Integrating transport automation in the urban system

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Cities as partners on transport automation

EUROCITIES recognises the potential of transport automation to make the movement of passengers and freight in urban areas safer, more efficient and more sustainable, and we call for European cities to be involved in the development of a pan-European strategy and roadmap.

Although transport automation is still at an early stage, driverless technology is developing at a fast pace and cities are preparing to tackle the challenges and maximise the benefits of automated vehicles (AVs)[1].

As city authorities, we believe low-carbon AVs can support the objectives of local sustainable urban mobility plans towards better quality of life on the condition that they complement high capacity public transport services and stimulate shared, multimodal travel.

We need more city-focused research and pilot schemes to address knowledge gaps and further test the roll out of AVs in urban areas. It would also be important to link city authorities, industry, operators and other stakeholders by establishing a platform at EU level.

Challenges and opportunities for cities

The potential impact of transport automation in urban areas is still largely based on assumptions. Optimistic scenarios[2] foresee a significant reduction of traffic, energy-consumption, emissions and accidents, a more optimised use of the transport network - and reduced need for on and off street parking, which can be reclaimed for public use. When integrated with high capacity public transport, AVs have the potential to stimulate more flexible travel behaviour and to significantly reduce car use and ownership in urban areas. In addition, they could improve accessibility for all by offering a consistent level of on-demand services across the urban catchment area.

On the other hand, if AVs became widely available and cheap to use, their introduction could also lead to an increase in motorised traffic. They could attract users from other sustainable transport modes such as cycling, walking and public transport, and stimulate unnecessary travel. More people could choose to live in car-dependent locations, while automated taxi fleets would need to be carefully managed to avoid unused vehicles occupying road space. Other potentially negative effects of urban transport automation include increased risks for vulnerable road users, exclusion of people that cannot afford or use a smartphone, job losses amongst drivers in the taxi, public transport and logistics sectors, risk of cyberattacks and loss of privacy. The deployment of automated trucks,

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1 A distinction should be made between connected vehicles, which are already on the market, and (semi or fully) automated vehicles, which do not necessarily require connectivity to function. Much of the benefit and value will however be enabled by connectivity, as will be the ability to manage networks and fleet operation effectively.

2 A simulation commissioned by the OECD and applied to the transport network and travel patterns in Lisbon, clearly demonstrated that the shared use of clean, connected and automated vehicles could substantially reduce car use and ownership, and free up valuable public space.

delivery vans and robots, in combination with the growing on-demand economy, could lead to a further increase in freight transportation.

Transport automation for better quality of life

Transport automation is an enabler, not an end goal, for sustainable mobility, similarly to Cooperative and Intelligent Transport Systems (C-ITS). The deployment of AVs will need to comply with the strategic long-term objectives of a city's sustainable urban mobility plan (SUMP), to maximise the potential and mitigate negative impact. This implies that – apart from optimising road capacity and traffic flows – local transport automation strategies should also support societal goals such as better social inclusion, health and wellbeing, quality of public space, access to jobs and services, climate protection and energy-efficiency.

Sustainable urban mobility is based on a hierarchy of modes, where walking, cycling, public transport and shared car use are favoured over single-car use. From a city perspective, AVs should not fundamentally change this hierarchy: automated shuttles and taxis should be complementary systems to the public transport network, and any AVs that are privately owned or used by one individual would have lower priority than more sustainable modes.

Like conventional cars, AVs in urban areas should be integrated in a multimodal transport system, and regulated through local transport demand management tools such as road use pricing, parking pricing, low emission zones, speed limits etc. This will allow for shared use incentives, adequate coverage of the network, user satisfaction, efficient operation and clean technologies. In addition, if regulating automated transport services or contracting fleet operators, cities may wish to ensure that services comply with certain standards of transparency, integration with other modes, safety performance and labour conditions.

Improving road safety

38% of fatal road accidents occur in urban areas, mainly involving pedestrians. According to the automotive industry, AVs are expected to significantly improve road safety, but this cannot mean that scarce public space in cities is used to separate them from vulnerable road users. An extensive real-world testing procedure should be put in place as part of the type approval process to ensure that AVs are capable of operating safely in a complex urban traffic environment, and interacting with different transport modes and users. As part of the transition towards fully automated vehicles, advanced driver assistance technologies (ADAS) such as Intelligent Speed Assistance (ISA), Automated Emergency Braking (AEB), Lane Keeping Assistance (LKA) and Vulnerable Road User Detection, should already be included as standard features in the European Commission's forthcoming proposals for revised vehicle safety standards.

Access to data, data privacy and security

The urban traffic environment will be increasingly connected and cooperative. Full-scale deployment of automated transport will create massive data flows between vehicles, infrastructure, traffic management centres, fleet operators and manufacturers, providing historical, real-time and predictive information on vehicle performance, network status and travel patterns. Cities and transport authorities should have access to specific datasets collected by AVs, operators and digital platforms, more specifically (anonymised) data related to origin/destination travel patterns, occupancy rates and environmental performance. This will enable better enforcement of traffic rules and better design, management and optimisation of local transport networks and services.

The ability of AVs to collect and transfer data could potentially compromise the privacy of individual users. It is therefore important that – already in an early stage of transport automation - vehicle manufacturers develop adequate 'privacy by design' mechanisms as required by the General Data Protection Regulation (GDPR). In addition, the automotive and telecom sectors and the infrastructure and service providers need to put defences in place to protect AVs, and connected cars in general, against possible cyberattacks ('security by design'). Cybersecurity of public services and information systems is a priority for European cities. They should have the possibility to be involved either directly or through their associations at EU level in the development and updating of common, open cybersecurity standards and technical specifications.

Addressing knowledge gaps and adequate financial support

It is currently unclear to what extent cities will need to adapt existing physical and digital infrastructure to unlock the potential benefits of AVs, and how this will affect the public domain and the budget of road managing road authorities. If AVs cannot be rolled out without cities making significant investments in new infrastructure, there will need to be policy and financial decisions about how this can be achieved. This could involve upgrades to signalling systems, road surface markings, road side units, traffic management protocols, detailed maps for navigation etc., and hiring staff with advanced digital skills. Even if major public investment is not required, there are still implications, for example regarding city planning and management of roads and public transport services.

Many cities across Europe are already playing an active role in the transition towards automated transport by conducting pilot projects with automated cars, shuttles or delivery robots, or by exploring how to adapt local regulatory frameworks. More research is needed to better understand the technical, legal, operational, financial and behavioural implications of AV deployment in urban areas, and how they will be integrated in the smart city ecosystem. Additional studies are also needed on how AVs will interact with urban traffic management centres as there is an opportunity for public authorities to better optimise traffic flows and services, incentivise sustainable travel and enforce traffic rules. For cities that want to prepare for the impact of transport automation or play an active role in the testing of AVs from a multimodal perspective, there should be adequate EU funding opportunities and financial instruments.

Working together on transport automation in the EU

We need a platform where representatives from national and local authorities can work together with industries, operators, and service providers to identify common challenges, elaborate joint actions and strategies as well as technical standards and specifications. This platform can be similar to or embedded within the C-ITS Platform. Bridging the distrust between the private and public sector more effectively should be a priority, as well as considering the possible implications for public policy of large technology platforms, who may have a different approach to 'traditional' public transport actors. Further efforts should be made to publicise and disseminate the findings of EU-funded (and other) research and innovation projects on transport automation. This is particularly important where projects are principally industry or technology-led, without much involvement of public authorities.

Also, existing initiatives such as CIVITAS, ELTIS, the SCC EIP, the Member States Expert Group on Urban Mobility and the Partnership on Urban Mobility under the Urban Agenda for the EU can be used to reflect on the potential impact of transport automation in urban areas, provide guidance, support exchange of best practice and coordinate between different actors and levels of governance.