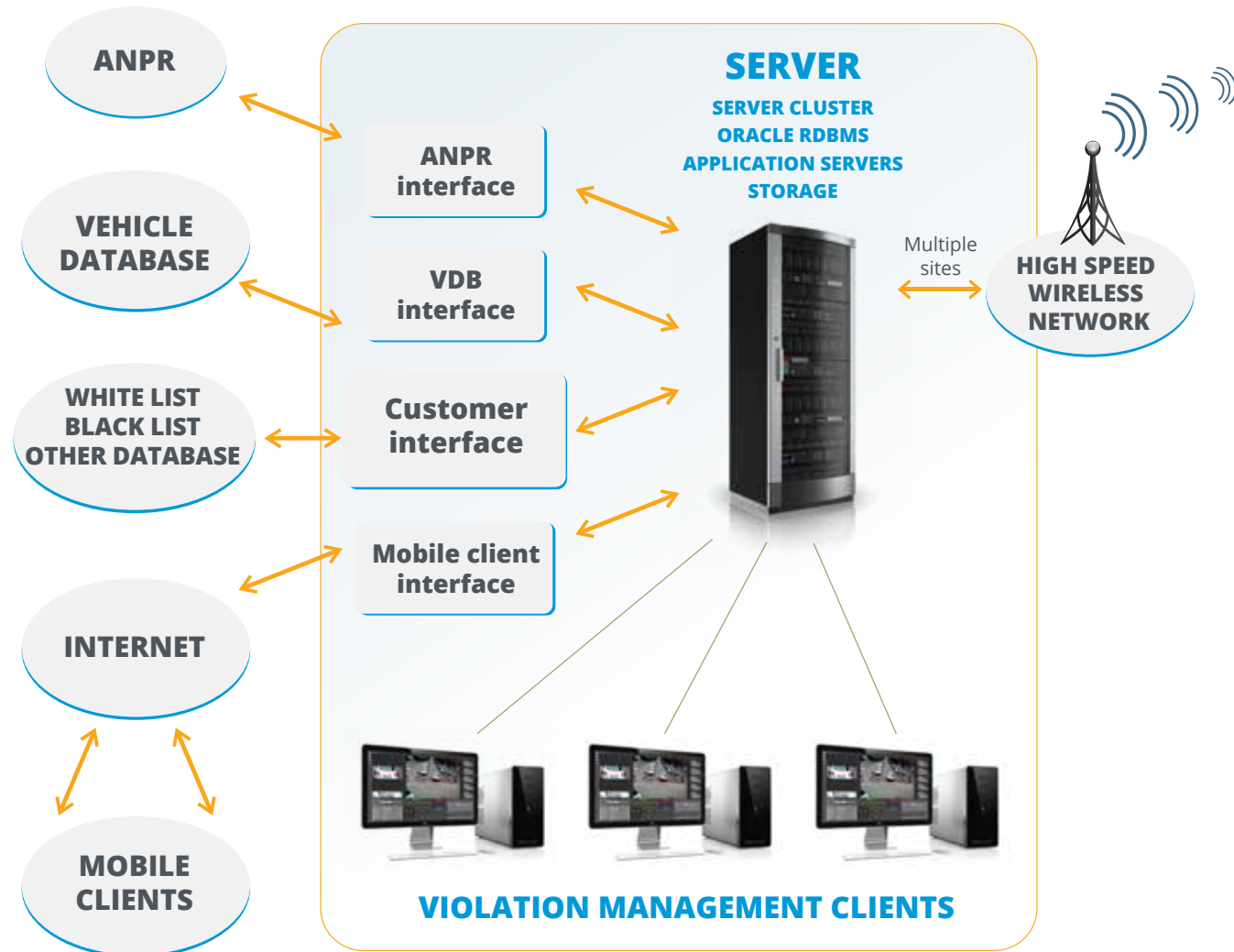
The main components of the solution

- Wide dynamic range Logipix ONE 20 MP cameras with 20 FPS, using JPEG2000 compression
- Integrated IR Flash
- Outdoor Network Video Recorder
- Integrated multi-lane radar / LIDAR for speeding
- Server cluster with dedicated application servers
- Oracle RDBMS
- ANPR interface
- Interface for external vehicle database and customer-managed lists
- Violation Management Client software (VMC)

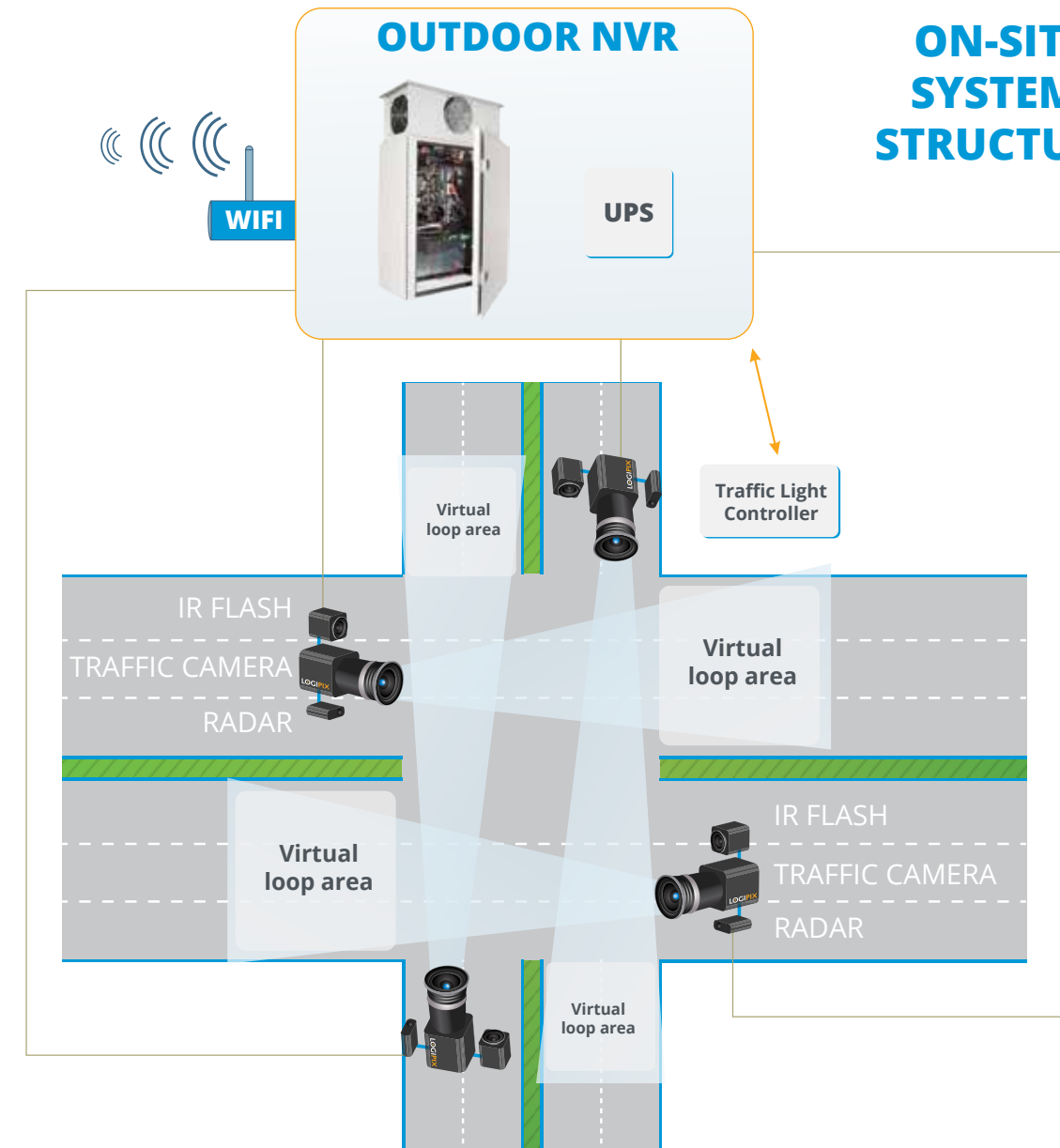
SYSTEM OPERATION

The Logipix system provides 24/7 operation, delivering high-definition images and ensuring **automatic traffic violation detection and management**.

VIOLATION MANAGEMENT CENTER



ON-SITE SYSTEM STRUCTURE



Monitoring

The Logipix high-end surveillance cameras were designed by our engineers to cover large areas and provide high-resolution images in any weather or lighting conditions. The **wide dynamic range 20 MP Logipix ONE** cameras are installed at intersections and city roads and are suitable for **monitoring**



multiple lanes. A specially developed **IR Flash** works synchronized with the cameras to provide sharp and detailed images even at night. As the IR Flash **has a multiple power illumination mode**, both reflective and non-reflective license plates can be detected.



Onsite recording

Logipix developed an **Outdoor NVR** for the traffic solution that **works onsite** at each intersection. This allows the system to be extremely **bandwidth-effective**, and performs fast communication between the sites and the server.

The NVR features an outdoor enclosure with **IP65** rating, designed specially to **resist even the most extreme weather conditions**. The thermal control

of the electronic components relies on a combined system of integrated heat pipes, fans, optional Peltier and sunshields.

A high-definition video card, fast CPU, and a large memory ensure the accurate operation of the **embedded Video Content Analysis** applications. Thanks to a **built-in I/O panel**, external signals can be connected easily to the traffic solution.

Connected traffic light system

Traffic light states can be visualized alongside the camera images, as the **traffic light system can be connected to the NVRs**. This way there is no need for extra investment to monitor the traffic lights.

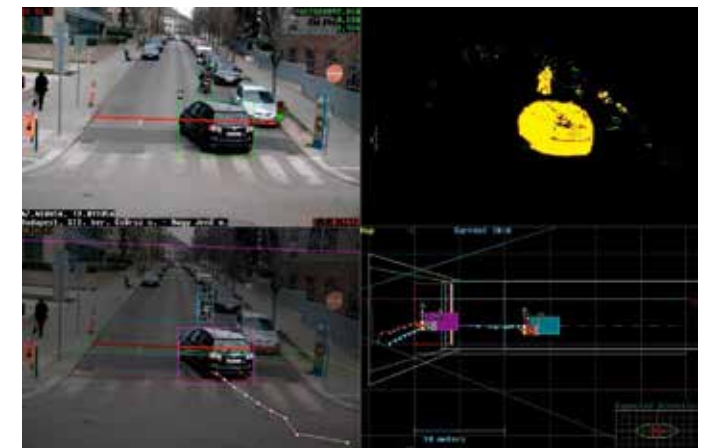
Violation detection

The detection methods rely on the high FPS video streams of the 20 MP cameras. For **speeding detection**, Logipix developed a monopulse, **multi-lane radar** that works together with the VCA. It provides telegrams that contain the coordinates and the speed of up to seven vehicles. This information is then matched with the VCA-recognized vehicle objects. As for other violations, the solution relies on the 20 MP Logipix ONE cameras that make accurate object recognition and tracking possible.



Video Content Analysis

In the Logipix Traffic Violation Management solution, the NVRs run the **Video Content Analysis applications**. They accurately detect traffic violations and provide information on traffic flow.



Traffic counting

The Logipix Traffic Violation Management solution provides **image-based traffic counting** as well. Since the VCA performs this feature, there is no need for expensive installation of inductive loops.



Automatic Traffic VCA applications

- Speeding detection
- Stop sign violation detection
- Red light violation detection
- Bus lane violation detection
- Wrong-way violation detection
- No left turn violation detection
- Parking violation detection
- Traffic counting

Law enforcement

After all information is gathered the violation package can be reviewed and confirmed in the **Logipix Violation Management client**. If the violation is confirmed, the system creates a ready **violation report** that can be sent for further investigation and may be used later as irrefutable

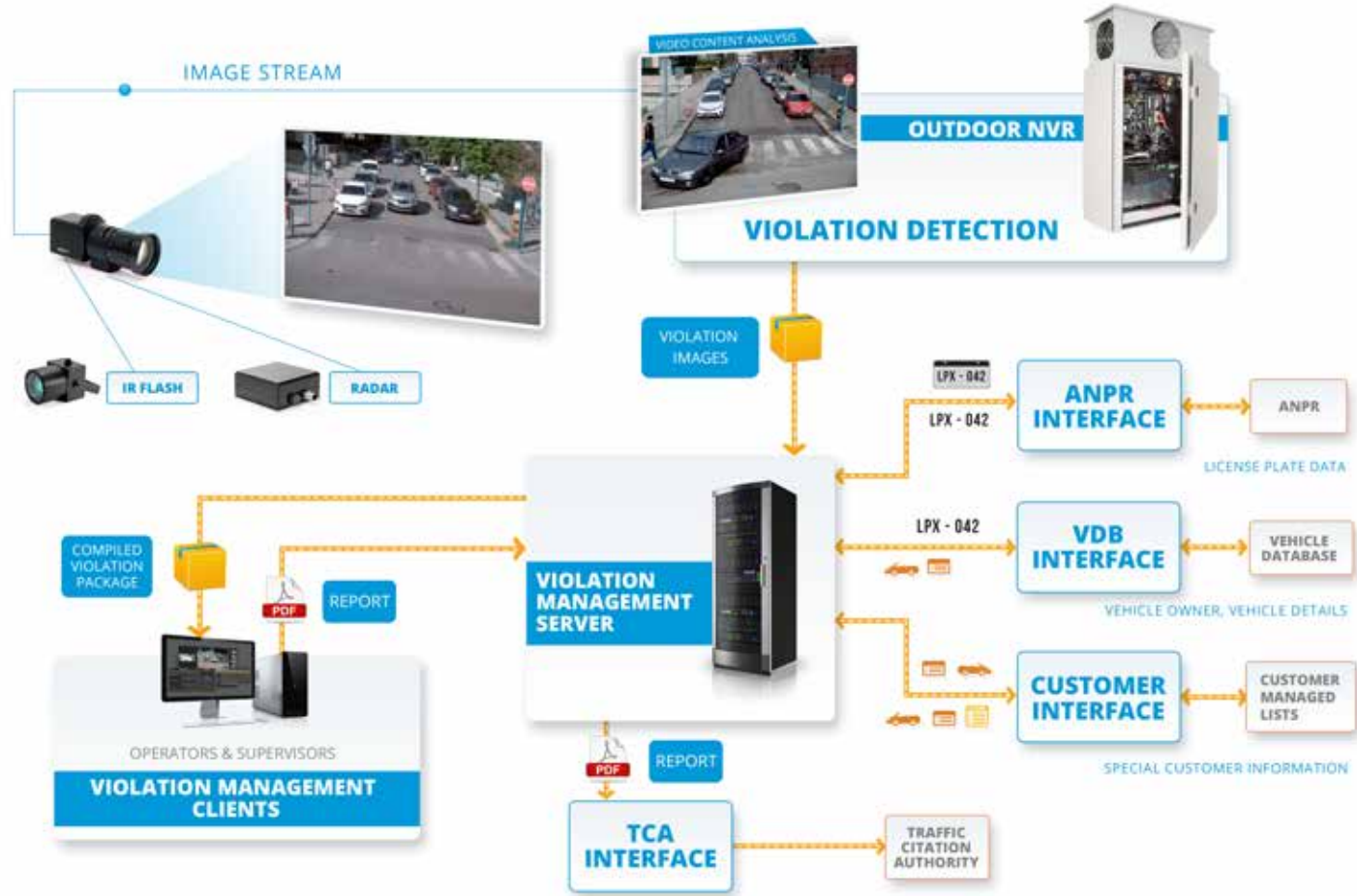
evidence in court. Logipix therefore does not stop at monitoring and detection but also **supports law enforcement** procedures. The system has benefits in the long-run as well. If drivers know that their actions have legal consequences, traffic discipline is likely to improve, leading to lower accident rates.



Traffic violation management

In case of a traffic violation, the VCA application automatically detects the violator and finds their license plate on the image. Based on a saved log file the server requests the key image, and further four other relevant images of the violation, and crops the license plate. The server sends the image of the license plate to the connected ANPR. The server of

the Logipix Traffic Violation Management solution is also able to interface with country-specified vehicle databases and special customer-managed lists that provide further vehicle and owner data. **All relevant images of the violation and important vehicle data are collected in a violation package.**



THE STRENGTHS OF THE LOGIPIX TRAFFIC VIOLATION MANAGEMENT SOLUTION



- Logipix successfully created an **end-to-end solution** that covers the entire workflow from automatic violation detection and violation management to compiling a detailed violation report.
- Logipix developed a wide dynamic range, 20 MP Logipix ONE camera to **effectively cover multiple lanes**, and to avoid the installation of a large number of devices.
- Thanks to a fewer cameras being needed and the ability of the Logipix Outdoor NVRs to perform the recording onsite, **installation and maintenance costs are significantly reduced**. It is possible to install a city-wide system without burdening the environment with serious construction works.
- The system provides stunning images even at night. A synchronized IR Flash with multiple power illumination ensures the visibility of **both reflective and non-reflective license plates** even after dark.
- Logipix ensures a **cost-effective and flexible solution** as it is able to **detect automatically detect all the common types of traffic violations** with license-dependent VCA using the same hardware components.
- The automatic VCA **facilitates the violation management procedure** and greatly increases the number of traffic violations detected daily.
- **The entire operation of the system is automatic.** Only the violation evaluation process is performed by operators in the **easy-to-use Violation Management Client** software that helps to maximize the number of violations processed daily.

CONCLUSION



Logipix successfully combines automatic traffic violation detection methods, high frame rate, and extremely high resolution in an end-to-end solution, allowing safer and more organized traffic in modern cities. Thanks to the Logipix Traffic Violation Management solution, authorities are able to prevent and quickly respond to incidents and operate more effectively while also remaining cost-effective.

ABOUT LOGIPIX

Logipix Technical Development Ltd. is a privately-held company established in 1996 in Budapest, Hungary. Since then, Logipix has grown into the international company that it is today – one of the most innovative developers and manufacturers of end-to-end video surveillance solutions. Today the main profile of the company is to provide specially designed, high-end video surveillance solutions considering the various characteristics of different application areas.

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