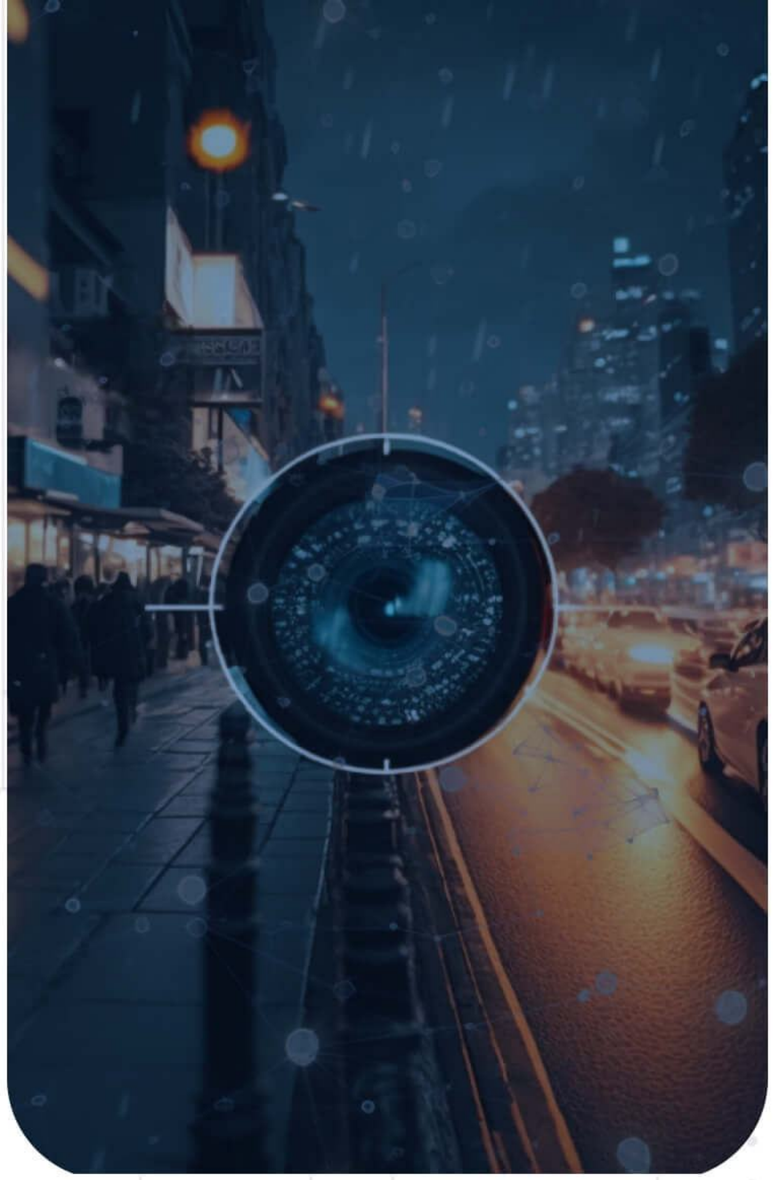
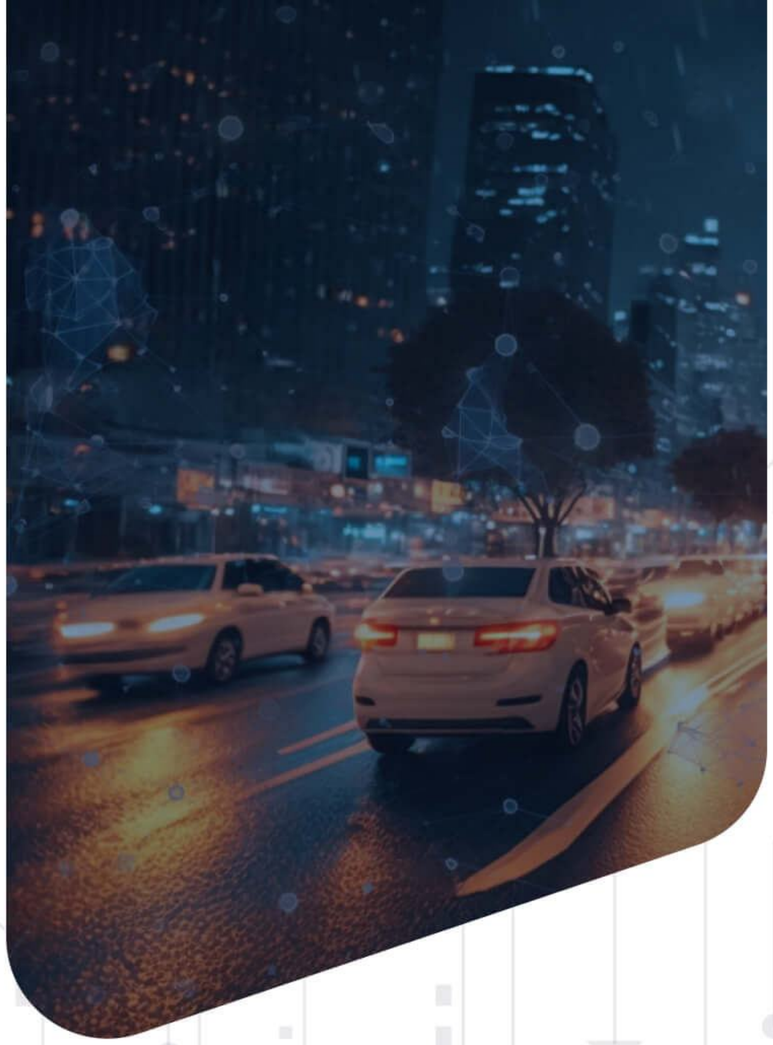




CAMAN

AI-DRIVEN DETECTION
CITIES & HIGHWAYS

WHO WE ARE
WHAT IS CAMAN

- Advanced **AI** using **Deep Learning** & **Neural Networks**
- **Detection** with **Success Rate** above **95%** & **GDPR Compliance**
- **Interactive Management System** for **Advanced Analytics** & **Planning**
- Offers a **programmable API** for integration into **third-party systems**

Advanced object analysis cameras have become a revolutionary tool in security solutions. Harnessing the power of **artificial intelligence** and **deep learning**, they provide **extreme accuracy** and **minimal false detections**.

CAMAN is the perfect solution for **safer transportation**, **industrial applications**, **smart city** and **IoT integration**.

OUR SOLUTIONS
WHAT WE OFFER

Smart City

CITY CAMAN

Real-Time Monitoring with **Object Detection** ensures seamless planning for **Cities** and their **Mayors**, saving time and money.

Smart Highway

HIGHWAY CAMAN

Real-Time Traffic Incidents with **AI Analysis** provides valuable **Insights** with immediate **Alerts** based on **Road Traffic Violations**.

Marek Vančo | **Founder of CAMAN**

Our products are designed for **practical, real-life applications** to **enhance safety** in **urban areas** and to **smoothen traffic**. Additionally, they aim to **improve the quality of life** for **city residents** and **simplify the tasks** of **communications managers** and **city technical services**.

SMART CITY WHAT CAN WE DETECT

1 Advanced Technology & Its Standards

- durable solutions for vehicles
- EN50155, EN45545, and NFPA 130
- 30-minute operation backup
- online data streaming
- offline synchronization of untransferred data

2 Trash-Cans & Their Assessment

- color & purpose of garbage-cans
- graffiti & vandalism criminality
- unauthorized or illegal dumping
- proper sorting and recycling
- missing garbage can
- garbage can fill levels
- payment compliance

OTHER

public amenities & bus stops # pollution of garbage stands and their areas # patches & drains

customer complaints # 4+ types of potholes # vehicle parking violations # abandoned objects

vegetation overgrowth # street lighting outages # sidewalk damage # public signage clarity

City CAMAN is an **advanced, modern solution** for **event analysis** in **urban environments**. We collect data using cameras and then analyze this data using **AI** and **neural networks**, achieving **exceptionally accurate results**.

Our long-term goal within our **smart city domain** is to enhance the **quality of life** for **city residents** by simplifying and making the work of **technical services** more **efficient**. We document **waste collection processes**, **validate claims**, identify **unauthorized waste disposal**, and ensure **waste disposal taxes** are paid.

Secondary waste collection vehicles monitor **the quality of roads**, detect **missing manhole covers**, document **graffiti**, and assess the **cleanliness of container sites** and **bus stops**. The system also focuses on **monitoring the speed** of the collection vehicle and **the timing of waste collection**, displaying **the duration of stops**, and **vehicle operations**.

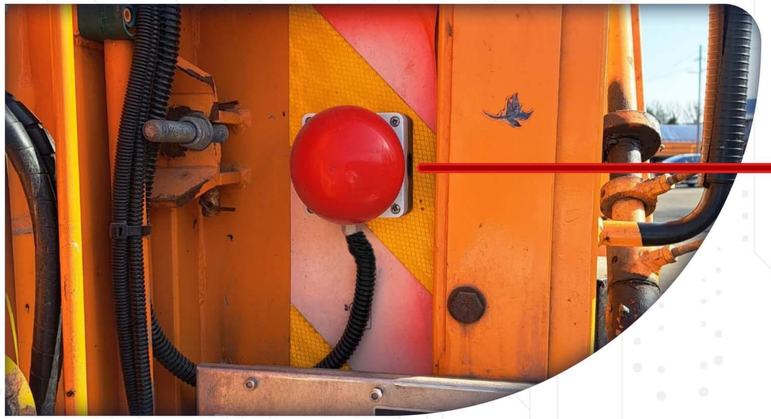
The system provides **immediate and clear results** from all analyzed areas, thereby **improving planning**, **increasing work efficiency**, and most importantly, **reducing costs**.

CITY CAMAN

ROBUST POWER WITH **BACKUP & COMMUNICATION**

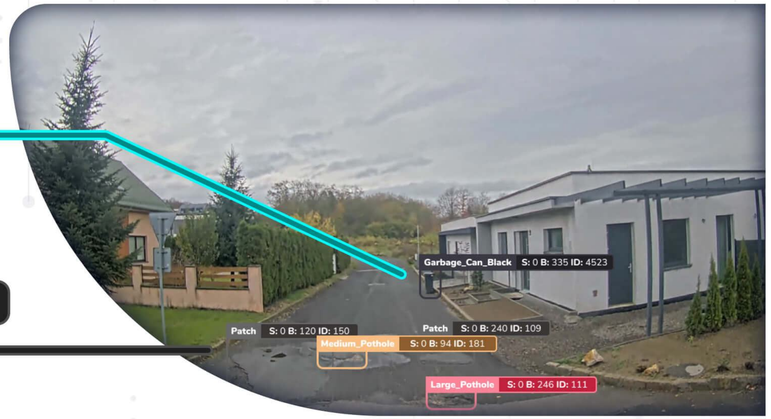
CONTROL DISPLAY MOUNT
VEHICLE CREW OPTIONAL

CERTIFIED CAMERAS **EN50155/45545 & NFPA 130**



MISSING/DAMAGED TRASH-CAN
ALERT BUTTON FOR REPORTING

TRASH-CANS & THEIR **COLOR ASSESSMENT**



TYPE CLASSIFICATION POTHOLES & THEIR

TRASH-CANS & THEIR **PAYMENT COMPLIANCE**

GRAFFITI VANDALISM BUILDINGS & THEIR

SMART FOR SAFE HIGHWAY ROADS

The ideal solution for **monitoring traffic** and effectively **resolving incidents on the road**, utilizing cutting-edge **camera sensors** combined with advanced **neural network technology**, ensuring **a safer** and more **efficient transportation environment**, while also providing **valuable data** for **future traffic planning** and **strategies**.

- cyclist on the road
- person on the road
- wild animals on the road
- verification of license plate
- stopping of a vehicle
- detection of wrong way
- evaluation of vehicle speed
- categorization of traffic flow
- categorization of weather
- assessment of road

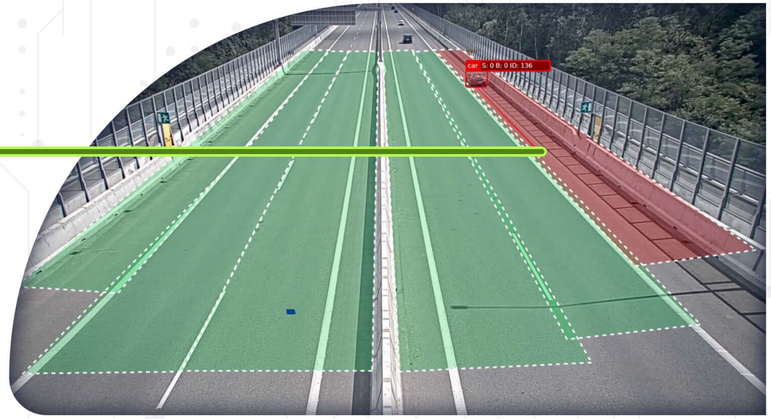
HIGHWAY CAMAN

Transform **an ordinary camera** into **a smart traffic sensor**. Monitor **traffic situations**, track **the behavior of road users**, count **vehicles**, and **classify by type or model**. Identify which vehicle has **violated traffic rules** and address these **incidents** immediately. Utilize **PTZ cameras** with **automatic scene calibration** or **an existing camera system**.

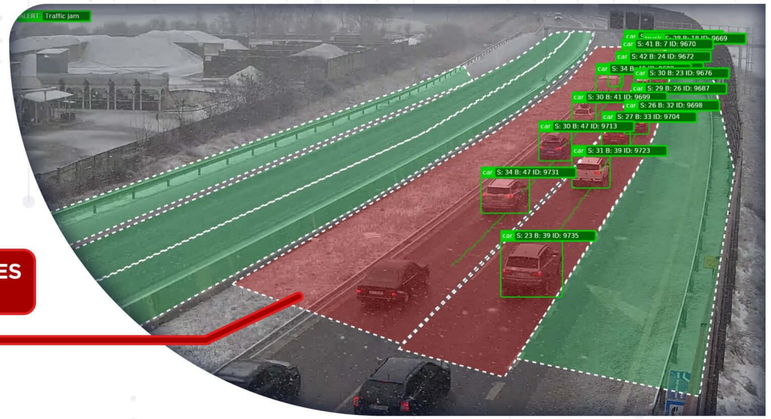
Highway-CAMAN generates **comprehensive traffic statistics** on **vehicle speeds**, **types**, **critical times**, and **congestion on road sections** under almost **any weather condition** or in **low light**. It **alerts** to the presence of **people or animals on the road** and is **a certified tool** for use in **C-ITS** solutions, providing information to **road users**.

Compared to standard **AI technologies**, we boasts a **high detection reliability** of **over 95%** thanks to **robust neural networks** trained on **thousands of datasets** with **traffic incidents**, **highly precise tracking** of each object, and a **reliable video management platform** with an **extensive user interface**.

DAY INCIDENT
STOPPING OF A VEHICLE



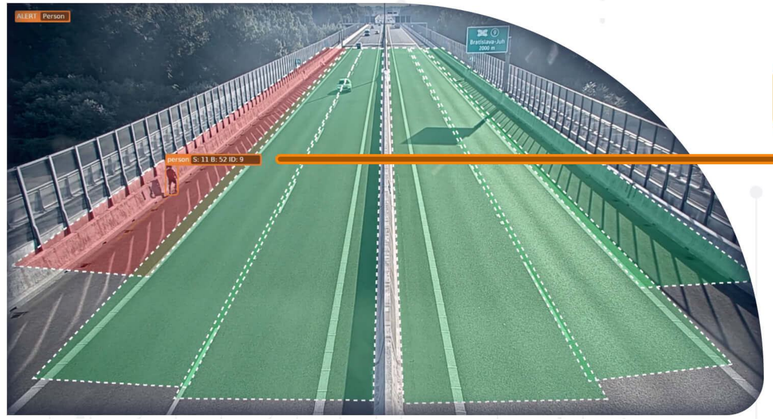
THE ALERTS ARE TRIGGERED AFTER A SET AMOUNT OF TIME



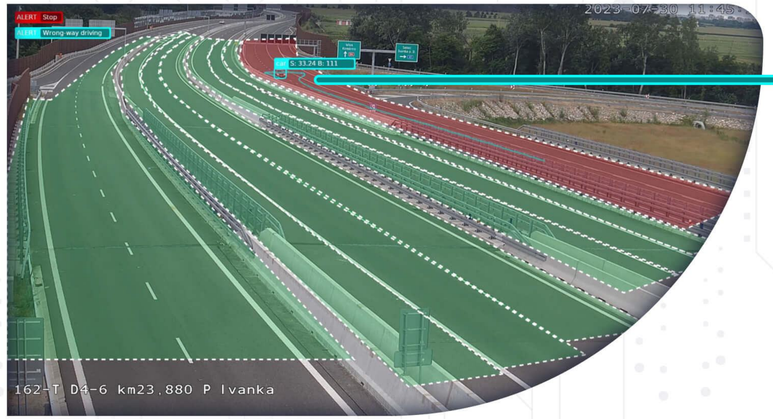
THE TRIGGERED DETECTION ZONES INSTANTLY TURN RED

TRAFFIC FLOW CATEGORIZATION
BAD WEATHER INCIDENT

DAY INCIDENT
PERSON ON THE ROAD



SPEED, DIRECTION, AND UNIQUE IDS ARE COLLECTED IN REAL-TIME

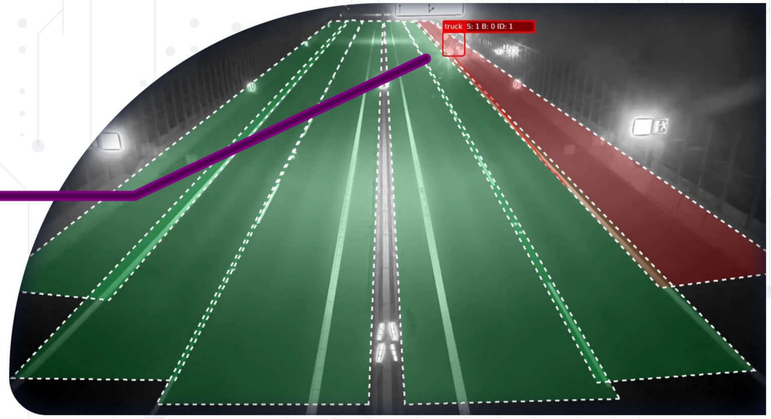


THE OBJECT MOVEMENTS ARE BEING TRACKED

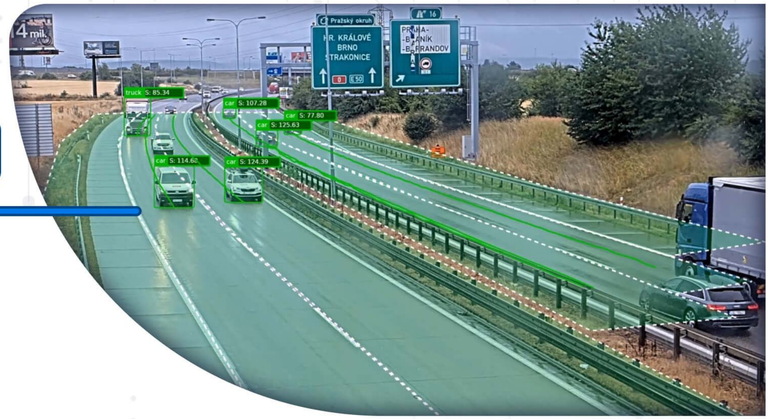
WRONG-WAY DETECTION
DAY INCIDENT

NIGHT INCIDENT
STOPPING OF A VEHICLE

OUR NEURAL NETWORK PROVIDES 95% DETECTION ACCURACY

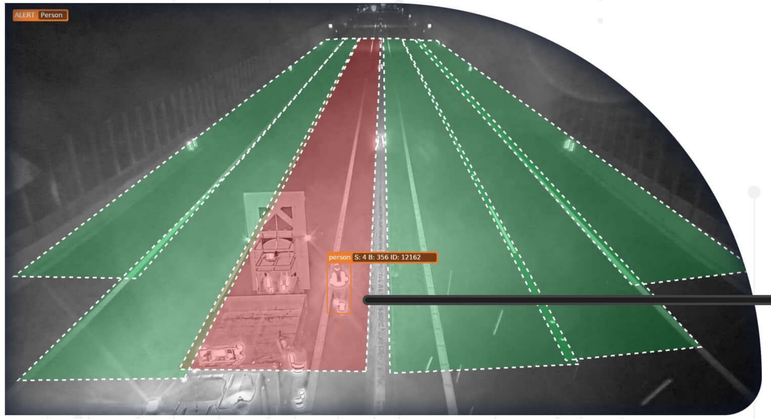


WEATHER & ROAD CONDITIONS ARE EVALUATED IN REAL-TIME FOR SAFETY

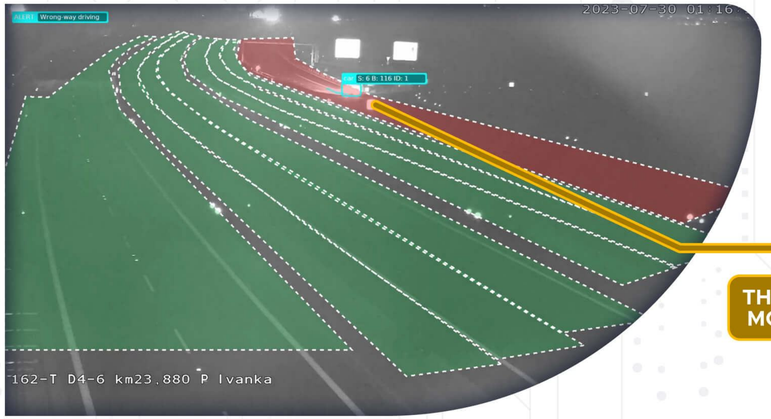


TRAFFIC SAFETY ASSESSMENT
BAD WEATHER INCIDENT

NIGHT INCIDENT
PERSON ON THE ROAD



DETECTION REMAINS EFFECTIVE EVEN IN HARSH NIGHT CONDITIONS



THE OBJECT CAN BE SPOTTED THANKS TO MOVEMENT PATTERN & SHAPE OF LIGHTS

WRONG-WAY DETECTION
NIGHT INCIDENT

ADVANCED PLANNING & ANALYTICS APP

INTERACTIVE DASHBOARD

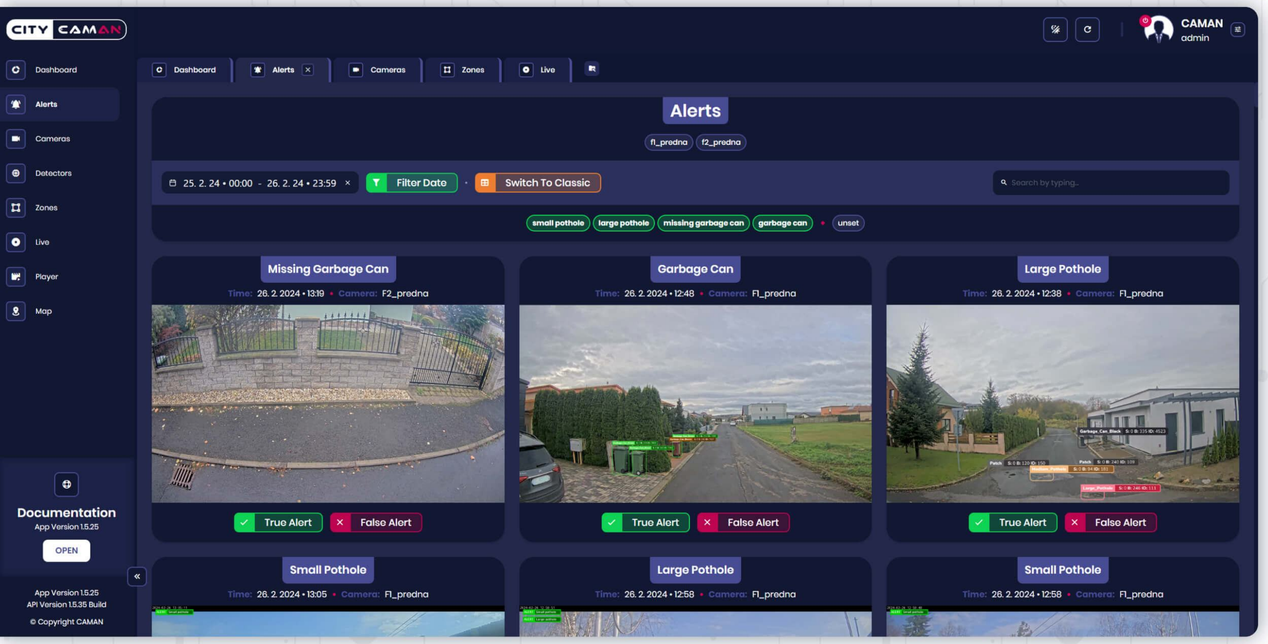
1 Customizable Charts

- Total and daily count
- Date and data filters
- Different chart types
- Chart export to PC
- Real-time data update

2 Dynamic Card Builder

- New custom cards
- Card management
- Custom filter combinations
- Predefined card sets

Comprehensive analyses at all levels. Gain **insights** into **all events** from one place. Discover what is currently happening in your city and what to expect. **Filter** and **compare** types of events by **time**, **location**, or **vehicle**. Plan **road repairs** by **categorizing sections** into a separate group. Locate **unemptied waste containers** and assist **the claims department** in proving their legitimacy. Find out who has not paid **the waste tax**, plan **street cleaning** from **graffiti**. Keep data **organized** and **accessible** in one place, online with just one click.

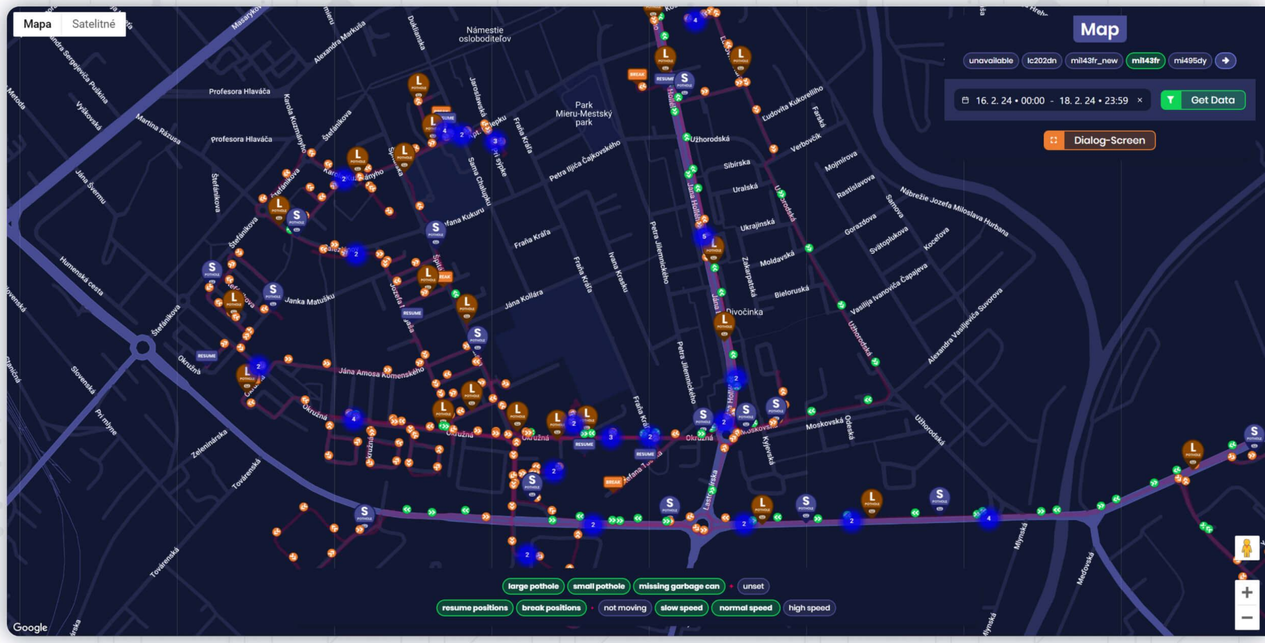


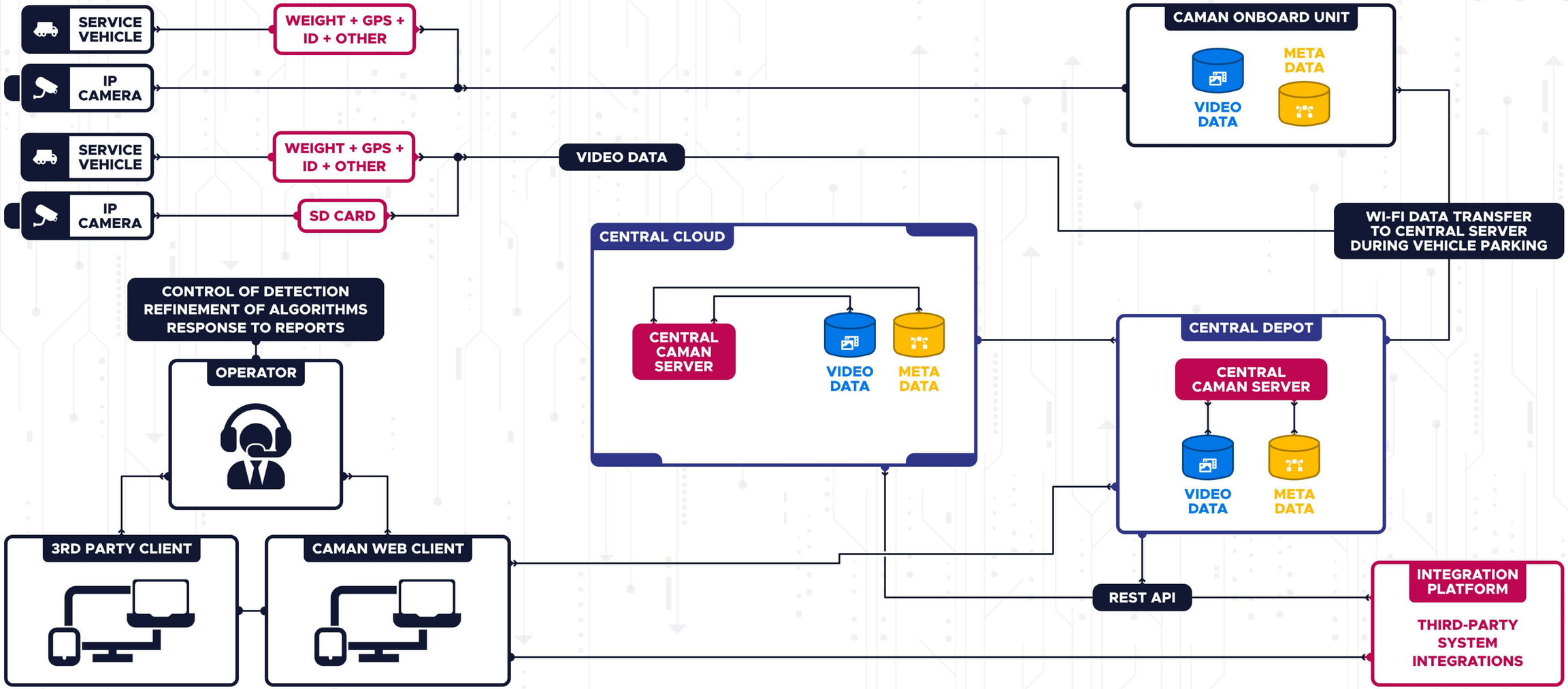
REAL-TIME DETECTED EVENTS
ASSESSMENT OF ALERTS

ADVANCED FILTERING | METADATA OPTIONS | TABLE DATA EXPORT | RAW & METADATA VIDEO | TABLE & MATRIX VIEW | TRUE/FALSE EVALUATION | VIDEO FOOTAGE DOWNLOAD

OVERVIEW OF POSITIONS
INTUITIVE & INTERACTIVE MAP

PRECISE POSITIONS | ALERT TYPE CATEGORIZATION | REAL-LIFE STREET VIEW | EFFECTIVITY CONTROL | VEHICLE SPEED INDICATORS | MISSING GARBAGE CAN | ROUTE VIDEO FOOTAGE | VEHICLE ROUTE




SERVICE VEHICLE
IP CAMERA
WEIGHT + GPS + ID + OTHER
SERVICE VEHICLE
IP CAMERA
WEIGHT + GPS + ID + OTHER
SD CARD
VIDEO DATA
CAMAN ONBOARD UNIT
VIDEO DATA
META DATA
WI-FI DATA TRANSFER TO CENTRAL SERVER DURING VEHICLE PARKING
CENTRAL CLOUD
CENTRAL CAMAN SERVER
VIDEO DATA
META DATA
CENTRAL DEPOT
CENTRAL CAMAN SERVER
VIDEO DATA
META DATA
CONTROL OF DETECTION REFINEMENT OF ALGORITHMS RESPONSE TO REPORTS
OPERATOR
3RD PARTY CLIENT
CAMAN WEB CLIENT
REST API
INTEGRATION PLATFORM
THIRD-PARTY SYSTEM INTEGRATIONS

1 Pothole Detection and Road Safety Features

- Detects potholes with a success rate of over 95%, even at speeds up to 90 km/h
- Classifies potholes into 4+ types for thorough passportization
- Detects and records status and location of all traffic signs, and the locations of potholes and container stands
- Sends real-time notifications and video sequences of container stands based on GPS

2 Seamless Connectivity and Data Transfer

- Sends events via online (3G/4G/LTE) to a centralized Video Management Platform, VMS
- Ensures no data loss with HDD buffering in case of connection failure
- Optimizes video data transmission by supporting RTSP/H264 cameras and employing video repackaging
- Ensures compatibility by supporting both ARM and AMD64 architectures on the Linux OS

3 Advanced Video and Data Management

- Provides automatic multi-level video synchronization and metadata database synchronization from all sites
- Enables video download by time and metadata, and single frame download without requiring the entire video
- Detects and records status and location of all traffic signs, and the locations of potholes and container stands
- Allows for maintenance-free, automatic deletion of older videos based on customizable settings for each camera

4 Integration and Customization Capabilities

- Offers an open, programmable API for integration into third-party systems
- Allows remote adjustment of selected camera settings and transmission of service data from camera recordings

5 Precise Video Analytics and Archiving

- Accurate video recording and metadata storage with 1 frame accuracy
- Metadata includes time, GPS, and results of current object detection (AI)
- Enables updates of object detection parameters for a newly learned neural network
- Allows filtering, downloading and exporting of videos based on collected metadata

6 Instant Data Transmission and Analysis

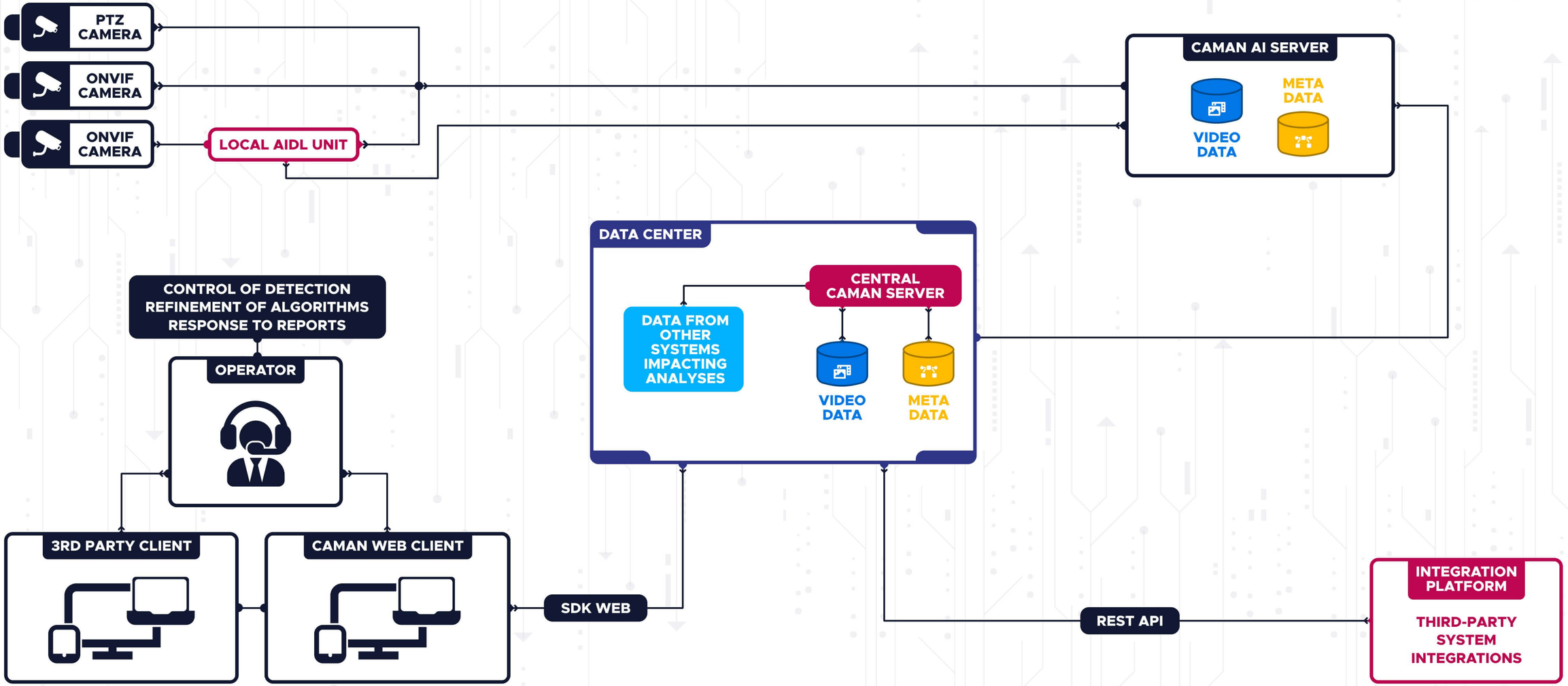
- Immediately sends data from a selected location to the central system after recording
- Allows uploading of analytical data triggered based on the event location
- Evaluates the status of parameters for determining deviations and parameter values
- Allows remote adjustment of selected camera settings

7 Interactive Video Management System (VMS)

- Allows operators to manually trigger emergency event recording
- Select data filtering according to camera, periods, and specified periodicity for annotation system
- Supports annotation types: label, bounding box, polygon, and curves
- Includes a native intelligence annotation tool for pre-analysis and user refining of analysis parameters

8 Advanced Data Collection

- Automatically generates alerts after incident detection for streamlined review
- Captures detailed data on incidents, including timestamps, GPS location, video footage, and metadata


PTZ CAMERA
ONVIF CAMERA
ONVIF CAMERA
LOCAL AIDL UNIT
CAMAN AI SERVER
VIDEO DATA
META DATA
DATA CENTER
CENTRAL CAMAN SERVER
DATA FROM OTHER SYSTEMS IMPACTING ANALYSES
VIDEO DATA
META DATA
CONTROL OF DETECTION
REFINEMENT OF ALGORITHMS
RESPONSE TO REPORTS
OPERATOR
3RD PARTY CLIENT
CAMAN WEB CLIENT
SDK WEB
REST API
INTEGRATION PLATFORM
THIRD-PARTY SYSTEM INTEGRATIONS

1 Road Safety and Real-Time Monitoring

- Detects people on the road with high precision, ensuring swift response to a potential risk
- Ecoducts Passportization: Identifies the presence of animals near or on ecoducts
- Monitors traffic conditions in real-time and sends immediate alerts: slowdown, stop, traffic jam, and wrong-way
- Capable of process and send multiple alerts simultaneously for comprehensive coverage

2 Advanced Video and Data Management

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- Includes a native intelligence annotation tool for pre-analysis and user refining of analysis parameters

5 System Requirements and Compatibility

- Operates seamlessly on both Linux with Docker Containers and Windows Environments
- Fully compatible with Windows Server from version 2019 (and newer)
- Optimized for NVIDIA graphics cards starting from the Ampere architecture and onwards

6 Advanced Data Collection

- Automatically generates alerts after incident detection for streamlined review
- Captures detailed data on incidents, including timestamps, video footage, and metadata

INTERESTED?

GET A SOLUTION

CAMAN

DOWNLOAD CATALOGUE

VISIT OUR WEBSITE