

Special Session Tentative Title:

Models and Technologies for zero-emission public transport.

Special Session Organisers:

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Short Description and Motivation:

The escalating impacts of climate change set the need for decarbonizing transport. Modern transportation systems are responsible for approximately 25% of greenhouse gas emissions in the European Union. Transportation is the only sector of human activity whose impact on the climate and environment has not been substantially mitigated to date. As a result, efforts are made to accelerate the transition to sustainable, zero-emission transportation systems. Indeed, both the European Commission's Clean Vehicle Directive and the National Energy and Climate Plans set specific, measurable targets regarding the minimum required percentage of zero-emission vehicles. Intelligent Transport Systems (ITS) offer several options for monitoring traffic conditions, providing information and managing transportation networks in real time. In the context of Public Transport, ITS can optimize operations and fleet management, and therefore assist in the transition towards zero emission options.

Public transport systems are expected to adapt to the zero-emission paradigm, utilize available resources and new technologies and, in parallel, continue responding to the on-going mobility challenges. We envisage this special session as an opportunity to assist the efforts towards the decarbonization of public transport and to contribute to cleaner, sustainable and environment-friendly urban transit systems.

Based on the aforementioned objectives, this special session aims to address the following questions:

- How ITS technologies can be considered in planning and operating zero-emission public transport?
- Which are the most efficient energy consumption models of urban transit systems?
- How can a public transport system operate smoothly and efficiently accounting for e-infrastructure and e-fleet constraints?
- Which is the optimal fleet composition based of the characteristics of a transit line/network?
- What role do IoT-enabled predictive maintenance systems play in minimizing the impact of unplanned disruptions on public transport operations?
- How can automation and connectivity in public transport systems enhance integration with emerging mobility solutions and improve operational efficiency?

Main focus:

This session focuses on leveraging Intelligent Transport Systems (ITS) and innovative technologies to facilitate the transition to zero-emission public transport systems. Emphasis is on strategic, tactical, and operational planning, as well as disruption management in urban transit systems.

Keywords

Public transport systems, Electrified Public Transport, Internet of Things (IoT) in Public Transport Applications, Sustainable Transportation, Zero-Emission Mobility, Green Energy Solutions.

Topics of Interest

Topics of interest include, but are not limited to, the following:

- Transit data analysis
- Policy and regulatory frameworks for decarbonizing public transport
- Energy consumption models
- AI-driven predictive models for fleet and energy management
- Developments in battery technology and charging infrastructure for electric buses
- Methods for reducing GHG emissions
- Transit simulation
- Smart energy management for urban bus systems
- Real time control of electric buses
- Digital twin development
- AI tools to support decision making in PT systems; and
- IoT-enabled predictive maintenance for transit systems.

Expected number of contributions:

The expected number of contributions is 4 to 6, corresponding to a full morning or afternoon slot.

Projects sponsoring the session:

This special session is sponsored by the eBRT – European Bus Rapid Transit of 2030: Electrified, Automated, Connect Project funded by Horizon Europe Call: HORIZON-CL5-2022-D5-01 and “REGEN -A data & simulation driven platform for sizing and analyzing the energy performance of electric buses in urban transit networks”.