

STRATEGIC DIRECTIONS FOR EU PLANNING ON TRANSPORT & MOBILITY RESEARCH

A shared view of the Delegates to the H2020 Transport Program Committee from Austria, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Montenegro, The Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Spain, Sweden.¹

INTRODUCTION

Planning of transport research under the societal challenges of Horizon 2020 should be based on a clear and concrete view of the challenges in the public domain that the EU and its Member States will face in the coming decade. With that in mind, the objective of this paper is to identify shared European needs for further knowledge and innovation in issues with a significant impact on society, economy or ecosystems in the near future. On these themes, further research and innovation now is of vital importance to have the right science and knowledge available in time:

- to answer the policy related challenges and mobility needs of the near future,
- to strengthen a competitive and innovative European transport industry,
- to ensure sustainable infrastructure and enduring mobility.

The strategic research directions have taken shape against the background of

- dominant trends that emerge in the EU context. These trends may be diverse and include cutting edge technological innovation, amongst others in logistics, aeronautics and ICT, such as connected and automated transport, or socio-economic developments such as ageing population, migration and urbanization. New bottlenecks may emerge from changes in the economic structure, while ongoing developments in the Member States might ask for new solutions as well, including on safety and sustainability, especially in relation to growing urban areas and economic junctions (megacities). In these situations traditional approaches might have shortcomings;
- the need to boost the European economy by focusing the European transport research programme on developing new technologies which will keep EU companies and academia at the fore-front of progress, and have positive impacts on growth and jobs at a European level;
- global goals as defined in the United Nations Sustainable Development Goals and global developments, especially with regard to 'industry, innovation and infrastructure', 'sustainable cities and communities' and 'climate action'. For the latter the intention, expressed by the regulation establishing Horizon 2020, to designate 35% of the total Horizon 2020 expenditure to climate related research and 60% to sustainable development is relevant;
- the need to promote and facilitate innovation and progress, while keeping the speed of change manageable and acceptable for individuals and companies and while keeping control over technology.

FOUR PRIORITY AREAS

Looking back to the earlier work programs of Horizon 2020, one cannot deny that technology relevant progress and improvements have been a strong driver for the

¹ This view is principally referring to parts of the Transport WP under remit of the TPC.

programming of transport & mobility research and innovation. From a policy point of view however, it is relevant that a broad range of aspects is addressed, both from a technological and non-technological nature and including the impact of technology and innovation on life and the ability of people to deal with that. As policy problems are usually complex and non-linear by nature, such diversity in available knowledge would allow for synergetic solutions needed to answer the different interests at stake.

A more holistic, systemic and integrated approach on the transport system as such is needed. In this view, technology oriented research -on improvements for infrastructure, means of transport, intermodality, logistics etc.- is most relevant and important indeed, but should not be the only priority for research planning. Knowledge about the impact of transport on society, economy and ecosystems and the evolution of user needs is important as well for policy issues and will be an asset for the competitiveness and innovative strength of European transport & mobility and the related industry. A demand-side oriented and user-centered approach in the analysis of needs and problems can ease the path for the implementation of innovation, thus providing a ready market field for the deployment of (technical and organizational) solutions yet to be developed. Test beds and large scale piloting are of vital importance as well as they may bring up new and unexpected aspects.

Most important for the planning of future research and innovation in the transport domain under Horizon 2020 is therefore an appropriate focus on user needs and societal issues for shaping the research agendas more adequately to balance supply-side driven and technological oriented research and innovation. This view leads to the identification of four priority areas for the programming of policy relevant research and innovation in the last phase of Horizon 2020:

ROBUST SYSTEM	<i>technology and methodology</i>
BEHAVIORAL INSIGHT	<i>the human factor</i>
QUALITY OF LIFE	<i>health and well-being</i>
IMPACT OF CHANGE	<i>long term developments</i>

Robust system:

The European transport system must be able to answer the actual needs and ensure mobility of persons and goods in an effective and efficient manner. This is even more important since the transport & mobility community all over Europe is facing increasing needs for maintenance, induced by an ageing infrastructure and to be carried out under tighter budgetary constraints in a complex environment and facing high traffic intensity. Furthermore innovative thinking is essential on how cross-modal cooperation, interdisciplinary linkages, mobility schemes and smart logistics can increase the capacity, resilience, availability, safety and effectiveness of the entire transport system. Life-cycle analysis, remote and preventive maintenance and a systems approach should be considered.

Behavioral insight:

When going from A to B or when moving goods, people have made choices on "if, when and how". Further differentiated research is needed on how such choices arise (cost, duration, comfort and beyond) and how they can be influenced, to take the human factor better into account in relevant (policy) decisions, amongst other on safety and sustainability. Such research is also of utmost importance for the introduction of new

transport means, tools and services, like e-bikes, automated high capacity bus systems, semi-automatic/self-driving vehicles and schemes for organizing mobility. Next to technology, successful introduction is determined by the readiness to accept and use new options for transport and mobility (often implying social innovation and new approaches like Mobility as a Service) and use it for their purposes. Research on effective implementation of innovations, with a focus on awareness and acceptance by the general public, is pivotal for successful market introduction.

Furthermore, progressing introduction of automated transport might decrease the ability of drivers to act adequately in situations where the automated system does not ensure required activities, or if unusual, safety-critical or emergency situations must be solved in a flexible manner. Research is needed to counter these adverse effects and develop adequate policy and technology.

Quality of life:

The negative environmental impacts of transport & mobility on air quality, greenhouse gas emissions, use of resources and vibration/noise/light pollution are well known and have already been subject of research for many years. Nevertheless still major progress might be conceivable, on technical and non-technical levels, also facilitated by the introduction of hybrid/electric technology and automation in all transport modalities and their efficient guidance through ITS. Further research could also contribute to increasing transport safety and promoting the value of transport as a service. Especially in urban context, technological upgrading of hardware and smart mobility services should deliver a palpable contribution to making cities more livable (rather than "smarter").

This might also connect to the accessibility of public transport for vulnerable persons, i.e. with reduced mobility, orientation, or communication capacities. Such users might have specific requirements related to data or to the accessibility of a specific place due to different handicaps.

Impact of change:

With a view to the future, it is necessary to develop insight in the effects of long term developments and scenarios for handling perspectives. These long term developments might include new mobility concepts, advanced ICT solutions, piloting, automation, electrification, innovations or even paradigm shifts and disruptive developments in technology, (vehicle/ride) sharing schemes, logistics and other, to the background of climate change, demographic developments, physical and cyber security, etc. A better insight in such game changers will allow us to anticipate them in policy and business decisions so that they are more robust and provide a basis for timely, pro-active handling of opportunities and threats.

COMPETITIVENESS AND GROWTH AS A RESULT OF SUCCESSFUL ACTION

Concerted action and research on the four priorities has the potential to stir innovation by demand pull, thus allowing research stakeholders and the industrial companies to respond to user needs by developing and supplying (also technology-based) solutions that will find a ready market. All in all, this approach can empower industry to remain competitive in a global environment, thus generating growth and employment as result.

