Digitalisation: driving the transition towards smart and sustainable mobility

The EU supports the transport sector by rolling out new technologies in order to become cleaner, safer and more effective.

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How is digitalisation impacting mobility?

Major progress in digital technologies such as artificial intelligence (AI), the Internet of Things (IoT), cloud and edge computing and 5G networks are leading the digital transformation of the mobility sector.

- **Autonomous vehicles are on the rise**, allowing new transport solutions like robotic taxis, connected lorries or driverless delivery systems.
- **New mobility services enabled by digital platforms** are changing how we move, from shared mobility such as ride hailing and bike sharing, to Mobility as a Service, which gives access to multiple transport modes on a single application. Freight transport relies more on greater synchronisation across modes.
- **The data generated and exchanged by vehicles is exploding**. Autonomous vehicles could produce around 4 terabytes of data per day according to Intel. Vehicles are increasingly connected to their physical and digital environment.
- **New habits and behaviours** caused by digitalisation, such as the rapid development of e-commerce of working remotely, are transforming mobility patterns.
What are the benefits and challenges ahead?

Benefits

- **Connected and Automated Mobility (CAM)** can make roads, railways and waterways safer. By optimising the use of vehicles and infrastructures, it can enhance efficiency, reduce congestion and help to lower gas emissions. CAM can also create business opportunities and increase competitiveness. It will make transport more accessible to the elderly and people with disabilities, transforming travel in the years to come.

- **Mobility as a Service** can help to decarbonise transportation by allowing seamless multimodal travel and facilitating access to greener alternatives. Leveraging the way different transport modes improve and enhance each other would allow more efficient use of resources and save time and costs for passengers and transporters.

- **Pooling and exchanging mobility data** can improve the synchronisation between different transport modes and infrastructures. Accessing large pools of data would fuel the development of AI-driven applications. Better access to mobility data will help public authorities monitor transport activities and their impacts, and plan transport infrastructure and services. Access to mobility data can create new sources of value: car sensor data, for instance, can be highly valuable to insurance, navigation, or road maintenance companies.

- **Supporting the transition to zero-emission mobility.** AI can improve the energy efficiency
of electric or hydrogen vehicles and optimise the deployment of charging infrastructures. Bi-directional electric vehicle charging could provide flexibility to the grid, making it possible to optimise energy usage and production while better integrating renewable energies. Such sector coupling requires digital enablers and real-time data sharing.

Challenges

- **Addressing technological challenges**: Connected and Automated Mobility and smart transport systems require huge investments to develop and deploy new technologies and infrastructures. We will need a cloud-edge computing continuum to process vast amounts of data in real time, 5G connectivity to ensure rapid and reliable data transfer, AI to analyse complex information, chips for smart vehicles, and new kinds of automotive operating systems. The EU remains highly dependent on other regions for some technologies like AI, cloud, or semiconductors.

- **Uniting in diversity**: the European mobility ecosystem is composed of a multitude of actors with different specialisations and sizes. This diversity is a strength but can also lead to fragmentation. To seize the benefits of digitalisation, mobility and transport, stakeholders will need to build partnerships, pool investments, and agree on common standards, infrastructures, platforms, and governance frameworks. This will also help to reach critical mass and avoid dependence on large dominant actors.

- **Ensuring security and privacy**: the digitalisation and automation of transport raise challenges in terms of personal data protection, cybersecurity, and user acceptance. Cyber-attacks could affect the functioning of services, cause damage to systems, data thefts and even injuries.
• **Managing social impacts:** the social acceptance of self-driving mobility will be key for its deployment. This transition will require new skills and could lead to the disappearance of certain types of jobs. It should thus be well managed. Certain new forms of mobility create types of work characterised by more flexible conditions, which need to respect EU labour law and ensure social protection.

**Towards the future of mobility**

The [Sustainable and Smart Mobility Strategy](https://transport.ec.europa.eu/transport-themes/mobility-strategy_fr), adopted in December 2020, defines digitalisation as an essential enabler for the transformation to safer, more efficient, accessible and sustainable mobility. It can play an important role in achieving the target of a 90% cut in greenhouse gas emissions from the transport sector by 2050.

A crucial challenge for Europe is [unlocking the potential of mobility data](https://digital-strategy.ec.europa.eu/en/policies/mobility-data) by making it easier to access and to share. The European Commission relies on a combination of policies, both transport-specific and cross-sectoral, and financial support to achieve this objective.

The digitalisation of transport also requires the [development and adoption of key technologies](https://digital-strategy.ec.europa.eu/en/policies/technologies-digitalisation-transport), which the EU supports through several funding and policy initiatives.

**Cooperation is key for Europe’s success**

It is urgent to modernise digital infrastructure and accelerate the deployment of digital technologies in the field of mobility, to achieve carbon-neutrality, competitiveness, technological sovereignty, resilience and security. The European Commission counts on the **active role of European industry** in investing in this digital transformation.

The scale of investments needed requires cooperation among European stakeholders. Without partnerships, co-investments, common standards and interoperability, innovative solutions and approaches will not reach critical mass.

The major investments by Member States, supported by the Recovery and Resilience Facility, represent a **historic opportunity** to accelerate this movement. The Commission encourages public and private stakeholders to take advantage of and **participate in European initiatives and programmes.**

Key technologies to boost the digitalisation of transport
Follow the latest progress and learn more about getting involved.
Latest news

PRESS RELEASE | 27 September 2023

The first report on the State of the Digital Decade, published earlier this week, provides a comprehensive look at progress towards achieving the digital transformation to empower a more digitally sovereign, resilient, and competitive EU.

EVENT | 16 November 2023 - 17 November 2023
4th European AI Alliance Assembly: Leading Trustworthy AI Globally
The European AI Alliance Assembly is the flagship event bringing together policymakers and stakeholders to contribute to shaping Europe’s Artificial Intelligence policy.

**EVENT | 29 June 2023**

This brokerage event aims to create a forum for potential applicants to discuss ideas and cooperation opportunities, as well as to clarify potential questions they might have on the call text.

**DIGIBYTE | 15 June 2023**

Digital Assembly 2023 to announce the first submission and comprehensive expressions of interest for European Digital Infrastructure Consortia, gathering policy makers and businesses to debate ideas and actions for a digital, open, and secure Europe.

Digital industrial platforms are key to placing Europe ahead in the digital transformation, linking technology building blocks and industrial applications.
Dig deeper

Key technologies to boost the digitalisation of transport

Accelerating the digitisation of mobility requires boosting the research and deployment of key enabling technologies.

Unlocking the potential of mobility data

A combination of EU policies and initiatives are key to unlocking the potential of mobility data, and thus supporting the digital and green transformation.

See Also

Digitalisation of the European Energy System

Interoperable and open digital solutions, as well as data sovereignty, are key to the digital transformation of the energy system.

Large-scale pilots in the digitisation of agriculture

The Commission has set up large-scale pilots to drive the digitisation of agriculture in Europe.

Data solutions for energy: from mobility to home and appliances

The Commission has established numerous large-scale pilots to help drive the digitisation of industry across Europe and beyond in recent years.

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Source URL: https://digital-strategy.ec.europa.eu/policies/digitalisation-mobility