

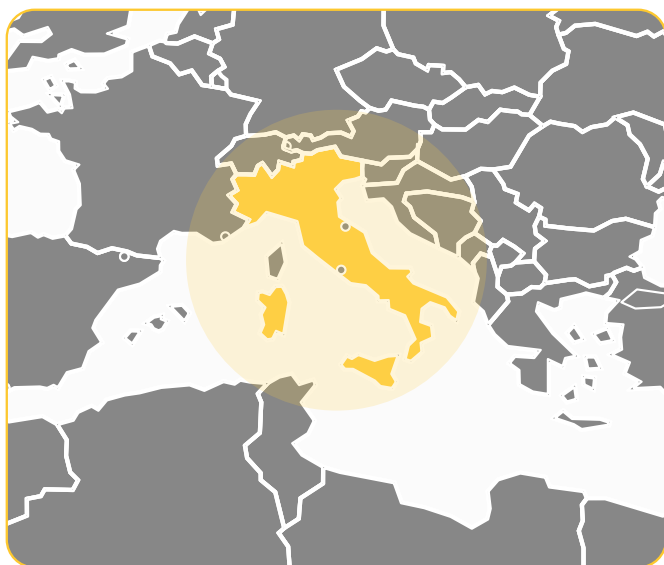
HIGHWAYS MANAGEMENT IN ITALY

What it is about

The design and construction of roads and highways are strongly affected by any movement of the ground. To avoid significant, rebuild costs, their design should be adapted to the underlying conditions; but these are often not known since measuring vertical movement (subsidence or heave) is difficult and very costly.

Vertical movements are not uncommon in Italy, which is a geologically young country.

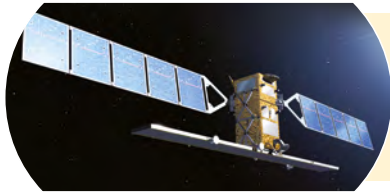
A new service called Rheticus based on Sentinel-1 is being used by the Italian state roads agency ANAS to show where movement of the ground has taken, or is taking, place. The national coverage allows ANAS planners and engineers to have a countrywide view of ground movement at considerably lower cost and superior performance compared to alternatives. Regular, high-precision measurements also enable monitoring of roads infrastructure such as bridges and tunnels.



What we found

- The extremely accurate measurements of ground movement allow road planners and builders to identify the risk of ground instability earlier in a project so saving millions of euros and reducing project delays and subsequent road closures.
- The ground deformation maps support compliance with regulations and stimulate innovation in road management & planning.
- In the future, enhanced measurements using corner reflectors offers the possibility of sustained monitoring of bridges and tunnels.
- Increased risk of severe flooding caused by changing climatic conditions, places more demands on designs and constructions which can be mitigated through ground motion measurements.

HIGHWAYS MANAGEMENT IN ITALY



The Satellite Data

Copernicus Sentinel-1 provides free-of-charge frequent, all-weather, day-and-night C-band radar images over Italy.



The Service Provider

Planetek Italia, a small and innovative company based in Bari, uses Sentinel-1 data to feed the Reticus service with millions of InSAR interferometric measurement points over Italy as the basis of a service delivering ground movement maps.



The Primary User

The state-owned company ANAS (Azienda Nazionale Autonoma delle Strade) make use of the ground movement maps to assess risk and adapt road designs to reduce the risk of subsequent problems for the highways as well as to monitor the site during construction to identify potential difficulties.



€ 3.8-8.6m pa



engineering and construction companies

Engineering and construction companies use the service to monitor the impact of engineering works on the ground stability and if movement is triggered by their activity.



€1m-2m pa



Citizens and Society

The use of InSAR-based ground deformation maps will help avoid road-closures and risk of damage in the future.



€0.8m-3m pa

Total benefits

Economic



€5.6m-13.6m pa

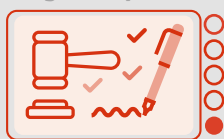
Environmental



Innovation



Regulatory



Science & Tech



Societal



About the project

Through a series of case studies, EARSC aims to gather quantitative evidence that the usage of Copernicus Sentinel data provides an effective and convenient support to various market applications. These studies are undertaken in the frame of the project "Assessing the detailed economic

benefits derived from Copernicus Earth Observation data within selected value chains: a bottom-up study survey", under an assignment from the European Space Agency.

Download the full report from the project website



<http://earsc.org/sebs>

