



TRANSPORT CHALLENGE IN HORIZON 2020

ECTRI SUGGESTIONS FOR THE SECOND WORK PROGRAMME (2016-2017)

***in the field of* “TRANSPORT ECONOMICS AND POLICY”**

November 2014

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 24 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.

European Conference of Transport Research Institutes | ECTRI aisbl

Rue du Trône 98 | 1050 BRUSSELS | Belgium

Tel: + 32 (0)2 500 56 87/88 | Fax: + 32 (0)2 500 56 89

Number: 831 370 370

Website: www.ectri.org

Contact: Caroline Alméras, Secretary-General

E-mail: caroline.almeras@ectri.org

1. Introduction

ECTRI launched its Thematic Groups in September 2007 as a means to facilitate exchanges among its researchers interested in similar research fields and in order to promote joint initiatives and positions. One of the groups is the Thematic Group on Transport Economics and Policy (TG-ECOPOL). The main objectives of this group are to define research topics of interest for supporting EC policies and programmes, to increase successful participation in EU projects and to provide a platform for networking and scientific exchanges. The group consists of 42 experts from 23 Transport Research Institutes and Universities representing 19 European countries. Most of these institutes are working in the field of policy analyses e.g. scenarios, foresights, cost benefit analyses, Public Private Partnership, pricing and externalities. Members are: BAsT, CDV, CENIT, DLR, DTU, DVS, Fraunhofer, HIT, IFSTTAR, ITS, KTI, LNEC, POLITO, TØI, TRL, TTI, UNEW, UNIZA, UPM, UVEG, VGTU, VTI and VTT.

TG-ECOPOL is proposing 6 topics it considers important in order to support the European transport policy in some key areas:

1. There is a need to assess and quantify the benefits derived from the invested committed to develop the TEN-T network, specifically its impact on economic growth and employment. This research can provide guidelines to speed up the selection and finalization of projects.
2. Electromobility is an important component of the European strategy to decarbonise transport. An assessment of the economic impact and behavioural aspects will help to smoothen the incorporation of this new technology into the transport system.
3. There is a need to develop an appraisal toolbox to support the development of the “smart city”-concept and the identification of promising initiatives to support it.
4. Ports are important nodes of the TEN-Ts and a key element influencing the competitiveness of Europe. There are distinct regional differences within Europe influencing the performance and competitiveness of ports, specifically regarding rail intermodality. Benchmarking will improve the understanding the differences and provide policy recommendations.
5. Novel approaches in the coordination of transport policies with spatial, financial, organisational policies combined with ITS and communication tools can will favour the transfer between private and public transport and enhance the convenience of travel.
6. “Big data” has opened a wide spectrum of opportunities in the field of transport research. Three areas are of specific interest: understanding travel behaviour, logistics, network capacity planning.

These topics have a close connection to the five main areas of research for advancing an integrated transport system suggested by ECTRI: –Individual users’ mobility behaviour; –Multimodal mobility systems and services; –Advanced logistic services; –Resilient and secure transport systems; – Research support for decision-making.

2. Suggested research topics

TG-ECOPOL is proposing six research topics based on the conviction that increased knowledge will be important for advancing an integrated transport system across all transport modes:

1. Social benefits stemming from a seamless TEN-T network in Europe (p. 3)
2. Impact assessment of electro-mobility scenarios and behavioural analysis of electric vehicle users in urban areas (p. 4)
3. Appraisal tools to support decision making in smart cities (p. 6)
4. Promoting seaport container terminals’ efficiency: by reducing cargo pass through cost and facilitating rail inter-modality to promote supply chain competitiveness (p. 7)
5. Transport policy integration, coordination and integration of transport modes at interchanges, Inter-modality new organization (p. 8)
6. Big Data in Transport: challenges and research opportunities (p. 9)

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Suggested title of the research topic	Social benefits stemming from a seamless TEN-T network in Europe
Programme	Transport (Infrastructures and socio-economic and behavioural research)
Timing/year Work Programme	2016/2017
Indication on “research area”	
Infrastructure, socio-economic and behavioural research	
Specific challenge	
<p>The White Paper: Roadmap to a Single European Transport Area—Towards a competitive and resource efficient transport system stated that Europe needs a ‘core network’ of corridors, carrying large and consolidated volumes of freight and passengers traffic with high efficiency and low emissions. The cost of EU infrastructure development to match the demand for transport has been estimated at over €1.5 trillion for 2010-2030. The completion of the TEN-T network requires about €550 billion until 2020 out of which some €215 billion can be referred to the removal of the main bottlenecks.</p> <p>As of January 2014, the European Union has a new transport infrastructure policy that connects the continent between East and West, North and South. This policy aims to close the gaps between Member States' transport networks, remove bottlenecks that still hamper the smooth functioning of the internal market and overcome technical barriers such as incompatible standards for railway traffic. The goal is to promote and strengthens seamless transport chains for passenger and freight, while keeping up with future technological trends. This initiative is expected to help the economy in its recovery and growth.</p> <p>Despite the large investment committed to develop the TEN-T there is still little research aimed at identifying and quantifying the impact that the completion on the TEN-T might have on promoting economic growth and employment in Europe.</p>	
Scope	
<p>Proposal should address the following aspects:</p> <ul style="list-style-type: none"> • Draw lessons from the successes and failures over the last few years on the implementation of the TEN-T policy and the use of European funds to promote a seamless transport network. • Identify best practices to facilitate other interested parties to emulate. • Draw lessons from the successes and failures over the last few years on the implementation of national transport policies attractive for meeting a seamless transport network • Propose measures (legal, financial, technical) to speed up the development of a seamless TEN-T network in Europe, especially regarding cross-border projects. • Identify key objectives (economic, social, energy conservation and environmental) to be achieved with the completion of the TEN-T, and outline the methodological approach in order to estimate the impacts TEN-T has on growth and employment in Europe. • Propose policy measures—including those related to the use of European funds, pricing, interoperability, use of IT—that can contribute to improve to deliver the TEN-T in the most effective way. 	
Expected impacts	
<p>The work is expected to provide policy makers—both at the national, regional and European level—a deep knowledge on the socio-economic impacts of the TEN-T on economic growth and employment in Europe, thus providing guidelines on the design and implementation of measures to speed up the selection and finalization of projects, particularly those aimed at interconnecting different member states. It is also expected to increase awareness of policy makers—especially those from the member states—to take the necessary measures (legal, financial, technical) to facilitate the implementation of a seamless transport network.</p>	
Further suggestions regarding this topic	
<p>Coordination and Support Action 2 M€, Single stage</p>	

2

Suggested title of the research topic	Impact assessment of electro-mobility scenarios and behavioural analysis of electric vehicle users in urban areas
Programme	Transport (Urban Mobility & Socio-economic and behavioural research)
Timing/year Work Programme	2016/2017
Indication on “research area”	
Urban Mobility & Socio-economic and behavioural research	
Specific challenge	
<p>Electric vehicles (EVs) are regarded as a promising component of the European strategy to decarbonise transport until 2050 and to answer the growing concerns of climate change. However, there’s a lack of understanding of the impact of various factors on users’ demand (e.g. battery performance, % of renewable energy sources or fossil fuel in the electricity production mix and the social cost/km, access to charging infrastructure, vehicle ownership costs, incentive measures, role of social media). Integrated knowledge of all potential influential factors is required for policy makers to promote a higher uptake of EVs in most European countries and those in the emerging economies. On the other hand, the electrification potential and the transferability of vehicle technologies to most polluted cities in Asia and Latina America remains to be fully explored. This also requires further research into business models and market feasibility analysis under a broad range of conditions. Combined results from a comprehensive range of “impact assessment tools” such as foresight analysis, Well-to-Wheel analysis (WTW), extended cost-benefit analysis (CBA) including key external effects (e.g. health and environmental) and financial models need to be analysed. Further research shall include how the above mentioned influential factors can interact together in the short to long-term to influence users’ choices and help desirable changes into more sustainable mobility patterns in urban areas. A related issue is to determine the role of private initiatives and the possibility of PPP in providing the required infrastructure for wider application.</p> <p>A more comprehensive impact assessment of electro-mobility based scenarios is required where a broader range of combined transport and energy production options can be jointly evaluated along with optimising the use of existing transport. The setting of naturalistic and behavioural experiments at the level of individuals’ users will allow new knowledge to be generated for policy making. Context-specific studies shall allow the development of new e-mobility services that could better answer the needs and expectations of most vulnerable groups of citizens such as the elderly.</p>	
Scope	
<p>Proposals should build on existing knowledge of socio-economic, behavioural and transport policy related research and shall answer one or two of the following domains:</p> <ul style="list-style-type: none"> • A top-down impact assessment approach with combined analysis tools: Impact assessment of electro-mobility scenarios in different European member states and in other selected countries/cities outside Europe (e.g. cities in Asia and Latin America with most acute air pollution problems) under different scenarios for the electricity production mix. The range of tools shall cover the various sustainability perspectives and shall include foresight analysis, extended CBA, LCA (WTW) and financial analysis. Integrated transport and energy scenarios shall explore the interaction of different factors and incentive measures and present results by means of a set of key performance indicators (KPIs), including economic/financial, environmental, social/equity impacts. KPIs shall include the external costs associated with each scenario to better evaluate the societal impacts of electro-mobility options. • Bottom-up behavioural approach tailored to each specific city context: Develop specific city tailored naturalistic and behavioural experiments for assessing user’s behaviour, role of different factors and potential users’ preferences for alternative e-mobility options; these will focus on the behaviour of different types of users but paying special attention to most vulnerable users such as the youngsters (e.g. as potential e-bikers) and the elderly (e.g. those able to change to EVs). Experiments can include cognitive surveys to better understand 	

possible disruptive impacts (and ways to tackle them) that may result from a change from a familiar driving experience (conventionally-fuelled vehicles) to an EV based mobility option.

Expected impacts

The proposed RIA is aligned with key aspects of the European strategy – decarbonisation of transport and of boosting its economic competitiveness. Research and innovation activities will bring together a wide diversity of actors (transport research institutes, industry partners, cities/regional bodies, etc.) for a set of behavioural experiments (as case studies) across Europe and in other World cities of emerging economies. This international cooperation will help decision-makers to support the development of a new generation of e-mobility services for social cohesion purposes – those that would fit mobility needs of the most vulnerable groups of society. This will catalyse innovation for new urban e-mobility services for the cities of the future. Also, a strong position can be expected to be achieved by European partners in the World market of electric-mobility and for the exchange of research capacities for achieving common policy goals.

Further suggestions regarding this topic

Research and Innovation Action (RIA)
5 M€, Two-stage

3

Suggested title of the research topic	Appraisal tools to support decision making in smart cities
Programme	Transport, Climate, Smart Cities and Communities
Timing/year Work Programme	2016/2017
Indication on "research area"	
Policies, economics, urban mobility and logistics	
Specific challenge	
<p>Responding to the climate change, congestion and security challenges of the future requires systemic changes in urban transport systems. This means that along with technological developments, the economic, social, environmental, cultural and political dimensions of the system need to be considered and adjusted to promote the systemic change towards smart, low carbon future. Currently, there is a lack of socio-economic and forward looking appraisal tools and knowledge related to smart city initiatives among city authorities and private companies responsible for strategic planning and decision making. Due to this shortcoming, many started smart city projects do not receive the acceptance needed and remain as short demonstrations. Since the projects do not lead to wider implementation, their impacts will remain on a low level. The challenge is to disseminate the knowledge and transfer the insights gained from local examples by up-scaling and wider exploitation of the lessons learnt in the form of a strategic implementation plan.</p>	
Scope	
<p>Development of a set of socio-economic, forward looking appraisal tools (toolbox) to support city authorities and SMEs operating in the city context in developing and making decisions on smart city solutions and services respecting the EU development goals and the EU scope of the problem. The appraisal tools will help the authorities and SMEs to see the bigger picture around the smart city initiatives or projects and assess their impacts and effectiveness. The toolbox development need to be carried out in close cooperation with the research, policy planning and business activities and tested in case studies. The toolbox may comprise of various tools, such as: stakeholder analysis, vision and scenario building, policy packaging, GHG impact assessments, cost-benefit analysis, value chain and business model development, ecosystem building, user-centric design, etc. The selection of tools will be tailor-made, case by case. However, there will be a common conceptual framework with a recommended set of evaluation methods and appraisal techniques. The emphasis is to create win-win situations and to identify the opportunity to achieve synergy.</p>	
Expected impacts	
<p>The development and use of appraisal toolbox in smart city projects will increase the knowledge and awareness of public and private city actors on the smart city project possibilities, challenges, impacts and effectiveness. Consequently, the activity will promote large scale implementation of effective smart city projects and prevent the deployment of the ones with only small or insignificant impacts. The activity will provide opportunity to interact, to exchange experience and to share ideas; as such, participation in such a project will strengthen the cooperation of various smart city stakeholders. The results could be used at the EU level to develop the union-wide policies aimed at balanced development of the smart city concept.</p>	
Further suggestions regarding this topic	
Expected instrument: RIA	

4

Suggested title of the research topic	Promoting seaport container terminals' efficiency: by reducing cargo pass through cost and facilitating rail inter-modality to promote supply chain competitiveness
Programme	Transport
Timing/year Work Programme	2016/2017
Indication on "research area"	
Port competitiveness, supply chain, inter-modality	
Specific challenge	
As in activities of import and export, the cargo pass through cost by port terminals is a key factor in the final product competitiveness, given the growing importance of logistics costs in the production function. The use of rail instead of road transport in the hinterland penetration is allowing some success cases in minimizing cost that provide a competitive plus in certain European sectors. The challenge is to identify policy measures that will promote efficiency in the allocation of scarce resources and to improve the conditions to enhance competitiveness by creating more equal playing field between the north and the south.	
Scope	
Europe presents a clear asymmetry between the ports located in the north facade, with well-developed rail inter-modality, and southern ports which are based mainly on the road transport for penetration in the hinterland. Therefore, this project presents an opportunity to identify the inter-relations between different social, economic and geographical factors with a European perspective, including the European benchmarking of the northern Europe to study its possible application to other areas of the European Union. Benchmarking provides an opportunity to identify factors that could have an influence on relative performance and to showcase the best practices.	
Expected impacts	
The project aims to generate specific recommendations in the field of policy-maker to improve a better understanding of the factors that have an impact on relative competitiveness at different geographical locations and to facilitate the appraisal of projects that aim to promote intermodal rail in container terminals.	

5

Suggested title of the research topic	Transport policy integration, coordination and integration of transport modes at interchanges, Inter-modality new organisation
Programme	Transport (Urban mobility)
Timing/year Work Programme	2016/2017
Indication on “research area”	
Urban mobility (Transport policy integration, transport modes coordination, multimodality and inter-modality systems and organisation)	
Specific challenge	
<p>Transport policy integration and transport modes coordination are indispensable domains to combine in order to obtain and to enhance multimodality and inter-modality systems and organisation.</p> <p>Effectively, urban mobility is growing and fits citizen’s needs for social and economic development. But to avoid congestion in inner urban areas with its related environmental and social and economic concerns the mobility system must be improved and/or changed to create new mobility behavioural within urban or outskirts areas.</p> <p>A FP7 research project, City-HUB will end early 2015. Research is needed to develop the possible applications of the findings after the validation phase process of the guidelines to implement interchanges. The study findings and lessons learnt offer an opportunity for upscaling and wider application in other cities and in major urban agglomerations.</p> <p>How to obtain this integration? By coordination of transport policies with urban policies and development policies, by organisational and technical and financial means, by the implementation of new communication tools and the implementation of ITS for the interface between private and public transport to favour seamless transfers and to enhance ease and convenience of travel.</p>	
Scope	
<p>To undertake research and to demonstrate the potentials by specific case studies on the actual possibilities to implement or enhance interchanges in different areas such as urban or peripheral areas in order to ease and encourage the use of urban or interurban public transport or combine other transport modes to reach inner city centres or other attractive centres. The emphasis is on the importance of examining different factors to provide better services and the provision of facilities to enhance door-to-door mobility. The prime objective is to design a smart and resilient transport system in an urban context to promote sustainable mobility.</p> <p>By developing the findings already obtained in FP7 research programs on actual fields of development proposing specific tools encouraging the use of public and /or collective transport when the alternative is created with the use of the private car.</p>	
Expected impacts	
Creation or enhancement of transport hubs at peripheral or urban areas facilitating transfers between transport modes. The use of ITS or new communication tools to shape the different inter-modal travels and services.	
Further suggestions regarding this topic	
<p>Expected instrument RIA and involvement of different transport authorities.</p> <p>Links with for instance the FP7 projects: City-HUB project www.city-hub-project.eu and NODES project www.nodes-interchanges.eu</p>	

6

Suggested title of the research topic	Big Data in Transport: challenges and research opportunities
Programme	Transport Others (Climate, Security, IT)
Timing/year Work Programme	2016/2017
Indication on “research area”	
Socio-economic and behavioural research, ITS (research area of transport and logistics economics)	
Specific challenge	
<p>Observing the recent emergent interest in the application of “big data” within transport science, as well as the extended scope of its applications, it is evident that most of the challenges have yet to be addressed. From freight transport and supply chain optimization to evacuation modelling and crowd dynamics under extreme phenomena, and from short-term traffic forecasting to travel behavioural research and the use of social media for efficient transport operations, data science and the so-called trend of “big data” has opened a wide spectrum of opportunities in the field of transport research. Many of these challenges will constitute opportunities for researchers (as well as the industry) in the foreseeable future.</p> <p>The question is how can we take advantage and get involved with these challenges? In this sense are summarized hereafter some ideas on research directions in the form of specific challenges on which to focus:</p> <ul style="list-style-type: none"> • <u>Travel behaviour</u>: Better understanding of travel behaviour (by incorporating in the modelling process heterogeneous sources of information) in order to better respond to passengers’ preferences, requirements, and needs. • <u>Logistics and consumer preferences</u>: Similar to passenger transport, the same tools can be used for the better prediction of consumers’ preferences in the freight sector. • <u>Network capacity planning and optimization</u>: Efficient use of data and information for optimizing the capacity of the transport network (e.g. in the case of toll roads). This could also be combined with cases of extreme weather events and/or other emergency situations. 	
Scope	
<p>The scope behind the three aforementioned research areas is to investigate the economic issues and implications of the utilization of big data in the transport field. There are open questions and issues in relation to which areas and contexts IT investments and exploitation of data should be implemented. By examining a series of different case studies and contexts from many countries, one could be in a position to provide useful information and suggestions on the prerequisites of successful big data implementation in the transport sector from a socio-economic point of view. Another point of focus could be the barriers of transportation system (in general terms) to exploit “big data” opportunities because of issues that range from technical to institutional. It is the case that many transportation agencies and authorities, transport industries etc. do not consider profitable the investment in having and analysing “big data”, worrying also about the associated costs and risks of data collection and sharing. ECTRI could also shed some light on the institutional and governmental issues and barriers concerning the application of big data in transport providing policy recommendations towards “data openness” and sharing. Public acceptance (e.g. privacy, data security, etc.) is an issue and should be addressed.</p>	
Expected impacts	
<p>The overall goal of “big data” is to help the EU policy makers, national governments, businesses and individuals to make more informed decisions. Better data can help transport authorities and industries to understand travellers’ and consumers’ behaviour, provide targeted information and identify policy interventions. In this sense the impacts of the aforementioned proposals are targeted towards the European Union and governments as well as the private sector (industry, corporations and private individuals).</p>	

Contact

ECTRI Transport Economics and Policy Thematic Group (TG ECOPOL)

José Manuel Vassallo
Moderator of TG ECOPOL
Associate Professor
UPM, Spain
josemanuel.vassallo@upm.es
+34 91 3366655

Elisabete ARSENIO
Rapporteur of TG ECOPOL
Senior researcher
LNEC, Portugal
elisabete.arsenio@lnec.pt
+351 21 8443326

Anu TUOMINEN
Rapporteur of TG ECOPOL
Principal Scientist
VTT, Finland
anu.tuominen@vtt.fi
+358 20 722 4976