

OMI((RON

Intelligent Road Asset Management Platform




Jose Solís Hernández | 16th February 2023 | RTR Conference



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The project leading to this application has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 955269



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▶▶ OMICRON in a Nutshell

OMI((RON

Innovative infrastructure for Europe

- Road Operators & Owners
- Road Contractors & Civil Eng. Experts
- Dis., Com. And Ex. Experts
- ICT Integrators
- Research Institutions & Technology Developers

Partners on map: ARMANDO RITO, Indra, UNIVERSITY OF CAMBRIDGE, ESCI, TEIXEIRA DUARTE, UFRJ, CATEC, EIFFAGE, PAVASAL, AISCATSERVIZI, LMS Laboratory for Manufacturing Systems & Automation, RÉGENS.

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Project Objectives

TO

EO SEO

OMICRON: Intelligent Road Asset Management Platform.

Technical Objectives (TO)

- Digitalisation** of inspection activities
- Safety:** Applications and tools for road personnel
- Development of **smart road platforms** for infrastructure managers
- Robotic technologies and adapted machinery for **automated intervention**
- Tools to support road **decision-making:** Predictive Maintenance
- Implementation and demonstration in European **CEF corridors**

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Project Objectives


TO

EO

SEO



OMICRON: Intelligent Road Asset Management Platform.

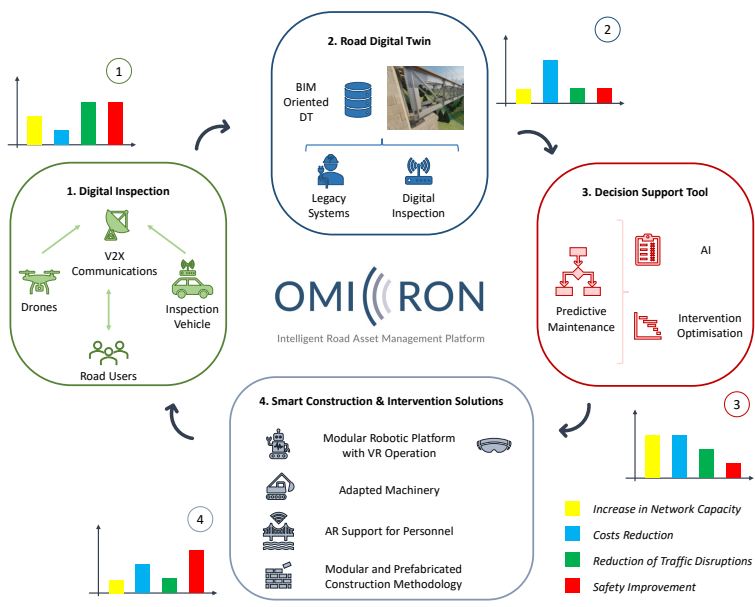
Environmental Objectives (EO)		Supporting road sector in the transition set by the European Green Deal
		Promoting the use of AUTLs in pavement rehabilitation
		Fostering the use of recycled materials in pavements
Socioeconomic Objectives (SEO)		Reduction of roads whole life-cycle costs
		Improvement of road services and safety
		Definition of possible required changes in legislation and/or standards

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OMICRON
Intelligent Road Asset Management Platform

OMICRON's Concept

Increase in Network Capacity
 Costs Reduction
 Reduction of Traffic Disruptions
 Safety Improvement




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OMICRON Technologies




Digital Inspection




UAVs Management Tool

- ✓ Multi-UAV Inspection
- ✓ Long-range Capabilities




Terrestrial inspection vehicle

- ✓ Innovative Sensor Combination
- ✓ Automation of Inspection Process




V2X Communications

- ✓ C-ITS Systems and user support




UNIVERSITY OF CAMBRIDGE

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OMICRON Technologies




Predictive Maintenance



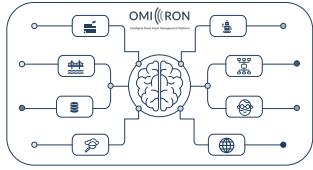
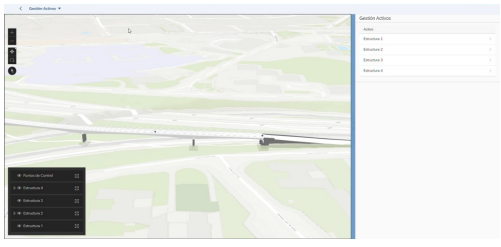
Road Digital Twin

- BIM-GIS oriented digital representation of roads.
- Integration of relevant sources of data and analytics.




Road Decision Support Tool

- Assessment of road condition state.
- Optimisation of road maintenance actions.

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OMICRON Technologies

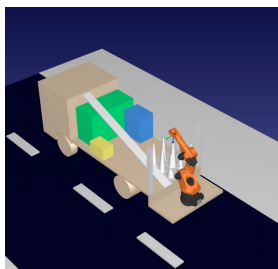


Automation of Intervention Actions



Robotic Modular Platform

- ✓ Safety barriers replacement.
- ✓ Safe signaling during construction.
- ✓ Installation of cones.
- ✓ Sealing of surface pavement cracks.
- ✓ Road assets cleaning.
- ✓ Laser removal of lane markings.



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Automation of Intervention Actions



Rehabilitation of surface pavement layers

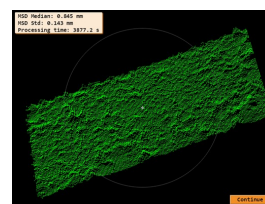
Integration of sensors

- ✓ Paver and roller location.
- ✓ Thermal control & weather conditions.
- ✓ Pavement surface texture.

Analysis of steps along the process

Promoting the use of greener pavements


- ✓ AUTLs and RAP.




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OMICRON Technologies




Road Personnel Support



AR Tools for Worker Support


- ✓ Use of various devices: tablets, glasses, etc.
- ✓ Support to the Robotic Modular Platform processes.





VR Platform for Robot Teleoperation


- ✓ Remote operation of RMP.
- ✓ Training of road workers.

Teleoperation



Intelligent Road Asset Management Platform

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OMICRON Technologies



Modular Construction



Modular Construction of Bridge Overpasses

Enabling the use of prefabricates

Reducing construction times

Reducing Traffic Disruptions

Improving Safety

Improving circularity










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OMICRON Technologies




Cooperation with other projects

Sister Projects


1. **Shared objectives:**
 - Safety.
 - Better road services.
 - Cost reduction.
2. **Periodic interaction:**
 - Inspection.
 - Robotics.
 - Asset management: Platforms.


Use of satellite information



Advanced inspection systems




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Project Impact






Demonstration


- 
Stage 1
 Preliminary TRL 4-5 Testing.
- 
Stage 2
 Technical Demonstration. TRL 5 to 7.
- 
Stage 3
 Final Demonstration of the Platform. TRL 7.

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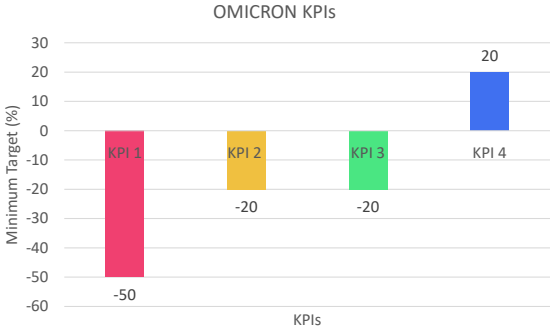


Project Impact



KPIs and Impact


-  **KPI Impact 1:** Reduction of fatal accidents of road users and deployed personnel due to maintenance works.
-  **KPI Impact 2:** Reduction of traffic disruptions due to maintenance works.
-  **KPI Impact 3:** Decrease in routine maintenance costs.
-  **KPI Impact 4:** Increase in network capacity.



KPI	Minimum Target (%)
KPI 1	-50
KPI 2	-20
KPI 3	-20
KPI 4	20

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OMICRON Next Steps



External Advisory Board Feedback

Final Demonstration



Date	Milestone	Activity
Today	Continue Technology Developments	Sensing, Robotics, Digital Twin, DSS, etc.
Upcoming Meeting: 31 st May 2023	External Advisory Board Feedback	Chairman and Contact: Dr. Jesús Rodríguez
May 2023	Low TRL Demonstration	TRL 4-5 Testing in Lab Conditions
Aug 2023	Final Demonstration	TRL 7 Demonstration of all the Technologies
Apr 2024	End of Project	Evaluation and Exploitation Analysis
Oct 2024	End of Project	Evaluation and Exploitation Analysis

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Thank you for your attention

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