

Improving infrastructure integrity in Italy

| The Metropolitan City of Milan | *Italy*

The Metropolitan City of Milan is a dynamic city that blends historical heritage with contemporary innovation. It's the second-most populous city in Italy, with around 3.25 million residents, and attracts a diverse mix of cultures and talents. The city's bustling financial district is Italy's economic hub and the country's technology and business center.

As the country's leading economic center, the Metropolitan City of Milan governs the city's urban region, including the city and neighboring municipalities. This administrative entity focuses on

urban planning, transportation and public services and manages the area's extensive network of bridges, spanning over 1,500 square kilometers (about 580 square miles).

To strengthen the safety and maintenance of these vital infrastructure assets and to align with the guidelines of the Ministry of Infrastructure and Transport (MIT), the City turned to longtime Hexagon partner Planetek Italia, which built the application Rheticus Safeway, a satellite monitoring system powered by Hexagon's M.App Enterprise technology.



Developing a comprehensive infrastructure census

To meet one of the key MIT guidelines, the Metropolitan City of Milan needed to produce a comprehensive census of all infrastructure within the metropolitan area. This involved gathering detailed information on the condition and characteristics of each bridge. In the past, the City used a method for monitoring bridges that, while valid, had some limitations that may not have fully met the infrastructure analyses required to meet the requirements set by MIT, such as the predictive approach.

The five levels of assessment and inspection of infrastructure, such as bridges, include inventory of infrastructures, visual inspections and defect records, risk analysis and classification, preliminary assessment of the infrastructures and detailed verification.

Planetek Italia's solution, Rheticus Safeway, provided immediate value by offering an additional informational layer that allowed for a better understanding of assets and accelerated the evaluation and inspection activities of the infrastructure required by MIT requirements. Rheticus Safeway offers advanced satellite-based intelligence for infrastructure monitoring and assessment. Through the use of satellite data and advanced algorithms, the solution supports the Metropolitan City of Milan to conduct a comprehensive census of its infrastructure, capturing key location information needed for further assessment and prioritization.

Rheticus Safeway is a cloud-based subscription service that utilizes the power of Hexagon's Smart M.App technology, which provides a comprehensive framework for data analysis and visualization. The solution connects to a continuous stream of data, performs complex analyses in the background and presents the findings in a simplified dashboard. The user-friendly dashboard includes an Inspection Priority Score that highlights city infrastructure particularly stressed by movements and refreshes data monthly for efficient network management and preventive actions.

With its advanced satellite monitoring alongside M.App Enterprise, the solution provides automated subsidence updates through advanced algorithms, giving the City real-time, accurate data of bridge conditions for proactive structural maintenance and resource optimization.

"There has been a cultural shift in problem-solving approaches with the use of innovative tools like Rheticus Safeway, like transitioning from an emergency-driven mindset to a predictive programming logic," said Alessandra Tadini, director of roads and sustainable mobility for the Metropolitan City of Milan. "This transformation has affected various elements, ranging from operational methods to a system capable of providing selected and continuously updated data."

Implementing a scoring system

By leveraging satellite-based intelligence and advanced algorithms, Rheticus Safeway generated a comprehensive infrastructure census with essential information for further assessment and prioritization. Based on this data, the City introduced an Inspection Priority Score, which ranked structures based on condition, potential risks and other pertinent factors. The Inspection Priority Score enabled effective resource allocation and directed inspection efforts toward critical infrastructure. This scoring system optimized maintenance and monitoring efforts, including visual inspections, risk analysis and territorial classification, while meeting MIT guidelines.

Rheticus Safeway has delivered substantial quantitative and qualitative benefits for the Metropolitan City of Milan. Quantitatively, it has significantly shortened inspection and maintenance timelines by automating data acquisition and analysis, leading to more frequent and efficient inspections, cost savings through optimized resource allocation and prevention of infrastructure failures caused by ground instability. Qualitatively, the solution has improved decision-making with real-time data for enhanced customer satisfaction through increased infrastructure reliability and performance. These improvements have translated into greater confidence in the city's bridges.

"Rheticus Safeway is a robust platform for data analysis and visualization," said Tadini. "It provides us with up-to-date, detailed information in a simple and easily understandable manner. Most importantly, it allows us to make the best decisions to protect residents and tourists and maintain the health of our bridges."

Hexagon is the global leader in digital reality solutions, combining sensor, software and autonomous technologies. We are putting data to work to boost efficiency, productivity, quality and safety across industrial, manufacturing, infrastructure, public sector and mobility applications. Our technologies are shaping production and people-related ecosystems to become increasingly connected and autonomous – ensuring a scalable, sustainable future.

Hexagon's Safety, Infrastructure & Geospatial division improves the resilience and sustainability of the world's critical services and infrastructure. Our solutions turn complex data about people, places and assets into meaningful information and capabilities for better, faster decision-making in public safety, utilities, defense, transportation and government. Learn more at [hexagon.com](https://www.hexagon.com) and follow us [@HexagonAB](https://twitter.com/HexagonAB).

© 2024 Hexagon AB and/or its subsidiaries and affiliates. All rights reserved. Hexagon is a registered trademark. All other trademarks or service marks used herein are property of their respective owners. 7/24