

EUTRAIN

EUropean Transport Research Area INternational
Cooperation Activities



Towards a Framework for EU
international transport research cooperation

FINAL RECOMMENDATIONS

BRUSSELS, NOVEMBER 2013



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Foreword

This publication presents a recommended framework for international cooperation in the field of Transport research and indeed for research in general. It is the result of a two year work done in the framework of the EUTRAIN project¹. It contains recommendations on the future mechanisms and programmes for international cooperation, a review of the current practices, the identified priorities and research needs from both European and international researchers, and many other material that was derived from the research conducted under the project as well as from the many workshops, Conferences, and bilateral visits that the study team performed as part of the project work.

The recommendations are primarily aimed for use by the relevant European Commission services, in order to assist them in promoting new structures and related actions that will contribute in future towards more international cooperation research activities especially within the new 7-year research framework programme Horizon 2020.

We hope that the reader will find this publication interesting as well as of use to his/her work and that it will ultimately promote International Cooperation not only in transport research but in transport policy and transport operation issues too.

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Abbreviations and Terminology

BRICS	Brazil, Russia, India, China and South Africa
CEN	European Committee for Standardisation
CENELEC	European Committee for Electrotechnical Standardisation
CIP	The EC's Competiveness and Innovative Programmes
CRR	Central Road Research Institute
CSA	Coordination and Support Actions
CSIR	Council for Scientific and Industrial Research
DETRA	Developing the European Transport Research Alliance
EC	European Commission
ECTRI	European Conference of Transport Research Institutes
ENP	European Neighbourhood Policy
ERAC	European Research Area and Innovation Committee
ERA-T	European Transport Research Area
ERRAC	European Rail Research Advisory Council
ERTICO	European Road Transport Telematics Implementation Coordination Organisation
ERTRAC	European Road Transport Research Advisory Council
ESFRI	European Strategy Forum on Research Infrastructures
ETSI	European Telecommunications Standards Institute
EURNEX	EUropean rail Research Network of Excellence
FEHRL	Forum of European National Highway Research Laboratories
FWHA	Federal Highway Administration
FRA	Federal Railroad Administration
GPC	High Level Group on Joint Programming
ICPC	International Cooperation Partner Countries
ICPNC	International Cooperation Promotion and Networking Centres
INCO	International Cooperation
ISO	International Standardisation Organisation
JPI	Joint Programming Initiative
NAE	Network of Associated Entities
NRE	Network of Related Entities
NoE	Network of Excellence project
PWRI	Public Works Research Institute
RE	Related Entities
RI	Research Infrastructure
SIMBA	A FP6 Project on Strengthening road transport research cooperation between Europe and emerging international markets
SIMBA II	A FP7 Project on Strengthening road transport research cooperation between Europe and emerging international markets
SRA	Strategic Research Agenda
STADIUM	A FP7 Project on smart Transport Applications Designed for large events with Impacts on Urban Mobility
TRA	Transportation Research Arena
TRB	Transportation Research Board
TRIPS	Trade Related Aspects of Intellectual Property Rights
VIAJEO	FP7 Project on Open Platform for Transport Planning and Travel Information
WATERBORNE	European Technology Platform for stakeholder from the Waterborne sector
WTO	World Trade Organisation





1. Introduction

The present document aims at highlighting a comprehensive set of recommendations for putting in place an efficient framework for international cooperation in the field of transport research (and in many aspects for any research field).

The framework presented herein has been developed by synthesizing the results of extensive and intense workshops, surveys and interviews as well as reviews of current activities on international cooperation, involving hundreds of individuals and organisations. During the two years of its duration, the EUTRAIN consortium organised four “regional workshops” in Athens, Beijing, Sao Paulo and Moscow with participants from their wider regions i.e.: the Mediterranean, Australasian, South America, and CIS/Black Sea regions countries respectively.

Furthermore, the EUTRAIN consortium members also visited several individual countries such as China, Japan, U.S.A., Egypt, Algeria, etc. During these visits, the consortium members carried out comprehensive surveys through questionnaires, interviews and focus groups meetings. These surveys collected local stakeholders’ needs and interests, priorities, as well as assessments of current international cooperative projects’ practices and policies. All the material that resulted from these activities together with existing experience and know-how (e.g. through the results and recommendations of projects such as: CETRRA, DETRA, SIMBA, SIMBA II, VIAJEO, STADIUM, SOLUTIONS and Viajeo PLUS), and the consortium’s own research and experiences, has been the main background to form the recommendations presented in this document.



2. The challenges faced

International research collaboration has to deal with specific issues and is faced with several difficulties, such as cultural differences, language barriers, different project management and funding regimes as well as instruments, etc. In FP7 and FP6 projects dealing with international cooperation issues, it was shown that participation of international partners as consortium members is – in most cases – quite essential to the success of the project or research being performed. However, many organisations involved in international cooperative research work have difficulties to fulfil the necessary administrative requirements and are in several instances unable to efficiently use the available resources.

International cooperation activities also face resource challenges in Europe, too. Since some European countries are still in recession or on slow recovery, the importance of supporting international cooperation work may not be highlighted by policy makers and supported by the public. In other words, in some countries there may be growing a sentiment arguing in favour of research funding and sponsoring research in Europe rather than internationally. Moreover, the industry – particularly SMEs – may not recognise the benefits of international cooperation and therefore, may not be so keen to join and contribute to international cooperation activities.



3. Mechanisms for setting priorities and topics for future international cooperation projects

Collecting and assessing the needs and priorities as regards Topics and programmes of research on behalf of the recipient countries/ regions is of paramount importance and for this reason a more permanent mechanism has to be established, through which the relevant Commission services will be able to monitor the general trends, needs and priorities for transport research funding in specific target regions and/or countries. This mechanism, as suggested in our recommendations, could take the form of an Observatory (see recommendations section) but also due account should be taken of the relevant suggestions and position papers of the involved multi-stakeholder initiatives or transport research Associations that do have experience from international cooperative research programmes.

As regards the type of projects suited for international cooperation work, these must provide for “simplicity” and “flexibility”, in order to suit the different organisational and financial frameworks that exist globally. While using Coordination and Support Action types of projects is a rather successful practice, the funding schemes to be used could well be improved as compared to the FP7 practice. A rather more suitable type of funding scheme could be something similar to the one used for the ‘Thematic Networks’ Competitiveness and Innovation Framework (CIP) projects. Such funding scheme has:

- Fixed rates based on the duration of the project and number of partners; For example 300 Euro per year per beneficiary for the first 10 beneficiaries;
- Personnel cost acknowledged to the coordinator only, for reporting and organising meetings;
- Other partners only receive fixed Lump Sums for general expenses; and
- Only the coordinator is required to submit a financial report.

Such a practice can significantly reduce the administrative burden to the participants, thus enabling partners to focus on the real contents of a project rather than spend resources on administrative and financial reporting, which is often more difficult for international partners, since different countries may have different financial management and accounting systems. Moreover, such projects may cover longer time periods, e.g. 5 years instead of 2 or 3 years of the current Coordination and Support Actions projects, in order to provide continuity and long-time reference frames.

The key word in the funding and administration function of international cooperation projects should be “simplicity”. This has been particularly underlined by researchers from even well advanced countries, who get increasingly discouraged from participating in EU funded research projects, either because of the sheer complexity of the rules or because of not getting in time all the required elements needed for participation. A project should not cover too wide range of topics or too wide range of regions. For example, if a project covers topics ranging from road, railway, air to waterborne transport and regions ranging from developed countries to emerging market countries, the project may not be able to deliver outcomes for all topics and all regions at the same quality.



4. Recommendations on future joint programs, funding schemes and project management

Transferring the European *Joint Programming Initiative (JPI)* experience to international cooperation would be a potential mechanism to establish a more committed and more in depth international research cooperation in transport across the world. The following principles in developing European JPIs have been found well suited for potential future International JPIs:

- i. *Variable geometry of each IJPI and open access*, i.e. based on the needs and configurations of each particular country or grouping of countries.
- ii. *Structures that increase the efficiency and effectiveness* of the participating States' ability to deal with the large-scale socioeconomic challenges and problems of the future;
- iii. *Voluntary in nature*, i.e. participation to be based on the simple recognition of the practical usefulness of what is being proposed;
- iv. *"Supervision" by a trusted neutral Organization* or network of Organisations as a mechanism of "triggering" and monitoring;
- v. *Streamlined and simple implementation*, i.e. without unduly complex and lengthy management procedures at all levels;
- vi. *Short turnaround times* from research proposals to research results;
- vii. *Managerial Flexibility*, e.g. in allowing the possibility to choose, within a range of managerial reference models, the option considered most suitable in the specific case and circumstances;
- viii. *Uniform and objective evaluation* procedures, applied to all levels and stages according to specifications and appropriate benchmarking;
- ix. *Openness to change and evolution*, so as to maximize the benefits that could be derived from the experience to be gradually gained in running actual IJPIs; and
- x. *Low administration overheads* by all categories of actors involved.

Furthermore the success of the introduction of **International JPIs** in practice would depend on the existence of certain necessary "preconditions" which are the following:

- A. *Harmonisation* at least to a certain acceptable level of similarity, of research organisation and management structures, i.e. more harmonised research governance in the cooperating countries. The idea is to create some well accepted "standards" for research governance and then work towards having countries adopt these "standards" through the adoption of some sort of international convention, or by promoting such standards through bilateral negotiations as part of bilateral scientific agreements. In both alternatives if the EU could get the support and cooperation of other "research developed" countries, e.g. the US, the chances of quick success would increase substantially.



- B. *Funding*: This is a more difficult area to handle and a more sensitive issue because countries will not be willing to commit to specific guidelines that may have financial implications for them. Nevertheless, funding is one of the major stumbling blocks and some uniformity in the ways of decision making, planning and committing funds for International Joint Programming projects must be achieved.
- C. Existence of a “*Neutral*” *supervising and monitoring Organisation*: Finding a “neutral” Organisation that would - at an international level - monitor and provide guidelines for International Joint Programming initiatives, is a major difficulty. Such “neutral” organisation would play the role of the coordinator Organisation (e.g. the Groupe de haut niveau pour la Programmation Conjointe - GPC of the European Research Area Committee - ERAC as operating within the EU’s JPI practice). It is felt that at international level such “neutral Organisation” can be found in the frame of one of the United Nations Institutes or specialised Agencies (e.g. UNESCO, or United Nations Development Programme - UNDP, or even UN “Institutes” such as the Institute for Training and Research - UNITAR or other appropriate UN agency). Alternatively, some well-developed regional or international NGOs should also be considered.
- D. In producing sufficient recognition of common challenges and priorities in the cooperating areas, the establishment of a common permanent mechanism for monitoring trends in the research needs and in defining common challenges and priorities is being recommended in the final recommendations section (chapter 7).
- E. Finally, there is the issue of dealing with the limited financial and human resources capable of handling the complex managerial and scientific tasks in order to have “balanced” participation in the IJPIs i.e. projects with teams that represent a “balanced” involvement of all sides in the initiative (or rather “relevant to each participating country’s GDP or some other measure of economic strength and capability”). The guidelines that should be worked out as suggested in (A) and (B) above, should clarify this issue too.

Given the difficulties and uncertainties inherent in an international multilateral joint programming initiative, it is suggested to try and establish one first International JPI involving the EU and 2 or 3 other countries. These countries could be found among those that already share common research ethics and research structures with the EU. The following topics could potentially draw enough support for such first **IJPI**:

- I. *Sustainability of surface transport*, maybe limited to urban areas only (i.e. dealing with the issues of urban congestion, air pollution, clean cars use and environmentally aware traffic management);
- II. *Maritime transport* with emphasis on anti-pollution and safety and security issues;
- III. *Climate change*: transport related adaptation and mitigation measures.

5. Global research infrastructures – information and data sharing

The findings from current examples on shared Research Infrastructures (RI) and the feedback received from Organisations and researchers that were interviewed, point towards a **roadmap for RI cooperation** comprising five levels, as explained below:

Level 1

(Explanation of need and benefits of cooperation around RIs), is to explain the needs for and the benefits of RI cooperation. This may sound simple, but before organisations are able to identify the potential for co-operation around RIs, they have to be convinced of its necessity. The following actions are recommended:

- Increase experience by participation in international projects and networks of excellence and/or become members of umbrella organisations;
- Allocate funding to contribute to the cost of participation;
- Raise interest by presenting positive examples and highlight their benefits.

Level 2

(Sourcing of partners through database searches), is aimed at creating awareness of the existence of world-class RIs in the international research community, in order to foster possible cooperation. A possible way of raising awareness is through the development of an RI database containing world-class RI addressing all transport modes, e.g. by further developing the FEHRL RI Online Catalogue and rendering this database accessible to the research community.

Level 3

(Establishing networks around special research topics) involves initiating formal cooperation and building a climate of trust and understanding between Organisations and researchers in order to facilitate the sharing of information, knowledge and experience. Only in such a climate will, sharing of results between partners is possible. The goal to be reached at this level would be the creation of a **pool of expertise founded on mutual trust**.

Level 4

(Sharing knowledge and experience), aims at the further development of existing methods (and their validation through round-robin testing) and the exchange of knowledge and experience by the exchange of staff or by having joint workshops / seminars / courses.

Level 5

(Collaboration through common RIs), comprises the establishment of **common projects around at least one RI**, where the RI forms an essential basis and common resource for a project.



It is also recommended that an **International RI Task Force for all transport modes** be established to formulate recommendations and promote actions for networking and for information and knowledge exchange on world-class RIs, and to identify requirements for new RIs linked to the Grand Challenges in particular. If the conditions are ripe this RI Task Force should create a Working Group on RIs (WGRI). This Working Group should have as its purpose to investigate the issues and instigate coordinated actions for the development of new RIs. The WGRI should provide recommendations on the selection of which RIs to promote by priority and submit those to the RI Task Force. In the main EUTRAIN report the particular tasks of this WGRI are also given.

It is finally recommended that a systematic initiative is taken by the owners of large, critically important transport-related RIs to have them incorporated in the short term future in the **European Strategy Forum on Research Infrastructures (ESFRI)** roadmaps (transport-related RIs do not feature in current roadmaps).



6. Research training and human resource issues

The need for systematically improving the human capital that is involved in transport research, especially in terms of its involvement in international cooperation research projects, is quite self-evident. A number of recommendations have been generated for training and human resource issues, the most eminent of which (as well as the most practical) are presented below.

1. *Reform the Marie Curie funding process* related to funding of the supervisory aspects of the hosting institutions in European funded support programmes, increasing the allowable percentage of commercial work that an EU supported researcher can undertake for the institution they are working for, funding structured mentoring, considering increased incentives for stronger and more commercial European research institutions participation and others.
2. *Creation of a Researcher Database*. This would provide data and CVs of suitable researchers for organisations looking for such skills and vice versa (i.e. potentially offering skilled researchers).
3. *Systematic web-based training of transport researchers* (with emphasis on international cooperative work), based primarily on the use of on-line (remote) education tools like webinars or other internet based tools.
4. *Organisation of Short courses and training workshops*. With some relatively moderate funding for visiting lecturers and for the participation of the trainees, special "training" workshops can be organised to provide participants with state-of-the-art case studies or new knowledge and know-how on specific subjects.
5. *Researcher exchange programmes*. The mobility of researchers is a key instrument of international cooperation that should be integrated in the Commission's strategy for international Science, Technology, and Innovation cooperation.





7. Harmonizing institutional cultures & governance regimes

Institutional cultures and governance regimes are specific issues of primary importance for international cooperation according to the current experiences. The importance of Institutional culture lays in the profound impact it has on the work environment and the ability of members of an institution to succeed. Institutional cultures in the “future world class level research institutions” should be more aligned towards a strategic typology —focusing on global challenges, with integrated vision, and extensive networking.

Establishing a network of International Cooperation Promotion and Networking Centres (ICPNC) is proposed in order to foster international cooperation actions and build human capacities in transport research. Institutional cultures in the “future world class level research institutions” should be more aligned towards a strategic typology focusing on global challenges, with integrated vision, and extensive networking.

Key members of ICPNCs could be identified and those key members could be surveyed in order to understand their institutional culture and potential obstacles caused by such culture in ICPNC.

The second step would be to raise awareness of the existing differences among key members in order to facilitate discussions on how to address the difference. It should be noted that few transport researchers have a broad view on either institutional cultures of different types of organisations (e.g. public or private, local or national) or similar organisations in different countries.

Future governance regimes and policymaking competencies could be gradually re-aligned and adapted to a more cooperative regime at the multinational level in terms of internal organisation, new political agendas setting, decision making regulations, and implementation procedures, and other relevant areas. Such process of change could be assisted by the creation and operation of a **Conference of Global Research Cooperation (CGRC)** i.e. a new international Organisation that should be created to act as the body that promote a more harmonised research governance and incorporating the ICPNCs.

The following possible steps may also help in achieving greater harmonisation of research cultures and governance regimes:

1. Further investigating the problems and mobilizing commitment to change, through joint diagnosis of these problems focusing on those that hinder cooperation between countries with institutional cultures and governance regimes, in order to adapt organizations to cooperate.
2. Develop a shared vision of how to organize and manage global (transport) research cooperation.
3. Foster consensus for a new vision of (transport) research, gather competence to enact this new vision, and achieve cohesion to move it along globally.
4. Spread revitalization spirit to all parties involved in the countries of interest avoiding to adopt a scheme in which “funding” countries are “imposing” their views on “recipient” or “lesser research oriented” ones.
5. Institutionalize revitalization through formal research policies, systems, and structures.
6. Monitor and adjust strategies in response to problems in the process of harmonization.





8. Intellectual property rights and international cooperation

The EC's financial support to international standardisation activities is essential, taking into account that the current economic situation does not allow industry to invest much into international standardisation. The current practice to support standardisation through coordination and support actions projects has been acknowledged as an efficient way, but the dissemination activities could be significantly reduced. It has even been proposed that such projects may not include general dissemination activities at all, in order to focus primarily on standardisation activities. They should be carried out by key industry players, with participation also of major research Organisations. To be eligible to participate in such projects, pre-agreements with standardisation organisations and international partners should be required. Partners of such projects should be experienced in international standardisations and ideally have been members of relevant working groups or of standardisation organisations.

The *European Research Area Guidelines* on Intellectual Property (IP) Management in International Research Collaboration Agreements between European and Non-European Partners propose three main elements of an effective system to protect and exploit IP:

- a system that enables the protection of IP (e.g. patents, copyrights, brand, industrial design) that includes clarity about the ownership of IP rights, rights to use IP, the rights and freedom of parties to transfer (assign) IP and the freedom to publish;
- a technology transfer framework, preferably with the provision of specialised knowledge transfer offices with professional staff;
- a fair law enforcement system in partner's countries that caters for dispute settlement but also that can award penalties and sanctions where appropriate.

Addressing IPR as a common practice is something that will facilitate the delivery of transportation research results. Europe has a decidedly different perspective than the United States on the ownership of intellectual property generated from government-funded transportation research. IPR is addressed before the transportation research is initiated and included in the research partnership contract. In general in Europe, development is seen as an opportunity to build a business based on the specific IP, creating an economic engine for the country.





9. Summary and final recommendations

9.1 Setting priorities and monitoring the needs

Setting priorities and topics for future international cooperation projects and programmes has in the past been primarily based on the priorities, the needs, and the interests of the “funding” sides. However, several indications were given that the needs and wishes of the “receiving” sides do not match with those of the “funding” sides and consequently there is a need to rethink and restructure the way that such priorities are set in a more balanced and consistent way.

As regards the criteria for prioritizing the topics for international cooperative research within the new H2020 programme, we recommend the following:

- Mutual interest and benefit between the EU and the partner country (as regards e.g. scientific and technological interest, complementarities, existing research facilities, economic interest, etc.);
- Excellence in research performance in the partner sides;
- European research potential in the specific field (need to attain “critical mass”);
- Analysis of risks and opportunities as regards the potential outcomes;
- Past experience from such cooperation between the EU and the partner country;
- Global environment (in the region concerned as regards international cooperative programs of all sorts, existence of activities from other relevant fora, etc.).

Besides the importance of setting priorities as regards the topics, it is also of great importance to set effective implementation mechanisms for:

- Determining the contents for such research cooperation (i.e. the topics),
- Determining the “partner” countries and / or regions of priority interest,
- Providing effective information dissemination mechanisms presenting timely information on the opportunities that exist so that all interested research stakeholders are well informed, and
- Monitoring mechanisms regarding the execution and follow up actions of international cooperation projects in transport research.

To cover the above tasks two types of actions are recommended in order to establish the corresponding “mechanisms” for promoting international cooperation in (transport) research. These mechanisms can be established through relevant EU Commission initiatives acting, preferably, in close cooperation with other major research funding entities outside the EU. The recommended actions, which could be pursued concurrently and as early as possible with initial financing (through corresponding facilitation projects in the H2020 programme), are:

- A. Creation of an **International Transport Research Cooperation “Observatory”- IRCO**. This will be a mechanism for permanent collection, maintenance, and revision of (transport) research needs





and priorities around the world with priority focus on the regions of prime interest to the EU. The same “Observatory” would act also as a mechanism for promoting information dissemination and calls to the countries of interest and would advise on specific sources and contact Organisations in “target” countries through which international cooperation activities with EU member countries could be promoted. The “Observatory” would issue regularly “Research Needs” reports would systematically publish collected relevant information and data related to transport research needs in various regions and countries and would be of regular use by the Commission services involved in international cooperation work.

The organisational basis of this “Observatory” could consist of a *central coordinating unit* (either within the EC’s DG RTD) and a number of “supporting” external Organisations (mainly “pioneering” transport research providing organisations located at “key” regions and countries). The technical basis will be a web based electronic platform that will act as a “research needs repository” in which the involved stakeholders will provide input which they have collected through a common methodology. These stakeholders will have to be selected carefully, so as to be independent and reliable. The form of administration and funding for the Observatory as well as the web platform can be defined through a specific facilitation CSA to be assigned once. Through this project this Observatory will be defined, planned, set up, and implemented for an initial period of a few years before it is handed over to its permanent hosting *central coordinating unit*.

The above mechanism for topic definition and prioritisation, for international cooperative work that will be initiated within H2020, can be complimented with the work of other appropriate entities such as the ETPs or Organisations such as the *European Transport Research Alliance - ETRA*² (i.e. Organisations representing several European transport research stakeholders).

- B. Creation of an international network of experienced and well-motivated (but largely “virtual”) **International Cooperation Promotion and Networking Centres – ICPNC**. This network of ICPNCs will aim at a more strategic and long term promotion of international cooperation activities in transport research. It will consist of a global network of carefully selected **“Champion Organisations”** devoted to building the necessary “capability for international cooperative work” in terms of training actions for the human capital involved, know-how transfer actions, and generally activities promoting such cooperation in specific thematic areas³.

The ICPNCs will engage in activities such as:

- Training of research personnel;
- International know-how transfer and scanning actions;
- Exchanges of research personnel for short stays in foreign research centres;
- Organisation of workshops and Seminars;
- Other related actions, as necessary, providing value added activities aimed at building the necessary networks of cooperating research stakeholders at global level. The strategies of the European Com-

² See: www.etralliance.eu

³ This recommendation was also made in EUTRAIN Deliverable D3.1.

mission for international cooperation in research and innovation as set out in the EC Communication: “*Enhancing and focusing EU international cooperation in research and innovation: a strategic approach*” (COM (2012) 497), should be taken into consideration here.

A first “focus” subject for such an ICPNC is recommended to be: **transport sustainability and climate change adaptation and mitigation** because this is a subject of global importance and interest and close to the EU’s policy of sustainability and decarbonisation in the field of transport – a concern shared by many governments around the world.

Both of the above “actions” can be initially set up through specific *Coordination and Support Actions (CSA)* projects – or similar – which can easily be “delineated” along the lines suggested above and funded through H2020 funds.

9.2 International “common pot” initiatives:

The case for joint programming and funding

The experience so far of *European Joint Programming Initiatives - JPIs* is the best model we have for a joint international cooperation funding and programming initiative. As recommended in Chapter 4, promotion of potential International Joint Programming Initiatives (IJPIs) can be made along the following principles:

- i. Variable geometry of each IJPI and open access, i.e. based on the needs and configurations of each particular country or grouping of countries;
- ii. Structures that increase the efficiency and effectiveness of the participating States’ ability to deal with the large-scale socioeconomic challenges and problems of the future;
- iii. Voluntary in nature, i.e. participation to be based on the simple recognition of the practical usefulness of what is being proposed;
- iv. “Supervision” by a trusted neutral Organization or network of Organisations as a mechanism of “triggering” and monitoring;
- v. Streamlined and simple implementation, i.e. without unduly complex and lengthy management procedures at all levels;
- vi. Short turnaround times from research proposals to research results;
- vii. Managerial Flexibility, e.g. in allowing the possibility to choose, within a range of managerial reference models, the option considered most suitable in the specific case and circumstances;
- viii. Uniform and objective evaluation procedures, applied to all levels and stages according to specifications and appropriate benchmarking;
- ix. Openness to change and evolution, so as to maximize the benefits that could be derived from the experience to be gradually gained in running actual IJPIs; and
- x. Low administration overheads by all categories of actors involved.

The success of the introduction of **IJPIs** in practice would, however, depend on the existence of certain



necessary “preconditions” of success which are primarily the following:

- *Harmonisation of research “cultures” and governance regimes.* This has been already referred to, in the previous sections;
- Finding a “neutral” Organisation that would – at an international level – monitor and provide guidelines for International Joint Programming initiatives. Such “neutral” Organisation could play the role of the Council of representatives (i.e. the ERAC-GPC) within the EU’s JPI practice. It is felt that at international level such “neutral Organisation” can be found in the frame of one of the United Nations Institutes or specialised Agencies (e.g. UNESCO, or UNDP, or even UN “Institutes”). Alternatively, some well-developed regional or international NGOs could also be considered, either from existing ones – carefully scrutinised – or new ones like the suggested *Global Transport Research Alliance* mentioned in section C (Other recommendations) below. Finally, if and when the proposed in the previous sections *Conference on Global Research Cooperation (CGRC)* Organisation is set up and running, it could undertake this task too;
- Establishing common themes of interest, challenges and priorities that would be solid enough to solicit support for joint funding;
- Existence of human resources as well as “champion” Organisations in all parties involved, capable of handling the complex managerial and scientific tasks that will be necessary in order to have “balanced” participation in the *IJPIs*.

Given the difficulties and uncertainties inherent in an international multilateral joint programming initiative, we would suggest as a first step, with good opportunities for success, to try and **establish one first International JPI involving the EU and 2 or 3 other countries**. These countries could be found among those that already share with the EU common research ethics, and research structures. The following topics could potentially draw enough support for such first **IJPI**:

- I. *Sustainability of surface transport*, maybe limited to urban areas only (i.e. dealing with the issues of urban congestion, air pollution, clean cars use, and environmental traffic management);
- II. *Maritime transport* with emphasis on anti-pollution and safety and security issues;
- III. *Climate change*: transport related adaptation and mitigation measures.

A simplified type of funding scheme must be evaluated and adopted for such international cooperation initiatives. Such type of funding rules could be similar to those used in the *Competitiveness and Innovation Framework (CIP)*, EU funded projects. Such funding scheme would have features like:

- Fixed rates based on the duration of the project and number of partners;
- Personnel cost acknowledged to the coordinator only, for reporting and for organising meetings;
- Other partners only receive fixed Lump Sums for general expenses;
- Only the coordinator is required to submit a financial report.

This recommendation is made with the aim of significantly reducing the administrative burden to the international participants, thus enabling these partners to focus on the real contents of a project rather than

spending disproportionate resources on administrative and financial reporting tasks which is often quite impossible to do for international partners.

9.3 Wider and more collaborative use of Research Infrastructures (RIs)

Enabling research Organisations to share their research infrastructures (hard or soft) and other facilities is of paramount importance, especially if this sharing and cooperation is also made between international Organisations with similar facilities. Through such cooperation (i.e. between international organisations with complementary facilities) as well as between major research Organisations, research infrastructures and resources would be utilised more optimally and this will benefit the research community by the creation of a cost-effective and diverse pool of research resources capable of stimulating more innovation.

Furthermore, the need for the creation of new world-class research infrastructures (RI) to address common future challenges in the transport sector must be addressed. So far major transport research infrastructures have been mostly created in a fairly fragmented way, in line with available National budgets and policies and usually have limited impact outside the country where the investment was undertaken. It is therefore of increased importance to the fostering of more international cooperation and collaboration to promote, with specific measures and actions, an environment (legal, financial, administrative) that can bring together different RIs, their capabilities, and the corresponding competences of the owning Institutions.

The possible roadmap for RI cooperation comprising five levels as shown in Figure 5 below⁴ was explained in Chapter 5 above.

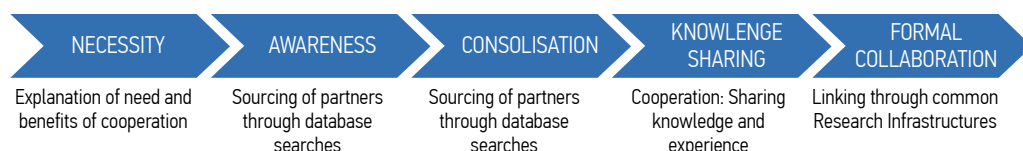


Figure : Levels of networking around RIs

The materialisation of these steps and the roadmap would be greatly helped if an **International RI Task Force for all transport modes** could be established to formulate recommendations and promote actions for networking and for information and knowledge exchange on world-class RIs, and to identify requirements for new RIs linked to the Grand Challenges in particular. Research organisations that have already acquired good experience on the above issues should share their know-how and should be invited to participate in the International RI Task Force. If the conditions are ripe as per above statement, this RI Task Force should create a Working Group on RIs (WGRI). This Working Group should have as its purpose to investigate the issues and instigate coordinated actions for the development of new RIs. The WGRI should provide recommendations on the selection of which RIs to promote by priority and submit those to the RI Task Force. In the main EUTRAIN report the particular tasks of this WGRI are also given.

It is finally, imperative that large, critically important transport-related RIs be incorporated in the short term future in the **European Strategy Forum on Research Infrastructures (ESFRI)** roadmaps (trans-

⁴ Originally developed in the DETRA project, but refined and substantiated further in the EUTRAIN project.



port-related RIs do not feature in current roadmaps).

On the whole subject of RI cooperation in the transport field, Organisations such as: The Conference of European Directors of Roads (CEDR), the European Transport Research Alliance (ETRA) and possibly other stakeholders such as universities, etc., should initiate a dialogue on the need for new, major transport-related RIs and their inclusion in the ESFRI roadmap. The first step should be to identify the national needs and to ensure that transport-related RI features on national roadmaps. Also the national representatives on ESFRI should be involved. Once the needs for new transport RIs have been articulated, the next step would be the drafting of ESFRI proposals for transport-related RI and the subsequent endorsement of these proposals by a delegation of national experts which has the task to submitting this draft to ESFRI. Upon approval by the ESFRI Executive Board that the proposal can be subjected to the ESFRI review process; the above mentioned Working Group would then take this process further. If the outcomes are found to be positive, the identified RIs could then be listed in the ESFRI roadmap, which will greatly assist towards the implementation of the specific “common” RI.

9.4 Human resource issues

A number of recommendations have been generated in Chapter 6 for training and human resource issues which if materialised would help tremendously in the long term. We repeat (and reformulate) the most eminent of these recommendations below.

1. *Systematic web training of transport researchers* (with emphasis on international cooperative work) based primarily on the use of on-line (remote) education tools like webinars or other internet based tools. This form of training has the advantage of not requiring physical presence, and thus it creates the least disruption to the professional obligations of the trainees. Such online educational tools would help transport researchers from around the world increase their skills and would also help develop researcher networks and help foster future collaborations.
2. *Organisation of Short courses and training workshops.* With some relatively moderate funding for visiting lecturers and for the participation of the trainees, special “training” workshops can be organised to provide participants with state-of-the-art case studies, or new knowledge and know-how on specific subjects. They, too, can be helpful sources of networking and collaboration for transport researchers across the globe. The European experience of the ECTRI/FERSI/FEHRL co-organised bi-annual Young Researchers Seminar (YRS) can be used as a guide here.
3. *Researcher exchange programmes.* The mobility of researchers is a key instrument of international cooperation that should be integrated in the Commission’s strategy for international Science, Technology, and Innovation cooperation. Marie Curie Actions and ERC grants contribute to Europe’s attractiveness and international cooperation status and this should be intensified in Horizon 2020. Framework conditions for incoming and outgoing mobility should be improved and simplified. We recommend particular attention to the following aspects:
 - a. Help with funding of the supervisory aspects of the hosting institutions in European funded researcher exchange programmes. Without funding support many research organisations without national government support find supporting researchers from other organisations to be significantly burdened by additional costs, making it unlikely that they will support these initiatives.

- b. Increase the allowable percentage of commercial work that an EU supported researcher can undertake for the institution they are working for. This will bring commercial experience and skills for the individual and help with managing institutional costs especially those organisations with no Government funding.
 - c. "Structured mentoring" should be considered as suitable for funding under researcher exchange schemes.
 - d. Consider increased incentives for providing highly skilled researchers to developing research organisations by stronger and more "recognised" European research institutions.
4. *Creation of a Researcher Database.* This would provide data and CVs of suitable researchers for organisations looking for such skills and vice versa (i.e. potentially offering skilled researchers). Such database is being developed already through EU funded project HERMES (concurrent to EUTRAIN) and will be sustained for a number of years in its web address: <http://www.hermes-project.net/>. In addition, or as a future development, this database could be attached to a new "*Skilled travel and Transport Researcher section*" in the EU website.

The *Researcher* database should cover:

- Information on institutional benefits or collaboration and temporary secondments of transport staff in the EU and Internationally.
- Information on the current financial incentives to organisations and individuals of collaborating by re-locating to other research organisations.
- A database of requests of organisations looking for temporary secondments to improve skills or for individuals/organisations offering skills for secondment.

A further possibility could be the use of the services of the various National Science Academies in order to explore the role that they can play in promoting south-south and north-south mobility of transport and travel researchers⁵.

9.5 Governance and research institutional cultures issues

The long term harmonization of research governances, will need to go through a number of stages and will naturally take time to conclude. These "stages" have broadly been defined as follows:

1. Further investigation of the problems and issues involved;
2. Development of a long term vision of how to organize and manage global (transport) research through the benchmarking and other actions suggested earlier.
3. Foster consensus for this new vision and gather competence to enact it and achieve cohesion to move it along globally.
4. Establish some "revitalized" cooperation frameworks with the countries of interest avoiding adopting a scheme in which "funding" countries are "imposing" their views on "recipient" or "lesser research ori-

⁵ G-Science Academies Statements 2013, see: http://www.leopoldina.org/uploads/tx_leopublication/2013_G8_Statement_Driving_Sustainable_Development.pdf



ented” ones.

5. Institutionalize this revitalization through formal research agreements introducing the new policies, systems, and research structures.
6. Monitor and adjust strategies in response to problems in the process of harmonization.

Actually, the recommendation made in previous chapters for the creation of the *International Cooperation Promotion and Networking Centres* – ICPNCs will go quite some way along the lines of promoting harmonization of research “cultures” across the globe, because the activities of such Centres will also promote such harmonization.

Finally, in order to compliment the above frame or process it is recommended that specific **benchmarks for international transport research cooperation** are established and gradually implemented through a number of concerted actions. The prime objective of this “benchmarking action” will be to promote “harmonisation” in international research governance, management (including evaluation), and funding regimes so that there is more coherence and ease of cooperation among the involved governmental and other entities.

The areas in which “Benchmarking” in this sense needs to be promoted are:

- a. *Formulation of basic rules and guidelines for calls and evaluation of proposals;*
- b. *Procedures for selecting topics and formulating work programmes;*
- c. *Organisational schemas and lean governance structures for research in general and transport research in particular;*
- d. *Monitoring indicators of international cooperative (transport) research actions.*

In order to take up this issue of “benchmark setting” but perhaps more importantly their promotion and wider acceptance i.e. promoting harmonization of research governances and “cultures” across the globe, we have recommended that these actions – after perhaps an initiating and facilitating study by the promoting governments – are undertaken by an independent global strategic Organisation, that can be entrusted with this task, either from existing appropriate Organisations (such as e.g. one of the UN educational and research related Institutes or Agencies), or by a new Organisation to be created by a common action off the interested governments: the **Conference on Global Research Cooperation (CGRC)**⁶. Such Organisation could be created to act as the body that promotes more harmonised research governance across the globe. It will have to be established through open and voluntary participation of the countries that are interested in promoting international research cooperation on the initiative of the EU, the US, or other interested governments.

⁶ Of relevance here is also the proposal made by the DETRA project for the creation at global level of a **Global Transport Research Alliance** Organisation (i.e. a more loose and flexible, partnership type of Organisation like the European Transport Research Alliance – ETRA) which would have as its main aim the promotion of International Cooperation in the field of Transport. This Global Transport Research Alliance could assume the format of a collaborative platform between major international Associations or other organisations representing Transport research and aimed at mobilising their members towards international cooperative actions to address the Grand Challenges in transport across all modes through innovation and the adoption of multiple-disciplinary approaches. The goal should be to yield collective impact at an international level, as well as transferable outcomes for deployment at regional and national level.

9.6 Promoting pre-standardisation and market uptake of research results

Currently, many R&D projects have activities related to standardisation, often as part of the Dissemination and Exploitation section of their activities. Some of them carried out gap analysis to identify needs for standardisation, including needs for international cooperation in standardisation. Many R&D projects give recommendations to future standardisation activities (often involved with international cooperation) in their exploitation plans. However, few of such recommendations have had real impacts on the future work since there is no resource to support such activities beyond a project's lifecycle.

It has been recommended to us by many stakeholders from both industry and research Organisations that the EC's financial support to international standardisation activities is essential, taking into account that the current economic situation does not allow industry to invest much into international standardisation. The current practice to support standardisation through coordination and support actions projects has been acknowledged as an efficient way, but the dissemination activities could well be significantly reduced. It has even been proposed that such projects may not include general dissemination activities at all, in order to focus primarily on standardisation activities. They should be carried out by key industry players, with participation also of major research Organisations. To be eligible to participate in such projects, pre-agreements with standardisation organisations and international partners should be required. Partners of such projects should be experienced in international standardisations and ideally have been members of relevant working groups or of standardisation organisations.

As an overall conclusion we can say that in developing the framework conditions for future international cooperation in research and innovation we must implicitly pay attention to promoting adequate systems of *Intellectual Property Rights (IPR)* protection in international collaboration and of the use of public procurement to stimulate the demand for innovation. A number of third countries and international organisations such as the OECD or UNESCO have undertaken similar discussions.

The EU should do more to promote the uptake of the outcome of these discussions, both internally and in its international cooperation activities. Priorities and future policies in these issues should be set through deciding:

- a. For which of the aspects of international cooperation mentioned above (e.g. IPR, public procurement but also of wider issues such as: ethics, societal engagement, open access, gender) would it be important to develop global "standards" in international cooperation?
- b. How can these standards be best promoted at the international level? Should they be included in the EU's S&T cooperation agreements with third countries?
- c. Should these standards have an implication on the way in which the EU provides funding to third country participants through Horizon 2020?

9.7 Other related recommendations and suggested action list

It is essential that all larger EU research based projects should have an expectation of some type of international co-operation built into them. This would increase international research collaboration proposals and some sort of actions to make world markets aware of the research capabilities and skills within the EU which may develop into commercial collaborations that will benefit both the EU and other countries.



In the context of Horizon 2020, and as regards the international cooperation components of projects, it is proposed to differentiate through three major country groupings:

- the industrialized and emerging economies;
- the enlargement and neighbourhood countries; and
- the developing countries.

This typology, for each of these groupings, will steer the focus of the cooperation activities. For the industrialized and emerging economies the principal concern will be of avoiding competitiveness issues, but complementing each other and creating synergies to increase the potential of both sides. For the enlargement and neighbourhood countries, a rationale of integrating into, or aligning with, ERA and taking advantage of proximity is more applicable. Finally, for the developing countries, external and development policies are likely to be the key drivers, but also increasingly market developments, sustainability concerns and responsible governance.

The key policy issues here, to which the Commission must give its (policy related) answers, are:

- Where is the balance between cooperation and competition in international cooperation and at what point does safeguarding the interests of Europe's companies prevail over the advantages of cooperation?
- Should a strengthened innovation dimension be systematically built into the Union's international cooperation activities or should it only be addressed with particular countries and/or regions and on a case by case basis?
- Should the innovation dimension of international cooperation activities be restricted to discussions at policy level (e.g. sharing of experience or identification of good practice) or should it go as far as jointly developing close-to-the-market activities?

As a final summary set of recommendations addressed primarily to the EU services (since most of the proposed actions and activities, in this document, normally would involve several stakeholders), the following can be singled out:

1. Create – through assignment of one facilitation project in the H2020 programme – of the specifications, basic characteristics, and blueprints for implementation of the recommended:
 - a. **International Transport Research Cooperation “Observatory”- IRCO**, which would also undertake the benchmarking activities for international transport research cooperation, and
 - b. **International Cooperation Promotion and Networking Centres – ICPNCs**.
2. Proceed to bilateral and multilateral coordinated agreements with as many governments as possible, that will aim to create consensus on supporting future common international collaborative actions in the following areas :
 - a. Further investigation of the problems and issues involved in international cooperation;
 - b. Development of a long term vision of how to organize and manage international cooperation in (transport) research through the benchmarking and other actions suggested earlier;



- c. Foster consensus for this new vision and gather competence to enact it and achieve cohesion to move it along globally.
3. As an important step in the above process of intergovernmental contacts and common actions, try to:
 - a. Establish formal research agreements with agreeable governments introducing the new policies, systems, and research structures for international cooperative projects.
 - b. Monitor and adjust strategies in response to problems in the process of harmonization.
 - c. Create, and confide on, a **Conference on Global Research Cooperation (CGRC)** the task of continuous promotion of harmonised research governance across the globe.
4. Coordinate, with at least one more government outside Europe that shares this common framework proposal, in order to co-fund at least one **International Joint Programming Initiative (IJPI)**. The conditions of success as well as the main steps to follow in this process are described in detail in the previous sections of this report.
5. Facilitate the creation or the continuation and support of existing “soft” actions that promote the enhancement of human resources in the field of Transport research. This action involves several actions, as follows:
 - a. Support the enhancement and maintenance of existing researcher data bases in the field of transport as per our more detailed suggestions above.
 - b. Facilitate and support researcher exchanges and the holding of short courses or training workshops.
 - c. Facilitate and support the creation and use of web based on-line “virtual” training courses in the form of webinars.
6. Support the continuation of the work that started, on the initiative of certain stakeholders, on listing major research infrastructures in the field of transport.
7. Support initiatives of relevant stakeholders for the inclusion of new transport research infrastructures in the **European Strategy Forum on Research Infrastructures (ESFRI)** roadmaps.







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1 (coordinator)	 European Conference of Transport Research Institutes	ECTRI	Belgium
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4	 European Rail Research Network of Excellence	EURNEX e.V.	Germany
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