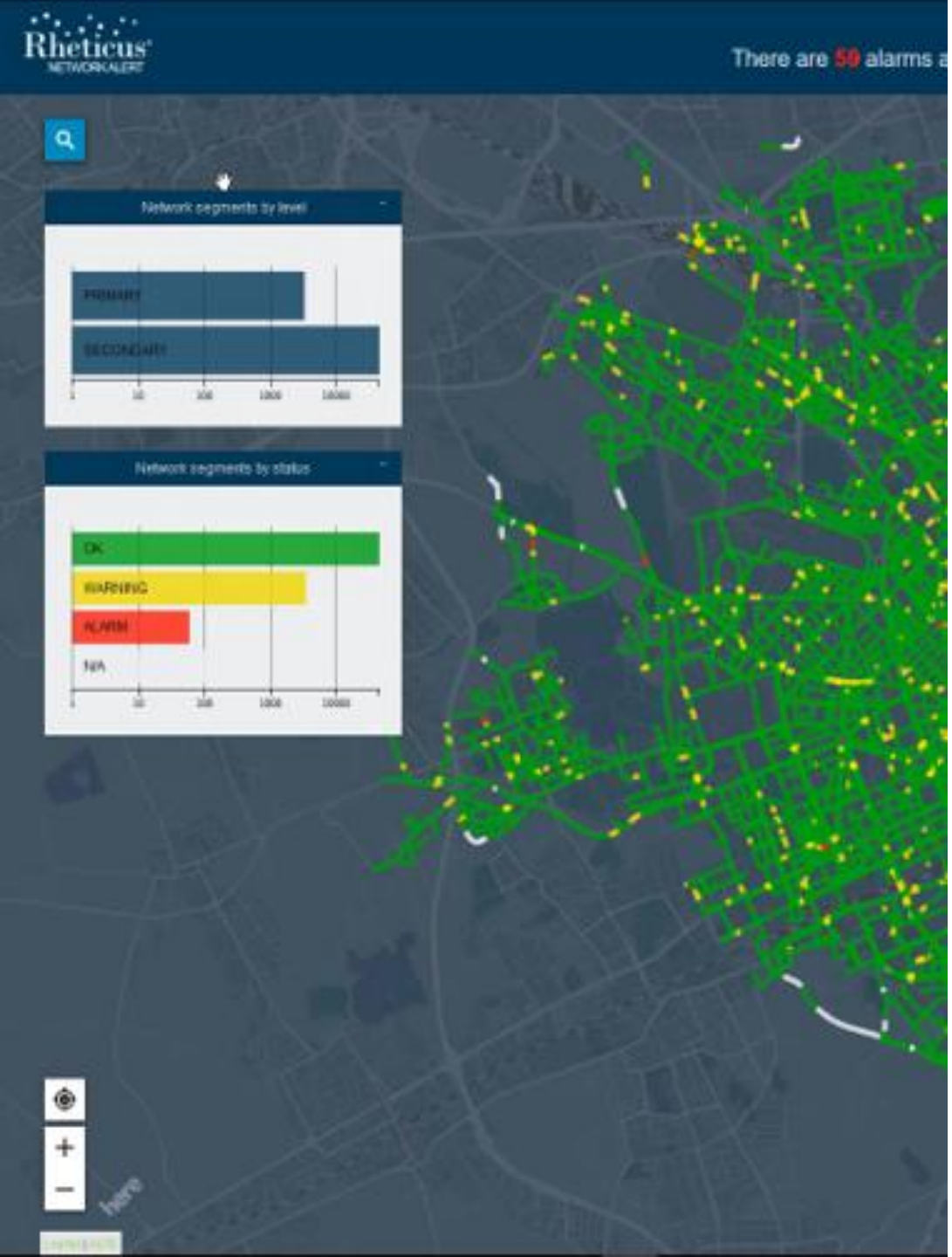


planetek italia

Rheticus® Network Alert, and the codesign with the HERA user

Pilot 6.3 | Assessing Geo-hazard vulnerability of Cities & Critical Infrastructures

e-shape disasters

Monitoring of the Earth's surface and infrastructures' stability is a key activity to ensure people's safety, environmental protection and the safeguarding of assets at all stages of the life cycle of infrastructures, from design to production, management and maintenance.

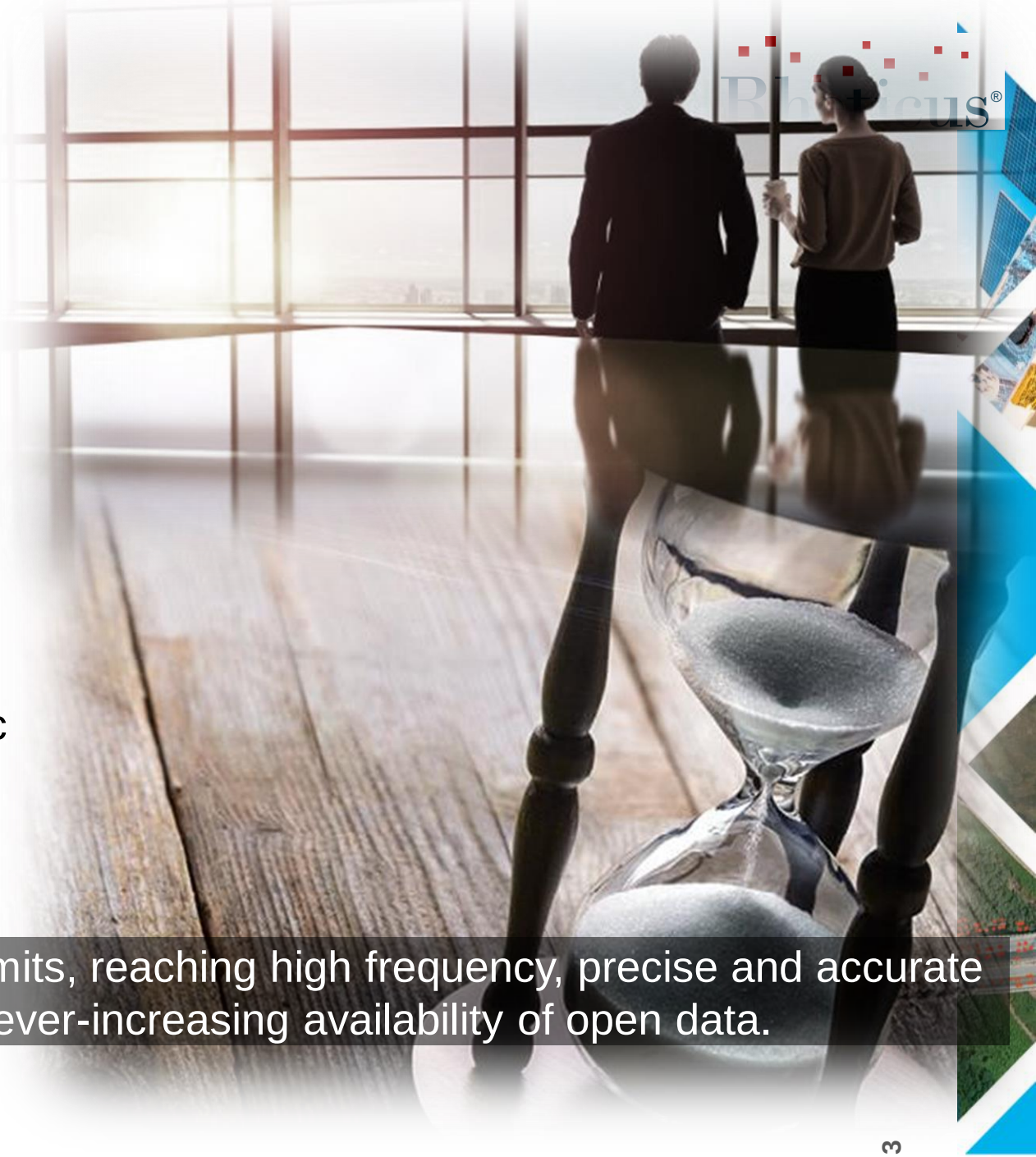
Subsidence: a global challenge

Natural and human-induced instability consequences

- Buried pipeline collapse
- Roads & bridges structural problems
- Buildings damages
- Damages due to landslides

Limits of traditional practices and technologies

- Surveys and inspections only when the problems occur
- No predictive info about what/where to inspect
- Time and cost uncertainties
- The use of traditional techniques for periodic monitoring of wide or remote areas requires considerable economic and time resources.



Satellite monitoring allows to overcome these limits, reaching high frequency, precise and accurate actionable information thanks to the ever-increasing availability of open data.

Rheticus®

e-shape

Advantages of satellite monitoring

Monitoring of ground surface movements, infrastructure stability due to subsidence or landslides.

- Detection of **millimetre movements** of infrastructures, roads and buildings;
- **Historical trends** over past years
- **Continuous monitoring** with high revisiting time;
- Low-cost monitoring on **wide and remote areas**;
- No measurement devices to be installed;

Rheticus®

e-shape

2. Rheticus®: Satellite-based monitoring services and periodical reports

Satellite-based monitoring services and periodical reports

Supporting asset management, environment and citizens well-being.

Rheticus®

- Cloud-based
- Satellite data
- Continuous update
- Analytics, Indicators, report
- Subscription-based

Rheticus® NETWORK ALERT

Rheticus® SAFEWAY

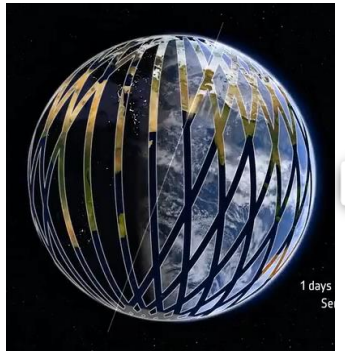
Rheticus® BUILDING CHECK

Rheticus® SAFELAND

Rheticus®

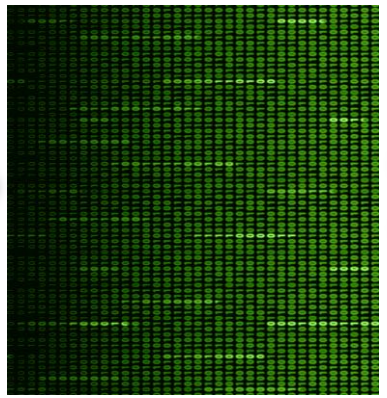
Rheticus ® Workflow

Rheticus®
Monitoring the evolution of our Earth



Satellite Data

Automatic Processing



Knwoledge

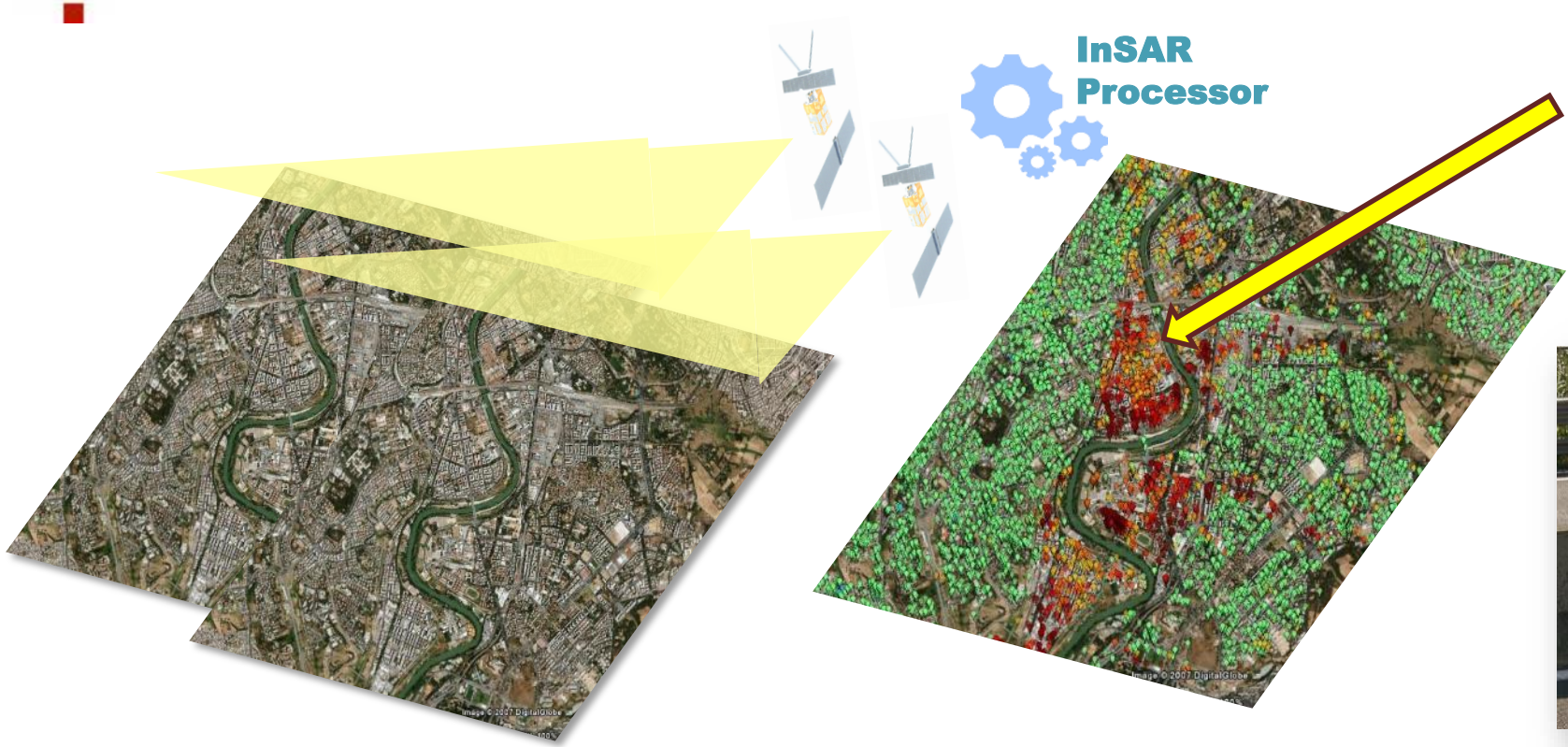
Geo-Portal

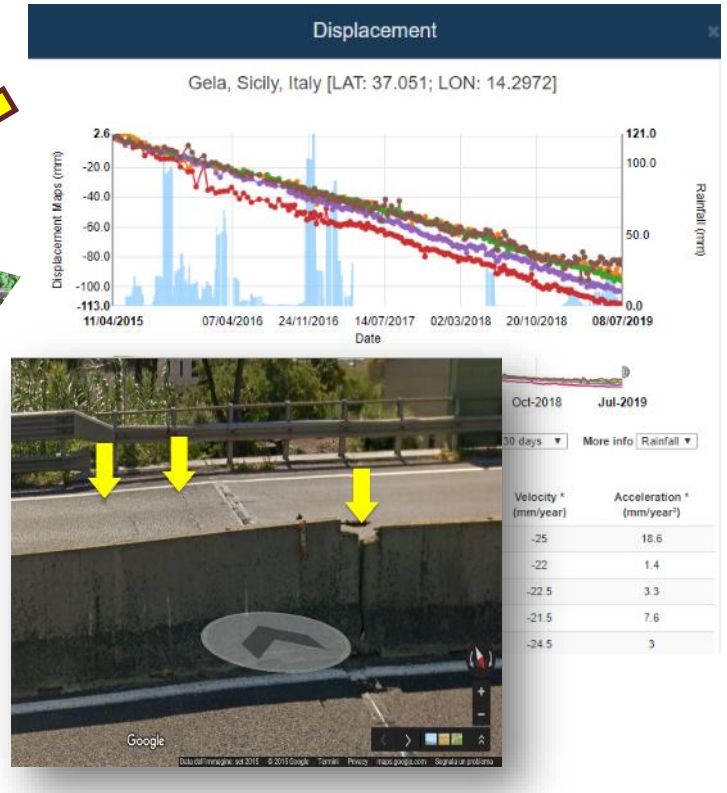
M2M

Rheticus®

e-shape

20 years of experience with the state of the art technique for the ground motion analysis





- The Earth's surface reflects the radar signal from satellites. Nowadays, we have continuous acquisitions, up to 1 per week.
- Analyzing the mirco-waves in the radar signal among hundreds of satellite images, the user receives ground motion maps with millimetric accuracy together with the historical trend of the movements.
- Sorting stable areas from unstable zones, the field inspections allow assessing the level of damages on the infrastructures, maintaining the periodical monitoring over time.

Rheticus®

2. Rheticus® Network Alert

From ground motion analysis to the knowledge on each pipeline segment

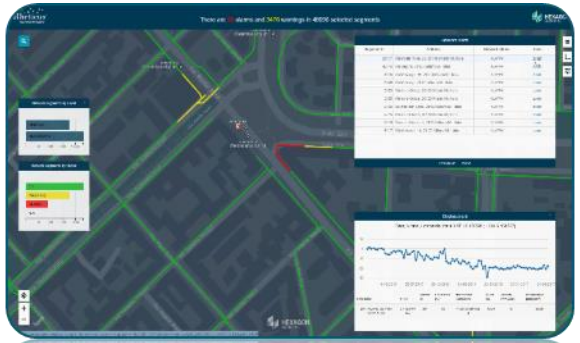
sentinel-1

- Radar satellite images (Sentinel-1, CosmoSkyMed, TerrasarX)

InSAR Processor

- Analysis on millions of measured points on the ground
- Quantify current and historical trends
- Classification of infrastructures

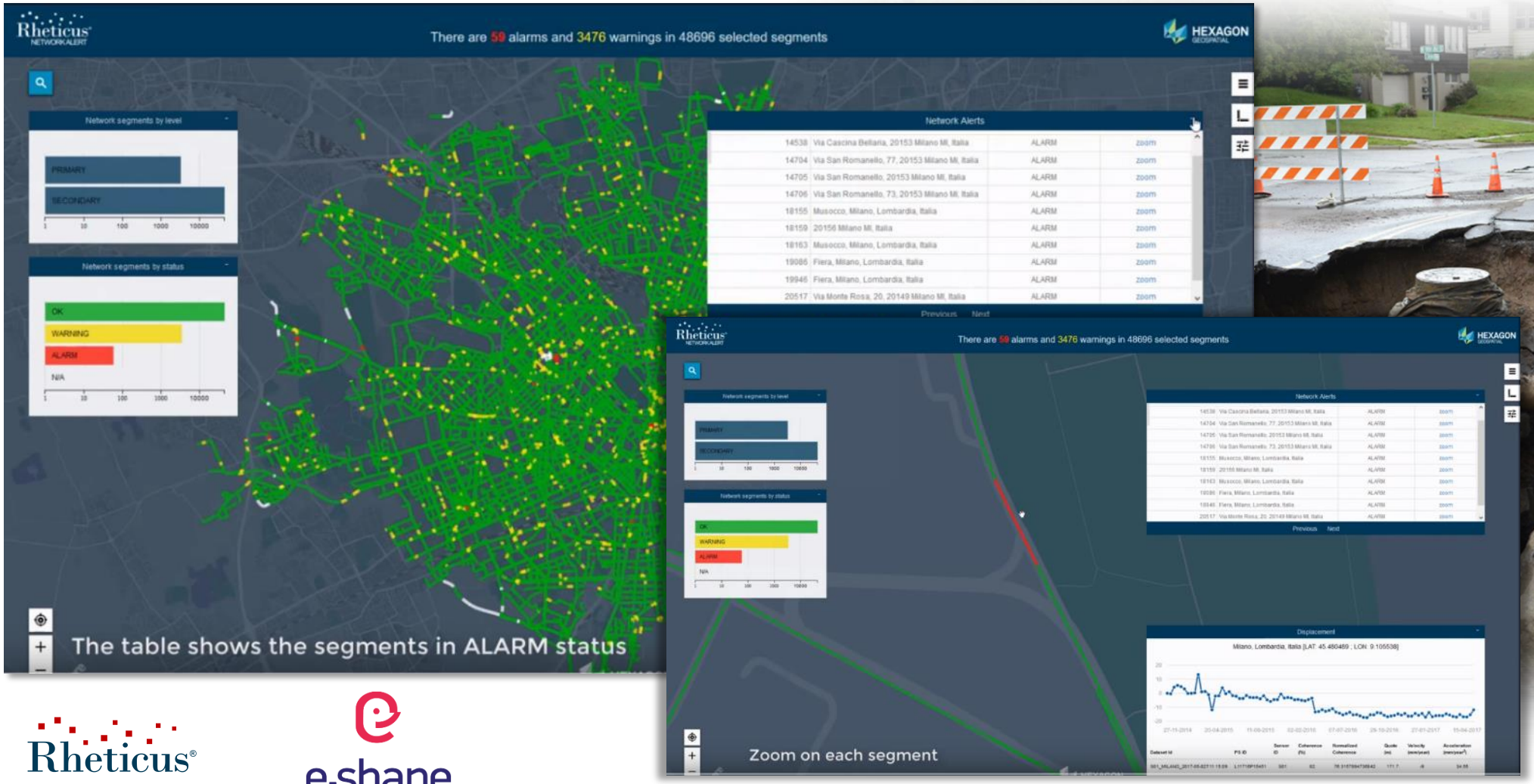
Rheticus®
NETWORK ALERT



- Exclusive Alghoritm for the identification of critical segments
- Inspection Priority score
- Rheticus® Geo-Portal
- M2M Web services, 3rd Party Systems

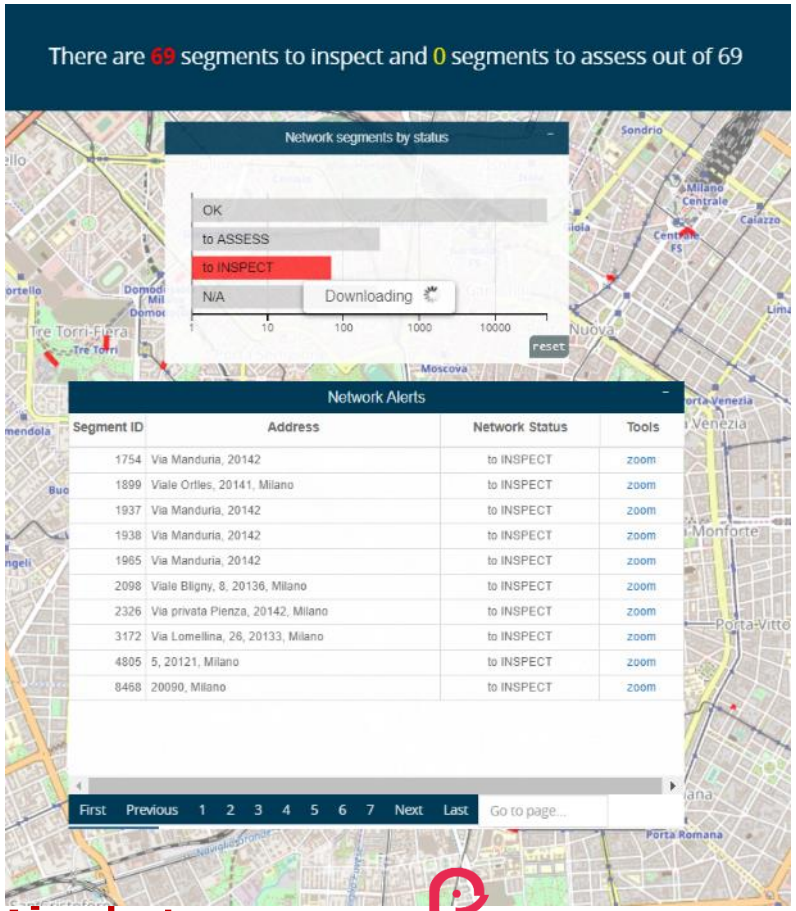
Rheticus ® Network Alert

*Predictive Maintenance for **utilities***



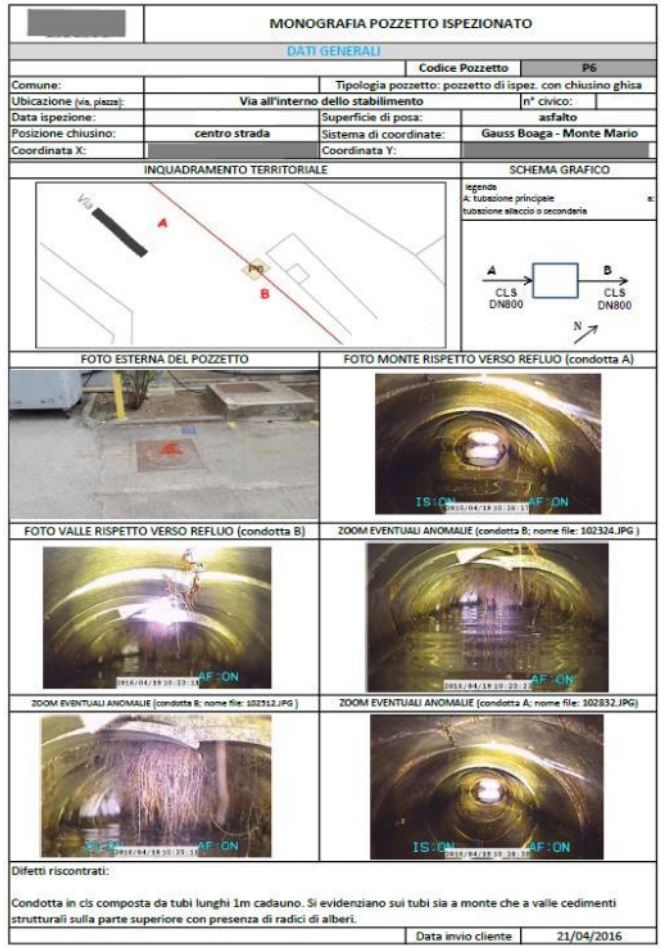
From satellite to field inspections - codesign

- Based on the level of mechanical stress due to the subsidence/instabilty, Rheticus® Network Alert indicates the critical segments



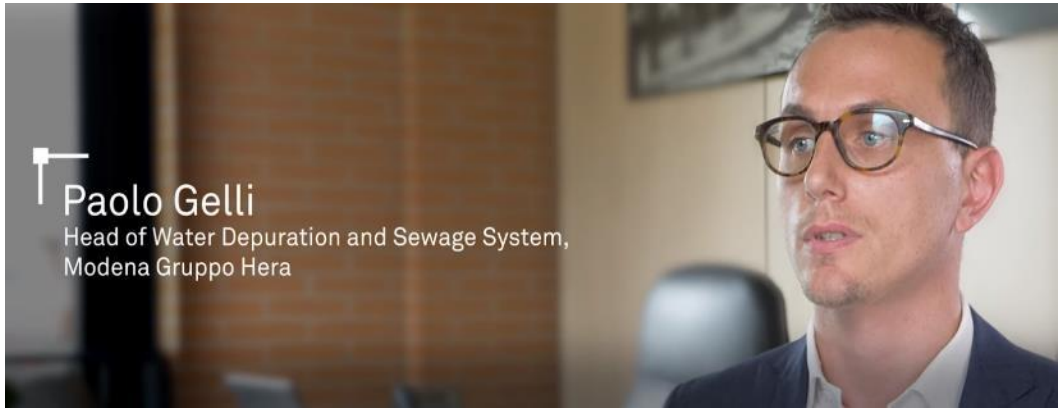
- The Utility's crew inspects the segments

- Each segment is assigned to a specific damage class*



*as the local and internal regulation defines

Hera subscribed Rheticus® nel 2017. Improving the sewer inspection rate by 40% , the success case has been presented at HxGn Live 2019 - Las Vegas, USA.



https://www.youtube.com/watch?v=M4xUn6BhEFg&t=29s