



ECTRI REFLECTIONS ON THE TRANSPORT CHALLENGE OF HORIZON 2020

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The European Conference of Transport Research Institutes (ECTRI) is an international non-profit association that was officially founded in April 2003. It is the first attempt to unite the forces of the foremost multimodal transport research centres across Europe and to thereby promote the excellence of European transport research. Today, it includes 26 major transport research institutes or universities from 19 European countries. Together, they account for more than 4,000 European scientific and research staff in the field of transport. ECTRI as the leading European research association for sustainable and multimodal mobility is committed to provide the scientifically based competence, knowledge and advice to move towards a green, safe, efficient, and inclusive transport for people and goods.

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1. Introduction

Following previous contributions¹, ECTRI wishes to reflect in this paper on research priorities for transport research in Horizon 2020. It is based on its vision of an integrated multimodal transport system that is able to support the societal needs in a sustainable and efficient way. To be able to have a concrete contribution to the ongoing preparation of the H2020 research programme in the field of transport it will refer for the sake of specificity to the Commission's proposal for the Specific Programme [COM(2011)811 final].

2. The transport system and the societal challenges: researching the trends

ECTRI would like to underline that the challenges Europe is facing have reached new dimensions. The present economic and financial crisis will continue to harass Europe's ability to create wealth for its citizens. New forms to finance the necessary investments in an efficient and reliable transport system need to be developed.

Globalisation and the rise of emerging economies in Asia, but also Latin America and Africa will have an enormous impact on the European Union. It will affect the distribution of economic activities and the related transport flows. This calls for an "intelligent" and adaptive transport and distribution system for Europe.

More fundamental are the energy and environmental issues. We have to take into account the fact that global energy demand will grow while conventional energy supply will dwindle and energy prices will drastically increase. We have also to take into account the big climate change issues. While passenger and freight transport has brought Europe together and contributed to jobs, wealth, and quality of life, we have to recognize that major changes of how transport is conducted are looming on the horizon in view of rising energy prices and the demand for sustainability.

ECTRI stresses the importance of a long-term vision on the transport system. It recognizes the fact that realizing long-term visions may deviate from problems experienced or solutions accepted by the present generation of European citizens. Research can play a major role to reconcile this gap by offering consistent paths into the future. There is also need for a more pronounced "systemic and cross-modal approach" in dealing with the transport challenge.

¹ See ECTRI's following position papers:

- ECTRI Position on the Horizon 2020 Specific Programme – December 2011
- ECTRI Position on the EC Transport White Paper 2011 *"Roadmap to a Single European Transport Area– Towards a competitive and resource efficient transport system"* – July 2011
- ECTRI Answer to the EC Green Paper Consultation: *"From Challenges to Opportunities: Towards a Common Strategic Framework"* – May 2011
- ECTRI Contribution to the *"Strategic Transport Technology Plan"* – March 2011
- ECTRI Position on FP8 – February 2011
- ECTRI Position on the EC Communication on *"The Future of Transport"* – September 2009

Therefore ECTRI welcomes the inclusion of a paragraph on “socio-economic research and forward looking activities” in the transport chapter of the Specific Programme. Given its overarching character ECTRI believes it should be placed at the beginning of the chapter.

Research under this paragraph should not only “meet the challenges raised by transport” but also address the positive contribution that transport can make to other societal challenges. It should also specifically address the evolution of future demand of an ageing and increasingly diversified society, including the raise of worldwide mobility. A thorough understanding of the role and contribution of the transport system to economic development is also essential to the competitiveness of Europe, also at the level of specific economic sectors e.g. agriculture, manufacturing industries... Furthermore, new transport concepts should be explored in view of their potential contribution to meeting the societal challenges. In this respect, the paragraph 4.3.4. Exploring entirely new transport concepts could have been included in 4.4.

3. Multimodal research priorities

Transport research in H2020 should address the system level and its relations with other societal systems; it should deal with the proper functioning of the system taking into account its multi- and intermodal characteristics and of course address the specificities of its modal building stones. In the following pages ECTRI will develop what it considers the key multimodal issues.

ECTRI has expressed, in February 2011, as part of its position paper on the Commission Consultation paper: “Towards a Common Strategic Framework for EU Transport Research and Innovation Funding”, the following five priorities for transport research until 2020:

1. System operation,
2. Vehicles and energy sources,
3. Transport networks – maintenance and resilience,
4. Demand management and traveller information,
5. Environmental and societal impacts and challenges of the Transport system.

The above outlined priorities deal with the different aspects of a multimodal system. Priority I deals with the overall management and organizational issues; priorities II and III address “cross cutting issues” regarding transport means and the transport infrastructure; priority IV concentrates on the demand side, the user of the system; and finally priority V deals with the “externalities” of transport (environmental and societal impacts).

These “priority themes” are further developed in the next sections, in line with the transport visions for 2020.

I. System operation (cost-efficient multimodal transport systems)

This Theme is concerned with the aspects of transport system operation (passenger and freight including intermodal and urban logistics) that refer to:

- Cost-efficient operation, co-modality and multimodal transport;
- Passenger and user requirements and behavioural aspects at all levels;
- Foresight, integrated, planning and monitoring;
- Pricing and internalization of external costs (e.g. environmental external costs);
- Operation of the system as a whole (with emphasis on cross modal cooperation and synergies), and finally the
- Management of transport systems, aiming at a safe and secure operation, cost-effectiveness issues, etc.

Researching passenger and user requirements and behavioural aspects will involve research on establishing the passengers' and users' requirements as well as the aspects affecting their behaviour for a more efficient use of the transport system. The ex ante assessment of travel behaviour should be investigated vis-à-vis medium to long term key issues such as: population ageing, tourism and leisure, tele-working and remote-working, acceptance of new technologies, pricing for the use of infrastructures, etc, and should aim at providing the inputs for more focused "demand management" policies to be analysed under Theme IV below.

For the planning and monitoring of the system, the programme should address the all-important issues of data collection integration (especially through use of advanced ICT tools, and cover issues such as data fusion, assessment of data quality and data management), statistics, forecasting models, future needs analysis, and an advanced system of planning tools for transport infrastructures and services of the future. It furthermore should include research in economics and macro-economic developments and the role and impact of the transport system on economic development, the financing of transport infrastructures (e.g. cost effectiveness of PPPs), the impacts of new markets (opening of new member states – globalisation), policy evaluation, and so on.

Research should concentrate on all aspects of (transport) system operation including:

- Intelligent Transport Systems for intelligent cost-efficient and safe transport system operation;
- Efficiency and effectiveness through multimodal cooperation and integration;
- Optimisation of transport chains including intermodal freight terminals and nodes, operations;
- Promotion of behavioural changes towards sustainable mobility especially in urban areas;

- Safety of operation;
- Security and resilience issues;
- New business models for efficient (transport) systems operation; and finally
- Promoting issues of International cooperation and globalisation in transport research.

Finally, under this theme research should address issues such as: management information systems, tools and services for efficient management, management organisational and business models, the linkages between private and public sector administrations in the transport chain, and related issues such as one-stop-shop arrangements, etc.

II. Vehicles and energy sources (towards low carbon transport and use of renewable energy for electro mobility futures)

This Theme addresses issues referring to the design, construction, and delivery of the vehicles used and their energy sources across all modes of transport (aircraft, trains, ships, and road vehicles). Critical issues to be addressed here include:

- New materials for vehicle construction;
- New methods of manufacturing;
- New energy sources and their delivery systems (alternative fuels and fuel cells).
- Electrification and the continuation of the "Green Cars initiative" ;
- Energy conversion transfer and storage issues; and
- Engines and related vehicle systems (power trains, transformation, etc).

III. Transport networks – construction, maintenance and resilience

All items of research referring to the construction and maintenance of transport networks are indented to be included in this Theme. In addition special emphasis is given to the need to develop resilience within our transport networks i.e. resistance in cases of sudden and major events that disrupt the normal operation of the system such as catastrophes of all sorts, or weather disruptions, and those arising from terrorism, etc.

The research content should include, for example: new materials for transport infrastructure construction, use and re-usability of materials, new methods of efficient construction and maintenance, risk analysis and emergency contingency planning and operation, advanced systems for maintenance monitoring, planning and execution, etc.

IV. Demand management and traveller information (towards reducing urban congestion and improve citizens' quality of life)

This Theme concentrates on the all-important demand side of transport. This involves the study of how transport demand is created, altered and managed through time, in order to realise a more sustainable use of the transport system. It should include behavioural as well as socioeconomic research into: ways and tools to manage transport demand, provision of on-time and individualised traveler information, formulation and implementation of relevant policies and actions for sustainable mobility, and so on.

Items of research work in this Theme would include:

- Impact analysis of demand management systems and policies;
- Effective infomobility systems for traveler information based on personalised information;
- Systems for productive travel time utilisation (e.g. info-tainment, and remote or tele-working and tele-manipulating home or office equipment);
- Formulation of effective Demand management policies;
- Advanced systems of data gathering – analysis – and utilisation for traveller information.
- Organisational and management aspects of sustainable mobility schemes.

V. Environmental and societal impacts and challenges of the Transport system (addressing climate change and equity in transport policies)

Finally, the last Theme refers to all the environmental and societal impacts, which are aspects of the transport system that have not been adequately researched in the previous FPs. The environmental impacts of the transport system have to do with air and noise pollution, visual intrusion and severance of the space and function of our cities, and all the aspects of our daily environment, especially in urban areas. On the other hand research must also be directed towards better understanding of how to mitigate the adverse impacts of transport, and also to the adaptation and resilience of the transport system to the effects of climate change. A new challenge in this issue would be to link urban and transport planning to environmental impacts analysis. An example is the emerging research on soundscape where urban and transport planners work together with ecologists and physicians to understand how our cities could become more livable paying attention to the soundscape, considered as a principle in supporting the “planning” in its largest meaning.

There is also a very important stream of research to be done on the impacts of transport vis-à-vis the Grand Societal Challenges, that include the ex ante assessment of the effects of the various society's changing characteristics and demands on the transport system.

ECTRI thinks that the Specific Programme strikes a good balance between multimodal and systemic approaches and mode related issues. The 'bipolarity' between "surface transport" (SST) and "aeronautics" (AAT) seems to be abandoned. More attention to "air transport" in research regarding transport and logistic chains is of great importance, given the developing trends (economic globalization, world wide business and touristic journeys). The adaptability and resilience of the transport system (infrastructure in interaction with transport means) to major and abrupt changes (economic crises, extreme weather conditions, incidents, etc.), as well as its interaction with land-use, is also an issue of strategic importance.