

A safer journey for all: how SOTERIA is redefining road safety for Europe's most vulnerable travellers

SOTERIA has demonstrated that data-driven, community-centred approaches to road safety are not only technically feasible but practically deployable at scale.

Every day, millions of pedestrians, cyclists, and micro-mobility users navigate Europe's cities, often sharing space with fast-moving traffic on roads designed for an earlier era. For these vulnerable road users (VRUs), the risks remain disproportionate: despite decades of safety campaigns and steadily improving infrastructure, VRUs continue to account for a significant share of road fatalities. The problem is not lack of awareness—it is lack of the right data, the right community engagement, and the right tools to convert awareness into action.

Addressing this challenge is essential to achieving the European Union's Vision Zero ambition of eliminating road fatalities by 2050. As yet, progress across member states has remained below the interim targets, particularly for VRUs. The mobility landscape is simultaneously undergoing rapid change, with e-scooters, e-bikes and other micro-mobility devices transforming how people move through cities, introducing new risk profiles that existing safety frameworks are ill-equipped to address. The challenge is systemic, and it calls for systemic solutions.

The SOTERIA project was launched in November 2022 to address this challenge. Funded under the Horizon Europe Research and Innovation Programme, SOTERIA brought together 16 partners with a shared mission: to design and validate innovative approaches that combine advanced analytics, artificial intelligence (AI) and real-world data to make urban mobility genuinely safer for VRUs.

A new perspective on road safety

Traditional road safety analysis has largely relied on historical crash data. While invaluable, this information provides insights only after incidents have occurred. SOTERIA sought to shift the focus from reactive analysis to proactive prevention by leveraging the growing availability of mobility, infrastructure, behavioural, and environmental data.

A key innovation of SOTERIA lay in its use of data-driven road intelligence. Rather than relying solely on historical accident data, the project incorporated new sources of information, such as near-miss detections captured by sensors and user-reported data. This enabled the identification of risk patterns before accidents occur.

By integrating multiple data sources and applying advanced predictive analytics, SOTERIA explored how cities and transport authorities can better understand complex safety dynamics and make evidence-based decisions that protect road users. Central to this mission was the development of open, standardised datasets on VRU safety. This supports interoperability between systems and facilitates collaboration across sectors and governance levels.

Building a data-driven safety intelligence framework

One of the project's most significant achievements was the development of a comprehensive safety intelligence framework capable of integrating and analysing diverse datasets relevant to road safety.

The framework brought together information from infrastructure sensors, traffic operations, mobility services, connected vehicles, and user-generated data to create a deeper understanding of road conditions in urban environments. By combining previously fragmented sources of information, SOTERIA demonstrated how data interoperability can provide richer insights into risk factors affecting VRUs.

The Safe Mobility Data Space provides the data-sharing infrastructure underpinning this intelligence. Designed around principles of interoperability and data sovereignty, it allows city authorities, mobility operators, and research institutions to exchange road safety data securely, without sacrificing control over their own datasets. This architecture positions SOTERIA squarely within ongoing efforts to build the European Mobility Data Space.

SOTERIA's approach enables the identification of emerging safety patterns that may not be visible through conventional accident statistics alone. By fusing a wide variety of data streams, the safety intelligence framework supports decision-makers in understanding where risks occur, why they emerge, and how targeted interventions can reduce the likelihood of serious incidents.

Importantly, the project also addressed challenges related to data sharing and interoperability, providing practical recommendations that can help cities and organisations collaborate more effectively in the future.

Predicting risk before crashes occur

A key innovation developed within SOTERIA was the application of advanced analytics and AI to predict high-risk situations before collisions take place.

The project developed AI-based predictive models capable of analysing multiple contextual variables, including traffic conditions, infrastructure characteristics, behavioural patterns, and environmental factors. These models enable a more proactive understanding of road safety by identifying situations that could potentially lead to conflicts or crashes.

By developing methodologies for detecting and analysing near-miss events that occur much more frequently, SOTERIA demonstrated how cities can gain earlier insights into safety problems and implement preventative measures before serious incidents occur. This approach represents a significant evolution in safety monitoring and offers valuable information about risks that may otherwise remain hidden.

Supporting safer decisions and safer journeys

The SOTERIA project explored how safety intelligence can support infrastructure planning and policy development. Enhanced access to safety

insights enables cities and transport authorities to prioritise investments, identify hazardous locations, and evaluate the potential impact of interventions more effectively.

This evidence-based decision-making capability is particularly important as cities seek to balance growing mobility demands with ambitious sustainability and road safety objectives. Explainable artificial intelligence (XAI) techniques were embedded throughout the intelligence framework, ensuring that the insights generated are not merely accurate but transparent and interpretable by city planners and policymakers who may lack a deep technical background.

Among the project's innovations were safer route planning approaches that incorporate safety-related information alongside traditional routing criteria such as travel time and distance. Complementing back-end capabilities, the SOTERIA Mobile Application delivers safety-weighted and pollution-aware routing to road users. By integrating hazard detection and real-time safety considerations, these tools guide pedestrians, cyclists, and micro-mobility users along routes that balance speed, safety, and environmental quality.

Safe City Certification: a framework for accountable progress

Developed in close collaboration with city partners and road safety experts, the Safe City Certification provides municipalities with a practical, data-driven pathway for demonstrating progress towards Vision Zero. Rather than relying on self-reported metrics or periodic audits, the framework draws on the continuous data streams generated within the SOTERIA framework to produce a living, updatable evidence base for certification claims.

Cities can use the certification as both an internal governance tool—providing a structured methodology for setting targets, measuring performance, and allocating resources—and as an external

communication mechanism, signalling to residents, investors, and European institutions their commitment to measurable road safety improvement. The framework is designed to be scalable and adaptable, applicable to municipalities of varying sizes and with varying levels of existing data infrastructure.

Living Labs: bringing innovation into real urban environments

What distinguished SOTERIA from conventional road safety research was its fundamental commitment to co-creation and validating innovations in real-world settings. Rather than developing technological solutions in isolation and then presenting them to communities, the project placed Living Lab communities at the heart of its methodology from the very beginning.

SOTERIA established 4 Living Labs across Europe, each addressing a distinct urban mobility challenge and engaging local stakeholders—from city authorities and transport operators to individual cyclists and pedestrians—as active co-designers of the solutions. Across the project, more than 3500 citizens and stakeholders were engaged through surveys, workshops, demonstrations, training activities, and solution evaluations, reflecting the scale of SOTERIA's stakeholder engagement and co-creation activities. This approach is grounded in the recognition that road safety solutions, however technically sophisticated, will only achieve real-world impact if they are trusted, understood, and actively adopted by the people they are designed to protect.

These diverse urban environments provided valuable opportunities to test methodologies, tools, and interventions under different mobility conditions and governance contexts. The pilot activities generated valuable evidence regarding the effectiveness, scalability, and transferability of data-driven safety solutions. They also highlighted the importance of stakeholder engagement in achieving long-term adoption and impact.



LL#1 – Oxfordshire, UK

Safe and inclusive integration of micro-mobility to current mobility paradigms.



LL#2 – Saxony, Germany

VRUs safety applications for generation Z.



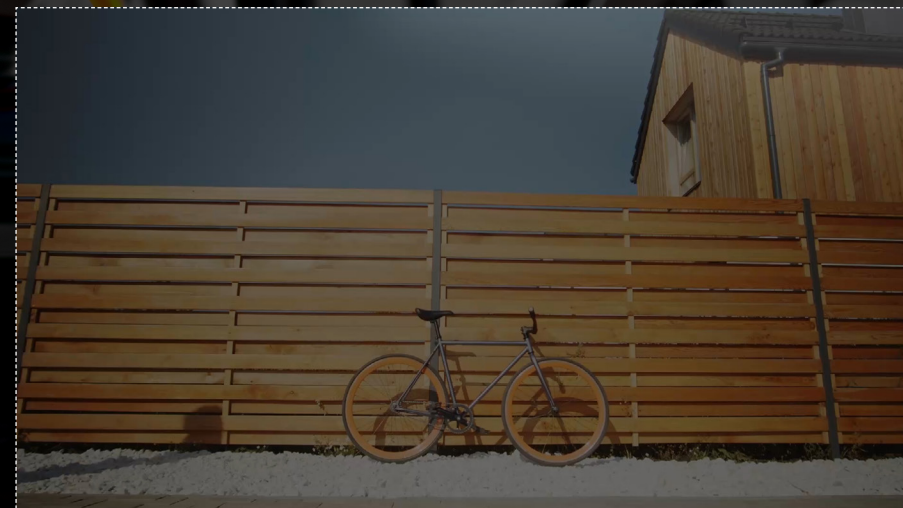
LL#3 – Madrid, Spain

Safe and shared mobility services for improving user well-being and clean urban environments.



LL#4 – Chania/Igoumenitsa, Greece

Proactivity-based and micro-vehicle centric measures for unprotected VRUs.



From research to policy and impact

While technological innovation formed a central pillar of SOTERIA, the project's ambitions have never been confined to the technical. From the outset, partners recognised that lasting improvements in road safety require supportive governance frameworks and effective policy implementation.

Throughout the project, partners worked closely with policymakers, public authorities, and stakeholder organisations to translate research findings and lessons learned across the Living Labs into actionable recommendations. The resulting policy guidance addresses a range of themes, including interoperable infrastructure design, regulatory frameworks, user behaviour, technology deployment, and adaptive data governance.

These recommendations provide practical pathways for accelerating the adoption of innovative safety solutions across Europe. They also contribute to broader European ambitions related to sustainable mobility, climate-neutral cities, and the reduction of road fatalities and serious injuries.

A lasting legacy for urban road safety

As SOTERIA formally concluded in April 2026, the project left behind far more than a collection of research outputs and technological innovations. It demonstrated the transformative potential of combining data, AI, stakeholder collaboration, and real-world validation to address one of Europe's most pressing urban mobility challenges.

The project has shown that road safety can increasingly be understood as a dynamic, data-rich domain where risks can be anticipated rather than simply analysed after the incident. As Europe moves towards a more connected, sustainable, and human-centred mobility future, SOTERIA stands as an example of how collaborative, data-driven innovation can help transform road safety from a reactive challenge into a proactive opportunity.

The challenge ahead is to ensure this work endures—and that the streets of European cities become measurably safer for every pedestrian, cyclist, and micro-mobility user who travels them.

PROJECT SUMMARY

SOTERIA (Systematic and orchestrated deployment of solutions in complex urban environments for ageing and vulnerable societies) was dedicated to making European roads safer for pedestrians, cyclists, and micro-mobility users. Through advanced data analytics, AI-based models, and a network of Living Labs, the 3.5-year Horizon Europe project aimed to turn fragmented data into actionable knowledge that supports European cities in turning the Vision Zero goal from ambition into evidence-based, measurable reality.

PROJECT PARTNERS

SOTERIA brought together a multidisciplinary consortium of experts in road safety, data analytics, AI, urban planning, and policymaking from across Europe. The partnership included research organisations, universities, industry partners, mobility operators, and European cities hosting Living Labs. This diversity was essential because road safety challenges are multidisciplinary—spanning engineering, data, human behaviour, and governance.

PROJECT CO-ORDINATOR

Netcompany S.A. Netcompany is one of Europe's leading technology and digital transformation providers, delivering innovative solutions for the public and private sectors. With extensive experience in implementing large-scale European research and innovation projects, Netcompany co-ordinated the SOTERIA consortium and led the project's management, dissemination, communication, and impact creation activities. As co-ordinator of SOTERIA, the company contributed to the development and deployment of data-driven tools supporting safer, smarter, and more sustainable urban mobility systems.

PROJECT CONTACTS

Project Coordinator: Kostas Thivaos

✉ info@soteriaproject.eu

🌐 soteriaproject.eu

🌐 [/company/soteria-project](https://company/soteria-project)

📧 [@Soteria_Horizon](https://twitter.com/Soteria_Horizon)

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