1st Newsletter

CONDUCTOR

Welcome!

October 2023

As we reflect on our productive first year, we are pleased to share our initial achievements with you. At CONDUCTOR, our mission is clear and purposeful: to advance the future of transportation. We aim to do this by developing the next generation of simulation models and tools, all driven by the powerful combination of AI and data fusion.

Our motivation is simple and compelling: we envision a world where transportation is not only efficient but also seamless, safe, and accessible to all. A portfolio of solutions will be applied and tested in various regions and cities. It will also foster intermodality and interoperability between different traffic management systems.

Our project has been showcased at prestigious events and featured in the latest CINEA brochure. For those seeking technical details, you will find access to our publicly available outputs, some of which are presented in this newsletter. CONDUCTOR has initiated collaborations with other projects. We are particularly pleased to have recently organised the special session at the ITSC 2023 conference. In addition, we have already promoted the scientific aspects of our project through journal article and conference papers.

Join us on this exciting journey to redesign transport. Keep your eyes open for more news from the CONDUCTOR project.

Yours sincerely,
CONDUCTOR Project Team

1 Integrated traffic management

2 Demand-responsive transport

3 Urban logistics

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Launch of the CONDUCTOR project

The CONDUCTOR project officially started on 1 November 2022 and will run for three years. The project aims to design, integrate, and demonstrate advanced high-level traffic and fleet management to allow efficient and globally optimal transport of passengers and goods while ensuring seamless multimodality and interoperability. To achieve this goal, the project has been built around a strong multi-disciplinary consortium of fifteen experienced partners in the field of traffic and fleet management.

The CONDUCTOR consortium gathered on 22 and 23 November 2022 during the official kick-off meeting organised by the project Coordinator **Netcompany-Intrasoft SA** in Athens, Greece. The kick-off meeting was the occasion for the partners to meet each other and discuss the practical implementation of CONDUCTOR project's activities and the achievements of its objectives via three use cases.

The consortium particularly appreciated the participation and the presentation made by our Project Officer from the European Climate Infrastructure and Environment Executive Agency (CINEA) who showed genuine interest and support in our CONDUCTOR project.

The CONDUCTOR General Assembly in Rome, Italy

A two-day CONDUCTOR General Assembly was organised by **Deep Blue SRL** in Rome, Italy, on 21 and 22 March 2023. On the first day, the initial progress of the project was reported and discussed. A significant part of our discussions was centered around the planned data sources, their technical descriptions and the degree of their availability. The results of the survey, filled by 58 relevant stakeholders from the logistics sector, public authorities and road operators, were presented and especially the data related to their regulatory needs, requirements, benefits, expected bottlenecks and challenges. The findings from the survey were transformed into insightful graphical representations. These were discussed during the meeting and are further detailed in the project **Report on stakeholders' requirements, user needs and social innovations**.

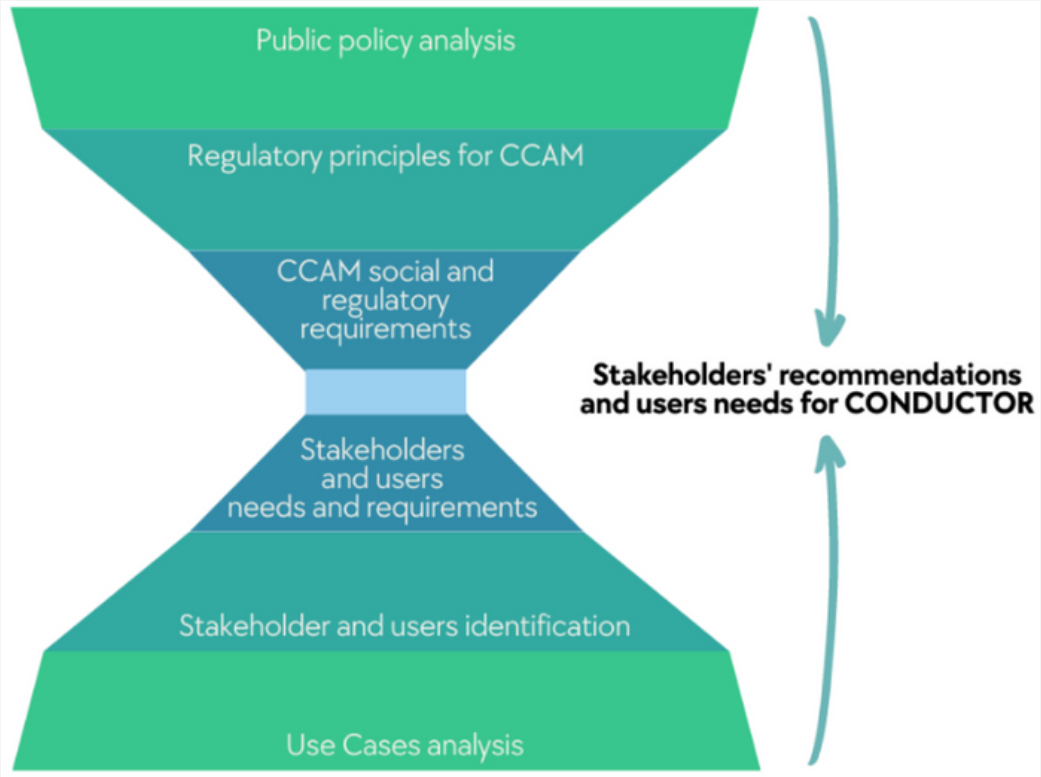
On the second day of the meeting, we organised two workshops. The "Stakeholders' inputs and use cases" workshop aimed to discuss the collected needs and requirements and map these and the associated key performance indicators to the use cases of the CONDUCTOR project. The "System Architecture and Data Sources" workshop provided insights into the architecture components, their interactions, and the data specifics for each use case.

The CONDUCTOR General Assembly in Bilbao, Spain

The CONDUCTOR consortium gathered for the 2nd General Assembly on 28 and 29 September 2023. The meeting took place at the University of Deusto in Bilbao, Spain. We focused on reviewing the progress of the project and planning the next steps for piloting our use cases, while considering the progress in refining methods and models tailored to Cooperative, Connected and Automated Mobility (CCAM). We also discussed our strategies to ensure seamless integration into the platform environment and formulated the methodology for conducting the use cases, addressing potential risks.

The second day was dedicated to the cooperation with the ORCHESTRA project. In a workshop we were introduced to the concept of Multimodal Traffic Management (MTM) and the strategies developed by their project. Following the theoretical lectures, we participated to an interactive board game developed by ORCHESTRA, where the participants put into practice the concepts presented earlier. This allowed us to reconsider a possible integration of the MTM concept into the CONDUCTOR project.

Stakeholders' requirements, user needs and social innovations



The CONDUCTOR report aiming to design, integrate, and demonstrate advanced traffic and fleet management for the efficient and optimal transport of passengers and goods, has been published. This report includes a careful analysis of the use cases covered by CONDUCTOR, a set of general regulatory and social requirements, and stakeholders and users needs collected from a state-of-the art review and a dedicated survey.

The CONDUCTOR consortium has developed an integrated methodology represented by a double funnel diagram. The methodology consists of:

- A top-down approach which gathers formalised and general input from regulators and public bodies.
- A bottom-up approach that facilitates the collection of service-specific inputs derived from user needs and the interests of other stakeholders.

The results of both the bottom-up and top-down analysis were jointly reviewed by the CONDUCTOR consortium, taking into account the input gathered during the workshop held on the 22 March 2023. The in-depth examination of the use cases produced more insightful results that highlighted the primacy of certain conditions for the specific purposes of CONDUCTOR.

The readers will find insights and suggestions for a profitable use of the results for the design process of the use cases and pilots.

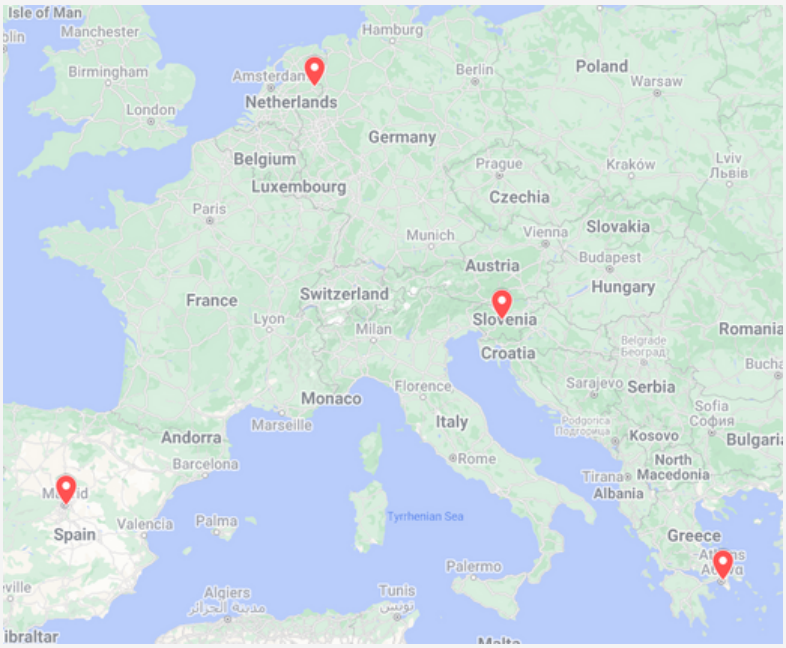
The full document is available on our **website**.

Detailed use-case specifications and their key performance indicators

The project's use case models describe the functional requirements of a system and specify how the system under consideration should interact with the user and other actors. Such specifications benefit further development and stimulate discussion between stakeholders, as the use cases are easy to understand and follow even without detailed knowledge. In close cooperation with the stakeholders, we took an iterative approach to create the use cases. We identified different scenarios for each pilot project, describing their trigger conditions, their main process flow and their termination conditions.

Recent research and reports highlight a shifting paradigm in the measurement of progress, emphasising the need to evaluate both positive and negative impacts on the economy, environment and society, taking into account differences between user groups. With this in mind, we present a comprehensive multidimensional framework to monitor and assess the impact of the functionalities of CONDUCTOR in the pilot cases. The framework considers four groups or dimensions of key performance indicators (KPIs): technical, economic, environmental and social. It also takes into account local challenges by considering use case and site-specific indicators. Although the groups are not directly transferable to other sites, they ensure an assessment along the dimensions of sustainable development.

Read more about the these specifications and the KPIs on our **website**.



ITSC 2023 conference special session

The 26th IEEE International Conference on Intelligent Transportation Systems (ITSC 2023) was held in Bilbao, Spain, from 24 to 28 September 2023. At the conference, the CONDUCTOR and TANGENT projects, represented by Jožef Stefan Institute, University of Deusto and National Technical University of Athens, joined forces to organise a special session on "Advanced traffic and network management" on 25 September 2023.

From a traffic and network management perspective, we focus on operational concepts for developing efficient, resilient and adaptable multimodal network and traffic management systems. These systems use innovative techniques for data collection and fusion, leveraging state-of-the-art technologies, including artificial intelligence and high-performance computing. This focus was reinforced at the special session, where experts presented advances in traffic management and modelling, behavioural analysis, travel modelling and efficient, connected mobility.

After receiving eight papers of high quality for our special session, the peer-reviewed process identified the top four papers covering new ideas in traffic and fleet management, such as bus lane control, cross-dock solutions for logistics and CAV taxonomy. Our special session was well received and attracted a total of 35 participants who actively participated in the technical discussions during the session.

CONDUCTOR in the CINEA Brochure

The European Climate, Environment and Infrastructure Executive Agency (CINEA) published project brochure on Cooperative, Connected and Automated Mobility (CCAM). CCAM technologies offer substantial benefits, including improved accessibility for individuals who are unable to drive, increased road safety and traffic efficiency, along with reduced costs and emissions. These innovations provide economic opportunities, creating businesses, jobs and specialised skills. Cluster 5 within the Horizon Europe Programme highlights its funding emphasis on CCAM to enhance safety, accessibility, and sustainability in transportation. The brochure provides a comprehensive overview of the CCAM projects funded under the Horizon Europe Programme. The projects are listed according to different thematic areas, i.e. data ecosystems, infrastructure support, demonstration, socio-economic and environmental aspects, vehicle technologies, validation methodologies and coordination activities. CONDUCTOR is among the projects that provide infrastructure support to enable the integration of CCAM vehicles into the transportation system.

The CONDUCTOR project is presented on page 21 of the CINEA **brochure**.

CONDUCTOR at EUCAD 2023 conference

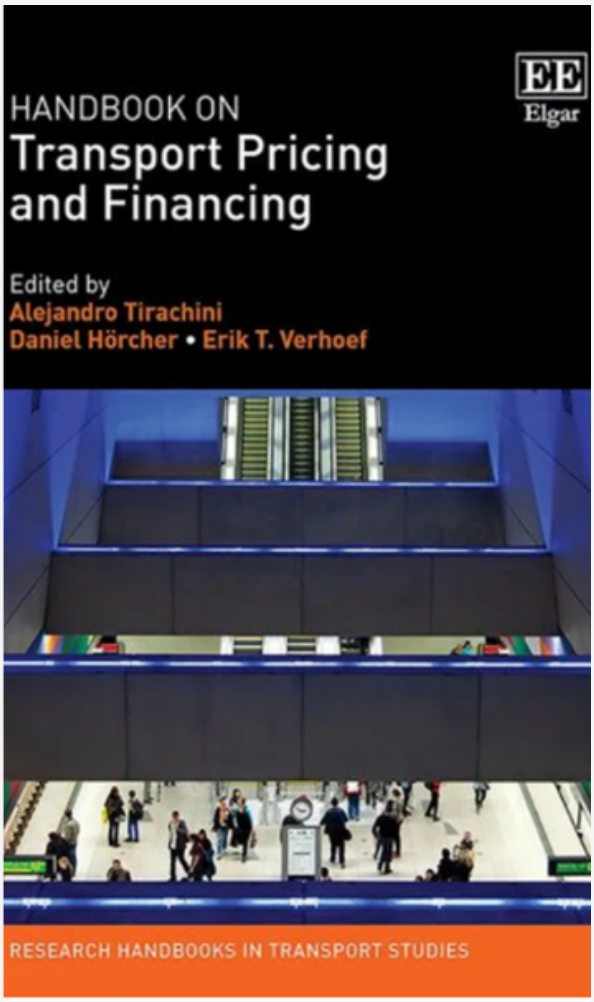
The CONDUCTOR project was invited to join the 4th European Conference on Connected and Automated Driving (EUCAD 2023) organised by the European Commission in Brussels, Belgium on 3 and 4 May 2023. The organisation team recognised the importance of CONDUCTOR project for bridging the gap between the development and deployment of Cooperative, Connected and Automated Mobility (CCAM) technologies.

Our CONDUCTOR team, consisting in representatives from the partners Netcompany-Intrasoft SA, BAX Innovation Consulting SL and Deep Blue SRL, participated to the high-level policy plenary sessions and the thematic technical breakout sessions.

In addition, CONDUCTOR was offered the opportunity to promote the project's activities, objectives and expected results during the Exhibition session organised on the 3 May 2023 at the Autoworld Museum. The CONDUCTOR booth was perfectly located, and we received positive feedback from all the participants who stopped by our stand.

Handbook on Transport Pricing and Financing

CONDUCTOR envisions a world where connected and automated vehicles (CAVs) are seamlessly integrated with advanced, high-level traffic and fleet management solutions, enabling efficient and globally optimal transportation for passengers and goods. This shift towards CAVs is having a direct impact on the pricing of transportation services which needs to be considered and assessed.



Assoc. Prof. Alejandro Tirachini from the Department of Transport Engineering and Management at the University of Twente, recently released a "Handbook on Transport Pricing and Financing", including a chapter on "Connected and automated vehicles: effects on pricing".

The comprehensive book focuses on transport pricing and financing, two crucial factors with far-reaching socio-economic implications. The handbook sheds light on how pricing goes beyond financial aspects and aims at economic efficiency. You will discover the potential of new technologies such as digital payment channels, dynamic pricing techniques and information provision shaping the future of transportation.

Chapter 13 reviews the theory of transport pricing theory and its relation to automated vehicles. It discusses the expected benefits and drawbacks of automated vehicle technologies and analyses their impact on pricing-related aspects. The findings suggest that automation can lower optimal fares for private cars and public transport, making them more accessible.

Liaison with relevant projects

The CONDUCTOR project started the collaboration with three projects that address similar transportation challenges:

The TANGENT project works on improving multimodal transport flows and innovative mobility solutions in cities. An important scientific collaboration between CONDUCTOR and TANGENT was the joint organisation of a special session on “Advanced traffic and network management” at the ITSC 2023 conference. In addition, the TANGENT project invited the members of the CONDUCTOR to participate in the scientific TANGENT Forum.

The ORCHESTRA project works on the coordination and synchronisation of traffic management for all transport modes. We organised a joint workshop to present the goals and challenges of ORCHESTRA to the CONDUCTOR partners. They developed a board game with the aim to learn about the concepts of multimodal traffic management and possible orchestration strategies in the context of daily challenges.

The IN2CAMM project is funded under the same Horizon Europe call (CL5-2022-D6-01-04) as the CONDUCTOR project. It aims to develop, implement and demonstrate innovative technologies and services for infrastructures and users to integrate connected and automated vehicles into passenger and freight transport. We have already identified commonalities and are planning our next liaison meeting in the coming weeks.

Upcoming events

TOMORROW. MOBILITY
WORLD CONGRESS
7-9 NOVEMBER 2023 | BARCELONA & ONLINE

RTR CONFERENCE
5-7 February 2024, Brussels

EUROPE 2023
AUTONOMOUS VEHICLES
13 - 14 November, 2023, Courtyard by Marriott Berlin, Germany

TRA
TRANSPORT RESEARCH ARENA
DUBLIN 2024
10th CONFERENCE • 15-18 April

CONDUCTOR publications

Journal papers

- Petelin, G., Hribar, R., & Papa, G. (2023). Models for forecasting the traffic flow within the city of Ljubljana. European Transport Research Review, 15(1), 1-20

Conference papers

- Hulleman, R. (2023). Sustainable Mobilityby providing Connected Mobility for all Modes of Transport. ITS European Congress
- Gkiotsalitis, K., Nikolopoulou, A. (2023). The Pickup and Delivery Problem with Crossdock for Perishable Goods. ITSC2023
- Wolf, F., Engelhardt, R., Zhang, Y., Dandl, F., & Bogenberger, K. (2023). Effects of Dynamic and Stochastic Travel Times on the Operation of Mobility-on-Demand Services. ITSC2023