



AI-powered software to support road management



Spreading transportation intelligence



01.

About us

Artificial Intelligence to support traffic managers

Cyclope.ai is a **software publisher** specialized in Artificial Intelligence applied to **image processing and video analysis**. It develops, designs and markets software solutions for **road infrastructure operators and traffic managers**.

250 million

of processed images

21

people

4

products

3

patents pending

Tunnelwatch



Automatic Incident Detection (AID) software in tunnels

Tollsense



Solution to automate toll class verification

Counting



Video-based traffic analysis solution

Carpooling



Integrated control device for HOV lanes

To address the challenges of road operations



A unique expertise to maximize the use of already installed cameras



SAFETY

For safer roads

INTELLIGENCE

Better-informed decisions

SAVINGS

Reduction of operating costs

EFFICIENCY

Automation and streamlined processes

FLUIDITY

Real-time traffic management

A structured team

Biography

Previously the Managing Director of DataCity by Numa
Co-founder of Westwing France, Top-5 e-commerce decoration website
Founder of Awango, by Total, spin-off of solar solutions
10 years within the Total group



Emmanuel Léger
CEO



Amir Nakib, PhD
Head of AI and CTO

Biography

Researcher and University lecturer
PhD and habilitated to conduct research projects (HDR) in AI & Computer Vision
Associate Professor at the University of Paris Est Créteil, within the LISSI Laboratory (Images, Signals, Intelligent Systems)
R&D Director of Loxlabs, an AI agency for industry
+160 research articles & 5 books on IA

DATA SCIENCE TEAM

data scientists
data engineer

PRODUCT TEAM

product owners
web developers
UI/UX designer

CUSTOMER SUCCESS

solution architects
projects managers

GROWTH TEAM

account manager
marketing manager

Cutting-edge scientific expertise...

Key figures





20 technical profiles
of which 4 PhDs

3 patents registered
or pending

10 scientific publications
in 24 months

2 in-house machines
IBM AC 922 DGX Station

Scientific publications [\(See in details\)](#)

 <p>A.Nakib July 28-31, 2019, Cartagena, COLOMBIA <i>Multi-objective optimization based fractal decomposition</i> Accepted in Metaheuristics International Conference - MIC 2019</p> <p>See the paper</p>	 <p>A. Sanogo, M. Khata, N. Shvai, A. Hasnat, A. Lianza, A. Meicler and A. Nakib June 24-27, 2019, Munich, GERMANY <i>PixMap: automatic license plate recognition with convolutional neural network based on saliency maps</i> Accepted in SPIE Digital Optical Technologies International Symposium</p> <p>See the paper</p>	 <p>A.Nakib September 22-25, 2019, Taipei, TAIWAN <i>Application guided Image Quality Estimation based on Classification</i> Accepted in 26th IEEE International Conference on Image Processing - ICIP 2019</p> <p>See the paper</p>	 <p>A. Lianza, N. Shvai, M. Khata, A. Hasnat, A. Sanogo, A. Meicler and A. Nakib August 11-15, 2019, San Diego, CA, USA <i>TunSeg: semantic tunnel scene segmentation</i> Accepted in SPIE Optics and photonics Conference</p> <p>See the paper</p>
---	---	--	---

Technical partners



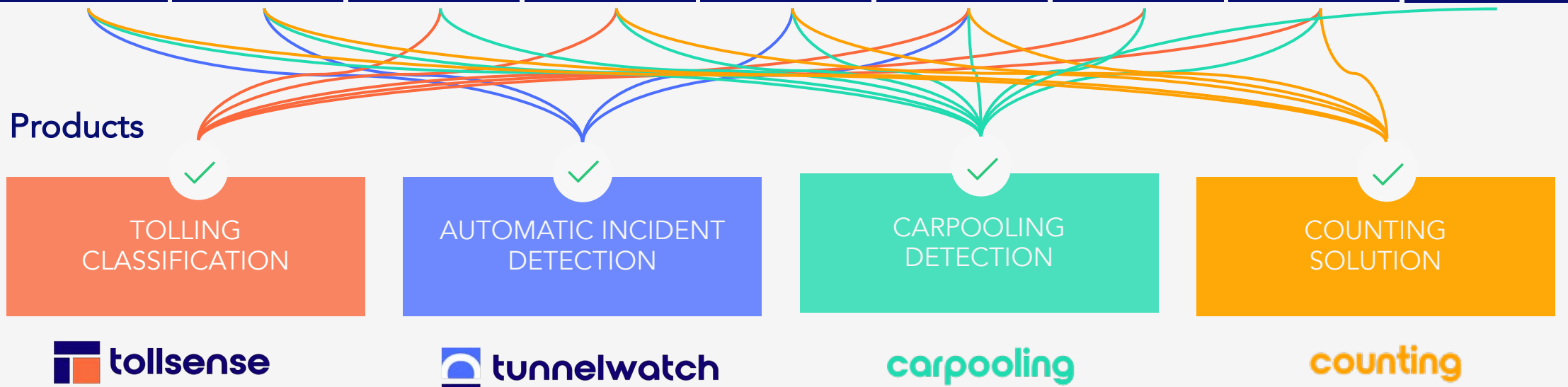
...to design technological bricks

Cyclope.ai has developed a high number of AI functions, which it then assembles to build **robust** and industrialized integrated software products

Functions



Products

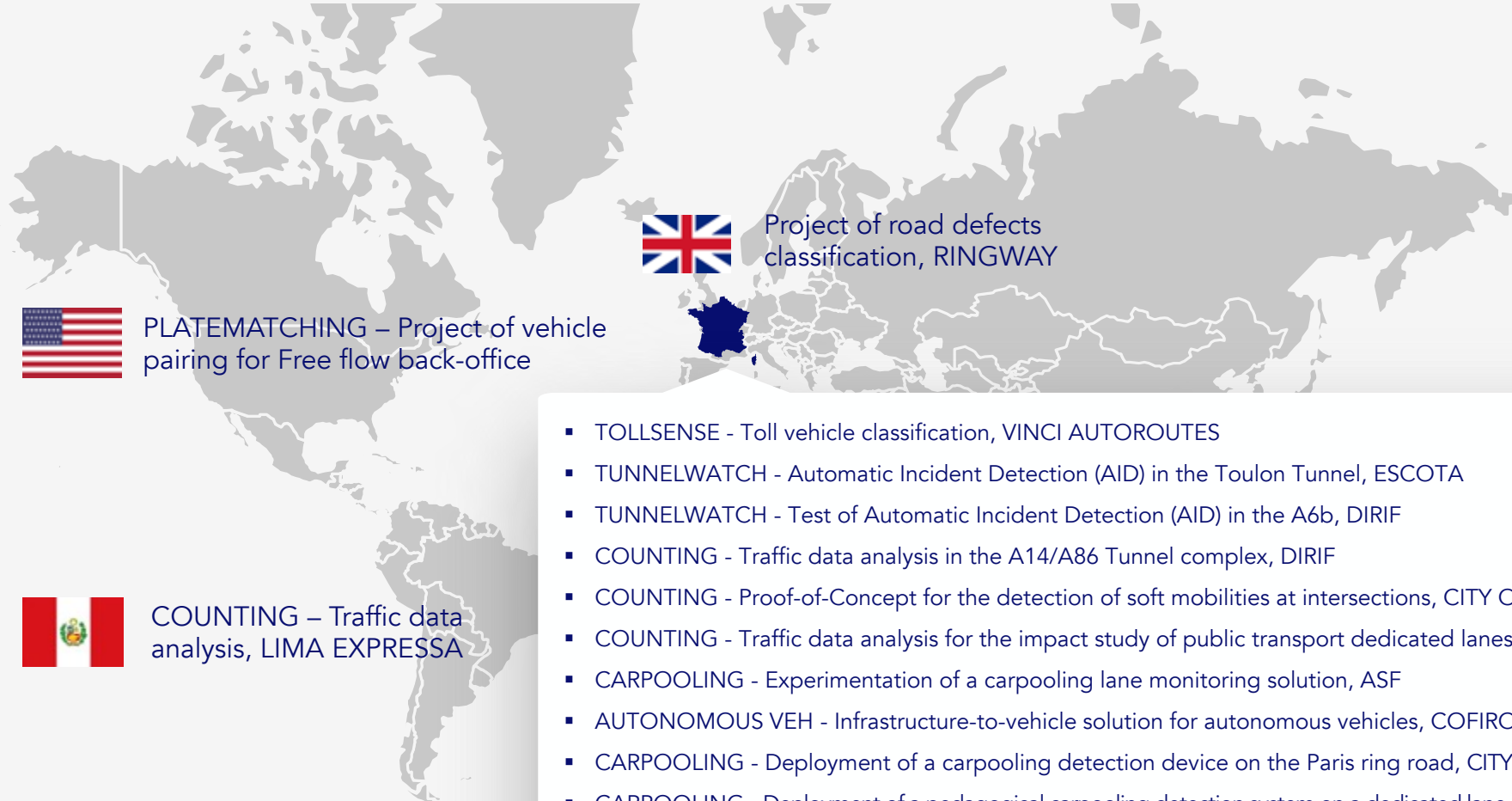




02.

Products & references

Industrial achievement overview



- TOLLSENSE - Toll vehicle classification, VINCI AUTOROUTES
- TUNNELWATCH - Automatic Incident Detection (AID) in the Toulon Tunnel, ESCOTA
- TUNNELWATCH - Test of Automatic Incident Detection (AID) in the A6b, DIRIF
- COUNTING - Traffic data analysis in the A14/A86 Tunnel complex, DIRIF
- COUNTING - Proof-of-Concept for the detection of soft mobilities at intersections, CITY OF PARIS
- COUNTING - Traffic data analysis for the impact study of public transport dedicated lanes, DIRMED
- CARPOOLING - Experimentation of a carpooling lane monitoring solution, ASF
- AUTONOMOUS VEH - Infrastructure-to-vehicle solution for autonomous vehicles, COFIROUTE
- CARPOOLING - Deployment of a carpooling detection device on the Paris ring road, CITY OF PARIS
- CARPOOLING - Deployment of a pedagogical carpooling detection system on a dedicated lane on the A15 motorway, DIRIF
- TUNNELWATCH - Detection of Transport of Dangerous Goods in the Tunnel of Castellar, ESCOTA
- TUNNELWATCH - Experimentation of the new generation AID solution Tunnelwatch, TRANSURBAN



First AI software dedicated to toll class verification



Operational efficiency



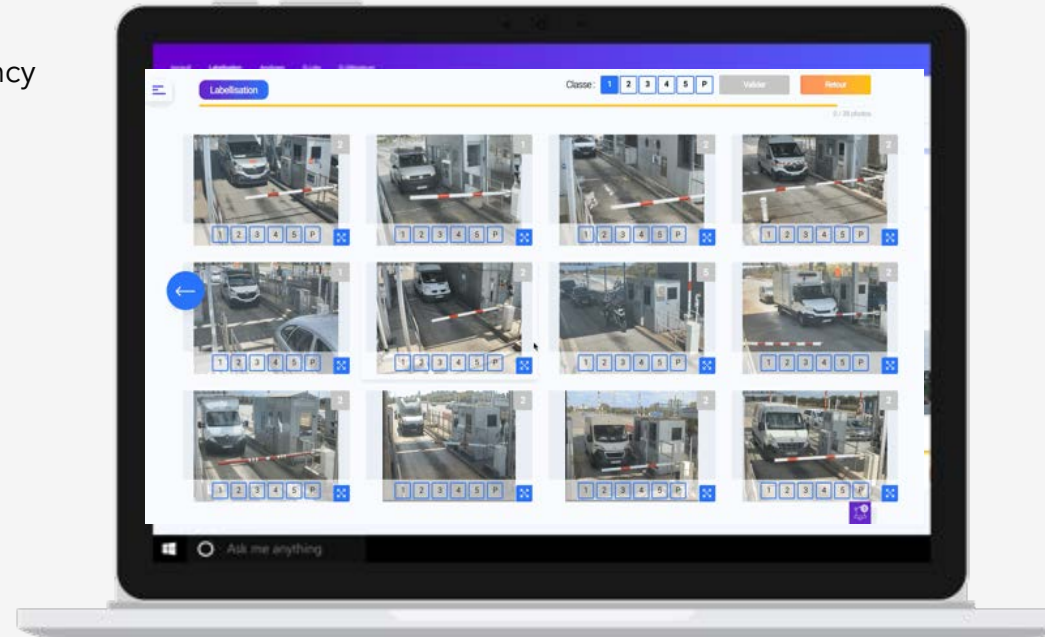
Improved customer service



Ready to scale



GDPR compliant



+ 250 M classified vehicles so far

+ 2M € of savings for a client

+ 99% performance rate

< 250 ms processing time

DEPLOYED ON THE VINCI AUTOROUTES NETWORK - 4443 KM - 1200 TOLL LANES :

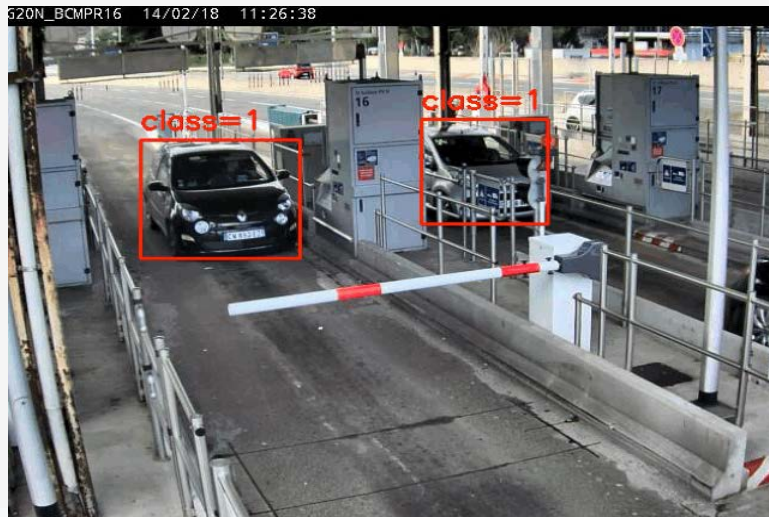
2018: deployment at an industrial level for all class 2 and 5 verification, directly into the lane software.

2020 : implementation of a new functionality to detect Persons with Reduced Mobility vehicle.

2021 : generalization of Tollsense reprocessing to all the class 1 at the toll plaza (80% of the traffic flow).



Demo of Tollsense classification algorithms



Toll classification



PRM sticker detection

Complex cases management



Armored van



Boxes for horses



Ambulance



Roof-mounted bikes



Bus



Camping-car



New generation of AI-powered Automatic Incident Detection (AID)



Accuracy and reliability



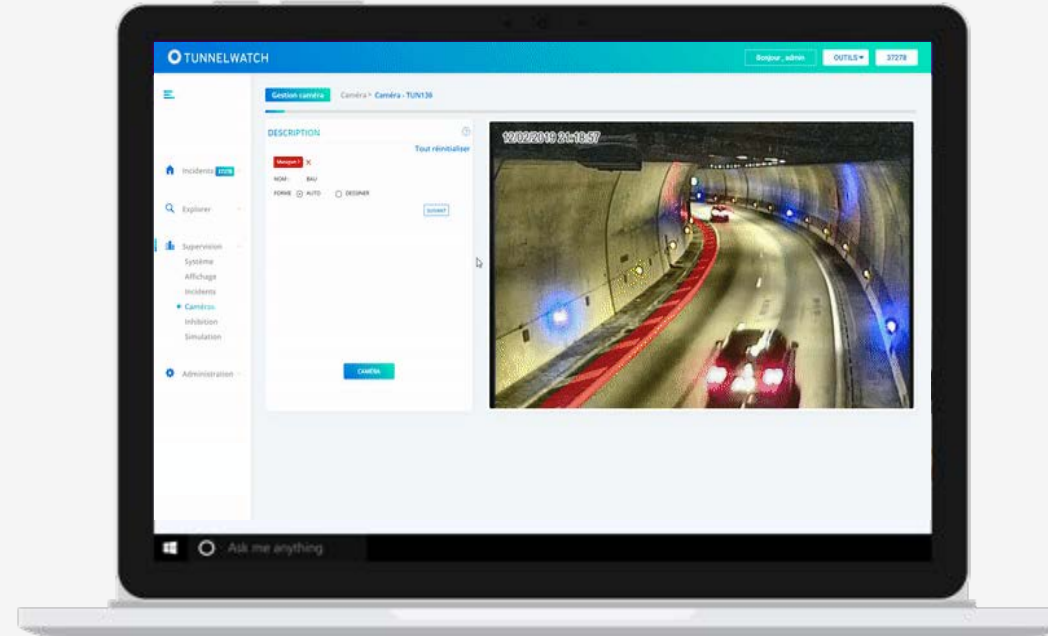
Easy installation and maintenance



Open and independent system



Shared intelligence



+ 98%

of performance rate

100%

automatic generated masks

< 0,06

false alarms
per day per camera

TMD

Transportation of Dangerous
Goods detection

DEPLOYED IN THE TUNNEL OF TOULON - 2 TUBES - 3 KM - 96 CAMERAS :

2019 : solution testing and evaluation by the Lombardi office over 3 nights of simulations with CETU and ESCOTA teams.

2020 : disconnection of the old AID and official release of the Tunnelwatch system for the 96 cameras real-time processing.
Drastic reduction of false alarms and improvement of the AID overall performance.





LOMBARDI RESULTS



Object detection **100%**



Pedestrian detection **95%**



Stopped vehicles detection **98%**



Wrong-way vehicle detection **100%**



Smoke detection **98%**



Slow vehicle detection **100%**



Congestion detection



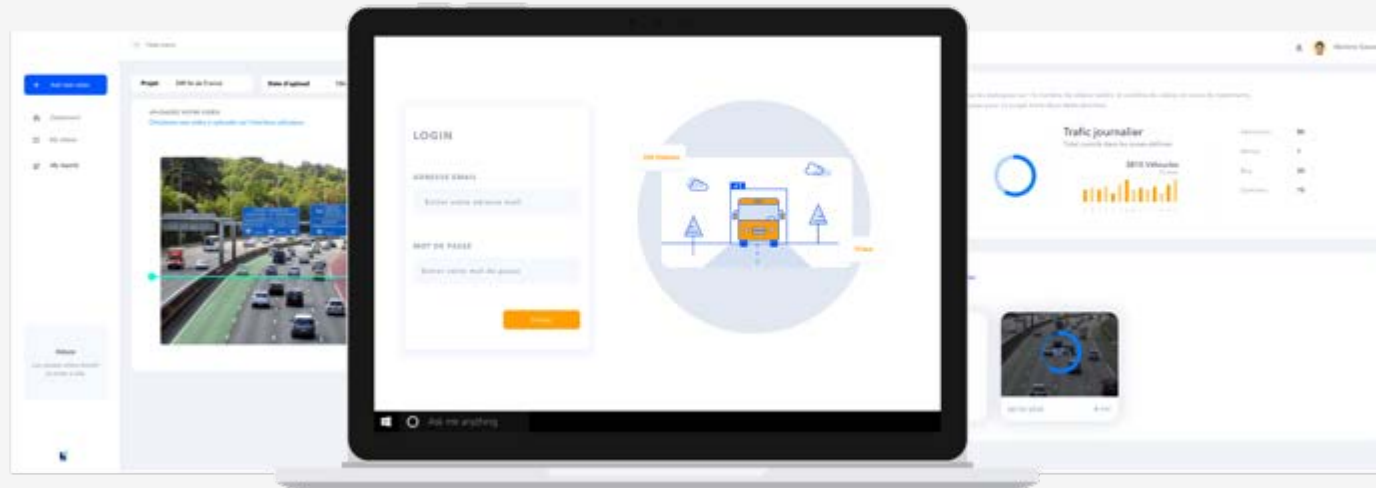
Occlusion management

counting

IA at the service of video counting for more accurate and reliable traffic data

More dense and accurate information

Classes details:
pedestrians, bicycles, motorcycles, lights vehicles, trucks, buses



Scalable and open system, via license or SaaS

Non-intrusive and easy to maintain



TRAFFIC CLASSIFICATION ON URBAN LANES

Video-based analysis for a better understanding of traffic flows on the Lima ring-road (Peru).



EXPERIMENTATION TO INTEGRATE SOFT MOBILITIES INTO A TRAFFIC LIGHT CYCLE

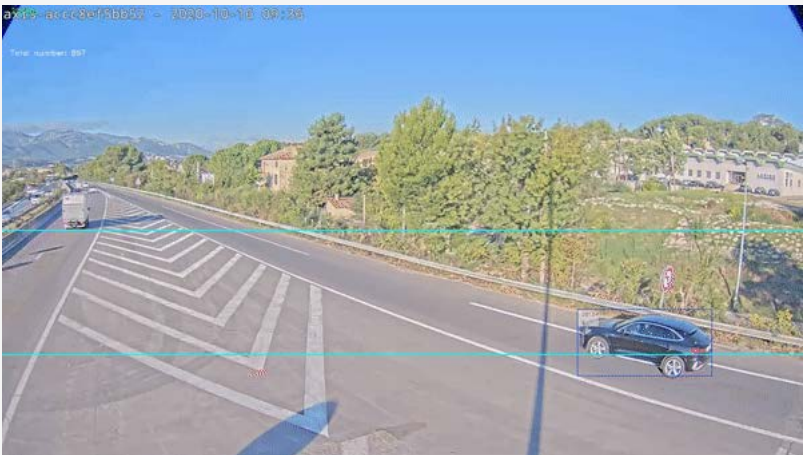
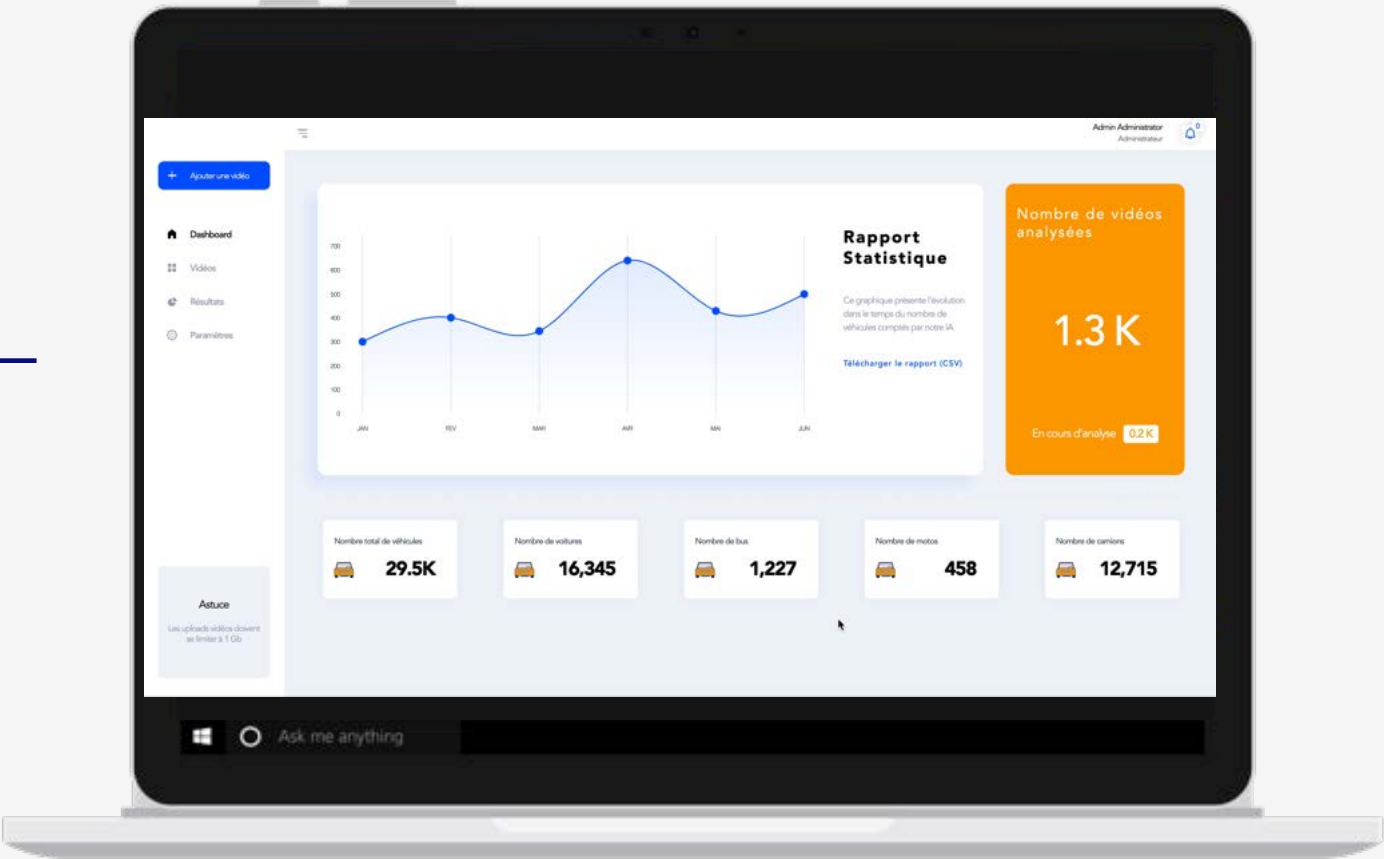
Integration of a real-time flow detection solution within a traffic light system, to better manage soft mobilities at the intersection.



TRAFFIC ANALYSIS FOR PUBLIC TRANSPORT RESTRICTED LANES

Provision of qualified data to evaluate the traffic impact of the implementation of new Public Transport restricted lanes around Aix-Marseille-Provence.

counting



carpooling

Restricted lane control device for the deployment of HOV lanes



High level detection



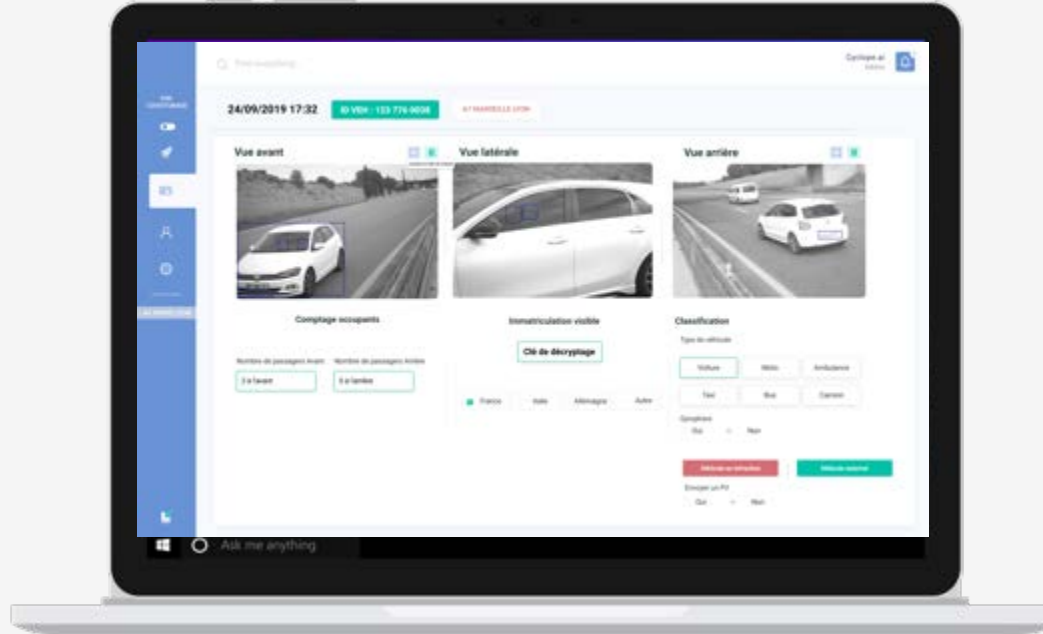
Minimized impact on operations



Easy to deploy



GDPR compliance via image anonymization



- Counting the number of occupants
- Classification of vehicle
- License plate reading
- Systematic blurring of faces



**PROTOTYPE TOTEM POLE
INSTALLATION ON THE A7**

Provision of an experimentation area by VINCI Autoroutes (ASF network) to contribute to the R&D of the final solution



**DEPLOYMENT OF A DEVICE TO BE
EVALUATED BY THE CITY OF PARIS**

Selected by the City of Paris to carry out an experiment in order to identify the final system for installing reserved lanes during the 2024 Olympic Games.



**DEPLOYMENT OF A PEDAGOGICAL
DEVICE ON THE A15 (in progress)**

Deployment of a second fully integrated totem in production for the DIRIF on the A15 in order to raise awareness among users of the reserved lane.

carpooling

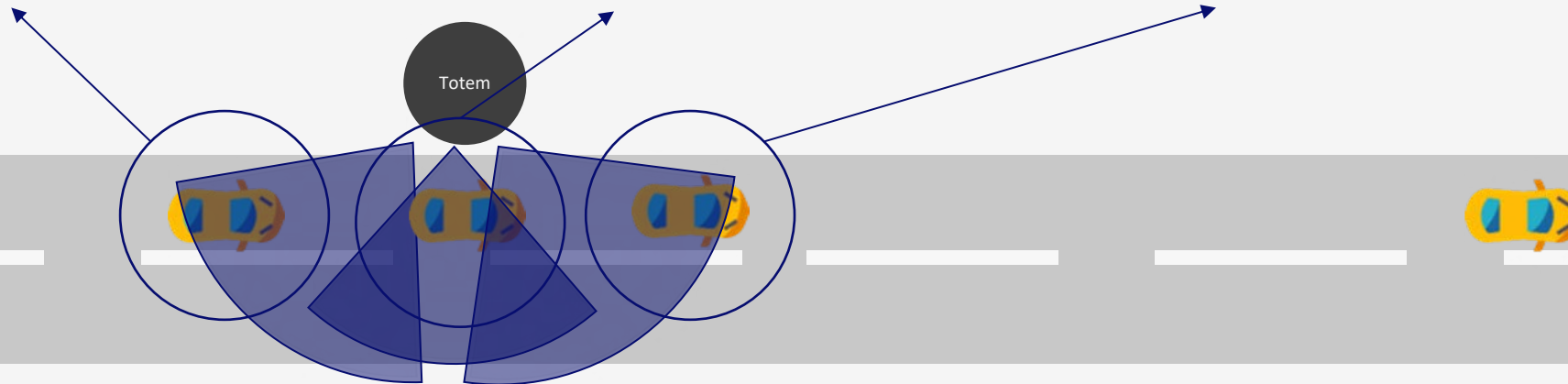


1.
Vehicle **front** capture

2.
Vehicle **profile** capture

3.
Vehicle **back** capture

4.
Creation and sending
of a **vehicle** file



carpooling

Demo of Frontal Detection algorithms



Counting the number of front seat occupants



License plate reading

Demo of Lateral Detection algorithms



Counting rear seat occupant



In-house anonymization technology



03.

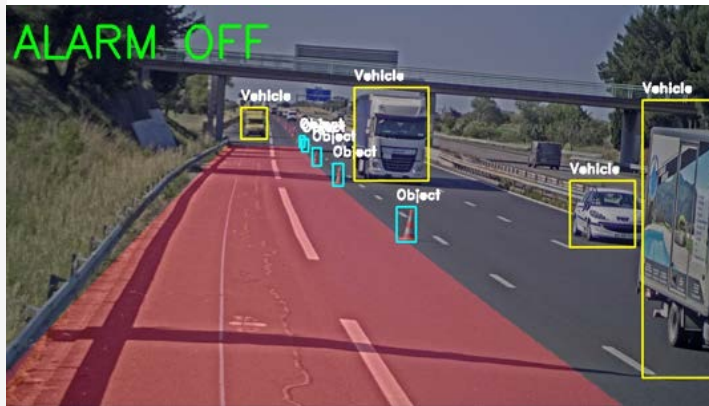
Other projects

Other deployments

Protection solution for patrollers in mission

Real-time danger alert system, fully embedded in intervention vans

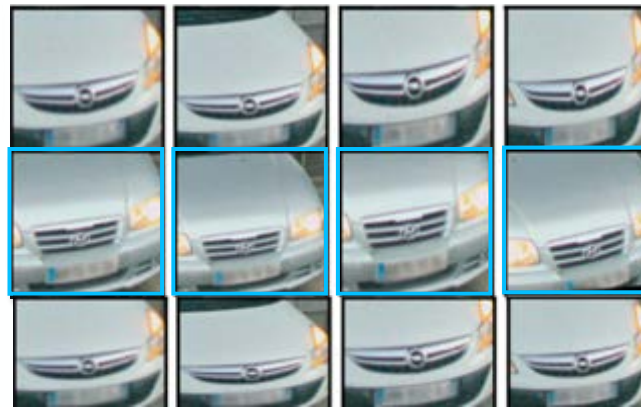
Where? District of Salon-de-Provence
When? 2020-2021



Path reconstruction via unique vehicle fingerprint

License-plate pairing for ultra-reliable origin-destination studies

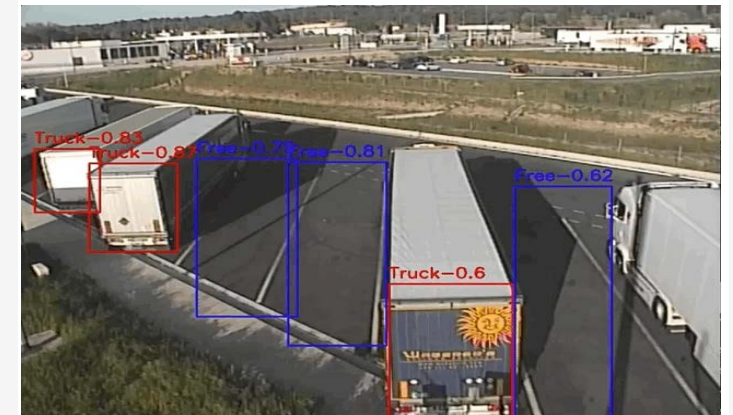
Where? ASF Network
When? 2020-2021



Follow-up of available places on Truck Parking

Detection of available places in Parking areas to inform truck drivers before arrival

Where? Parking of the Saint-Rambert
When? 2020-2021

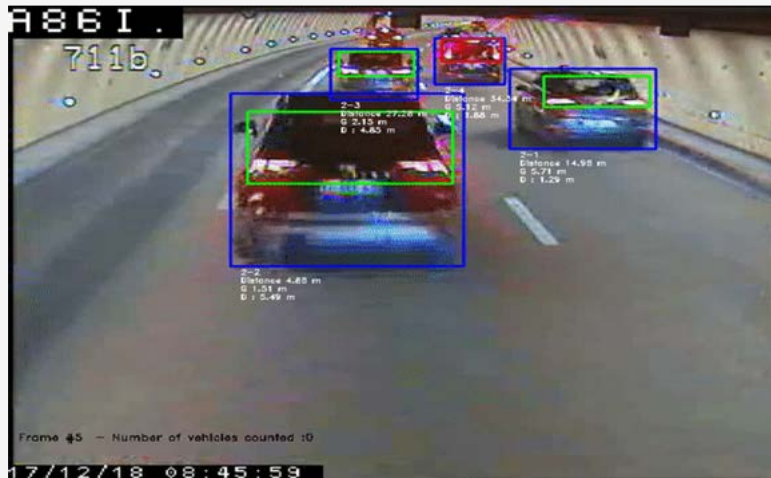


SAM Project : I2V infrastructure in the A86 Duplex

Project description

As part of the SAM Project, Cyclope.ai has designed an image processing solution for Cofiroute to inform connected and autonomous vehicles of traffic conditions and incidents in the A86 Duplex Tunnel. This solution will be integrated on the video surveillance cameras already installed.

The autonomous vehicle will start running in 2021, in partnership with Actemium and PSA and Renault.



Planning

- **2019** - Beginning of development and implementation of an IT infrastructure
- **2020** - Delivery of a complete system in Cloud and first runs of the prototypes within the framework of the SAM consortium.
- **2021** - Redesign of the A86 Duplex AID system

Client



specificities

- **Dynamic Data Feedback** - flashing information, braking, speeds
- **No change of equipment** - processing of video streams only from existing cameras

Partners



Spreading Transportation Intelligence

Follow us! Website: [Cyclope.ai](https://cyclope.ai) | LinkedIn : [Cyclope.ai](https://cyclope.ai)



Ask for a Demo!

Emmanuel LEGER

CEO

emmanuel.leger@cyclope.ai

+ 33 6 26 26 19 14

Rémi ARNOULD

Business Development Manager

remi.arnould@cyclope.ai

+33 6 78 92 39 57