Thematic Priority
1.6. Sustainable Development, Global Change and Ecosystems
1.6.2: Sustainable Surface Transport

WORK PROGRAMME
2002-2006
Year 2005 update - Call 4A

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1. INTRODUCTION

Surface transport plays a key role in people's everyday lives and is a decisive factor in economic competitiveness and employment. The promotion of its sustainable development without sacrificing either economic growth or the freedom of movement has become a central objective of the European Union policy.

Surface transport has to face the challenge of supporting future economic development and subsequent traffic increase without degrading the quality of transport services and protecting the environment. Research and technology developments have an important role to play and are providing the European Transport System with innovative vehicle and vessel technology and new forms of transport organisation and infrastructure.

The sustainable surface transport work programme proposes a set of research objectives which implement the content of the Gothenburg declaration of June 2001 and the Commission White Paper on European Transport Policy 'European transport policy for 2010: time to decide'[1].

The realisation of ERA across the entire surface transport chain of stakeholders and the different research schemes proposed at national level will be essential to achieve the aims for an Integrated and Sustainable Surface Transport System in Europe. The work programme implementation will, where appropriate, strengthen and complement research carried out under non-EU initiatives such as PREDIT, Mobilität und Verkehr, (LOGCHAIN, DEUFRAKO) Foresight Vehicle, EUREKA etc in order to maximise the impact of research within ERA. Also, participation of organisations from New Member States and Candidate Countries in ERA instruments will ensure a sustainable development and security of transport in an enlarged Union.

The creation of Technology Platforms for the different industrial sectors of surface transport, such as ERRAC (European Rail Research Advisory Council) in rail transport and ERTRAC (European Road Transport Research Advisory Council) in road transport, is an important element to reach the main objectives of the priority and to achieve a higher degree of integration in research. Technology Platforms provide a mechanism to develop a long-term vision for research and a strategic research agenda for its implementation.

The complexity of the transport system is addressed in an integrated and comprehensive way, through two complementary approaches, that are identified in this work programme as *Research to support the European Transport Policy* and *Research, technological development and integration*.

Research to support the European Transport Policy addresses research for transport policy with emphasis on short-term implementation and exploitation of results. *Research, technological development and integration* focuses on the development of new technologies specific to surface transport and on their integration into future transport systems and products with a short, medium and long term perspective.

Periodic Calls for *Research to support the European Transport Policy* are identified with the letter A (1A, 2A, etc.) and periodic calls for *Research, technological development and integration* with the letter B (1B, 2B, etc.).

1 'European transport policy for 2010 : time to decide', COM (2001) 370.

2. OBJECTIVES, STRUCTURE AND OVERALL APPROACH

Objectives

The sustainable surface transport work programme addresses the following objectives as defined in the Specific Programme:

Objective 1: New technologies and concepts for all surface transport modes (road, rail and waterborne).

Objective 2: Advanced design and production techniques.

Objective 3: Rebalancing and integrating different transport modes.

Objective 4: Increasing road, rail and waterborne safety and avoiding traffic congestion.

Modalities for implementation

Research to support the European Transport Policy

The activities described are being implemented by means of four periodic calls with deadlines in December 2003, 2004 and 2005. These calls will include both new and traditional instruments.

Research, technological development and integration

Integrated projects, networks of excellence, specific targeted research projects, co-ordination actions and specific support actions are being implemented by means of three periodic calls with deadlines in 2003, 2004 and 2005, respectively, and one continuous call from year 2003 to 2006. Periodic calls cover integrated projects, networks of excellence, specific targeted research projects and co-ordination actions. The continuous call includes only specific support actions. Information on the continuous call is given in section 6.

For both activities, specific attention will have to be given, where appropriate and throughout the work programme to issues of standardisation and harmonisation, in order to achieve an integrated surface transport system.

Focussing the technical content of the research activities

An invitation to submit for Expressions of Interest[2] was organised with the aim of assessing the readiness of the scientific community and industry to propose Integrated Projects and Networks of Excellence. The results of the invitation were used as one of the inputs to help define topics for the new instruments of the work programme and to specify the technical scope of the first calls as well as indicative trends for future calls.

Research to support the European Transport Policy

Several research domains, including topics identified from the Expressions of Interest, have been considered ready for implementation by means of new instruments.

Research, technological development and integration

Given the number of expressions submitted, the strong presence of industry (49%) and the indicative size of potential projects it was considered appropriate to allocate up to 70% of the budget to new instruments in Calls 1B and 2B. The technical content of Call 3B (the last periodic call of the priority) seeks to ensure a balanced coverage of the priority's objectives and technology areas.

2 OJ C71, 20.03.2002, p. 14

An analysis of research domains and topics covered within the previous calls and evaluations was carried out. It was concluded to reduce the budget for integrated projects and networks of excellence from the initial share of 70% to 60%, with a corresponding increase of the budget for traditional instruments from 30% to 40%.

This new division takes into consideration a need to re-open strategic research domains such as the construction of new transport infrastructure to better integrate New Member States and the development of trans-shipment operations in support to intermodal transport in Europe. This is also in line with the recommendation from the Marimón Group[3] that the importance of Specific Targeted Research Projects, in particular for SMEs and New Member States, "must be reflected in a substantial increase in the total share of the budget finally allocated to STREPs in future calls of FP6 and beyond under FP7" .

In order to fulfil the objectives of sustainable surface transport, integration through critical mass and structuring effect (by means of integrated projects and networks of excellence) have to be complemented with technological developments of a more limited scope (by means of specific targeted research projects). Projects to acquire new essential knowledge on aspects such as developing new transport concepts (e.g. new types of vessels) or processes (e.g. advanced automation in manufacturing processes) are also foreseen. A limited and strategically relevant number of research domains of the work programme will be open for specific targeted research projects in the periodic calls.

International co-operation

The sustainable surface transport research programme encourages the collaboration of organisations from Third Countries on a project-by-project basis, if the participants in the project find mutual benefit. All open topics and research domains of the four objectives are eligible for support under "international co-operation".

This co-operation could be of particular relevance on long-term research for new transport technologies (e.g. hydrogen technology), on research for supporting standards and regulations (much of transport is regulated at international level) and safety issues.

Participation of SMEs

SMEs will have an important role to play in integrating and structuring the technological and scientific base driving innovation in surface transport. In particular, they will be essential to the creation of new and improved value added supply chains across Europe and accordingly are expected to be key players in the underpinning research programme. SMEs are therefore encouraged to participate in research activities using integrated projects and networks of excellence. Applicants should actively seek to build partnerships to include SMEs. Specific targeted research projects in areas such as design and manufacturing linked to new product generations and new construction infrastructure concepts represent concrete opportunities to stimulate SMEs' participation. Specific measures to facilitate their participation in all instruments will be implemented throughout the programme by means of Specific Support Actions, continuing the effort initiated in Framework Programme 5.

3 An independent Panel of high –level experts, chaired by Professor Ramón Marimón, to evaluate the effectiveness of the New Instruments introduced in Framework Programme VI

3. TECHNICAL CONTENT

3.1: Objective 1 « New technologies and concepts for all surface transport modes (road, rail and waterborne) »

3.1.1 Research to support the European Transport Policy (Research domains from 1.1 to 1.3)

Clean Urban Transport

The development and introduction of new transport policy concepts in cities, where 80% of the EU population lives, are a major challenge for policymakers. The White Paper on European Transport Policy has identified congestion, pollution and energy consumption as key causes for the deteriorating performance of Europe's transport systems, especially in the industrialised urban regions. The Commission's Communication "Towards a thematic strategy on the urban environment"[4] presents a vision on how urban transport can contribute to achieving a better environmental performance and increased quality of life in urban areas.

This research priority is of direct concern to authorities, businesses, citizens and the transport industry. It addresses both urban passenger and freight transport. In an era of just-in-time delivery, competition among cities and regions and environmentally conscious development, urban transport has become an important element of the European production system and social fabric – ensuring the conditions for economic growth and social integration.

Research will focus on RTD activities for developing, testing and demonstrating innovative policy tools and technological solutions.

CIVITAS II addresses implementation and transition strategies for Clean Urban Transport. Research in the field of public transport will include the development of innovative solutions for market analysis and product development, offensive marketing, service integration, improved access for people with reduced mobility, private sector investments, and low-cost network and vehicle refurbishment. To advance the knowledge on innovative measures, research is planned on urban pricing, awareness and information tools, mobility management, integrated planning approaches, and access control and regulation.

Research domains:

1.1 Testing implementation and transition strategies for Clean Urban Transport– CIVITAS II (Call 2A)

1.2 High quality public transport (Call 3A)

1.3 Advancing knowledge on innovative measures in urban transport (Call 3A)

1.3-i CIVITAS dissemination and best practice transfer action (topic selected for call 4A)

In the framework of the ongoing CIVITAS Initiative, the following topic will be addressed:

4 COM (2004) 60 final

Topic selected for the call 4A

- **CIVITAS Dissemination and Best Practice Transfer Action**

Objective: The CIVITAS Initiative addresses Energy and Transport objectives in an integrated way. The demonstrations and evaluation activities undertaken within the CIVITAS are producing a wealth of experiences that are relevant for politicians, technicians and the scientific world. In the year 2006 the first group of demonstration projects is coming to an end. The objective of this action is to ensure that these projects' experiences are exploited up to a maximum level; that the validation and promotion of results and knowledge transfer are continued; that innovative means for dissemination and take up are implemented; that networks for information exchange are maintained and expanded; and that the wider impacts of CIVITAS are assessed.

Scope: The practical work programme should include studies and actions to promote the transfer and take up of project results; preparation of publications and topic-based best practice guides; establishment of interactive partnerships between cities; organised site-visits; 'on the job' information exchange and learning; presentations and workshops; international networking; impact studies; and the preparation of scientific articles and conferences.

Expected results: It is expected that the selected project will offer an umbrella for a number of activities that should address:

First target group - cities and local level actors:

- Ensuring knowledge transfer, identification, description and active promotion of the CIVITAS results and best practices through different means, paying attention to the achieved technical results, the processes and the framework conditions;
- Maintaining topic or project-based networks for information exchange and validation of results that were established between the CIVITAS demonstration cities at technical and political level, and enlarging them with committed 'newcomers';
- Establishing partnerships to transfer results between CIVITAS demonstration cities and cities that will be or are candidates for receiving funding to improve their urban transport systems in the framework of the European Union's Regional Policy.

Second target group – policy-makers and implementers at all levels:

- Assessing the contribution of CIVITAS and the project results to EU policy and development of policy recommendations, with a specific emphasis on the Lisbon Strategy, Sustainable Development Strategy, Energy policy, Transport policy and Environmental policy;
- Undertaking validation of the CIVITAS project results, both public and political acceptance, as well as scientific validation, including some post-project monitoring, and ensuring a high quality and targeted dissemination of these results to the scientific world and to Member States programmes;
- Setting up, maintaining, where appropriate translating, and exploiting an electronic library of the educational material developed by the CIVITAS projects, as part of the CIVITAS website.

The selected project should consolidate, build on and provide added value to the results of the CIVITAS I and II demonstration projects and the activities undertaken by the METEOR and GUARD projects. Dissemination activities will also need to be coordinated with other energy and transport dissemination projects. The cities and local level actors that will benefit from the projects' activities should be (largely) identified in a transparent way after contract signature and should provide a reasonable own contribution.

Preferred instrument: Specific Support Action

3.1.2 Research, technological development and integration (Research domains from 1.4 to 1.10).

The main focus will be on the development and promotion of future generations of clean, quiet and efficient vehicle concepts for all surface transport modes and to reach a target of 20% fuel substitution of fossil fuels by 2020. The next generation of alternative and renewable fuel propulsion systems, designed to achieve greenhouse emissions targets as expressed in the Kyoto agreement and Euro V for regulated emissions, has to be conceived and tested.

To maximise its impact, research on new propulsion concepts needs to be interfaced with work on compatible fuel infrastructure as well as investigations on new forms of mobility and organisation of transport in cities, including demonstration with acknowledged technology that needs to be validated in real scale. The objective will be to reduce the use of polluting transport means in populated areas while maintaining the same level of accessibility and to put on course the transition towards an environmentally harmless transport system based on renewable fuels and reduced environmental noise emissions.

Selected research domains for Call 3B and relevant instruments

SSAs are included as part of the continuous call.

1.4 Technologies for propulsion and power systems increasingly based on alternative and renewable fuels and fuel blends in vehicles and vessels, in particular the optimisation and control of more flexible power trains, the development of new components and auxiliary systems, the combination of various types of motorizations and fuels and the implementation of advanced control technology for optimal propulsion efficiency and cleanliness.

Instruments: **STREP** (*for all transport modes and for road transport with emphasis on after-treatment),* **CA** and **SSA**

1.5 Integrating zero or near-zero emission propulsion systems and components such as fuel cells which offer high-energy efficiency benefits.

Instruments: **CA** and **SSA**

1.6 Development of holistic noise abatement solutions which consider the entire vehicle/vessel and infrastructure system, new technologies and systems approaches for improved noise control at source and the further support to legislation. Particular attention will be given to urban areas.

Instruments: **CA** and **SSA**

1.7 Integration and validation of measurement and sensing technologies to ensure the optimised environmental operation of both vehicles/vessels and infrastructure.

Instruments: **CA** and **SSA**

1.8 Technologies for the effective, safe and clean supply and delivery of alternative and renewable fuels at fuel distribution points.

Instruments: **STREP**, **CA** and **SSA**

1.9 Development of concepts for innovative, non-polluting means of transport to achieve a more effective organisation of urban transport of persons and goods that would, as a consequence, result in a more rational use of motorised traffic.

Instruments: **CA** and **SSA**

1.10 Research to develop, compare and assess possible scenarios for the transport system and energy supply of the future taking into account ongoing research outside the research framework programme undertaken by or in co-operation with the Commission. The analysis includes modelling and forecasting and will consider such criteria as the autonomy and security of energy supply, effects on the environment and economic, technical and industrial viability including the impact of potential cost internalisation and the interactions between transport and land use.

Instruments: **CA** and **SSA**

Selected topics for Call 3B and relevant instruments

- **Low cost power-integrated advanced hybrid configurations**

Objective: The project aim is to develop an optimised advanced hybrid vehicle concept for road transport, based on innovative architectures and on low cost, standardised hybrid drivetrain components (possibly resulting from work performed in the Joint Call or previous and ongoing European and national projects) and on innovative auxiliary components, such as electric based after-treatment, component cooling and air conditioning systems, so that the whole electric and thermal energy flows are optimised. Work on the ICE (Internal Combustion Engine) should complement this effort by looking at matching its characteristics and performances to those of the electric subsystem to achieve marketable acceleration and driving behaviour while reducing cost, fuel consumption, noise, pollution. Diesel, gasoline and alternative fuel based ICEs are within the scope of this project. Emphasis should be placed on the capability to run in a zero or near-zero emission mode.

Scope: The project must concentrate on the development, implementation and control of appropriate architectures including optimisation of the engine/transmission subsystem, the development of appropriate global energy management and control, the integration of optimised after-treatment systems (in particular electrical powered ones both for direct exhaust gas treatment or for assisting in the simplification of current catalytic systems) and of electric-powered environmental control. Component development work should not be included as far as the electrical part of the power-train

is concerned. Although the focus of the work will be on light vehicles, any synergy with heavy duty vehicles could be exploited where appropriate. ICEs using advanced combustion processes, as well as the integration of these innovations (such as electric air conditioning systems) in fuel cell-based hybrids, could also be taken into account if appropriate synergies could be exploited.

Expected outcome: The project should deliver proof of concept vehicles achieving more than 35% fuel consumption reduction with respect to today's best-of-class conventional vehicles of the same category. When compared to current best-of-class hybrid vehicles, the improvement should be of at least 10% in the NEDC (New European Drive Cycle) while including air conditioning requirements in the usage cycle. At the same time, pollution should be reduced to one fourth of current Euro IV levels, while demonstrating the capability to drive at least 10 km with a negligible impact on air quality.

Instrument: Integrated project

- **Towards advanced road transport for urban environment**

Objective: The aim is to develop advanced concepts for innovative automated and/or driver assisted road vehicles for passengers and goods to support the introduction of new methods for managing urban transport aiming at the sustainable use of motorised traffic, less congestion and safer driving. These concepts should be applicable in the short to medium term. The project is expected to contribute significantly to a sustainable development of European cities and also to the development of a large interoperable road network in the long term.

Scope: The project must include the development and deployment of road vehicles with fully automated and/or driver assistance to support real door to door services (for both passengers and goods) in urban areas. These road vehicles (cars, busses, light duty vehicles, trucks,…) may have dual modes capabilities running automatically on restricted environment and manually elsewhere. The research must consider the development of concepts and pilots for dedicated and protected infrastructures (new or existing to be adapted). Infrastructure with high throughput and accurate positioning system to link automated zones must be taken into account as well. Particular attention to the integration of such concepts will be necessary considering the technical, operational, financial (cost/benefit), legal, political and social aspects as well as the city needs. New intelligent transportation systems based on automated and/or driver assisted road vehicles should be validated and demonstrated in different cities within the enlarged Europe. These developments should be based on the results of existing European and national projects, especially CyberCars, CyberMove and EDICT taking into account recommendations from FREDERIC and CITY FREIGHT, projects for what concerns city problem solving.

Expected outcome: Proof of concept of an integrated environment comprising various organisation tools for city trips, new vehicle technologies and dedicated infrastructure for urban transport. Evaluation of impacts and deployment strategies through large scale demonstrators, including considerations on pubic acceptance of these innovations.

Instrument: Integrated project

- **Efficient rail traction and sustainable energy supply**

Objective: The main objective is to address the energy efficiency of the railway system, taking a long term perspective, and considering the introduction of innovative traction technologies and the integration of energy efficiency targets into vehicle, operations and infrastructure management strategies. Specific targets include increasing the level of energy regeneration within the rail system, developing more energy efficient train control systems and reducing Life Cycle Costs, by taking into consideration strategies and product solutions for new developments in traction, enhanced driving techniques to reduce energy consumption and reducing energy needs for ancillary equipment.

Scope: The overall efficiency of the generation, distribution and consumption of electrical traction energy must be revisited to develop solutions with significant impact. The research should be guided by consideration for cost effectiveness through the optimisation of the complete power train (and the combination of power train and ancillary equipment) and the search for more efficient designs enabling significant energy savings to be achieved. Further technology solutions for the integration of energy recovery and storage options should be investigated as an integral part of future energy consumption. Other issues for which solutions should be found are reduced energy needs for ancillary systems and the development of alternative traction technologies and systems (such as hybrid thermal-electric power c.f. potential cross-applications with bus/truck sector and linear motors).

Expected outcome: An operational energy reduction of at least 6% below the anticipated energy consumption in 2020 given the target of a doubling in traffic intensity should be achieved. There should be clear identification of the individual savings made by each sub-system in the energy consumption process, how these sub-systems inter-relate to achieve energy savings and how they contribute to the overall reduction in energy consumption of the complete railway system.

Instrument: Integrated project

3.2: Objective 2 «Advanced design and production techniques»

3.2.1 Research to support the European Transport Policy

No specific research domain is foreseen under this objective.

3.2.2 Research, technological development and integration (Research domains from 2.1 to 2.7).

Research will concentrate on developing and promoting concepts of one-off, small series and mass customisation production environments specific to surface transport, based on the innovative use of advanced design and manufacturing.

The objective will be to achieve improved product quality and performance based on cost effective and environmentally friendly production systems on a life-cycle basis. Research will seek to reduce manufacturing costs by 30%-40% and production lead-times by 25%.

Selected research domains for Call 3B and relevant instruments

SSAs are included as part of the continuous call.

2.1 Integration and standardisation of enhanced product development tools for design, simulation, prototyping, testing and risk management that would reduce product development time and all associated costs and resources.

Instruments: **CA** and **SSA**

2.2 Application of advanced design and manufacturing techniques used in vehicle and vessel production and infrastructure aiming at developing clean, silent, safe and comfortable products and services with reduced operational cost and energy consumption. In addition, activities will support the development of a new generation of products and systems enabling Europe to strengthen its competitiveness or for certain categories of products to regain competitiveness (e.g. guided vehicles, floating structures, ro-pax and ferries, gas tankers).

Instruments: **STREP** (*only for new products and systems generation in waterborne transport),* **CA** and **SSA**

2.3 Development of advanced, low-mass material structures and systems for vehicles and vessels offering product structural and functional integrity for rated performance at low cost.

Instruments: **STREP** (*for all types of transport vehicles and vessels excluding passenger cars),* **CA** and **SSA**

2.4 Integration of new manufacturing processes for products (vehicles, vessels and their components) characterised by a high degree of complexity with emphasis on quality, cleanliness, flexibility and cost effectiveness.

Instruments: **STREP**, **CA** and **SSA**

2.5 Development of strategies and processes for clean maintenance, dismantling and recycling of vehicles and vessels including interventions on vehicle and vessel wrecks. Emphasis will be put on clean, cost and energy effective processes, sub-sea robotics and autonomous systems for maintenance and inspection, innovative dismantling and recycling operations including the removal of oil slicks at sea.

Instruments: **CA** and **SSA**

2.6 Design and manufacture of new construction concepts for road, rail, waterborne and inter-modal infrastructures that are high quality, cost effective, energy efficient, low noise, safer, risk mitigating and low maintenance, and that promote rapid infrastructure renewal.

Instruments: **STREP** *(with special consideration of the needs of New Member States),* **CA** and **SSA**

2.7 Design and manufacturing technologies to improve vehicle/vessel interfaces with transport infrastructure and other vehicles/vessels from the same and different transport modes including infrastructure and vehicle inspection aspects.

Instruments: **CA** and **SSA**

Selected topics for Call 3B and relevant instruments

- **Future road vehicle production structures (the 5 day car initiative)**

Objective: The aim is to define a manufacturing automotive system capable of delivering products with a high level of responsiveness to customer requirements within all necessary performance specifications. It would have to develop and integrate the necessary product technology, product configuration, supply, distribution and marketing systems and methods needed to meet the shortened time delivery target.

Scope: Emphasis is placed on developing a design and manufacturing environment of a new production system that cuts down the inventory and the time to produce a specific, customised car configuration. It should take into account and build on the results of research work (in particular financed within European Framework Programmes) on low cost and high quality innovative manufacturing processes, light weight structures and the environmental implications of the new production system and of the recycling of the end product (i.e. in terms of its disassembly). All this while lowering lead and production times, production and maintenance costs and increasing quality, through the involvement of suppliers at all levels and, where necessary, the logistics providers. All aspects related to production (both upstream and downstream) should be taken into account, either directly or through other ongoing projects. For a correct inclusion of environmental aspects, logistics and their energy needs should be also analysed in depth. The proposed system should take into account all future requirements of light-weighting (including therefore the ensuing construction, assembly and maintenance requirements), safety and equipment and the necessary changes in the design environment and procedures. Modular approaches should be explored, as well as different supply models. The establishment of links with previously launched Integrated Projects on safety and light weight vehicles (Call 1B and 2B respectively) is highly recommended and expected.

Expected outcome: Integrated, life cycle optimised, design, production and logistics environment capable of flexibly delivering mass customised, built to order vehicles in as few as 5 days, including the production of relevant hardware demonstrators where necessary. Impact analysis of such a system in organisational, financial, social, environmental terms for the industry and definition of strategies for its application.

Instrument: Integrated project

- **Development of cost-effective high performance track infrastructure for heavy and light rail systems**

Objective: The strategic aim is to support separate projects for light and heavy rail which consider the cost-effective introduction of new high performance track infrastructure products and techniques as positive drivers in modular and interoperable rail systems. The ambition is to develop and build an integrated family of "maintenance-free" modular track infrastructure solutions which can be adapted to specific circumstances and have the benefit of standardised components. Based on real and verifiable figures of today's life cycle costs that comprise track construction/renewal costs, maintenance and monitoring expenditure, the target should lead to a substantial reduction in track infrastructure costs, with a significant increase of the availability of track infrastructure (for both heavy and light rail applications). This must be demonstrated as a result of the implementation of the projects' findings.

Scope: Research in these projects should cover the development, testing and validation of new track components, materials, construction and maintenance methods to give an optimum lifecycle, reduced investment and annual costs and an improved Reliability, Availability, Maintainability and Safety (RAMS) performance. This requires a holistic approach to track infrastructure including its monitoring and maintenance, taking into consideration potential noise and vibration impact. The needs of railway undertakings for new maintenance technologies must be taken into account. This must allow for a targeted increase of traffic volume; meeting future demands for longer freight trains, heavier axle loads, increased train frequencies, higher speeds and punctuality.

Expected outcome: The projects should give rise to innovative solutions for heavy and light rail applications. Special emphasis should be given to the development of track infrastructure solutions with consideration for smart integration of standardised platforms, modules and components ensuring an optimised operational performance, as well as maintaining and regenerating the existing network, allowing potential retrofitting and eventual end-of-life processing.

An integrated deployment of innovative track technologies with a significant reduction in life cycle costs and an increased track availability for rail operators through improved performance and minimum downtime.

Instrument: Integrated project

- **Structuring the European Marine Testing capacity for increased competitiveness**

Objective: The aim is to build a lasting and complimentary relationship between major marine testing facilities and shipbuilders that provides Europe and its researchers with a complete, comprehensive, efficient and integrated set of advanced marine testing services (including inland navigation) and that will define R&D priorities in marine testing. This will ensure Europe's world lead within the field of marine testing and as a consequence contribute to a successful European waterborne transport sector.

Scope: Emphasis will be placed on measures to facilitate technology transfer of relevant research results (test facilities, maritime companies, academia), improvement of the reliability of testing processes taking into account the feedback of real trials of equipments and vessels, and on the structuring of marine test facilities in order to fully exploit the capacity within Europe in order to cover the needs of both shipbuilding industry and ship operators. The activities will encourage and facilitate the creation of lasting collaborative agreements that will ensure more efficient use of human, infrastructure, material and research resources and thereby improve competitiveness and the excellence of the services provided. These activities may also include the research and development of test methods and technologies and harmonised model to vessel correlation procedures.

Expected outcome: A formal and lasting structure that will coordinate the definition and introduction of common measurement technologies, unified observation methodologies and reporting of results. A knowledge base system for exchange of information on best practices, exchange of personnel, policy on hydrodynamic and structural testing and measurement technology, equipment and vessels trial processes and future joint investment plans.

Instrument: Network of excellence

3.3: Objective 3 « Re-balancing and integrating different transport modes »

3.3.1 Research to support the European Transport Policy (Research domains from 3.1 to 3.13).

There is a growing imbalance between modes of transport in the European Union. The success of road and air transport is resulting in ever-worsening congestion while failures to exploit the full potential of rail and short sea shipping, and in general of intermodal transport, are impeding the development of real alternatives to road haulage. The present situation, and its trend, which is forecasted to push even more in this unsustainable direction, is leading to an uneven balance of modes on the main Trans-European network corridors.

Interoperability of the European Railway System

The "2020 Vision" of the European Rail Research Advisory Council (ERRAC) aims at tripling rail freight's volumes. This calls for a set of new measures; concepts of co-operation and technologies designed to increase rail services attractiveness. The focus is on increasing the interoperability and integration of the European Railway System to actually enable and push forward the implementation of the new regulatory framework and to foster innovation in the railway sector for the benefit of all stakeholders.

Research domains:

3.1 Implementation of change in the European Railway System (Call 2A)
3.2 New concepts for trans-European rail freight services (selected topic for call 4A)

Intermodal transport and Logistics

Intermodal transport research activities will support technologies and services to ensure that the inherent advantages of the individual modes can be exploited in "Door to Door" transport chains. Activities should pay special attention to the needs and interests of the customers (shippers and passengers) so as to make intermodal transport more attractive to users.

The transport of freight also has to be understood as part of broader logistics systems which include packaging, scheduling, transporting, handling, storing, labelling, delivering etc. As transport costs are only a small part (10%-15%) of total logistics costs, shippers efforts to reduce total logistics costs often have significant negative impacts on transport demand (e.g. smaller more frequent deliveries, short delivery time windows etc.). Activities will focus on logistics practices that contribute directly to European transport policy objectives.

Research domains:

Intermodal Transport

3.3 Freight Transport Corridors (Call 1A)
3.4 Intermodal Freight Transport Systems, Technologies and Strategies (Call 3A)
3.5 Intermodal Freight Transport management System (Call 3A)
3.6 Motorways of the sea (MoS) (selected topic for call 4A)
3.7 EU Co-ordination and Promotion Forum on Intermodal Passenger Travel (selected topic for call 4A)
3.8 Knowledge Base for Intermodal Passenger Travel (selected topic for call 4A)

Logistics

3.9 City Logistics (Call 1A)
3.10 Logistics best Practice (Call 3A)

Safe, secure, efficient and interoperable waterborne transport

90% of the EU external trade and 41% of the intra-EU trade in volume are transported by sea. Short sea shipping has shown an increase in growth rates over the last years, but it still offers an even larger capacity that should be exploited to re-balance the different transport modes. A major goal should be the integration and interoperability of maritime and inland waterways transport

In addition, shipping is a truly global business that, whilst being highly competitive, has to respond to an increasing political and public pressure for high-quality operations that include activities such as improved ship safety and environmentally friendly ship operations and design.

Research will lead to the take-up of innovative concepts and systems in large-scale European validation platforms. To this effect, research will support the implementation of the new regulatory framework and encourage best practice of the shipping community.

Research domains:

3.11 Maritime navigation and information services (Call 1A)
3.12 Maritime transport coordination platform (Call 1A)
3.13 Vessel Data Management (Voyage Data Recorder, Electronic logbooks) (selected topic for call 4A)

Topics selected for the call 4A

- **New Concepts for Trans-European Rail Freight Services**

This research activity addresses also the fourth objective of the specific programme, 'Increasing road, rail and waterborne safety and avoiding traffic congestion'. As research activity 3.1 'Implementation of change in the European Railway System' has started and will pave the way for research activity 3.2, a description of its structure is below:

Objective: European rail freight has declined for many years and especially international rail freight suffers from serious quality problems. There is some progress and growth, however, with great variations from country to country. Serious actions are urgently needed. These matters are highlighted in the Transport White Paper as well as in the Commission Communication 23.1.2002 COM (2002) 18 "Towards an integrated European railway area".

With an objective and unbiased approach this research activity should therefore develop the necessary, operational and logistic prerequisites for a setting up and demonstration of seamless rail freight services in two or three Trans-European "corridors" based on the results and recommendations from research activity 3.1.

Research activity 3.1 is building on the new European regulatory framework in evaluating and overcoming foreseen and non-foreseen technical and non-technical barriers, and effects of liberalised markets for a successful demonstration of the objectives in 3.2.

Scope: This activity should establish and demonstrate:

- A business solution pertained to management and operational models that involve external business relationships, such as collaboration with other mode operators, infrastructure providers, management of contractual arrangements with customers, strategic relationships with financial institutions, and market communication for launching seamless freight movement services in (at least two) corridors,

- Create the conditions for an efficient supply of (intermodal) freight services and for their field evaluation.

Some examples of potential corridors (to be analysed in more detail by research activity 3.1) are:

Iberia – Benelux	British Isles – Eastern Europe (incl. CIS)
Iberia – Germany	Baltic states – Adriatic states
Nordic Countries – Southern Europe	Benelux – Balkan states

This activity should deal with the whole variety of events in the supply-chain of international freight services, incorporating the customers' needs and requirements for quality of service. Identification of the infrastructure, operational and logistics requirements are required to implement the service concept defined above. Variations in axle loads, train lengths, loading gauge, rules & regulations, business concepts etc., will need special attention as well as data exchange items. Improvements as e.g. introduction of the European Rail Traffic Management System (ERTMS) or opening of new railway lines, which will be effective when the project will be completed, should be taken into account.

Requirements concerning dangerous goods must also be incorporated in the proposed management and business models. Devising solutions designed to overcome the above "gaps" may include the establishment of e.g. one-stop-shop for supply and/or operations management or other concepts, involving the corridor-wide capacity management, tracking and tracing of freight movement, resource management, staff training, both from a system and regulatory point of view.). Incompatible driver rules concerning for instance their training and deployment are important barriers to a truly interoperable European rail system. Connected to the driver issues are differing safety regimes and to some extent attitudes. These factors must be taken into account. Other measure improving efficiency of international operations such as training of traffic control and capacity allocation staff may also need to be included into proposed/demonstrated management models.

The research activity 3.2 should continuously liaise with projects under research activity 3.1. It should also liaise with relevant EC activities such as ERTMS, the Rail Market Monitoring System (RMMS), and the European Railway Agency (ERA). It should furthermore liaise with the Strategic RTD plan of the European Rail Research Advisory Council (ERRAC) and national regulatory bodies. Finally it should take into account the effects of existing or non-existing cabotage in rail freight in general.

It is strongly advisable to engage expertise not only from the incumbent railway undertakings and railway infrastructure managers but also from other rail freight operators, and other transport and logistics services sectors. New entrants and their organisations in particular from the new member states are much needed in this activity.

Expected outcome: A field-validated concept for Dedicated Rail Freight Operation in European wide corridors. This will include spin-off contributions to on-going legislative work on interoperability, infrastructure and safety. This would include, e.g., a validation of telematics and traffic management concepts and solutions, new templates for operational activities, including driver rules and regulations, innovative corridor-wide integrated safety management approaches, demonstration of new technologies for reducing the environmental impact. A higher market share for rail freight in these corridors, environmental improvements, less road congestion, improved safety along these corridors. Evening out the differences between high and low performing countries. A dissemination of good practice on realistic testing and demonstration.

Preferred Instrument: Integrated project

- **Motorways of the Sea (MOS)**

Objectives: The White Paper 'European Transport Policy for 2010: Time to decide' promotes a policy of mode shift towards transport modes with a good environmental performance and accessible spare capacities (e.g. short sea shipping) and the integration of the different transport modes in efficient door-to-door transport chains.

The Motorways of the Sea initiative as proposed in the White Paper is one of the Commission actions to achieve these objectives.

The Motorways of the Sea are part of the trans-European transport network (TEN-T) and shall reduce road congestion and enhance the access to peripheral and island regions and States. In an innovative approach, the Motorways of the Sea concept aims at the integration of logistics and infrastructure planning.

Motorways of the Sea should be an integral part of door-to-door logistics chains and should offer efficient, regular, reliable and frequent services that can compete with road only transport. The ports connected to the Motorways of the Sea should have efficient hinterland connections, rapid administrative procedures and a high level of service that is targeted to making short sea operations successful.

Although Short Sea Shipping would be the mode to operate on the Motorways of the Sea, the overall concept of the Motorways of the Sea is larger and emphasises improvements throughout the entire transport chain. The realisation of the Motorways of the Sea concept will require the consolidation and concentration of freight flows and the collaboration between industry and administrations. All supply chain parties will have to be committed and involved.

The Motorways of the Seas network shall consist of infrastructures (port infrastructures, infrastructures for direct land and sea access, waterway and canal infrastructures) and facilities (electronic logistics management systems, safety and security measures/systems such as continuous monitoring of goods, administrative and customs facilities, information systems including traffic management (VTMIS) and electronic

reporting systems, facilities for ice-breaking and dredging operations) involving at least two ports in two different Member States.

The legal framework for the Motorways of the Sea concept is established through the Council decision on amending the Trans-European Network of April 2004 (Art. 12a TEN-T)[5]. The decision identifies as the TEN-T priority project N° 21 four corridors, in which Motorways of the Sea projects can be implemented: the Baltic Sea, Western Europe, South-East Europe and South-West Europe.

The current Marco Polo programme and especially the proposal for the Marco Polo II programme (2007 to 2013)[6] foresee explicitly supporting Motorways of the Sea projects.

Both programmes, TEN-T and Marco Polo, would support costs of implementation. As a rule of thumb, Marco Polo would support operational costs of services and logistics, whilst TEN-T would support costs for infrastructure and facilities.

However, to support the more innovative aspects of the Motorways of the Sea, research and technological development actions are needed.

Research and technological development activities shall support the development, testing and validation of innovative technical, organisational and operational solutions aiming at enhancing the overall quality of the Motorways of the Sea network and at facilitating a common European maritime space in which the movement of goods are treated the same way as inland moves. They shall further identify scenarios and strategies for the actual implementation of the results as well as quality criteria. Incorporating innovation into maritime and intermodal transport is essential for the sector and will facilitate the implementation of the Motorways of the Sea concept, which the legislator has specifically labelled as a quality initiative.

Research and technological development should target the following areas:

- quality of the port services (simplification of procedures, one stop administrative services, efficient cargo handling, service to the ship),
- quality of the hinterland connections and services,
- information systems and monitoring in the transport chain and
- quality of the shipping services (efficiency, safety, environmental friendliness)
- security provisions

Research and technological development shall further help to enhance the knowledge basis as regards corridor development, traffic forecasts, technological forecasting and can therefore support the decision-making process for Motorways of the Sea at the European, national and regional level.

Scope: The action should foster Motorways of the Sea by large-scale demonstration and validation of efficient ship/port/hinterland interfaces, in terms of concept development, physical equipment (vessel/port design,handling equipment, loading units etc) and

[5] OJ L 167 30/04/2004 COM (2004) 884
[6] COM (2004) 478

information management. The proposed concepts, technological solutions and applications should be corridor-independent and leave the possibility of customisation in different locations and services.

The action should aim at the establishment of one-stop administrative shops between ports and the electronic submission and exchange of administrative data. It should enhance the compatibility of port information systems and where appropriate make recommendations for harmonisation and standardisation proposals. This work should include links with freight forwarders and cargo owners.

It should consider, where appropriate, concepts for port facilities suitable to accommodate short sea shipping services as regards e.g. port and terminal management including the tracking and tracing of goods in port areas and in the whole door-to-door transport chain as well as handling and transhipment equipment.

It should take into account and integrate existing information and management systems including logistics and traffic management systems and electronic reporting in support of enhanced efficiency, safety and security.

The action should assess new concepts and technologies aiming at the enhanced environmental performance of shipping as regards water and air emissions and the vessel's energy efficiency.

An integral element of the work proposed should be the identification of the impact of new technologies and systems on the organisational, administrative, legal and regulatory framework of Motorways of the Sea.

The action should contribute to a balanced development of Motorways of the Sea network throughout the Union through identifying, disseminating and promoting best practices.

The work shall be accompanied by an impact assessment in terms of economical, safety and environmental costs and benefits. Techniques for evaluating the costs and additional benefits of networking Motorways of the Sea routes (i.e. not just A to B and B to A services) may need to be developed. The impact assessment should further consider ways to evaluate and maximise the contribution of Motorways of the Sea to improving the cohesion of the EU.

The proposed action should lead to proposals for quality criteria and performance indicators in support of equally high-quality Motorways of the Sea services throughout the European Union.

The action should contribute to the development of training for European transport professionals through providing an overview of the current situation and future needs as a result of new technologies, systems and operational procedures.

It should provide an overview of MS policies and programmes, and their connection with EU programmes.

Dissemination of the results and the development of implementation strategies and scenarios would be of paramount importance.

The work should be closely linked to the regulatory work at international and European level and take into account the corresponding time schedules. As much importance is attached to the effective application of the existing rules as to adoption of new ones.

The proposed partnership should involve all participants of the supply chain and transport operation. The work should be governed by a High Level Steering Committee composed of Member States, Candidate Countries and Associated States, relevant organisations and industries and should take into account the work of the different regional, national and European working groups and organisations.

National and European programmes and research projects such as INTEGRATION, D2D, MARNIS, TRAPIST, ECOPORTS, SEAM and MARTOB should be taken into account.

Expected outcome: The action should be in support of European transport policy objectives and the legislator's vision of Motorways of the Sea as quality intermodal projects. The action should lead to results regarding:

- New concepts and procedures as regards port-ship interfaces including standardisation proposals
- Assessment of the impact of new concepts and technologies on the organisational, administrative and regulatory framework beyond the port-ship interface
- Facilitation and simplification of administrative procedures through one-stop administrative shops
- Improvement and integration of hinterland links and connections, especially with rail and inland waterway, inland ports and terminals
- Assessment of new concepts and technologies aiming at enhanced environmental performance (particularly as regards water and air pollution as well as the vessels' energy efficiency)
- Implementation strategies and scenarios
- Quality criteria and indicators
- Impact assessment

Preferred Instrument: Integrated Project

- **EU Co-ordination and Promotion Forum on Intermodal Passenger Travel**

Objectives: The increasing complexity of mobility demands, combined with rising traffic volumes requires a more efficient use of environmental and financial resources. Car traffic, which dominates the passenger transport sector for a variety of practical and emotional reasons, imposes a heavy burden on society in terms of energy consumption and external costs such as accidents, noise emissions, pollution, space consumption etc. Intermodal transport solutions involving several different modes of transport in a single journey, including air plane, train, bus, tramway, car, bicycle and pedestrian travel, can be a comfortable and reliable alternative to 'car only' travel and makes better use of resources.

The European Commission has therefore advocated intermodal transport solutions in its White Paper "European transport policy for 2010: time to decide". Intermodal transport networks should allow for seamless intermodal passenger transport. The integration and co-ordination of long distance passenger transport receives considerable attention at the local and regional levels however, despite the potential benefits, there is no co-ordination or co-operation at the EU level.

European intermodal passengers currently face a fragmented and diverse market. A lack of standardisation impedes efficient service delivery and makes orientation in stations and vehicles difficult. The multitude of ticketing schemes and terms and conditions for booking and using of services are also significant barriers. Regional and national framework conditions with restricted geographic coverage largely influence this development, complicating passenger transport systems and their interfaces. A European framework for enhancing intermodal transport solutions is only emerging slowly thus reducing the attractiveness of intermodal long-distance and international travel especially when compared to private car travel.

The key objectives of this project are therefore to overcome, from a passenger perspective, the fragmentation of the market and to generate a more favourable environment for intermodal passenger transport planning and operation. A European-wide forum on intermodal passenger transport is expected to overcome the variety of mainly national planning focuses and policy priorities, differing organisational structures, language and cultural problems at planning and operational levels. The forum shall achieve a long-term continuity in providing and fostering trans-national solutions in favour of an improved intermodal passenger transport.

A clear strategy setting out the role of the forum and the practical activities to be undertaken will be fundamental for the long-term success of the forum. It is crucial to take into account existing structures and also existing RTD results, as many Member States have already been active on a national or regional level, in this field. Specifically, the results of the FP5 project tr@nsITS should be taken into account. The Commission also draws attention to the study "Towards Passenger Intermodality in the EU" and the extensive inventory having been compiled in this context.[7] Achievements from finished and ongoing actions in terms of research and promotion of best practices shall be further

[7] ILS, Babtie, Langzaam Verkeer, ETT: *Towards Passenger Intermodality in the EU,* Dortmund, December 2004, for download at http://europa.eu.int/comm/transport/intermodality/index_en.htm.

developed and promoted beyond the always limited duration of individual projects and thus secure sustainable effects.

Scope: This action shall set up a forum with a long-term perspective which significantly supports the development of intermodal passenger transport comprising all transport modes. A joint action of administrations, associations, operators and research institutions shall establish the viable basis for such a forum. Proposals for this action should include the following areas of activities, always keeping in mind the practical implementation of the RTD results:

- Identification of stakeholder groups as well as their possible role in the development of long distance intermodal passenger transport solutions. Consultation and integration of stakeholders in all project phases;

- Bringing together relevant stakeholders and practitioners. Practices should be mainly based on existing (research) results and experiences from similar co-ordination and dissemination activities. Enhanced working, communication, and dissemination practices shall be tested.

- Setting up and/or maintaining communication and co-operation networks (local, regional, national, European levels in research, planning, operation and policy). Best practices shall be tested and (further) established and included in the dissemination activities;

- Setting up a knowledge and promotion centre for intermodal passenger transport at European level. This task shall include the collection, evaluation, and dissemination of information, tools, material, best practices, etc. and its structured presentation to the public.

- Structuring and clustering of research, completed and ongoing, at regional, national, and international level;

- Identification and reporting of organisational, regulatory and legal barriers to intermodal travel and travel services;

- Identification of success and failure factors in particular market segments;

- Proposing and fostering of solutions to overcome the barriers identified, with specific attention given to demand-responsive solutions.

The forum is not intended to replace existing entities at any level but should rather coordinate and integrate action in the field of passenger intermodality. Existing information and support tools and services such as the Extraweb[8] database, newsletters, etc. are prone to integration in a moderated network. Where adequate contacts, partners or entities do not exist at national or regional level, the forum shall initiate their establishment. Accession Countries should be involved in the process to support their early EU-integration.

Expected outcome: The forum should become a driving force in fostering intermodal travel at European level, stimulating coherent activities of the various stakeholders in Europe. The most promising approaches shall be identified and implemented resulting

[8] Database access: http://europa.eu.int/comm/transport/extra/web/index.cfm

from an intense evaluation of alternatives. The implementation plan for a self-sustainable existence of the forum on passenger intermodality beyond the EU funding phase should

- adopt a well balanced strategy in terms of objectives, nature, structure, and integration of the forum into existing administrative and market structures;
- include a sound business plan, also for continuation after the project phase
- secure political support from stakeholders.

Preferred instrument: Co-ordination action

- **Knowledge Base for intermodal Passenger Travel**

Objectives: The use of intermodal passenger transport solutions instead of 'car only' transport is one way to reduce the negative external impacts of transport on society. According to estimates external costs of transport amount to approx. 7,3 % of EU-GDP of which passenger transport accounts for 2/3. Approximately 20 % of the transport volume in passenger-km is long distance travel (journeys $\geq$100 km)[9] for which intermodal transport is a viable solution. On the other hand intermodal transport solutions are of vital importance to non-car travellers relying on high quality transport solutions to satisfy their mobility demands.

A recent major study[10] has revealed significant deficiencies in the knowledge about intermodal travellers and the intermodal market. As a result, no proper measurement of intermodal behaviour and demand is currently possible, and we lack a proper basis for reliable cost-benefit-studies, impact assessment and policy making. Transport operators hesitate to offer new services to a still not well-known market. The proposed action should therefore elaborate applicable methods and solutions in the above mentioned fields. All transport modes should be covered including walking and cycling, the two latter playing an important role in acceding motorised transport systems (first/last mile).

Scope :. The project aims at providing a high-quality knowledge base for decision-making at the political, planning and operational levels. Besides scientific institutions, this will require the participation of transport operators, regulators and other stakeholders to clearly identify and evaluate the scope and content of research to be undertaken. The activities should pave the way to a European approach to defining and measuring long distance and international intermodal passenger travel and should be based on the following tasks;:

- Develop a clear understanding of the principles of intermodality and understanding the underlying motivations of travellers for modal choice;
- Identification and quantification of market segments (existing as well as potential) for intermodal passenger travel.

[9] EUROSTAT (Author: WECKSTRÖM-ENO, K.), 1999. Statistics in Focus. Theme 7, 4/1999. Long distance passenger travel. Luxembourg: Eurostat

[10] ILS, Babtie, Langzaam Verkeer, ETT: *Towards Passenger Intermodality in the EU, Report 3, Recommendations for Advancing Passenger Intermodality in the EU*, Dortmund, December 2004, for download at http://europa.eu.int/comm/transport/intermodality/index_en.htm.

- A strategic approach to data collection shall be established. The role of departments for statistics, national or international, e. g. EUROSTAT, shall be evaluated. A methodology for their integration shall be elaborated;

- Building on the methodological results of the previous three fields a methodology for cost-benefit studies and impact assessment of measures and projects in the intermodal passenger sector shall be developed and tested;

- Identification of types of interchange facilities and of costs of interchange;

- Understanding of knowledge and data and its manipulation and dissemination, especially in real time.

Expected outcome: An initial task will be the analysis of existing research results and ongoing research projects as well as established approaches to travel surveys, real-time information services, mobility research, and transport statistics throughout the EU with a focus on long-distance and international travel. Good practices will be identified and screened for the refinement of a research plan.

Further research shall lead to the following results:

- Definition of intermodal travel and travel chains e. g. with regard to statistical applications;

- Description and quantification of travel behaviour, impacts and customer reaction. Elaborated methods for measuring intermodal travel;

- Quantification of actual intermodal travel demand and the influencing factors;

- Quantified potential for intermodal passenger travel based on market analysis with regard to different types of measures/strategies, taking into account also the issue of unsatisfied demand;

- Benefits of intermodal travel (including energy, environmental aspects) and a clear methodology for cost-benefit analyses;

- Data requirements, taking account of existing information systems;

- Showcase application of cost-benefit analyses on the basis of new/updated research results.

The quantifiable results as well as the methodologies to be developed shall provide a working basis for service operators as well as planning and financing bodies to evaluate strategies and measures in the intermodal passenger market.

Preferred instrument: STREP

- **Vessel Data Management (Voyage Data Recorder, Electronic logbooks)**

Objectives: For the purpose of a more efficient vessel data management a number of efficient tools have been developed. These tools enable the recording and storage of all kind of data on board merchant vessels. Those data can be used for the investigation of maritime incidents, as well as for several other applications including ship security, ship maintenance and fleet management.

The IMO has agreed on specifications and a timetable for the carriage of Voyage Data Recorder (VDR) and S-VDR (simplified VDR) on board existing and new ships. Passenger ships and ships other than passenger ships of 3000 t gross tonnage and upwards constructed on or after 1 July 2002 must carry voyage data recorders (VDRs) to assist in accident investigations, under regulations adopted in 2000, which entered into force in July 2002.

The mandatory regulations are contained in chapter V on Safety of Navigation of the International Convention for the Safety of Life at Sea, 1974 (SOLAS).

Like the black boxes carried on aircraft, VDRs enable accident investigators to review procedures and instructions during the moments before an incident and help to identify the cause of any accident.

The purpose of the maritime black box is to act as a reliable data source in the reconstruction of marine casualties. As regards this purpose, main areas of application will be

- Accident investigation
- Response assessment
- Training support
- Promotion of Best Practice
- Reduction of insurance costs

in order to help avoiding past mistakes and increase the safety of navigation.

The above mentioned international requirements have been supported by the EU and incorporated into the EU regulatory framework through Directive 2002/59/EC[11] on traffic monitoring. It has been extended to other categories of vessels (notably on domestic trade). However, in the light of the experience gained so far with the use of VDRs, certain loopholes have been detected and improvements are needed, that require further research and technological development.

Moreover, electronic data recording is becoming more and more common on board merchant vessel, notably through the electronic logbook features. These tools provide electronic recording of all events related to navigation, engine watch, port calls and other operational issues.

The benefits of such systems are significant. Electronic logbooks help the users through simplifying vessel operations, notably reporting procedures. They provide users, both on-board and on-shore, with more accurate and useful information and make data exchange easier. They also support data analysis, and in particular they can provide evidence in case of disputes.

To date, there are multiple electronic data collection systems on board vessels. At this stage, the collection and recording of data from a wide range of data sources lacks

[11] OJ L208 5/8/2002 Directive 2002/59

standardisation. There are also no standards for the reading and exploitation of the recorded data.

In addition to the industrial developments of the data collecting products there is a strong need for developing a common technical basis in order to facilitate the development and adoption of internationally recognized standards. To this end, a high-level group of stakeholders, including especially Member States and equipment manufacturers, should be established.

Scope: The action should pave the way towards a European approach on the issues related to electronic data collection on board merchant vessels. Therefore, the action should address the following technical issues as regards

Voyage Data Recorder

- improving the specifications for recording and storing the data in VDRs,
- retrofitting of s-VDRs on existing ships of all sizes
- standardization and simplification of access to data stored by the VDR (taking into account, where applicable, the possibilities of long-range communication and analysing different ship situations)
- development of new functionalities, e.g. to improve knowledge of structural constraints of merchant vessels.
- developing concepts and procedures for the routine use of the information obtained in safely operating vessels and managing shipping
- assessing additional fields of applications of VDR as regards automated and autonomous control

Electronic logbooks

- studying the possibility of developing specifications for electronic logbooks,
- standardization and simplification of access to data stored by electronic logbooks,
- identification of possible new applications (e.g. use of electronic data for the prosecution of illegal oil discharge at sea).

The work on the electronic logbooks should take into account, when applicable, developments in other sectors, especially inland navigation.

Furthermore, in the light of the high number of casualties which involve fishing vessels and the difficulties to understand the causes of such casualties, the adaptation of the VDR concept to the specific needs of fishing vessels should be further investigated.

Expected Outcome: The action will result in new applications, functionalities and proposals for specifications and standards for enhanced, interactive VDRs and electronic logbooks and will lead to a better and more objective analysis of the causes of incidents and accidents in European waters and subsequently to the improvement of maritime safety, including improved ship design.

Preferred Instrument: STREP

3.3.2 Research, technological development and integration (Research domains from 3.14 to 3.17).

Research will target the development of transport technologies to achieve a sustainable modal shift from road to railways and water-borne routes including inland navigation and short sea shipping. Both innovative vehicle/vessel concepts and their effective integration in multi-modal door-to-door transportation chains will be addressed.

The objective will be to remove congestion from road infrastructure in Europe, to improve the mobility of travellers and goods and to promote a safe and clean transportation system for Europe. Research and policy measures for road freight would seek to limit growth from 50 % to 38% by 2010. Targets for rail include tripling freight and doubling passenger market share by 2020.

Selected research domains for Call 3B and relevant instruments

SSAs are included as part of the continuous call.

3.14 Development of vehicle and vessel concepts for both passengers and freight, characterised by interoperability and inter-connectivity, for cross-operation between different transport routes and networks supported by advanced mechatronics, on-board electronics, information and communication systems.

Instruments: **STREP** (*only for rail transport),* **CA** and **SSA**

3.15 Development of new inter-modal vehicle/vessel concepts to attain optimal performance in terms of fuel economy, environmental impact (including noise), manoeuvrability (including obstacle avoidance), stability and maximum carrying volume.

Instruments: **CA** and **SSA**

3.16 Development of equipment, methods and systems for optimal accommodation, fast loading and unloading of intermodal transport units and definition of optimal use of storage space both in vehicles/vessels and terminals and efficient final distribution of goods.

Instruments: **STREP**, **CA** and **SSA**

3.17 Technologies to ensure effective, clean and safe operations of vehicles/vessels in terminals and minimisation of turn-round time combining manoeuvring assistance, terminal auxiliary services, waste management (including ballast water in ports) and integration of telematics support for improved communication with terminals control and management systems.

Instruments: **CA** and **SSA**

Selected topics for Call 3B and relevant instruments

- **Effective operations in ports**

Objective: The aim is to develop integrated concepts to enhance the overall effectiveness, environmental friendliness and safety of operations in ports. This will allow for the optimal use of port facilities and waterways infrastructure, the minimization of ship turn-round times and the reduction of hazards associated to the transport and storage of dangerous goods.

Scope: Within this project, supporting operations and services in ports include all relevant operations from ship arrival to ship departure. The assistance of ship approaches in ports takes into account all critical operative conditions such as shallow water, restricted waters, congested areas by ships and small boat traffic, strong wind and current, zero or near zero maneuvering speeds and /or other obstacles. Developments in this area include remote control of ships approaching ports, navigation and maneuvering assistance systems, effective and safe tugboats operations, efficient and automated mooring operations. Risk analysis associated to the different ship types, traffic congestion, environmental conditions and cost benefit analysis will be important aspects of the research. To achieve effective and efficient use of port facilities and waterways infrastructure the following items are considered of particular importance: the maintenance of sea beds, sea lines and channels including autonomous systems for inspection; the integration of RORO, LOLO and bulk feedering operations; the optimal management of reception, processing and recycling of ship waste such as ballast and bilge water and exhausted oils. Manage, combat and mitigate major hazards in ports areas on land and water including collision and grounding are within scope. Specific handling and storage devices for cargo in ports are not included in this project considering that they are covered in other parts of the priority work programme, in particular Research Domain 3.16 is open for STREP proposals in this call. Developments will have to consider relevant national, European and international legislation (e.g. recently amended SOLAS convention) as well as new research developments and existing tools and technologies available on the market.

Expected outcome: Methods and tools for sailing and manoeuvring of ships approaching ports. Efficient and automated mooring systems and operations. Remote control and navigation systems for ships sailing in traffic congested areas. Risk analysis tools and procedures including the availability of models and simulation tools for collision and grounding assessment. Modeling and simulation tools for the definition of hazard control strategies. New procedures and systems for dredging and removal of polluted silt starting from today best practice and for the treatment and recycling of ship refuses.

Instrument: Integrated project

3.4: Objective 4 « Increasing road, rail and waterborne safety and avoiding traffic congestion »

3.4.1 Research to support the European Transport Policy (Research domains from 4.1 to 4.10)

Road Safety Strategies

Currently, more than 40.000 persons are killed every year on EU roads and less than 1000 in the other modes of transport. The short term strategic objective of the Community is to halve the number of fatalities by 2010. The medium term objective is to cut by around 75% the number of persons killed or severely injured by 2025, while the long term vision is to render road transport as safe as all other modes.

To be effective road safety policy and the supporting research must target the human, the vehicle and the infrastructure environment. In addition, the interaction between these elements must be considered as well as the acceptability and cost-effectiveness of the proposed measures in a wider socio-economic context. Research should devise the economic mechanisms necessary to reward the introduction of advanced technologies with a view to their overall safety benefits, instead of the defensive approach taken today to avert possible liability risks.

Research will combine measures and technologies for prevention, mitigation and investigation of road accidents placing special attention to risky and vulnerable users groups, including children, handicapped persons and the elderly.

Research domains:

4.1 Accident analysis and injury analysis (Call 1A)
4.2 Influence of Alcohol, Drugs and Medicines (Modification of "Driver Safety Training" domain) (Call 3A)
4.3 Road infrastructure safety (Call 1A)
4.4 Enforcement of traffic rules (Call 3A)
4.5 Effectiveness of road safety campaigns (Modification of "Awareness campaigns and acceptability of measures" domain) (Call 3A)

Integrating Intelligent Transport Systems

Clearly the wide array of technologies is meant to change the face of the transport system. All the research activities described in this work programme involve in one way or another the use of these technologies. Particular attention will be paid to the close co-ordination with Information Society technologies thematic priority, which addresses also Smart Transport Systems development. In this context, Galileo applications will be particularly encouraged and scrutinised. However, as well as the overall co-ordination and monitoring of the implementation of these technologies in the different activity areas, two particular actions are foreseen for future calls:

Research domains:

4.6 European service for electronic fee collection on roads (Call 2A)
4.7 Multimodal real-time information for people on move (Call 3A)

Implementation of Transport Pricing

Successful implementation of the pricing reform, as put forward in the White Paper, is a complex issue. This requires first cross-modal research on cost calculation to ensure a coherent approach and level playing field in support of the European legislation currently being prepared and put in place. Policy makers and the public also need further and more detailed information on the benefits of pricing. One way of demonstrating these are through real-life demonstration projects. These should be carefully designed to tackle both the technical and socio-economic complexities and to address acceptability problems, which can be particularly striking in urban areas.

This research area will be implemented through the research domains listed below. They will be closely co-ordinated with actions funded under *Clean Urban Transport* (objective 1) and *Integrating Intelligent Transport systems* (objective 4) areas, when relevant.

Research domains:

4.8 Costs of transport infrastructure use (Call 2A)
4.9 Optimal investment and charging (Call 2A)
4.10 User reaction and efficient differentiation of charges and tolls (Modification of "Pricing demonstrations" domain) (Call 3A)

4.11 Improve infrastructure cost allocation methods (selected topic for Call 4A)
4.12 Design appropriate contractual relationships (selected topic for Call 4A)

Topics selected for the call 4A

➢ **Improve infrastructure cost allocation methods**

Objective: In order to charge infrastructure costs to users, state-of-the-art research suggests combining cost allocation methods and econometric analysis in determining charges. But some of the key parameters for cost allocation methods are based on studies carried out a long time ago and may need to be revised or harmonised. Also, the scope of applicability of the cost allocation methods is not context-independent. And in modes other than road, cost allocation methods are less well established.
Further research is therefore needed:

- to assess the limits of validity of the existing allocation rules (where key parameters may be outdated, or which may be too limited in scope, or inapplicable in different contexts) and to refine these rules where necessary
- to develop allocation methods where they do not exist today.

In particular, different types of situations need to be covered, such as:

- building new infrastructure, versus maintaining or improving existing infrastructure
- differences in infrastructure quality and in the composition and volume of traffic.

In addition, the variety of policy goals targeted needs to be taken into account (e.g. relieving congestion, environmental problems, enhancing the financial base to fund transport programmes).

Scope: The objectives for the research work are the following:

- To review the current cost allocation practices (and underlying principles) for the various modes in EU Member States, identifying best practise in the light of the recent research on marginal infrastructure costs, and to define the fields where their application is pertinent and reliable.
- To propose and test new allocation procedures where the reliability of the existing ones is not sufficient, in particular for variable infrastructure costs. Different infrastructure quality and vehicle types should be covered for all transport modes, including road, rail, maritime and aviation.
- To analyse the ability of infrastructure managers, or authorities in charge of setting the levels of charges, to implement the cost allocation procedures, and to identify factors for successful implementation. Complexity and enforceability should be assessed.
- The various modes should be addressed.

The research should rely on numerous and various real world cases and work in close cooperation with infrastructure managers and operators.

Engineering inputs will be essential, but both econometric and engineering approaches should be considered where appropriate.

Expected outcome: Comprehensive review of existing methods of cost allocation (and underlying principles) used in the Member States, identifying best practise and the fields and limits of their applicability. Description of new, harmonised and/or refined allocation procedures recommended for the various modes and contexts of application. Validation of the methodological approach and of the recommendations drawn through testing and feedback from policy-makers and other end users of the research results (including on implementation issues).

Preferred instrument: Specific Targeted Research Project

➢ **Design appropriate contractual relationships:**

Objective: To ensure efficient project delivery and management of transport infrastructure and/or services, public authorities have often recourse to the private sector either through public-private partnerships (PPPs) or privatisation. Concession contracts for the construction and operation of motorways are common in several Member States while in the maritime and air sector both public and private ports coexist and compete. Introducing marginal cost pricing and internalisation of external cost could limit the freedom of the concessionaire/private operator to freely determine the level of charges and thus to contravene their cost recover / profit objectives. The objective of this task is therefore to assess how efficient pricing can be developed and implemented in a way that it does not hamper the setting up of PPPs or the coexistence of public and private operators, and accommodates the variety of goals targeted.

Scope: Based on research already carried out to determine mark-ups to reach cost recovery targets, further research should focus on the contractual relationships ensuring the use of marginal cost based charges to repay part of the infrastructure. The work should:

- Identify the degree of variability over time in the level of each component of the costs and to what extent this variability can induce risk in the funding and operating of infrastructure within a concession or privatised framework. Both the provision and the operation of the infrastructure should be analysed. Provision of new transport infrastructure and management of existing infrastructure should be distinguished.
- Develop possible ways to share, between public authorities and private investors, the risk inherent to the determination of variable external costs over time (refinement of the methods, evolution of the pollution levels per vehicle, etc.).
- Draw from a series of infrastructure projects currently under the study process, the sensitivity of key parameters. This analysis implies economic simulations for each of the projects to be selected.
- The various modes should be addressed.

The research should work in close cooperation with public and private infrastructure managers, operators and investors, and with authorities awarding concessions contracts

or regulating privatised sectors. It should include and integrate both legal and economic dimensions, as well as institutional aspects.

Expected outcome: Analysis of contractual relationships which ensure the use of marginal cost based charges to repay part of the infrastructure (based on the state-of-the-art in determining mark-ups to reach cost recovery targets), taking into account the degree of variability over time of cost components and the induced risks in a concession or privatised framework. Recommendations on ways to share the risk inherent to the determination of variable external costs over time. Analysis of the sensitivity of key parameters, based on case studies. The various modes should be addressed, and the analyses, results and recommendations drawn should be validated in close cooperation with policy-makers and other end users of the research results, taking into account both legal, institutional and economic aspects.

Preferred instrument: Specific Targeted Research Project.

3.4.2 Research, technological development and integration (Research domains from 4.11 to 4.16).

The research will focus on increasing the capacity of existing and new transport infrastructure by maximising safety and well being of drivers, passengers, crew and pedestrians. The aim will be the development of strategies, systems and technologies to attain optimal operational performance of vehicles/vessels and their supporting infrastructure, seeking to halve the number of transport fatalities by 2010 and increasing capacity by 15%.

Technological innovation will largely rely on computer-based decision support tools, information services on the condition of transport routes (e.g. road holding, sea state or traffic congestion) and vehicle/vessel operational responsiveness.

Selected research domains for Call 3B and relevant instruments

SSAs are included as part of the continuous call.

4.11 Integrating technologies for driving, piloting and manoeuvring assistance to improve safety and maximise the effective capacity of the infrastructure, including the secure transportation of hazardous goods.

Instruments: **CA** and **SSA**

4.12 Developing technologies to sense and predict natural and infrastructure conditions affecting safety and efficiency of transport operations.

Instruments: **CA** and **SSA**

4.13 Developing integrated safety systems which are reliable and fault tolerant (preventive, active and passive) taking into account human-machine interface concepts focusing on the system implementation.

Instruments: **STREP** (*only for rail transport and powered two-wheelers),* **CA** and **SSA**

4.14 Designing user-friendly driver interfaces based on human-centred design philosophies taking into consideration bio-mechanical ergonomics, injury reduction measures, environment perception and effective lay-out of signalling and piloting information for improved safety.

Instruments: **CA** and **SSA**

4.15 Developing integrated, single platform, modular computer-based validated training systems for land-based drivers and waterborne pilots, that are cost effective, with monitoring capability of fitness to navigate and muster, including avoidance and management of crisis conditions.

Instruments: **STREP**, **CA** and **SSA**

4.16 As a contribution to a possible future large-scale integration and validation platform across modes for the realisation of the intelligent transport vehicle and infrastructure of the future, technology will concentrate on intelligent vehicles/infrastructure interactions and advanced management and guidance systems. This might include satellite navigation systems capable of stabilising vehicle trajectory, with respect to lateral and longitudinal displacement, and will regulate vehicle speed and separation with high accuracy and reliability.

Instruments: **STREP**, **CA** and **SSA**

Selected topics for Call 3B and relevant instruments

- **Safe maritime operations**

Objective: The aim is to reduce the risks to life, the environment and vessels from waterborne transport while enhancing the competitiveness of European maritime transport. Within the framework of safe maritime operations, the project will create the basis for further enhancing crew, passenger and vessel safety, the capacity of freight services as well as reliability while minimising the negative impact from accidents.

Scope: The emphasis of the project is on monitoring, inspection, navigation, and management systems of ships and the development of incentives and controls to maximise the utilisation of effective tools, processes and procedures. Further development of decision support tools for day-to-day operation as well as the emergency response is within the scope of the project. Concerning the technical management of ships the project shall consider on onboard and onshore inspection, maintenance and operation support systems, to shorten the time required to identify and prioritize equipment or elements that need maintenance or repair. Technical condition monitoring, life cycle use of electronic documentation and electronic exchange of information on equipment and ship with equipment suppliers, repair yards and post-repair inspection authorities, shall be investigated. Tools should be validated within suitable operational environments and contribute to improved operational efficiency. Integrated decision support tools for inspection and maintenance planning as well as emergency response and navigation are expected to assist ship owners, captains and crews to take decisions during operations in normal or degraded conditions. Such systems should have a modular architecture and fit in integrated bridges with a generic core that is applicable to a range of vessel types. Testing and validation should be included based on risk-model scenarios for at least three different vessel categories. Developments must be compatible

with existing and forthcoming regulations and must principally address the most likely causes associated with accidents. In addressing these causes, the systems should reduce the risk from human factors and errors. In this respect, considerations should be given to organisational incentives, training requirements and crew qualification with respect to new types of ship equipment. The research and proposed solutions must clearly build upon work undertaken within national and European research programmes. For new tools, a cost-benefit analysis and impact assessment for all stakeholders should be made to identify incentives and controls to maximise implementation.

Expected outcome: New knowledge and innovative tools that will assist owners and captains take decisions to address the principal operational factors and risks in order to ensure safe and efficient maritime operations. The developed tools should include decision support tools for on-board operations in routine and emergency situations; automatic notification and transfer of updated rules and regulations; on-line link between ship-to-ship and ship-to-shore for better management of accidents, including medical emergencies and e-learning; remote diagnostics and maintenance systems for on-line crew support possibly enhanced by continuously updating safety and environmental indicators for the ship in question; monitoring systems for real-time assessment of structures and components including environmental surveillance. The developed integrated decision support systems should be low-cost, easy to implement on board with open architecture that are able to integrate existing monitoring systems (e.g. propulsion, hull, navigation, flooding, fire, ventilation etc). The new tools should take into account the next generation of navigation, communication and reporting technologies as well as upcoming IMO and EU resolutions and recommendations.

Instrument: Integrated project

4. LINKS TO OTHER RESEARCH TOPICS

To maximise its impact, research on sustainable surface transport will have to integrate the most recent developments in areas such as Information Society technology, materials and new production processes, renewable energy sources and energy efficient systems, intelligent satellite navigation systems. The specific links to other priorities and identified research topics are:

a) Objective 1: New technologies and concepts for all surface transport modes (road, rail and waterborne)

New power train technologies will have an impact on transport sustainability provided new sources of cleaner and renewable energy can be developed and introduced in a way that is compatible with market and societal conditions.

In particular, critical mass will be needed to move towards totally clean mobility solutions such as cars fuelled by hydrogen. As a consequence, advanced vehicle technology will have to be linked with technology for economically affordable hydrogen production and efficient manufacture of fuel cells compatible with surface transport requirements as defined in sub-priority 1.1.6.1 (sustainable energy systems). Equally, technologies for low CO_2 and near zero emissions powertrains must take into account new advances on possible alternative fuels (sub-priority 1.1.6.1).

The programme '*Energy Intelligent Europe*' will promote non-technological activities on the rational use of energy in urban transport complementary to those described for CIVITAS II– Clean Urban Transport. Both will be closely co-ordinated. The CIVITAS

II Initiative (research domain 1.1) is an activity jointly funded by the sub-priority 1.6.2 (Sustainable Surface Transport) and sub-priority 1.6.1-i (Sustainable Energy Systems, research activities having an impact in the short to medium term).

b) Objective 2: Advanced design and production techniques

Generic developments on new materials and production systems will be the basis to achieve lighter vehicle structures, effective and reliable manufacturing processes and decreasing production lead time (relevant to priority 1.1.3 Nanotechnologies and nanosciences, knowledge-based multifunctional materials and new production processes and devices).

c) Objective 3: Rebalancing and integrating different transport modes

Several initiatives launched in the context of the European Transport Policy like Marco Polo (start up initiative for intermodal transport services) and major infrastructure projects of the trans-European Transport Networks (TEN-T), and other research avenues like Galileo will be linked with the activities described in this section.

d) Objective 4: Increasing road, rail and waterborne safety and avoiding traffic congestion

Applied research within priority 1.1.2 (Information Society technologies) in the area of mobility (1.1.2.I) addressing vehicle infrastructure and portable systems to provide integrated safety, comfort and efficiency will be relevant to attain targets as defined in this objective. Equally, in the area of embedded systems (1.1.2.II), systems dealing with integration of fault tolerant embedded controls will be relevant to efficiency and safety for all modes of surface transport. Links will also be established with programmes such as EuroNCAP and other research activities at national level. In addition, applications of GALILEO and GMES will facilitate information acquisition on infrastructure conditions affecting safety and operational performance of the transport system. Activities are also closely co-ordinated with priority 8 (policy-oriented research) - Area 3.2 '*The development of tools, indicators and operational parameters for assessing sustainable transport and energy systems performance (economic, environmental and social)*' and Area 3.3 '*Global security analysis and validation systems for transport and research relating to accident risks and safety in mobility systems*'.

5. Implementation Plan and Related Issues

ROADMAP – Thematic priority 1.6.2 "Sustainable Surface Transport"

Type of Activity **Focussing and integrating Community research**		**Indicative budget (m€)** **Date of publication in OJ:** *[date]* **Deadline for submitting proposals**				**Type of instrument** **Open in each call (1)** **IP** – integrated project **NoE** – network of excellence **STREP** – specific targeted research project **CA**: co-ordination activity **SSA -** specific support action
Thematic Priority	**Area**	**Call 1A**	**Call 2A**	**Call 3A**	**Call 4A[12]**	
6.2 Sustainable Surface Transport. Research to support the European Transport Policy	*1.New technologies and concepts for all surface transport modes (road, rail and waterborne)* *3.Rebalancing and integrating different transport modes* *4.Increasing road, rail and waterborne safety and avoiding traffic congestion*	Dec 2002-March 2003 39 M€ (CLOSED)	June 2003 – Dec 2003 48 M€ (CLOSED)	June 2004 – Dec 2004 56M€ (CLOSED)	June 2005 – Dec 2005 36M€	IP, STREP, CA, SSA
Thematic Priority	**Area**	**Call 1B**	**Continuous Call**	**Call 2B**	**Call 3B**	
6.2 Sustainable Surface Transport. Research, technological development and integration	*1.New technologies and concepts for all surface transport modes (road, rail and waterborne)* *2.Advanced design and production techniques* *3.Rebalancing and integrating different transport modes* *4.Increasing road, rail and waterborne safety and avoiding traffic congestion*	Dec 2002-April 2003 170M€ (CLOSED)	Dec 2002 – March 2006 5 M€	Dec 2003-April 2004 150M€ (CLOSED)	March 2005 - Sept 2005 150M€[13]	IP, NoE, STREP, CA, SSA

[12] 1,5M€ of this amount is from the 2005 budget, the remaining amount relates to the 2006 budget and is under the condition that the preliminary draft budget for that year is adopted without modifications by the budgetary authority.

[13] 10.68 M€ of this amount is from the 2005 budget, the remaining amount relates to the 2006 budget and is under the condition that the preliminary draft budget for that year is adopted without modifications by the budgetary authority.

Number of participants and budget per instrument for each area in the call for proposals

Instrument	Number of participants	Indicative budget per group of instruments (%)
Integrated Projects	See general Rules for Participation	60
Networks of Excellence	See general Rules for Participation	
Specific Targeted Research Projects, Co-ordination Actions and Specific support Actions	See general Rules for Participation	40

Notes: *Dates and budget figures are indicative. Applicants should verify the closing dates in the text of the relevant call, as published in the Official Journal. The proposals will be evaluated and selected according to the guidelines and procedures laid down in the Guidelines on Proposal Evaluation Procedures, using the single stage submission procedure.*

***6. CALL INFORMATION*:**

Call 4A (Call open from June – December 2005 for the areas of "Sustainable energy systems" and "Sustainable surface transport, and from June - November 2005 for the area of "Aeronautics and Space")

1. **Specific Programme**: Integrating and strengthening the European Research Area

2. **Activities**:
- Priority thematic area of research "Aeronautics and Space".
- Priority thematic area of research "Sustainable development, global change and ecosystems". Sub-priority "Sustainable energy systems"
- Priority thematic area of research "Sustainable development, global change and ecosystems". Sub-priority "Sustainable surface transport"

3. **Call title**: Periodic call in the area of "Aeronautics and Space", "Sustainable energy systems" and "Sustainable surface transport".

4. **Call identifier**: **FP6-2005-TREN-4-Aero** (for "Aeronautics and Space") / **FP6-2005-TREN-4** (for "Sustainable energy systems" and "Sustainable surface transport").

5. **Date of publication**: 08/07/2005

6. **Closure date(s):** 04/11/2005 at 17.00 (Brussels local time) (for "Aeronautics and Space") and 22/12/2005 at 17.00 (Brussels local time) (for "Sustainable energy systems" and "Sustainable surface transport").

7. **Total indicative budget: 214** M€, broken down as follows
- "Aeronautics and space": 53 M€
- "Sustainable energy systems": 125 M €
- "Sustainable surface transport": 36 M €

Instrument[14]	€ (millions)
IP	139
STREP or CA	75
SSA	

[14] IP = Integrated project; STREP = Specific targeted research project; CA = Coordination action; SSA = Specific support action

8. Areas called and Instruments:

- Aeronautics and Space

Area	Topic	Instrument
Open Upstream Research (See Section 1.3.1.4.)	Reduced separation standards Research Domain 4.c	STREP
	Innovative air traffic management research Research Domain 4.g	STREP
	Co-ordination Action Research Domain 4.h	CA
	Air Transport System Wide Information Management Research Domain 4.j	STREP
	ATM Safety regulation and supervisory functions Research Domain 4.k	STREP
	Mitigating capacity constraints due to Wake vortex Research Domain 4.l	STREP
	Environmentally responsible air transport Research Domain 4.m	STREP
1.3.2 Integrated Focused Downstream Research	Subject 13. Improvement of ATM system processes through validation	IP

– Sustainable energy systems

Area	Topic	Instrument
Section 6.1.3.1.1.1 « Cost effective supply of renewable energies »	Demonstrations of innovative designs of automated biomass heating systems	STREP
	Solar heating and cooling	STREP
	Geothermal energy	STREP
	Innovative wind farms, components and design tools	STREP
	Demonstrations of the next generation of PV technologies / products	STREP
	Ocean / marine energy technologies	STREP
	All	CA, SSA
Section 6.1.3.1.1.2 “Large scale integration of renewable energy sources and energy efficiency” and Section 6.1.3.1.2.2 “Polygeneration”	Grid issues - Distributed electricity generation	STREP, CA and SSA
	Grid issues - Management of electricity grids linked to large scale decentralised wind power generation	STREP, CA and SSA

Section 6.1.3.1.2.1 “Eco-buildings	Eco-buildings	STREP
Section 6.1.3.1.2.2 “Polygeneration”	Polygeneration	STREP
Section 6.1.3.1.1.2 “Large scale integration of renewable energy sources and energy efficiency”	CONCERTO II– Managing energy demand and renewable energy supply in high performance communities	IP
Section 6.1.3.1.2.1 “Eco-buildings”		
Section 6.1.3.1.2.2 “Polygeneration”		
Section 6.1.3.1. “Thematic promotion and dissemination”	Renewable electricity technologies	SSA
	Renewable heating and cooling technologies	SSA
	Production and distribution of liquid and gaseous biofuels	SSA
	Eco-buildings	SSA
	Polygeneration	SSA
	Energy demand management and renewable energy supply in high performance communities	SSA
	Alternative motor fuels	SSA
Section 6.1.3.1.3 “Alternative Motor fuels	CIVITAS Dissemination and Best Practice Transfer Action	SSA

- Sustainable surface transport

Area	Topic	Instrument
Objective 1 « New technologies and concepts for all surface transport modes (road, rail and waterborne) »	CIVITAS Dissemination and Best Practice Transfer Action	SSA
Objective 3 « Re-balancing and integrating different transport modes »	New concepts for trans-European rail freight services	IP
	Motorways of the sea (MoS)	IP
	EU co-ordination and promotion forum on intermodal passenger travel	CA
	Knowledge base for intermodal passenger travel	STREP
	Vessel data management (Voyage data recorder, Electronic logbooks)	STREP
Objective 4 « Increasing road,	Improve infrastructure cost allocation methods	STREP

rail and waterborne safety and avoiding traffic congestion »	Design appropriate contractual relationships	STREP

9. Minimum number of participants[15]:

Instrument	Minimum number of participants
IP, STREP and CA	3 independent legal entities from 3 different MS or AS, with at least 2 MS or ACC
SSA	One legal entity from a MS or AS.

10. Restriction on participation: None.

11. Consortia agreements:
- Participants in IP are required to conclude a consortium agreement.
- Participants in STREP, CA and SSA resulting from this call are encouraged, and may be required, to conclude a consortium agreement.

12. Evaluation procedure:
- The evaluation shall follow a single stage procedure.
- Proposals will not be evaluated anonymously.

13. Evaluation criteria: See Annex B of the work programme for the applicable criteria (including their individual weights and thresholds and the overall threshold) per instrument.

14. Indicative evaluation and contractual timetable:
- Evaluation results: estimated to be available within some 3 - 4 months after the closure date;
- Conclusion of first contracts: it is estimated that the first contracts related to this call will come into force 10 months after the closure date.

15. Additional terms:

- It is expected that this call should not result in more than 60 to 70 projects.

[15] MS = Member States of the EU; AS (incl. ACC) = Associated States; ACC = Associated candidate countries.

Any legal entity established in a Member State or Associated State and which is made up of the requested number of participant may be the sole participant in an indirect action.

Call 3B

1. **Specific Programme**: Integrating and strengthening the European Research Area

2. **Activity**: Priority thematic area of research "Sustainable Surface Transport".

3. **Call title**: Thematic call in the area of "Surface Transport 3B".

4. **Call identifier**[16]: FP6-2005-Transport-4

5. **Date of publication**[17]: 31 March 2005.

6. **Closure date(s)**[18]: 1 September 2005 at 17.00h (Brussels local time).

7. **Total indicative budget**: 150 million € , broken down as follows

Instrument[19]	€ (millions)
IP or NOE	90
STREP or CA	60

8. **Areas called and Instruments**:

Area	Topic	Instrument
Objective 1 "New technologies and concepts for all surface transport modes (road, rail and waterborne)"	Low cost power-integrated advanced hybrid configurations	IP
	Towards advanced road transport for urban environment	IP
	Efficient rail traction and sustainable energy supply	IP
	Research domain 1.4 (for all transport modes and for road transport with emphasis on after-treatment) and research domain 1.8	STREP
	Research domains 1.4 to 1.10	CA

16 The call identifier shall be given in the published version of this call.
17 The Director-General responsible for the publication of this call may publish it up to one month prior or after its envisaged publication date.
18 When the envisaged date of publication is either advanced or delayed (see previous footnote), closure date(s) will be adjusted accordingly.
19 IP = Integrated project; NOE = Network of excellence; STREP = Specific targeted project; CA = Coordination action; SSA = Specific support action

Objective 2 "Advanced design and production techniques"	Future road vehicle production structures (the 5 day car initiative)	IP
	Development of cost-effective high performance track infrastructure for heavy and light rail systems	IP
	Structuring the European Marine Testing capacity for increased competitiveness	NoE
	Research domain 2.2 (only for a new generation of products and systems in waterborne transport), research domain 2.3 (for all types of transport vehicles and vessels excluding passenger cars), research domain 2.4 and research domain 2.6 (with special consideration of the needs of New Member States)	STREP
	Research domains 2.1 to 2.7	CA
Objective 3 "Re-balancing and integrating different transport modes"	Effective operations in ports	IP
	Research domain 3.14 (only for rail transport) and research domain 3.16	STREP
	Research domains 3.14 to 3.17	CA
Objective 4 "Increasing road, rail and waterborne safety and avoiding traffic congestion"	Safe maritime operations	IP
	Research domain 4.13 (only for rail transport and powered two-wheelers) and research domains 4.15 and 4.16	STREP
	Research domains 4.11 to 4.16	CA

9. Minimum number of participants[20]:

Instrument	Minimum number of participants
IP, NOE, STREP and CA	3 independent legal entities from 3 different MS or AS, with at least 2 MS or ACC

10. Restriction on participation: None.

11. Consortia agreements: Participants in RTD actions resulting from this call are required to conclude a consortium agreement.

20 MS = Member States of the EU; AS (incl. ACC) = Associated States; ACC = Associated candidate countries. Any legal entity established in a Member State or Associated State and which is made up of the requested number of participant may be the sole participant in an indirect action.

12. Evaluation procedure:

- The evaluation shall follow a single stage procedure.
- Proposals will not be evaluated anonymously.

13. Evaluation criteria: See Annex B of the work programme for the applicable criteria (including their individual weights and thresholds and the overall threshold) per instrument.

14. Indicative evaluation and contractual timetable:

- Evaluation results: estimated to be available within some 3 months after the closure date;
- Conclusion of first contracts: it is estimated that the first contracts related to this call will come into force 8 months after the closure.

Continuous Call

1. **Specific Programme:** Integrating and strengthening the European Research Area

2. **Activity:** Priority thematic area of research "Sustainable Surface Transport".

3. **Call title**: Thematic call in the area of "Sustainable Surface Transport Specific Support Actions".

4. **Call identifier:** FP6-2002-Transport-2

5. **Date of publication[21]:** 17 December 2002.

6. **Intermediary and final closure dates[22]:** 1 September 2005, at 17.00h (Brussels local time). The final closure date will be 30 March 2006.

7. **Total indicative budget (2002-2006):** 5 million € (2005: 1M€) (2006:1M€)

Instrument[23]	**€** (millions)
SSA	5

8. **Areas called**

Area	**Topic**	**Instrument**
All research domains for research, technological development and integration	Promoting SME participation	SSA
	Stimulating dissemination and exploitation of results	
	Realising the European Research Area	
	Promoting Candidate Countries participation	
	Stimulating international co-operation	

9. **Minimum number of participants[24]**:

Instrument	**Minimum number of participants**
SSA	1 legal entity from a MS or AS

10. **Restriction on participation**: None.

21 The Director-General responsible for the publication of this call may publish it up to one month prior or after its envisaged publication date.

22 Where the envisaged date of publication is either advanced or delayed (see previous footnote), closure date(s) will be adjusted accordingly, if needed, in the published call for proposals.

23 IP = Integrated project; NOE = Network of excellence; STREP = Specific targeted project; CA = Coordination action; SSA = Specific support action

24 MS = Member States of the EU; AS (incl. ACC) = Associated States; ACC = Associated candidate countries.
Any legal entity established in a Member State or Associated State and which is made up of the requested number of participant may be the sole participant in an indirect action.

11. Consortia agreements: Participants in RTD actions resulting from this call are required to conclude a consortium agreement.

12. Evaluation procedure:

- The evaluation shall follow a single stage procedure
- Proposals will not be evaluated anonymously.

13. Evaluation criteria: See Annex B of the work programme for the applicable criteria (including their individual weights and thresholds and the overall threshold) per instrument.

14. Indicative evaluation and contractual timetable:

- Evaluation results: estimated to be available within some 2 months after the closure date.
- Conclusion of first contracts: it is estimated that the first contracts related to this call will come into force 6 months after the closure date.