TANGENT

**PRESS RELEASE**

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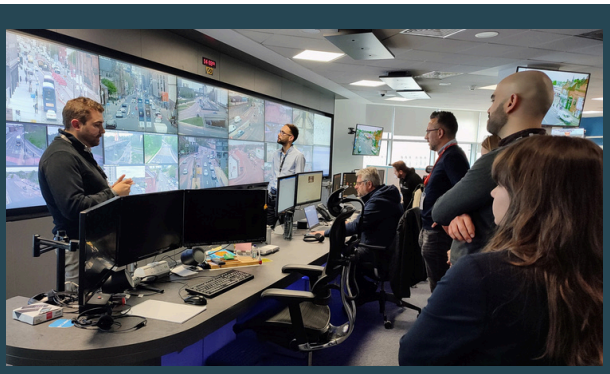
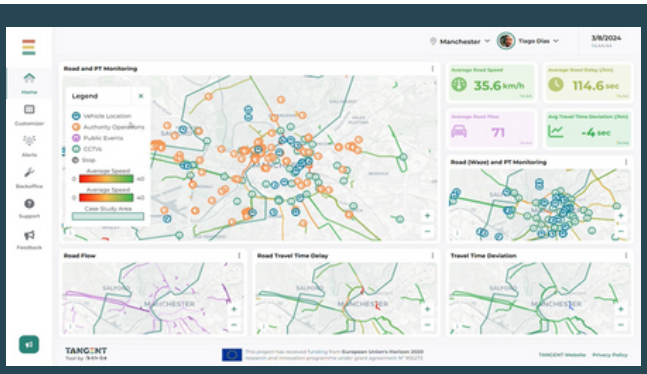
# TANGENT PROJECT REVEALS ITS RESULTS

## OPTIMISING MULTIMODAL TRAFFIC MANAGEMENT ACROSS EUROPEAN CITIES





Left: TfGM Traffic Management Control Center (Source: POLIS Network), right: the TANGENT dashboard (Source: A-to-Be)

TANGENT, an EU-funded project under Horizon 2020 coordinated by the University of Deusto, recently published its "Final Booklet" outlining its key findings, methodologies, tools and dashboards which aim to **optimise urban traffic management**.

Network and Traffic Management has historically been deployed in silos by different operators with a disproportionate focus on optimising road transport. However, achieving climate change mitigation, safety, security, efficiency, and liveability goals requires **better connected and multimodal transport networks.** To achieve this, improved cooperation between stakeholders managing a transport ecosystem is essential. Indeed, successful multimodal traffic management requires not only advanced tools and models, but also **a strong strategic and organisational foundation**. This may iclude clear policies for data sharing, digital infrastructure investments and governance frameworks that clearly define roles and responsibilities of all stakeholders, especially during disruptions.

In this context, TANGENT developed **solutions, tools and dashboards for traffic managers and operators to optimise traffic management** in a coordinated and dynamic way from a **multimodal perspective**. The dashboards' functionalities include:

- Monitoring and visualisation of live data from various modes, providing situational awareness
- Predictions of the traffic evolution through data-driven and simulation-base approaches
- Incident management mechanisms through the design, optimisation and evaluation of response plans to address incidents in real-time

The TANGENT solutions, dashboards and tools were designed through multi-actor co-creation and cooperation processes and tested in **four demonstrator cities and metropolitan areas**: Lisbon, Greater Manchester, Rennes Métropole, and Athens (virtually).

Through recurrent **workshops and interviews,** each demonstration's collected and identified with the help of the consortium their gaps, needs, opportunities, cooperation structures, agreements notably on data governance requirements, and mechanisms to facilitate multimodal traffic management.

Along the way, the dashboards were tested in the demonstrations using various scenarios: a baseline, planned events such as football matches and music festivals, and unplanned events or incidents. Overall, they highlighted that the TANGENT solutions **enhance their operational capabilities, improve real-time insights, and foster better multi-modal coordination**. However, challenges around data reliability and ownership were encountered and in some areas, they remain a challenge.

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*"TANGENT has provided a great opportunity for Transport for Greater Manchester to understand traffic management functions, data and technology solutions with our partner cities. Testing TANGENT tools in our operational control centre has demonstrated the benefits and successes that can be achieved with next generation traffic management systems allowing us to address congestion and supporting a digital network management approach as we develop the Bee Network."* - **Hannah Tune, Intelligent Transport Systems Development Manager, Transport for Greater Manchester.**

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The TANGENT dashboards are based on **four technical tools and solutions.**

Firstly, TANGENT used advanced traffic management applications and machine learning models. To do so, large-scale historical and real-time **intermodal mobility data** across the four demonstrations was collected, harmonised and integrated. To address interoperability issues, comprehensive solutions were created and used such as data catalogues for sharing uniform descriptions, a reference conceptual model for standardising transportation data, semantic harmonisation pipelines for integrating diverse sources, and a data API for streamlined access.

Secondly, using **transport prediction and simulation models**, a system combining data-driven and simulation-based approaches to monitor and predict multimodal traffic conditions in real time was developed. It forecasts traffic supply and demand, detects anomalies, predicts congestion duration, and supports response planning. Using data from traffic sensors, travel patterns, and existing traffic models, it addresses challenges such as data quality and real-time processing. Simulations enhance predictions by filling gaps in observed data, while demand models adapt historical patterns to current disruptions, enabling accurate, dynamic traffic management and network performance optimisation.

Thirdly, **travel behaviour models** were used that integrated econometric and machine learning techniques to help predict travel demand shifts during specific interventions, such as congestion pricing and public transit signal prioritisation. The models were trained on both stated and revealed preferences through data collected through surveys and trip tracking.

Finally, TANGENT developed **a transport optimisation framework** using AI, simulation, and consensus-based decision-making. A number of key functionalities were tested including dynamic congestion pricing to reduce congestion and pollution by adjusting toll prices based on various factors, optimised demand-responsive transport for better first/last-mile connectivity, and synchronised public transport with traffic control to handle disruptions. Additionally, the project explored signal vehicle coupled control with Connected and Automated Vehicles (CAV) to improve traffic flow by optimising signal timings and CAV routes, reducing congestion, emissions, travel time and more.

**The TANGENT project concludes with the following key take-aways:**

- Tools for facilitating the collocation and harmonisation of heterogeneous data sources of transport and mobility are already available. Dynamic and real-time data is required to efficiently respond to events affecting the transport network and optimise transport flows.
- Solutions for predicting traffic, combining data-driven and simulation-based approaches for proactive real-time traffic management under recurrent and non-recurrent situations need to be enhanced.
- Collaboration and data sharing among different stakeholders has been shown to improve evidence-based decision-making processes for transport operators.
- New governance models for traffic management need to be set up for a coordinated management of transport operations, considering the needs and priorities of the different transport agents.
- New regulations will boost the implementation of novel traffic management systems for collaborative decision-making.

"*TANGENT has achieved successful results on reducing traffic congestion, transport emissions, and shift in travel behaviour to sustainable modes thanks to the side by side work between the technical partners and the cities, getting insights on the real needs for multimodal traffic management from the transport modellers and traffic managers, and transforming them to digital solutions, that enable evidence-based traffic management involving different transport agents in a city." -* ***Leire Serrano, TANGENT Project Coordinator (University of Deusto)***

For more information about the TANGENT project, please contact the project coordinator Leire Serrano (leire.serrano@deusto.es) and/or, for communication or media purposes, please contact the dissemination manager Mark Meyer (mmeyer@polisnetwork.eu).

The TANGENT project runs between September 2021 and November 2024.TANGENT has received funding from the Europeain Union's Horizon 2020 Research and Innovation Programme, Grant Agreement No 955273.

LINKS: The TANGENT website, the Final Booklet and the TANGENT tool video