



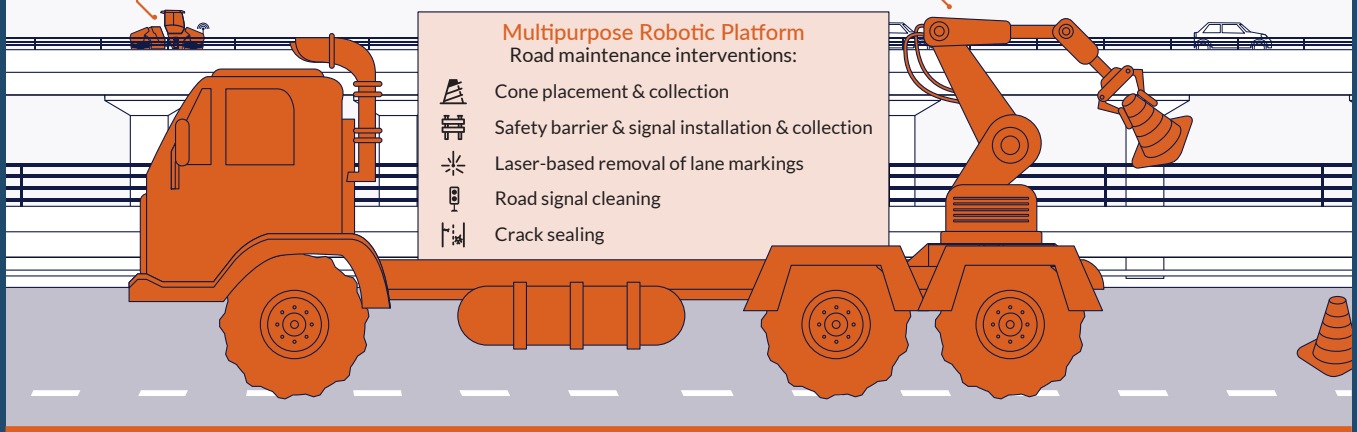
### Smart Paving Intervention

- Data on asphalt temperature, compaction & macrotexture
- Improved real-life pavement operation execution



### Operated & Supported with AR & VR

- Better road operator control, safety & health
- Tasks less dangerous
- Improved efficiency / quality



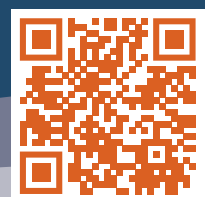
## OMICRON road intervention & maintenance solutions

The EU-funded OMICRON project developed a range of automated and roboticized road intervention and maintenance solutions. Being tested in real-life demonstrations in Italy and Spain, these have the following expected impacts:

- **15% reduction in emergency, ordinary and extraordinary maintenance intervention times**
- **30% reduction in volume of people in dangerous zones in road maintenance areas**
- **10% reduction in traffic disruptions due to maintenance interventions**
- **10% reduction in maintenance and inspection activity costs**

All solutions are at TRL 7.

*To read more about OMICRON activities, solutions, benefits and the relevant contact partners, turn the page or visit the OMICRON website.*



## Multipurpose robotic platform for road maintenance interventions

Our Modular Robotic Platform consists of a container with an extended, height-adjustable rear section where a robotic arm performs various maintenance operations. The container can be loaded onto any truck using a standard multilift hook system. The platform can easily be used for other functions as its architecture is based on distributed computing.

### Interventions:

- Safety barrier installation
- Road signal cleaning
- Cone placement & collection
- Signal installation during construction works
- Laser-based removal of lane markings
- Pavement crack sealing

**Key value:** One multipurpose solution performs a variety of maintenance operations.

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## In-field worker AR support tools

Our Augmented Reality (AR) tools support on-site road workers and improve the management of maintenance work. The operator view and awareness of the real world is augmented with visualised models and text that are overlaid via AR glasses or a tablet. This display provides workers with step-by-step instructions about maintenance operations and enhances their awareness of the surrounding environment.

**Interventions:** Tablet: 1) crack sealing, 2) cone placement/removal, 3) signal cleaning, 4) laser-based paint removal. Headset: 1) signal installation and 2) safety barrier installation.

**Key value:** Enhanced awareness for road operators improves safety during interventions.

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## Pavement rehabilitation and maintenance decision support tool

Our pavement rehabilitation and maintenance decision support tool supports key performance in asphalt paving such as density, macrotexture and temperature during the construction process. This ensures quality of the work and compliance with asphalt quality (compaction and macrotexture) requirements. Enables use of environmentally-friendly warm Asphalt for Ultra-Thin Layers (AUTLs).

**Interventions:** Pavement rehabilitation and maintenance.

**Key value:** Combines all pavement rehabilitation operation instrumentation for the equipment and machinery in a single tool (cheaper than using various tools per machine).

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## VR platform

Our web-based Virtual Reality (VR) platform enables the teleoperation of robotic resources during road maintenance. It allows road operators to intervene remotely, without needing to be on the road. Real-time creation/updates of the virtual environment using on-site sensors (cameras) provides the operator with an experience that closely mirrors reality, enabling full awareness and more efficient teleoperation. Communication between the VR application and the remote robot is based on a remote ROS (Robot Operating System) connection, which makes robot control easy without rigid programming.

**Interventions:** Designed for sealing of pavement cracks and cleaning of signals.

**Key value:** Road operator no longer has to be in dangerous on-road environments.

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