**IEEE Transactions on Intelligent Transportation Systems (IEEE T-ITS)**

**Call for Papers**

Special Issue on

# "AI-Empowered Automated Driving in Mixed Traffic: From Sensing, Perception, to Planning and Control"

## Scope and aim

The gradual integration of automated vehicles (AVs) into mixed-traffic environments, where AVs coexist with human-driven vehicles (HDVs) and vulnerable road users (VRUs), introduces profound challenges to safety, efficiency, interaction dynamics, and social acceptability.

Recent advancements of AI, notably Vision-Language Models (VLMs), Vision-Language-Action (VLA), and multimodal foundation models, as well as deep reinforcement learning, open new possibilities for high-quality sensing, perception, prediction, planning, and control in AVs. Yet real-world mixed traffic is highly intricate: AVs of varying automation levels must share the road and interact with HDVs, and other road users (e.g., cyclists, scooters, and pedestrians), yielding emergent complex, multi-scale, and multimodal dynamics that isolated perception, planning, or control studies cannot capture. Key research gaps remain:

1. Scarcity of high-fidelity mixed-traffic datasets and benchmarks;
2. Limited end-to-end studies linking modern multimodal perception to explainable planning and control models;
3. Challenges in generalization, robust sim-to-real transfer, and AI trustworthiness;
4. Insufficient empirical validation and human-factors assessment under realistic conditions.

Motivated by these challenges and building on the IEEE ITSS Technical Committees on Automated Mobility in Mixed Traffic and Cooperative & Connected Vehicles, this Special Issue seeks interdisciplinary contributions that address the loop from sensing to action. We invite empirical, data-driven, theoretical, and simulation research that advances modeling, reproducibility, safety assurance, deployment readiness, and resource sharing (e.g., datasets and tools), and that explores societal impacts, energy and traffic efficiency, and policy implications. Ultimately, this Special Issue aims to accelerate safe, efficient, and socially compliant AV development and deployment. With an editorial team of efficient, renowned reviewers, it targets a turnaround of 1-2 months per review cycle and promotes timely high-impact publications.

## Topics of interest

Topics of interest to this Special Issue include, but are not limited to:

- Dataset collection, annotation standards, and open benchmarks for mixed traffic
- Sensor fusion, sensing uncertainty quantification, and robust perception for mixed traffic scenarios
- Multimodal VLM perception and VLA applications for automated driving in mixed traffic
- Empirical and theoretical studies on behavioral modeling and interaction (AV-HDV-VRU)
- Trajectory prediction and intent recognition in heterogeneous traffic flows
- Decision-theoretic planning that accounts for human behavior and social compliance
- Motion planning and control algorithms under mixed autonomy constraints
- End-to-end solutions for automated driving in mixed traffic
- Sim-to-real transfer, domain adaptation, and validation

- Safety assurance, verification, interpretability, transparency, and trustworthiness of AI-driven AVs
- Microscopic/macroscopic mixed-traffic flow modeling and impacts on network performance
- Field studies, large-scale pilots, and human factors/acceptance studies
- Energy/eco impacts, traffic efficiency, and policy/regulatory implications for mixed autonomy

## Submission guidelines

We invite researchers and practitioners to submit high-quality research articles, comprehensive review papers, and case studies addressing the topics outlined above. All submissions must be original and not under review elsewhere.

Please prepare manuscripts according to the information for authors available at https://ieee-itss.org/pub/t-its/#toc_Submission_Information_Information_for_Authors, and submit via the IEEE Author Portal at: https://ieee.atyponrex.com/journal/t-its. When submitting, under "***Article Type***" in the portal, please select "***Special Issue on Automated Driving in Mixed Traffic: From Sensing to Planning and Control***".

## Review process

Submissions will undergo a rigorous peer-review process to ensure they meet the high-quality standards of the IEEE Transactions on Intelligent Transportation Systems.

With a guest board of efficient, responsive, and renowned reviewers, we will strive for an accelerated review cadence and aim for a **1-2 month review cycle** whenever feasible, while fully complying with IEEE T-ITS editorial policies.

## Important dates

First submission deadline: **31 January 2026**

Notification of first decision: 30 April 2026 [For early submissions, **~8 weeks** after submission]

First revision submission deadline: 30 June 2026

Notification of final decision: 31 October 2026

Final files (camera-ready) deadline: 30 November 2026

Issue of publication: 01 January 2027

*Note: All accepted papers will be published in IEEE Early Access shortly after completion of the proofing process with the publication team. Authors do not need to wait until the official issue date (1 January 2027) for their work to appear online.*

## Guest editors

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