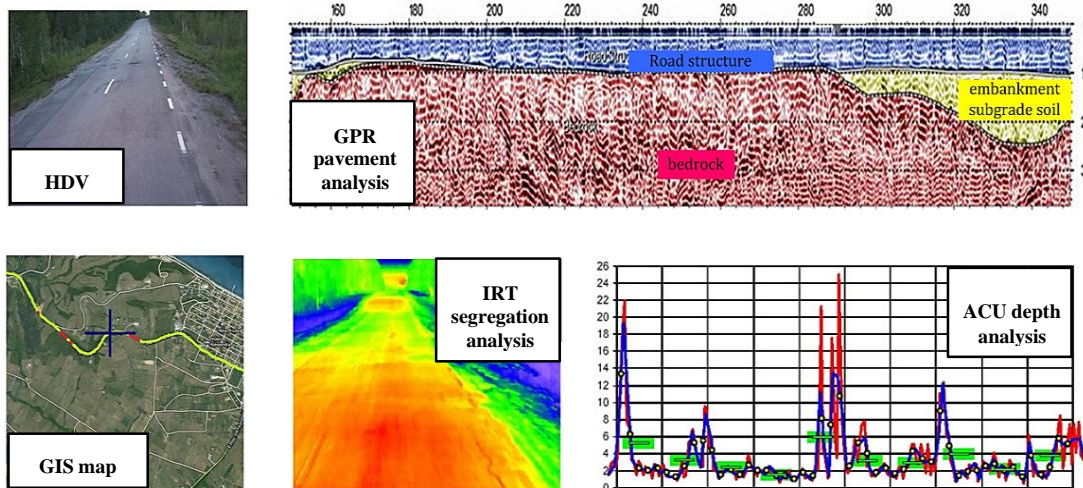


## Road Pavements & Bridge Deck Health Monitoring / Early Warning Using Advanced Inspection Technologies

A project funded by the European Commission in order to improve European Road Network infrastructure

The European Road Network is undoubtedly one of the most important land infrastructures in the EU. It is and will remain for the foreseeable future a crucial artery for Europe, both in economic terms, as it services the vast majority of goods traffic, and in social terms, as it does so for passenger travel as well. Maintenance is considered to be the most expensive function of a high-way operating agency, so there is a special need for the early detection of deterioration mechanisms and of potential presence of defects through a more advanced road pavements inspection technology.

The RPB HealTec project system will detect the presence of defects, determine the cause, extent and rate of deterioration, provide information for assessing stability and serviceability and evaluating the cost-effectiveness of various remedial measures and provide this information in real time, not causing traffic disturbances.



The system is aiming to upgrade and optimize the inspection & maintenance of the European roads, reducing costs and increasing traffic safety and will achieve this by developing a novel automated and integrated NDT (Non Destructive Techniques) system for high speed analysis and evaluation. There is the importance of having the technology to provide the highest coverage in evaluation of pavement, bridge deck and tunnel condition.

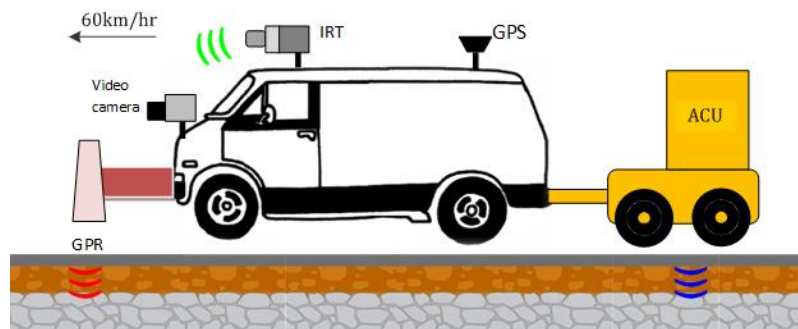
### Project coordinator: City University London

#### Project partners:

BRENNERO [www.autobrennero.it](http://www.autobrennero.it) (IT)  
 CERTH [www.certh.gr](http://www.certh.gr) (GR)  
 CETRI [www.cetri.net](http://www.cetri.net) (CY)  
 CITY [www.city.ac.uk](http://www.city.ac.uk) (UK)  
 CJ VRANCEA [www.cjvrancea.ro](http://www.cjvrancea.ro) (RO)  
 GDT [www.gdt.gr](http://www.gdt.gr) (GR)  
 IRIS [www.iris-thermovision.be](http://www.iris-thermovision.be) (NL)  
 METGEO [www.metconsultancygroup.com](http://www.metconsultancygroup.com) (UK)  
 NARDONI [www.nardonibs.com](http://www.nardonibs.com) (IT)

NDT assessment techniques such as **Ground Penetrating Radar (GPR)**, **IR Thermography (IRT)** and **Air Coupled Ultrasonic testing (ACU)** have the ability to inspect effectively substantial areas, such as pavements and concrete. These NDT techniques will be used successfully in the detection of cracks, voids and other imperfections appearing either from the ageing of the materials or due to poor workmanship.

- IRT directly senses the infrared radiation that a material or structure emits and detects surface temperature differences. Investigation of pavements by the means of IRT is achievable, in view of the fact that subsurface defects in a material affect the heat flow through that material, triggering surface temperature differences. So, the method is ideal for measuring segregation in asphalt pavements.
- GPR provides information concerning the underlay structure of the examined pavements, layer thickness, as well as the depth and thickness of cracks, voids or other imperfections, such as moisture problems, appearing on the pavements.
- Furthermore, the use of ACU is mainly applied for sensitive inspections for defects such as delaminations, voids and dis-bonds, for the identification of the thickness and complex modulus of elasticity of pavements.



Computational intelligence and multi-modal data fusion will play a key-role in RPB HealTec project acting as the integrator of the different NDT techniques. This new concept will improve the monitoring conditions, both, in time and accuracy, and therefore decrease the operating costs by reducing unnecessary maintenance of pavements and/or bridge decks, and most of all planning the maintenance just in time. This will provide the following benefits:

- Optimisation of maintenance procedures thus increasing the average life of a pavement and/or bridge deck.
- Improvements in the calculation methods that will be implemented for new pavement design and analysis.
- Reduction of at least 0.1% on future pavement construction and maintenance costs, translating to savings of EUR 60 million in the EU27 within the first six years after completion.

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