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The network of Horizon Europe
Cluster 5 National Contact Point.

Large-scale demonstrations of CCAM

Grupo Brisa

Topic of interest - Large-scale demonstrations of CCAM

Contact details:
Andreia Moreira de Jesus, Funding Manager
andreia.jesus@brisa.pt
https://grupobrisa.pt/

The GREENET project has received funding from the EU Horizon Europe programme under Grant Agreement No 101069604

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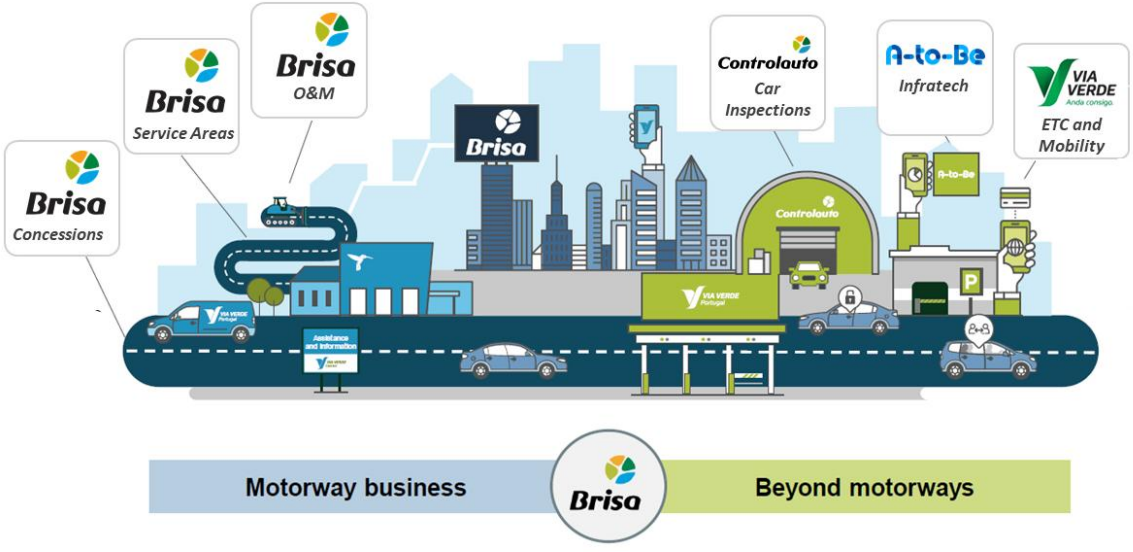
Company description



5	Concessions in Portugal
21	Motorways
1 525 km	Network in Operation
42%	Market Share (in km)
~2.7	Million ETC customers
99.8%	Collection Efficiency
11 US States	Infratech Deployment
24	Service Areas (under mgmt.)
46	Vehicle Inspection Centers

Topics of interest: D6-CCAM-1: Flagship-pilot: large-scale demonstrations of CCAM

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Specific contribution to the topic

1. Automatic real-time camera detection of incidents

- Using AI-based cameras to detect and identify incidents and notify Brisa's control centre. Road patrol teams are dispatched to the incident to monitor damage. Nearby vehicles are alerted via V2X. AI Algorithms detect, capture, collect, and analyse the incident, improving efficiency compared to manual processing.

2. Integration of data collected by sensors into digital twins for predictive maintenance

- Sensor data (e.g., LiDAR) integrated into Digital Twins. Predictive maintenance algorithms use of sensor data from the digital twins, together with collected sensor data from the vehicles (e.g., weather data) to monitor and predict potentially dangerous situations. Together with an autonomous alert system, dangerous situations can be minimized, and maintenance efforts can be optimized.

3. V2X infrastructure to support road works and road workers' protection

- V2X-enabled infrastructure sends alerts to vehicles, road workers and the control centre where infrastructure interventions are taking place. The driver receives warnings to slow down or take an alternative route, improving road safety and traffic flow. Road workers may also be equipped with V2X devices, sending alerts to vehicles and thus minimizing potentially dangerous situations.

Specific contribution to the topic

4. Analyze interconnected environments within the context of road mobility

- The SOC already relies on many established processes and technologies, including SIEM, SOAR, OT network monitoring systems, and others. These solutions are primarily targeted to the reactive cybersecurity approach. However, because of the continuous advancements in attack techniques, a noticeable increase in vulnerabilities of IT/OT assets, and the high complexity of the road infrastructure, we should systematically increase the security posture of the system, to prevent cyber-attacks from occurring in a cost-effective manner.
- Outcome: guarantee trust and security for a connected IoT ecosystem such as the one envisioned for Brisa, including a platform that gathers information from 4 different areas that are currently dispersed and work in silos: Road assistance, Tolls, Road works, Telematics. The key challenge

5. Security of critical infrastructure by multi-modal dynamic sensing and AI

- Innovative multi-modal sensing and AI-powered combined data analysis. Incorporation and fusion of acoustic, visual, radar, multispectral, LiDAR, or environmental sensor modalities together with already existing data sources (police data, social media data) helps to obtain a multi-faceted, comprehensive view on the infrastructure security/safety situation. The AI-based analysis of the combined data enables robust detection of hidden, complex or context-dependent anomalies, as well as their mapping to threats and timely cross-coordinated response, contingency or mitigation.
- Outcome: The objective is to improve current solutions to ensure optimal traffic flow and safety, maintain independence regarding equipment vendors and manufacturers and integrate different IoT devices / road-side telematics equipment.

Technology profile

- Brisa is responsible for the largest road concession in Portugal, managing the primary network of roads and motorways.
- Operations extend across a vast area, including **15 operational centres, 107 toll plazas, and a traffic operations centre.**
- Road assistance is available 24/7, comprising 19 vehicles dedicated to accident support, 168 for safety and protection, and 17 for general assistance.
- In terms of data collection, the Brisa network is equipped with 215 traffic sensors and counters, 33 weather stations, 5 fully equipped tunnels, 695 CCTV cameras, and 1,370 emergency call boxes.

Experience

Brisa has been actively involved in Connected, Cooperative, and Automated Mobility (CCAM) initiatives since 2009. Over the years, Brisa has participated in several funded projects within the CCAM scope:

- **TANGENT** focuses on developing an integrated support tool for cooperative traffic management, which has been piloted in cities like Lisbon, Rennes, Manchester, and Athens.
- **C-Streets** aims to deploy C-ITS services at the interconnection of inter-urban roads to urban environments, with various pilots covering intelligent surveillance, communication systems, and connected cars.
- **ModalShift** aims to create a transport network and traffic management optimization framework that bridges data from infrastructures, logistics, and mobility operators
- **5G-MOBIX** demonstrates the potential of 5G features on real European roads and highways, creating sustainable business models for 5G corridors and executing CCAM trials along cross-border and local corridors to evaluate the benefits of 5G infrastructure in the CCAM context.

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juanfrancisco.reyes@cdti.es, marta.herrero@cdti.es, and juan.henriques@ani.pt

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Social Sciences and Humanities