European Commission

Smart Mobility and Services

Roadmaps

In Brief

Smart mobility systems and services can contribute to the decarbonisation of the European transport sector. Changes in transport behaviour and lifestyles such as the use of smart phones, mobile web applications and social media together with the trend to *use* rather than *own* a particular means of transport has opened up new pathways to sustainable mobility.

A critical link exists between new technologies, services and transport decarbonisation. However, policy and innovation efforts have focused overwhelmingly on small changes to improve vehicle technology rather than on integrated transport and mobility strategies. Breaking this path-dependency remains a key innovation challenge.

Future transport and mobility services will need to be part of smart and sustainable city strategies to improve urban resource efficiency, decarbonisation and ensure an integrated transport system.

The Strategic Transport Research and Innovation Agenda (STRIA) *Roadmap for Smart Mobility and Services* aims to assess emerging new technologies such as multi-modal, electric and autonomous vehicles, drone technology and on-demand mobility services. It will establish and assess the impacts of such technologies on transport and mobility systems and services.

Current Developments

Road: Investments in cooperative intelligent transport systems and connected driving technologies to improve the flow of road traffic on urban roads will result in better movement of goods and people. This includes enhanced vehicle management (i.e. from conventional to autonomous vehicles), vehicle fuel technologies (i.e. from fossil to alternative fuels), bicycle and vehicle sharing, public transport, walking and cycling, especially in large urban areas. On extra-urban roads, it is necessary to achieve a safe, efficient and sustainable road transport in order to offer connected mobility, less congestion and pollution, fewer accidents and improved levels of European-wide multi-modal travel information services.

Rail: The increase of different international and local railway traffic flows requires better planning and management. These include improving cross-border sections (especially when using different signalling and train operating systems), rail terminals connecting rail with other transport modes (e.g. advanced rail-rail trans-shipment yards) and complex and heavily used conventional railway stations for passenger trains in urban areas (e.g. hosting local/high-speed/international/freight traffic).

Autonomous transport systems: Autonomous electric vehicles are expected to form a significant component of mobility as a service in urban transport. As with sharing models, autonomous vehicle technology will blend with mobility as a service model and can potentially enable widespread smart traffic management.

Drones and low-altitude aerial mobility: Drone and low-altitude aerial mobility is now technically possible for passenger transport. However, the combined demand for such vertical urban mobility solutions requires governance, regulation and infrastructure innovation.

Big and open data: Faster and cheaper processing, freely available data capacity and computing power are enabling greater energy efficiency, spatial distribution and utilisation of transport, mobility and smart city assets and systems.

Data governance: The flow of big and open data requires significant governance and regulatory design to ensure the interests of all stakeholders and that access to available data is equally protected.

Data availability and processing: Transport systems are increasingly able to aggregate and analyse data from multiple sources and networks to dynamically face demand and operate more efficiently.

Key Research Innovation Pathways

The roadmap focuses on eight action areas that will contribute to the decarbonisation of the European transport sector and meet European Union (EU) energy and climate targets.

Key actions to 2050

Integrate drones and low-altitude aerial mobility in the transport system Light-weight drone platforms can deliver economic and energy efficiencies in the short-range distribution of small goods. Effective integration of drone-based delivery systems with other urban logistics, public transport and building services infrastructure is a promising innovation. Drone and low-altitude aerial mobility is technically possible for passenger transport but will require significant governance, regulation and infrastructure innovation.

Establish better operating models
New operating models are required for essential public transport and mobility services to collaborate with private individual mobility providers to co-deliver sustainable mobility and transport systems. Municipal and regional institutions will need to be equipped with strategic capacity to transform and develop stable operational frameworks for new urban mobility. This will require innovative approaches to cross-sectoral planning, public participation and procurement and the shared use of embedded physical and technical infrastructure.

Develop integrated mobility systems
Cities, users, science and industry should develop and test solutions to complex mobility problems at a sufficient scale. Private and public sector should collaborate in research and data sharing, network and infrastructure access, and the development of inclusive user interfaces. Sharing the research and analysis burden between the private and public sectors can enable effective technological advancement and innovation.

Share data and infrastructure
Companies, governments and public entities should be encouraged to share data collected on public space and infrastructures wherever available so stakeholders can make informed decisions and innovate their applications. Aggregate dynamic mobile phone and traffic data, real-time location of buses or the train arrival times will enable third parties to integrate such information into their systems and set up 'cross-infrastructure' integrated mobility systems.

Support future interoperability
Development of European technical standards for communication and interoperability of user devices, infrastructures and vehicles will be vital for a future integrated transport system. Such standards should evolve and adapt with technologies to prevent innovation stagnation. A dialogue between users, governments, science and industry and start-ups will be important for multi-stakeholder standard setting. Such standards should be flexible and facilitate robust privacy frameworks, decarbonisation and international interoperability.

Undertake large-scale city demonstrations
Large city-scale demonstrations should integrate solutions into city operations to achieve long-term decarbonisation. Strategic capacity of municipalities and regions should be developed to manage integrated transport systems and infrastructure. Partners from government, science, industry and users should be involved in the development of future mobility and transport services and systems that integrate new mobility service innovations into existing transport infrastructure, allowing optimal use.

Develop and test public-private mobility services
Public-private co-design of transport and mobility services should be developed and tested. Attention should be given to efficient use of existing physical transport infrastructures across sectors and modes as well as to the secure collation, management and protection of user and city data in public and commercial open data platforms and public digital infrastructures. Real-time information and operation across public and private service providers should be enabled as well as an integrated access, tariff and user interface system.

Develop and test governance, regulatory, and public procurement strategies
These strategies should integrate indicators and urban plans and focus on assessing the impact on transport decarbonisation and sustainable land use. The development of such strategies will enhance and strengthen integrated planning tools and open, real-time data systems to optimise sustainable mobility as well as enable integrated public procurement across sectors.

Transport Research and Innovation Agenda

The Strategic Transport Research and Innovation Agenda (STRIA) outlines future transport research and innovation priorities to decarbonise the European transport sector.

STRIA is one of five interlocking dimensions set out in the Energy Union strategy that provides a framework to achieve EU energy and climate goals. It supports the vision of a clean, connected and competitive European transport system.

In coordination with Member States and transport stakeholders, STRIA aims to set out common priorities to support and speed-up the research, innovation and deployment process leading to radical technology changes in transport.

STRIA builds on and integrates seven thematic transport research areas:

- Cooperative, connected and automated transport;
- Transport electrification;
- Vehicle design and manufacturing;
- Low-emission alternative energy for transport;
- Network and traffic management systems;
- Smart mobility and services; and
- Infrastructure.

STRIA is also the interface between other relevant sectors such as energy and information and communication technology.

About TRIMIS

The Transport Research and Innovation Monitoring and Information System (TRIMIS) supports the implementation and monitoring of STRIA and its seven roadmaps.

TRIMIS is an open-access information system to map and analyse technology trends and research and innovation capacities, as well as monitor progress in the transport sector.

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