
# *STRATEGIC ISSUES AND CHALLENGES FOR EUROPEAN TRANSPORT RESEARCH*

## *A position paper of the European Transport Research Alliance (ETRA)*

The ***European Transport Research Alliance (ETRA)*** was formed in September 2012 to promote and support the realisation of the *European Research Area* in the field of Transport (ERA-T).

It consists of five Partner Associations: ECTRI, EURNEX, FEHRL, FERSI, and HUMANIST with more than 100 transport research organisations as members (collectively) in 37 countries.

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**INTRODUCTION**

This document is the 2016 ETRA strategic paper that is submitted to the European Commission in the framework of the reflection on the third call of the Horizon 2020 Framework Programme, the Strategic Research and Innovation Agenda (STRIA) and the next Framework of Research and Technological Development Programme (FRTDP 9).

*Research and innovation* as well as *transport* stand implicit in all ten political priorities set up by the European College of Commissioners at its inception. This being said, these priorities need to rely on efficient transformative transport systems, services, and industries and to encourage strong endeavours of focused (surface) transport research and innovation (potentially transformative focused research). This position is a key position of the ETRA in a context in which Europe considers its leadership in the world through real competitive advantages, including capacity building.

Transport besides being one of the seven "societal challenges" [1] that have featured (since 2009 with the Lund Declaration) in European policymaking and have become an established theme of European Research, is a basic element underpinning almost all them. The EU2020 strategy presented innovation and research as a key element in order to kick-start economic growth and stressed the positive relation at an aggregate level between investment in research and development (R&D) and socio-economic growth, as well as the positive relation at firm level between such investment and productivity. Transport research, therefore, is a fundamental constituent of the EU's efforts to create and sustain economic and social growth in the continent, and this has rightly been reflected by its overall position and funding within the Horizon 2020 Programme.

ETRA believes that Transport research should continue to be prominently featured in future EU funded research and other programmes and welcomes the development of the new *Strategic Transport Research and Innovation Agenda (STRIA)* as well as the next *Framework Research and Development Programme (FRDP)* for the post 2020 years. As a partnership of five European Transport research Associations whose more than 100 members are Organisations exclusively involved in transport research, in 37 countries, the ETRA wishes to state both the wish and the ability to support, participate, and assist in the materialization of the goals of the Lund Declaration and the subsequent ones. The ETRA members participate in the H2020 Programme

[1] Namely:

1. Health, demographic change and wellbeing;
2. Food security, sustainable agriculture and forestry, marine and maritime and inland water research, and the Bioeconomy;
3. Secure, clean and efficient energy;
4. Smart, green and integrated transport;
5. Climate action, environment, resource efficiency and raw materials;
6. Europe in a changing world - inclusive, innovative and reflective societies;
7. Secure societies - protecting freedom and security of Europe and its citizens.

and have a genuine interest in its instruments for keeping up their international scientific cooperation.

**THE TRANSPORT ELEMENTS OF KEY EU POLICIES**

Transport is a well-developed and mature policy domain, therefore stressing its importance to our societies and the need for a continued development of innovative policies in this sector is relevant for this paper.

This is the reason why the following priorities are particularly relevant for the ETRA community:

- "Jobs, Growth and Investment" and "Digital Single Market" – for these priorities a very transformative transport infrastructures network (design, maintenance and operation) is critical as well as the communication and energy ones. In the same way, a transformative operating industry, a transformative vehicle, systems industry, and a better regulation approach are decisive for the future. Similarly, application of ICT technologies is very valuable for improving the quality and the efficiency of people and goods' mobility,

- "Energy Union and Climate "as well "Internal Market" , "EU-US Free Trade", "EU as a Global Actor" are reinforcing the need for these transformations and innovations based on research and competition with other global actors (USA, China, Japan ,Korea among others.),

- Mobility, safety, security and health are also at the basis of many "Democratic Change" or "Justice and Fundamental Rights" where transport is critical.

Many transport related policies, as well as transport related research and innovation policies are paramount to tackle these priorities. Therefore, the ETRA strongly believes these arguments support the need for continued attention to relevant transport policies. Our transport system can be considered as the single most defining competitive advantage that Europe has in a globalised market. A fully integrated, resilient, flexible, environmentally sustainable transport system is therefore the basis for European economic competitiveness, sustained economic recovery as well as human development and European citizens' happiness. It allows attracting investments in an increasingly volatile and rapidly evolving mix of economic activities.

Furthermore, it is to be noted that the policy priorities defined by the European Commission comprise a list of well-chosen issues that certainly deal with the major challenges facing our society at present. Transport is not part of this list; this is understandable as it is a well-developed, mature policy field with no urgent problems at stake. In addition, the importance of transport for our society and the need for a continued development of innovative policies in this field is self-evident. For example, if we look at "Jobs, Growth and Investment", we do not need to remind that the transport vehicle industry is a major generator of growth and employment and a vast field of application of innovations in the field of new materials, ICT, energy and environment…

With regard to the “Energy Union and Climate” challenge, we would like to recall that transport contributes about one third of the emissions. The progress achieved in the reduction of these emissions through alternative fuels and electric vehicles is spectacular. Still, we are at the beginning of a paradigm shift leading us away from the classical internal combustion engine and still a long path has to be followed.

Transport is a major field of application of ICT technologies that is improving the quality and efficiency of mobility and ultimately can help reducing mobility needs for persons and materials (freight).

We therefore strongly believe that these arguments support the need for a continued care and attention for transport policy issues.

## IMPLEMENTATION ISSUES FOR H2020

In this section, we touch upon Governance, Instruments and Management issues of Horizon 2020.

### Governance

ETRA strongly supports keeping transport research as one block in Horizon 2020 and in its third specific programme. It can consist of:

a. An industry led research and innovation part;
b. A transformative focused research part that includes cross-cutting Human Factors, Economics, Societal and Behavioral developments, and a
c. Future and leapfrog oriented evidence based - knowledge procurement part dealing with specific policy issues stemming from key EU strategies such as Climate Change, Energy Union, Transport policy and Industry Competitiveness.

Furthermore, it is time to consider in more detail and support the process of implementation of research results and innovation production in the Transport sector. Specific steps must be designed in order to facilitate and channelize innovation production as part of the research production process. The newly formulated Scientific Advice Mechanism (SAM) of the Commission could be brought in to advice on this issue.

### Management of Horizon 2020

ETRA partners and their members, who as underlined represent more than 100 research organisations, widely participate in H2020 projects; they therefore have a genuine interest in this programme for European scientific cooperation.

In order to contribute to the improvement of its functioning we would like to raise a number of suggestions:

1. Preparation of the work programmes

   - Keep continuous dialogue and cooperation with the various stakeholders to define the programmes and to set priorities
   - Keep a bi-annual work programmes with limited change for 2nd year to facilitate proposal planning

2. Calls

- Place the calls deadline in a “usual” working period (March and October). Align the deadline dates for a similar call (whatever it is 1 or 2 stages-evaluation) to avoid confusion..

- Provide a more focused description of topics instead of broad scope and a more specific information on the allocated budget / size; do not make any explicit reference to previous projects (bounding to previous initiatives and biasing the competition); be more explicit whether proposals should address part of the topic / bullets or the entire topic; keep same funding schemes (RIA, CSA) which are well understood by participants.

- Keep using and improving the current electronic system i.e. “participant portal” as main tool for information and proposal submission as participants are getting used and comfortable with.

- Keep using and improving the current administrative/financial rules as participants are getting used and comfortable with them.

- Improve the two-stages evaluation as follows::
  -if the two stage is kept:
    - Speeding up the whole process: 10 months maximum between publishing and grant should apply to the 2 stages including quicker announcement of 1st stage results evaluation and more time to prepare full proposal compared to short proposal
    - Be more selective in first stage evaluation: only best ranked proposals and not all, which pass the thresholds, should be asked to prepare a full proposal (magnitude of 30% to 50% success rate, not 5 or 10%).
    - More information / guidance on what can be changed / not changed between 1st and 2nd stage would be welcomed

  -If not possible, then a single stage remains less costly and more efficient.

- Single stage evaluation
    - In general, the single stage evaluation is well adapted to the transport sector and mostly preferred by its research Community.
    - Concretely for the first calls, the fact to have 2 different deadlines for single stage evaluations (Single Stage A and B) mixed with different dates for 2 stages evaluation creates confusion; do not multiply the different dates for proposal submission
    - Speed up in informing the participants of results whenever they are known instead of using the full allowed timing 8 months (case of single stage A)

3. Evaluation

- Keep clarity and transparency on evaluation / selection criteria

- Evaluators should be provided with clear guidance for proposals with a broad scope having very different approach and magnitude
- Participants going to second stage (instead of a simple GO") would appreciate more feedbacks on first stage evaluation.
- Speed up in informing the participants of results whenever they are known instead of using the full allowed timing 8 months (case of single stage A and 2 stages evaluation)

4. Grant Agreement
   Instruct the Agency to refrain from "negotiating" the Grant Agreement while it is not anymore the case according to H2020 rules.

**THE FUTURE OF TRANSPORT RESEARCH IN THE FRTDP**

Rapid developments have been taking place regarding structure and management of the Transport research programme. Most prominent is the 'outsourcing' of research. New instruments (JTI's, JU's) have a more efficient, tailor-made management on the one hand, but lead to fragmentation, a silo structure and reduced transparency on the other. Addressing multimodality and reaching synergies is thus seriously hampered.

One of the challenges to avoid a silo structure is not to separate the vehicle, the infrastructure and the land use. For example, the autonomous vehicle research should be conducted for road and rail in its various operating components, safety and security, in an intermodal approach.

A new structure and organization of transport research in the next FP is required, focussing on the need for a fully integrated, reliable and sustainable transport system.

In this respect, the role of the Technology Platforms should be re-considered. At a given time, the ETP's played a valuable role in integrating the research needs and visions of the modal stakeholders and facilitated the market take up of results.

In this context, two additional comments are considered:

- Attractiveness of the programme: the funding scheme (25% overheads) diminishes the attractiveness of the programme for a number of research organisations

- "New mechanism" for performing research at EU level like JTI as long term public-private partnerships, involving industry, the research community and public authorities, are managed within dedicated structures: lack of transparency and exclusion of part of the actors from funding.

ETRA wishes therefore to stress the strong need for a holistic approach of the transport system addressing its different facets, while taking into consideration the specificities of the "individual" transport. Such approach should include the following dimensions:

- Technological (integration of new technologies into the existing transport system, interoperability, resilience, etc.),
- Social/behavioural (accessibility for different social groups, acceptance of new technologies, and so on)
- Economic (position of transport in the supply chain/value chain, financial issues, externalities, new economic models affecting design of vehicles and services due to socio-economic breakdown in owner paradigm, etc.)

- Organizational/legal (competition, access to the transport market, new business and organisational models, etc.)
- HRM/labour (education & training, new professions, matching education provision to market demands, and so on)
- Safety/security (please refer to the FERSI 2014 Position Paper "Towards safer roads in Europe")
- Environmental/energy ("green vehicles", energy efficiency, $CO^2$ and other emissions, environmental driving, etc.). In our view, the Co2 and noise topics have been expressed in a very soft and general way in the current Programmes. The contribution of the rail system to these topics is hindered very much by poor (in terms of aims and methods) harmonization of the relevant technical and operational demands in the national countries and over Europe.
- ICT (cooperative systems, bid data collection and analysis, user information on-line provision, advanced ITS based traffic management, routing and vehicle management, etc.)

Furthermore, ETRA stresses the need that in order to maintain and improve the European competitive, sustainable, safe and resource-efficient transport system, as stipulated in the Transport White Paper of 2011, more emphasis must be given to formulating a more effective, fair and human being oriented transport policy. Toward this end, the Commission must try to establish a new "balancing counterweight" to industry driven research, which by definition is mainly technological research, with human being focussed research and recommendations. ETRA, as representative of transport research providers, wishes to state its willingness and availability to provide this "counterweight" as it comprises researchers and research Organisations who are committed to contribute to the societal well-being and not only to technological or economic aspects. Seven of ten happiest countries of the world are European countries (and fourteen of the first thirty) according to the World Happiness report. This is a mark that we should be proud and happy about and one that we should strive to maintain.

Relevant to the above point, a comparison of our approach with the priorities identified by DG Research and Innovation[2] shows that in Europe we still trust in manufacturing and

[2] E.g. for the transport safety research area:
- ✓ Advanced engineering systems and risk-analysis methodologies for designing vehicles and infrastructure
- ✓ Integrative approaches linking human elements, structural integrity, preventive, passive and active safety, rescue and crisis management.
- ✓ Inherent design of vehicles/systems for safety and security (special focus on human-machine interfaces), use of intelligent safety systems and integrated safety.
- ✓ Post-crash rescue technology and methods and new training systems to improve awareness of safety and security issues

management technologies stronger than in modifying the human behaviour. A better balance should therefore be found here which, among other issues, would mean a fundamental shift in understanding freedom of mobility and self-reliance of road users.

ETRA understands transport research as an integral part of addressing the Societal Challenges. We understand mobility as one fundamental value of the European society and as one of the fundamental reasons for European success in economic terms, as well as in terms of human development and happiness. In order to maintain and increase opportunities for safe and affordable mobility across Europe an ultimate pre-requisite is for inclusion, social peace, economic growth and development.

ETRA further recommends considering transport research as an integral part of addressing EU societal challenges. This is why on thematic level there are the following suggested thematic areas of importance:

- Maintaining and upgrading transport infrastructure as it is the backbone of the transport system
- Better regulation research (setting, monitoring and KPIs) and better standardisation, including better understanding and performance measuring
- Cross-cutting safety and security issues, including certification methods and issues
- Managing rapid technological change, including digitalisation
- Economics, human factors and behavioural sciences, forecast and foresight, in relation to the transformation of transport infrastructures, systems-operation- and services

In the context of COP21 and the consequences of the Paris agreement, ETRA believes clear emphasis and priority should be given to:

- The transformation and resilience of the transport infrastructures, systems, operation and services, including new radical concepts
- Supporting relevant work on energy efficiency or productivity, electrification or hydrogenation, with their transition pathways

Furthermore new thematic results relevant as well when frontier and focused research are concerned with the objective of tacking current and future societal challenges:

- Transformative material research for sustainable and energy efficient or economically productive transport infrastructures
- Integrated Urban mobility for persons and goods within the “Smart Cities and Communities “ Programme

- Transformative research for sustainable and energy efficient or economically productive infrastructure maintenance and operation
- Transformative Human factors research for automation, robotisation, digitalisation and cross-cutting developments in transport infrastructures, equipment, vehicles, systems, operation, and services
- Transformative safety and security research
- Transformative economics for transport systems engineering, building, maintaining and operation

Finally, future thematic content of European transport research should be seen in conjunction with major similar initiatives in the USA, Japan, Korea, China or India. In this context, it could be seen as the "European Global Leadership and Actor Counterpart" of those initiatives.
Final points are relative to the above:

a. The need to maintain and increase the European "capacity building" in the field of Transport through the appropriate Education, Training and Competencies building actions within the rapidly changing innovation landscape. In this respect, we note the US initiatives in this field through the support of a new generation of Transport and ICT NoEs (through the new UTC generation); new research infrastructure facilities (e.g. the National Advanced Driver Simulators - NADs or the automation test beds; and the so-called STEMs, etc).
b. The need to make a more concerted effort for the transfer of frontier knowledge into practical knowledge for up taking innovation pathways and abandoning "cul-de-sac" pathway risk and uncertainty. This will necessitate a new generation of ways and tools for the implementation of research and creation of innovation pathways in the Transport sector. We note that the innovation rhythm in the Transport domain, besides being often incremental and accumulative could also be subject to very rapid change, putting in question even the traditional linear scheme of research to innovation transformation and its TRL levels. Recent example of such rapid change is the road driving automation area).

ETRA believes that the future of EU based Transport research should include the above elements (perhaps among others) and that the EU and the MSs need to tackle the above points, with an official agenda for research complying with the Treaties requirements. They could hopefully also form the basis for consideration and debate by the Scientific Advice Mechanism (SAM).