



ACTION PLAN FOR THE FUTURE OF MOBILITY IN EUROPE

CONTEXT MAP I TOWARDS TRANSPORT IN 2030

TRENDS, DRIVERS, TECHNOLOGY

Description of the map

The context map is organised as a 4 layer-structure and the reading direction goes from bottom to top, on a vertical orientation.

The first layer shows the **trends** that shape the future scenario. The trends represent long-term issues that are projected to have relevance for at least 20 years, shaping the future European transport system in 2030.

The second layer shows three main elements: the **stakeholders' needs, the political and the economic factors** impacting the 2030 scenario.

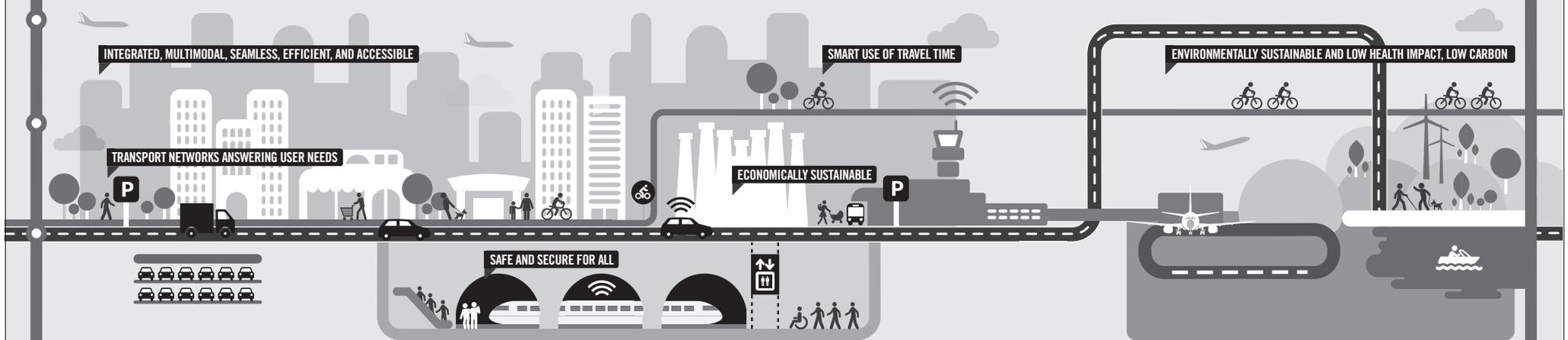
The category **"uncertainty"** is distributed over the other three categories, as it can impact stakeholders' needs and expectations, as well as political factors and economical climate.

The third layer, just below the narrative scenario of transport in 2030, lists the most relevant **technologies** that will enable the changes towards the future transport system. Finally, **at the top of the map**, the **"future transport system scenario in 2030"** is depicted and exemplified with some of its key features.

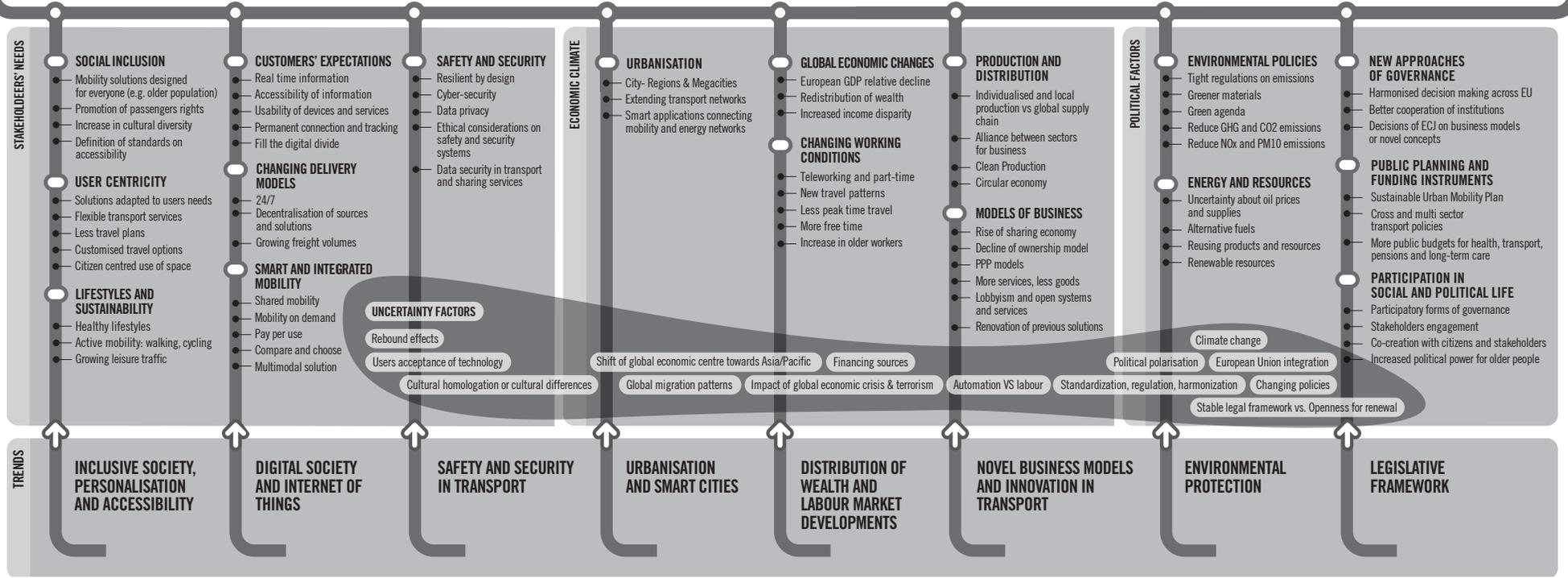
The visual style of the map goes from abstract to figurative when moving from bottom to top, with the aim of clarifying the vision. The metaphor of the **metro line** was used to connect all the elements of the map to the future transport scenario in 2030.

TOWARDS TRANSPORT IN 2030

TRENDS, DRIVERS, TECHNOLOGIES



- TECHNOLOGY**
- ROBOTICS
 - ADVANCED ALTERNATIVE FUELS
 - HYPERLOOP
 - SMART SYSTEMS
 - INTELLIGENT TRANSPORT SYSTEMS
 - SMART ENERGY FLOWS
 - LIGHT PERSONAL VEHICLES
 - LIGHT MATERIALS
 - MEGA AIRCRAFT
 - 3D PRINTING
 - BIO FUEL
 - BATTERY TECHNOLOGIES
 - ELECTRIFICATION
 - ARTIFICIAL INTELLIGENCE
 - INTEROPERABILITY
 - BIG DATA
 - POSITION BASED INFORMATION
 - E-TICKET
 - DRONES
 - SMART ENERGY GENERATION AND STORAGE
 - CHARGING E-VEHICLES WHILE DRIVING
 - AUTOMATION
 - SOLAR ENERGY
 - STORE AND GIVE ENERGY TO THE NETWORK



STAKEHOLDERS' NEEDS

- SOCIAL INCLUSION**
 - Mobility solutions designed for everyone (e.g. older population)
 - Promotion of passengers rights
 - Increase in cultural diversity
 - Definition of standards on accessibility
- USER CENTRICITY**
 - Solutions adapted to users needs
 - Flexible transport services
 - Less travel plans
 - Customised travel options
 - Citizen centred use of space
- LIFESTYLES AND SUSTAINABILITY**
 - Healthy lifestyles
 - Active mobility: walking, cycling
 - Growing leisure traffic
- CUSTOMERS' EXPECTATIONS**
 - Real time information
 - Accessibility of information
 - Usability of devices and services
 - Permanent connection and tracking
 - Fill the digital divide
- CHANGING DELIVERY MODELS**
 - 24/7
 - Decentralisation of sources and solutions
 - Growing freight volumes
- SMART AND INTEGRATED MOBILITY**
 - Shared mobility
 - Mobility on demand
 - Pay per use
 - Compare and choose
 - Multimodal solution
- SAFETY AND SECURITY**
 - Resilient by design
 - Cyber-security
 - Data privacy
 - Ethical considerations on safety and security systems
 - Data security in transport and sharing services
- UNCERTAINTY FACTORS**
 - Rebound effects
 - Users acceptance of technology
 - Cultural homology or cultural differences

ECONOMIC CLIMATE

- URBANISATION**
 - City- Regions & Megacities
 - Extending transport networks
 - Smart applications connecting mobility and energy networks
- GLOBAL ECONOMIC CHANGES**
 - European GDP relative decline
 - Redistribution of wealth
 - Increased income disparity
- CHANGING WORKING CONDITIONS**
 - Teleworking and part-time
 - New travel patterns
 - Less peak time travel
 - More free time
 - Increase in older workers
- PRODUCTION AND DISTRIBUTION**
 - Individualised and local production vs global supply chain
 - Alliance between sectors for business
 - Clean Production
 - Circular economy
- MODELS OF BUSINESS**
 - Rise of sharing economy
 - Decline of ownership model
 - PPP models
 - More services, less goods
 - Lobbyism and open systems and services
 - Renovation of previous solutions

POLITICAL FACTORS

- ENVIRONMENTAL POLICIES**
 - Tight regulations on emissions
 - Greener materials
 - Green agenda
 - Reduce GHG and CO2 emissions
 - Reduce NOx and PM10 emissions
- ENERGY AND RESOURCES**
 - Uncertainty about oil prices and supplies
 - Alternative fuels
 - Reusing products and resources
 - Renewable resources
- NEW APPROACHES OF GOVERNANCE**
 - Harmonised decision making across EU
 - Better cooperation of institutions
 - Decisions of ECJ on business models or novel concepts
- PUBLIC PLANNING AND FUNDING INSTRUMENTS**
 - Sustainable Urban Mobility Plan
 - Cross and multi sector transport policies
 - More public budgets for health, transport, pensions and long-term care
- PARTICIPATION IN SOCIAL AND POLITICAL LIFE**
 - Participatory forms of governance
 - Stakeholders engagement
 - Co-creation with citizens and stakeholders
 - Increased political power for older people

TRENDS

- INCLUSIVE SOCIETY, PERSONALISATION AND ACCESSIBILITY**
- DIGITAL SOCIETY AND INTERNET OF THINGS**
- SAFETY AND SECURITY IN TRANSPORT**
- URBANISATION AND SMART CITIES**
- DISTRIBUTION OF WEALTH AND LABOUR MARKET DEVELOPMENTS**
- NOVEL BUSINESS MODELS AND INNOVATION IN TRANSPORT**
- ENVIRONMENTAL PROTECTION**
- LEGISLATIVE FRAMEWORK**



Trends

Based on an extensive review of the literature and past EU projects, Mobility4EU identified 9 major trends. The trends describe emerging societal factors that have impacts on mobility, both for freight and passengers' mobility.

DISTRIBUTION OF WEALTH AND LABOUR MARKET DEVELOPMENTS

Economic climate and economic conditions play a major role in shaping the demand of mobility.

The implementation of industry 4.0 will lead to an increase in productivity.

Employees' expectations, devices innovation and faster connectivity are converging to transform the way we do business. This will require more flexibility in labour conditions and restructuring in working arrangements. Needs and requirements on public transport (e.g. patterns in time, frequency and distance, "peak-hours", requirements on affordability, flexibilities in tickets etc.) will also change due to the shifts in economic power and shrinking middle class in EU.

Emerging economies are lifting millions out of poverty while also exerting more influence in the global economy. These developments and growing e-commerce, will increase the amount of freight and change the patterns of loads, frequency, time of delivery, distances.

INCLUSIVE SOCIETY, PERSONALISATION, ACCESSIBILITY

Predominantly aging, but also migration are the main demographic trends in Europe. The goal of social inclusion ensuring wide opportunities and resources for everyone to participate fully in economic, social and cultural life, will pose great challenges also to transport providers.

The value of the consumer experience includes the design of environment, services, and products that are responsive to citizens' needs and desires. Customer-centric products and services will be increasingly demanded. They will be based on a wealth of information about the individual passengers and their needs. Increased awareness of environmental concerns is engaging society in more sustainable patterns of behaviour. Public focus on health and wellness is shifting mobility choices towards more active modes such as walking and cycling.

URBANISATION AND SMART CITIES

Urban space has become very dominant in the European geography. Growing and extending cities lead to the emerging concept of city-regions, which combines several spatial scales and imposes different transport modes. This impacts demands on personal and freight transport. The resulting de-centralization of logistic facilities and the growing demand for extending transport networks is more and more seen as an issue by urban and regional planners and requires novel business and financing models. The idea of Smart Cities is rooted in the creation and connection of human capital, social capital and information and Communication technology infrastructure to generate greater and more sustainable economic development and a better quality of life. The implementation of the smart city will further push the digitization and deployment of new technologies in transport.

ENVIRONMENTAL PROTECTION: CLIMATE CHANGE, POLLUTION AND RESOURCE AND ENERGY EFFICIENCY

Climate change, air pollution, and noise are gaining importance within society. Carbon emissions will be subject to tight regulations and stronger price mechanisms. Stringent regulations on emissions may affect the planning and operation of transportation systems, with a preference for greener materials and modes of travel. Vehicles will have to adapt to these regulations and road infrastructure will have to accommodate new vehicle and fuel technologies.

The resources required to sustain current levels of economic growth may not be available over the next decades. The implementation of the circular economy, where products and resources are reused to extract their maximum value rather than entering the waste stream, is strongly growing in society and industry, as well as reshoring and local sourcing. Changes in preferred transport options and for demand on freight will be triggered.



Trends

DIGITAL SOCIETY AND INTERNET OF THINGS

According to the International Transport Forum, by 2050 there will be around three to four times as much global passenger mobility (compared to 2000) and 2.5 to 3.5 times as much freight activity. Employing novel ICT and especially the IoT, transportation modes will communicate with each other and with the environment. Together with big data applications the way for truly integrated and inter-modal transport solutions is paved. This maximizes efficiency gains and allows infrastructures to be designed and operated in a more integrated way. Mobility will be more integrated, efficient, comfortable and eco-friendly. Robotics and automation will play an increasing role in the delivery of transport services, security and infrastructure maintenance. A wider deployment of automated systems in cities could also lead to a significant increase in the 24h availability of products and services. Due to speed and access to data, passengers will expect certainty in terms of time, so reliable and accurate real-time information will be key, and they will assume optimal pricing. New uses of travel time will be possible.

NOVEL BUSINESS MODELS AND INNOVATION IN TRANSPORT

New societal and technology trends such as the growing demand of personalised offers, changing ownership models, new usage of transport as well as the increasing integration between information and communication technologies with the transport system will lead to the demand of new and innovative business and financing models for mobility solutions. Sharing economy and collaborative consumption is substituting ownership models and has great impacts also in transport of people and freight. Sharing economy focuses on redistribution, sharing and reuse of excess capacity in goods and services. Stakeholder engagement can be a powerful tool for cities to find solutions to complex issues. Community involvement in urban planning processes helps tailor developments to the needs of communities, increases commitment and provides valuable location-specific insights.

SAFETY IN TRANSPORT

Safety systems will even more than today be integrated with business management systems, ensuring that safety is built-in by design and that they are efficient, effective and dynamic enough to adapt and respond to fast changing and evolving threat and risk scenarios. Increasing investments in safety, and changes in the nature of liability will have a fundamental impact on insurance industry.

SECURITY IN TRANSPORT

The security concepts resilient against attacks will be very strongly researched, developed and implemented throughout the global transportation system including infrastructure and equipment design and materials. They will need to also address human and cultural aspects. The internet and new technologies will inevitably increase the risk for cyber threats.

LEGISLATIVE FRAMEWORK

The belief that mobility should be solely regulated by a single actor, commonly the local authority, will be gradually abandoned. Tackling mobility necessarily implies to find a sustainable and coherent balance between the necessity to develop an efficient network and the difficulty to preserve the surrounding environment against nuisances of all kinds: pollution, noise, deterioration of the network, public disturbance, etc.

Technological developments obliged the legislator to review and sometimes reform classical business schemes in place. The reforms have been both a reaction and a trigger to changes in the transport sector. Uber, together with the growing systems of sharing economy and automated vehicles, lead to novelties in labour law, issues of insurance law and to new forms of self-employment.