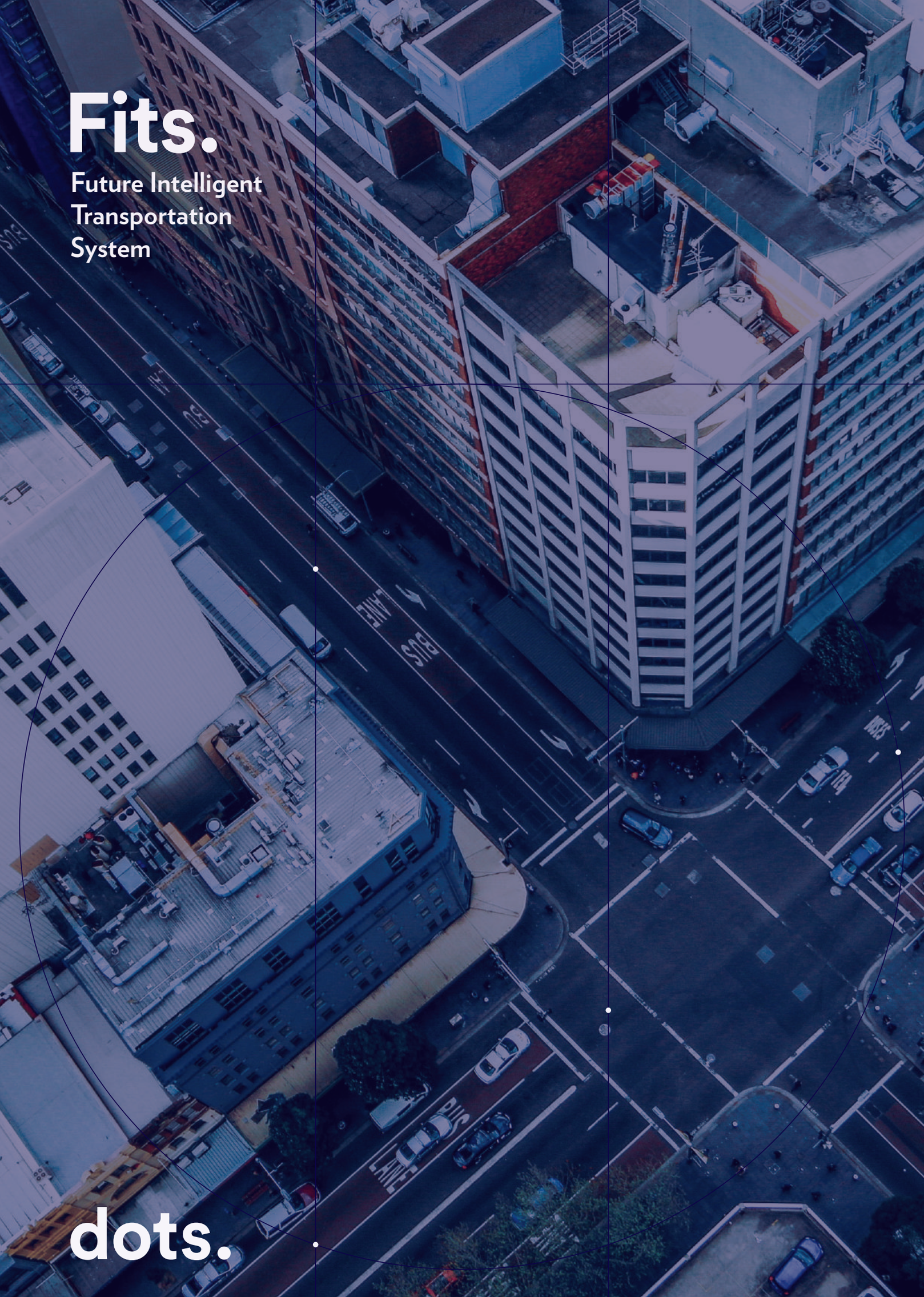

Fits.
Future Intelligent
Transportation
System
dots.

Who is it designed for?


Law Enforcement


City Administrations


Road Sensor Service Companies


Road Administrations


Public Safety Organizations


Road Sensor Manufacturers

About the system

FITS (Future Intelligent Transportation System) is an Artificial Intelligence-based centralized and vendor-independent solution that ingests data from any road and transportation-related sensors, fuses it and helps manage the business decision workflow based on the data processed; it also monitors the fleet of sensors to ensure maximum data collection uptime and includes 24/7 monitoring center services.

All sensor data is processed with proprietary deep learning computer vision. It processes workflow to detect, segment, classify, recognize and cross-correlate objects for multimedia data (e.g. to determine the class of the offending vehicle and recognize its number plate). As the next step, the specific data workflow is applied to a particular activity (e.g. processing and issuing the speeding ticket, adjusting dynamic road signage readings based on meteorological inference from weather station data etc.) and required data is provided to any relevant agencies (e.g. the police for speed enforcement).

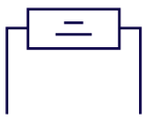
What can it be used for?


Speed Enforcement


Traffic Flow Planning


Congestion Charge Control

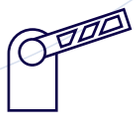

Road Toll Administration

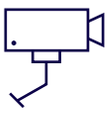

Smart Traffic Signs Management

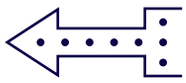

Traffic Monitoring


Weather Station Data Ingest


Sensor Monitoring

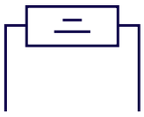

Traffic Flow Control at the Border Crossings/ Customs

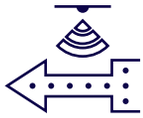

Road and Highway Surveillance


Full Traffic Flow Control


Other Smart Road Sensors

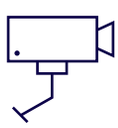
Examples of use


Variable Message Signs


Traffic Detectors


Traffic Lights


Weather Stations


Video Surveillance


Speed Cameras

Where's the catch?

Maximum data availability and automated data ingest into a unified system

Advanced classification and recognition, based on AI (e.g. vehicle make and model, type, color, etc.)

Continuous improvements in Neural Network Models

Artificial Intelligence

Now, you can hyper personalize enforcement and automate back office tasks, from the visual data automatically classifying and recognizing:

taxis,
trucks,
buses,
regular vehicles,
emergency vehicles,
license plate,
make and model,
color,
weight class.

Benefits

Privacy
Single tenant and isolated EUROPEAN data center
Compliance with ISO/IEC 27001/27002:2013
Compliance with GDPR

Optimized Operations
24/7 monitoring and call center (in English, Latvian, Russian)
Automatic incident tracking system

Complete Management
Quick deployment
Scalability
OpEx over CapEx
Risk reduction

Customized Integration
Case data offload for legal post-processing
Cross-checking object registration
Whitelist/blacklist and advanced workflows

About us

DOTS (previously SQUALIO cloud consulting) is a software development company that has been operating for 20 years and combines innovative, dedicated and certified IT professionals with in-depth experience and knowledge, creating Artificial Intelligence solutions fit for any industry and any need. Thanks to our dedicated team we are able to provide the full life-cycle of an IT system from the first contact and design up to development, IT security testing, deployment and maintenance.

We cooperate closely with road administrations, border control, customs, police forces and administrations of various cities and municipalities.

DOTS (previously SQUALIO cloud consulting) uses up-to-date and state-of-the-art technologies, bringing innovative solutions to specific business models.

Our technical specialists are highly qualified and certified, owning MCPD, MCSD, MCAD, MCTS, MCP, MCSA, ISTOB, CISSP, PRINCE2, ITIL, M_o_R, CISA, CEH etc.

We have extensive know-how in Microsoft Azure, AWS, .NET, MVC, ASP.NET, WindowsForms.NET, WCF, SOA, Java etc.

We are a Microsoft Gold partner and an active participant of the Co-Sell program.

What are we passionate about?

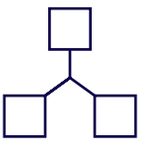
Transportation-related Solutions

Cloud Solutions

Machine Learning

Facial Recognition

IT Security Solutions



Base and Advanced Infrastructure Solutions

Our mission

Is to genuinely understand the clients' actual needs and provide the best technology solutions that help to meet their business goals.

Our vision

Is to become a trusted advisor, offering IT solutions with the highest added value to our clients.

Find out more

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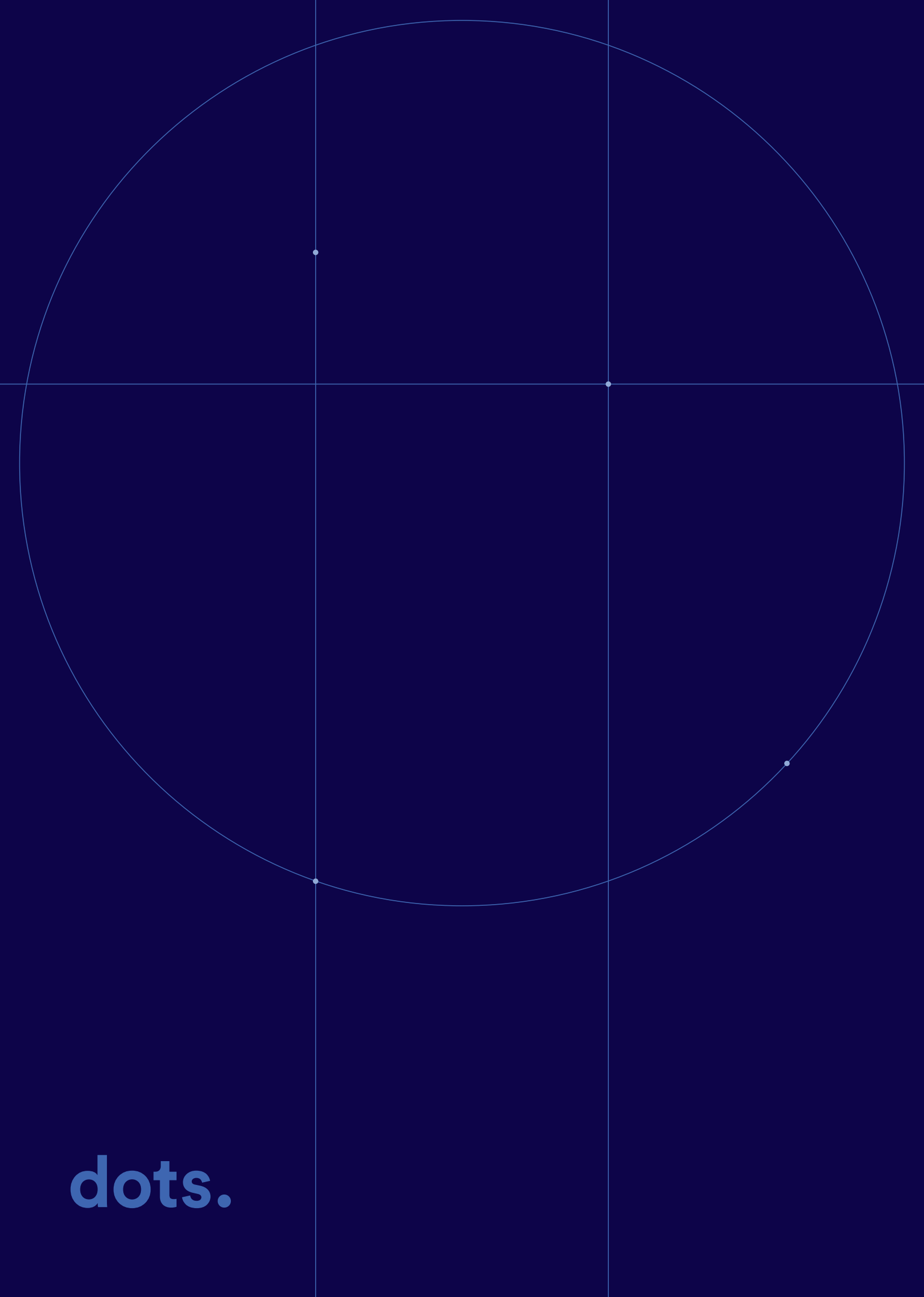
+371 67509912
www.wearedots.com



dots.

Fits Modules

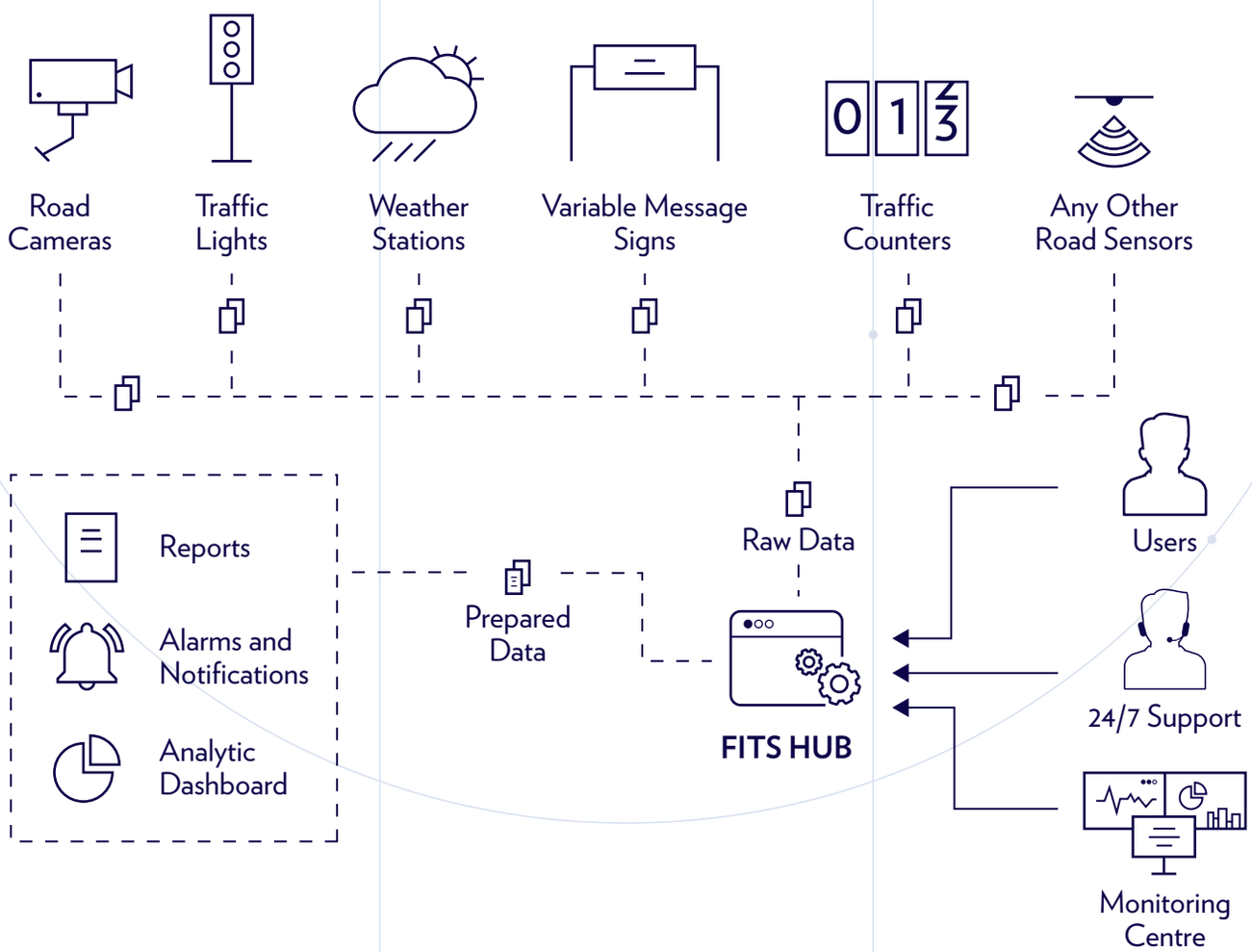
Fits.HUB

What you use today, may be out of production or outdated tomorrow.

There are many systems that collect data from sensors, analyze it and either take necessary actions or forward sensor data to other systems. The times have changed and one of the many challenges that organizations are now facing is how to implement the latest technologies into the existing systems and how to efficiently perform with large amount of unsorted (raw) data, gathered from mutually independent systems?

In order to facilitate the management of and operations with various sensors produced by various vendors, we have created FITS HUB - a unified, vendor-independent management platform which is able to sort and process raw data and present it in a comprehensive and connected way so that the respective business logic can be applied in the most efficient manner.

How does the system work?



Where's the catch?

Vendor-independence: single data repository for all data from any sensor

SMS or e-mail notifications

Information transparency & connectivity

Real-time alarm transmission

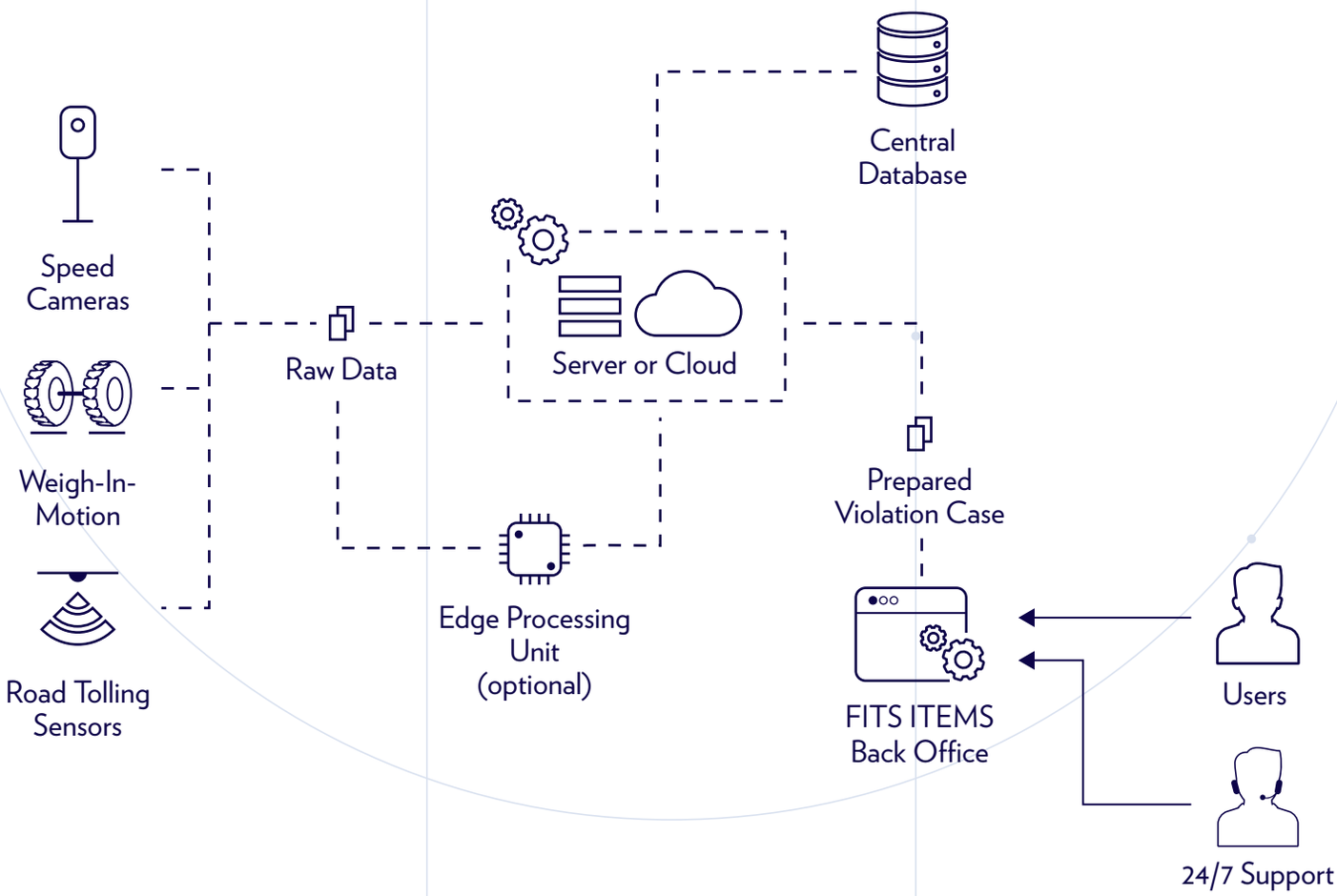
Fits.ITEMS

Saving lives.

It is known that road accidents kill 400 times more people than airplane crashes. Safety and security is a paramount goal for transportation. We provide next generation enforcement solutions for customers that are tailored for this goal.

FITS ITEMS is an integrated, vendor-independent system that offers image-based automatic violation inspection, analysis and overall process control to provide a cost-efficient service to law enforcement (portable, mobile, in-vehicle speed cameras, weigh-in-motion and red-light enforcement), quick data ingestion from all traffic violation sensors, using state-of-the-art Deep Neural Network for machine vision tasks, such as establishing the type, model, class, color, speed, weight etc. of a vehicle.

How does the system work?



Where's the catch?

Vendor-independence: single data repository for all data from any sensor

Multi-modal violation recognition platform

Low quality network conditions (e.g. mobile)

SMS or e-mail notifications

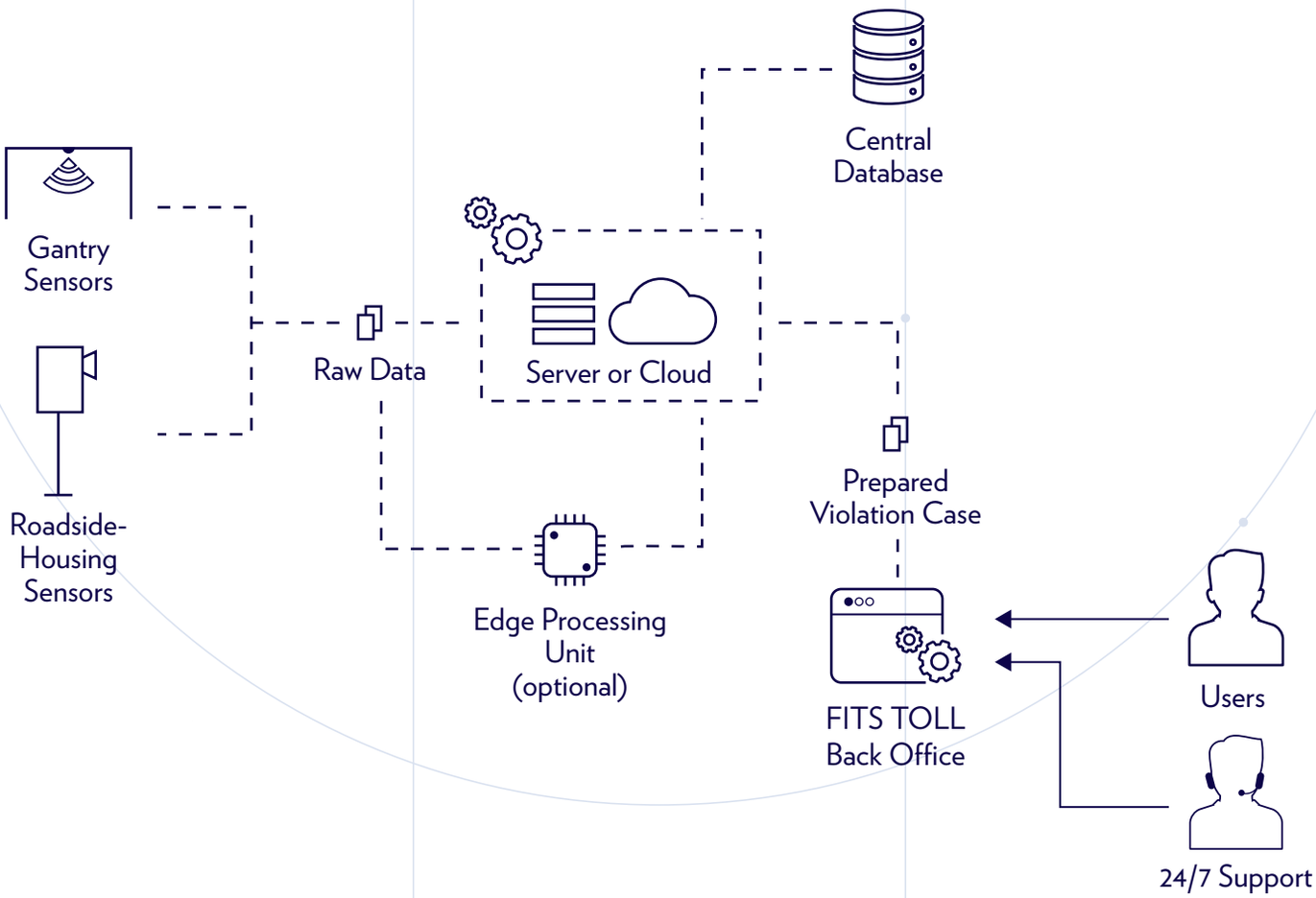
Fits.TOLL

Roads are important asset and require proper maintenance. Tolling should support social equity and provide funds for infrastructure maintenance and development at the same time.

Toll roads reduce congestion, save commuters' time and money, create a safer driving environment, improve fuel efficiency and support business growth. Let's achieve these goals together!

FITS TOLL is a fully automated and vendor-independent toll enforcement system, connected to different road sensors scanning passing vehicles, based on real-time visual data and providing sufficient information about both the traffic flow (vehicle type, time, location, country) and vehicle status (e.g. the owner has purchased Road User Charge and Insurance, paid for entering a Low Emission Zone, has passed Vehicle Safety Inspection, or performed other transportation-related check-ups), so that the necessary actions can be taken.

How does the system work?



Where's the catch?

SMS or e-mail notifications

Vendor-independent adaptability

AB 1234

FCNN and LSTM based smart license plate recognition

Vehicle's quality verification

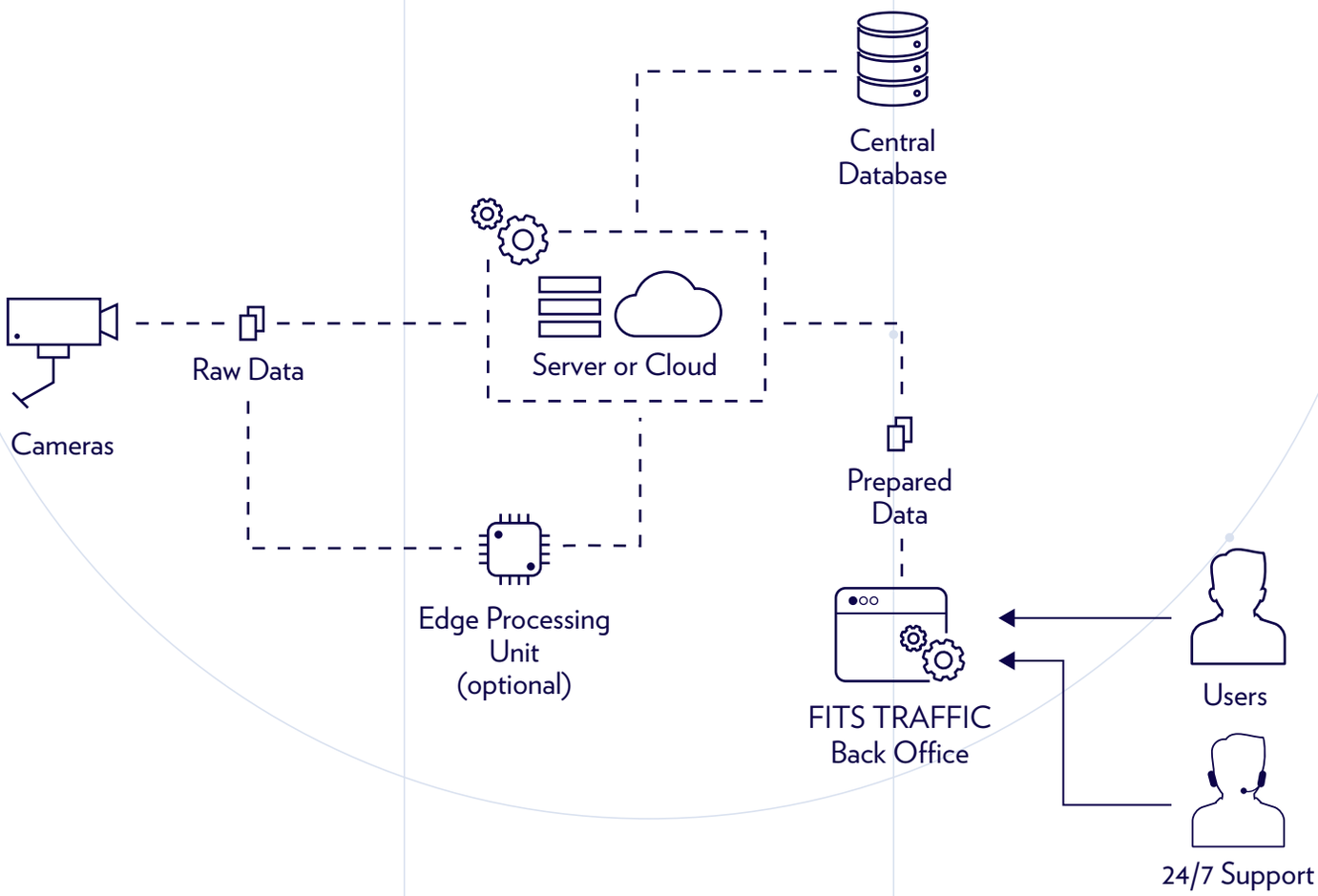
Fits.TRAFFIC

Transportation is a bloodline of modern economy. How can it be made as efficient as possible?

Understanding the traffic flow can be of immense help in reducing accidents and improving road-user safety. Moreover, an increased traffic load is one of the most serious problems in a city, but by analyzing traffic flow patterns it can be predicted in advance. And we have a solution to help you with that.

FITS TRAFFIC is a new-generation traffic management platform that provides real-time data through using a live traffic camera, in order to help monitor and analyze passing vehicles by their number plate, type, model and color, along with searching for vehicles from a watch list and transmitting notifications in case it finds something odd.

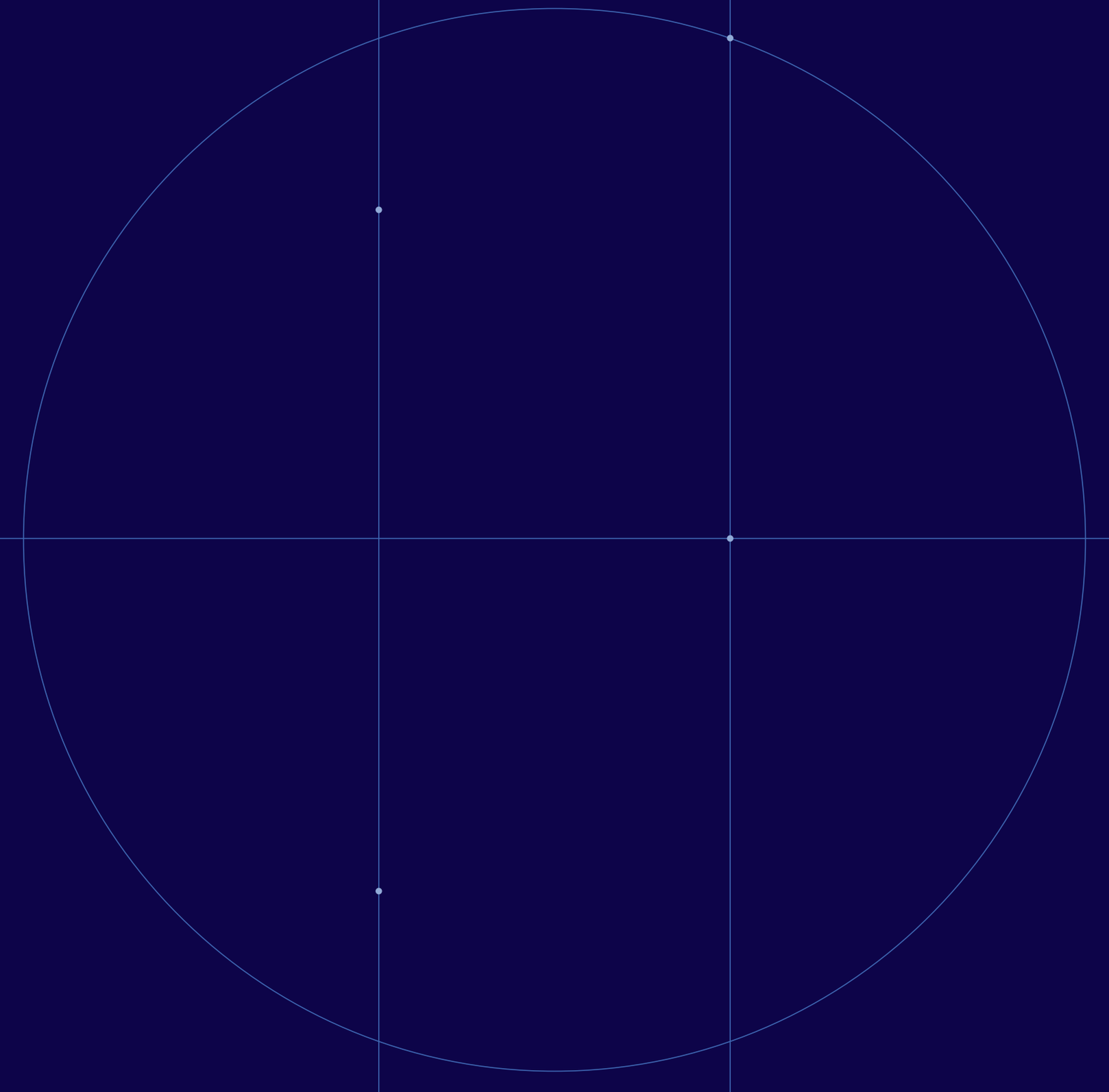
How does the system work?



Where's the catch?

- Real-time 24/7 traffic monitoring
- Full traffic flow analytics
- Vendor-independent adaptability
- Black-list recognition

dots.



Case Studies

Implementing Speed Enforcement

Client

The Road Traffic Safety Directorate (CSDD) is a public limited company that deals with vehicle registration, drivers' qualification exams, issuing driving licenses, technical insurance, road safety audits and general monitoring, maintaining the public register as well as educating and informing road users.

The Challenge

Due to the limited number of outdated speed detection devices and the increased number of car accidents caused by speeding, the Latvian demography and economy were suffering considerably. The challenge was to create a cost-effective and fast roll-out solution to improve road safety.

The Solution

The solution was to deploy speed cameras - powerful and precise, difficult to damage, equipped with 24/7 monitoring and a re-trained deep neural network for ANPR/MMR (Automatic Number Plate Recognition and Make and Model Recognition), allowing to detect upcoming issues, pre-process speeding violations, enable rapid response, ensure statistical analysis and educate drivers about being safe on the road.

The Outcome

In 2016-2018, the number of traffic accidents have dropped by 47% and serious traffic accidents - by 45%. Moreover, in 2016, 97 257 speeding protocols were processed and penalties for the total of 3.7M EUR were imposed, proving that the funds invested in the solution can be paid off within 1-2 years. But most importantly 0 deaths were recorded due to speeding in these locations where speed cameras have been places.

> Every year 1M people worldwide die due to car accidents. That makes half of the population of Latvia. And if we can change this atrocious statistic by improving the road environment, it's our number one priority! Last year, 3 790 car accidents were recorded in Latvia, but by implementing new technology speed cameras, we were able to significantly decrease these numbers, allowing us to believe that the cameras are doing their job properly.

2012-2015 — **Before FITS ITEMS**

2016 — **FITS ITEMS deployment**

Speed cameras detect violations, through a proprietary Deep Neural Networks FITS ITEMS recognizes the vehicle's type and its license plate, and then the pre-processed violation case is sent to a law enforcement agency

0 deaths recorded due to speeding in locations where speed cameras were placed

45% decrease in serious traffic accidents

47% decrease in traffic accidents

Implementing Toll Enforcement

Client

Ministry of Transport, the leading institution of state administration of transport and communications, whose mission it is to improve and implement the state policy of Latvia in the fields of transport and communications, to maintain and develop an effective, safe, competitive, environmentally friendly and flexible transport system and create a liberalized and harmonious legal and economic environment of the communications sector.

The Challenge

Roads and means of transport make a crucial contribution to the economic development and growth, bringing important social benefits with it. Poorly maintained roads constrain mobility, significantly add to vehicle operating costs, increase accident rates and the costs associated with them. Seeking for an automated go-to solution, the Ministry of Transport decided to introduce the Road User Charge - a payment for using the main state and regional Latvian roads to facilitate their maintenance and development, as well as to promote the use of environmentally friendly vehicles. However, after an in-depth examination they noticed that the toll is often not paid according to the vehicle's gross weight. Moreover, if the Latvian border could be crossed within 3 hours of driving, both domestic and international drivers predominantly chose not to purchase the toll at all. Thus, in 2016, around 30% of the planned (> 4M EUR) revenue from the Road User Charge wasn't collected and couldn't be applied to improve the road environment.

The Solution

With that in mind, The Ministry of Transport decided to deploy a long-term, cost-effective smart toll enforcement system, combining high quality transportation sensors and a customized FITS TOLL system connected to various registers in order to automatically scan the traffic flow (collecting data regarding the vehicle's type, time, location, country) and verify if the owner of the passing vehicle has purchased the Road User Charge and Insurance and has passed the Vehicle Safety Inspection, or performed other transportation-related check-ups that the client has indicated in advance.

The Outcome

Within the set time frame of 4 months and owing to a close collaboration of all stakeholders, a fully automated and integrated toll enforcement system has been installed. Today, the Ministry of Transport is able to gather valuable traffic flow information and facilitate the vehicle verification process. It has been established that within 2 months the total sum of violation protocols drawn up regarding the Road User Charge has surpassed the investments allocated to the implementation of FITS TOLL. Everything being fully automated means less human intervention in administrative processes and lesser overall costs, but most importantly – the Ministry of Transport can claim full transparency and instant information regarding the overall traffic flow situation so that calculated and adjusted road improvements can be made.

> «Thanks to advanced technologies, we have accessed valuable data and gained information transparency regarding vehicles on our roads. Today, as the system is fully automated, we have diminished human involvement in the administrative tolling process, and are now able to focus on strategically more important tasks - how to further improve the road environment and maintenance so that every road user feels safe while driving.»

in 2016
30%
of planned revenue from the Road User Charge wasn't collected at all

Tolling sensors with a built-in FITS TOLL system scan passing vehicles and automatically verify if all quality assurances are properly made, e.g., the owner of the vehicle has purchased the Road User Charge and Insurance, and has passed the Vehicle Safety Inspection. Afterwards, this data is pre-processed and forwarded to a law enforcement agency.

Traffic flow transparency

Facilitated verification of passing vehicles

Within 2 months the calculated violation protocols regarding the Road User Charge have exceeded the investments

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