Cite this article
Ellis C (2023)
Editorial.
Proceedings of the Institution of Civil Engineers – Transport **176(3)**: 125–126,
https://doi.org/10.1680/jtran.2023.176.3.125

Transport

ice Publishing

Editorial

Craig Ellis BEng(Hons), CEng, FICE, FIKE, DipEM
Programme Director I Digital Consulting I Advisory & Analytics, Amey, York, UK

Welcome to this themed issue of the Institution of Civil Engineers' (ICE) *Transport* journal on connected vehicles and autonomous transport. This editorial covers the four papers that make up this third issue of the year 2023. The papers relate to a variety of topics including, travel time, fire safety, managed lanes and driver platoon behaviour in the field of autonomous vehicles (AVs).

Connected vehicles and automated transport are important in our infrastructure because they have the potential to revolutionise the way we travel. The editorial panel decided to choose this topic for a themed issue to discover the latest developments in AVs and what the future holds for this exciting technology. Last year, Paret and Rebaine (2022) opened up an exploration of the major technological changes taking place in the field, and they described the different levels of autonomy possible with current technologies and the legal and regulatory contexts in which new AVs will circulate. The UK government paper *Connected & Automated Mobility 2025* (HMG, 2022) sets out government's response to the Law Commissions' recommendations and commits to a new legislative framework for safe self-driving road vehicles, based on these recommendations. This new framework will enable innovation whilst also ensuring safety.

Self-driving vehicles are a promising technology with the potential to revolutionise transportation. They have the potential to make our roads safer, more efficient and more accessible. However, there are also some safety concerns that need to be addressed before self-driving vehicles can be widely adopted. One of the biggest concerns about self-driving vehicles is that they are vulnerable to hacking. If a hacker were able to take control of a self-driving vehicle, they could potentially cause a crash or other serious incident. This is a serious concern, and it is one that needs to be addressed before self-driving vehicles can be considered safe. Another concern about self-driving vehicles is that they may not be able to handle all driving situations. For example, self-driving vehicles may have difficulty driving in bad weather or in areas with heavy traffic. This is a concern that needs to be addressed through further testing and development.

Despite these concerns, the potential benefits of self-driving vehicles are significant. They have the potential to save lives, reduce traffic congestion and improve air quality. If the safety concerns can be addressed, self-driving vehicles have the potential to make a major positive impact on transportation. However, it is important to address the safety concerns before self-driving vehicles can be widely adopted.

These technologies can make our roads safer, more efficient and more accessible to everyone. By reduced traffic congestion: connected vehicles can communicate with each other and with traffic infrastructure, such as traffic lights and road sensors. This allows them to coordinate their movements and avoid collisions, which can help to reduce traffic congestion. By improving safety: automated vehicles can be programmed to drive more safely than human drivers. They can avoid distractions that humans might not be able to. By increasing accessibility: automated vehicles can be used to transport people who are unable to drive themselves, such as the elderly, the disabled and children. This can help to increase their independence and mobility. Finally, by reduced environmental impact: automated vehicles can be programmed to drive more efficiently, which can help to reduce fuel consumption and emissions.

In the first paper, Wadud and Huda (2023) explore the potential benefits of fully automated vehicles (FAVs) and how they can transform travel. The authors investigate the concept of travel time as a valuable resource that can be used for other activities while in an FAV. They also examine how this perception of travel time relates to people's intention to use FAVs. The study is based on a multi-country questionnaire survey, with a sub-sample of chauffeur-driven car users to mimic time use in FAVs. Responses show that users are likely to engage in non-driving activities while riding in FAVs, and these differ according to trip purpose and direction. Time spent travelling in FAVs is perceived to be more useful than in current modes of transport. Interest in using FAVs is directly correlated with perceived usefulness of time therein. The paper concludes with recommendations for policymakers and industry stakeholders on how to address these factors and promote the adoption of FAVs.

The second paper provides an overview of the impacts of autonomous vehicles on fire safety in parking buildings. The types of vehicles that will be on public roads are set to change and this will present new challenges and opportunities when it comes to the use of parking buildings. Spearpoint and Dickson (2023) discuss the benefits of using AVs in designated parking zones, including the mitigation of hazards posed by alternatively powered vehicles and the installation of fire-suppression systems. They also highlight the need for re-analysing fire safety guidance to address the challenges posed by AVs. The paper includes figures illustrating traditional and alternative parking arrangements, as well as potential ventilation requirements and building structure configurations.

Park *et al*. (2023) evaluate the impact of managed-lane operation plans for AVs. The authors conducted a comparative analysis of eight scenarios using traffic simulation. They compared three types of managed-lane operations and scenarios without a managed lane. The study found that managed lanes can improve traffic flow and reduce travel time for AVs. However, the benefits depend on the level of market penetration and the type of managed-lane operation. The paper also highlights potential challenges in integrating AVs into existing transportation systems, such as safety concerns and infrastructure requirements. Overall, the study aims to provide insights for selecting an optimal operation strategy for an autonomous car managed lane that considers various aspects and scenarios simultaneously.

The final paper (Yang *et al*., 2023) examines the behaviour and experience of non-autonomous vehicles (NVs) around automated freight vehicle platoons in mixed traffic conditions. The study uses a driving simulator and the National Aeronautics and Space Administration Task Load Index survey to analyse NVs' behaviour at highway inflows and outflows. The study considers an environment where automated freight vehicle platoons occupy a designated lane and examines vehicle driving characteristics and driver psychology as NVs enter and exit the highway. The deployment of a platoon of AVs is emerging as a response to existing safety and environmental problems in the truck industry. However, before autonomous technology can be applied to all vehicles in a traffic flow, mixed traffic containing both AVs and NVs is inevitable. The development and commercialisation of autonomous technology have been made possible by copious research on AVs. This study sheds light on the challenges of mixed traffic containing both AVs and NVs, which is not easy but necessary for future autonomous technology development.

Connected vehicles and automated transport are still in the early stages of development, but they have the potential to make a significant impact on our lives. As these technologies continue to evolve, we can expect to see even more benefits in the years to come. In addition to the benefits listed above, connected vehicles and automated transport could also have a positive impact on the economy. By making our roads safer and more efficient, these technologies could help to reduce transportation costs and improve productivity. They could also create new jobs in the development and manufacturing of these vehicles, as well as in the provision of related services, such as fleet management and maintenance. The development of connected vehicles and automated transport is a complex and challenging undertaking, but the potential benefits are significant.

On behalf of ICE and the editorial panel of *Transport*, I would like to thank the authors for sharing their findings with the transportation community, and our reviewers for contributing to ensure the quality and integrity of this peer-reviewed publication.

Transport and its authors are eager to receive the valuable comments of their readers. You can provide discussion on the papers or send comments to support@emerald.com. Authors are also welcome to submit papers online for consideration; full details can be found at https://www.icevirtuallibrary.com/page/authors.

As a closing note, we would like to remind readers that *Transport* publishes its most recent articles Ahead of Print on its Virtual Library homepage, which will give you quicker access to the innovations in *Transport*.

REFERENCES

HMG (Her Majesty's Government) (2022) *Connected & Automated Mobility 2025: Realising the Benefits of Self-driving Vehicles in the UK*. The Stationery Office, London, UK. See https://www.gov.uk/government/publications/connected-and-automated-mobility-2025-realising-the-benefits-of-self-driving-vehicles (accessed 30/05/2023).

Paret D and Rebaine H (2022) *Autonomous and Connected Vehicles: Network Architectures from Legacy Networks to Automotive Ethernet* (Engel BA (tr.)). Wiley, Hoboken, NJ, USA.

Park N, Yang S, Park J and Won M (2023) Evaluation of managed-lane operation plan for autonomous vehicles. *Proceedings of the Institution of Civil Engineers – Transport* **176(3)**: 153–164, https://doi.org/10.1680/jtran.22.00038.

Spearpoint M and Dickson S (2023) An overview of the impacts of autonomous vehicles on fire safety in parking buildings. *Proceedings of the Institution of Civil Engineers – Transport* **176(3)**: 142–152, https://doi.org/10.1680/jtran.22.00028.

Wadud Z and Huda FY (2023) Fully automated vehicles: the use of travel time and its association with intention to use. *Proceedings of the Institution of Civil Engineers – Transport* **176(3)**: 127–141, https://doi.org/10.1680/jtran.18.00134.

Yang S, Park J and Abdel-Aty M (2023) Driver behaviour and experience around automated freight vehicle platoons. *Proceedings of the Institution of Civil Engineers – Transport* **176(3)**: 165–197, https://doi.org/10.1680/jtran.22.00039.