

# URBAN AND REGIONAL DEVELOPMENT

## PNRR - Connected, Cooperative and Automated Mobility, Connected Networks and Smart Infrastructure

<b>Funded By</b>	MINISTERO DELL'UNIVERSITA' E DELLA RICERCA [P.iva/CF:97429780584] Politecnico di TORINO [P.iva/CF:00518460019]
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<b>Context of the research activity</b>	<p>Project funded within PNRR. Project code: CN00000023. Topic: Sustainable Mobility. Centro Nazionale per la Mobilità Sostenibile – CNMS. Spoke 7 – CCAM, Connected networks and Smart Infrastructure.</p> <p>The research aims at developing methodologies and technological solutions to allow transport networks to be ready for the advent of cooperative, connected and automated mobility (CCAM) with a focus on designing a "tool" able to monitor and control the resilience of infrastructures and networks.</p>
<b>Objectives</b>	<p>The research will be carried out within the Spoke 7 – CCAM, Connected networks and Smart Infrastructure. The final aim is to develop a technological platform, consisting of an ecosystem of physical and digital components, cooperation models, development and integration environments, digital twins and testing/validation environments. The resulting platform is capable of integrating and making sensors, devices, infrastructures, vehicles and digital transportation services natively interoperable, toward more sustainable and resilient mobility, incorporating off-the-shelf and newly-developed technologies from research units as well as from private companies. The platform is adopted as a common technological framework and as the interoperability basis for several vertical solutions in the domains of smart and sustainable mobility.</p> <p>Within this framework, the goal of the research is to develop in experimental environments:</p> <ol style="list-style-type: none"><li>1. methodologies and technological solutions facilitating the advent of cooperative, connected and automated mobility in transport networks, to allow a more integrated, smart, safe, secure and sustainable mobility. The focus is twofold: 1) understand how guarantee a proper interaction between vehicles and infrastructure; and 2) define how a path for autonomous driving has to be, in terms of spatial variables (geometric characteristics of the road as well as surrounding spaces), status of infrastructure (pavement, safety,</li></ol>

etc.), environmental conditions;

2. methodologies and technical solutions for data collection to allow the monitoring of the resilience of the infrastructures and of the transport networks with respect to local and global fragilities due to ageing, degradation, unexpected events, and other natural and anthropic susceptibility factors;
3. design a prototype allowing to collect data related to the infrastructure and the mobility in real time when possible, and providing the proper integration of such tool as a technological layer of the integrated platform;
4. test the prototype in real environment to check the interoperability with the CCAM ecosystem.

**Skills and competencies for the development of the activity**

The candidate should have some knowledge related to the context of cooperative, connected and automated mobility (CCAM), with attention to the issues related to the implementation of such mobility on infrastructures. In addition, some competences related to stereocamera algorithm design for obstacle recognition, camera and LiDAR sensor fusion algorithm design, and LiDAR clustering and plane removal algorithm design would be highly appreciated.