

# The Task Force of the Lyon Declaration Signatories

## Creating a European Transport Research Alliance (ETRA)

### Towards MERITE Main European Research Initiative in surface Transport

*November 2009*





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(ETRA)**

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# VISION

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**To follow the Lyon process to the creation of a European Transport Research Alliance to develop the European Research Area in Transport to overcome the Grand Challenges.**

## **Mission of the Lyon Declaration signatories Task Force towards this Vision**

- The mission of this joint Task Force is to deliver the inputs related to the development of the ERA for transport over the period 2014-2020. This period will encompass the next EU Research Framework Programme (FP8), the further evolution of Joint Programming activities between Member States and the second Competitiveness and Innovation Programme (CIP2).
- The outputs of the Task Force will be made at the appropriate times and in adequate formats for EU institutions and Member States throughout the various steps of the preparation and decision of the relevant programmes.

## **The Aims of this Mission**

The aims are threefold:

- In order to address the Grand Challenges, transport research shall be both visible and legible in the context of policy making and competitiveness. Being part of the problem and part of the solution of these Grand Challenges, transport shall be recognised as a core, integral and indivisible part of the future of European research.
- FP8, CIP2 and Joint Programming shall be innovative in their final format and articulated in line with the ERA Vision 2020 and the Lund Declaration.
- They shall be also strongly articulated to the "new Lisbon Strategy", the Knowledge Triangle challenge and the implementation and the follow-ups of the Ljubljana process.

## **Composition of the Task Force**

Moderator: Jean-Pierre Médevielle

- ECTRI: Detlef Zukunft, Josef Mikulik
- FEHRL: Claude Van Rooten, Steve Phillips
- FERSI: Evangelos Bekiaris
- EURNEX: Wolfgang Steinicke
- HUMANIST: Josef Krems, Annie Pauzié
- ISN: Jean-Pierre Verriest, Philippe Vezin
- NEARCTIS: Samuel Sellam, Jean-Baptiste Lesort

*This report is the first released following the roadmap of this joint Task Force.*



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## EXECUTIVE SUMMARY

In 2009, the signatories of the Lyon Declaration agreed to work together in developing the ERA Vision 2020 in the field of surface transport. Representing the main research organisations in the field, these organisations recognised the imperative to work in partnership and with others to address the Grand Challenges facing Europe.

One of the outcomes of this cooperation between the research organisations was the creation of a joint task force to work on the planning for the implementation of FP8, CIP2 and Joint Programming activities for surface transport research and innovation.

This first report prepared by the Lyon Declaration signatories joint Task force presents the preliminary recommendations for:

- **The implementation of the Ljubljana process** following the ERA Vision 2020 and the Lund Declaration
- The proposal for the **architecture of surface transport related research and innovation at European level** with the MERITE (Main European Research Initiative in surface Transport).
- The first **macro level thematic proposals and ideas for coupling the funding instruments and research themes**
- **The need for new instruments that will better support an accelerated pace of research and innovation and promote research for step-changes.**
- The creation of the **European Transport Research Alliance** of research organisations

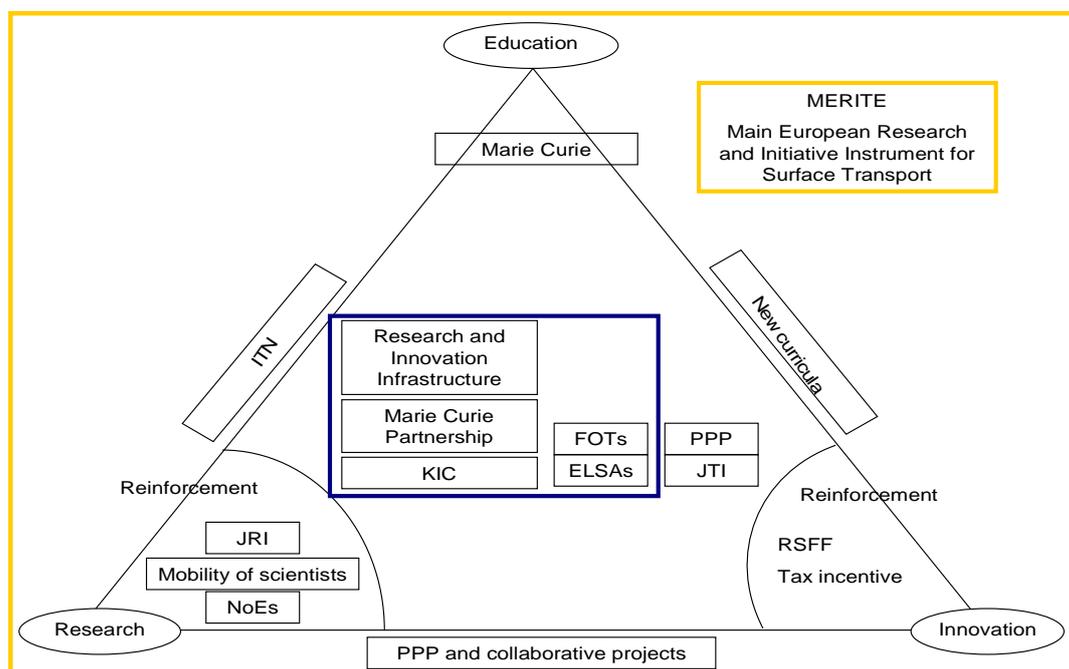
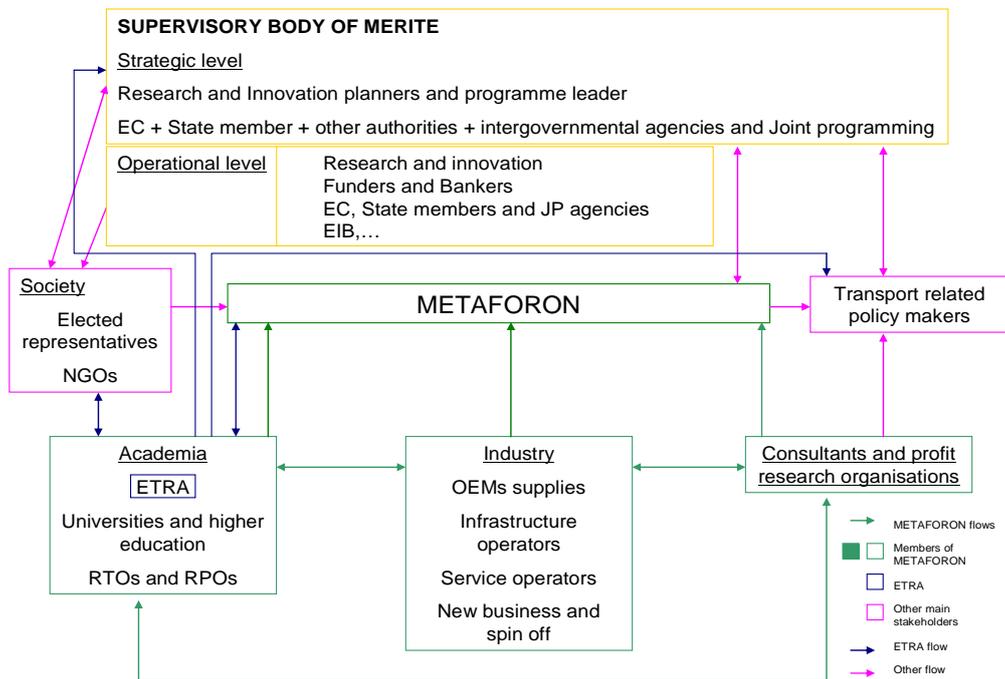


Figure 1: Research and Innovation instruments in the Knowledge Triangle

- The recommendations for the further development of the **European Transport Research Alliance** and the evolution of the **governance of transport research through the interaction with the METAFORON stakeholders forum**



**Figure 2: Suggested governance of European Research and Innovation in Surface Transport**

**Some examples of thematic issues that** could be targeted through such funding using both the traditional and new instruments are listed in Annex of this document.

- The current analysis of the **overall budget required for such an initiative for the period 2014-2020 would be €32.7Bn** including €12 Bn for research in the EU Research Framework Programme and associated Joint Programming activities, €20.5 Bn of EIB and other loans for innovation and €0.2Bn of grants within the Competitiveness and Innovation Programme (CIP).

# INTRODUCTION AND SCOPE

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Prepared by the seven Lyon Declaration signatories (ECTRI, FEHRL, FERSI, EURNEX, HUMANIST, ISN, NEARCTIS), the so-called European Transport Research Alliance, this report contains the preliminary thoughts for the structuring of surface transport research for the period 2014-2020. This period will encompass the next EU Research Framework Programme (FP8), the further evolution of Joint Programming activities between Member States and the second Competitiveness and Innovation Programme (CIP2). The report is intended to support the planning processes of the Member States, the European Commission (EC), the European Parliament (EP) and also those of the European Transport Research Alliance and other bodies engaged in the process.

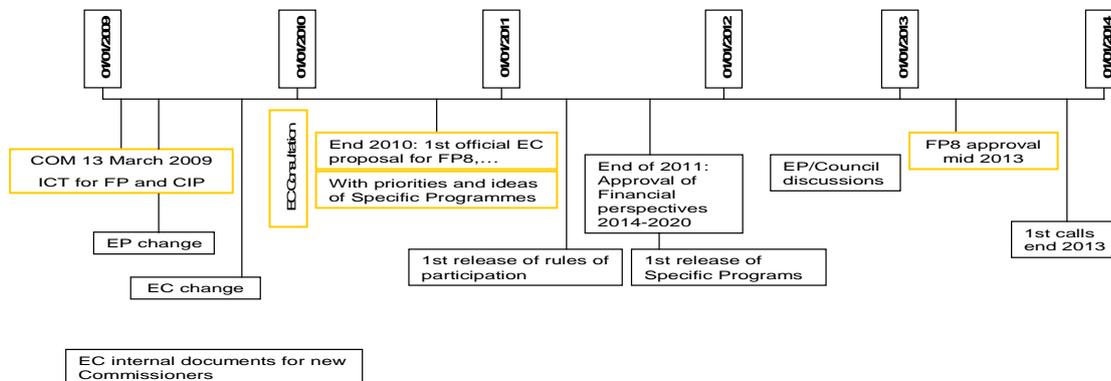
This report is aimed at the development of the European Research Area concept (horizontal, governance, administrative and financial issues including instruments) in the field of surface transport and at outlining initial components of the programme for surface transport related research.

These thoughts should be considered as a deepening of the process of the Lyon Declaration and the associated Brno Commitment (detailing important urban transport components). Taking into account the Lund Declaration “Europe must focus on the Grand Challenges of our time”, the proposals of the ETRA are consistent with ERA Vision 2020 and the previous troika of EU Presidencies for transport research and for all scientific domains.

The relevance of transport in the Grand Challenges that Europe faces, e.g. climate change, energy, water and food, public health, ageing societies and globalisation, should not be disputed. In many of them, transport is part of the problem, in others it is a part of the solution and in many it is both problem and solution. Taken from a global perspective, the relevance of transport becomes more concrete;

This report is not only important for the signatories of Lyon Declaration and their members; is also the first building block submitted to the Member States, EC, EP and other relevant stakeholders (automotive, rail, urban transport ...) about the European Research Area in the time scale 2014-2020 (encompassing FP8, Joint Programming and CIP2 issues) for an important sector and system facing big challenges of today and the future.

This report shall be followed in due course by other documents according to the time table proposed by the Task Force members and detailed in the following chart.



**Figure 3: Chart of the most probable time frame**



## SETTING THE SCENE: VISION AND SCENARIOS

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1. The question that is addressed here is; why is a strong and dynamic Surface Transport European Research Area of such overarching importance? This can be addressed in a number of different ways;
  - First, the transport system is either part of the problem or the solution for all of pressing societal and political **Grand Challenges**. Often transport is in both the problem and solution category. These Challenges include climate change, energy, water and food, public health, ageing societies and globalisation. Some examples of these issues include the need;
    - to make transport infrastructure and transport systems more resilient to a changing climate as well as directly reducing the climate change impacts of transport (22% of CO<sub>2</sub> emissions in EU<sup>1</sup>),
    - to reduce energy consumption in transport system increasing the security of supply ((20% of energy consumption and 98% of the energy consumed in this sector is fossil energy<sup>2</sup>)
    - to reduce transport system impacts on ground water supplies and consider transport and water in land-use planning
    - to increase effectiveness of transport for necessary food production (eg in developing countries) and to improve/innovate in transport logistics to reduce food wastage.
    - To raise the standards of public health by increasing access to health facilities (including developing countries), increasing the resilience of the transport system in pandemics and reducing traffic accidents fatalities and injuries.
    - To adapt transport and mobility systems for an aging population (17% of people in the EU are more than 65 years old<sup>3</sup>).
    - to shape and maintain a transport system that reflects the needs of the developing globalisation and to help European transport system stakeholders adapt.
  - Second, on the economical side, the industries (automobile, construction, rail, ship building, and their suppliers) are facing key challenges for their competitiveness: necessitating innovation or revolution of their services and products while facing market or reform regulation for better transport system integration and performance.
  - Third, on the scientific and technological side, new technologies (ICT, nanotechnologies) are entering the transport system, the constituent components, services or products and their standardization. But there is also a need for integrated or system approach that draws on the agendas for soft research outcomes such as HMI, economics, acceptance, innovation process and pathways, orgware research<sup>4</sup>...
  - Fourth, the urgencies linked to the economical and ecological crisis and their impact on the transport system create a need for timely research results (requiring sufficient anticipation) to resolve all the challenges in innovative and creative ways. A consensus is emerging that the 'Business as Usual' scenario has no role in the future<sup>5</sup>. The various scenarios that emerge create various research needs from the need for an acceleration of incremental or breakthrough innovations (technological, organisational, societal, institutional etc).

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<sup>1</sup> Source [http://ec.europa.eu/energy/publications/doc/statistics/ext\\_co2\\_emissions\\_by\\_sector.pdf](http://ec.europa.eu/energy/publications/doc/statistics/ext_co2_emissions_by_sector.pdf)

<sup>2</sup> Source <http://www.ec.europa.eu>

<sup>3</sup> Source Eurostat 2008

<sup>4</sup> Research on organisational or institutional issues

<sup>5</sup> See ERTRAC scenario 2030+ or EGCI road map - eSafety, RTD WG, WATERBORNE and ERRAC vision and scenarios

According to all models, "Anticipation by research and the accompanying research for the transition" becomes a critical subject.

The research outcomes of the period to 2020 will determine, even in a non-linear innovation scheme, the essential elements of the transport system of 2040+. All have to be integrated in this transport system<sup>6</sup> which is moving towards a zero-accident and de-carbonised system.

- Fifth, the Challenges lead to a requirement for an increase of the European program dimensions (both in their scope and funding) allocated to surface transport research. This should lead to greater contribution from and between EU programs, Joint Programming and national programming, and research innovation and education, and also addition of new instruments in this perspective.
- Sixth, the needed response requires substantial investment for the training and education of professionals. If Europe wants to keep or attract world R&D centres, it is of overarching importance that a new generation of the European transport scientific community (scientists, engineers, and other staff) is created; replenishing and replacing but also growing industrial, commercial, public sector and academic research capacity.
- Seventh, it is of vital importance to tackle the need for hard and soft research infrastructures providing the capabilities to address the challenges. This will include full-scale experimentation capabilities addressing aspects such as climate change adaptation as well as new simulation facilities and data bases.
- Eighth, without a strong integrated and dynamic European Research Area in the surface transport domain, it could be difficult to tackle all these challenges.

2. To build both surface transport European Research Area and surface transport research programs, the so-called Ljubljana process is critical with its five main issues of the Lund Declaration:

- Mobility and the Fifth Freedom
- European Research Infrastructure
- Training and Education and European research partnership
- Reinforcement of the research institutions
- International cooperation.

The quest for excellence in this domain is not only the peer to peer evaluation of excellence, but also the relevance excellence determined by the impacts achieved as well as the governance and management excellence, including scientific process or innovation processes.

Our joint vision is that the legibility at the European level of the transport research domain is an essential attribute of any meaningful attempt to tackle the Grand Challenges, new key scientific challenges, globalization and standardization because their inclusion in the integrated transport system is the cornerstone of all scenarios for a real sustainable transport system

In other words, to split transport related research into more than one priority in any future programmes will inevitably reduce Europe's ability to succeed in addressing Grand Challenges. This is because for each of the Grand Challenges, transport is at least the second priority.

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<sup>6</sup> See position paper of Lyon and Brno Declaration signatories for the next transport White Paper

Finally, it could also be possible to consolidate an articulated process with ICT technologies. Our belief is that it could further facilitate the dialogue between scientists and society and between scientists and policy makers who are not yet sufficiently organised to be able tackle all the Grand Challenges and the related transport issues.



## **GAPS AND RECOMMENDATIONS FOR EUROPEAN RESEARCH AREA**

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1. As the Lyon Declaration<sup>7</sup> gives an overview on the ERA 2020 Vision for the surface transport related research domain, many of the recommendations of this report are developments of this Declaration of the key research bodies.

The transport related research domain is based on focused research encouraging new frontier research developments and its translation into scientific knowledge in a form useful for the different stakeholders according to their individual time frames or strategic requirements. This process is of considerable Strategic importance when the Grand Challenges demand an acceleration in the pace of innovation (both incremental and breakthrough) and implementation.

So, the first recommendations of the Group focus on the ERA development and needs for instruments.

2. On ERA development, surface transport research needs a major development of the Fifth EU Freedom.

- Mobility of researchers through Marie Curie and European partnership is absolutely critical for “passing the ball” around and between the European transport research team. This will improve interaction between frontier and focused scientific knowledge.

- Training and Education for a new generation of scientists, engineers and technical staff for academia, RTOs, industry and policy making institutions is important. A key challenge will be the creation of a new generation of professionals linked to the evolution of the transport system.

- World-class European research infrastructures are critical for the transport sector, not only aimed at opening new frontier knowledge but also at preparing the answer to the political and/or societal challenges and address competitiveness issues.

The types of investments here include new hard research infrastructures addressing issues such as climate change adaptation but also new soft research infrastructures, particularly there is a need for new data bases from demonstrations, FOTs or scientifically adapted to the new challenges.

- The reinforcement of the research institutions and their transnational, institutional or scientific networks in the frame of the Knowledge Triangle or for the need of innovation is supercritical: it is not only relevant for the research institutions but also to avoid detrimental effects on other stakeholders. Scientific knowledge and the information society must be strengthened by increasing the attractiveness of EU for World-class R&D centres. The key aim in this respect is raising (scientific) Excellence, Relevance and Governance and promoting good interaction between frontier and focused research.

- International cooperation, on the models prepared by some European projects or the so called ECTRI-TRB report<sup>8</sup>, has to be reinforced in order to address the ERA challenges globally. Practical examples of research benefits could arise through greater harmonization of data and knowledge useful for standardisation and policy making, through mutual understanding and recognition of scientific excellence as well as direct research cooperation through the key areas addressed above: mobility, training and research infrastructures all have international dimensions. This effort will be aimed at improving the international interfacing of European surface transport research excellence.

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<sup>7</sup> The Lund Declaration has generalised the Lyon Declaration to the European research and innovation system.

<sup>8</sup> Title of report

- Tackling the new Grand Challenges where transport is a part of the problem and a part of the solution is of overarching importance.

3. On the needs for instruments, the development of a strong and dynamic transport ERA depends on achieving proper balance between introducing novelties and maintaining the necessary familiarity for stakeholders to focus on innovative research rather than the research process.

- a. There is a strong argument of the Continuation of existing instruments in their essential forms. This includes the need for the continuation of various instruments albeit with some careful clarification of their scope, their limits and their formats. These should include;
- European Technology Platforms (ETPs) ,Public Private Partnerships (PPP)
  - Collaborative Projects including both the large Integrated Projects (IPs) as well as the STREPs and CSAs
  - NoEs /VCEs favouring lasting integration<sup>9</sup>, ITNs and EIT/KICs.
  - ERIC for research infrastructure operation
  - Public Private Partnerships (PPP)

b. There is a need for new instruments because the evolution of the research environment in its diversity and time frame, and the need to tackle Grand Challenges with an adequate and timely response demands that we go further and develop in parallel a new series of instruments including meta-instruments. These instruments should be responsive to and developed to encourage new innovative research practises and processes

In other words, at the same time as maintaining the familiar instruments, we need to have parallel developments of legitimate instruments that not aimed at the same part of the Knowledge Triangle, and meta-instruments articulating all these developments around the Knowledge Triangle concept and its dynamics.

c. The needs for “new simple instruments” will largely be driven by the implementation processes. This case will be particularly representative of the transport research dealing with the accelerated pace of innovation associated with the new scientific knowledge needs (ICT or low carbon) and the Grand Challenges. This will create the need to have the following instruments:

c.1. A series of instruments linked to the development in line with introduction phases; where simple demonstration or pilot project are insufficient:

A package of the type of FOT<sup>10</sup> has to be developed aimed to meter and collect adequate engineering and/or societal data scientifically:

- Firstly, at various scales of the implementation of innovation, accelerated incremental and breakthrough innovation needs to take into account the actions and reactions between society, the business model and the regulatory framework. This will apply for the local and/or lead market through to the full European and global market.
- Secondly, for the geographical orientation of FOTs where there is a need for it to be developed to improve the robustness of result and for determining the stability over time and distance.
- Thirdly, for the integration of the various steps of innovation process and addressing the different facets of the innovation process (industrial development, commercial development, organisational development and institutional environment, regulation, standardization).

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<sup>9</sup> - European Court of Auditors Survey result Special Report No 8

- DG budget ad'hoc Task Force report on NoE sustainability

<sup>10</sup> The next step planned after current or planned FOTs by DG INFSO, the so called ELSA Transport is one of this new key large scale action.

- And finally, to comprehensively demonstrate the stability and cost-effectiveness of the technological and other aspects of these innovations.

This type of instrument would aim at different balances of private or public funding<sup>11</sup> and will require both hard and soft research infrastructures to meter and collect adequate data.

c.2. In addition there is a need to think of a package of PPP linked to Joint Programming,.

c.3. The need to promote the development of scientific knowledge and for international excellence in Europe (including relevance and governance) generates a greater need for Focused Joint Research Initiatives. This instrument aimed at the international excellence and reinforcement of European research organisations and their European networks would tackle and accelerate the creation of scientific knowledge and is focused on one corner of the Knowledge Triangle.

These projects shall be consist of focuses oriented, freely developed partially and developed under calls aimed at developing focused and scientific knowledge that could be useful in the future for different stakeholders with a variety of models of scientific development.

- Taking new frontier research outcome and transforming it for the transport scientific community of stakeholders without time frame
- Working on the excellence of each partner and of the European network
- Anticipating and addressing the needs for standardization (because of the time lag)
- Disseminating to the stakeholders or by spin-offs
- Or creating new scientific based soft research and innovation infrastructures useful for all the stakeholders at intermediate, medium or long term, or managing new hard research infrastructure at European and/or International level as appropriate.

The overall aims of these initiatives are organizing both the international excellence of European research operators as well as preparing the strategic scientific knowledge of tomorrow and the future models in a synergetic way of some existing Associations, the previous NoEs, ITNs or some elements of the KICs

The concept could be described as a research organisation consortium conducting the programme with a strong platform of oversight (from stakeholders, scientists etc) exchange, dissemination with other stakeholders and a platform for spin-offs creation

c.4. To foster the innovative step-change characteristic of R&D there is a need for a new instrument that supports preparatory research through funding at full cost lead by academia/research institutions with road maps defined by relevant stakeholders. This could either be a new form of Collaborative research project or part of JRIs.

#### d. Needs for Meta-instruments

d.1. Joint Programming has a need for consistency, organisation and articulation of all instruments around a concept of research process development or research innovation paradigm. In deed this aspect is also important for the development of the remainder of FP7 and the forthcoming FP8 through the Vision 2020 of the European Research Area,

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<sup>11</sup> Key Large Scale Action of 20 000 vehicles or plus can be requested for policy action but not be at the financial scale of the industry to make accelerated or breakthrough innovations into life.

d.2. So, we support the idea in the information society application domain of the new ELSA instrument and the coupling between research innovation and implementation. We are strongly in support of the prospect of an ICT transport ELSA. In fact, ICT development has its proper culture and is articulating innovation with technology on the shelf and innovation coming directly from research. This has been demonstrated through all the linking of ICT for Mobility and Intelligent Transport Systems (eSafety, Intelligent Car or ICT part of EGCI). Organisational and institutional issues including research issues and the path for implementation at a local pilot to a national or European (and international) scale provided challenges for research and innovation at each step of the process that could be better tackled together. (see c.1).

We are recommending that besides this ELSA, stakeholder-led collaborative research, networking and process oriented issues of research and innovation and possibility of JRIs should be added. In doing so, the needs for different scales of FOT and their articulation to full implementation should not be forgotten.

d.3. Need for a Main European Research Initiative instrument

Each Grand Challenge, as each big scientific or technological domain, could lead to a big priority in the next European programmes (FP and/or Joint Programming).

But, when a societal, political, economical domain depending on scientific development for its innovation and competitiveness is a key part of the problem and of the solution of these grand challenges, there is a clear argument for a dedicated European Initiative on that topic.

We are strongly supporting the idea that a Main European Research Initiative instrument for Transport be created. Such an initiative shall include and be articulated in a big European programme based on, for example;

- Various types of PPPs (soft PPP, EIT/KIC)  
IPs, STREPs, CSAs and appropriate clusters of them
- JRIs
- New NoEs

At the least, such a Main European Research Initiative should cover the surface transport domain but it might better to cover the entire transport domain or at least have strong institutional links with the aviation and maritime sector, as it also should with energy, building/construction and other sectors.

This needs also an institutional evolution of existing European instruments:

- A cooperative organisation of European and national TPs
- A cooperative organisation of European and national programmes : the Joint Programming
- A cooperative organisation of research organisations in the vein of a European Transport Research Alliance.

#### 4. Main recommendations

- This report recommends that for the domain of surface transport (and possibly transport) the very clear need, according to the vision of the new Lisbon Agenda and the ERA Vision 2020 and in the vein of Joint Programming and FP8, the creation of a Main European Research Initiative instrument for surface transport. This MERITE should be articulated to the concept of the ICT ELSA (MERITE) and supported by a cooperative organisation of European and national Technology Platforms dealing with the surface transport issue. We

proposed to call such a structure, METAFORON (Main European TrAnsport Forum for Research and innovation)<sup>12</sup>,

- The signatories of the Lyon Declaration, representing the research side will constitute the so-called European Transport Research Alliance or ETRA.
- Because of the Grand Challenges to be faced by surface transport in near future, on the public budget side, we think that on the period 2014-2020, the general budget shall be around 12 G€<sup>13</sup> for research grant coming from FP and JP and 20.5 G€ of loan for innovation and 0,2 G€for CIP as detailed in the conclusion.

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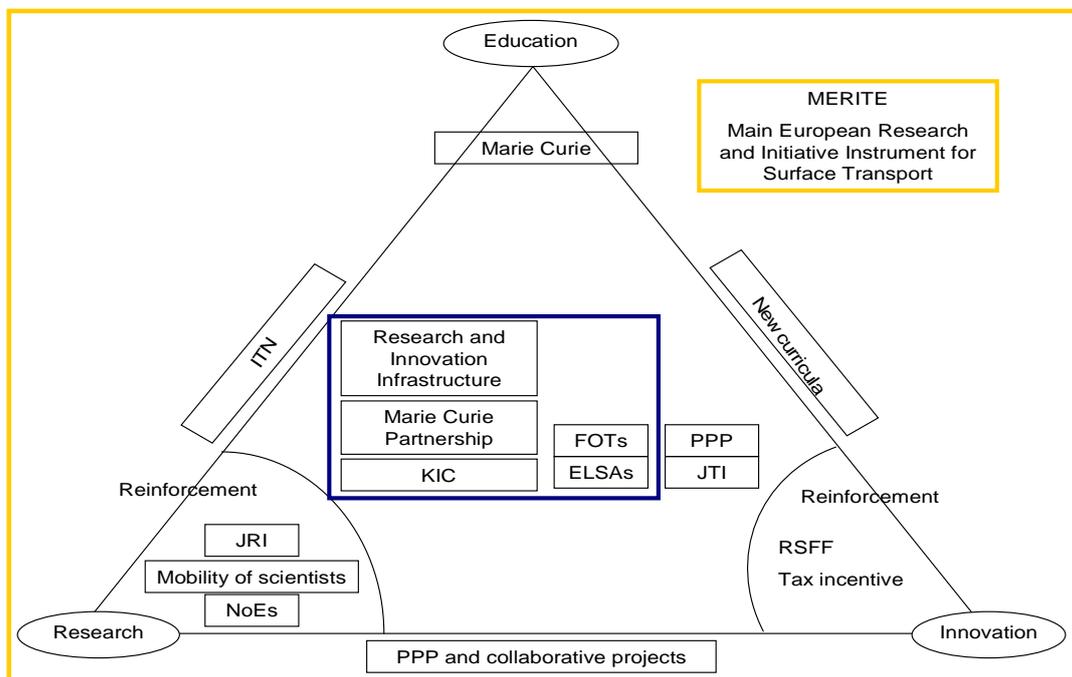
<sup>12</sup> From the Greek word meaning transport

<sup>13</sup> It is not in contradiction with the two EC proposals for FP8, 8 G€for green activities and 8 G€for ICT.



## CONCLUSION

- The European Transport Research Alliance, formed from the signatories organisations of the Lyon declaration have proposed, and are committed to, developing a robust structure for transport research in Europe that will address the Grand Challenges.
- Transport is both a major challenge and opportunity is finding solutions for each of the Grand Challenges and the innovation and implementation needs must be address in a holistic way across the transport sector by avoiding fragmentation.
- The model scheme for addressing these Grand Challenges, as well as other societal and competitiveness is for the creation of the MERITE - Main European Research Initiative instrument which will address the knowledge triangle for transport.



**Figure 1: Research and Innovation instruments in the Knowledge Triangle**

- This MERITE should be supported by a cooperative organisation of European and national Technology Platforms dealing with the surface transport issue. This would be the, METAFORON (Main European TrAnsport Forum for Research and innovation)<sup>14</sup>,
- Some examples of thematic issues that could be targeted through such funding using both the traditional and new instruments are listed in Annex of this document.

<sup>14</sup> From the Greek word meaning transport

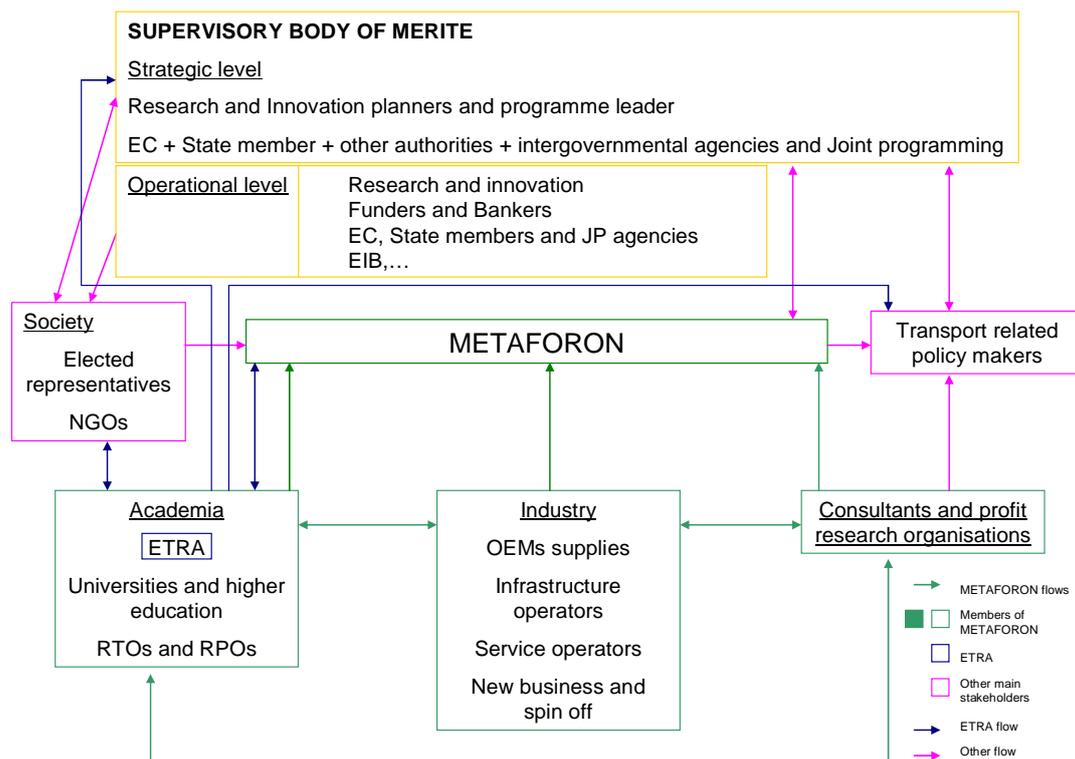


Figure 2: Suggested governance of European Research and Innovation in Surface Transport

The current analysis of the **overall budget required for such an initiative for the period 2014-2002 would be €33 G€** including €12.3 Bn for research in the EU Research Framework Programme and associated Joint Programming activities, €20.5 Bn of EIB and other loans for innovation and €0.2Bn of grants within the Competitiveness and Innovation Programme (CIP). The specific topics that should be targeted through such funding are listed below.

	Research Grant	Innovation Grant (CIP)	Innovation loan	G€
<b>JRI and NoEs</b>	€1 Bn mainly FP	0	0	€1 Bn
<b>Research infrastructures</b>	€1 Bn mainly JP	0	€0,5 Bn	€1.5 Bn
<b>FoTs and/or ELSAs</b>	€4 Bn FP and/or JP	0.1 G€	10 G€	€4.1 G Bn
<b>Collaborative projects</b>	4 G€ FP and/or JP			€4.1 G €
<b>PPP and/or KIC</b>	2 G€	0.1 G€	10 G€	12.1 G€
<b>People</b>	0.3 G€			0.3 G€
<b>Total</b>	<b>€12.3 Bn FP and/or JP</b>	<b>0.2 G€</b>	<b>20.5 G€</b>	<b>€33.0G€</b>

## GLOSSARY

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CIP: Competitiveness and Innovation Programme  
CSA: Coordination and Support Action  
EC: European Commission  
ECTRI: European Conference of Transport Research Institutes  
EIT: European Institute of Innovation and Technology  
ELSA: European Large Scale Action  
EP: European Parliament  
ERA: European Research Area  
ERIC: European Research Infrastructure Consortium  
ERRAC: European Rail Research Advisory Council  
ERTRAC: European Road Transport Research Advisory Council  
ETP: European Technology Platform  
ETRA: European Transport Research Alliance  
EURNEX: EUropean rail Research Network of EXcellence  
FEHRL: Forum of European National Highway Research Laboratories  
FERSI: Forum of European Road Safety Research Institute  
FOT: Field Operational Tests  
FP: Framework Program  
HMI: Human-Machine Interface  
HUMANIST: HUMAN centred design for Information Society Technologies  
ICT: European Conference of Transport Research Institutes  
IP: Integrated Project  
ISN: Integrated Safety Network  
ITN: Initial Training Network  
JP: Joint Programming  
JRI: Joint Research Initiative  
JTI: Joint Technology Initiative  
KIC: Knowledge and Innovation Communities  
MERIT: Main Europe Research Initiative in surface Transport articulated to a METAFORON Forum and an ETRA  
METAFORON: Main European TrAnsport Forum for Research and innovatiON  
NEARCTIS: Network of Excellence for Advanced Road Cooperative Traffic management in the Information Society  
NoE: Network of Excellence  
PPP: Public-private partnership  
RPO: Research Public Organisation  
RTO: Research and Technological Organisation  
STREP: Specific Targeted Research Projects  
VCE: Virtual Centre of Excellence



# ANNEX: GAPS AND RECOMMENDATIONS FOR THEMATIC RESEARCH PRIORITIES

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To render legible, consistent, manageable and appropriate in front of the Grand Challenges priorities or of the big S&T trends, these thematic research priorities are presented in four main domains compatible with the architecture of national programmes or ERANET or Strategic Research Agenda and scenario of transport European Technology Platforms.

## 1. Congestion and capacity

### 1.1 Urban mobility

There is an urgent need for innovative solutions contributing to the sustainable urban mobility development. Most of these steps imply a joint effort of all protagonists. From that point of view the European Union should play an important role and direct its research programs towards the objective of world-leading scientific and technical excellence.

New measures are important to encourage the greater integration of all modes of transport (including soft-modes, park and ride) within an overall infrastructure system that integrates electric vehicles power supplies and can be maintained at high quality within minimum disruption for all users. In addition the EC's initiatives on electrification of urban transport have to be emphasised. There is besides a need of upgrading of statistics and databases on urban mobility (i.e. data on soft transport modes, road safety or environmental and health impact). The resilience of urban networks to climate change and other effects (including security concerns) needed to be anticipated.

The necessity to create cooperation between research community, municipalities and operators has also to be highlighted, linked to the important role that soft transport modes (like cycling or walking) are playing for the mobility in many European cities.

In addition FP 8 calls have also to be based on research and development of ITS technology that bring innovative solutions for goods transport.

### 1.2 Long distance freight and passengers

The idea is not only to work on new connected and sustainable vehicles for all modes, it is also to have a real supply of the co modality chair offered to passengers of freight forwarders, this co modality being a corridor or network co modality.

Whilst not forgetting the needs of existing networks, the concept of the so-called green corridors must be supported. Considerable innovation is needed to develop concepts that could allow the use of the term Green to be applied for routes where high-capacity road/rail services can operate with substantially lower environmental than is possible for current generation of vehicles and infrastructure. Novel and evolutionary approached are needs to far areas addressing the maximisation of available capacity. This could include ITS, 'invisible maintenance', weather-proof networks/routes etc.

### 1.3 Organizational issues

Research on organizational and institutional issues is critical because 'Business as usual' scenarios are no more envisaged for the future.

### 1.4 Architecture and articulation of the three infrastructures (transport, communication, energy)

The ecological and economical crisis allows us to explicit not only the role of transport and communication infrastructures for transport but also the role of energy infrastructure (including grid and smart grid).

Clearly, transport services and operators have to tackle these infrastructures serving transport in a new co modal sustainable and intelligent infrastructure operated with CO2 concern in mind.

## 2. Environment and Energy

Besides the CO<sub>2</sub> problem, other GHGs have to be looked after, as other air pollutant but a new problem has to be revisited the noise vibration and dust issues by mode but also in a co modal operation of networks.

CO<sub>2</sub> problem is highly costing in transport, so the difference between the two oil peaks of 1973-1979, where fossil fuels have been kept for transport explaining the growth of the share of transport in the energy consumption landscape, is today to tackle also for transport with robust reliable accelerated incremental and breakthrough solutions.

A comprehensive picture of the entire GHG, health and ecological footprint of the surface transport sector needs to be examined that addresses all aspects of vehicles and infrastructures. The impact of infrastructure needs to be reduced – including its interaction on vehicles – with low-noise, low-energy, low-emissions, low-severance and low-pollution solutions demonstrated and implemented.

## 3. Safety and Security

In road safety, the unachieved goals for 2010 of traffic fatalities reduction call for further strengthening of our efforts to bridge the gap and, especially, to focus upon sustainable safety improvements. Furthermore, the safety of specific vulnerable road users (i.e. elderly, children, bicyclists and PTW riders) needs to be prioritised. Finally, new traffic safety challenges from the introduction of clean vehicles need to be met.

Regarding comodal and multimodal transport, it seems that more and more freight or passengers are utilising their benefits. So far security, safety and scientific knowledge have to be developed and created even for a large part: this is critical for the users of transport systems. By example, RFID research as new format of communication such IPV6 and frequency allocation or EMC are also critical.

As far as rail and guided transport is concerned, the aim is to develop global rail safety and security approach in relationship with operators in order to make the transport infrastructure and vehicles safer and to ensure optimal levels of network capacity, passenger and freight mobility. It is necessary to carry out research on:

- Safety and security management including philosophy and culture
- Active safety (control/command, level crossing...)
- Passive safety requirements and assessment
- Incident/accident database and learning
- Risk analysis and assessment
- Technical and operational safety
- Occupational Health and Safety
- Safety impact of maintenance
- Human factors and safety
- New technologies to enhance security
- Psychological aspects of security
- Prevention of terrorism.

## 4. Globalization

The Grand Challenges are global or at least intercontinental, so the internationalization and globalization are critical issues for transport systems and transport industries.

The main issue is to participate at the European level to the S&T knowledge production these Grand Challenges require.

The international rule or policy making and the international standardization, or the economic globalization, require a lot of scientific knowledge production in cooperation or not, and a lot of scientific knowledge harmonization especially when quantification and measurement is at stake, but not only.

That is clear not only for automotive industry or maritime transport but also for rail industry or waterborne industry and it is clear also for the management, the conception and the operation of transport infrastructure in inter relation with ICT and energy infrastructure. It is clear to benchmark, to meter and to deliver operational concepts into life.

**Some ideas of coupling themes and new or restructured instruments :**

JRIs	FOTs and ELSAs	Research and Innovation Infrastructures	PPP
<ul style="list-style-type: none"> <li>• Individual acceptability and acceptance including HMI</li> <li>• New concepts for modal safety and co modal safety</li> <li>• Advanced Transport Network Sustainable and Intelligent Operation</li> <li>• Preliminary research for articulation between Transport ICT and Energy Network Organisations and Operators</li> <li>• Co modal Noise Vibrations and Dust</li> <li>• New concept of future rail system in a co-modal environment</li> <li>• Stimulation and modelling of transport capacity/efficiency, environmental and system aspects</li> <li>• Scientific knowledge for international harmonisation               <ul style="list-style-type: none"> <li>. Safety</li> <li>. Operation</li> <li>. CO2</li> <li>. Other environment issues</li> <li>. Other energy issues</li> </ul> </li> </ul>	<p>ELSA:</p> <ul style="list-style-type: none"> <li>• ICT IPV6 cooperative systems ELSA</li> <li>• Surface transport electrification ELSAs FOTs</li> <li>• New multimodal cooperative systems</li> <li>• Freight sustainable and intelligent corridors and Networks</li> <li>• International benchmark and cooperation of FOTs and ELSAs</li> <li>• Naturalistic driving studies</li> <li>• Step change technologies for system level improvements in rail operations</li> <li>• Skidding resistance and surface properties</li> </ul>	<ul style="list-style-type: none"> <li>• New databases and warehouses for transport and its grand challenges</li> <li>• Virtual testing facilities</li> <li>• Simulation facilities</li> <li>• Climate change adaptation testing structures network</li> <li>• Environmental bench marking testing facilities</li> <li>• High-speed modelling data links (including INCO)</li> <li>• EURail European Rail University</li> </ul>	<ul style="list-style-type: none"> <li>• European Green Car Initiatives</li> <li>• ERail train set initiative</li> <li>• ERail Intelligent Infrastructure Initiative</li> <li>• New Articulated Sustainable and Intelligent Transport Infrastructures (eg. Forever Open Road)</li> </ul>

## THE LYON DECLARATION SIGNATORIES

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ECTRI, the European Conference of Transport Research Institutes, is an international non-profit organisation that was founded in April 2003. Its members are 20 major transport research institutes or universities from European countries. Together, they account for more than 3,000 European scientific and research staff in the field of transport. ECTRI aims to help building the "European Research Area" (ERA) in surface transport by cooperation in thematic and process oriented working groups, task forces, Framework Programme projects and seminars. More information about ECTRI at: <http://www.ectri.org>



Formed in 1989 as the Forum of European National Highway Research Laboratories, FEHRL provides a coordinated structure for the interests of the thirty plus national research and technical centres in Europe and Internationally. FEHRL's aim is to encourage collaborative research and information exchange between European Laboratories and Institutes in the field of road engineering as well as to provide relevant knowledge and advice to governments, the European Commission, the road industry and road users on related technologies and policies. FEHRL is engaged in road engineering research topics such as safety, environmental issues, telematics, bridge and pavement engineering and geotechnics. More information about FEHRL at: <http://www.fehrl.org>



The Forum of European Road Safety Research Institutes (FERSI) was established in 1991 with the objective of encouraging collaboration between European road safety research institutes. Such collaboration was, and continues to be, necessary to ensure that the problems of road safety in European countries are researched by the best available expertise, and that the results of the research are implemented in the most appropriate and effective way, both at national or at European level. More information about FERSI at: <http://www.fersi.org>



EURNEX - the FP6 European Rail Research Network of Excellence (NoE) - was created in January 2004 and supported by ECTRI. It aimed to integrate a fragmented research landscape, promote the railways contribution to sustainable development and improve the competitiveness and economic stability of the European rail sector. EURNEX included 63 universities and research centres from 18 EU Member States and Russia, as well as key railway associations, such as UIC, UITP, and UNIFE. EURNEX ended in December 2007 and has successfully turned into a self standing sustainable legal entity in order to continue its activities. More information about EURNEX at: <http://www.eurnex.net>



The goal of the FP6 HUMANIST Network of Excellence (NoE), supported by ECTRI and FERSI, was to promote a Human centred design approach and also to federate research in its scientific domain, by creating a European Virtual Centre. The creation of the virtual centre was an answer to the scattering of research capacities in Europe. This has been done by setting up strong connections between partners inside the NoE. The relationship with Universities and Academic World outside the NoE were not set aside, and were enhanced through training programmes and welcoming young researchers. Outputs from NoE were also targeted toward other relevant stakeholders such as National and European public authorities, Standardisation Bodies, National and European RTD Projects. Diffusion and transfer of knowledge, in addition to common partnerships between NoE and these entities ensured flow of information in order to disseminate the concept of Human centred design outside the Network. Such a diffusion of information ensured the effectiveness of the expected impacts. The HUMANIST Network of Excellence ended in February 2008 and is now continuing its activities under the status of a Virtual Centre of Excellence created as an international association.

More information about HUMANIST NoE at: <http://www.noehumanist.org>

More information about HUMANIST VCE at: <http://www.humanist-vce.eu>



The aim of APSN - Advanced Passive Safety Network – (FP6 Network of Excellence supported by EARPA and ECTRI) was to mobilise the European scientific & business expertise in Vehicle Passive Safety to accelerate improvements in road safety in order

to reduce the annual road victims for the European Union. APSN joint technical and scientific objective was to enhance the level of road safety at affordable costs for the individual user as well as for the European society. APSN members' expertise varies from vehicle, body parts and restraint system manufacturers, computer modelling and software companies to international research and educational organisations like universities, crash testing and biomechanical research institutes. The Network counted more than 50 different organisations from about 20 different countries. It ended in April 2008 and now continues its activities under the status of a Virtual Centre of Excellence called Integrated Safety Network (ISN) created as an international association.

More information about APSN/ISN at: <http://www.passivesafety.com>



NEARCTIS (FP7 Network of Excellence: Advanced Road Cooperative Traffic management in the Information Society, sponsored by ECTRI) is an academic network involving teams working in the field of traffic management and optimisation, with a particular focus on

cooperative systems. Within the field of ICT for mobility, the project deals more specifically with the question of cooperative systems for road traffic optimisation, but also covers a wider scope as it appears that cooperative systems have to be integrated into the whole traffic management system. This aims to develop systems able to cope with the main problems at stake: safety, energy consumption, environmental impacts and congestion as an obstacle to mobility. The main objective of the project is to constitute what could be considered as a virtual research institute. To reach these objectives, the project will include a harmonisation of the research programme of all the partners on the various topics addressed, specification of case studies to be made in common, and the elaboration of a dissemination and training programme for researchers and professionals. A focus will be on spreading excellence towards the scientific community of the field, particularly for the European Union newcomers. Tight relationships with the international scientific community, but also with the main stakeholders of the field (traffic operators, local authorities, consultants or manufacturers) are ensured through a network of associate partners who are involved in all the main activities of the project.

More information about NEARCTIS at: <http://www.nearctis.org>



## LYON DECLARATION

### TEXT

- We, ECTRI, FEHRL, FERSI, EURNEX, HUMANIST, ISN and NEARCTIS,
- Meeting in Lyon-Bron, France, at the opportunity of the French EU Presidency event on "Sustainable transport and mobility and climate change challenge" organised by INRETS,
- Representing an active part of the European Surface Transport scientific community,
- Taking into account the prominent role of transport in the key challenges that society and economy face (energy, climate change, globalization, congestion and capacity, safety and security, ageing population),
- Committed to the success of the European Research Area in the field of transport research,
- Considering the solemn approval by the European Ministers of Science Council of the European Research Area (ERA) Vision 2020 on December 2, 2008,
- Having in mind the European Economic Recovery Plan announced on November 26, 2008 (COM(2008) 800),
- Approve the following Lyon Declaration, and invite all transport related research stakeholders to support it by discussions, actions, and further developments:

Lyon Declaration, 11 December 2008

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[http://eufp-event.inrets.fr/docs/Lyon%20Declaration\\_ETa.pdf](http://eufp-event.inrets.fr/docs/Lyon%20Declaration_ETa.pdf)



We, ECTRI, EURNEX, FEHRL, FERSI, HUMANIST VCE,

- Meeting in Brno, Czech Republic at the opportunity of the Czech EU Presidency event "European Transport Research and Innovation Week" organised by CDV – Czech Transport Research Centre,
- Representing an active part of the European Surface Transport scientific community,
- Having in mind the European Economic Recovery Plan announced by the European Commission on 26 November 2008,
- Having regard to the Commission Green Paper of 25 September 2007 entitled "Towards a new culture for urban mobility" (COM(2007)0551),
- Having regard to the Commission White Paper of 12 September 2001 entitled "European transport policy for 2010: time to decide" (COM(2001)0370),
- Having regard to European Parliament resolution of 23 April 2009 on an action plan on urban mobility (2008/2217(INI)),
- Having regards to the Opinion of the Committee of the Regions on the European Parliament's Report on 21 April 2009,
- Committed to the success of the European Research Area in the field of urban transport research,
- Recognising the fact that sixty per cent of the European population lives in urban areas and that number will rise to eighty per cent in 2020, making urban transport a major component of goods and passenger transport in Europe, which has also very significant impact on the environment and health,
- welcoming the European Parliament resolution of 23 April 2009 on an Action Plan on Urban Mobility,
- supporting the European Commission activities on urban mobility and encouraging the rapid publication of the announced Commission Action Plan,
- being convinced that there is added value of action at EU level in the field of urban mobility and especially in the field of research and its application.
- We agree the following Brno Declaration and invite all urban transport related research stakeholders, municipalities, transport operators and political decision makers to join with us to support it by discussions, actions, and further developments:

#### Our commitment

1. We are committed to establish partnership between transport research institutions and city and transport authorities and organisations in order to tackle the urban mobility problems and contribute to their solution.
2. We are committed to the common conviction that the application of innovation will provide solutions to the challenges of sustaining transport and mobility in urban areas.
3. We are committed to furthering and expanding the partnership established through the Lyon Declaration of 11 December 2008.

LUND DECLARATION  
July 2009

### The Lund Declaration

EUROPE MUST FOCUS ON THE GRAND CHALLENGES OF OUR TIME.

- European research must focus on the Grand Challenges of our time moving beyond current rigid thematic approaches. This calls for a new deal among European institutions and Member States, in which European and national instruments are well aligned and cooperation builds on transparency and trust.
- Identifying and responding to Grand Challenges should involve stakeholders from both public and private sectors in transparent processes taking into account the global dimension.
- The Lund conference has started a new phase in a process on how to respond to the Grand Challenges. It calls upon the Council and the European Parliament to take this process forward in partnership with the Commission.

The global community is facing Grand Challenges. The European Knowledge Society must tackle these through the best analysis, powerful actions and increased resources. Challenges must turn into sustainable solutions in areas such as global warming, tightening supplies of energy, water and food, ageing societies, public health, pandemics and security. It must tackle the overarching challenge of turning Europe into an eco-efficient economy.

To respond effectively, the European Research Area must develop processes for the identification of Grand Challenges, which gain political support and gradually move away from current thematic approaches, towards a structure where research priorities are based on these Grand Challenges. Responses to Grand Challenges should take the form of broad areas of issue-oriented research in relevant fields.

Processes to ensure quality, relevance and trust will be of crucial importance for Europe's ability to meet contemporary and future Grand Challenges and use knowledge as a tool to turn problems into opportunities and progress. Such processes have to be articulated in the context of Research, Education and Innovation communities, and be based on the understanding of the interaction between "bottom-up" and "top-down" initiated research. The development of such processes is a matter of urgency.

The identification of the Grand Challenges must engage the major stakeholders including the European Institutions, business, public services, NGOs and the research community as well as interaction with major international partners. Meeting the challenges should involve public-private partnerships, including SMEs, with their potential to develop excellent and sustained problem-solving capacity. It will require Member States to develop more pro-active strategies on research priorities at regional, national and Community level. The Framework Programme for Research must also respond to these demands. Therefore the Commission and the Member

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<http://etiw.cdv.cz/file/brnenska-deklarace-pdf/>

[http://www.se2009.eu/polopoly\\_fs/1.8460!menu/standard/fil/e/lund\\_declaration\\_final\\_version\\_9\\_july.pdf](http://www.se2009.eu/polopoly_fs/1.8460!menu/standard/fil/e/lund_declaration_final_version_9_july.pdf)





EURNEX

FEHRL

