



Thematic Research Summary

Transport R&D - cooperation with international partner countries



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Preface

This Thematic Research Summary (TRS) has been produced as a part of the activities of the Transport Research and Innovation Portal (TRIP) project. The purpose of TRIP is to collect, structure, analyse and disseminate the results of EU-supported transport research and research financed nationally in the European Research Area (ERA), and selected global research programmes. The main dissemination tool used by TRIP is the public web portal www.transport-research.info.

The Thematic Research Summaries provide a structured guide to the results of research projects carried out mainly at EU level, either as part of an EU Research Framework Programme or as a study commissioned by the European Commission (EC). These summaries are intended for policy makers at European, national and local levels, stakeholders and researchers.

The current Thematic Research Summary refers to the TRIP theme 'International Cooperation and EU Neighbourhood Policy' and provides:

- an overview of research activities in a specific aspect of transport focusing on EU-funded projects;
- analysis and compilation of research findings and recommendations.

An overview of the Thematic Research Summaries is presented in Table 1.

Table 1: Transport themes used in TRIP

Domains	TRIP Themes
Sector	Passenger transport
	Freight transport
Mode	Air transport
	Rail transport
	Road transport
	Urban transport
	Water transport (sea and inland)
	Multimodal transport
Policy	Financing, pricing and taxation
	Regulation, competition and public services
	Infrastructure and TEN-T
	Land use and transport planning
	Climate policy and energy efficiency
	Security and safety
	International Cooperation and EU Neighbourhood Policy
	Awareness, information and user rights
Technology	Intelligent transport systems
	Innovative technologies
	Transport management
Evaluation	Long-term perspectives
	Assessment and decision support methodologies
	Environmental impacts
	Economic and regional impacts
	Accessibility, social and equity impacts

1. Introduction

The EU distinguishes two types of international cooperation, cooperation with neighbouring countries adjoining the EU and with countries and regions that do not border EU territory, each types with specific goals and policy priorities with regard to transport. The policy on international research cooperation with third countries¹ is a key driver in the development of the EU, supporting strategic goals and reinforcing the EU role as a global player (EC, 2012). In addition, the policy has impacts on global challenges emerging from society, economy, safety and security and climate change.

The EU European Neighbourhood Policy (ENP) was revised in 2011 (EC, 2011d), to strengthen the prospect of political association and economic integration for those partner countries most committed to building deep and sustainable democracy and to support inclusive economic development. The EU's objective to develop special relationships with its neighbourhood countries in order to establish an area of prosperity, based on common values, is enshrined in the Treaty of the European Union. The promotion of such values as a means towards democratic governance, building security and supporting democratic, sustainable and inclusive development in the countries of the neighbourhood, is a core objective of collaboration.

EU policy on international cooperation in transport research includes bilateral dialogue with key countries and regions, such as China, India, Russia, and the USA. The research priorities are identified according to the mutual interests of the partnership between the EU and the specific country and/or regions concerned, and their specific economic and social needs including harmonisation and common standards regarding safety, security and interoperability. As a contribution to this goal, research cooperation in the transport sector has focused on the EU neighbours to the East (Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine), for example through the Eastern Partnership Transport Panel and the TRACECA programme, and on the EU neighbours to the South (Algeria, Egypt, Israel, Jordan, Lebanon, Libya Morocco, Palestine, Syria², Tunisia), for example through the EuroMed Transport Project.

¹ "Third country" in terms of research cooperation is a country that is neither an EU Member State nor a state associated to the research framework programme, unless otherwise mentioned. "Third country" in general terms is any non-EU country.

² EU cooperation with Syria is currently suspended due to the political situation.

Furthermore, multilateral efforts are necessary especially for the development of cooperative policy frameworks, promotion of safety, security and environmental standards, and establishing research and innovation partnerships. EU funded programmes for research and development, notably FP6 and FP7, acknowledged the need for collaborative action as well as the importance of awareness raising with respect to the deployment and uptake of project results. In terms of research in transport, during FP6 and FP7, international cooperation focused on specific priority areas and collaboration research was fostered between Europe and particularly Brazil, China, USA, Russia and South Africa, as well as countries in its immediate neighbourhood, particularly Ukraine.

Based on the areas of common research and EU funding priorities, three categories or subthemes have been identified to present the cooperation with international partner countries on projects undertaken through the EU's Research Programmes during this period:

- Strengthening cooperation in research and development.
- Enforcing safety and security, and reducing environmental impacts.
- Improving integration, standardisation and interoperability.

2. Sub-Theme: Strengthening cooperation in transport R&D

Large-scale transport research requires international cooperation to bring together state-of-the-art knowledge and experience and work towards common standards for wide scale roll-out of technologies. Exchange with third countries will also strengthen research clusters in the EU. Moreover, cooperation is required in tackling global challenges such as oil dependency and emissions. R&D cooperation can distribute the financing burden and bring together funding for the design and deployment of new innovations.

International R&D cooperation focuses on the one hand on developing and improving technological innovation and exchange of best practices and experiences. On the other it facilitates political and economic targets such as the development of common standards and capacity building in less developed countries. The EU directs investment towards developing a global knowledge society primarily by establishing multilateral agreements for joint activities, such as Transport Corridor Europe-Caucasus Asia (TRACECA), South-East Europe Transport Observatory (SEETO) and Northern Partnership on Transport and Logistics (NDPTL). These activities involve mapping the research needs of countries and regions as well as tools, practices and policies in support of innovation. These joint efforts involve stakeholder activities that often lead to cooperation in projects and to exploitation of business practice-oriented results.

Based on the geographical spread of transport R&D cooperation related to FP6 and FP7, the research projects have been grouped as follows:

- Enhancing research and development cooperation amongst entities from **EU Member States and neighbouring countries**. The EU supports cooperation in transport R&D with countries close to its borders to meet challenges arising from different institutional settings and regional transport research policies in order to work on common solutions benefitting all participants while respecting individual characteristics and circumstances.
- Enhancing research and development cooperation with **other international partners**. International innovation partnerships are catalysts in the search for solutions to global challenges, which is especially the case in air transport technology and services, maritime transport technology and services and logistic services.

Transport Research with neighbouring countries

FOSTER RAIL (Future Of Surface Transport Research Rail, FP7, 2013–2016) is a coordination and support action to strengthen research and innovation strategies of transport industries in Europe through European Technology Platforms, such as EIRAC.

EcoHubs (Environmentally Coherent measures and environmental interventions to debottleneck HUBS of the multimodal network favoured by seamless flow of goods, FP7, 2012–2015) is developing models and capabilities for cooperation and communication between green hub stakeholders. It is enabling the creation of value added services to make co-modal networks attractive to use as well as contributing to reducing greenhouse gas emissions and other environmental issues. This is being done through the cooperation of authorities and industries from the EU countries, as well as from countries associated to H2020, such as Norway.

InTraRegio (Towards an Intermodal Transport Network through innovative research-driven clusters in Regions of organised and competitive knowledge, FP7, 2012–2014) is a coordinated action bringing together five clusters of EU Member States, including one non-EU country (Turkey), to enhance intermodality in regional transport systems. The focus is to strengthen regional capacity for investment in research, technology, and development.

Socool@EU (Sustainable Organization between Clusters Of Optimised Logistics @ Europe, FP7, 2012–2014) is aiming to create a European platform of excellence in supply chain management and logistics. Knowledge is being fostered between research-driven clusters, by means of developing and implementing joint action plans, by supporting internationalisation of research clusters, and by mentoring regions with a less developed research profile. Non EU Member States involved include Turkey and Ukraine.

NECL II (North East Cargo Link II (Midnordic Green Transport Corridor), FP7, 2010–2013) developed and promoted the east-west Midnordic Transport Corridor, from Norway through Sweden and Finland to Russia. This was done by improving roads, railways and intermodal solutions in the corridor, and developing and optimising an ICT system for the corridor.

NEARCTIS (Network of Excellence for Advanced Road Cooperative Traffic Management in the Information Society, FP7, 2008–2012) established a network of researchers in traffic management and optimisation to identify research issues to develop and exploit the potential benefits of cooperative ICT for traffic management. The main problems identified were safety, energy consumption, environmental impacts and congestion as obstacles to mobility. Entities from EU Member States and Switzerland participated in this project.

PLATINA (Platform for the Implementation of NAIADES, FP7, 2008–2012) supported the European Commission, EU Member States and Non-EU Countries, including Switzerland and Serbia, in implementing the NAIADES action plan. This plan is a Commission initiative to enhance the use of inland navigation in intermodal freight transport. Together with the European Commission, PLATINA identified policy actions, brought together stakeholders and developed knowledge and tools. In addition, synergies at the European level were created through networking and knowledge exchange.

SUNJET (Sustainable Network for Japan-Europe aerospace research and Technology cooperation, FP7, 2011–2012) established a framework, database and network to facilitate and enhance cooperation in research and technology between Japan and Europe. A roadmap was prepared for cooperation in responding to calls for proposals in the EU Framework Programmes, a well outline research mechanism in Japan. A structured dialogue was introduced to identify areas of mutual interest in the respective research agendas and roadmaps.

AERO-UKRAINE (Stimulating Ukraine-EU Aeronautics Research Cooperation, FP7, 2009–2011) facilitated research cooperation between the EU and Ukraine, raised awareness of collaborative research and supported participation of Ukraine in collaborative research projects funded under FP7.

B2B LOCO (Baltic-to-Balkan network for logistics competence, FP7, 2009–2011) targeted SMEs in stimulating collaboration in international research through participation in FP projects and exploitation of business, practice-oriented results. SMEs were drawn from transport and logistics, manufacturing and retail, as well as hi-tech and green technologies. Involved were 16 partners from 15 countries ranging from Baltic to Balkan, and including partners from Turkey and Israel.

EIRAC II (European Intermodal Research Advisory Council, FP7, 2007–2011)

stimulated EU and international public stakeholders and market players in intermodal transport and logistics to invest in research, to assess research results, and to disseminate research results. EIRAC had a broad geographical scope, going well beyond the boundaries of the EU Member States.

ENR2 (ERA-NET ROAD II, FP7, 2009–2011)

built on the ERA-NET I project in networking for road research programmes in Europe and Norway. Common working procedures were developed and common strategic research opportunities identified. The lessons learnt resulted in recommendations including: that trust between participants needs further development, that the parties need to understand their common obligations, and that the parties need to commit resources. The project launched several transnational research actions.

REACT (Supporting research on climate-friendly transport, FP7, 2009–2011)

coordinated, supported and strengthened the research RTD on climate-friendly transport and mobility. As a result, a Strategic Research Agenda was created in the main research areas to achieve the goal of climate friendly transport. The project consortium involved both EU (UK, Germany, Italy, Greece, Croatia and Cyprus) and non-EU partners (Serbia).

TransNEW (Support for realising new Member and Associate States' Potentials in Transport Research, FP7, 2010–2011)

mapped the national research capabilities of the new EU Member and countries associated to the EU's FP7 research programme in all transport modes including aeronautics. An international database was set up to link researchers, transport organisations and SMEs, providing opportunities for networking and partner search.

BESTLOG (Logistics Best Practice, FP6, 2006–2010)

developed a European platform for sharing and disseminating best practices in city logistics. Online toolsets and a logistic research database were developed to support stakeholders and transport actors to increase intermodality, efficiency and integration. This project also involved non-EU countries (Norway, Russia, Turkey and Switzerland).

MEDIATE (Methodology for Describing the Accessibility of Transport in Europe, FP7, 2008–2010)

developed a European platform for sharing and disseminating best practices in city logistics. Online toolsets and a logistic research database were developed to support stakeholders and transport actors to increase intermodality, efficiency and integration. Project participants included entities from EU Member States, as well as Norway.

TRANSBONUS (Transport EU-Western Balkan Network for Training, Support and Promotion of Cooperation in FP7 research activities, FP7, 2009–2010)

strengthened science and technology cooperation between the EU and the Western Balkan countries on surface transport. Sector needs were identified and research competences strengthened through the formation of a network of researchers and universities. A roadmap of research capacities and funding opportunities was also developed. Support was given in disseminating best practices and organising training on FP7. A Project Lab was set up, and partnering schemes and national collaboration between the research institutions and industry were stimulated.

PROMIT (Promote Innovative Intermodal Freight Transport, FP6, 2006–2009)

initiated and facilitated cooperation in national and European initiatives, projects, promotion centres, technology providers, research institutes and user groups in intermodal freight transport. Synergies were identified in the European intermodal community and contributed to policy initiatives at EU Member States (Greece, Germany, Hungary, Finland, the Netherlands) and Switzerland.

ECARE+ (European Communities Aeronautics Research +, FP6, 2006–2008)

was a follow-up to the ECARE project that built on the knowledge gained in the first project to improve services and cooperation for research-intensive small and medium enterprises (SMEs). Several workshops were held, and a database created to present technology offers made by SMEs. This project included non-EU Member States, including Norway and Turkey.

CONDUITS (Coordination Of Network Descriptors for Urban Intelligent Transportation Systems, FP7, 2009–2011)

investigated current and potential use of ITS in urban transport management. To enable cities to evaluate progress, key performance indicators were developed to assess the performance of traffic management and ITS. Project participants included entities from Turkey and Israel.

EUROMAR-BRIDGES (Building bridges between EU Member and Candidate States in Maritime Research on Transport within the Frames of European Research Area, FP6, 2006–2008)

increased cooperation between the EU Member States, EU Candidate Countries and non-EU countries (Russia, Ukraine) in research and development (R&D) to improve EU competitiveness in the maritime transport. Ten national contact points were established, and awareness was raised in the participating countries of the benefits of R&D cooperation.

RRTC (Regional railway transport research and training centre foundation, FP6, 2005–2007) created an open international foundation to integrate scientific and educational potential in developing safe and sustainable rail transport in Balkan countries, namely Serbia and Bulgaria. It also developed an online registration system and a human resources database. The project also focused on dissemination, via two science forums, and set up a MSc programme. In some countries, foreign companies expressed interest in collaborating with the Centre.

INTERMODE-TRANS (Specific Support Action for pan-European stakeholders and users sustaining integrated pilot technologies for increasing the efficiency of intermodal transport, FP6, 2004–2006) provided a dynamic platform between manufacturers, engineering and transport operators to generate RTD intermodality guidelines for innovative technologies, including partners from France, Sweden, Germany, Belgium, Italy, Spain and Norway. Barriers to freight intermodality and measures for improved ICT systems were identified in a move towards making intermodal transport cost-competitive in relation to other transport modes.

START (Stimulate Aerospace Research and Technology START in Associate Candidate Countries, FP6, 2004–2006) mapped the aerospace of EU Member States (Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia) and Turkey and developed a database for sharing research, created an Aeronautic and Space Portal to strengthen the network of researchers, publish regular newsletters, and increase human resource capacity in this area in the countries.

Transport research with other international partners

CooperatEUS (Conditions of success for R&T Open options through a Platform of communications and for Expressing Recommendation Actions to Team-up Europe and U.S., FP7, 2010–2012) established a framework, database and network to facilitate and enhance cooperation in research and technology between the USA and Europe. More structured dialogue has been introduced to identify mutual interests in the respective research agendas and roadmaps.

DURABROADS (Cost-effective DURABLE ROADS by green optimised construction and maintenance, FP7, 2013–2017), a twinning project with the US, is identifying existing constraints in the adoption of cost-effective, eco-friendly and optimised long-life roads. The project is furthermore, conducting an analysis, characterisation and selection of the most suitable carbon nano-materials for long-life pavement sections. The project is testing its findings in two demonstrations and is exploring the possibility to add its solutions in the Green Public Procurement procedures.

ECOLABEL (Development of a novel ECO-LABELing EU-harmonised methodology for cost-effective, safer and greener road products and infrastructures, FP7, 2013–2016), a twinning project with the US, is defining from a new eco-labelling methodology considering existing relevant labelling approaches as well as the analysis of road products, to the development of guidelines and of a software tool will motivate future EU-harmonised labelling approaches for roads.

HAIC (High Altitude Ice Crystals, FP7, 2012–2016) is characterising the microphysical properties of core or near-core regions of deep convective clouds. Experimental and numerical capabilities for the development and certification of future aircraft products are being developed. On-board awareness and detection technologies will be developed to alert crew of glaciated icing conditions. On-board weather radar will be upgraded. A pre-operational space-borne remote detection and forecasting application of glaciated icing conditions will also be investigated for implementation in SESAR meteorological services. Project participants include entities from Canada and Turkey.

HIKARI (High Speed Key Technologies for future Air transport – Research and Innovation Cooperation Scheme, FP7, 2012–2014) is creating synergies between Japanese and European programmes in order to establish a common roadmap for technology development and demonstration strategy of future high speed aviation. The economic feasibility of high-speed transport will be assessed and attention given to gaining public acceptance. In addition, in depth studies will be carried out on fuel and environmental impacts, thermal and energy management and propulsion.

INFRAVATION (ERA-NET Plus on Infrastructure Innovation, FP7, 2014–2018), a twinning project with the US, is addressing topics reflecting the needs of researchers/industry, road infrastructure owners and operators and EC for joint research on road infrastructure. Infravation is a pioneer in transnational research funding cooperation by merging national, international (US) and EC funding. This approach allows for a coordinated, common governance structure for funded R&D projects, enabling the best expertise to be used regardless of nationality, thereby minimising programme management and allowing maximum use of resources for transnational research cooperation.

MODULUSHCA (Modular Logistics Units in Shared Co-Modal Networks, FP7, 2012–2015) is facilitating the development of a roadmap to a fully interconnected logistics system by 2030. This will contribute to the development of interconnected logistics at European level in close coordination with North American partners and the International Physical Internet Initiative.

NEAR2 (Network of European Asian Rail Research Capacities, FP7, 2012–2014) established a Rail Research Network including Asian and European research in order to develop a Trans-Eurasian rail line. The rail line is to support growing trade relations between Europe and Asia and provide an alternative to today's practice which sees the sea as the main means for the transport of goods between the two continents.

ORINOCO (cOoperation with Russia in the field of advanced engIne NOise Control based on plasma actuators, FP7, 2010–2014) investigates advanced engine noise control based on plasma actuators through the collaboration of entities from the EU and Russia. Theoretically, numerical and experimental investigations are being carried out to establish the relationship between plasma actuators and jet noise reduction.

CANNAPE (Canadian Networking Aeronautics Project for Europe, FP7, 2011–2013) strengthened cooperation in aeronautics and air transport research and development between entities from the EU and Canada. A platform was set up to enhance bilateral cooperation in this area and to enable networks and partnerships on specific technical themes. Canadian participation in aeronautics and air transport activities of FP7 has been encouraged.

EUTRAIN (European Transport Research Area International cooperation activities, FP7, 2011–2013) assessed research supporting schemes in the following countries- USA, Tunisia, Egypt, Ukraine, Turkey, China, Russia, India, South Africa and Japan. A framework for international cooperation in transport research was launched. It builds on key EU policy (EC, 2008), including information and data sharing, pre-standardisation, capacity building, intellectual property, and joint programmes.

MARS (Manipulation of Reynolds Stress for Separation Control and Drag Reduction, FP7, 2010–2013) investigated the behaviour of Reynolds stresses and techniques that can manipulate flow control. Better understanding of these aspects has led to significant improvements in effective separation control and drag reduction, which contribute to controlling larger scale structures. The project involved extensive cooperation between research institutions in Europe and Asia.

NICETRIP (Novel Innovative Competitive Effective Tilt Rotor Integrated Project, FP6, 2006–2013) , bringing together partners from Belgium, France, Germany, Italy, Latvia, Poland, Spain, the Netherlands and Russia, addressed the acquisition of new knowledge and technology validation on the tilt rotor. Research was carried out on topics, such as flight mechanics modelling and aircraft performance prediction. Teaching and training programs and tools were developed and knowledge disseminated. New elements for the rotorcraft and new rotorcraft systems were developed. Tilt rotors were subsequently integrated into air traffic management and control.

AeroAfrica-EU (Promoting European-South African research cooperation in aeronautics and air transport, FP7, 2009–2011) created a platform to enhance cooperation in aeronautics and air transport research as well as policy development between the EU and South Africa. Networks and partnerships were developed involving researchers, air industry and operators from the EU, South Africa as well as other African countries.

ENABLE (Stimulate Sustainable Freight Transport Systems with Latin-American Countries, FP7, 2009–2011) contributed to improving external relations between the EU and Latin American countries, namely Argentina and Brazil, in co-modal and intermodal freight transport. Attention was given to networking and building partnerships to strengthen research links between the two regions.

TURBLOG-WW (Transferability of Urban Logistics Concepts and Practices from a World Wide Perspective, FP7, 2009–2011) developed a coordination platform to promote the exchange of experience, ideas, information and knowledge on the urban dimension of freight transport logistics. Several case studies were selected for the transfer of experience amongst entities from the EU, USA and Asia.

CETRRA (Actions to stimulate participation of cooperation partners in surface transport research, FP7, 2008–2010) fostered the European surface supply chain by enabling the development of an interoperable and harmonised transport system. CETRRA enabled cooperation between researchers and SMEs as well as knowledge sharing and technology transfer with scientific institutions in Russia, China and Hong Kong through the European Rail Research Network of Excellence (EURNEX).

CoopAIR-LA (Cooperation between EU and Latin America in Aeronautics and Air Transport Research, FP7, 2009–2010) strengthened strategic R&D cooperation between Europe and Latin America, especially Brazil, Argentina, Mexico and Chile. A multinational and multi-stakeholder community was established with common research needs to identify issues and opportunities for cooperation in co-funded aeronautics R&D programmes.

AeroChina (Promoting Scientific Cooperation between Europe and China in the field of multiphysics modelling, simulation, validation, experimentation and design methods in aeronautics, FP6, 2005–2007) established cooperation amongst industry, universities, and research organisations in the aeronautics' sectors from Europe and China. The project led to a deeper understanding of R&D activities and outlined prospects for future cooperation.

AeroChina2 (Prospecting and Promoting Scientific Cooperation between Europe and China in the Field of Multimodal Modelling, Simulation, Experimentation and Design Methods in Aeronautics, FP7, 2007–2009) fostered cooperation in aeronautics amongst companies, universities and research organisations in Europe and China. The focus of the research was on multi-physics modelling, computer simulation and code validation, experimental testing and design methods for the solution of multi-physics in aeronautics.

ENCOMAR-Transport (Enhanced Co-operation between EU Member States and Associated Candidate States in Maritime Research on Transport, FP6, 2005–2006) supported cooperation and joint use of R&D resources amongst EU Member States, EU Candidate Countries, Russia and Ukraine. The focus was on shipbuilding, waterborne, intermodal transport and maritime safety, with specific focus on the transport of dangerous goods and prevention of environmental hazards in European waters. A network of Maritime National Contact Points was developed to support the preparation of R&D projects. The target groups included universities, research organisations and authorities and SMEs.

GLOBAL VIEW (Strengthening Rail Research Cooperation between Europe and Emerging International Markets for an Integrated International Research Arena, FP6, 2006–2008) disseminated the results of selected EU projects carried out in FP5 and FP6. Several conferences and workshops were organised together with the development of a Clustering Contact Database. The project involved participants from Russia, India and South Africa.

ILA-CONFERENCE (Merging the Efforts: Russia in European Research Programs on Aeronautics, FP6, 2004) entailed the organisation of a conference organised with the purpose of increasing cooperation between the EU and Russia on aeronautics research. The conference considered issues such as ecology and efficiency, and research systems in aeronautics.

SIMBA II (Strengthening Road Transport Research Cooperation between Europe and Emerging International Markets II, FP7, 2008–2010) supported emerging markets to improve transport and to enhance European competitiveness via the transfer of technologies. RTD cooperation was strengthened between the EU and the International Cooperation Partner Countries (ICPC) of Brazil, China, India, Russia and South Africa. Collaboration between the EU and ICPC was identified to improve road safety, mobility and transport efficiency, road and transport network management and research appropriate pavement design, while reducing transport-related emissions. Expert groups were set up, and workshops held to strengthen cooperation.

3. Sub-Theme: Enforcing safety and security, and reducing environmental impacts

The Transport White Paper (EU, 2011a) stresses the importance of international cooperation in developing and enforcing high standards of safety, security, and environmental protection. The research emphasises the use of environmentally friendly transport while developing systems, methods and procedures to improve safety and security.

As international trade and passenger movements grow there is increasing focus on safety, security and environmental protection. Joint research projects under FP6 and FP7 include initiatives on safety and security for all transport modes and on responding to concerns about depleting fossil fuel reserves, climate change and environmental issues as well as economic pressures on the vehicle manufacturers.

The broad coverage of projects related to risks to life, health and the environment research have been grouped as follows:

- **Enforcing security and safety:** technology cooperation in security and safety addresses capacity problems and safety risk analysis, safe systems, optimal land-use planning and more secure infrastructure, including natural phenomena or man-made risk mitigation.
- **Reducing environmental impacts:** the research focuses on reducing the transport sector's environmental impact while maintaining the challenging goal of competitiveness.

Enforcing security and safety

SecureStation (Passenger station and terminal design for safety, security and resilience to terrorist attack, FP7, 2011–2014) is investigating potential terrorist attacks and safety incidents caused by blasts, fire, accidental or deliberate particle dispersion. Design principles and risk assessment methodologies are to be standardised. The Constructive Design Handbook is being prepared to improve the resilience of passenger stations/terminals through structural design, interior design, and building services design. The project involved partners from Spain, United Kingdom, Romania, Italy, as well as from Switzerland and Israel.

SAFEWIN (SAFEty of WINter navigation in dynamic ice, FP7, 2009–2013) developed a system for ice compression and ice dynamics forecasting to increase the safety of winter navigation in dynamic ice conditions, specifically in the Baltic Sea, Okhotsk Sea and the western Russian Arctic. This system is particularly effective for large oil tankers navigating in arctic seas.

SaferBraIn (Innovative Guidelines and Tools for Vulnerable Road Users Safety in India and Brazil, FP7, 2009–2012) used the experience gained in Europe in this area, to analyse the main risk factors with respect to vulnerable road users in India and Brazil. Best practices, innovative methodologies and tools for planning, designing and maintaining safe infrastructure have been developed and a Decision Support System (SaferBraIn DSS) was defined. Events were organised in Pune (India) and in São Paulo (Brazil) to disseminate the project results to local stakeholders.

SVETLANA (Safety (and maintenance) improvEment through automated fLight data ANALysis, FP7, 2010–2012) developed an automated and standardised flight data management cycle to process routinely large amounts of data to enable operators to examine all data from every flight. The project involved EU and Russian industries and research organisations from the aviation sector.

INTEGRITY (Intermodal Global Door-to-Door Container Supply Chain Visibility, FP7, 2008–2011) developed a methodology and an IT system to create visibility in the supply chain. Enhanced security measures, data sharing on vehicles, cargo and inspection results resulted in improvements in the reliability and performance of transport chains. The project involved entities and authorities from EU Member States and China.

ESTEEM (Enhancing Safety and Security Aspects in Transport Research in the Euro-Mediterranean Region, FP7, 2008–2009) strengthened links between the Maghreb transport research system and three Mediterranean neighbouring EU countries (Italy, Spain, France). Three Mediterranean Partner countries were also directly involved (Tunisia, Algeria, Morocco). Partnership of the Mediterranean countries was strengthened, sub-areas were identified and roadmaps for future research were developed.

FLYSAFE (Airborne Integrated Systems for Safety Improvement, Flight Hazard Protection and All Weather Operations, FP6, 2005–2009) contributed to the ACARE goal of safety in flight operations, involving partners from Austria, Belgium, France, Germany, Greece, Italy, Malta, The Netherlands, Portugal, Slovenia, Spain, Sweden, United Kingdom and Russia. A methodology was formulated to facilitate crew decision-making to avoid conflicts based on categories of accidents such as loss of control, controlled flight into terrain, and approach and landing accidents. Three types of threats were addressed (adverse weather conditions, traffic hazards and terrain hazards) in system solutions: improved situation awareness; advance warning; alert prioritisation; and enhanced human-machine interface. The Next Generation Integrated Surveillance System (NG ISS) and Weather Information Management Systems (WIMS) were produced.

NODESIM (Non-deterministic simulation for CFD-Based Design methodologies, FP6, 2006–2009) addressed aircraft development costs and increasing safety by using a new paradigm for computational fluid dynamics based on virtual prototyping, to minimise the chance of error in the aircraft design process. This prototyping incorporated operational uncertainties and other uncertainties in the simulation process for CFD-based Design. Three types of uncertainties were classified and three categories of non-deterministic methodologies were developed. The non-deterministic methodologies were then tested and the results collected in a database. The project brought together partners from Spain, Italy, France, United Kingdom, Germany, Belgium, the Netherlands and Russia.

SAFE (Security of Aircraft in the Future European Environment, FP6, 2004–2008) investigated prevention of terrorism by direct human action and by electronic means, and offered an integrated approach for detection and prevention. This included on-board threat detection, threat assessment and response management flight protection through Emergency Avoidance System, and data protection system. Because of the sensitivity, the results were disseminated in six user club meetings of European experts in Air Transport, Aeronautics and Security. The partner countries were France, Germany, United Kingdom, The Netherlands, Italy, Greece, Ireland, Portugal, Belgium, Spain and Israel.

SELCAT (Safer European Level Crossing Appraisal and Technology, FP6, 2006–2008) evaluated the safety performance of level crossings in the EU and made recommendations for safety targets in rail transport. Cost-benefit analysis was carried out on safety methods, targets and indicators. Project participants included entities from China, India, Japan, Morocco and Russia.

EU-INDIA (Cooperation between Europe and India on eSafety, FP6, 2005–2007) established cooperation on ITS development between entities from the EU and India in order to explore opportunities to develop intelligent integrated safety systems for traffic management in India. The project resulted in a better understanding of how technology can contribute towards improved road safety, to better business cooperation for improving safety and to developing cooperation on targeted ITS developments, such as an emergency response service.

Reducing environmental impacts

RECEPT (RECEPTivity and amplitude-based transition prediction, FP7, 2011–2014) is contributing to the design of advanced transition control devices to achieve higher technology readiness, reduce fuel consumption and thus emissions from air transport. Theoretical and numerical tools are being used to develop an amplitude-based prediction method for analysing flow patterns, disturbance and turbulence in wind tunnels and free-flight conditions. These technologies contribute to the competitiveness of the European manufacturing industry and reduce the environmental impact of future aircraft. The project participants included entities from Russia.

ECOSTAND (Coordination Action for creating a common assessment methodology and joint research agenda with Japan and the USA on ITS applications focusing on energy efficiency and CO₂ reduction, FP7, 2010–2013) supported an agreement by the EU, Japan and the USA on energy efficiency and reduction of CO₂ emissions. A framework was developed for a common methodology to assess the impact of ITS on energy consumption and greenhouse gas emissions. In addition a roadmap and a research agenda for the future were proposed.

Alfa-BIRD (Alternative Fuels and Biofuels for Aircraft Development, FP7, 2008–2012) developed alternative fuels for aviation. The adequacy of five alternative fuels was assessed in line with aircraft requirements on the basis of tests and experiments, and the environmental and economic performance of each was evaluated. Project participants included research institutions from EU Member States, as well as third countries such as South Africa, Australia and Canada.

HOSANNA (Holistic and sustainable abatement of noise by optimized combinations of natural and artificial means, FP7, 2009–2012) focused on noise abatement along transport routes, including greening of buildings and use of vegetation on urban and rural areas, innovative barriers including recycled material, and treatment of the ground and road surface. The project resulted in a toolbox to reduce road and rail traffic noise. Noise impact was assessed in terms of sound levels (including spectra and time patterns) and noise annoyance, well-being and other health related aspects. The partner countries for this project were Sweden, France, Belgium, United Kingdom and South Korea.

DREAM (Validation of radical engine architecture systems, FP7, 2008–2010) combined aeronautic expertise and capabilities in the EU, Russia and Turkey to reduce CO₂ and NO_x emissions and noise by means of information dissemination, examination of engine architecture, innovative systems, and demonstration of alternative fuels.

X3-NOISE (Aircraft External Noise Research Network and Coordination, FP6, 2006–2010) addressed aircraft noise based on ACARE goals. A network structure and comprehensive work plan was presented which involved expert groups, scientific workshops, stakeholder seminars and a common information system. The X3-NOISE Coordination Action analysed the state-of-the-art of the sector, formulated research priorities, and reinforced future project partnerships through expertise mapping and a network of national focal points. The project brought together various EU Member States, as well as Ukraine, Switzerland, Egypt and Brazil.

BEST (Bioethanol for Sustainable Transport, FP6, 2006–2009) demonstrated extensive substitution of petrol and diesel with bioethanol. Demonstrating the benefits of small adjustments to the traditional engine, the project led to an accelerated development of bioethanol fuel in Europe and paved the way for a market breakthrough for ethanol-fuelled vehicles. Project participants included entities from Brazil and China.

HyFLEET: CUTE (Hydrogen for Clean Urban Transport in Europe, FP6, 2006–2009) brought together 31 partners from industry, government and consultants from a number of countries to develop a hydrogen-based transport system. Hydrogen-powered bus technology and new hydrogen refuelling infrastructure were developed and the next generation of fuel cell and internal combustion engine buses were designed and tested. Several hydrogen fuel cell powered buses are in now use in nine cities worldwide, Amsterdam, Barcelona, Beijing, Hamburg, London, Luxembourg, Madrid, Perth, and Reykjavik.

ShipDismantl (Cost-Effective and Environmentally Sound Dismantling of Obsolete Vessels, FP6, 2005–2009) proposed a model inventory of hazardous materials and their location on board of vessels together with other material properties that could provide a significant risk potential to the crew's health and to the environment. The model indicates aspects of materials that are difficult to identify immediately but need to be known prior to dismantling a vessel. Project participants included entities from India and Turkey.

4. Sub-Theme: Integration, standardisation and interoperability

EU transport policy is directed at optimising efficient use of transport infrastructure, integration of transport modes, networks and services, beyond the borders of the EU. In support of this policy, research focuses on developing common standards and implementing flexible, reliable and efficient interoperability concepts, smart information systems and coordinated platforms.

The transport sector in the EU is active and competitive on the world market, and thus innovation is essential in maintaining the EU's position in global transport. In optimising efficient use of transport infrastructure, consideration is given to coordinating communication channels and traffic management systems; implementing common standards using the high benchmarks established by the EU; and improving interoperability. Research focuses on navigation and positioning systems, integration of networks (data and tools) and traffic management systems. Research has also pinpointed the need for standardisation, namely in air traffic and freight transport, given the cross-border nature of container transport.

The project research summaries are presented in two clusters:

- **Integration of transport systems and networks** addresses research on removing technical and administrative barriers.
- **Standardisation and interoperability.**

Integration of transport systems and networks

PRIMAE (Packaging of future Integrated Modular Electronics, FP7, 2010–2014) is lowering the cost and lead-time in developing aircraft systems by reducing the volume and weight of electronics packaging. After standardisation, this concept will replace the 35-year old ARINC 600 standard for packaging. Project participants include research institutions from EU Member States, as well as Russia.

ARIADNA (Maritime assisted volumetric navigation system, FP7, 2009–2012)

developed a series of navigation support systems based on the Volumetric Navigation System (VNS) concept in order to optimise maritime and inland infrastructure; navigation in dense traffic in ports, rivers, channels, lock and port access areas; improve traffic separation scheme and risk control including grounding; and provide efficient and environmentally-friendly operations. The project participants included research institutions from EU Member States and Turkey.

RISING (RIS Services for Improving the Integration of Inland Waterway Transports into Intermodal Chains, FP7, 2009–2012)

identified, developed and demonstrated River Information Services (RIS) to support inland waterway transport and logistics operations. Besides entities from EU Member States, project participants included entities from Norway and Serbia.

VIAJEO (International Demonstrations of Platform for Transport Planning and Travel Information, FP7, 2009–2012)

designed and validated an open platform to facilitate cross-modal journey planning by promoting information exchange between transport operators. The platform, which was demonstrated in the cities of Athens, São Paulo, Beijing, and Shanghai, enables harmonisation of operation strategies, optimisation of transport modelling, and evaluation of long-term policy.

CREAM (Customer-driven Rail-freight services on a European mega-corridor based on Advanced business and operating Models, FP6, 2007–2011)

focused on improving the performance and reliability capabilities of EMA in harsh thermal environmental conditions. An advanced, smart, miniaturised and reliable electronics platform was produced that can integrate compact technologies, such as temperature control in valves and pumps. This platform contributed to high performance and reliability capabilities of EMA in harsh conditions. Project participants included entities from Macedonia and Serbia.

GAGARIN (Galileo-Glonass Advanced Receiver Integration, FP7, 2009–2011)

contributed to the development of standardised worldwide GNSS solutions. GALILEO was merged with the GPS and GLONASS systems for adoption of GALILEO in air transport in Russia. Project participants included companies and research laboratories from Russia and Europe.

WORLDNET (European Transport Network Model Refinement Regarding Freight and Intermodal Transport to and from the Rest of the World, FP6, 2007–2009)

refined the European transport network model for freight and intermodal transport to enable a more precise representation of freight flows. A common, international modelling framework would give a consistent, quantitative baseline for the assessment of technological and economic trends in transport, energy and environment sectors. A new communication network was set up, involving regions and other third countries, namely Turkey, China and Argentina, to improve understanding and planning of global freight flows.

Standardisation and interoperability

SMART-CM (Smart Container Chain Management, FP7, 2008–2011) studied and implemented advanced technology on container door-to-door transport. A single window interoperability platform that is neutral and open was developed to enable secure and interoperable data communications between public administrations and market players. This was demonstrated on a world-scale in two demonstrations covering four supply chain corridors. The analysis produced included technology, market, organisational and security issues. Besides European entities, the project also included participants from China, Thailand and Switzerland.

URBAN TRACK (Urban Rail Infrastructure, FP6, 2006–2010) delivered an integrated series of modular track infrastructure solutions at low cost, with little or no maintenance, greater comfort and punctuality, in an environmentally friendly and safe way. Through this project, the quality and attractiveness of the rail infrastructure was improved and new technologies and standardisation introduced. Project participants included entities from the EU, Philippines and South Africa.

ERASMUS (En Route Air Traffic Soft Management Ultimate System, FP6, 2006–2009) designed a cooperative air-ground approach for the validation of human centred innovative ATC automation. The TC-SA based Strategic De-conflicting was designed and validated. Project participants included entities from the EU, Switzerland and USA.

INTEGRAIL (Intelligent European Intermodal Research Advisory Council Integration of Railway systems, FP6, 2005–2008) developed a framework to integrate railway information systems into one single system. Technology was developed to enable transparent access to information systems (databases, monitoring systems and user applications) and thus improve rail transport management. Introduction of this integrated system has led to cost reduction in railway operation and maintenance due to its ability to reduce delays and disruptions while increasing traffic volumes. The project participants included entities from the EU and Chile.

5. Future Challenges for Research Policy

By external expert Dr Monika Bak

Transport is global and involves international cooperation. The Transport White Paper (EC, 2011a) puts its integration at the heart of the Single Transport Area as well as the cooperation between the EU and other countries to meet global challenges.

Geographic location, political environment, historical conditions and other determinants influence national transport and a country's transport performance in international markets. Countries have different ways of identifying and dealing with transport issues and different approaches to the role of transport in sustainable development. Transport research involving international partners addresses the global challenges faced by the transport sector. For this reason, much effort has been made to strengthen international R&D and identify new ways of cooperation and covering many dimensions – legal, institutional, financial, technological, social and behavioural.

International cooperation is needed to overcome legal barriers that restrict the movement of people and freight across national boundaries. Challenges include developing concepts and frameworks to enable the harmonisation of legal conditions as well as more efficient methods for implementation of standards and rules and how to deal with transport data collection, access and sharing.

Future strategic research needs

International cooperation is vital in achieving smart, green and integrated transport on regional and global level.

International cooperation can contribute to improved mobility, reducing congestion, and improving transport safety and security. Also, best practice and experience from outside the EU can contribute towards strengthening the EU transport sector and to the goal of global leadership for the European transport industry. Furthermore, socio-economic research and forward looking activities for policy making can be stimulated through international cooperation to improve understanding and to develop models and scenarios.

Research involving international cooperation should be prioritised given its relevance for EU transport objectives and EU research policy (EC, 2011b). Research involving other countries should be identified systematically and coherently based on an analysis of the EU in a global setting in line with criteria for research, innovation risks and opportunities in accessing new and emerging markets. In addition, the impact on EU competitiveness, contribution to EU international commitments, and lessons learnt from earlier cooperation also need to be taken into account.

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Glossary

ACARE	Advisory Council for Aeronautical Research in Europe
ATC	Air Traffic Control
CO₂	Carbon dioxide
DG MOVE	Directorate General for Mobility and Transport
EC	European Commission
ERA	European Railway Agency
ERTRACS	European Road Transport Research Advisory Council
EU	European Union
FP	Framework Programme
GLONASS	Global Navigation Satellite System (Russia)
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
H2020	Horizon 2020 – Framework Programme for Research and Innovation
ICT	Information & Communication Technology
ITS	Intelligent Transport Systems
IWT	Inland Waterway Transport
MSc	Master of Science
NO_x	Nitrogen Oxides
NPDL	Northern Partnership on Transport and Logistics
RIS	River Information System
RTD	Research and Technological Development
R&D	Research and Development
SA	Republic of South Africa
SEETO	South East European Transport Observatory

SESAR	European air traffic control infrastructure modernisation programme
SME	Small and Medium size Enterprises
TEN-T	Trans-European Transport Network
TRACECA	Transport Corridor Europe-Caucasus Asia
TRIP	Transport Research and Innovation Portal
TRS	Thematic Research Summary
US(A)	United States (of America)

ANNEX: Projects by Sub-Theme

Sub-Theme: Strengthening cooperation in transport R&D - Transport Research with countries close to the EU				
Acronym	Title	Funding Programme	Project Website	Duration
FOSTER RAIL	Future Of Surface Transport Research Rail	FP7	http://www.errac.org/foster-rail/	2013–2016
EcoHubs	Environmentally Coherent measures and environmental interventions to debottleneck HUBS of the multimodal network favoured by seamless flow of goods	FP7	http://eskema.eu/ecohubsknowledge/default.aspx	2012–2015
InTraRegio	Towards an Intermodal Transport Network through innovative research-driven clusters in Regions of organised and competitive knowledge	FP7	http://www.intraregio.eu/	2012–2014
Socool@EU	Sustainable Organization between Clusters Of Optimised Logistics @ Europe	FP7	http://www.socool-logistics.eu/	2012–2014
NECL II	North East Cargo Link II	FP7	http://www.midnordictc.net/	2010–2013
NEARCTIS	Network of Excellence for Advanced Road Cooperative Traffic Management in the Information Society	FP7	http://www.nearctis.org/	2008–2012

PLATINA	Platform for the Implementation of NAIADES	FP7	http://platina1.naiades.info/platina/page.php?id=1	2008–2012
SUNJET	SUstainable Network for Japan-Europe aerospace research and Techonolgy cooperation	FP7	N/A	2011–2012
AERO-UKRAINE	Stimulating Ukraine-EU Aeronautics Research Cooperation	FP7	http://www.aero-ukraine.eu/	2009–2011
B2B LOCO	Baltic-to-Balkan network for logistics competence	FP7	N/A	2009–2011
EIRAC II	European Intermodal Research Advisory Council	FP7	N/A	2007–2011
ENR2	ERA-NET ROAD II	FP7	http://www.eranetroad.org/	2009–2011
REACT	Supporting research on climate-friendly transport	FP7	http://www.react-transport.eu/	2009–2011
TransNEW	Support for realising new Member and Associate States' Potentials in Transport Research	FP7	N/A	2010–2011
BESTLOG	Logistics Best Practice	FP6	N/A	2006–2010
MEDIATE	Methodology for Describing the Accessibility of Transport in Europe	FP7	http://www.mediate-project.eu/	2008–2010
TRANSBONUS	Transport EU-Western Balkan Network for Training, Support and Promotion of Cooperation in FP7 research activities	FP7	http://www.arcfund.net/index.php?id=1960	2009–2010

PROMIT	Promote Innovative Intermodal Freight Transport	FP6	http://www.promit-project.net/	2006–2009
ECARE+	European Communities Aeronautics Research +	FP6	N/A	2006–2008
EUROMAR-BRIDGES	Building bridges between EU Member and Candidate States in Maritime Research on Transport within the Frames of European Research Area	FP6	N/A	2006–2008
RRTC	Regional railway transport research and training centre foundation	FP6	http://old.vtu.bg/projects/project-FP6_e.htm	2005–2007
INTERMODE-TRANS	Specific Support Action for pan-European stakeholders and users sustaining integrated pilot technologies for increasing the efficiency of intermodal transport	FP6	N/A	2004–2006
START	Stimulate Aerospace Research and Technology START in Associate Candidate Countries	FP6	N/A	2004–2006

Sub-Theme: Strengthening cooperation in transport R&D – Transport research with other international partners				
Acronym	Title	Funding Programme	Project Website	Duration
CooperatEUS	Conditions of success for R&T Open options through a Platform of communications and for Expressing Recommendation Actions to Team-up Europe and U.S.	FP7	http://ec.europa.eu/research/transport/news/items/cooperateus_eu_us_cooperation_in_aeronautics_research_en.htm	2010–2012
DURABROADS	Cost-effective DURABLE ROADS by green optimised construction and maintenance	FP7	http://www.durabroads.eu/	2013–2017
ECOLABEL	Development of a novel ECO-LABELing EU-harmonised methodology for cost-effective, safer and greener road products and infrastructures	FP7	http://ecolabelproject.eu/home/overview/	2013–2016
HAIC	High Altitude Ice Crystals	FP7	http://www.haic.eu/	2012–2016
INFRAVATION	ERA-NET Plus on Infrastructure Innovation	FP7	http://infravation.net/	2014–2018
MODULUSHCA	Modular Logistics Units in Shared Co-Modal Networks	FP7	N/A	2012–2015
HIKARI	High Speed Key Technologies for future Air transport – Research and Innovation Cooperation Scheme	FP7	http://www.hikari-project.eu/main	2012–2014
NEAR2	Network of European Asian Rail Research Capacities	FP7	http://www.near2-project.eu/	2012–2014

ORINOCO	cOoperation with Russia in the field of advanced engIne NOise COntrol based on plasma actuators	FP7	http://www.orinoco-project.org/	2010–2014
CANNAPE	Canadian Networking Aeronautics Project for Europe	FP7	N/A	2011–2013
EUTRAIN	European Transport Research Area International cooperation activities	FP7	http://www.eutrain-project.eu/	2011–2013
MARS	Manipulation of Reynolds Stress for Separation Control and Drag Reduction	FP7	http://www.cimne.com/mars/	2010–2013
NICETRIP	Novel Innovative Competitive Effective Tilt Rotor Integrated Project	FP6	http://nicetrip.onera.fr/	2006–2013
AeroAfrica-EU	Promoting European-South African research cooperation in aeronautics and air transport	FP7	N/A	2009–2011
CONDUITS	Coordination Of Network Descriptors for Urban Intelligent Transportation Systems	FP7	N/A	2009–2011
ENABLE	Stimulate Sustainable Freight Transport Systems with Latin-American Countries	FP7	N/A	2009–2011
TURBLOG-WW	Transferability of Urban Logistics Concepts and Practices from a World Wide Perspective	FP7	http://www.turblog.eu/	2009–2011
CETRA	Actions to stimulate participation of cooperation partners in surface transport research	FP7	N/A	2008–2010

CoopAIR-LA	Cooperation between EU and Latin America in Aeronautics and Air Transport Research	FP7	N/A	2009–2010
AeroChina2	Prospecting and Promoting Scientific Cooperation between Europe and China in the Field of Multimodal Modelling , Simulation, Experimentation and Design Methods in Aeronautics	FP7	http://www.cimne.com/aerochina2/	2007–2009
GLOBAL VIEW	Strengthening Rail Research Cooperation between Europe and Emerging International Markets for an Integrated International Research Arena	FP6	http://globalview.uic.asso.fr/intro.html	2006–2008
AeroChina	Promoting Scientific Cooperation between Europe and China in the Field of Multiphysics Modelling , Simulation, Validation, Experimentation and Design Methods in Aeronautics	FP6	http://www.cimne.com/aerochina/	2005–2007
ILA-CONFERENCE	Merging the Efforts: Russia in European Research Programs on Aeronautics	FP6	N/A	2004
SIMBA II	Strengthening Road Transport Research Cooperation between Europe and Emerging International Markets II	FP7	N/A	2008–2010
ENCOMAR-Transport	Enhanced Co-operation between EU Member States and Associated Candidate States in Maritime Research on Transport	FP6	N/A	2005–2006

Sub-Theme: Enforcing safety and security, and reducing environmental impacts – Enforcing security and safety				
Acronym	Title	Funding Programme	Project Website	Duration
SecureStation	Passenger station and terminal design for safety, security and resilience to terrorist attack	FP7	http://securestation.group.shef.ac.uk/index.html	2011–2014
SAFEWIN	SAFETY of WINter navigation in dynamic ice	FP7	http://safewin.org/	2009–2013
SaferBraIn	Innovative Guidelines and Tools for Vulnerable Road Users Safety in India and Brazil	FP7	http://www.saferbrain.eu/	2009–2012
SVETLANA	Safety (and maintenance) improvement through automated flight data ANALYSIS	FP7	http://svetlanaproject.eu/	2010–2012
INTEGRITY	Intermodal Global Door-to-Door Container Supply Chain Visibility	FP7	http://www.integrity-supplychain.eu/	2008–2011
ESTEEM	Enhancing Safety and Security Aspects in Transport Research in the Euro-Mediterranean Region	FP7	N/A	2008–2009
FLYSAFE	Airborne Integrated Systems for Safety Improvement, Flight Hazard Protection and All Weather Operations	FP6	N/A	2005–2009
NODESIM	Non-deterministic simulation for CFD-Based Design methodologies	FP6	http://www.nodesim.eu/	2006–2009

SAFE	Security of Aircraft in the Future European Environment	FP6	http://www.safee.reading.ac.uk/	2004–2008
SEL	Safer European Level Crossing Appraisal and Technology	FP6	http://www.iva.ing.tu-bs.de/levelcrossing/selcat/	2006–2008
EU-INDIA	Cooperation between Europe and India on eSafety	FP6	N/A	2005–2007

Sub-Theme: Enforcing safety and security, and reducing environmental impacts – Reducing environmental impacts				
Acronym	Title	Funding Programme	Project Website	Duration
RECEPT	RECEPTivity and amplitude-based transition prediction	FP7	https://www.mech.kth.se/drupal6/recept/	2011–2014
ECOSTAND	Coordination Action for creating a common assessment methodology and joint research agenda with Japan and the USA on ITS applications focusing on energy efficiency and CO ₂ reduction	FP7	http://www.ecostand-project.eu/	2010–2013
Alfa-BIRD	Alternative Fuels and Biofuels for Aircraft Development	FP7	http://www.alfa-bird.eu-vri.eu/	2008–2012
HOSANNA	Holistic and sustainable abatement of noise by optimized combinations of natural and artificial means	FP7	http://greener-cities.eu/	2009–2012
DREAM	Validation of radical engine architecture systems	FP7	N/A	2008–2010
X3-NOISE	Aircraft External Noise Research Network and Coordination	FP6	http://www.xnoise.eu/home/	2006–2010
BEST	Bioethanol for Sustainable Transport	FP6	http://www.best-europe.org/	2006–2009
HyFLEET: CUTE	Hydrogen for Clean Urban Transport in Europe	FP6	http://www.global-hydrogen-bus-platform.com/	2006–2009

ShipDismantl	Cost-Effective and Environmentally Sound Dismantling of Obsolete Vessels	FP6	N/A	2005–2009
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Sub-Theme: Integration, standardisation and interoperability – Integration of transport systems and networks				
Acronym	Title	Funding Programme	Project Website	Duration
PRIMAE	Packaging of futuRe Integrated Modular Electronics	FP7	http://www.primae.org/	2010–2014
ARIADNA	Maritime assisted volumetric navigation system	FP7	http://www.ariadna-fp7.eu/	2009–2012
RISING	RIS Services for Improving the Integration of Inland Waterway Transports into Intermodal Chains	FP7	http://www.rising.eu/web/guest/home	2009–2012
VIAJEO	International Demonstrations of Platform for Transport Planning and Travel Information	FP7	http://viajeo.eu/	2009–2012
CREAM	Customer-driven Rail-freight services on a European mega-corridor based on Advanced business and operating Models	FP6	http://www.cream-project.eu/home/index.php	2007–2011
GAGARIN	GAliileo-Glonass Advanced Receiver Integration	FP7	N/A	2009–2011
WORLDNET	European Transport Network Model Refinement Regarding Freight and Intermodal Transport to and from the Rest of the World	FP6	N/A	2007–2009

Sub-Theme: Integration, Standardisation and interoperability – Standardisation and interoperability				
Acronym	Title	Funding Programme	Project Website	Duration
SMART-CM	Smart Container Chain Management	FP7	http://www.smart-cm.eu/	2008–2011
URBAN TRACK	Urban Rail Infrastructure	FP6	http://www.urbantrack.eu/	2006–2010
ERASMUS	En Route Air Traffic Soft Management Ultimate System	FP6	http://www.atm-erasmus.com/	2006–2009
INTEGRAIL	INTElligent inteGration of RAILway systems	FP6	http://www.integrail.info/	2005–2008