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Greening

Competitiveness



Modal Shift

Green Car

Activities



Cross Cutting



Urban



Safety





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# Group of Topics 1

## Efficient Railway Services





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# Group of Topics 1

## Efficient Railway Services

### Background

- Improve the **efficiency** of Railway services, better **meeting** freight and passenger **customer needs**.
- Improved **urban** rail **energy** efficiency, **interoperability** and cost effective **infrastructures** to improve competitiveness.
- Improving **safety** and **service** by reducing freight train **derailments** and **fatalities** from **suicide** and **trespass** which account for the largest proportion of railway related deaths.





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# Efficient Railway Services Overview

→ Group of Topics 1: Efficient Railway Services **26 M€**

Activity 7.2.1 **GREENING**

1 topic **level 2**; large scale

Activity 7.2.2 **ENCOURAGING MODAL SHIFT- DECONGESTION**

1 topic **level 1**; small or medium

Activity 7.2.4 **SAFETY & SECURITY**

2 topics **level 2**; both small or medium

Activity 7.2.5 **COMPETITIVENESS**

2 topics **level 2**; 1 large, 1 small or medium,



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# Group of Topics 1: Efficient Railway Services

*FP7-SST-2011-RTD-1*

- **TOPIC –SST.2011.1.1-4. Large, Level 2**
- Energy Consumption Reduction in Urban Rail Systems
- **Objective:** Reduce energy consumption in urban rail systems by 10% compared with current levels by 2020 in Europe through the application of a holistic energy management strategy.
- **Coverage:**
  - ◆ Benchmark energy consumption in AC & DC urban rail systems
  - ◆ Validate existing storage and traction energy technologies, with Key Performance Indicators and decision support tools.
  - ◆ Consider feasibility to retrofit regenerative braking technology
  - ◆ Heat dissipation in tunnels, rolling stock and use of regenerated energy on vehicles, wayside and stations.
  - ◆ Consider quantity, duration and distribution of stored energy through advanced storage technology and grid management.
  - ◆ Identification of related safety risks for customers and staff.



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# Group of Topics 1: Efficient Railway Services

*FP7-SST-2011-RTD-1*

- **TOPIC – SST.2011.2.5-1 Small/medium, Level 1**  
Rail System Interoperability (Regulatory and non legislative interoperability based on technological innovations)
- Objective: Develop **technology** and **train concepts** for passenger and freight transport that are characterised by **interoperability** and cross operation between networks
- Coverage:
  - **Standardisation** in relation to **TSI's coverage & non regulated interoperability** and standardisation between mainly propriety solutions.
  - **Proposals shall cover one or more of the following** for freight and passengers:
    - ◆ **Harmonising rolling stock approval testing for EMC compatibility.**
      - Cross acceptance tests on electric lines, harmonised handling of transients, harmonised testing on non electrified lines.
    - ◆ **Virtual Homologation of train acoustic performances.**
      - Virtual certification, demo TSI parameter influence by separating track and rolling stock noise, Procedure for breaking and curve squeal noise
    - ◆ **Functional open couplings**
      - Specify communication system and interface, Define open protocol and prototype for two or more train sets.

# Group of Topics 1: Efficient Railway Services

*FP7-SST-2011-RTD-1*

- **TOPIC – Level 2 -SST.2011.4.1-2 Small/medium, Level 2**

Mitigation measures and good practice to reduce human fatalities and disruption of service resulting from suicides and trespasses on railway property

- Objective: Establish **mitigation measures** and **good practice** to reduce the approximately **3,000 annual deaths** from suicide and trespass on Europe's railways.

- Coverage:

- ◆ **Analyze suicide and trespass** on railways using best data sources.
- ◆ Establish the **state of the art on suicide and trespass prevention**.
- ◆ **Analyze current mitigation practices**, establish most effective, cost efficient.
- ◆ Particular attention to crucial and frequent locations such as **level crossings**.
- ◆ **Demonstrate** that measures are **feasible & cost-effective**.
- ◆ Establish field **pilot projects** to evaluate and refine findings.
- ◆ Partnership with **human scientists & infrastructure experts**; develop **tool kit** with “route map”, communication strategy and guideline for design around level crossings and other high risk access points.

# Group of Topics 1: Efficient Railway Services

*FP7-SST-2011-RTD-1*

- **TOPIC -SST.2011. 4.1-3. Small/medium, Level 2**  
**Reducing occurrences and impacts of freight train derailments.**
- **Objective: Reduction** in freight train **derailments** to improve the quality of service and safety for rail freight transportation. To develop **future** rail freight **systems** that **integrate reduction of derailments** and their impact.
- **Coverage:**
  - Analyze existing knowledge of derailments and complement it, particularly concerning combined causal effects.
  - Define & describe the foreseeable macro features of a 2050 rail freight targeted **system**, considering EU transport policy, future technology deployment, freight logistic research and other sectorial trends.
  - Define cost effective **scenarios** for integrating system changes and new safety measures in order to reach the proposed **targeted systems** and the expected reduction in freight derailment and its impacts.
  - Demonstrate with field tests the most innovative system changes/safety measures





# Group of Topics 1: Efficient Railway Services

*FP7-SST-2011-RTD-1*

- **TOPIC – Level 2 -SST.2011.5.2-5 Large Level 2**

A system approach for railway operations management to increase capacity and decrease delays for rail customer satisfaction

- Objective: Apply a holistic approach across borders & along EU rail corridors enabling increased capacity, punctuality and improved customer satisfaction for freight and passengers.
- Coverage:
  - Analyse the effectiveness of existing railway operation tools and establish the research priorities
    - ◆ Analysis to consider timetable data and disposition, theoretical capacity, real time train control, info flows, customer needs.
  - Propose new systems, tools and/or organisational innovations for holistic rail management, across systems and borders.
    - ◆ Systems to handle large complex simulations covering simultaneous multiple parameters
    - ◆ Efficient cross border data flows and disposition.
    - ◆ Disposition assistance, enabling advanced hold back/diversion of trains in event of traffic disruption
    - ◆ Automatic information flow between infrastructure managers and rail undertakings
    - ◆ Maintain energy efficiency
  - Leading to: smoother traffic flow, decreased bottlenecks and delay, providing drivers and customers with better information and enabling more flexibility, capacity and optimisation of train paths

# Group of Topics 1:

## Efficient Railway Services

*FP7-SST-2011-RTD-1*

- **TOPIC – Level 2 -SST.2011. 5.2-6. Small/medium**  
Cost effective improvement of rail transport infrastructure.
- Objective: To cost effectively improve railway infrastructure by improved assessment and targeting, rapid cost efficient construction techniques and logistics. Considering particularly developing rail freight and passenger networks needing substantial infrastructure improvement (e.g. developing economies & Eastern Europe).
- **Coverage:**
  - ◆ New technology application to extend life of elderly infrastructure
  - ◆ Improve rail infrastructure degradation and structural models to develop realistic safe life cycle and safety models that can be used to plan improvement programmes.
  - ◆ New construction and logistic techniques that minimise time and cost for replacement.
  - ◆ Use and cost effectiveness of advanced monitoring techniques, to complement or replace existing tools.
  - ◆ Develop a tool that works with widely utilised asset management tools, to assess whole life environmental and economic impact from track and infrastructure maintenance and renewal
  - ◆ In addition to rail draw upon expertise and experience from other sectors and institutions.
  - ◆ Demonstrate a clear plan for implementation, drawing upon client needs to maximise relatively short term benefits.



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# Group of Topics 2

## Eco-innovations in shipbuilding and waterborne transportation





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## **Group of Topics 2 Eco-innovations in shipbuilding and waterborne transportation Background**

- **Europe can only survive if it concentrates on high technology added value solutions**
- **Eco-innovations can provide decisive competitive advantage to European industries in view of increasing international legislation concerning maritime environmental activities?**
- **Eco-innovations address CO2 emissions reduction, towards step changes.**



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# Waterborne Eco Innovation Topics Overview

→ Group Topics 2 Waterborne Eco Innovation 26 M€

Activity 7.2.1 **GREENING**

3 topics, 2 small/med *level 1* & 1 large *level 2*;

Activity 7.2.5 **COMPETITIVENESS**

3 topics: 1 CA, 1 small/med level 2, 1 SA



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# Group of Topics 2: Waterborne Eco Innovation

*FP7-SST-2011-RTD-1*

- **TOPIC –SST.2011.1.1-1 Small/medium level 1**

**Green retrofitting through optimisation of hull-propulsion interaction.**

- **Objective: To increase efficiency & reduce emissions through solutions that improve hull propulsion interactions and can be fitted to existing ships.**

- **Coverage towards improved energy performance and retrofitting:**

- ◆ Develop tools to determine environmental, energy and operational benefits, including remaining vessel life cycle for various service profiles
- ◆ Develop tools for structural and technical assessment of retrofitting possibilities, including safety, vibration and noise.
- ◆ Develop innovative solutions to improve propulsion efficiency of existing ships and reduce emissions.
- ◆ Analysis of prime factors affecting energy consumption
- ◆ Optimise hull propulsion interaction of existing ships
- ◆ Cost effective innovative solutions for retrofitting (tools, down time environment, surface protection, processes).
- ◆ Develop best practices and test optimal cooperation scenarios between actors to optimise retrofitting processes.

→ Compatibility expected with tools included in topic SST.2010.1.1-2



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# Group of Topics 2: Waterborne Eco Innovation

*FP7-SST-2011-RTD-1*

- **TOPIC –SST.2011.1.1-2 Small/medium level 1.**

**Retrofitting of existing ships with green technologies.**

- **Objective: Develop and validate new and combined solutions to reduce the environmental and climate change footprint of existing ships.**

- Coverage:

- ◆ Identification, develop methods and assess green technologies and components (not hull/propulsion).
- ◆ Taking into account new and expected legislation, develop tools and methods for life cycle optimised solutions considering; the condition of the ship for retrofit, remaining components and new components.
- ◆ Decision support for emission control and energy optimisation in ship operations, including ship, environment and service parameters.
- ◆ Integrated with other systems, innovative waste management solutions that use waste as an energy source.
- ◆ Green concepts, processes, support tools and equipment for retrofitting and/or direct plug in technology to reduce ship lay off time.
- ◆ Develop tools to monitor and manage retrofitted performance throughout its life cycle.

- Compatibility expected with tools included in topic SST.2010.1.1-1

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# Group of Topics 2: Waterborne Eco Innovation

*FP7-SST-2011-RTD-1*

- **TOPIC –SST.2011.1.1-3 Large level 2**  
**Towards zero emission marine engines**
  
- **Objective: Develop marine engines with even higher efficiency, lower emissions, better reliability and longer life.**
  
- **Coverage:**
  - ◆ Advanced engine development
    - Combustions concepts, fuel nozzle modelling and validation, multi-fuel and advanced turbo charging.
  - ◆ Optimised ship energy management:
    - Computer based optimization, including thermal process adaption, propulsion integration-including energy usage and storage
  - ◆ Advanced adaptive engine control for extreme operation.
  - ◆ Integration of sequential after treatment, towards near zero emissions.
  - ◆ Technology and materials to improve performance
    - Friction investigation, new material application, engine health monitoring.



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# Group of Topics 2: Waterborne Eco Innovation

FP7-SST-2011-RTD-1

- **TOPIC –SST.2011.5.2-1 Coordination Action**

**Strengthening the European maritime sector competitiveness.**

- **Objective:** Develop, implement and sustain the knowledge triangle (*research, innovation, education*) developed inside the Waterborne Technology platform. Develop a strategic road map that ensures sufficient skills in Europe and timely, adequate connection between research and innovation. Provide a model for partnerships in the waterborne sector concerning specific innovation opportunities.
- **Coverage:**
  - ➔ Develop tools and/or services to; identify innovation demand & feed back mechanisms, results of research suitable for innovation.
  - ➔ Identify key competences in the waterborne sector and training needs
  - ➔ Elaborate the SRA, & roadmap of "Waterborne" towards innovation and education and how this could be integrated in a "Waterborne" SRA & road map
  - ➔ Elaborate a model for partnerships in the waterborne sector concerning innovation opportunities- optimising use of national and EU funding instruments.



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# Group of Topics 2: Waterborne Eco Innovation

*FP7-SST-2011-RTD-1*

- **TOPIC –SST.2011.5.2-3 Small/medium level 2**  
**Cost Effective Modernisation of the inland fleet for freight transport.**
  
- **Objective: Modernisation of the inland fleet to improve the economic and ecological performance of inland waterways transport. Meeting the challenges of an over aged fleet, climate change and stronger environmental objectives through cost effective retrofit concepts and alternate propulsion systems.**
  
- **Coverage:**
  - ➔ Modernisation of the inland with a focus on existing vessels and transfer technology from other transport modes.
  - ➔ Further improvement of energy and environmental efficiency.
    - ◆ Short, mid term & post fossil fuel
  - ➔ Adaption to regulatory needs (ADN) concerning transport of hazardous goods.
  - ➔ Modernisation of existing vessels based on research, technology transfer and a holistic approach concerning tools, identification of ship types, and service needs.
  - ➔ Cost effective retrofit concepts for carrying hazardous goods.
  - ➔ Assessment of retrofit concepts, considering life cycle.
  - ➔ Cost effective solutions to reduce energy demand, engine efficiency, alternate/renewable energy, energy recovery and energy management
  - ➔ Real scale demonstration platforms.



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# Group of Topics 2: Waterborne Eco Innovation

*FP7-SST-2011-RTD-1*

## ● **TOPIC – SST.2011.5.2-4, Support Action**

### **Exploring and fostering international collaboration in the waterborne transport sector.**

- Objective: Foster international cooperation for research and innovation in the waterborne sector. In particular with Russia and Brazil with a view to improve the quality of maritime products and services, in particular regarding environmental and safety aspects.
- Coverage:
  - ◆ Identification of actors, competencies and interests in maritime research for Brazil, Russia and Europe towards, greener, safer competitive ships.
  - ◆ Elaboration of roadmaps with concepts for closer cooperation.
  - ◆ Elaboration of scenarios and schemes for cross fertilisation in the domain of maritime education and training.
  - ◆ Organisation of a conference on International collaboration in the waterborne sector.



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Mutual Learning (MML) Action Plans on Societal Challenges

**Topic: Marine resources, inland activities and sustainable development**

**Science in Society call, Not call  
FP7-SST-2011-RTD-1**

To address the societal challenge regarding the marine system to support the development of a sustainable maritime economy, in an environmentally sustainable manner

→ **Ensuring a sustainable balance between development and management of inland activities and preventing/mitigating impacts on the marine environment and coastal areas.**

- A MML Action Plan address's Societal Challenges where science and technology are involved, bringing together actors with different interests and experience to develop a mutual understanding
- The MML Action Plan can bring together, all related organisations, businesses, research bodies, civil society, ports, ship operators ..... etc
- **Call ref;** FP7-SCIENCE-IN-SOCIETY-2011-1, Topic **SiS-2011 1.0-1, Deadline 20/1/201**
- **Funding scheme: Supporting Action**
- **More information on CORDIS – <http://cordis.europa.eu/fp7/sis/>**



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## Group of Topics 4

# Untapped Research Potential and Filling Gaps





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## Group of Topics 4 Untapped Research potential and filling gaps

- **Filling gaps from previous calls**
- **Research potential that is otherwise untapped within the three other topic groups, for example road safety and road infrastructure.**



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## Untapped Research potential and filling gaps

### → Group of Topics 4 :

#### → Activity 7.2.2 ENCOURAGING MODAL SHIFT- DECONGESTION

1 topic *level 2* small or medium

#### Activity 7.2.4. IMPROVING SAFETY AND SECURITY

1 topic *level 1* small or medium

#### Activity 7.2.5 COMPETITIVENESS

1 topic: *level 1* small/med

#### Activity 7.2.6 Cross-Cutting activities for implementation of the sub theme programme.

1 topic: level 1 Support Action



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# Group of Topics 4:

Untapped Research potential and filling gaps

*FP7-SST-2011-RTD-1*

- **TOPIC –SST.2011.2.1-1 Small/medium Level 2**

**Efficient Interfaces between transport modes**

- **Objective:** Develop eco efficient technology, transshipment equipment and organisational solutions for more sustainable processes effecting energy production and consumption. An substantial decrease in energy consumption is expected, with a cleaner energy mix and substantial emissions reduction without reducing capacity and operations.
- **Coverage:**
  - ➔ Development of Energy profiles for ports and inland terminals.
  - ➔ Reduction of the carbon footprint from ports and terminals by clean energy applications covering (not exhaustive):
    - ◆ Transshipment equipment,
    - ◆ optimised storage and tranship models,
    - ◆ cooperative solutions amongst actors,
    - ◆ energy regeneration,
    - ◆ business models introduced for proposed solutions.



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# Group of Topics 4:

Untapped Research potential and filling gaps

*FP7-SST-2011-RTD-1*

- **TOPIC –SST.2011.4.1-1 Small/medium Level 1**

**Design of vehicle safety systems for a better protection of vulnerable road users and other under-protected and less safe user groups**

- **Objective: Develop, integrate and evaluate vehicle safety systems and technologies leading to increased protection of all road users. Special attention towards vulnerable users such as children and elderly.**

- **Coverage:**

- ➔ Design of vehicles and components compatible with the needs of vulnerable users, both as passengers or traffic opponents.
- ➔ Test procedure and standards for active, passive and combined systems for pedestrian, two wheeler safety for consumer (EURO NCAP) and regulatory testing.
- ➔ Safety of Public transport systems, in particular safety of children, persons with reduced mobility and elderly users in public transport, transport drivers and crew.



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# Group of Topics 4:

Untapped Research potential and filling gaps

FP7-SST-2011-RTD-1

- **TOPIC -SST.2011.5.2-2 Small/medium Level 1**

*Advanced and cost effective road infrastructure construction, management and maintenance*

- **Objective:** Cost efficient replacement of road infrastructure, maintaining high road user service, energy efficiency, life cycle performance, durability, low resource and appropriate environmental consideration.
- **Coverage:**
  - Methods and technologies
  - Innovative systems, models, tools and technologies for multifunction smart safe risk based monitoring assessment, control and generation of real time data over road life span.
  - Reduced vulnerability of road networks to natural hazards and incidents.
  - Optimisation of road infrastructure through model and method development to:
    - ◆ Lower CO2 emissions and air pollution
    - ◆ Lower vehicle wear impact and rolling resistance
    - ◆ Increase energy efficiency (recovery/utilisation) of the system
    - ◆ Minimise indirect emissions due to road and tyre wear or pollution trapping



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# Group of Topics 4:

Untapped Research potential and filling gaps

*FP7-SST-2011-RTD-1*

- **TOPIC -SST.2011.6-1 Level 1 Support Action**

*Supporting the organisation of the TRA 2012 conference and other research relevant events*

- **Objective:** To disseminate the results/knowledge and impact arising from European and national surface transport research leading to improved coordination of research with the sector.
- **Coverage:**
- **Organisation of TRA conference for 2012 with larger scope covering all surface transport modes.**
  - High scientific standard
  - First event in the world covering all aspects of transport R&D from basic to applied science and demonstration.
  - Assure a long term commitment towards developing a high standard European scientific conference.
  - Systematic approach to transport; greener, safer, smarter.
  - Linked to European Technology platforms
- **Organise an early stage research student competition with a goal to stimulate interest in the conference amongst young researchers.**



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# RTD Surface Transport Team



**FP7-SST-2011-RTD1**

*Get connected with Surface Transport!!*

Contact:

[Frederic.Sgarbi@ec.europa.eu](mailto:Frederic.Sgarbi@ec.europa.eu)

Contact:

**Rail :** [peter.crawley@ec.europa.eu](mailto:peter.crawley@ec.europa.eu)

**Maritime Eco Innovation :**

[dominique.ramaekers-jorgensen@ec.europa.eu](mailto:dominique.ramaekers-jorgensen@ec.europa.eu)

**European Green Car:** [maurizio.maggiore@ec.europa.eu](mailto:maurizio.maggiore@ec.europa.eu)

**Other Topics for call:** [joost.de-bock@ec.europa.eu](mailto:joost.de-bock@ec.europa.eu)



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# Final Information





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## Further information

- **CORDIS:**  
<http://cordis.europa.eu/fp7/dc/index.cfm>
- **Transport web site:**
  - RTD: [http://ec.europa.eu/research/transport/index\\_en.html](http://ec.europa.eu/research/transport/index_en.html)
  - TREN: [http://ec.europa.eu/transport/index\\_en.html](http://ec.europa.eu/transport/index_en.html)
- **Helpdesk:**  
[http://ec.europa.eu/research/new\\_hp/index.cfm?pg=enquiries](http://ec.europa.eu/research/new_hp/index.cfm?pg=enquiries)
- **Call for experts (evaluators and reviewers):**  
<http://cordis.europa.eu/emmfp7>



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**Thank you for your attention !**



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