



European  
Commission

## STRIA Roadmap on Smart Mobility and Services (SMO)



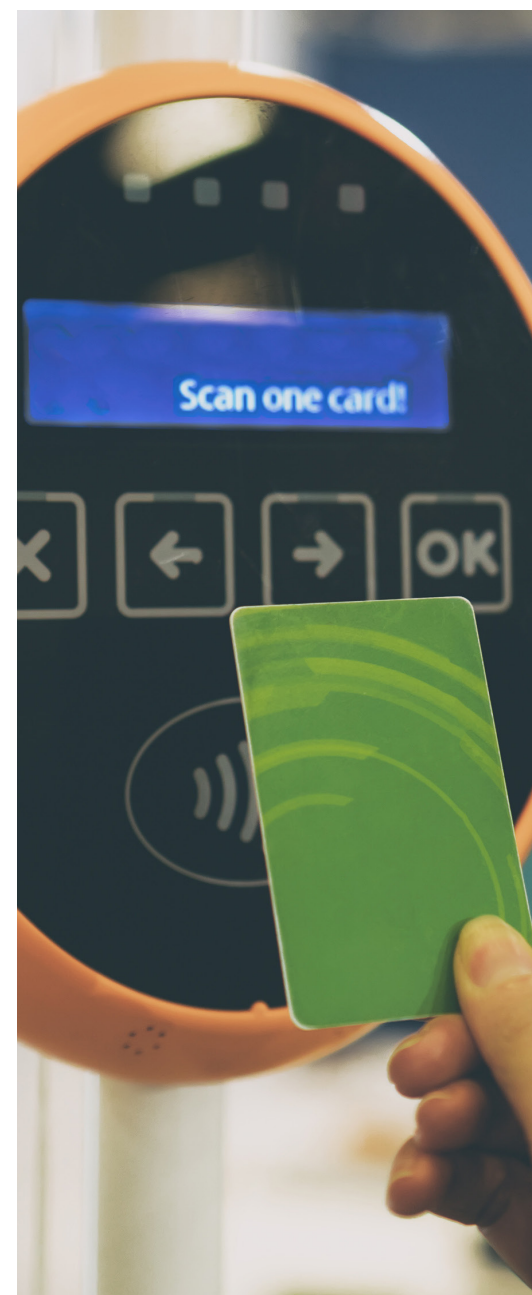
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Smart mobility systems and services need to be evaluated in terms of their contribution to overall energy and transport system sustainability, rather than solely on their sectoral and often incremental impact along existing modes.

Similarly, efforts at deploying electric, shared and automated vehicle systems should be reviewed in terms of their strategic contribution to overall transport systems redesign rather than be predominately focused on electrifying, automating and expanding existing and unsustainable road-based individual motorisation modes.

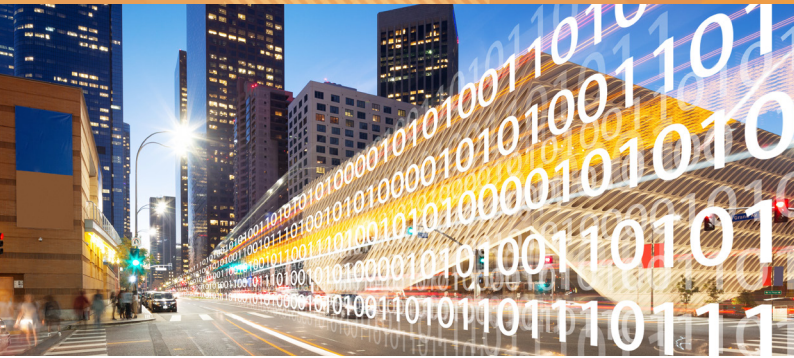
The 2019 Strategic Transport Research and Innovation Agenda (STRIA) Roadmap for Smart Mobility and Services aims to identify transport research and innovation (e.g. multi-modal, electric and autonomous vehicles, drone technology and on-demand mobility services) that can contribute to the successful implementation of European Union (EU) decarbonisation goals.

It complements the 2017 STRIA roadmap on the same topic and recommends innovation actions that facilitate smart mobility systems and services.



*These factsheets are available on the TRIMIS portal (<https://trimis.ec.europa.eu>), and aim at providing a summary of the main features and targets identified in each of the seven STRIA Roadmaps.*





## Current Developments

### PASSENGER TRANSPORT

Innovation actions have focused on improving fuel efficiency, fuel substitution and electrification, automation of individual and freight transport, as well enabling mobility-on-demand. Although progress has been made in expanding active mobility mode shares in European cities, motorised individual road transport remains dominant and current strategies of electric, shared and automated individual car-based mobility are likely to exacerbate this trend.

The expansion and innovation of smart public transport services (both road and rail-based) in combination with micro-emobility, micro-transit and active mobility offer high potential for decarbonisation. There are opportunities for significant modal shift away from car-based individual motorisation. The piloting of new ridepooling services and shared and autonomous shuttles or shared micro-mobility services offer promising potential, if operated in coordination with public transport.

### URBAN AND REGIONAL FREIGHT

The urban and regional freight sector has seen significant innovation through the deployment of real-time smart logistics information and track networks, warehouse automation, a growing fleet of electric delivery vehicles and the emergence of micro-distribution (e.g. cargo bikes, drones). However, urban freight demand continues to grow, driven by the demand for online retailing and delivery, as well as general economic growth.

### WATERBORNE AND AIRBORNE

Waterborne urban transport, as well as air and virtual mobility have been of a lesser or negligible focus, and future innovation actions should be directed at exploring and validating the potential contribution of air mobility (i.e. low altitude aerial and electric vertical take-off and landing) and virtual mobility systems and services in particular. Urban and rural air mobility could provide for disruptive impact and could offer an alternative mode for electric urban freight and passenger transport, but a range of environmental, safety, technical and governance challenges will need to be validated and met to ensure it can be sustainably integrated with surface mobility modes and urban infrastructure.

## Challenges

The continued raise in transport demand and related transport emissions means incremental efforts will be insufficient to deliver medium- or long-term transport and energy policy goals. Urgent action is required to meet EU decarbonisation goals and to provide effective mobility transition pathways that will provide a fundamental modal shift, transformative urban and regional land use, behavioural change and energy efficiency improvements.

The central challenges of integrating smart mobility systems and services are to:

- 1 Prioritise smart, sustainable and integrated mobility systems that provide public transport connectivity and individual public mobility in both urban and rural settings.
- 2 Identify and implement governance and regulatory frameworks that support active mobility and light travel modes, improving road safety for pedestrians, cyclists and micro-mobility users.
- 3 Facilitate smart urban, land-use and infrastructure design to allow for behavioural change and to prioritise active mobility, micro-mobility, ridepooling, public transport and sustainable freight services.
- 4 Ensure smart and distributed zero-carbon primary transport energy supply, taking into account also energy demand from digital services and virtual mobility.
- 5 Provide for integrated energy and transport transformation and long-term sector-coupling, as well for as sufficiency in travel demand.
- 6 Establish ubiquitous and fair-access digital public infrastructure to ensure socially inclusive digital services, to enable equitable data-sharing and evidence-based public policy and to facilitate collaborative service innovation in private and public transport offerings.
- 7 Provide robust governance, regulatory and standardisation frameworks to enable scaling and effective integration of smart mobility services as a public good.
- 8 Identify and implement functional frameworks for both technical interoperability and shared operating models across current modes and purposes.
- 9 Support solutions for flexible physical infrastructure that can be functionally shared across type, time, mode and vector of transport for both passenger and freight services.
- 10 Validate and integrate sustainable automated, air and virtual mobility.

# Key Research and Innovation Pathways

Innovation actions should facilitate the pro-active integration of smart mobility services with existing public transport and utility systems to unlock their potential to significantly leverage low-carbon and efficient mobility in European cities and rural settings. This will require a renewed focus on their potential contribution to modal shift, behaviour change, energy transition and intelligent demand and land use management. To this end, the roadmap recommends designing and prioritising innovation actions targeting five key areas:

## **DEVELOPMENT OF SUSTAINABLE AND INTEGRATED SMART MOBILITY SYSTEMS CONNECTING URBAN AND RURAL MOBILITY SERVICES AND PROMOTING MODAL SHIFT, SUSTAINABLE LAND USE, SUFFICIENCY IN TRAVEL DEMAND AND ACTIVE AND LIGHT TRAVEL MODES:**

- ▶ Smart mobility solutions sustainably interlinking urban and rural mobility systems.
- ▶ Develop urban design and land use strategies that promote active, micro and public mobility and that facilitate the integration of passenger and freight services.
- ▶ Defining new governance concepts, tools and technologies through large-scale systems implementation.
- ▶ Frame transport policy to foster inclusion, public acceptance and respect for diversity through research on behavioural change and user needs.

## **DESIGN OF EFFECTIVE OPERATING MODELS FOR INTEGRATING SMART MOBILITY WITH PUBLIC TRANSPORT SERVICES AND ZERO-CARBON ENERGY SYSTEMS:**

- ▶ Design and development of effective operating models that sustainably integrate public and individual mobility service provision.
- ▶ Development of integrated multimodal solutions providing a sustainable energy-transport nexus.

## **FAIR-ACCESS PUBLIC DIGITAL INFRASTRUCTURE AND MOBILITY DATA MANAGEMENT SOLUTIONS:**

- ▶ Collecting and collating systemic and dynamic mobility data to contribute to effective policymaking and implementation.
- ▶ Fair-access digital infrastructure and mobility data management.

## **IMPLEMENTATION OF INTERMODALITY, INTEROPERABILITY AND SECTOR-COUPLING:**

- ▶ Design and development of efficient solutions for integrated infrastructure and mobility systems shared by passenger and freight services.
- ▶ Expand and extend the role of active and light travel modes and use of micro-mobility solutions as part of integrated intermodal mobility systems.

## **VALIDATION AND INTEGRATION OF AUTOMATED, AIR AND VIRTUAL MOBILITY:**

- ▶ Test and validate the potential contribution of automated mobility services to sustainable, zero-carbon and integrated public transport systems.
- ▶ Test and validate real-world integration and governance of air mobility with urban and rural transport systems.
- ▶ Validate and integrate virtual mobility.



# Strategic 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:

- Connected and automated transport (CAT);
- Transport electrification (ELT);
- Vehicle design and manufacturing (VDM);
- Low-emission alternative energy for transport (ALT);
- Network and traffic management systems (NTM);
- Smart mobility and services (SMO); and
- Transport infrastructure (INF).

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 the analytical support tool for the establishment and implementation of STRIA, and the Commission's instrument for mapping technology trends and research and innovation capacities in the transport field, as well as monitoring progress against the targets set for all the transport sectors. TRIMIS is an open-access information system to map and analyse technology trends, research and innovation capacities, as well as monitor progress in the transport sector.



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