



# **7 FRDP PREPARATION**

## **ECTRI CONTRIBUTION**

**November 22, 2004**

**(Approved in ECTRI' s Assembly  
Crowthorne, November 11 & 12,  
2004)**

**REPORT ECTRI 2004-01-EN**



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## Executive Summary

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### I – The Background

1. Recognising the real importance of transport systems for the competitiveness and sustainability of Europe, ECTRI's Assembly approved in October 2003 its long term strategy about its vision of a sustainable, multimodal transport system in the Europe of the future, including orientations for a strategic research agenda taking into account the roles of various stakeholders (ECTRI report 2003-1-EN).

2. ECTRI has produced this contribution to the preparation of the 7FRDP as an in-depth follow-up to :

- the above 2003 ECTRI Strategic Paper
- the ECTRI statement on COM (2004) 353 final
- the extensive and relevant experience of the ECTRI members on conducting and managing transport research
- the inputs and/or ECTRI's participation to European Technological Platform Strategic Research Agenda developments, as well as to national views on the same subject (ie the next 7FRDP).

3. To prepare this contribution four selection criteria were used :

- Conformity with European Treaties and compatibility to the signed European Constitution
- Contribution to the Lisbon agenda (the internationally interfaced surface transport European Research and Innovation Area)
- Maximisation of the real European added value (through enhancing the achievement of sufficient critical mass, anti fragmentation and international competition in European transport research) in the light of both enlargement and the 7FRDP budget and time horizon.
- Knowledge within the surface transport research domain of the various stakeholders' needs and problems (industry<sup>1</sup>, governance, academia<sup>2</sup>)

### II – The ECTRI proposals for 7FRDP

4. Our proposals can be divided into three main streams :

- One stream dealing with the need to prepare the next generation of surface transport European scientists and professionals trained and/or educated by or through research ;
- One stream dealing with the realisation of “research process” oriented activities ; and
- One stream dealing with the various thematic issues regarding the general aim of the European transport system of the future and the ECTRI defined five priorities for transport research which are the following:
  - Issues for a sustainable transport system ;
  - Intelligent transport systems;
  - Traffic and transport safety and security ;
  - Behavioural and societal aspects of traffic and transport ;
  - Transport economics.

#### Preparing the next generation of transport scientists and professionals

5. Our first concern is the need to fund activities at a European level in order to prepare and train the next generation of surface transport scientists and professionals.

There are two issues specific to the domain of surface transport research in Europe:

- A large number of current transport research scientists will be retiring in the next few years, their recruitment having been made in the early 1970s notably through the OECD, ECMT and NATO (or COMECON) programmes.
- In some transport domains, e.g. guided transport, the need for a shift from professional knowledge to scientific knowledge as a basis for operation, rules and standards and safety is crucial.

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<sup>1</sup> OEMs, suppliers, operators, infrastructure operators

<sup>2</sup> Universities, TU, Grandes Ecoles, Research Institutes

6. All the activities of the Marie Curie programme and its sub programmes can address this problem, in both public and private areas, with transfer of knowledge organised around focussed scientific knowledge developed through simulation, observation and experiment. This programme must be given particular importance and weight in the overall effort.

## Research process oriented activities

7. Our second concern is for the enhancement of the process of research production. This is of main concern for the challenge of excellence.

8. Our opinion is that the choice between research instruments and their adequacy to the tasks and their role is very crucial for excellence. We thus give, in the core text, some specific ideas on the potential instruments so that they form real incentives to ensure involvement of suitable stakeholders as champion, leader or partner in European research. As a consequence the use of 100% funding for many of the research issues needs to be extended and strengthened.

9. It is desirable to clearly open the “research infrastructure” programme to the transport domain – a large part of the competitiveness of governance and industry is linked to the international quality of these European research infrastructures, both hard and soft.

10. There is also a need to keep this domain open to the NoE instrument, and also to open within the ERANET scheme a research supply oriented instrument, dedicated to both public and private entities.

## Transport research thematic priorities

11. Our third concern is about the choice of research thematic issues related to surface transport.

An important area of common European focus and interest is the research and study of transport systems of the future. This includes the integrated (in a European sense) and visionary study of the future of a number of transport and traffic related items such as infrastructure development, political, economical, societal,

organizational and institutional issues. In paragraph 4 above we stated the five thematic priorities set earlier by ECTRI members based on their National agendas and their own experience. Relative to these priorities the following can be suggested.

12. For all thematic priorities for surface transport of the future the following general main needs can first be stated:

- Creation of a free access research or policy infrastructure around updated or new data basis and/or models
- Creation of a scientific knowledge corpus (multi disciplinary, systemic and holistic) aimed ultimately at the customer or user of the system as well as the needs of industry and government.
- Creation of adequate soft transport research infrastructures (e.g. libraries networks,...)

*First ECTRI priority for 7FRDP transport research issues: issues for a sustainable transport system*

13. For a sustainable transport system, the first cluster concerns *environmental issues*: additional needs about noise research and its impact are important on both a uni- and multi-modal basis (corridor and hubs)

The same applies to landscape, water, soil and wetland impacts.

The second cluster addresses *energy* for all modes and types of vehicles with hybrid and energy management technologies on one side, and advanced ICDE and Fuel Cell technologies from the perspective of the hydrogen economy on the other side.

A third cluster is concerned with *air pollution* and *GHG climate change* as well as enhanced economic and behavioural knowledge on sustainability.

*Second ECTRI priority of 7FRDP transport research issues: Intelligent Transport Systems and space technologies*

14. For Intelligent Transport Systems including satellite technologies, besides the GALILEO project the following concerns are raised for all modes :

- Electromagnetic compatibility for vehicles or systems
- Advanced control system for networks
- Cooperative and/or integrated systems
- Human Machine Interaction.

Needs are potentially similar for the integration of onboard embedded systems, or micro nano technologies.

*Third ECTRI priority of Transport research 7FRDP issues: traffic and transport safety and security*

15. The issues of traffic and transport safety and security (ie. EMC, cooperative systems, HMI, advanced technologies and fatigue) are common to the needs for all modes.

In addition to this agenda and the specific modal safety issues raised below, multimodal and intermodal safety and security have to be increased and improved.

In road safety and security research :

- New strategic research is needed at international level linking health concerns and road safety; this type of research could be achieved through teams of excellence or NoEs.
- New in-depth accident analysis needs to be harmonised at European level (eventually internationally). This points to a need for research to build a framework of new informative statistics. This could be done by societal IPs eventually involving industry.
- Behavioural, fatigue and HMI research concerns need to be continued.
- The crucial issue of an ageing society on the move (see OECD report) has to be addressed through societal IPs or STREPs.
- The whole international agenda of International Harmonised Research Agenda (for road vehicle safety) for years 2006-2010 has to be solved through societal or industrial IPs.

In rail (and transit) safety research:

All requirements linked to the implementation of National and European Safety Agencies, directives or rules have to be addressed, preferably with open access to results. This area could be an idea for a European Technological Initiative or large IPs involving industry, safety and regulation authorities.

In multimodal waterway and maritime safety and security:

There are requirements for the building of European scientific knowledge as an input to new international (multilateral or not) standards or rule making for vessel building and design,

vessel operation, traffic management services including emergency services, and containers.

This could be done through industry-led IPs, operators or manufacturers.

*Fourth ECTRI priority of transport research 7FRDP issues: traffic and transport behavioural and societal scientific knowledge*

16. On behavioural and societal aspects of traffic and transport research, the strong need (arising from concerns of competitiveness or governance challenges about acceptability, acceptance, advanced marketing, and usability) is to revise all the behavioural and societal scientific corpus known today, by an in-depth scientific analysis, as well as questioning and revision and perhaps by initial introduction and trial and error process of all the new ideas and concepts focussed on the needs of industry and policy makers.

*Fifth ECTRI priority of transport research 7FRDP issues: transport economics research*

17. A similar approach is recognised for transport economic research, focused on pricing, charging, tolling, organisational issues, and service operational economics, following from the specific needs of regulatory and supervising bodies, and of operators and industrialists. The challenge is really international and linked to excellence.



# Main Report

## The background and frame of reference

### I - Introduction

1. ECTRI was created as an Association, at the beginning of the 2003 in order to fulfil what was perceived by its founding members (themselves leading European Transport Research Institutes and Organisations) as an overwhelming need for cooperation, coherence, and integration in European Transport research. This perception stemmed from a wider perception of the needs and priorities for European Transport in the coming decades, as they appear to shape now based on the current European socio-economic environment, the trends of EU enlargement, and the Transport policies currently formulated by the EU and the National European governments.

2. This perception of the needs and priorities for European Transport in the coming decades, i.e. what we call "ECTRI's vision of a safe, efficient, cost effective, and environmentally friendly multi-modal transport system in the Europe of the future" is our starting point.

3. There are several studies and "Scenarios" relating to the future needs and priorities of European Transport that have seen the light of publicity recently. ECTRI notes in particular the "vision" projected by the EU's White paper on Transport Policy, which in itself is a "de facto" basis for looking at the future. There are however, still important differentiations and "precisions" that have to be made in order to take into account the "National dimension" i.e. the specific conditions and restrictions that apply in each country. In fact one of the main reasons for creating ECTRI, was to help towards more "harmonisation" and "consensus building" about the desired and/or advisable future Transport or Transport related policies and priorities and to help towards their integration and harmonisation at European (EU based), National, and local or regional levels.

4. In addition we strive to underline the role and importance, of a number of "elements" and "factors" that affect the "overall" result where research or development is crucial i.e. the proper functioning of the **transport systems and their innovations**. These elements refer to the:

- Society's trends and attitudes and the societal policies followed,
- Industry's views, plans, and innovations (industrialists and operators)
- Attitude and the role of the various other stakeholders
- Transport or transport related policy environment, and the policy making process,
- State and results of transport or transport related research.
- The organisation and functioning of the different markets.

### II - ECTRI strategic paper 2003

5. In October 2003, ECTRI's Assembly approved its long term strategy about its vision of a sustainable multimodal transport system in the Europe of the future.

6. This document has been considered as another step towards the creation of the Surface Transport European Research Area (STERA) because it is supported by the following more specific visions :

- To achieve Integration of European Transport Research (starting with its members) primarily by effecting common priorities and programme of work, mobility of researchers, and working towards developing Joint European Infrastructures (JElS) in some key areas of Transport research and / or research related activities. This calls, among others, for devising a

way for jointly utilizing the current infrastructures within each Institute, and joining forces to build new ones at the European level. Particular emphasis and priority will be given to integrating Institutes and research organizations from the new member states.

- To provide an independent – “intellectual” dimension of advice towards the research funding bodies of the EU or member states whose thinking is currently heavily solicited by industry.
- As an extension to the previous «vision», to create practical and usable “links” between the results of applied research and their industrial transformation into “products” or services.
- To work against European fragmentation of Transport research and provide a uniform European representation towards Transport research in the US, Japan, and Asia.
- To promote coordinated and high quality European - wide training options for Transport executives.
- To expand the European transport related experience and know-how to other countries and environments and vice versa.

7. This is also a reflection about the key transport research issues taking into account the variety of transport related research stakeholders in the context of the European Research and Innovation Area :

- Industry
- Policy makers
- Operators: service providers and infrastructure service providers
- Users/customers and society
- Scientific community
- Research funders.

8. This draws ECTRI to some conclusions after an international benchmarking exercise and to propose not only thematic priorities for the next 10 years but also :

- Process oriented activities
- Preparation of the next generation of transport scientists and professionals educated or trained through or by research.

9. On the thematic priorities, the ECTRI strategy concerning the **simple European safe, sustainable and efficient transport system of**

**the future** delivers five **priorities on science or technology towards innovation.**

They are :

- a. Issues for a sustainable Transport system.**
- b. Intelligent Transport systems (ITS) including space based technologies**
- c. Traffic and Transport Safety and Security.**
- d. Behavioral and societal aspects of traffic and transport.**
- e. Transport Economics.**

10. The first three are clearly industry and/or government led in partnership with academia . While the last 2 can be government or industry led, they need a championship of academia because academia has to bring more adequate scientific understanding or developments focused on government or industry concerns

11. In appendix 1 to this report can be found the ECTRI Strategic Paper report executive summary. The full report (ECTRI report 2003-01-EN) can be downloaded at <http://www.ectri.org>.

### III - ECTRI and EC COM(2004) 353 final

12. On 12 July 2004, ECTRI reacted to the European Commission Communication COM (2004) 353 final (“Science and technology, the key to Europe's future - Guidelines for future European Union policy to support research”) by producing the ECTRI statement that can be found in Appendix 2 to this report.

The Commissioner in charge of Research replied to ECTRI on August 30, 2004.

### IV - ECTRI and the European surface Technology Platforms

13. The following table shows which of ECTRI, ECTRI members or ECTRI member seniors are participating in the three existing technological platforms directly relating to surface transport, besides others that are impacting surface transport innovation (fuel cell, embedded systems, nanotechnologies, steel,...)

14. These technological platforms have created their vision 2020, and developed strategic research agendas; these are shared by ECTRI.

	ECTRI	ECTRI members presence	ECTRI member seniors presence
<b>ERTRAC</b>			
Assembly	X	X	
Support Group	X		
W.G. of Experts			X
<b>ERRAC</b>			
Assembly	X	X	
Support Group		X	
W.G. of Experts			X
<b>ACMARE</b>			
Assembly		X	
Support Group		X	
W.G. of Experts			X

15. ECTRI is also involved in the E-safety forum activities (plenary, steering group and WGs of experts)

**V - ECTRI strategic additional inputs to STERA**

16. ECTRI believes, because of specific competitiveness concerns that there is a need to deepen strategic additional issues, e.g.:

- the societal impact of urban transport (key organizers and regulators, key operators, key manufacturers at European and World level, and strong societal needs).
- the truck industry (in any sustainable transport policy options there are trucks on the road or streets, and Europe is the main industrial player in the world) ;

17. ECTRI is very interested in COST transport activities continuation; together with the involvement of many of its members or member's seniors as experts within the activities of the Joint Transport Research Committee common to OECD and ECMT, this is leading to a first international interfacing of STERA and integration of the whole European family.

18. In parallel, the involvement, as experts, of some ECTRI members in "ERANET transport activity" brings additional concern to the following proposals, as is also the case from EUREKA clusters.

## The ECTRI proposals for 7FRDP

### VI – Organisation of the ECTRI proposals

19. This chapter deals only with 7 FRDP priorities, although some of these could also be common with the end of the 6 FRDP.

Many may not be apparently new compared with the development of the various strategic research agendas described previously, but we are emphasise four criteria used to establish the ECTRI proposals:

- Conformity with the current European Treaties based mainly on competitiveness and European policies and compatibility with the signed European Constitution.
- Building the internationally interfaced Surface Transport European Research and Innovation Area (STERIA) coming from the so-called Lisbon agenda.
- Real European added value in light of the enlargement and the FRDP budget and time horizon alternatives based on :
  - Critical mass
  - A not too-fragmented research landscape
  - Concerns of international competition (in line with the 2 main aims of industry and public governance)
- Our good knowledge of the various stakeholders' needs and problems for surface transport research.

20. The proposals are organised in three main streams :

- One stream dealing with the preparation of the next generation of surface transport scientists and professionals trained and/or educated by or through research ;
- One stream dealing with process oriented activities;
- One stream dealing with thematic issues around the general aim of the European transport system of the future and the following five priorities :
  - Issues for a sustainable transport system ;
  - Intelligent transport systems ;
  - Traffic and transport safety and security ;

- Behavioural and societal aspects of traffic and transport ;
- Transport economics.

21. The priorities are :

- Raising the question of adequate instruments in the sense of they should be real incentives to involve the appropriate stakeholders (champions, leaders and partners)
- Evoking the question of funding mechanisms
- Concerning the domains of activities of various European Parliament Committees (in charge of Transport, Research Competitiveness), and various Commissioners' portfolios (mainly Research, Transport, Information Society, Enterprise, Environment and Energy)
- Accompanying or complementary to State members or regional and local government initiatives
- Supporting the view that EU funding should be sufficient for this domain<sup>3</sup>, the mechanism of funding relevant to all types of partners (private, public, small or big entities), and the type and the balance of eligible expenses and overheads to be funded, not excluding real 100% funding.

### VII – Preparing the next generation of surface transport scientists and professionals

22. An issue for a good European governance for Science and Technology in the field of surface transport research is the preparation of the next generation of scientists and professionals educated or trained by or through research: *this is a need overlapping all the transport research stakeholders.*

23. In addition to the general needs for all scientific domain there are 2 issues specific to surface transport research in Europe :

<sup>3</sup> During the 6FRDP this domain has benefited taking into account all interested priorities of the same amount of money that aerospace domains.

- A large number of current scientists will be retiring in the next few years, their recruitment having been made in the early 1970s notably through the OECD, ECMT and NATO (or COMECON) programmes.

- In some transport domains, as in guided transport, the need for a shift from professional knowledge to scientific knowledge as a basis for operation, rules and standards and safety is crucial.

24. That is to say that it is crucial for the surface transport research community (industry, universities, research institutes, governmental agencies, ...) to have access to Marie Curie Program activities dealing with young researchers, host or individual driver activities, or to develop harmonised (not necessarily common) curricula of European PhDs or Masters in line with need and through the Marie Curie program (ie EST, RTN,...).

25. It is important to note the role of academic research focussed on the specific needs of industry, government or academia itself, because the assembly of multidisciplinary, interdisciplinary and systemic or holistic scientific knowledge is critical to competitiveness and public governance.

### VIII – Research process oriented activities

26. ECTRI believes that European scientific excellence at the international level in the field of surface transport related research requires:

- A structure of research supply by adequate instruments.
- An enhancement of transfer of knowledge and know how towards the NMS, AC and WBC transport research community.
- An enhancement of governance and management of research entities.
- An enhancement of the quality of process and procedures to provide research.
- An enhancement of the infrastructure research that is facing competition from abroad in both the types of infrastructure research :
  - hard facilities or platforms
  - soft research infrastructure :
    - data bases for research and/or policy making
    - libraries and electronic access to knowledge

- advanced electronic collaborative environments.

- A scientific training program to accelerate the allocation of human resources towards these specific scientific needs.

27. It is necessary to have in the surface transport related research domain access to some parts of the Marie Curie programme that are in line with this requirement such as :

- RTN
- Events
- host driven activities (exchange of researchers and/or post-doctorants)

28. It is desirable to clearly open the research infrastructure programme to the transport domain – a large part of the competitiveness of governance and industry is linked to the international quality of these research infrastructures, both hard or soft.

29. This also points to the need to keep open this domain of research to the Network of Excellence instrument and also to have ERANET instrument oriented to the research supply side.

In fact, the evolution of a research program towards an traceability of the various roles of programme authorities points also to the need for a light integration of research providers: ie funding bodies, research providers, research stakeholders, research buyers, research regulators and/or evaluators.

30. ECTRI believes that all these research process oriented activities are not only aimed at public bodies, but they are also relevant to private bodies (both profit and non-profit making).

### IX – ECTRI proposals for 7FRDP transport research thematic priorities

31. While not neglecting the importance of aerospace transport and/or industry and having members dealing also with aerospace, air transport or space transport issues, ECTRI is focusing its proposals on surface transport related research (road, rail, waterways, maritime and multimodality and intermodality).

32. Nevertheless, some issues concerning the applications to surface transport of aerospace technologies including securities issues, or the interdependency between air or space transport and surface transport, are included in the following proposals.

33. These proposals are organised according to the general aim of the transport systems of the future and the five thematic priorities of transport research domains contained in the ECTRI strategic paper, ie:

- Issues for a sustainable transport system
- Intelligent transport system
- Traffic and transport safety and security
- Behavioural and societal aspects of traffic and transport
- Transport economics.

*IX a – General issues for 7FRDP thematic transport research priorities focussed on the European transport system of the future*

34. An important area in which ECTRI members see a common European focus and interest is the research and study of transport systems of the future, i.e. the integrated (in a European sense) and visionary study of the future of a number of transport and traffic related items such as infrastructure development, political, economical, societal, organizational and institutional issues.

35. In this regard, research integrating not only technological development but all other research domains is crucial; the multidisciplinary and systemic or holistic approach should be the determinant.

The needs related to society, the economy, human factors, the needs for disabled and the aging, the needs for European and international trade are of importance even in the urban areas.

They determine the acceptability and ultimate success of the policies and technologies applied.

36. Even if some issues could be regarded as linked to the subsidiary principle, there is an European added value to structure the research in these areas through two instruments in particular: integrated networks of excellence and/or societal integrated projects.

37. It is clear that there is a specific need for updated data bases or models as a research or policy infrastructure:

- Creation of a research or policy infrastructure around updated or new data bases and/or free access models
- Creation of a scientific knowledge corpus (multi disciplinary, systemic and holistic) aimed at a customer or user and industry and governments end users
- Creation of other soft transport research infrastructures (libraries, network...)

38. It is very important to recognise that even if data bases or models are in many legal respects covered by intellectual property rules, there is a strong requirement that these data bases or models should be freely accessible as it is the case in North America, otherwise there will be barriers to scientific research.

39. This is specially relevant for:

- transport system planning at any geographical level and specially TENs
- transport traffic flow forecasts or data bases for planning, evaluation, impact assessment of transport systems
- transport freight flow data bases

40. It is also necessary for this purpose to use a 100% funding instrument, through both calls for proposals and open calls for tenders.

*IX b - First ECTRI priority for 7FRDP transport research: Issues for a sustainable transport system*

41. This issue concerns all the European added value research needs linked to the aspects of energy and the environment that are connected to the existence and functioning of transport systems.

42. In the environment field, in any case and in any specific policy agenda, noise research on both a modal and multimodal basis is of key importance corridors or big transport facilities such as dry or wet ports or airports, or big logistical facilities have to be considered).

43. This research has to address the source and the propagation, but also perceptions, and also be considered as autonomous (intercity) or integrated (within urban areas).

44. Societal IPs - as well as industry-led IPs additional to those of 6FRDP - need to be created: the European added value comes from

the fact that the cost and scope of a full research cannot be any longer be handled at national level even by the main State members.

45. The impact of transport on land use and the landscape needs additional research.

The European added value of STREPs or societal IPs is linked to the necessity to have a harmonized approach through the TEN networks.

46. It is the same for water, soil and wetlands.

47. In the domain of air pollution, the main priority should be around the GHG and climate change; local climate changes or local regional impacts are undeniable, and there is a scientific competition on transport research issues in every consensual or controversial global climate change debate.

48. ECTRI believes that it this is very relevant to energy research and energy policy specially on energy security issues, but the various scientific programs that are in worldwide competition need to address the “Renaissance Knight Dilemma called the sword and dagger strategy” ie to have a strategy with a main stream effort and a protecting stream effort if Europe will not buy “on the shelf technologies”. For example, hybrid technologies and energy management are the “dagger priority”. Advanced treated internal combustion diesel engine and fuel cell technologies in the perspective of a hydrogen economy are the “sword” priority with different dates of utilisation in the future. This is applicable with various time horizons to cars, light trucks, trucks, bus, coaches, locomotives, even to maritime or inland ships.

49. The “dagger priority” meets a European added value comforting the second priority and is relevant to the IP instrument; the “sword” priority needs a funding volume in excess of the capacity of each main manufacturer or the main State members.

It could be carried out through IPs linked to EUREKA projects, that are following the strategies of industry; this could lead to various excellent consortia at the same time on the same task.

50. Additionally the advanced diesel engine for rail could be a task covered by an IP.

51. For fuel cells, there is an added value at European level, if, as the US, Europe wants to be a fuel cell provider in the world economy, or to participate in international partnerships and focusing on other key components of the fuel cell industry.

*IX c –Second ECTRI priority for transport research issues: Intelligent Transport Systems and space technologies*

52. All aspects related to applications in the field of Transport (passenger or freight) of Information and Communication Technologies (ICT) as well as space-based technologies (GALILEO, GMES, etc) and the functioning of the European Intelligent Transport Systems and services, are included here.

The transport vehicles, as the transport systems need to be reliable and of adequate quality; this could require some specifications for the use of NTIC, also for safety or security purposes.

53. A first priority could be Electromagnetic Compatibility for vehicles or systems. This could be attain through the use of 2 types of instruments :

- Networks of excellence because there is a need to address the fragmentation of the European scientific and technological landscape
- Integrated projects both led by various OEM industries or safety authorities.

54. A second priority is to revisit all the concepts or components conducting to advanced control systems of network for road, rail, waterway or maintenance of highways. This could be made through NoE or IP instruments.

55. A third priority of research is for road system, the cooperative systems and after the integrated systems (vehicle-vehicle, vehicle-infrastructure).

56. For collective urban transport or rail there is a need research to lower the cost of ERTMS, UGTMS.

57. For waterway and maritime, there are needs linked to security, safety and traffic management.

58. For multimodal or intermodal information or management systems, there is a need of industry led STREPs about the building of components or subsystems, and a need for a multi stakeholder IP on the world compatible architecture.

59. Many of the current results of ITS need to be revisited with the integration of on board embedded systems or micro nano technologies based components, systems or subsystems.

60. And Human Machine Interaction concern continues to need to be addressed through NoE and IPs instruments even in simulation technologies.

*IX d – Third ECTRI priority for transport research*  
*7FRDP issues: traffic and transport safety and security*

61. Here, there is a core area of research in almost all ECTRI members since there is a common view that a lot more attention must be paid to both technological and behavioural and societal issues.

These include vehicle design and infrastructure safety issues but also issues related to user or driver (pilot...) behaviour or fatigue and complex societal questions related to the introduction of large socio-technical systems in societies in different phases of economic and demographic development.

62. These research issues are relevant for all modes and multimodal concern.

63. Electromagnetic compatibility is a key issue of all traffic transport safety and security. There is a need for multi stakeholders IPs between industry and safety authorities.

64. Safety and security concepts need to be revisited with the introduction of advanced technologies such as micro, nano technologies, satellite based technologies, and the embedment of NTIC in an integrated approach.

This could be done through various IPs or STREPs addressing various modal or multimodal transport systems or vehicles.

65. Multimodality and Intermodality is a key concern for transport safety or security; there are needs for teams of excellence, networks of

excellence and obviously IPs led by safety or security authorities.

66. On a modal basis there is some additional specific needs to be address by research, in line with the following priorities.

67. In road safety research :

- New research linking health concern and road safety is strategic at international level; that could be done through teams of excellence or NoE.
- New in depth accident analysis to be harmonised at European level (eventually internationally) draw to need of research to build a frame of new informative statistics. This could be done by societal IP eventually involving industry.
- Behavioural, or fatigue and HMI research concern need to be continued.
- The crucial issue of aging society on the move (see OECD report) has to be addressed through societal IPs or STREPs.
- All the international agenda of IHRA for years 2006-2010 has to be solved through societal or industrial IPs.

68. In rail (and transit) safety research:

- All the needs linked to the implementation of National and European Safety Agencies, directives or rules have to be addressed with open access results preferably.
- This could be an idea for a European Technological Initiative or big IPs involving industry, safety and regulation authorities.
- The second main concern is about the stability of rail safety expertise, linked to 2 big trends :
  - Retirement of professional experts (mainly belonging to historical operators but not only) who have an excellent know how of tests and trials.
  - The path to have more and more scientific based knowledge than professional knowledge safety rules or requirements, the need to educate, train new scientists or professionals educated through sciences (observation, experiment, theory)
  - This needs a very strong NoE in rail safety research, and a NoE in transit safety research to address the historical fragmentation of research due to the trend to go from “national blocks” to a European or international market addressing a real European rail or transit system.

69. In waterway and maritime safety and security:

There are needs to cope with the building of European scientific knowledge as an input to new international (multilateral or not) rule raising for vessel building and design, vessel operation, traffic management services including emergency services, and containers.

This could be done through industry led IPs or STREPs, operators or manufacturers.

*IX e – Fourth ECTRI priority for transport research*  
*7FRDP issues: scientific knowledge for traffic and transport behavioural and societal aspects*

70. This is an increasingly interesting area for research that follows the almost exclusive emphasis on technological developments and applications in the field of Transport, given in the 90s. In this area one should include the consideration at both the micro level, i.e. focusing on the individual user, to the macro level including planning and implementation issues but also concern coming from the large socio-technical systems interacting with societies.

71. It is in fact nowadays widely recognized that technological implementations are only one of the levers that will allow transport systems to evolve towards more sustainable equilibria, the second one being the set of socioeconomic and behavioural factors that influence personal attitudes and choices. This is linked to introduce new ideas coming from various disciplines and to have new trade off or balances of multidisciplinary assemblages, not only from social or human sciences but also from life sciences or integrative sciences such as cognitive sciences.

72. ECTRI considers then that two focal points for 7 FDRP actions concerning this priority should be: the integration of engineering and non engineering research methods in the transport sector, the research needs related to the introduction of large socio-technical systems in societies in different phases of economic and demographic development.

73. The scientific community has started revising all the behavioural and societal scientific corpus known today, but not yet in a systematic way. The first step should then be to deepen the scientific problematic through various instruments

such as excellence teams, NoEs, societal IPs and eventually CAs.

74. The best manner to do it is to focus this scientific shift around transport focused questions. It is important to structure the supply side of research because it needs to be supported to go where are the needs while respecting the scientific internal process. Concerning possible research topics, both the industry and policy makers show a crucial interest to find answers to questions related to advanced marketing research for products, systems or services, research for acceptability or acceptance of products, systems or services, and potential policy constraints such as sustainability issues.

*IX f – Fifth ECTRI priority for transport research*  
*7FRDP issues: transport economics research*

75. This, like safety and security, also seems to be a core area of interest. It includes topics like pricing for the use of infrastructure, proper pricing of Transport services, (econometric) modelling, evaluation methods of economic policies in the field of Transport (where the money goes and what are the real choices), pricing policies, etc. As mentioned previously a most important topic is also the “economics” of productivity, employment, and land use interaction of the transport system as well as the “economics of multi-modality”, i.e. the investigation of the costs and prices for making multi-modal Transport more competitive.

76. ECTRI is thinking that transport economics in itself have to be revisited in line with the evolution of planning methods, charging, tolling, operating methods in transport proprio sensu, but also in other transport related issues such as environment, energy or land use trends or because that is the locus of convergence of various sub discipline of economical sciences as service economics, industry and manufacturing economics, financial service economics in addition to infrastructure economics or network economics.

77. This is true of deregulation or new organisation required by the law, that needs to revisit natural monopoly industry concepts, essential infrastructures concept, social marginal cost charging concept, to introduce transactional costs linked to the new organisational charts, and also to address economical barriers to entrance

in the market, and to free through a fair system of access to the infrastructure network.

78. This is true because of competition supervision of services, and also ways to private-public or public-public partnerships providing or funding universal services or advanced services. This is true also that transport economics have to address not only efficiency, but also accessibility to transport service, charging with an equitable distribution financial system. This is true because of the various stakeholders (and their roles) of the transport system or markets: regulatory authority, societal demand, service providers, infrastructure service operators.

79. This is drawing ECTRI to propose the following issues as a package, to enhance and revisit the international interfaced European excellence in transport economics.

80. First, there are needs of “soft transport research infrastructure” European wide even if some are addressing issues covered by subsidiarity, European transport research has to address the needs of all European governments (EU, State members, Acceding Countries, regional and local governments).

First of all, a big data basis on transport economics results and projects be carrying out is of relevance.

A second big data basis, free accessible, should be created for data mining, econometrics,... regularly updated about the flow of goods within the European internal market, including international flows. This shall be addressed all shipping allotments (from parcels to containers load and less than truck load) to train or vessel bulk load ; the aim of this data basis shall be through an harmonized method to cover all logistical and transport related issues to be data mined through surveys or researchers.

In the domain of person mobility, there are needs of such type of data basis for intercity passengers, rural or urban mobility and intermodality.

Third, a virtual library on transport economics, with physical access mode and electronic interactive environment dedicated on access to data basis, is needed at European level; Europe has to fill the gap she has in front of the American network of transport libraries.

81. Second, on the thematic side and because of the frequentation of transport economics sciences and scientists, it should be efficiency for the reality of STERA to create networks of excellence dealing with new transport economics based on state of the arts report (ECMT, ECTRI). This could be:

- focused on a group of discipline ;
- focused on urban mobility economics, intercity mobility economics, goods transport and logistics economics;
- focussed on charging, tolling and financing transport services or transport infrastructure services.

## **Appendix 1: ECTRI strategic paper (ECTRI report 2003-01-EN) executive summary (October 28, 2003)**

This document presents the strategic vision and mission of ECTRI. It begins with some basic «realizations» about the future of European Transport. These realizations, in effect describe the overall picture of the future European transport shared by the members of ECTRI. The most important of these «realizations» are the notions of an ever increasing demand for travel and transport, increasing traffic congestion in all parts of the networks of today, the need for higher quality of (transport) services, higher sustainability of the transport operation, safety and security, and the importance of the user / customer.

In addition to the above “realisations” the role and importance, of a number of “elements” or “factors” that affect the “overall” result i.e. the proper functioning of the transport systems and their innovations, is also stressed. These elements refer to the:

- Society’s trends and attitudes and the societal policies followed,
  - Industry’s views, plans, and innovations (industrialists and operators)
  - Attitude and the role of the various stakeholders
  - Transport or transport related policy environment, and the policy making process,
  - State and results of transport or transport related research,
- and finally
- The organisation and functioning of the different markets (transport or others).

A number of other potential future key issues are then mentioned and these are the following:

- Quality and affordability of transport services.
- True pricing of transport services through external costs calculation.
- Training and public information in the field of transport.
- Integration and optimization of the ICT<sup>4</sup> and their applications in Transport so as to achieve a truly integrated ITS in the Europe of the future.
- In relation to the previous point, provision of accurate certification mechanisms for products and new services especially in relation to the functioning of the European ITS.
- Integration of the various Transport services to form truly multi-modal networks.

The report is then presenting the relationship that exists between (transport) research and commercial applications of the research products, and shows that there is a close interaction in all stages of the 5 – 20 year cycle that is necessary to elapse between initial research and development until full market acceptance and integration. In relation to this “relationship” (which is diagrammatically shown in Figure 1), the report then goes on to define the role of each of the main “stakeholders” in the provision of transport services, and namely of the following:

- The Industry
  - The policy environment and policymakers
  - The operators / service providers and of the owners of infrastructures
  - The users / customers and society as a whole
  - The scientific community,
- and finally
- The public and private research funding structures.

Within the light of the above considerations and based on the founding aims and objectives of the ECTRI Association, it is stated in a clear and concise way that the core area of ECTRI' s focus is:

*To work primarily towards a Single European Transport System which is truly multi-modal, safe and secure, heavy user of ICT, and reconciling the objectives of efficiency and environmental protection.*

The long - term **vision** of ECTRI is defined by a number of more specific “visions” which are as follows:

- A.** To achieve **Integration of European Transport Research** (starting with its members) primarily by effecting *common priorities* and programme of work, *mobility of researchers*, and working towards developing *Joint European Infrastructures (JEl)s* in some key areas of Transport research and / or research related activities. This calls, among others, for devising a way to jointly utilizing the current infrastructures within each Institute, and joining forces for building new ones at European level. Particular emphasis and priority will be given to integrating Institutes and research organizations from the new member states.
- B.** To provide an **independent – “intellectual” dimension of advice** towards the research funding bodies of the EU or member states whose thinking is currently heavily solicited by industry.
- C.** As an extension to the previous «vision», to create practical and usable **“links” between the results of applied research** and their **industrial transformation** into “products” or services.
- D.** To work (together with other relevant European Organizations and bodies like for example FEHRL, FERSI, and others) against European fragmentation of Transport research and provide a **uniform European representation** towards Transport research in the US, Japan, and Asia.
- E.** Promote coordinated and high quality **European - wide training options** for Transport executives.
- F.** To expand the European transport related experience and know-how to other countries and environments and vice versa.

*In materializing all the above strategic objectives, ECTRI will strive to create at the end a single European virtual Transport Research Institute incorporating the strengths and potential of all its members and utilizing their expertise and / or infrastructure in the different domains, to achieve the best possible results, while having a truly horizontal coverage of its core-area of focus.*

The **mission** of the ECTRI Association can be specified as follows:

- a. To create an ECTRI sponsored network of research infrastructures available for joint programmes of research or projects.
- b. To help European researchers especially young ones, to increase their mobility and training opportunities. The emphasis will be to young researchers from the new member states as well as the associated ones.
- c. To reinforce the position of its member Institutes and research Organizations in their countries as primary Transport research bodies and centers of excellence in Transport research.
- d. To acquaint its members with the policies and practices followed by each other within their National research priorities and policies, and promote discussion with a view to reconciling these policies vis-à-vis the ECTRI' s common vision, and the EU' s policies for Transport research.
- e. To create and keep open, permanent links and liaisons with the EU' s three DGs that are active in supporting transport research (i.e. RTD, TREN, and INFSO) with a view to providing advise and assistance in their (transport research) policy formulation and helping them to go beyond their “industrial focus” of today without neglecting the needs of other DGs like DG ENTR or DG ENV.

- f. To create and keep open, acting in co-operation with other European Organizations, permanent links and liaisons with the US TRB, and similar bodies in Japan, Korea, China, India, and Australia.
- g. To promote an open and free exchange of information on what happens in Transport Research at national level by creating state-of-the-art reports, and organizing other appropriate events and activities.
- h. To promote dissemination of research results and knowledge transfer between European researchers, especially in an East - West notion.
- i. In the sense of the previous point, to support its members in formulating and promoting joint proposals for research within the current 6<sup>th</sup> FP calls (or other programmes and calls) as a first step towards co-ordination and co-operation of its member Institutes and research Organizations.
- j. To produce a Joint Programme of Activities (JPA) valid for 3 years periods that pursues the ECTRI vision and defines the ECTRI business in the same time period (ECTRI 3-year Business plan).

In fulfillment of its above mission ECTRI formulates and updates regularly a specific 3-year *Joint Programme of Activities* (JPA). This is an internal document approved by the ECTRI Assembly and forming the background to all of ECTRI 's activities.



## **Appendix 2: ECTRI statement on EC COM (2004) 353 final (July 22, 2004)**

29 June 2004

**Note from ECTRI  
(European Conference of Transport Research Institutes)  
To the attention of the European Commission  
"Opinion on the proposed architecture of the 7th FRDP"  
COM (2004) 353 Final**

### **I - The FRDP and the European Research and Innovation Area in surface transport**

1. ECTRI is aware of the Communication from the Commission related to the 7<sup>th</sup> FRDP and gives the following opinion.
2. The field of transport and research in transport is very marked, like others, by the international and European dimension of the problems or solutions which underlines:
  - The reform of the State and public governance,
  - The societal development,
  - The economic development.
3. The complexity of the problems and innovations, as well as the research of scientific and technological excellence, require "mode de faire", tools and instruments, including governance of research, diversified and especially adapted to the various problems of the concerned stakeholders.
4. The foreseen architecture of the 7th FRDP answers well to these preoccupations and to this challenge, even in the fields related to transport which concern all the human activities and touch directly 1/6 of the European GDP.
5. ECTRI is very supportive of:
  - Technology platforms and related potential technological initiatives,
  - Collaborative research,
  - The initiative on security.

And especially:

- Mobility and research infrastructures,
- Coordination of the structural funds and FRDPs;

There are including:

- International Interfacing of European Research Area,
- Research and society articulation.
- Financial innovative engineering

6. This paper is also giving some comments on:

- Excellence research,
- European Research Council,
- Problem related to Networks of excellence.

### **II. The governance for economical and institutional competitiveness**

7. ECTRI is very favourable to the governance of research in the field of the surface transport for international economic competitiveness by developing technology platforms.
8. This instrument must have an objective of direct economic competitiveness of industries and/or linked services (and nothing else).

9. ECTRI particularly supports the fact that it represents various types of articulated partnerships:

- Industrial companies, manufacturers, operators, research institutions and universities in the conception and realization of the research programs planned through the strategic research agendas (SRAs),
- Undertakings, financial institutions, financing agencies and European, national and other authorities in their conception, financing and management.

10. The strategic research agendas must be articulated with the medium-term strategic vision. Concerning the research and innovation policies, this vision does not always have to be completely articulated with the politically correct vision in the short and medium term. In addition, when the public policies impact the structure of industry and operators - as it is the case in the railway field - these SRAs could envisage all useful researches for the innovations linked to these sectorial reorganizations, if not the directives and regulations could not be implemented.

11. The car and manufacturer industries are directly linked to the ERTRAC platform, to the pseudo platform E-safety Forum and for the parts concerning transport application of the hydrogen and fuel cell platform (H2PAC).

12. The Rail industry<sup>5</sup> is directly linked to the ERRAC platform and to the transport application of H2PAC platform.

13. We can regret some major gaps in the current landscape of surface transport platforms that could be also solved through the collaborative research line:

- There is nothing concerning the innovating urban transport (bus industry, coach and subway, tram at international level, like the operators)
- The truck industry (Europe is a world-leader) is also missing, whereas, even in the strongest hypothesis on modal transfer, road transport of goods will remain the majority<sup>6</sup>.
- The impact on the transport systems of demographical trends including ageing society.

14. But the development of technology platforms does not exhaust the whole problem of international economic competitiveness of the surface transports<sup>7</sup>.

15. Research for the direct framework of this sectorial competitiveness (policies of technical regulation, standardization, industrial policy), like research for the general framework of the transport governance (public policies relating to transport... transports, energy, safety - security, environment, health...) and like the one of full economic competitiveness (transport relates to all economic and societal activities), and like research on societal development transport related (ageing, handicap, environment...) require the preservation of a governance close to the last FRDPs through a collaborative focus research.

16. In particular, the research is crucial for:

- Systems and organization of transport (intermodality, safety, durability...)
  - Impact of new technologies (NTIC, nanotechnologies, power electronics...)
  - Peri-normative or peri-regulatory,
- with their systemic, multidisciplinary or interdisciplinary nature.

If the Joint Research Centre has a legitimate role on these subjects, it can not be the only provider as there are critical masses outside.

### **III - The surface transport research dynamics and governance excellence**

17. Beyond the instruments of direct competitiveness, the aim is to organize a well balanced governance and dynamics, notably in term of research processes.

18. Mobility and research infrastructures are crucial for the focus research development in surface transport. If the needs in the field of 'Big Science' are obvious and legitimate, the scientific and technological and by the way, the economic and societal ones, requires that a part of the funding and research professionals go to the needs of focus research and in particular the surface transport one.

19. The renewal of the generation of researchers and research professionals and the capacity to transform Europe into a second reserve of scientific and technical competencies - even in the industry - the renewal of the generations of academics will draw firstly the renewal of generation in a disciplinary way - make that it is imperative to devote financing means for mobility in the field of interdisciplinary multidisciplinary, complex or systemic focus research.

<sup>5</sup> Maritime and naval industries are also well covered

<sup>6</sup> If these lacks are not completed, it shall be taken into account in collaborative research

<sup>7</sup> It shall also be taken into account in collaborative research

20. The quality of research infrastructures:

- Experimentation, simulation or observation facilities,
- Data bases, libraries, collaborative environments,

is fundamental for quality, relevance of scientific and technological knowledge that is the base of public policies, industries and services developments.

We can notice that two thematic networks of 5th FRDP and ECTRI complementary work parallels to those of ESFRI result in raising this question quickly for the surface transport area.

21. There is neither excellence nor excellence governance without interfacing internationally the European Research Area.

For research in surface transport, the priorities should be:

- Western Balkans Countries,
- Non-European countries of OECD,
- China, India.

It will be necessary to raise the question of the ex-countries of USSR, the countries of the Barcelona process and those of southern Africa and America.

22. COST activities were historically strategic and still remain strategic notably for the coordination and development of the projects and networks.

23. The enlargement of the European Research Area requires a very good coordination of FRDPs and structural funds, in order to avoid what occurred at the occasion of the latter enlargements, i.e. distortions of competition by introduction of ultra modern equipments competing with the existing ones, even if it is legitimate to modernize the quality of research infrastructures in these countries.

24. The imperative character of the research investment for growth is facing a public budgetary constraint (EU, Member States, Regions...) and needs an adapted financial engineering.

25. ECTRI particularly thinks that research and society dialogue is relevant; but giving the fact that the debate "Research and Society" is in depth cultural, it raises the question of cultural and linguistics diversity in Europe.

26. ECTRI wishes that the level of administrative and financial complexity reached by FRDPs shall be re-examined; it notes that an opportunity is opened with the fact that various mode de faire are at stake besides the direct management of the Commission.

27. ECTRI thinks that it should be better to charge a flat rate to everything that is possible within the 7th FRDP (the Marie Curie program is a good example, including at the diversified costs).

#### **IV. Scientific excellence and Surface Transport**

28. ECTRI thinks that all mode de faire and new instruments or tools of the 7th FRDP pursue scientific and technological excellence.

29. ECTRI notes that the European Research Council (ERC) will have to manage with:

- Setting teams of excellence in competition,
- Mobility.

It could be of good governance not to manage the 2 issues by the same mode de faire (see 19).

30. ECTRI notes that it is necessary that the program aiming at setting the European teams of excellence in competition shall not only be applied to disciplinary but also to the multidisciplinary, the interdisciplinary, the systemic and the complex research.

31. ECTRI notes that the communication project speaks about the networks of excellence (NoE); it would be damaging for the action continuity and the investment required by the NoEs that they do not appear any more in the future.

32. From the presence of centres of excellence and integrated networks of excellence depends the non excessive delocalization of industrial research centres.

**Conclusion**

33. At this stage, ECTRI is supporting the architecture of the 7th FRDP such as foreseen into the Communication from the European Commission, COM (2004) 353 Final.

34. It is clear that this architecture of the new mode de faire create some problems of coordination<sup>8</sup> and positioning for all the research stakeholders.

35. The success of this architecture will depend on the level of financing the 7<sup>th</sup> FRDP and especially of its inducements on national, regional and private financings and ECTRI welcomes the idea of a doubling evoked in the Communication.

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<sup>8</sup> Overtaking the schemes of OCM (Open Coordination Methods) and "ERANET demand/program" and asking for "ERANET supply side" and other coordination methods.

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