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Thematic Research Summary

Multimodal transport

COMMUNICATING TRANSPORT RESEARCH AND INNOVATION

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Transport



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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). TRIP collects, structures, analyses and disseminates 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 a 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 Thematic Research Summary on Multimodal transport is one of 24 themes, which 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

Road is the dominant transport mode in Europe, claiming 73.4% of passenger transport, and 71.8% of the hinterland freight transport, excluding sea transport (2011 value; EC, 2013a). This dominance of road transport has impacts on congestion, environment and safety, and limits the use of more resource efficient modes, impeding their growth and competitiveness.

An efficient transport system is a prerequisite to the development of a Single European Transport Area and improvement of EU competitiveness (EC, 2011). Multimodal transport of passengers and freight contributes to a competitive well-connected Europe by reducing congestion on the road network and stimulating the use of more resource-efficient modes using a competitive well-connected European network.

Furthermore, the European Commission strives for more reliable integrated transport, with low operating and administrative costs. More specifically, EU policy highlights the contribution of multimodal passenger solutions, such as the improvement of multimodal transport information (EC, 2009; EC, 2010). In addition, EU policy promotes services for multimodal logistics for a resource-efficient and low energy transport (EC, 2013b).

To meet the requirements for a seamless multimodal transport system, new technical solutions are promoted for infrastructure and vehicles (EIRAC, 2010). Infrastructure for freight transport needs to include transshipment facilities, and vehicles need modification to minimise time and resources in transferring freight from one transport mode to the next. Multimodal passenger transport requires faster interconnections between modes to make transport seamless and thus more competitive, shifting from the car and road transport (JRC, 2011).

In addition to improving technical aspects of infrastructure and vehicles, EU funded research has contributed to smart operations and services in providing integrated multimodal solutions. Improved real-time monitoring systems and optimised timetables have reduced transit time between modes. Integrated ticketing systems have also stimulated the use of multiple transport systems. Reliable planning tools have been developed to boost the use of different infrastructure segments shared among different service providers and create synergies for network use optimisation.

Research has also addressed challenges to multimodal transport by minimising the administrative burden, among different providers, local or international and promoting horizontal collaboration (EIRAC, 2010).

While research on equipment and services identifies smart and efficient ways to make transport seamless, the solutions need to be disseminated to stakeholders to stimulate market uptake. Promoting multimodal techniques and services and harmonised standards and regulations contribute to market uptake of new solutions to streamline multimodal chains. Furthermore, tools to monitor the multimodality effects support the shift to multimodality.

Research on multimodal transport is directed to improving the technical performance of infrastructure and vehicles, meeting transport demand and harmonising the rules and demands between stakeholders. Moreover, research has identified tools and support mechanisms to promote multimodal solutions.

Research projects on multimodal transport are grouped as follows:

- Multimodal infrastructure and vehicle equipment
- Smart multimodal services
- Support and promotion of multimodal solutions.

2. Sub-Theme: Multimodal infrastructure and vehicle equipment

Effective multimodal transport requires linking infrastructure for transfer and operation of vehicles on different modes. Whereas infrastructure creates multimodal connections bridging the gap between different modes in ports and terminals, multimodal vehicle equipment warrants compatible, transferable loading units between modes.

Advances in multimodal infrastructure and vehicle equipment have been accommodating efficiently different transport modes and vehicle technologies. In infrastructure, new technological developments and business models and strategies have been piloted to improve network operations in ports and terminals. Innovative vehicle equipment has been developed for passenger and freight transport, to improve multimodal performance such as tracking and tracing systems for seamless operations, and multimodal loading units.

Research projects are grouped as follows:

- **Transport infrastructure:** improvement to facilitate transfer of vehicles and/or vehicle components between modes, and development of multimodal network.
- **Vehicle equipment:** technical developments of vehicles to improve interoperability between different modes.

Transport infrastructure

CONTAIN (Container Security Advanced Information Networking, FP7, 2011–2015) is demonstrating and specifying a Shipping Containers Surveillance System that encompasses regulations, policy and standardisation, business models and advanced container security management.

CREAM (Customer-driven Rail-freight services on a European mega-corridor based on Advanced business and operating Models, FP6, 2007–2011) produced a Quality Management System for rail operations in intermodal services, a shuttle-train between Worms (Germany) and Trieste (Italy), a ferry boat between Trieste (Italy) and Istanbul/Izmir/Mersin (Turkey), and a new traction concept for the DB Schenker rail entities in Romania and Bulgaria. Concepts and strategies were developed for corridors between Turkey and Greece, and the Benelux countries.

RETRACK (Reorganisation of Transport Networks by Advanced Rail Freight Concepts, FP6, 2007–2012) developed a demonstration train for specific corridors in Europe to identify and test the limits of new and innovative transport concepts to shift freight from road to rail. An effective and scalable rail freight corridor was created between high demand regions in Western Europe and new high growth regions in Central and Eastern Europe.

SAFE OFFLOAD (Safe Offloading from Floating LNG Platforms, FP6, 2006–2008) designed solutions for floating LNG platforms to improve the safety and efficiency of offloading operations. Several methods were developed to predict environmental impacts, such as high waves and strong winds.

TIGER (Transit via Innovative Gateway concepts solving European Intermodal Rail needs, FP7, 2009–2012) provided ideas and methods to overcome road congestion in and around Europe's major ports by building intermodal freight logistics chains. A new business model was developed for transport via dry ports, hubs, mega hubs, and an industrial scale operations concept was introduced.

Vehicle equipment

BIKE intermodal (Multi-modal Integration of Cycling Mobility through Product and Process Innovations in Bicycle Design, FP7, 2010–2013) constructed an innovative hinged bicycle frame that is lightweight, strong, compact when folded, and a system for automatic opening and closing the bicycle frame.

BRAVO (Brenner Rail Freight Action Strategy Aimed at Achieving a Sustainable Increase of Intermodal Transport Volume by Enhancing Quality, Efficiency, and System Technologies, FP6, 2004–2007) created a model for increasing the volume of intermodal transport in the Brenner corridor and in other European corridors. To reduce emissions in the Brenner corridor, actions included cross-border operations of multi-system locomotives, radio remote control of pushing engines, a mega-trailer, pocket wagon, an online train monitoring system, internet timetable displays, and the Brenner Quality Manual.

CARGO-ANTS (Cargo handling by Automated Next generation Transportation Systems for ports and terminals, FP7, 2013–2016) is designing smart Automated Guided Vehicles (AGVs) and Highly Automated Trucks (HATs) to operate in shared workspaces to increase efficiency and safety of freight transport in main ports and freight terminals. Active dialogue is being established with customers, workforce and authorities to maximise acceptance and use of the new systems.

CASSANDRA (Common assessment and analysis of risk in global supply chains, FP7, 2011–2014) is developing a data sharing concept for more efficient and effective container security that enables extended risk assessment by authorities and companies. This is directed to improving the supply-chain visibility, and efficiency of trade compliance and effectiveness of border controls, and to facilitating control by combining E-Freight and E-Customs.

CHINOS (Container Handling in Intermodal Nodes – Optimal and Secure, FP6, 2006–2010) demonstrated the effectiveness of the system to identify and track containers throughout the logistics chain. This system can also monitor a container seal status and thus detect whether the container has been opened and tampered with. CHINOS software is commercially available.

DE-LIGHT TRANSPORT (DE-LIGHT TRANSPORT, FP6, 2006–2010) developed methods for designing lighter materials for transport vehicles. A design tool based on algorithms from other projects and from research in this project was used to develop DE-LIGHT transport materials, and to improve structures for maritime applications.

EU-CARGOXPRESS (Greening of surface transport through an innovative and competitive CARGO-VESSEL Concept connecting marine and fluvial intermodal ports, FP7, 2009–2012) developed a competitive and sustainable cargo vessel for medium and small marine and river ports to meet requirements for green transport, contributing to reducing road congestion in Europe, thus to reducing environmental pollution.

FANTASSY (Future Aircraft design following the carrier-pod concept as an enabler for co-modal seamless transport, passenger safety and environmental sustainability, FP7, 2012–2014) is developing an aircraft that can carry both cargo and passengers. The advantages include greater flexibility in aircraft configuration and fleet management, improved airport facilities, faster and easier passenger loading, and easier aircraft evacuation in an emergency.

ISTU (Integrated Standard Transport Unit for Self-guided Freight Container Transportation Systems on Rail, FP6, 2003–2006) redesigned a simple switched reluctance 30 kW motor, increasing its overload capability considerably for installation in a self-guiding freight container. In addition, a brake system was added to the motor shaft, and road performance assessed.

LOGBASED (Logistics-Based Ship Design, FP6, 2004–2007) developed a methodology for a Logistics-Based Ship Design for ro-ro vessels to make sea transport more competitive in relation to rail and road transport. The methodology was tested in four business cases: the Atlantic Case for ro-ro sea transport services between Spain and the British Isles; the Baltic Case for services in the north-eastern part of the Baltic Sea; the Hydro case transport system operating between the three cities in the west of Norway, Bergen, Haugesund and Stavanger; and the Rhine Case for ro-ro sea transport services between Norway and the Rhine river. For each case, the logistics services were analysed for the transport system prerequisites and the proposed ship design. The project provided insight in better design of ferries. Advances in this area have the potential to reduce the amount of freight carried on Europe's roads.

PICAV (Personal Intelligent City Accessible Vehicle System, FP7, 2009–2012) extended public transport systems in pedestrian environments with small, networked, mobile units. The PICAV concept is directed to making public transport more accessible in urban areas, especially for vulnerable public transport user groups, such as the disabled and the elderly.

TELLIBOX (Intelligent Megaswapboxes for Advanced Intermodal Freight Transport, FP7, 2008–2011) developed a 13.7 m intermodal loading unit, the Megaswapbox with adaptable chassis. The box is characterised by its 'stackability', inside height of 3 m, length of 13.7 m, a loading capacity of 100 m³, and by the fact that it can be opened on three sides. The Megaswapbox is designed for top handling, and is theft-proof.

TELLISYS (Intelligent Transport System for Innovative Intermodal Freight Transport, FP7, 2012–2015) is developing an ITS for intermodal freight transport by road, rail, short sea and inland shipping. The system will consist of volume-optimised and traceable Megaswapboxes, and an adapted trailer and prime mover for road transport.

TRIMOTRANS (Development of New Intermodal Loading Units and Dedicated Adaptors for the Trimodal Transport of Bulk Materials in Europe, FP6, 2005–2008) developed new intermodal containers to contribute to reducing congestion caused by trading partners using different-sized containers. Two large intermodal containers were developed, one is a large ISO container and the other is an ISO compatible roll-off container.

VEL-WAGON (Versatile, Efficient and Longer Wagon for European Transportation, FP7, 2010–2012) developed longer and lighter train wagons to increase the competitiveness of intermodal transport. An 80 feet VEL-WAGON with 4 axles was produced and used in simulations on the railway line between Rotterdam (the Netherlands) and Milan (Italy) to demonstrate that the wagons could be a profitable solution.

3. Sub-Theme: Smart multimodal services

Smart multimodal services are designed to support users to prepare for trips involving different transport modes, and to adjust journeys based on real-time information. As well as research to develop these services, research is carried out to support harmonisation of services, ensuring continuity between modes and geographical coverage.

EU-funded research has supported the development of information systems contributing in various ways to seamless multimodal door-to-door passenger and freight transport. While planning tools contribute to optimising vehicle routes, on-time information systems facilitate tracking and tracing vehicles and adjusting routes. Research has also focused on creating conditions for multimodal services in the Single European Market Area by harmonising systems between different countries.

Research projects are grouped into three clusters as follows:

- **Real-time information:** design and implementation of solutions for real-time traffic information for passengers and freight on different transport modes.
- **Planning tools:** optimising route planning to stimulate efficient multimodal transport.
- **Harmonising information systems:** harmonising information systems to improve interoperability of modes.

Real-time information

EURIDICE (European inter-disciplinary research on intelligent cargo for efficient, safe and environment-friendly logistics, FP7, 2008–2011) resulted in a platform to link freight items with information systems and users in the logistic chain. In demonstrations, the platform was shown to increase the speed and efficiency of freight transport, and to reduce environmental impacts.

i-TOUR (intelligent Transport system for Optimized URban trips, FP7, 2010–2013) designed an open framework for multimodal mobility services to improve safety, efficiency and environmental sustainability of urban transport. Specifically, public transport was improved by developing a system of incentives for users. The requirements for an incentive system to function in the open market were identified.

i-TRAVEL (Service Platform for the Connected Traveller, FP7, 2008–2009) developed a virtual travel assistant. While other such programmes are reactive (providing travel alternatives), i-TRAVEL is proactive and context aware. A platform was developed to continuously monitor travellers' trips using real-time information on the current location and their progress to the final destination.

RISING (RIS Services for Improving the Integration of Inland Waterway Transports into Intermodal Chains, FP7, 2009–2012) identified, integrated, and further developed information services, such as the River Information Services, to support inland waterway transport and logistics. Tailor-made proactive information services were developed including a booking system, an information system for events such as increase in water levels, and integrated terminals to align transport between seaports and inland waterways.

SMART-CM (Smart Container Chain Management, FP7, 2008–2011) improved the door-to-door transport of containers, increasing efficiency and security and making container transport more market driven and competitive. The benefits were highlighted in real-life demonstrations of the SMART-CM system for stakeholders in container transport.

Planning tools

BE LOGIC (Benchmarking Logistics and Co-Modality, FP7, 2008–2011) developed an e-tool to support companies in identifying strategic improvements through making modal changes. The e-tool compares current practices with alternatives based on different transport modes using six criteria: time, cost, flexibility, reliability, quality and sustainability.

Co-cities (Cooperative Cities extend and validate mobility services, FP7, 2011–2013) developed a platform for cooperative mobility services between cities in Europe, and resulted in the development of various phone applications to enable users to connect directly to information systems in the cooperating cities.

eCOMPASS (eCO-friendly urban Multi-modal route PIAnning Services for Mobile uSers, FP7, 2011–2014) is developing a comprehensive set of tools and services to enable transport users to optimise planning of multimodal journeys in urban areas based on eco-awareness.

FREIGHTWISE (Management Framework for Intelligent Intermodal Transport, FP6, 2007–2010) contributed to a shift of freight from road to intermodal transport. The FREIGHTWISE Framework contributed to simplifying freight booking services to four roles and six messages containing all information needed to publish, advertise, plan, book, execute and invoice an intermodal transport service. The four roles are transport service provider, transport user, transport network manager, and transport regulator. The six messages are transport service description, transport execution plans, transport execution status, transport item status, transport operation status, and network and traffic status.

INTEGRITY (Intermodal Global Door-to-door Container Supply Chain Visibility, FP7, 2008–2010) developed a Shared Intermodal Container Information System (SICIS) to enable authorised companies and authorities to access planning and status information on containers during transport. The system meets the needs of companies and authorities for supply chain visibility.

NECL II (North East Cargo Link II (Midnordic Green Transport Corridor, FP7, 2010–2013) focused on further development of the Midnordic Green Transport Corridor from Norway through Sweden and Finland to Russia. A strategy was implemented in close cooperation with national transport authorities, companies and other stakeholders. The strategy is based on pre-investment studies, development of transport solutions, marketing the corridor at a macro-region level, and continued development of a logistics ICT solution.

REDUCTIOn (Reducing Environmental Footprint based on Multi-Modal Fleet management System for Eco-Routing and Driver Behaviour Adaptation, FP7, 2011–2014) is developing advanced ICT solutions to manage multimodal transport fleets and reduce their environmental impact. Particular attention is being given to optimising driver behaviour, making eco-routing available and creating support for multimodality.

VIWAS (Viable Waggonload production Schemes, FP7, 2012–2015) is developing market-driven business models and production systems for single wagonloads, and security of the critical mass needed for their operation. New ways to design and organise the last mile infrastructure have been developed, and to raise cost-efficiency of single wagonload operations and to adapt new technologies for their use.

Harmonising information systems

COMCIS (Collaborative Information Services for Container Management, FP7, 2011–2013) optimised multimodal supply chain activities by managing and providing information to customers on the whereabouts and status of goods in ports. The tools aggregate, standardise and consolidate information from multiple sources, to provide added value services. The COMCIS tools have been developed to enhance the efficiency and reliability of international multimodal transport when integrated into stakeholder platforms (Port Community Systems).

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 hubs stakeholders, and establishing value added services to create co-modal networks. Attention is given to minimising greenhouse gas emissions and to decreasing the environmental impact of other pollutants. “Green demonstrators” are to be used to evaluate the impact of project activities and a stakeholder engagement programme will be set up to disseminate the project outcomes.

eMOTION (Europe-wide Multi-modal On-trip Traffic Information, FP6, 2006–2008) developed a service-oriented system to provide uniform data on container journeys, tested in pilot sites in Genoa (Italy) and Austria. This uniform data is encoded and documented in Unified Modelling Language, based on selection, harmonisation and integration of the existing standards. The organisational and legal framework was prepared for the system exploitation and further transferability of the project results on a European level.

ENHANCED WISETRIP (Enhancing Intermodality of Content, Personalised Information and Functionality of WISETRIP Network of Journey Planning Engines, FP7, 2011–2014) is building on the findings of the WISETRIP project to integrate journey planning engines into an intermodal planner for international journeys. The ENHANCED WISETRIP planner is being adapted to user needs, multiple trip criteria, environmental impact and personal preferences. Based on a review of existing services and journey planning needs, real-time and non-real-time data sources are integrated in a communication and decision management mechanism to alert travellers and redesign journeys.

IC-IC (Enhancing interconnectivity through infoconnectivity, FP7, 2011–2014) is developing an info-connectivity system and mobile application for the airports of Amsterdam, Frankfurt, Paris and Vienna to improve traveller experience and to reduce transfer time between transport modes. Surveys and current practices in interconnections are being reviewed in order to make recommendations on enhancing mobility concepts. The outcome of the surveys will be incorporated in the info-connectivity system and mobile application for airports.

IM@GINE IT (Intelligent Mobility Agents, Advanced Positioning and Mapping Technologies, Integrated Interoperable multimodal location based services, FP6, 2004–2006) developed a system to improve seamless travel in Europe by providing real-time information on all transport modes through a single system. This new info-mobility service aggregates travel and transport information from multiple content providers, and allows the end user access through a set of web services.

WISETRIP (Wide Scale Network of E-systems for Multimodal Journey Planning and Delivery of Trip Intelligent Personalised Data, FP7, 2008–2010) developed a multimodal door-to-door journey planner, based on a centralised mechanism that effectively connects all participating web-based travel engines, keeping the data simple and minimal. The project developed an interface that dissects trip query components, identifies gateway nodes for each, pinpoints relevant journey planners and responds to traveller's needs.

4. Sub-Theme: Support and promote multimodal solutions

As well as developing technical solutions and smart services to facilitate multimodality, the EU is supporting promotion and dissemination of these services. Best practices and networking activities are used to disseminate research results, while support tools show the potential benefits of shifting to multimodal transport. Furthermore, roadmaps and future strategies have been developed to shape the future of multimodal transport.

EU-funded research is oriented to supporting the large-scale deployment of multimodal solutions, for instance, by networking activities, identification of best practices and in demonstration projects on the socio-economic and environmental benefits of multimodal transport chains. Moreover, research has developed support tools to increase understanding of drivers and barriers to multimodal transport, and to model the effects of multimodal solutions. Projects have brought together stakeholders to identify policy priorities, set targets for multimodal transport, and to make recommendations on achieving these targets.

Research projects are grouped into three clusters as follows:

- **Promoting multimodality:** solutions such as networking activities and demonstration projects.
- **Support tools for multimodality:** design, monitoring and assessment of multimodal solutions, such as decision-making tools.
- **Strategic planning for multimodality:** roadmaps and concepts for multimodal transport.

Promoting multimodality

BESTFACT (Best Practice Factory for Freight Transport, FP7, 2012–2015) is enhancing the use of best practices and innovations in freight logistics to contribute to competitiveness and to reduce environmental impacts. BESTFACT is selecting practices based on a wide range of criteria, such as implementation costs, innovation level, and the involvement of small and medium-size enterprises. Best practices are being disseminated by means of online media and workshops. The project is building on projects BESTUFS, PROMIT and BESTLOG, integrating four interrelated areas in freight logistics: urban freight, green logistics, co-modality, and e-Freight.

BESTLOG (Logistics Best Practice, FP6, 2006–2010) was a consortium of experts who endeavoured to decouple economic growth and transport growth. A European platform was established to share best practices in logistics. An online toolset and directory of training in logistics in Europe, logistics research database, benchmarking online for European countries were established. A European conference to share logistics best practices and an industry workshop were organised.

CAESAR (Coordination Action for the European Strategic Agenda of Research on intermodalism and logistics, FP6, 2005–2007) contributed to the development of a common vision on intermodal research in Europe. This was done through the establishment of the European Intermodal Research Advisory Council (EIRAC). The project published the Strategic Intermodal Research Agenda 2020 (SIRA), which lists future research needs and presents EIRAC ambitions and strategic targets for multimodality up to 2020.

CENTRAL LOCO (Central European Network for Logistics Competence, FP6, 2005–2007) was a networking project to support dissemination of the results of FP5 and FP6 projects, and to create links with the new EU Member States. Attention was given to promoting participation of SMEs and key industry stakeholders in EU Framework Programmes, and to raising awareness of current issues in European transport policy. Partnerships for future European research collaboration were created to stimulate international cooperation.

CIVITAS (City-Vitality – Sustainability Initiative, FP6/FP7, 2002–2016) is creating cleaner, better transport in cities, focusing on the elements of a city, vitality and sustainability. To this end, numerous innovations and measures have been introduced to make transport more eco-friendly in over 60 urban areas in Europe, referred to as demonstration cities. In the last ten years, over 800 measures and urban transport solutions have been demonstrated and assessed, supported by the intensive exchange of good practices. In multimodality, CIVITAS is focusing on measures for collective passenger transport including integrated services, such as ticketing systems.

CO3 (Collaboration Concepts for Co-modality, FP7, 2011–2014) is working on improving the efficiency of transport through co-modality and collaboration to prevent increasing costs being passed on consumers. A supportive operational and legal framework is being developed to guide companies to participate in horizontal collaboration projects, and collaborative business models are being identified. The project outcomes will be demonstrated in four case studies, which will also provide market feedback.

DELTA (Concerted coordination for the promotion of efficient multimodal interfaces, FP7, 2009–2010) addressed issues associated with passenger transport systems in periods of high seasonal demand. A web-based decision support instrument was developed and complemented with a benchmark handbook. The web-based DELTA Network provides a platform for regions confronted with seasonal peaks in transport demand and traffic.

EIRAC II (European Intermodal Research Advisory Council (EIRAC), FP7, 2008–2010) determined the need for and released the Strategic Intermodal Research Agenda 2010–2030+ for Intermodal Transport (continuation of the CAESAR Strategic Intermodal Research Agenda 2020) and an Implementation Roadmap. The intermodal transport handbook was published in 2010.

eMAPS (eSafety Digital Maps Public Private Partnership Support Action, FP7, 2011–2013) built on the results of the ROSATTE (Road Safety Attributes exchange infrastructure in Europe) project to establish an independent public-private platform promoting the ROSATTE framework for collection of reliable data on road safety. A data exchange platform was set up together with public authorities to update data and to improve usability.

EXCROSS (EXploiting safety results aCROSS transportation modes, FP7, 2011–2013) enhanced cross-fertilisation and synergies between research initiatives on safety in different transport modes. A common understanding of safety principles across transport modes was established and research on safety was collected and analysed. The main stakeholders were identified to establish overlapping elements that could be used in identifying joint initiatives, multi-domain policy making, cross-domain comparisons and research.

GHG-TRANSPORD (Reducing Greenhouse-gas Emissions of Transport Beyond 2020: Linking R&D, Transport Policies and Reduction Targets, FP7, 2009–2011) contributed to the EU research and development strategy to reduce greenhouse gas emissions from transport modes, and thus its environmental impact. It does so by defining a feasible research and policy strategy that fits and contributes to the overall GHG reduction targets set by the EU and by proposing targets for both transport as a whole and for individual transport modes.

IntraRegio (Towards an Intermodal Transport Network through innovative research-driven clusters in Regions of organised and competitive knowledge, FP7, 2012–2014) is developing a transnational strategy to enhance intermodality in regional transport systems. The analysis is based on the R&D capacity and transport strategies of five EU regions: the Canary Islands (Spain), Bremen (Germany), Marmara (Turkey), Calabria (Italy), and Ruse (Bulgaria). The regional state-of-play is being assessed and a cross-regional assessment is being made of the local research agendas. The first Joint Action Plan of tested and proposed solutions for promoting multimodality has been published.

KASSETTS (Knowledge-enabled Access of Central Europe SMEs to Efficient Transnational Transport Solutions, ERDF, 2008–2011) improved ICT tools for optimising transnational logistics to support manufacturers and especially SMEs. The International Broker Network, an open network of logistics brokers, was set up in 2010 to improve transnational logistics.

KITE (A Knowledge Base for Intermodal Passenger Travel in Europe, FP6, 2007–2009) created a knowledge database on intermodal passenger transport in Europe. This database, which integrates and disseminates all data, enables stakeholders to develop and evaluate intermodality measures.

LINK (The European Forum on Intermodal Passenger Travel, FP6, 2007–2010)

created a platform to address the gap between growing long distance traffic by road and air, and stagnation of rail and local public transport. Five working groups prepared recommendation on what needs to be done by regulators and facilitators to enhance passenger intermodal transport in Europe.

LOGINN (LOGistics INNovation uptake, FP7, 2012–2015)

is bridging the gap between pilot implementation and market uptake of innovations in logistics by coordinating and supporting research and technology development. A platform, the LogisticsArena, has been set up to stimulate discussion, share practices and gain consensus of public stakeholders, market players and researchers on intermodal and freight logistics to facilitate and accelerate commercial uptake of logistics innovations.

PLATINA (Platform for the Implementation of NAIADES, FP7, 2008–2012)

supported the European Commission, Member States, and other countries in implementing the NAIADES (European Action Programme for Inland Waterways). Administrative and regulatory barriers to inland waterway transport were identified. Actions included the development of a good practices database and report, a strategic research agenda, European Hull Database, finalisation of a life-long learning initiative, and recruitment strategy of high-quality personnel. Contribution was made to the development of a European Infrastructure Development Plan for 2025 for inland waterway transport, and to European harmonisation, standardisation, and implementation of River Information services.

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

contributed to improvement and implementation of intermodal freight transport technologies and procedures, and promoted innovative intermodal freight transport and modal shifts. Three Intermodal Innovative Day Conferences and 15 cluster workshops were conducted. The results were compiled and an inventory made of projects and operational solutions. An in depth study of the Stora Enso North European Transport Supply System was completed. Innovative intermodal freight transport has been promoted through media, such as flyers, newsletter and websites.

PROPS (Promotional Platform for Short Sea Shipping and Intermodality, FP7, 2008–2011) promoted and developed short sea shipping by identifying best practices in its integration in inland logistic chains. Stakeholders in short sea shipping were brought together which resulted in requests for greener solutions by both shippers and by consumers.

TURBLOG-WW (Transferability of Urban Logistics Concepts and Practices from a World Wide Perspective, FP7, 2009–2011) was a coordination platform and knowledge centre for urban logistics practices and solutions to extend, expand, and transfer knowledge to other countries, particularly to countries in Latin America. Best practice in urban freight transport were identified and assessed in several case studies.

Support tools for multimodality

AMITRAN (Assessment Methodologies for ICT in Multimodal Transport from User Behaviour to CO₂ reduction, FP7, 2011–2014) is developing a framework for evaluating the effects of ICT measures in traffic and transport on energy efficiency and CO₂ emissions. The framework is contributing to ICT solutions for multimodal freight transport and passenger mobility.

IMCOSEC (Integrated approach to IMprove the supply chain for COntainer transport and integrated SECurity simultaneously, FP7, 2010–2011) improved and further developed supply chain security for container transport, and resulted in a generic transport model of essential processes and activities in intermodal loading unit transport chains. Security regulations, standards and trends were identified as well as possible weaknesses and security threats in the supply chain and mitigating measures were proposed. Contributions were made to a Strategic Roadmap to improve the supply chain in container transport.

INTERCONNECT (Interconnection between Short and Long-Distance Transport Networks, FP7, 2009–2011) reduced the environmental impact of passenger transport through encouragement, integration, cooperation, and competition in the sector. Transport interconnections were examined in long distance and inter-regional passenger journeys in Europe. Feedback from stakeholders has led to a matrix of solutions for reducing the environmental impact of passenger transport, and an assessment of their feasibility, applicability and potential impact.

KOMODA (Co-modality – Towards Optimised Integrated Chains in Freight Transport Logistics, FP7, 2008–2009) surveyed logistics chain stakeholders to obtain an overview of e-logistics applications in transport operations. The survey concluded that e-logistics are fragmented in Europe, unevenly developed, and almost inaccessible. Development of a new e-logistics system was recommended to better match the needs of suppliers and purchasers by means of improved ICT systems.

META-CDM (Multimodal, Efficient Transportation in Airports and Collaborative Decision Making, FP7, 2012–2014) is conducting a study on the conditions under which collaborative decision making can support air transport stakeholders in dealing with major events that can disrupt civil aviation.

NODES (New tOols for Design and OpEration of Urban Transport InterchangeS, FP7, 2012–2015) is developing tools and guidelines to support cities in Europe to design and operate new and upgraded interchanges. Five interchange functions are included: strategies for integrated land use planning and urban passenger infrastructure planning; innovative approaches to design new and upgrade transport interchanges; intermodal operations and information services; management and business models for interchanges; and energy efficient and environmentally friendly interchanges.

SoCool@EU (Sustainable Organisation between Clusters Of Optimised Logistics @ Europe, FP7, 2012–2014) is developing a European platform of excellence in supply chain management and logistics for hubs and gateways in other regional clusters with a logistics and transport profile. The project fostered transnational cooperation between research-driven clusters, and mutual learning between regional actors. It is developing and implementing joint action plans for improving regional economic competitiveness, supporting collaboration of research-driven clusters, and mentoring regions with a less developed research profile.

USEMOBILITY (Understanding Social Behaviour for Eco-friendly Multimodal Mobility, FP7, 2011–2013) investigated passenger behaviour patterns in choosing transport means to gain understanding of the reasons for a switch to eco-friendly multimodal mobility. The project also provided insight into future patterns for more energy efficient and more environmentally friendly transport. To this end, recommendations were made for different stakeholders including decision makers, transport service providers and civil society associations.

Strategic planning for multimodality

2050+ Airport (The 2050+ Airport, FP7, 2011–2014) is improving airports to be more sustainable, affordable and time efficient. To achieve these goals, three airport concepts are being developed: the ultra-green airport; time-efficient airport; and cost-effective airport.

CARGOMAP (Air Cargo Technology Road Map, FP7, 2011–2013) mapped the framework conditions for air cargo operations in Europe, drew conclusions on the consequences of airport availability, and analysed other developments and aspects relevant to air cargo operations, such as availability and mobility of aircraft and airports.

CLOSER (Connecting Long and Short-distance networks for Efficient transport, FP7, 2010–2012) built on research and practices from previous projects to develop innovative tools to analyse interfaces that were then tested in case studies. Emerging mobility patterns in interurban, long distance intermodal passenger and freight transport and best practices were identified and analysed.

DECOMOBIL (Support action to contribute to the preparation of future community research programme in user centred Design for ECO-multimodal MOBILity, FP7, 2011–2014) is currently widening the market for ICT based mobility transport services by preparing design recommendations for the next generation of cooperative systems. Integrated road transport systems are to be improved by means of analysis of the long-term effects and potential impacts of ITS deployment on clean and safe multimodal mobility. Measures to improve the efficiency and environmental friendliness of mobility and transport in Europe will be assessed.

ENABLE (Stimulate sustainable freight transport systems with Latin American countries, FP7, 2009–2011) strengthened relationships between the EU and Latin American countries by stimulating sustainable freight transport systems in both regions. Recommendations and actions for promoting business and research cooperation were developed in a forum of representatives on logistics and freight transport.

HERMES (High Efficient and Reliable arrangeMEnts for CroSsmodal Transport, FP7, 2010–2011) developed and analysed new mobility schemes in the light of the interface and interconnection between long distance and local/regional transport networks. Key requirements of travellers were identified, corresponding services and underlying company agreements were made, and a business plan was developed. Demonstrations were conducted in selected corridors during a period of six months and a handbook of recommendations was prepared.

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 platform for manufacturers, and engineering and transport operators for research and technology development. Obstacles to intermodal transport were identified and improved ICT systems were pinpointed as a requirement to improve intermodal transport. Six criteria were established to demonstrate the added value of intermodal transport: price, time and timing, regularity of services, safety records, quality management, and efficiency.

NEWS (Development of a Next generation European Inland Waterway Ship and logistics system, FP7, 2013–2015) is developing and validating a novel container ship with tailored and integrated logistics system to optimise use of waterways as a transport mode. The project is preparing technical innovations in the ship design and in the propulsion system (LNG, electric). The project is also examining the logistics structures to identify the most promising application area in the future. Moreover, it is defining technical and commercial implementation scenarios together with a business plan for raising awareness and for attracting investors.

LOGSEC (Development of a Strategic Roadmap towards a Large scale Demonstration Project in European Logistics and Supply Chain Security, FP7, 2010–2011) developed a strategic roadmap for a large-scale demonstration project in logistics and supply chain security. Security policies, regulations, standards, technologies, procedural aspects, services, IPR issues were evaluated in close cooperation with stakeholders.

MODAIR (Co-modal Airport, FP7, 2012–2014) is designing and setting up a forum for representatives of air, rail and urban transport to contribute to the development and improvement of co-modal and inter-modal passenger transport in European airports.

Various projects are being reviewed to identify the current state-of-affairs in European airports, based on this review, a roadmap for future research is being prepared and a group of experts identified to help select the most efficient ways of improving airport connectivity with other transport modes.

ORIGAMI (Optimal Regulation and Infrastructure for Ground, Air and Maritime Interfaces, FP7, 2011–2013) built on extensive knowledge from projects on long-distance passenger transport and other sources to develop a web directory of best practices and ways to optimise long-distance passenger transport by enhancing co-modality and inter-modality. Policy recommendations were made for changes and improvements in passenger transport.

SUPERGREEN (Supporting EU's Freight Transport Logistics Action Plan on Green Corridors Issues, FP7, 2010–2013) promoted green freight logistics. Corridors were benchmarked and bottlenecks and best practices identified, and recommendations made on the design of green supply chains. To this end, management and harmonisation practices were analysed for development of ICT solutions, policies and regulations, and transport infrastructure.

5. Future Challenges for Research

Policy

Multimodal transport has the potential to contribute to a cleaner, smarter and more sustainable transport, shifting mobility of passenger and goods from road, making optimal use of infrastructure and reducing costs. This requires the development of integrated solutions, linking vehicle and infrastructure and creating an interface between user and multimodal services. Moreover, it requires promoting strategies for large-scale market uptake. The EU has supported development and deployment under the FP6 and FP7 programmes with various research projects on multimodal transport. While progress has been made, research presented here indicates open issues in need of further research.

Multimodal infrastructure and vehicle equipment

Research has been targeted at accommodating better interaction between infrastructure and vehicle by improving the network to accommodate multiple modes, and to transform and to develop transport for better multimodal use. Research could further improve infrastructure and vehicles interaction, for example by upgrading infrastructure nodes to facilitate multimodal transport.

Smart multimodal services

Smart services have been developed in the last few years to improve the performance and uptake of multimodal solutions. Better coverage, improved accuracy of journey planners and detailed track and trace systems for freight create confidence to use multimodal transport.

Further research is needed to improve these services in terms of data access and availability. Improved data availability could help broaden the applicability and improve the accuracy of services. Moreover, the harmonisation of services is a challenge in multimodal transport, especially in coordination between countries and regions.

Research could contribute to removing such discrepancies, developing standards for harmonising systems interaction, and developing new systems.

Support and promote multimodal solutions

Further research may focus on assessing the impact of research initiatives, especially the effect of demonstration projects and awareness campaigns. In addition to traditional dissemination methods, new media, such as social media, need to be explored.

The scope of decision making support tools needs to be broadened to cover all aspects of the decision making process, including the administrative burden and financing (lifecycle costs), as well as the socio-economic effects of multimodal chains. Roadmaps and strategies should be extended in scope to set a clear path for deployment, taking into account behavioural trends, the latest technology developments and the effects of communication technologies.

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Glossary

AGV	Automated Guided Vehicle
DG MOVE	Directorate-General for Mobility and Transport
CO₂	Carbon Dioxide
EC	European Commission
EIRAC	European Intermodal Research Advisory Council
ERDF	European Regional Development Fund
EU	European Union
FP6	Sixth Framework Programme
FP7	Seventh Framework Programme
GHG	Greenhouse Gas emissions
HAT	Highly Automated Trucks
ICT	Information and Communication Technology
ILU	Intermodal Loading Unit
ISO	International Organization for Standardisation
ITS	Intelligent Transport Systems
JRC	Joint Research Centre
LNG	Liquefied Natural Gas
RIS	River Information Systems
RTD	Research and Technological Development
SICIS	Shared Intermodal Container Information System
SME	Small and Medium-sized Enterprises
TRIP	Transport Research and Innovation Portal
TRS	Thematic Research Summary

ANNEX: Projects by Sub-Theme

Sub-Theme : Infrastructure and transport equipment				
Acronym	Title	Funding Programme	Project Website	Duration
BIKE INTERMODAL	Multi-Modal Integration of Cycling Mobility through Product and Process Innovations in Bicycle Design	FP7	http://www.bike-intermodal.eu/	2010–2013
BRAVO	Brenner Rail Freight Action Strategy Aimed at Achieving a Sustainable Increase of Intermodal Transport Volume by Enhancing Quality, Efficiency, and System Technologies	FP6	http://www.bravo-project.com/home/index.shtml	2004–2007
CARGO-ANTS	Cargo Handling by Automated Next Generation Transportation Systems for Ports and Terminals	FP7	http://www.iri.upc.edu/project/show/133	2013–2016
CASSANDRA	Common assessment and analysis of risk in global supply chains	FP7	http://cassandra-project.eu/	2011–2014
CHINOS	Container Handling in Intermodal Nodes – Optimal and Secure	FP6	http://www.martrans.org/chinos/	2006–2010
CONTAIN	Container Security Advanced Information Networking	FP7	http://www.containproject.com/	2011–2015

CREAM	Customer driven Rail-freight services on a European mega-corridor based on Advanced business and operation Models	FP6	http://www.cream-project.eu/home/index.php	2007–2011
DE-LIGHT TRANSPORT	DE-LIGHT TRANSPORT	FP6	http://www.delight-trans.net/	2006–2010
EU-CARGOXPRESS	Greening of Surface Transport through and Innovative and Competitive Cargo-Vessel Concept connecting Marine and Fluvial Intermodal Ports	FP7	http://www.cargoxpress.eu/	2009–2012
FANTASSY	Future Aircraft design following the carrier-pod concept as an enabler for co-modal seamless transport, passenger safety and environmental sustainability	FP7	http://www.upatras.gr/index/index/lang/en	2012–2014
ISTU	Integrated Standard Transport Unit for self-guided Freight Container Transportation Systems on Rail	FP6	N/A	2003–2006
LOGBASED	Logistics-based Ship Design	FP6	N/A	2004–2007
PICAV	Personal Intelligent City Accessible Vehicle System	FP7	http://www.dimec.unige.it/pmar/picav/	2009–2012
RETRACK	Reorganisation of Transport Networks by Advanced Rail Freight Concepts	FP6	http://www.retrack.eu/	2007–2012

SAFE OFFLOAD	Safe Offloading from floating LNG Platforms	FP6	http://www.mar.ist.utl.pt/safeoffload/	2006–2008
TELLIBOX	Intelligent MegaSwapBoxes for Advanced Intermodal Freight Transport	FP7	https://www.zlw-ima.rwth-aachen.de/webtellibox/	2008–2011
TELLISYS	Intelligent Transport System for Innovative Intermodal Freight Transport	FP7	https://www.ima-zlw-ifu.rwth-aachen.de/en/research/current_projects/project_view/projekt/tellisys.html	2012–2015
TIGER	Transit via Innovative Gateway concepts solving European Intermodal Rail needs	FP7	http://www.tigerproject.eu/	2009–2012
TRIMOTRANS	Development of New Intermodal Loading Units and Dedicated Adaptors for the Trimodal Transport of Bulk Materials in Europe	FP6	N/A	2005–2008
VEL-WAGON	Versatile, Efficient and Longer Wagon for European Transportation	FP7	http://www.vel-wagon.eu/	2010–2012

Sub-Theme: Smart multimodal services				
Acronym	Title	Funding Programme	Project Website	Duration
BE LOGIC	Benchmarking Logistics and Co-Modality	FP7	http://www.be-logic.info/	2008–2011
Co-Cities	Cooperative Cities extend and validate mobility services	FP7	http://www.co-cities.eu/	2011–2013
COMCIS	Collaborative Information Services for Container Management	FP7	http://www.comcis.eu/	2011–2013
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
eCOMPASS	eCO-friendly urban Multi-modal route PIAAnning Services for Mobile uSers	FP7	http://www.ecompass-project.eu/	2011–2014
eMOTION	Europe-wide Multi-modal On-trip Traffic Information	FP7	http://www.emotion-project.eu/	2006–2008
ENHANCED WISETRIP	Enhancing Intermodality of Content, Personalised Information and Functionality of WISETRIP Network of Journey Planning Engines	FP7	http://www.wisetrrip-eu.org/	2011–2014

EURIDICE	European inter-disciplinary research on intelligent cargo for efficient, safe and environment-friendly logistics	FP7	http://www.euridice-project.eu/	2008–2011
FREIGHTWISE	Management Framework for Intelligent Intermodal Transport	FP6	http://freightwise.tec-hh.net/	2007–2010
IC-IC	Enhancing interconnectivity through info-connectivity	FP7	http://www.ic-ic.eu/	2011–2014
IM@GINE IT	Intelligent Mobility Agents, Advanced Positioning and Mapping Technologies, Integrated Interoperable multimodal location based services	FP6	N/A	2004–2006
INTEGRITY	Intermodal Global Door-to-door Container Supply Chain Visibility	FP7	http://www.integrity-supplychain.eu/	2008–2010
i-TOUR	TOUR: intelligent Transport system for Optimized URban trips	FP7	http://www.itourproject.com/web/	2010–2013
i-TRAVEL	Service Platform for the Connected Traveller	FP7	http://itravelproject.wordpress.com/	2008–2009
NECL II	North East Cargo Link II (Midnordic Green Transport Corridor)	FP7	http://www.midnordictc.net/	2007–2013
REDUCTION	Reducing Environmental Footprint based on Multi-Modal Fleet management System for Eco-Routing and Driver Behaviour Adaptation	FP7	http://www.reduction-project.eu/	2011–2014

RISING	RIS Services for Improving the Integration of Inland Waterway Transports into Intermodal Chains	FP7	http://www.rising.eu/web/guest/home	2009–2012
SMART-CM	Smart Container Chain Management	FP7	http://www.smart-cm.eu/	2008–2011
VIAJEO	International Demonstrations of Platform for Transport Planning and Travel Information	FP7	http://viajeo.eu/	2009–2012
VIWAS	Viable Waggonload production Schemes	FP7	http://www.viwas.eu/	2012–2015
WISETRIP	Wide Scale Network of E-systems for Multimodal Journey Planning and Delivery of Trip Intelligent Personalised Data	FP7	http://www.softeco.it/wisetrip/	2007–2010

Sub-Theme: Support and promote multimodal solutions				
Acronym	Title	Funding Programme	Project Website	Duration
2050+ Airport	The 2050+ Airport	FP7	http://www.2050airport.ineco.eu/2050airport	2011–2014
AMITRAN	Assessment Methodologies for ICT in Multimodal Transport from User Behaviour to CO ₂ reduction	FP7	http://www.amitran.eu/	2011–2014
BESTFACT	Best Practice Factory for Freight Transport	FP7	http://www.bestfact.net/	2012–2015
BESTLOG	Logistics Best Practice	FP6	http://www.bestlog.org/	2006–2010
CAESAR	Coordination Action for the European Strategic Agenda of Research on intermodalism and logistics	FP6	N/A	2005–2007
CARGOMAP	Air Cargo Technology Road Map	FP7	http://cargomap.eu/	2011–2013
CENTRAL LOCO	Central European Network for Logistics Competence	FP6	http://www.ilim.poznan.pl/english-version/international/55-projects/international/217-central-loco-srodkowoeuropejska-siec-kompetencji-w-logistyce	2005–2007
CIVITAS	City-Vitality – Sustainability Initiative	FP5/FP6/FP7	http://www.civitas.eu/	2002–2016

CLOSER	Connecting LOng and Short-distance networks for Efficient tRansport	FP7	http://www.closer-project.eu/	2010–2012
CO3	Collaboration Concepts for Comodality	FP7	http://www.co3-project.eu/	2011–2014
CONTAIN	Container Security Advanced Information Networking	FP7	http://www.containproject.com/	2011–2015
DECOMOBIL	Support action to contribute to the preparation of future community research programme in user centred Design for ECO-multimodal MOBILity	FP7	http://decomobil.humanist-vce.eu/	2011–2014
DELTA	Concerted coordination for the promotion of efficient multimodal interfaces	FP7	http://www.delta-project.eu/	2009–2010
EIRAC II	European Intermodal Research Advisory Council (EIRAC)	FP7	N/A	2008–2010
eMAPS	eSafety Digital Maps Public Private Partnership Support Action	FP7	http://www.ertico.com/emaps	2011–2013
ENABLE	Stimulate sustainable freight transport systems with Latin American countries	FP7	http://www.enable-project.net/	2009–2011
EXCROSS	EXploiting safety results aCROSS transportation modes	FP7	http://www.excross.eu/	2011–2013
FOSTER RAIL	Future of Surface Transport Research Rail	FP7	http://www.errac.org/transport-research-arena-2014/	2013–2016

GHG-TRANSPORD	Reducing Greenhouse-gas Emissions of Transport Beyond 2020: Linking R&D, Transport Policies and Reduction Targets	FP7	http://www.ghg-transpord.eu/ghg-transpord/index.php	2009–2011
HERMES	High Efficient and Reliable arrangeMEnts for CroSsmodal Transport	FP7	N/A	2010–2011
IMCOSEC	Integrated approach to IMprove the supply chain for COntainer transport and integrated SECurity simultaneously	FP7	https://www.isl.org/en/projects/imcosec	2010–2011
INTERCONNECT	Interconnection between Short and Long-Distance Transport Networks	FP7	http://www.interconnect-project.eu/	2009–2011
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
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
KASSETTS	Knowledge-enabled Access of Central Europe SMEs to Efficient Transnational Transport Solutions	ERDF	http://www.kassetts.eu/	2008–2011
KITE	A Knowledge Base for Intermodal Passenger Travel in Europe	FP6	http://www.kite-project.eu/kite/cms/	2007–2009

KOMODA	Co-modality – Towards Optimised Integrated Chains in Freight Transport Logistics,	FP7	http://www.ilim.poznan.pl/english-version/international/55-projects/international/215-komoda-co-modality-towards-optimised-integrated-chains-in-freight-transport-logistics	2008–2009
LINK	The European Forum on Intermodal Passenger Travel	FP6	N/A	2007–2010
LOGINN	LOGistics INNovation uptake	FP7	http://www.loginn-project.eu/	2012–2015
LOGSEC	Development of a Strategic Roadmap towards a Large scale Demonstration Project in European Logistics and Supply Chain Security	FP7	http://www.logsec.org/	2010–2011
META-CDM	Multimodal, Efficient Transportation in Airports and Collaborative Decision Making	FP7	http://www.meta-cdm.org/	2012–2014
MODAIR	Co-modal Airport	FP7	http://www.eia-ngo.com/modair.html	2012–2014
NEWS	Development of a Next generation European Inland Waterway Ship and logistics system	FP7	http://www.news-fp7.eu/	2013–2015
NODES	New tOols for Design and OpEration of Urban Transport InterchangeS	FP7	http://www.uitp.org/nodes-new-tools-design-and-operation-urban-transport-interchanges	2012–2015
ORIGAMI	Optimal Regulation and Infrastructure for Ground, Air and Maritime Interfaces	FP7	http://www.origami-project.eu/	2011–2013

PLATINA	Platform for the Implementation of NAIADES	FP7	http://www.naiades.info/platina/page.php?id=1	2008–2012
PROMIT	Promote Innovative Intermodal Freight Transport	FP6	http://www.promit-project.net/	2006–2009
PROPS	Promotional Platform for Short Sea Shipping and Intermodality	FP7	http://www.props-sss.eu/	2007–2011
SoCool@EU	Sustainable Organisation between Clusters Of Optimised Logistics @ Europe	FP7	http://www.socool-logistics.eu/	2012–2014
SUPERGREEN	Supporting EU's Freight Transport Logistics Action Plan on Green Corridors Issues	FP7	http://www.supergreenproject.eu/	2010–2013
TIPS	Enhancing the Capacity of EU Transport Projects to Transform Research Results into Innovative Products and Services	FP7	http://www.transport-tips.eu/	2012–2014
TURBLOG-WW	Transferability of Urban Logistics Concepts and Practices from a World Wide Perspective	FP7	http://www.turblog.eu/	2009–2011
USEMOBILITY	Understanding Social Behaviour for Eco-friendly Multimodal Mobility	FP7	http://usemobility.eu/	2011–2013