WORK PROGRAMME 2013

COOPERATION

THEME 7

TRANSPORT (INCLUDING AERONAUTICS)

(European Commission C(2012)4536 of 09 July 2012)

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7. TRANSPORT (INCLUDING AERONAUTICS)

Objective

Based on technological and operational advances and on the European transport policy, develop integrated, safer, "greener" and "smarter" pan-European transport systems for the benefit of all citizens and society and climate policy, respecting the environment and natural resources; and securing and further developing the competitiveness attained by the European industries in the global market.

I.0. CONTEXT

Against the backdrop of the current economic situation and increased global competition, the Union has defined a strategy to support growth and job creation, Europe 2020. The Innovation Union Flagship initiative supports this strategy through specific commitments. Research and innovation are key drivers of competitiveness, jobs, sustainable growth and social progress.

The work programme 2013 aligns with, and contributes towards, the objectives of Europe 2020, the Innovation Union Flagship, and other EU policies. There is a determined focus on fostering new ideas, supporting world class teams tackling significant societal challenges, and on ensuring that the fruits of our investments can be properly exploited.

In this way the work programme provides for a smooth transition towards the new research and innovation programme for 2014-2020, Horizon 2020.

I.0.1. Political landscape

European transport research and innovation (R&I) have a role to maintain and increase the efficiency of the different transport modes as well as their interaction and to foster progress. Technological progress, the organisation of transport and understanding the supply and demand factors are key elements in European transport R&I. The European transport system serves key roles in the transportation of people and goods in a local, regional, national, European and international context. At the same time, it is essential to Europe's prosperity and closely linked to economic growth and quality of life. The grand challenge for Transport is to make growth and sustainability compatible, by decoupling environmental impacts from economic growth, while assuring the competitiveness and innovative character of the European transport industry. Economic crisis, increasing scarcity of non-renewable energy sources, aging, migration and internal mobility, urbanisation, and globalisation of the economy are among the other challenges to be faced by Transport research.

In the *Political guidelines of President Barroso* for the next Commission[1], it is stated that "the next Commission needs to maintain the momentum towards a low emission economy, and in particular towards decarbonising our electricity supply and the transport sector – all transport, including maritime transport and aviation, as well as the development of clean and electric cars. Decarbonising electricity supply and transport will also bring additional benefits in terms of security of energy supply".

[1] Political guidelines for the next Commission, José Manuel Barroso, 3 September 2009.

The Commission Communication *'Europe 2020 – A strategy for smart, sustainable and inclusive growth'*[2] emphasises that essential elements of the transport policy are better integration of transport networks, promoting clean technologies, and upgrading infrastructure. Four of the flagship initiatives of this strategy, *'Innovation Union'*[3], *'Resource efficient Europe'*[4], *'A digital agenda for Europe'*[5] and *'An industrial policy for the globalisation era'*[6] are of particular relevance to Transport research. The concept of the Innovation Union recognises the need of strengthening the innovation chain today by launching a new approach, the European Innovation Partnerships, which will pool efforts and expertise in R&I to focus on results, outcomes and impacts, and rapid modernisation in key transport-related areas such as cities and mobility. Concentrating on growth enhancement and job creation is also an urgent measure as stated by the European Council on 30 January 2012[7]. Further, a New White Paper on Transport has been adopted by the Commission on 28 March 2011[8], which lays down a long-term strategy that would allow the transport sector to meet its goals with a 2050 horizon.

R&I priorities outlined in this annual work programme are based on the above policy framework as well as on the overall objectives and research activities defined in the Specific Programme 'Cooperation' of the Seventh Framework Programme. Other European Union policies are also of relevance for Transport R&I. Following the adoption by the Commission of the *'European Economic Recovery Plan'* on 26 November 2008[9], a *'European Green Cars Initiative (EGCI)'* has been launched involving R&I on a broad range of technologies and smart energy infrastructures essential to achieve a breakthrough in the use of renewable and non-polluting energy sources, safety and traffic fluidity. The initiative is funded by the European Union, the European Investment Bank (EIB), industry and Member States. It is worth to mention as well the Sustainable Development Strategy, the Marine and Maritime Research Strategy, the European Road Safety Action Programme 2011-2020, the European Agenda for Freight Logistics, the establishment of the European Maritime Transport Area without barriers, the EU Maritime Transport Strategy 2018, the ITS Directive and its Action Plan, the Action Plan on Urban Mobility, and a European strategy on clean and energy efficient vehicles.

Over recent years, the transport industry has changed under the impact of the internal market and of globalisation. Transport is a high-technology industry, making R&I crucial to its further development and conducive to European competitiveness, environmental and social agendas. The European Technology Platforms set up in the Transport sectors (ACARE for aeronautics and air transport, ERRAC for rail transport, ERTRAC for road transport, and WATERBORNE for waterborne transport) have elaborated long-term visions and strategic research agendas which constitute useful inputs that complement those from the Transport Advisory Group and the EGCI Advisory Group to the approach and activities of the Transport theme and the needs of policy makers and expectations of society.

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[2] COM(2010) 2020 final
[3] COM(2010) 546 final
[4] COM(2011) 21; COM(2011) 571 final
[5] COM(2010) 245 final/2
[6] COM(2010) 614
[7] "Towards growth-friendly consolidation and job-friendly growth", Statement of the Members of the European Council, 30 January 2012.
[8] COM(2011) 144 final
[9] COM (2008) 800

I.0.2. Approach for 2013

A revised approach has been adopted for Work Programme 2013 (WP 2013), reflecting the new political context and the priority given to the Innovation Union. This revised approach is based on focusing on major socio-economic challenges and responding to societal concerns. The work programme is structured accordingly to these challenges and addresses the innovation cycle in its integrity, while respecting the rules of competition (see below in section I.0.3 the innovation dimension of the activities).

The Transport theme takes a holistic 'transport system' approach in addressing the challenges and the innovation dimension, by considering the interactions of vehicles or vessels, networks or infrastructures and the use of transport services. Such an approach will necessitate the integration and demonstration of new concepts, knowledge and technologies, and the support to bringing them to the market within a socio-economic and policy context. Given the different structure and focus of the sectors, the theme is divided into three sub-themes (accordingly with the Specific Programme) and socio-economic research and cross-cutting issues:

7.1. AERONAUTICS and AIR TRANSPORT (AAT)

7.2. SUSTAINABLE SURFACE TRANSPORT (SST) including the 'European Green Cars Initiative'

7.3. SOCIO-ECONOMIC RESEARCH and CROSS-CUTTING ISSUES

7.4. GALILEO

For the period 2012-13, a multi-annual strategy is proposed focusing on the above new approach. Work Programme 2013 will be the last one of FP7 and a smooth transition towards the future EU research and innovation funding should also be ensured.

Based on the policy context, to achieve critical mass, leverage effect and EU added-value, the **strategic research and specific objectives for WP 2013** will focus on three major socio-economic challenges:

1. **Eco-innovation** – The decarbonisation of the transport system[10] and an efficient use of natural resources[11], i.e. eco-innovation in all transport modes, greater energy efficiency, and the further development of clean vehicles and vessels.
2. **Safe and seamless mobility** – The optimisation of the global efficiency, safety and security of the transport system (by application of intelligent transport systems and logistics), making efficient use of infrastructure and network capacity, with the aim of offering safe and seamless transport and mobility to all European citizens, as transport is also crucial for social inclusion.
3. **Competitiveness and growth through innovation** – The strengthening of the competitiveness of European transport industry and job-friendly growth through

[10] Transport is the only sector in which CO_2 emissions keep growing.

[11] The increasing scarcity of fossil fuels makes the transport sector with 97% oil dependency particularly vulnerable.

innovation, as competition from developed and emerging economies is intensifying in a global economy.

A thorough approach has been taken in order to select the most promising technology areas and innovation prospects to attain the three major challenges mentioned above. It takes into account the consultations with other Commission services, the Transport Advisory Group, MS/AS and stakeholders (including the Transport Technology Platforms of the four transport modes; and the EGCI Advisory Group), which ensure the added-value at EU level, ERA dimension and complementarity with national programmes and synergies of the activities and topics proposed. The results of previous calls (2007 to 2012) have also been considered when making the present proposal. The synergies between the sub-themes and their contribution to responding to the societal challenges of the Transport system will be exploited, as appropriate.

Also, this work programme contributes to priority themes or big tickets identified for 2013, particularly to the following ones:

- **Oceans of the future:** A new 'The Ocean of Tomorrow' joint call will be launched in collaboration with other RTD Directorates: Food, Agriculture, Fisheries and Biotechnologies (RTD/E), Environment (RTD/I), Transport (RTD/H), Energy (RTD/K) and Industrial Technologies - NMP (RTD/G) to promote research and innovation on marine technologies, in particular sensors, antifouling materials, and innovative transport and deployment systems for the offshore energy sector. The following topics are part of the joint call and will make a major contribution from the Transport theme:

  OCEAN 2013.3: Innovative antifouling materials for maritime applications.
  OCEAN 2013.4: Innovative transport and deployment systems for the offshore wind energy sector.

- **Smart Cities and Communities:** This initiative encompasses a broad range of topics related to energy production, distribution and use, urban mobility and enabling information and communication technologies. The Work Programme 2013 of the Transport Theme addresses some aspects of potential relevance for the Smart Cities and Communities Initiative; more specifically, the following two topics of the European Green Cars Initiative can be seen as contributing to the objectives of the Initiative:

  GC.SST.2013-1: Feasibility analysis and technological development of on-road charging for long term electric vehicle range extension.
  GC.SST.2013-4: Demonstration of electric buses as urban public transport.

A common structure of Challenges / Activities / Topics has been adopted for the sub-themes. The specificities of each sub-theme are provided in detail in the 'Context' sections of the sub-themes (sections I.1 and I.2).

The 2013 work programme has the following calls:

- FP7-AERONAUTICS and AIR TRANSPORT (AAT)-2013-RTD-1
- FP7-AERONAUTICS and AIR TRANSPORT (AAT)-2013-RTD-L0
- FP7-AERONAUTICS and AIR TRANSPORT (AAT)-2013-RTD-RUSSIA

- FP7-AERONAUTICS and AIR TRANSPORT (AAT)-2013-RTD-HIGH SPEED
- FP7-SUSTAINABLE SURFACE TRANSPORT (SST)-2013-RTD-1 (including the 'European Green Cars Initiative')
- 'The Ocean of Tomorrow 2013' (FP7-OCEAN-2013)
- FP7-TRANSPORT-2013-MOVE-1

For budgetary reasons, there will be no calls for ***Galileo*** in Transport Work Programme 2013 (see section 7.4).

a) Innovation dimension of the activities and bridging towards Horizon 2020

The Transport programme is intrinsically industrial/service oriented and its final target is to bring innovative products and services to the market to meeting the socio-economic challenges, promoting growth and creating jobs. Supporting innovation in the short, medium and long-term is underpinning all topics proposed in the Transport work programme for 2013.

Aeronautics and Air Transport (AAT)

Innovation and sustainable growth in AAT is being promoted by a coherent set of R&I actions at various levels of technology readiness going from future technologies (Level-0 – open for the second time in FP7-AAT) via upstream research on specific technologies (Level-1) to technology integration, demonstration and validation (Level-2) and final demonstrators in the appropriate operational environment (Level-3: "Clean Sky" and SESAR). From research and technology development to market, all actors will be present in project partnerships. The key industrial participants are expected to bring innovative products and services to the market, particularly in downstream research, and promote job-friendly growth. In particular, Level 2 projects will be requested to address the innovation phase (obstacles to exploitation, aspects related to certification, etc.).

To address challenges 1 (decarbonisation and eco-innovation) and 3 (competitiveness), upstream research (Level-1) focus mainly on the following activities: 'The greening of air transport' and 'Improving cost efficiency'. The other activities, particularly 'Increasing time efficiency', 'Ensuring customer satisfaction and safety', and 'Protection of aircraft and passengers '(all three related to challenge 2) are open for a limited number of topics selected from the gap analysis of previous calls and ensuring complementarity with research undertaken in Level-2 and Level-0.

WP 2013 put particular emphasis on technology integration (Level-2) in order to strike an equal balance between focussed projects and integrated projects over the entire duration of FP7. Topics for addressing the three challenges mentioned above have been selected, complementing the demonstration work in the Clean Sky's Integrated Technology Demonstrators and SESAR, and taking into account the availability at the time of the call of the underpinning technologies from previous research at lower technology readiness levels.

Sustainable Surface Transport (SST) including the 'European Green Cars Initiative (EGCI)'

Innovation and sustainable growth will be promoted by following a similar approach to AAT, i.e. balancing upstream and downstream components of the supply/demand side of innovation and ensuring adequate partnerships. Many topics involve demonstration, standardisation, certification, regulatory and/or other activities to promote innovation and job-friendly growth (see list below). Of particular importance is the *European Green Cars Initiative*, where most topics have a strong innovation character.

The 'European Green Cars Initiative' Private-Public Partnership – The three components of the EGCI are covered in Work Programme 2013: 1) development of electric vehicles for road transport; 2) medium and long distance road transport; and 3) logistics and co-modality, in line with the roadmaps adopted by the Industrial Advisory Group of the PPP. These three components underpin the R&I needed to address the three socio-economic challenges (i.e. eco-innovation, seamless transport and mobility for all, and global competitiveness).

Increasing railway attractiveness, efficiency and capacity – The Transport White Paper sets the goal that 30% of road freight over 300 km should shift to rail (or waterborne) by 2030 and more than 50% by 2050. The majority of medium-distance passenger transport (up to 1000 km) should go by rail in 2050. The Strategic Research Agenda 2020 of ERRAC includes targets to increase overall rail passenger transport by 40% compared to 2000. In line with this policy framework, railway R&I in WP 2013 focuses on contributing to safe and seamless mobility by focusing on train control systems, and railway infrastructure and operation, while taking also into account eco-innovation and competitiveness aspects such as noise reduction and certification of new materials for railway rolling stock.

Improving the efficiency of waterborne transport – R&I on waterborne technologies addresses all three societal challenges. The focus of WP 2013 will be on the reduction of ship emissions through energy systems integration, on safety aspects of ships in operation and risk management, and on strengthening competitiveness by focusing on innovative vessel designs and automatic manufacturing techniques. WP 2013 will also contribute to cross-thematic marine and maritime research ("The Ocean of Tomorrow 2013"), as mentioned above.

Urban transport, ITS, safety and road infrastructure – R&I topics on these areas are included in WP 2013 to address the three challenges, particularly on managing integrated multimodal urban transport networks, on capitalising CIVITAS[12] knowledge and experience, on virtual testing to design innovative vehicle safety systems, and on advanced materials and cost-effective construction and maintenance for greener, safer and reliable road infrastructure.

Innovation measures

This work programme contains innovation measures in support of activities closer to market such as support to market-uptake, notably through more activities aimed at generating knowledge to deliver new and more innovative products, processes and services. A list of innovation-related topics (AAT and SST) is presented below summarising those involving explicitly demonstration, standardisation, certification, regulatory and/or other issues

[12] The CIVITAS Initiative ("City-Vitality-Sustainability" or "Cleaner and Better Transport in Cities") was launched in 2002 (http://www.civitas-initiative.org/index.php?id=4)

addressed to fostering innovation and job-friendly growth. The list is not exhaustive. Many other topics not listed here are also implicitly underpinning innovation in the medium or long-term (e.g. all Level-1 topics in AAT).

The involvement of industry and service enterprises in project consortia including SMEs goes beyond 50% on average, which contributes to a great extent to an efficient exploitation of results and their take-up by the market.

In addition, specific recommendations are made in many topics to identify bottlenecks preventing innovation. It has to be emphasised that many of these topics will be implemented by large scale projects involving a large amount of financial resources, and coordination and support actions targeted to innovation-related issues.

List of topics with aspects related to demonstration, standardisation, certification, regulation, market take-up and/or other issues to fostering innovation and growth

SOCIO-ECONOMIC CHALLENGES	TOPICS	Funding scheme (1)	Demonstration (2)	Std./Cert./Reg.	Market take-up (3)	Other innovation aspects (4)
Eco-innovation	AAT.2013.1-2. Aerostructures	CP-FP		Yes		
	AAT.2013.1-3. Low pressure system for Ultra High By-Pass Ratio Engine	CP-IP	Yes	Yes	Yes	
	AAT.2013.1-4. Maturation of an integrated set of active flow, load and noise control technologies for the next generation of active wing, including in-flight demonstration	CP-IP	Yes	Yes	Yes	
	SST.2013.1-1. Railway infrastructure optimisation and monitoring for further noise reduction	CP-FP	Yes	Yes		
	SST.2013.1-2. Towards the zero emission ship	CP			Yes	Yes
	SST.2013.1-3. ERA-NET Plus 'Advanced systems, materials and techniques for next generation infrastructure'	CSA-CA	Yes			Yes
	GC.SST.2013-1.Feasibility analysis and technological development of on-road charging for long term electric vehicle range extension	CP	Yes	Yes	Yes	

	GC.SST.2013-3. Future light urban electric vehicles	CP-FP	Yes	Yes	Yes	
	GC.SST.2013-4. Demonstration of electric buses as urban public transport	CP	Yes	Yes	Yes	Yes
	GC.SST.2013-5. Configurable and adaptable truck	CP	Yes	Yes		
	GC.SST.2013-6. High efficiency energy conversion for future heavy duty transport	CP-FP	Yes			
	GC.SST.2013-7. Technical and operational connectivity in intermodal freight transport	CP-FP	Yes		Yes	Yes
	OCEAN 2013.3. Innovative antifouling materials for maritime applications	CP	Yes	Yes	Yes	Yes
	OCEAN 2013.4. Innovative transport and deployment systems for the offshore wind energy sector	CP	Yes		Yes	
Safe and seamless mobility	AAT.2013.3-1. Human factors	CP-FP				Yes
	SST.2013.2-1. Next generation of train control systems in the domain of urban and main line European railway systems	CP	Yes	Yes		
	SST.2013.2-2. New concepts for railway infrastructure and operation: adaptable, automated, resilient and high-capacity	CP	Yes	Yes	Yes	
	SST.2013.3-1. Managing integrated multimodal urban transport network	CP	Yes	Yes	Yes	Yes
	SST.2013.3-2. Implementing innovative and green urban transport solutions in Europe and beyond	CSA-CA			Yes	
	SST.2013.3-3. Capitalising CIVITAS knowledge and experience	CSA-CA			Yes	Yes
	SST.2013.4-1. Ships in operation	CP	Yes	Yes		
	SST.2013.4-3. Biomechanics and advanced digital human body models and testing for vehicle safety	CP-FP	Yes	Yes	Yes	

Competitiveness and growth through innovation	AAT.2013.4-1. Systems and equipment.	CP-FP				Yes
	AAT.2013.4-2. Design systems and tools	CP-FP	Yes	Yes		Yes
	AAT.2013.4-3. Production	CP-FP	Yes			
	AAT.2013.4-4. Maintenance, repair and disposal	CP-FP	Yes	Yes		
	AAT.2013.4-5. Integrated environment for optimised airline maintenance and operations	CP-IP	Yes	Yes	Yes	Yes
	AAT.2013.4-6. Integrated thermal analysis and design for aircraft	CP-IP	Yes		Yes	
	AAT.2013.4-7. Large scale demonstration of extended Distributed Modular Electronics	CP-IP	Yes	Yes	Yes	
	AAT.2013.4-8. Seamless aeronautical networking through integration of data links, radios and antennas extended beyond ATM	CP-IP	Yes	Yes		
	SST.2013.5-1. Technical requirements for the certification of new materials for railway rolling stock	CP-FP		Yes		
	SST.2013.5-2. Low cost flexible automation and mechanisation in small to medium shipyards	CP-FP	Yes		Yes	Yes
	SST.2013.5-3. Innovative, cost-effective construction and maintenance for safer, greener and climate resilient roads	CP-FP	Yes	Yes	Yes	
Cross-cutting issues	AAT.2013.7-1. Coordinating research and innovation in the field of Aeronautics and Air Transport	CSA-CA			Yes	Yes
	AAT.2013.7-2. Coordinating research and innovation in the field of sustainable alternative fuels for Aviation			Yes		Yes
	AAT.2013.7-3. Communication of EU funded RTD project results to targeted audience	CSA-SA				Yes
	AAT.2013.7-4. Creating cohesive links and common knowledge between potential partners in EU Framework Programme Collaborative Projects	CSA-SA				Yes

	AAT.2013.7-5. Conference: support for the organisation of Aerodays	CSA-SA				Yes
	AAT.2013.7-6. Enhancing coordination and stimulating cooperation in research and innovation among EU Member States and Associated States to the EU Framework Programme	CSA-SA				Yes
	AAT.2013.8-1. Coordinated call with Russia	CP-FP	Yes			
	AAT.2013.8-2. International cooperation on civil high speed air transport research	CP-FP	Yes		Yes	
	SST.2013.6-1. Strengthening the research and innovation strategies of the transport industries in Europe	CSA-SA			Yes	Yes
	SST.2013.6-2. Towards a competitive and resource efficient port transport system	CP CSA-CA			Yes	Yes
	SST.2013.6-3. Organisation of Transport Research Awards for the Transport Research Arena (TRA) conference	CSA-SA				Yes
	TPT.2013-1. Technology transfer in the area of Transport	CP-FP			Yes	Yes
	TPT.2013-2. Mapping regional capacities in transport research and innovation	CSA-SA				Yes

(1) Funding schemes:
CP: collaborative project
CP-IP: collaborative project (large scale integrating project)
CP-FP: collaborative project (small or medium-scale focused research project)
CSA-CA: coordination and support action aiming at coordinating research activities
CSA-SA: coordination and support action aiming at supporting research activities
(2) Demonstration may include aspects such as prototyping, testing, demonstration and validation.
(3) Deployment and market take-up of innovative solutions may include preparing deployment strategies and roadmaps, cost-benefit analysis, benchmarking, transferring know-how, public/pre-commercial procurement, as well as identifying funding/finance opportunities, new niche markets, barriers and bottlenecks, and business models.
(4) Other innovation-related aspects such as mobilising all innovation actors (particularly SMEs), disseminating results, human skills requirements and training programmes.

Socio-economic research and cross-cutting issues

Policy-driven and socio-economic research actions are included in this work programme. They cross-cut the three Socio-economic Challenges and focus in helping the implementation of Transport and Innovation policies (White Paper and Innovation Union), and in strengthening, coordinating, evaluating and communicating research and innovation. These

actions are described in chapter 7.3 (Horizontal Activities) and in the cross-cutting sections of chapters 7.1 (AAT) and 7.2 (SST). They are included in the AAT and SST main calls (see lists of topics of cross-cutting and horizontal activities in sections III.1.1 and III.2.1).

Joint undertakings: 'Clean Sky', SESAR and FCH

On the basis of Article 187[13] of the Treaty on the Functioning of the European Union (TFEU), the 'Clean Sky' Joint Technology Initiative[14], the SESAR Joint Undertaking[15],and the 'Fuel Cells and Hydrogen' Joint Technology Initiative[16] will all be relevant to and will impact on transport innovation. These activities aim at final demonstration in appropriate operational environments. They will be implemented by separate mechanisms and the details of topics will not be elaborated in this work programme.

Bridging towards Horizon 2020

A major objective of this work programme is to pave the way for Horizon 2020. The three major priorities and socio-economic challenges presented above are in line with the activities proposed for the Transport challenge of Horizon 2020. Further emphasis is made on creating critical mass on areas of high innovation potential and EU-added value. As a consequence, there is more strategic prioritisation and selection of topics than in previous work programmes, more focus on larger projects, and the number of topics is reduced to about half compared to WP 2012. Particular care is taken on balancing all the components of the innovation cycle as explained above, and on anticipating some research areas and topics which in Horizon 2020 are proposed to have much higher relevance than in FP7 (e.g. rail and road infrastructures, ports and terminals, new logistic concepts, and urban networks).

b) SME relevant research

Participation of SMEs has strongly been encouraged in FP7 Transport Theme. A strategy planned for the whole period of FP7 (including support actions) has permitted the Transport theme to attain and even go beyond the 15% objective (participation: 20.9%; EU contribution: 17.3%; projects with SME participation: 88%; projects coordinated by SME: 14.8%)[17]. Specific actions targeted to support these objectives were included in all previous work programmes. The aim of this strategy is to encourage participation of SMEs in the Transport programme with the objective of enhancing their role in the supply chain. Actions are aimed at providing ad hoc support and training for partners and coordinators who want to set-up proposals, as well as access to relevant information. Emphasis has also been placed on facilitating the start-up and emergence of new high-tech SMEs. A better understanding of barriers and drivers in the Transport research area and specific support to the involvement of weaker players including SMEs is being pursued.

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[13] Ex Article 171 TEC.
[14] Council Regulation (EC) No 71/2007 of 20 December 2007 setting up the Clean Sky Joint Undertaking (OJ L 30 of 4.2.2008) as amended by Commission Decision 2009/520/EC (OJ L 175 of 4.7.2009).
[15] Council Regulation 219/2007 of 27 February 2007 as amended by Council Regulation 1361/2008 of 16.12.2008.
[16] Council Regulation (EC) No 521/2008 of 30 May 2008 setting up the Fuel Cells and Hydrogen Joint Undertaking (OJ L 153 of 12.6.2008).
[17] Data at 1 January 2012, 'Eighth Progress Report on SMEs' participation in FP7', DG Research and Innovation.

In line with the above-mentioned strategy, in WP 2013 several actions are included to fostering the role of SMEs in research and innovation as one of the objectives, and/or to satisfying their needs:

TPT.2013-1. Technology transfer in the area of Transport	CP-FP
TPT.2013-2. Mapping regional capacities in transport research and innovation	CSA-SA
SST.2013.1-3. ERA-NET Plus 'Advanced systems, materials and techniques for next generation infrastructure'	CSA-CA
SST.2013.5-2. Low cost flexible automation and mechanisation in small to medium shipyards	CP-FP
GC.SST.2013-7. Technical and operational connectivity in intermodal freight transport	CP-FP

In addition to that, the participation of SMEs is important and explicitly recommended in the following topics:

AAT.2013.4-1. Systems and equipment.	CP-FP
AAT.2013.4-2. Design systems and tools	CP-FP
SST.2013.1-2. Towards the zero emission ship	CP
GC.SST.2013-1.Feasibility analysis and technological development of on-road charging for long term electric vehicle range extension	CP
OCEAN 2013.1. Biosensors for real time monitoring of biohazard and man-made chemical contaminants in the marine environment	CP
OCEAN 2013.2. Innovative multifunctional sensors for in-situ monitoring of marine environment and related maritime activities	CP
OCEAN 2013.3. Innovative antifouling materials for maritime applications	CP
OCEAN 2013.4. Innovative transport and deployment systems for the offshore wind energy sector	CP

c) Strengthening the European Research Area

In addition to the ERA structuring effects that are implicit in most of the activities and topics proposed in this work programme, the Transport theme continues supporting ERA-NET activities[18] that develop trans-national coordination. In particular, an ERA-NET Plus is included in WP 2013, which is part of a joint call FP7-ERANET-2013-RTD that will be launched separately:

SST.2013.1-3. ERA-NET Plus 'Advanced systems, materials and techniques for next generation infrastructure'	CSA-CA

This action will increase effective national public investment and will be jointly implemented by MS/AS thus reinforcing pan-European research and innovation in this domain.

[18] ERA-NET activities will be subject to a joint call across the Specific programme 'Cooperation' – See Annex 4.

Further, a number of topics are particularly suited for strengthening the ERA by e.g. helping transferring technology, creating links between potential partners or supporting European infrastructures and urban networks:

TPT.2013-1. Technology transfer in the area of Transport	CP-FP
TPT.2013-2. Mapping regional capacities in transport research and innovation	CSA-SA
AAT.2013.7-4. Creating cohesive links and common knowledge between potential partners in EU Framework Programme Collaborative Projects	CSA-SA
AAT.2013.7-6. Enhancing coordination and stimulating cooperation in research and innovation among EU Member States and Associated States to the EU Framework Programme	CSA-SA
SST.2013.2-2. New concepts for railway infrastructure and operation: adaptable, automated, resilient and high-capacity	CP
SST.2013.3-1. Managing integrated multimodal urban transport network	CP
SST.2013.3-3. Capitalising CIVITAS knowledge and experience	CSA-CA
SST.2013.5-3. Innovative, cost-effective construction and maintenance for safer, greener and climate resilient roads	CP-FP

d) Dissemination and exploitation actions

Building a European transport system that serves the citizen and society by means of safe, secure, greener, quality transport options for the demands of life in the 21st century requires significant RTD investment. In line with the innovation approach presented above, the creation of partnerships is of paramount importance to ensuring the dissemination and exploitation of results of this investment to promote growth and job creation. From research and technology development to market, all actors should be present in the project partnerships accordingly with their role, particularly in downstream research. Further, actions are included in chapter 7.3 (Horizontal Activities) and in the cross-cutting activities of AAT (chapter 7.1) and SST (chapter 7.2) to help bringing innovative products and services to the market (e.g. by coordinating research and innovation, creating cohesive links and common knowledge at industrial level, or transferring technology in the area of Transport). In many topics (e.g. AAT integrated projects) bottlenecks to innovation will be identified and possible solutions proposed.

Risk Sharing Finance Facility

In addition to direct financial support to participants in RTD actions, the European Union is improving their access to private sector finance by contributing financially to the 'Risk-Sharing Finance Facility' (RSFF) established by the European Investment Bank (EIB) (See Annex 4).

e) Overall expected impact

Many positive impacts on innovation and growth-enhancing benefits in all transport modes (air, road, rail and waterborne) are expected as a consequence of implementing WP 2013. They are detailed in the Activities or Topics. Overall they can by summarised as follows:

- Reduction of greenhouse gases (GHG) emissions (particularly CO_2) and pollutants, by e.g. focusing on developing aerodynamics and engines of aircraft, electric vehicles and infrastructures, and optimising energy systems in ships.
- Increased safety in transport, by e.g. taking into account human factors related to aircraft and operations, enhancing ship safety, and advanced tools and test methods for road vehicle safety.
- Easy mobility of passenger and goods, by e.g. technical and operational connectivity in intermodal freight transport, and managing integrated multimodal urban transport networks.
- Higher competitiveness of the European transport industry, by e.g. an integrated environment for optimised airline maintenance and operation, flexible automation and mechanisation in shipyards, and innovative, cost effective construction and maintenance of roads, and by actions helping to bring innovative products and services to the market.
- Among other funding schemes, large scale projects integrating demonstration, standardisation and certification will help promoting innovation in these issues (see table above).

I.0.3. International cooperation

International cooperation activities will be encouraged in the Transport theme based on the following lines of activities: 1) market attraction (e.g. global trade development and connecting networks and services at continental and intercontinental level); 2) opportunities to access and acquire science and technology that is complementary to current European knowledge and of mutual benefit; and 3) where Europe responds to global needs (e.g. climate change), contributes to international standards and global systems (e.g. applied logistics) or addresses third countries' regional issues on the basis of mutual interest and benefit. All activities are open to researchers and research institutions from third countries[19]. In some areas of mutual interest, enhanced participation of certain third countries is emphasised where relevant expertise, opportunities and common challenges are identified.

This approach has resulted in successful specific cooperation actions with Canada, China, Latin America, India, Japan, Russia, South Africa, Ukraine and United States in the period 2007-2012. Of particular relevance have been the coordinated calls with China and Russia in 2010 and with Japan in 2012. Based on this experience, a new coordinated call with Russia is included in WP 2013. Also cooperation with specific regions or countries is encouraged as indicated in the following list.

List of areas and topics for specific cooperation actions

Topics	Targeted country/region
AAT.2013.2-1. Airports	USA

[19] Both International Co-operation Partner Countries (ICPC) and non-ICPC countries can participate. Organisations from EU Member States, from Associated States to FP7 and from ICPC can be funded in all cases, while from other countries only if indispensable (Cf. FP7 Rules for Participation). The list of eligible ICPC countries is provided in Annex 1.

AAT.2013.3-1. Human factors	ICPC and/or other third countries (e.g. Canada, USA)
AAT.2013.4-2. Design systems and tools	USA
AAT.2013.7-2. Coordinating research and innovation in the field of sustainable alternative fuels for Aviation	ICPC and/or other third countries (notably USA, Brazil)
AAT.2013.7-7. Exploring opportunities and stimulating cooperation in research and innovation with China	China
AAT.2013.8-1. Coordinated call with Russia	Russia
AAT.2013.8-2. International cooperation on civil high speed air transport research	Australia, Japan, Russia and possibly other third countries
SST.2013.1-3. ERA-NET Plus 'Advanced systems, materials and techniques for next generation infrastructure'	USA
SST.2013.3-2. Implementing innovative and green urban transport solutions in Europe and beyond	China, Singapore, Latin American countries, Mediterranean countries
SST.2013.4-3. Biomechanics and advanced digital human body models and testing for vehicle safety	ICPC and/or other third countries (e.g. USA, Japan)
SST.2013.5-3. Innovative, cost-effective construction and maintenance for safer, greener and climate resilient roads	USA
SST.2013.6-2. Towards a competitive and resource efficient port transport system	Mediterranean countries
GC.SST.2013-7. Technical and operational connectivity in intermodal freight transport	Mediterranean countries

I.0.4. Cross-thematic approaches

The European Green Cars Initiative. This initiative is part of the '*European Economic Recovery Plan'*, as explained in section I.0.1, and was launched in WP 2010. It is being jointly implemented by Energy, Environment, ICT, NMP and Transport. In WP 2013, it focuses on efficient, safe and convenient solutions for grid and road integration of electric vehicles. The grid connection system of fully electric vehicles is turning into a distinguishing factor between vehicle manufacturers, thus a jointly harmonised and standardised solution would be a competitive edge for Europe. The complete work programme text is presented in Annex 5.

The Ocean of Tomorrow. Special attention will be paid to cross-cutting marine and maritime research with the launch of a new cross-thematic call "The Ocean of Tomorrow": joining research forces to meet challenges in ocean management". It will be implemented jointly between Theme 2 "Food, Agriculture and Fisheries, and Biotechnology" (FAFB), Theme 4 "Nanosciences, Nanotechnologies, Materials and new Production Technologies" (NMP); Theme 5 "Energy", Theme 6 "Environment (including climate change)" and Theme 7 "Transport (including Aeronautics)". The main objective of the call is to promote research and innovation on marine technologies, in particular sensors, anti-biofouling materials, and innovative transport and deployment systems for the offshore energy sector. The topics and funding mechanisms will allow for large, multidisciplinary and multi-stakeholder topics with an appropriate balance between (basic/applied) research, knowledge transfer and

demonstration, and to support a number of specific EU policies. The four topics are published in the Work Programmes of all participating Themes, as a cross-thematic call. "The Ocean of Tomorrow" call (FP7-OCEAN-2013) is subject to a separate call fiche.

I.0.5. Societal aspects

Where relevant, account should be taken of possible socio-economic impacts of research, including its intended and unintended consequences and the inherent risks and opportunities. A sound understanding of this issue should be demonstrated both at the level of research design and research management. In this context, where appropriate, the projects should ensure engagement of relevant stakeholders (e.g., user groups, civil society organisations, policy-makers) as well as cultivate a multi-disciplinary approach (including, where relevant researchers from social sciences and humanities) and contribute to raising awareness, education and training. Projects raising ethical or security concerns are also encouraged to pay attention to wider public outreach.

The pursuit of scientific knowledge and its technical application towards society requires the talent, perspectives and insight that can only be assured by increasing diversity in the research workforce. Therefore, all projects are encouraged to have a balanced participation of women and men in their research activities and to raise awareness on combating gender prejudices and stereotypes. When human beings are involved as users, gender differences may exist. These will be addressed as an integral part of the research to ensure the highest level of scientific quality. In addition, specific actions to promote gender equality in research can be financed as part of the proposal, as specified in Appendix 7 of the Negotiation Guidance Notes[20].

20 http://ec.europa.eu/research/participants/portal/ShowDoc/Extensions+Repository/General+Documentation/Guidance+documents+for+FP7/Negotiations+and+amendments/negotiation_en.pdf

7.1. AERONAUTICS AND AIR TRANSPORT

I.1. CONTEXT

This introduction is complementary to the general one (section I.0). The strategy for 2013 is summarised there, including the new innovation dimension of the activities, SME relevant research, international cooperation, and cross-thematic approaches and societal aspects. Only the specificities of the sub-theme are presented here.

The information provided in this introduction as well as in the content of calls for 2013 shall not be considered as eligibility criteria (unless it is explicitly indicated) but shall be taken into account during the evaluation for the respective evaluation criteria. For eligibility criteria and additional information, e.g. funding schemes, budget limits, etc., please refer to section III.

I.1.1. Specific approach for Aeronautics and Air Transport

The scope of research and innovation includes the technologies, services and operations of all the components of the air transport system (i.e. aircraft, airport and air traffic management) from airport kerbside to airport kerbside. Research regarding door-to-door aspects of the travel can also be included provided it focuses exclusively on aspects relevant to air transport and excludes ground vehicles.

The three **Socio-economic Challenges** indicated in section I.0.2 are addressed by six **Activities**, where proposers can find the **topics** calling for **proposals**. The Activities are in agreement with the Specific Programme and the Strategic Research Agenda of ACARE[21]:

1. The greening of air transport
2. Increasing time efficiency
3. Ensuring customer satisfaction and safety
4. Improving cost efficiency
5. Protection of aircraft and passengers
6. Pioneering the air transport of the future

In order to reflect the level of readiness of the developed technologies with respect to the final application that is commonly used in aeronautics, three Levels are applicable.

Level 0 is located at the origin of the technology readiness levels. It comprises the research and development of breakthrough, highly innovative technologies and concepts that need a first maturation before they can be developed at larger scale, within larger consortia and larger financial resources (for example in Level 1). In order to provide more agility and flexibility to the process, this is being implemented by means of a specific ***open call***. The call fiche specifies recommendations for a limited size of the partnership, a shorter duration and lower budget compared to current practice in Level 1. The call covers exclusively promising pioneering ideas in air transport, i.e. technologies and concepts that have the potential to bring step changes to European aeronautics and air transport *in the second half of this century and*

[21] ACARE: Advisory Council for Aeronautics Research in Europe (www.acare4europe.org).

beyond. Information on the eligibility criteria and evaluation procedure are detailed in the corresponding call fiche (section III.1.2) and in the Guide for Applicants.

Level 1 comprises the research and technology development activities that span from basic research to the validation of concepts at component or sub-system level in the appropriate environment through analytical and/or experimental means. *Generally, topics for Level 1 can be addressed in the proposals with a high degree of flexibility, selecting only part of a topic and/or combining several topics. However, in the frame of 'coordinated calls' (see below), topics must be answered in their entirety and a proposal should address only one topic.*

For most of the Level 1 topics, the requested EU contribution *shall not exceed EUR 5 million per topic* which threshold constitutes an additional eligibility criterion. Specific limits apply for the coordinated call with Russia and the coordinated call on High Speed Aircraft (sections III.1.3 and III.1.4).

Level 2 comprises the research and technology development activities up to higher technology-readiness, centred on the multidisciplinary integration and validation of technologies and operations through demonstration at a system level in the appropriate environment (large scale flight and/or ground test beds and/or simulators). Level 2 projects have also a particular role to play in the innovation process, i.e. they should identify potential bottlenecks that could prevent the effective use of the results for their application in product and services, including certification aspects where relevant. *Proposals can address only one of the proposed topics and should address it in its entirety.*

Only one proposal will be funded for each Level 2 topic (see section III.1.1, CP-IP). The requested EU contribution *shall exceed EUR 5 million and it is expected not to exceed EUR 35 million*. The minimum threshold (EUR 5 million) constitutes an additional eligibility criterion.

Level 3 comprises the research and technology development activities up to the highest precompetitive technology readiness, focusing on the combination of systems and the final demonstration in the appropriate operational environment of the comprised technologies in fully integrated system of systems. These activities will be undertaken in large scale public-private partnerships especially established for this purpose in specific areas: the 'Clean Sky' Joint Technology Initiative relevant mainly to the Work Programme Activity 'The greening of air transport' and SESAR, Single European Sky Air Traffic Management Research. Clean Sky and SESAR will also cover research activities of lower technology readiness levels (i.e. Level 1 and Level 2), where appropriate. Both Clean Sky and SESAR Joint Undertakings are briefly described in a subsequent section.

Cross-cutting activities. In addition to the above six activities, cross-cutting issues for *structuring European aeronautics research, supporting programme implementation* and *international* cooperation are addressed by means of Coordination and Support Actions. The requested EU contribution for *Coordination Actions shall not exceed EUR 1 200 000,* and for *Support Actions shall not exceed EUR 600 000,* which constitutes an additional eligibility criterion (see section III.1.1).

Topic description and expected impact. Previous work programmes were structured in Activities and Areas, where Areas were broadly dividing an Activity between Topics related to aeronautics/vehicle and Topics related to air transport operations. The 'expected impact'

was described for each Area, and Topics with the same name were repeated in the relevant Areas detailing the elements specific to the Area under consideration. In the view of streamlining the approach, Areas are not explicit anymore in the structure, **the expected impact is now described at Activity level, if not defined under the individual topic**, and the former Areas are indicated in *italic*. Where relevant, a specific expected impact section is also added in the description of the Topic, which complements the general one(s). This is systematically the case for Level 2 projects.

Topics appear now only once under the Activity that is the most relevant, but they can still contain elements that are relevant to other Activities. This is indicated in the Topic description as follows: Activity 1: *Greening/environmental*; Activity 2: *Time efficiency*; Activity 3: *Customer satisfaction* / *Safety*; and Activity 4: *Cost efficiency.*

I.1.2. Coordinated call with Russia

Following workshops held between European and Russian stakeholders in the field of Aeronautics and Air Transport, a coordinated call with Russia is included in WP 2013 with an indicative EU budget of EUR 4.5 million and a matching amount from Russia (see section III.1.3). The European partners will be funded by the European Union. The Russian partners will be funded by the Department of Aviation Industry (Ministry for Industry and Trade of the Russian Federation) and other authorities concerned. The requested EU contribution *shall not exceed EUR 1.2 million per project,* which is an additional eligibility criterion. In order to ensure a balance between EU and Russian participants, *at least two independent legal entities established in Russia are requested,* which is another additional eligibility criterion.

I.1.3. Coordinated call on high speed air transport research

Following a number of Level 1 projects on environmentally and economically sustainable high speed aircraft (e.g. ATLLAS I-II, LAPCAT I-II), a workshop held between European and Australian, Japanese and Russian stakeholders on this subject demonstrated the scientific interest to coordinate efforts in the view of performing flight-tests. Therefore, a Topic is opened in the frame of a specific coordinated call where the EU dedicates an indicative EU budget of up to EUR 5 million to fund European partners. However, a certain number of conditions apply as described in the call fiche (see section III.1.4). The EU contribution requested by a project *shall not exceed EUR 5.0 million*, which is an eligibility criterion. *Only one project is expected to be funded.* Furthermore, a proposal submitted to the European Commission (EC) will be eligible only if it is coordinated **with at least two** complementary proposals either submitted in parallel or to be submitted afterwards to the corresponding funding authorities/organisations of Australia, Japan or the Russian Federation **or with at least two** complementary projects already selected for funding from these Third Countries to be synchronised in time with the EU project.

I.1.4. ‘Clean Sky’ Joint Technology Initiative

The ‘Clean Sky’ (CS) Joint Technology Initiative is a unique public private partnership aiming at developing environmentally friendly technologies impacting all flying segments of commercial aviation, thus contributing to the ACARE targets for reduction of emissions and noise in Air Transport in Europe and increasing the competitiveness of the European aeronautical industry.

To implement CS, the European Union, represented by the Commission, and the major aeronautical stakeholders in Europe have set up a Joint Undertaking (CS JU) as a legal entity for a period up to 2017. The Council Regulation setting up the CS JU was adopted in December 2007. Since autumn 2009, the Joint Undertaking is autonomous from the Commission.

The objectives of the CS JU are to be achieved through the support of research activities that pool resources from the public and private sectors, and that are carried out by the main aeronautical stakeholders (CS private members) directly and by partners selected following open and competitive calls for proposals. The total budget of CS amounts to up to EUR 1.6 billion.

Clean Sky is organised in six Integrated Technology Demonstrators, corresponding to technological research areas, each led by two founding members:

Smart Fixed Wing Aircraft (SFWA) led by Airbus and Saab
Green Regional Aircraft (GRA) led by Alenia Aeronautica and EADS Casa
Green Rotorcraft (GRC) led by Agusta-Westland and Eurocopter
Sustainable and Green Engines (SAGE) led by Rolls-Royce and Safran
Systems for Green Operations (SGO) led by Thales Avionics and Liebherr Aerospace
Eco-design (ED) led by Dassault Aviation and Fraunhofer Gesellschaft

A Technology Evaluator (TE) led by Thales Avionics and DLR has the purpose of assessing the environmental performance of the technologies developed in CS.

At least 25% of the EU funding to the CS JU is allocated to partners selected via calls for proposals. They serve the dual purpose of widening the participation to Clean Sky to further organisations, especially SMEs, and to identify R&D performers called in to participate to the mainstream activities of Clean Sky.

The activities related to Clean Sky are implemented by separate mechanisms and the details of topics will not be elaborated in this work programme, as Clean Sky is autonomous in the execution of its budget. Call for proposals are published on www.cleansky.eu as well as on the Participant Portal[22].

I.1.5. SESAR – Single European Sky Air Traffic Management (ATM) Research

The SESAR (Single European Sky ATM Research) Programme has been launched as an integrated part, the “technological pillar”, of the Single European Sky initiative (SES). It aims at developing a modernised and high-performance air traffic management infrastructure which will enable the safe, cost-efficient and environmentally friendly development of air transport in support of the Single Sky 2020 objectives.

The on-going SESAR Development phase (2008-2016) is managed by the SESAR Joint Undertaking (SJU), established by a Council Regulation, under Article 187 of the TFEU. This includes the targeted and coordinated research, development and validation activities of the SESAR programme, and SJU is responsible for the execution and maintenance of the

[22] http://ec.europa.eu/research/participants/portal/

European ATM Master Plan. In order to rationalise and organise ATM research so that it leads to actual operational and industrial implementation, all relevant Air Traffic Management (ATM) research in the Seventh Framework Programme will be undertaken and implemented by the SJU. It will also be coordinated with other aeronautical research activities in order to maintain a consistent system wide approach for the entire air transport system and in order to avoid possible duplications between different programmes.

The SESAR development phase programme is composed of over 300 research projects and transversal activities, plus other supporting activities defined in the multi-annual and annual work programme and in the General Agreement with the Commission. As the SJU is subject to its own separate mechanisms, the details will not be developed in this Work Programme for 2013. The detailed description of the work programme can be obtained via the SJU webpage www.sesarju.eu.

The European Union will provide a maximum total contribution of EUR 700 million to the SJU for the development phase of the programme over the period 2007-2013. This amount will be provided in equal parts from the Seventh Framework Programme for research and technological development and from the Trans-European Network programme. The contribution of EUR 350 million from FP7 shall be transferred to the SJU by the Commission through annual contributions over the entire programme in accordance with a General Agreement concluded between them. This contribution shall be used to finance the costs of the activities in the relevant areas indicated in the work programme, including programme management, and the running costs of the SJU. For this purpose, an amount of EUR 60.01 million will have to be transferred to the SJU for the year 2013.

II.1. CONTENT OF CALLS FOR 2013

CHALLENGE 1. ECO-INNOVATION

The decarbonisation of the transport system and an efficient use of natural resources, i.e. eco-innovation in all transport modes and the continuation of the development of clean vehicles and vessels.

Activity 7.1.1. The greening of air transport

Developing technologies to reduce the environmental impact of aviation with the aim to halve the emitted carbon dioxide (CO_2), cut specific emissions of nitrogen oxides (NO_x) by 80% and halve the perceived noise. Research will focus on furthering green engine technologies including alternative fuels technology as well as improved vehicle efficiency of fixed-wing and rotary wing aircraft (including helicopters and tiltrotors), new intelligent low-weight structures, and improved aerodynamics. Issues such as improved aircraft operations at the airport (airside and landside) and air traffic management, manufacturing, maintenance and recycling processes will be included.[23]

Expected impact: The aim is to ensure more environmentally friendly air transport focussing on the following *Areas*:

- *Green aircraft* – addressing the greening and energy optimisation of aircraft, without compromising safety.
- *Green air transport operations* – addressing the greening and energy optimisation of aircraft and airport operations, as well as to provide tools for improved understanding of the environmental role of aviation in support of European policy-making.

  Proposals targeting these two areas should demonstrate making significant contributions to achieving one or several of the following objectives for technology readiness by 2020 taking 2001 as the baseline:
  - To reduce fuel consumption and hence CO_2 emissions by 50% per passenger-kilometre.
  - To reduce NO_x emissions by 80% in landing and take-off according to ICAO[24] standards and down to 5 g/kg of fuel burnt in cruise.
  - To reduce unburned hydrocarbons and CO emissions by 50% according to ICAO standards.
  - To reduce external noise by 10 EPNdB per operation of fixed-wing aircraft. For rotorcraft the objective is to reduce noise foot-print area by 50% and external noise by 10 EPNdB.

- *Ecological production and maintenance* – addressing the cleanliness of the industrial processes involved in the manufacturing and maintenance of aeronautical products to reduce toxic emissions as well as improve re-usability and disposal. Where appropriate the modification of maintenance rules should be considered. Proposals targeting this area should demonstrate making contributions to substantially reduce the environmental impact of the manufacturing, maintenance and disposal of aircraft and related products.

AAT.2013.1-1. Flight physics

Level 1 - CP-FP - Call: FP7-AAT-2013-RTD-1

Content and scope: Research and innovation on flight physics will focus on the *greening* of air transport while taking into account the *cost efficiency* related aspects. Proposals could address the following subjects:

[23] The above text is a reproduction of the text included in the Council Decision on the Specific Programme Cooperation regarding this activity. The topics in each call for proposals do not necessarily have to cover all the issues mentioned in this text.

[24] International Civil Aviation Organization.

- Advanced or novel aircraft configuration concepts, including improved airframe/engine integration, which could deliver enhanced aerodynamic efficiency compared to traditional configurations for subsonic, transonic or supersonic flight.
- Advanced concepts and technologies for airframe aerodynamics design to reduce drag.
- Advanced designs for high lift over drag ratios; innovative high lift devices to enable steeper take-off and landing flight profiles.
- Development of adaptive wing and wing morphing technologies.

Note: In WP 2013, active and passive flow control technologies for drag reduction are addressed by Topic AAT.2013.1-4.

AAT.2013.1-2. Aerostructures

Level 1 - CP-FP - Call: FP7-AAT-2013-RTD-1

Content and scope: Research and innovation on aerostructures will focus on the *greening* of air transport while taking into account the *cost efficiency* and *safety* related aspects. Proposals could address advanced concepts and technologies for the following subjects:

Greening:

- Increased and optimised use of light-weight metallic, composite materials, including metal laminates, in primary structures; application of 'smart' materials, multi-functional materials, micro and nano-technologies; 'smart' structures and morphing airframes with a potential to reducing greenhouse gas emissions; and mastering aero-elasticity issues.

Cost efficiency:

- Development of highly integrated structures with optimum combination of advanced metallic and composite materials eliminating or minimising the number of join/assembly elements.
- Increased integration of additional functions (sensing, actuating, electromagnetic, electrical conductivity, etc.) in structural components for wider 'greener' applications at low cost and weight.

Safety:

- Experimental validation for improved protection against crash, impacts and blast loads, including passive and active 'smart' aerostructures, to ensure safety of aging airframe and engine structures.

AAT.2013.1-3. Low pressure system for Ultra High By-Pass Ratio Engine

Level 2 - CP-IP - Call: FP7-AAT-2013-RTD-1

Content and scope: Research will target the maturation of a coherent and integrated set of technologies enabling the Low Pressure (LP) systems needed for the next generation of Ultra High By-Pass Ratio Engine operating with high overall pressure ratio (> 50). The research work will encompass comprehensively all the components of the LP system:

- Regarding the by-pass flow system (i.e. fan system, intermediate case, nacelle and exhaust system), work will focus on an integrated approach to preserve high levels of aerodynamic efficiency (in spite of a reduced fan pressure ratio), on minimising the weight thanks to an increased used of lightweight material and the introduction of novel structural concepts (in spite of an increased external diameter) and on minimising the noise; mounts, pylon and airframe integration aspects should be considered.
- Regarding the LP compressor and the LP turbine, both geared (high speed LP shaft) and ungeared (low speed LP shaft) configurations will be investigated for high levels of

aerodynamic efficiency and low weight; designs will target compressor operability, low noise turbine and high aerodynamic loads for the low shaft speed case.

- Regarding the transmission systems (for the geared approach), methodologies will be developed to improve the heat management of the gearbox and to better predict the transient dynamic behaviour and ensure safe operation under transient regimes.

The impact of the investigated technologies on fuel consumption, emission and noise and operability will be assessed quantitatively using an integrated technology evaluation methodology and in coherence with related projects such as LEMCOTEC or other related projects working on the high pressure system.

Bottlenecks to innovation that could prevent their implementation such as for example cost, weight, safety, certification requirements, market conditions, etc. will be identified.

Expected impact: It is expected that the project will deliver the ultra-high by-pass ratio LP system enabling future high overall pressure ratio engine, and allowing significant reductions in fuel consumption, emission and noise.

AAT.2013.1-4. Maturation of an integrated set of active flow, load and noise control technologies for the next generation of active wing, including in-flight demonstration

Level 2 - CP-IP - Call: FP7-AAT-2013-RTD-1

Content and scope: Research will target the maturation of a coherent and integrated set of promising technologies for active flow, load and noise control. Work will focus on sensors, actuators, control systems and strategies which have a clear potential to reduce drag, to control loads and reduce noise. These are for example technologies to maintain hybrid laminar flow over the wing, to control local separation, to control the flow conditions on the trailing and side edges of the wing, to master transonic effects (wave drag and buffeting), to control potential excitation to the airframe (e.g. jet airframe interaction). Research will also include innovative wing layouts, taking advantage of recent advances in materials and structural design and in combination with flow control technologies.

The concepts will be matured under representative conditions in wind tunnels up to Technology Readiness Levels 4-5 while the most mature technologies will be demonstrated with flight tests. The design of the experiments will make the best used of multi-disciplinary design environments and exploit the potential multifunctional use of the technologies (i.e. to reduce drag and/or control noise and/or control loads).

The project will perform an integrated and coherent quantitative assessment of the potential of the different technologies to reduce drag (fuel consumption), noise and improve load control. The assessment will include the identification of bottlenecks to innovation that could prevent their implementation, such as, for example, cost, weight, safety and certification requirements.

Expected impact: It is expected that the project will increase the technology readiness of active flow technologies, down-select a coherent and integrated set of technologies in the perspective of allowing a later a large scale demonstration.

CHALLENGE 2. SAFE AND SEAMLESS MOBILITY

The optimisation of the global efficiency and safety of the transport system (by application of Intelligent Transport Systems and logistics), making efficient use of infrastructure and network capacity , with the aim of offering safe and seamless transport and mobility to all European citizens, as transport is also crucial for social inclusion.

Activity 7.1.2. Increasing time efficiency

Realising a step-change in aviation in order to accommodate the projected growth of three times more aircraft movements by improving punctuality in all weather conditions and reducing significantly the time spent in travel-related procedures at airports while maintaining safety. Research will develop and implement an innovative Air Traffic Management (ATM) system within the context of the SESAR initiative, by integrating air, ground and space components, together with traffic flow management and more aircraft autonomy. Design aspects of aircraft to improve handling of passengers and cargo, novel solutions for efficient airport use and connecting air transport to the overall transport system will also be addressed.
The most efficient coordination of the development of ATM systems in Europe will be ensured through the SESAR initiative[25].

Expected impact: The aim is to ensure reduced waste of time in air transport operations focussing on the improved time-efficiency of basic operational infrastructures, namely the airport and air traffic management. Research work will address a wide range of innovative concepts and methodologies which will result in optimised passenger-related activities. Proposals should demonstrate making contributions to achieving one or several of the following objectives for technology readiness by 2020:

- To enable the air transport system to accommodate three times more air movements.
- To enable 99% of flights to arrive and depart within 15 minutes of their scheduled departure time, in all weather conditions.
- To reduce the time spent by passengers in airports for purely transportation related procedures to under 15 minutes for short-haul flights and to under 30 minutes for long-haul.

AAT.2013.2-1. Airports

Level 1 - CP-FP - Call: FP7-AAT-2013-RTD-1

Content and scope: Research and innovation on airports will focus on increasing *time efficiency* while taking into account the *environmental* related aspects. Proposals could address the following subjects:

Time efficiency:

- Advanced concepts and techniques for
  - time efficient passenger and luggage flow in the terminal area and for passenger boarding patterns, including multi-door embarking and disembarking;

[25] The above text is a reproduction of the text included in the Council Decision on the Specific Programme Cooperation regarding this activity. The topics and areas open in each call for proposals do not necessarily have to cover all the issues mentioned in this text.

- time efficient freight operations, including comprehensive planning of airport operations; and
- advanced fleet management concepts and techniques for fast, efficient and reliable turnaround at the apron area.

- Innovative modelling tools and techniques in support of:
  - strategic decision making for improved flexibility and optimum use of airports in the context of the full air transport system; and
  - integrated decision making allowing time optimised passenger choices.

Greening:

- Concepts and technologies for:
  - reducing greenhouse gas, pollutant and noise emissions for apron operations (e.g. boarding of passengers, support to aircraft at the gate, services provided by ground vehicle etc.); and
  - new environmentally friendly approach for aircraft de-icing, real time detection, monitoring and modelling of local air quality and aircraft noise around airports
- Investigations for improved understanding of the effects of aircraft noise in the airport surrounding community (cooperation with the USA is encouraged in this particular item).

Note: Proposals should focus on landside operations. Proposal involving airside operations must demonstrate that they complement but not duplicate activities foreseen in SESAR.

Activity 7.1.3. Ensuring customer satisfaction and safety

Introducing a quantum leap in passenger choice and schedule flexibility, whilst achieving a five-fold reduction in accident rate. New technologies will enable a wider choice of aircraft/engine configurations ranging from wide body to smaller size vehicles including rotorcraft, increased levels of automation in all the elements of the system. Focus will also be on improvements for passengers comfort, wellbeing and new services, cabin logistics systems and active and passive safety measures with special emphasis on the human element. Research will include the adaptation of airport and air traffic operations to different types of vehicles and 24-hour utilisation at acceptable community noise levels[26].

Expected impact:

Concerning *passenger friendly air transport operations*, the aim is to ensure that the passenger is less exposed to delays and travel inconveniences due to air transport operations. Research work will address a wide range of innovative solutions and technologies which will contribute to improve passenger related activities at the airport and timely aircraft maintenance operations. Proposals should demonstrate making contributions to achieving one or several of the following objectives for technology readiness by 2020:

- To increase passenger services and choice.
- To enable 99% of flights to arrive and depart within 15 minutes of their scheduled departure time, in all weather conditions.

[26] The above text is a reproduction of the text included in the Council Decision on the Specific Programme Cooperation regarding this activity. The topics and areas open in each call for proposals do not necessarily have to cover all the issues mentioned in this text.

- To reduce the time spent by passengers in airports for purely transportation related procedures to under 15 minutes for short-haul flights and to under 30 minutes for long-haul.

Concerning *aircraft and operational safety*, the aim is to ensure that aviation safety remains at current high standards or even improves regardless of air transport growth, through the increased enhancement of the safety of the aircraft itself, its systems and air transport operations. Research work will address a wide range of concepts, innovative solutions and technologies for active and passive safety measures related to essential features of aircraft designs, human factors, operation of basic infrastructures of the system, such as airports and air traffic management, as well as to improved integrated safety solutions. Proposals should demonstrate making contributions to achieving one or several of the following objectives for technology readiness by 2020:

- To reduce accident rate by 80%
- To achieve a substantial improvement in the elimination of and recovery from human error.
- To mitigate the consequences of survivable accidents.

International cooperation is encouraged on topics related to safety (e.g. where standardisation issues are considered). In particular, cooperation with Canada and USA is encouraged on subjects related to safety in adverse atmospheric conditions and on human factor aspects.

AAT.2013.3-1. Human factors

Level 1 - CP-FP - Call: FP7-AAT-2013-RTD-1

Content and scope: Research and innovation will focus on *customer safety* (vehicle and operations) while taking into account the *cost efficiency* related aspects. Proposals could address the following subjects:

Safety:

- Advanced concepts, methods and techniques for:
  - improved human centred design of cockpit displays;
  - improved understanding of the human factor (e.g. state of mind, attention, awareness, response to the stress) in support of human-machine interaction and the role of automation in the decision-making process;
  - improved crew performance and collaboration in the cockpit when managing information from different ends such as cockpit, ATM and ground control;
  - increased consideration of human behaviour in the conceptual design of the air transport system, in particular with regard to the mission of the crew and maintenance personnel, with special consideration of abnormal situations and crisis management; and
  - training of crews.

Cost efficiency:

- Advanced concepts and techniques, including training, to support the acquisition and retention of skills and knowledge of personnel in the air transport system.

If ATM related aspects are addressed, close coordination with SESAR will be ensured and complementarity demonstrated.

CHALLENGE 3. COMPETITIVENESS THROUGH INNOVATION

The strengthening of the competitiveness of European transport industry through innovation**,** as competition from developed and emerging economies is intensifying in a global economy.

Activity 7.1.4. Improving cost efficiency

Fostering a competitive supply chain able to halve the time-to-market, and reduce product development and operational costs, resulting in more affordable transport for the citizen. Research will focus on improvements to the whole business process, from conceptual design to product development, manufacturing and in-service operations, including the integration of the supply chain. It will include improved simulation capabilities and automation, technologies and methods for the realisation of innovative and zero-maintenance, including repair and overhaul, aircraft, as well as lean aircraft, airport and air traffic management operations[27].

Expected impact:
Concerning *aircraft development costs*, the aim is to ensure cost efficiency in air transport focussing on the reduction of aircraft acquisition costs. Research work will address a wide range of concepts, innovative solutions and technologies which will result in lower lead time and costs of the aircraft and its systems from design to production, including certification, with a more competitive supply chain. Proposals should demonstrate making contributions to achieving one or several of the following objectives for technology readiness by 2020:

- To reduce aircraft development costs by 50%.
- To create a competitive supply chain able to halve time to market.
- To reduce travel charges.

Concerning *aircraft operational cost*, the aim is to ensure cost efficiency in air transport focussing on the reduction of aircraft direct operating costs. Research work will address a wide range of concepts, innovative solutions and technologies which will increase energy efficiency and reduce weight, fuel consumption, maintenance, and crew operational costs as main contributors. Proposals should demonstrate making contributions to achieving one or several of the following objectives for technology readiness by 2020:

- To reduce aircraft operating costs by 50% through reduction in fuel consumption, maintenance and other direct operating costs.
- To reduce travel charges.

Concerning *air transport system operational cost*, the aim is to ensure cost efficiency in air transport focussing on the reduction of the operational costs relevant to the system. Research work will address a wide range of innovative concepts and technologies which will increase cost efficiency in basic operational infrastructures such as airports and air traffic management, including also the human element. Proposals should demonstrate making contributions to achieving one or several of the following objectives for technology readiness by 2020:

[27] The above text is a reproduction of the text included in the Council Decision on the Specific Programme Cooperation regarding this activity. The topics and areas open in each call for proposals do not necessarily have to cover all the issues mentioned in this text.

- To reduce operating costs by 20%
- To reduce travel charges.

AAT.2013.4-1. Systems and equipment

Level 1 - CP-FP - Call: FP7-AAT-2013-RTD-1

Content and scope: Research and innovation on systems and equipment will focus on improving *cost efficiency* while taking into account the *environmental* and *safety* related aspects. Proposals could address the following subjects:

Cost efficiency:

- simulation of installation environments to enable rapid customisation and industrialisation with low manufacturing and maintenance costs; and
- innovative management systems for small aircraft operators

Greening:

- Advanced concepts and technologies for:
  - the all-electric aircraft;
  - reducing engine bleed and systems weight, including power generation, distribution and management, primary flight control;
  - reducing weight of mechanical, pneumatic and hydraulic systems; and
  - aircraft anti-icing and de-icing.

Customer satisfaction and safety:

- New technologies, equipment and systems for:
  - detection of aircraft internal air contamination;
  - on-board detection, awareness and avoidance systems for weather hazards and/or volcanic ash;
  - enhanced levels of safety for small aircraft; and
  - alternative landing and take-off on/from unprepared terrain (including water).

The involvement of SMEs is strongly encouraged.

AAT.2013.4-2. Design systems and tools

Level 1 - CP-FP - Call: FP7-AAT-2013-RTD-1

Content and scope: Research and innovation on design systems and tools will focus on improving *cost efficiency* of vehicles and operations while taking into account the *greening* and *safety* related aspects. Proposals could address the following subjects:

Cost efficiency (vehicle):

- Advanced modelling and simulation tools to include ‘virtual reality’ in support of design and ‘virtual prototyping’; development of advanced cost-effective highly accurate computational tools, including multidisciplinary optimisation, and experimental testing methods in the fields of structural analysis, fluid dynamics, aeroelasticity, flutter, noise, dynamic loads, flight dynamics, aerothermodynamics, icing thermodynamics, electromagnetic environment.
- Knowledge-based design tools and methods to include integrated life-cycle (design, manufacturing, maintenance, re-use or disposal) product definition.
- Concepts and methodologies for efficient multi-site product development in support of the extended enterprise.

- Methods and tools to support reconfigurable customisation of aircraft cabin architectures and interior designs; methods and tools enabling the modular aircraft concept; on-ground and in-flight tests; advanced concepts and procedures in support of novel approaches to certification of aeronautical products and operations.

Cost efficiency (operations):

- Innovative modelling tools and techniques in support of collaborative decision making for improved flexibility and optimum use of aircraft (fleet management).

Greening:

- Advanced simulation tools and systems:
  - to model interdependencies between air transport, environment and the society; and
  - to assess the potential of alternative fuels prior to production (including for certification purpose).

Safety:

- Advanced concepts and techniques for the development of safety metrics to identify, assess and manage the risks in systems and procedures taking into account reliability, resilience, maintainability and availability; development of anticipation, diagnostic and prognostic systems for early detection and response to faults, incidents and accidents; advanced concepts and procedures in support of novel approaches to certification of aeronautical products and operations; tools and procedures supporting a system approach to safety encompassing flight, air traffic and ground components and the evaluation of the system performance.

If ATM related aspects are addressed, close coordination with SESAR must be ensured and complementarity demonstrated. The involvement of SMEs is strongly encouraged. International cooperation with the USA is encouraged in the field of interdependencies modelling.

Note: Integrated thermal analysis and design for aircraft is the subject of Topic AAT.2013.4-6, thus design tools and systems related to this domain are excluded from the current Topic.

AAT.2013.4-3. Production

Level 1 - CP-FP - Call: FP7-AAT-2013-RTD-1

Content and scope: Research and innovation on production processes and technologies will focus on improving *cost efficiency* while taking into account the *environmental* related aspects. Proposals could address the following subjects:

Cost efficiency:

- Development of advanced ‘intelligent’ knowledge-based manufacturing, assembly processes and technologies with increased degree of automation.
- Advanced manufacturing methods to reduce both recurring and non-recurring costs across the whole production cycle from single component manufacturing process to final assembly including techniques to repair and re-use key components and for reduction of waste and consumables.
- Development of techniques for increased flexible tooling.
- Advanced in-process inspection and quality control, including knowledge-based diagnosis and prognosis and damage tolerance.
- Tools and procedure to manage production workload and timing.

Greening:

- Advanced concepts and techniques for:

- the elimination of toxic chemicals and materials and reduction of waste in manufacturing processes; and
- increased utilisation of environmentally sustainable materials in aeronautical products in a safety neutral approach.

AAT.2013.4-4. Maintenance, repair and disposal

Level 1 - CP-FP - Call: FP7-AAT-2013-RTD-1

Content and scope: Research and innovation on processes and technologies for maintenance, repair and disposal will focus on improving *cost efficiency* while taking into account the *environmental* and *safety* related aspects. Proposals could address the following subjects:

Cost efficiency:

- Advanced concepts and techniques for:
  - continuous inspection of structures and systems allowing on-time maintenance and eliminating unscheduled maintenance;
  - 'smart' on-condition maintenance systems, including self-inspection and self-repair capabilities up to 'maintenance-free' aircraft; and
  - cost-efficient repair and overhaul operations applicable at the gate or at the workshop including time and cost-efficient logistic processes for the supply of parts.

  The relevant certification strategies should be developed in parallel with the research work.

Greening:

- Advanced concepts and techniques for:
  - elimination of toxic chemicals and materials and reduction of waste in maintenance operations;
  - increased re-use of components; and
  - increasing the life-time of aeronautical products and for full recyclability at life-end in a safety neutral approach.

Safety:

- Advanced concepts and techniques for:
  - continuous health and usage monitoring (e.g. non-destructive testing, signal processing techniques); and
  - avoidance/mitigation of structural corrosion.

AAT.2013.4-5. Integrated environment for optimised airline maintenance and operations

Level 2 - CP-IP - Call: FP7-AAT-2013-RTD-1

Content and scope: The work will target the development of a coherent set of technologies and systems to be implemented in a flexible multiple-user integrated framework for aircraft fleet maintenance and operations. Innovative technologies and concepts will encompass fleet management (e.g. real time operational awareness, operator centred decision making, etc.), management of the maintenance (e.g. optimised maintenance thanks to on-demand and/or event-based health status reporting, remote support, and just-in-time spares delivery), inclusion of maintenance aspects in the design process, use of ICT solutions and mobile devices for information transmission, finding and also allowing a flexible training of maintenance actors and pilots.

These technologies and concepts will be integrated in a flexible open environment (extended enterprise) allowing stakeholders to interact and allowing optimisation of operations, e.g. maximise availability and minimise usage of fuel while maintaining the highest level of safety. Demonstrations will be performed involving hardware and software prototypes to validate the effectiveness of the system and the benefits for the different stakeholders will be evaluated. Bottlenecks preventing innovation (e.g. implementation of this framework for the different stakeholders, data protection, handling of IPR, etc.) and associated potential solutions will be identified.

The consortium should involve the relevant stakeholders from airline, maintenance, aircraft, equipment, research, and certification/standardisation.

Expected impact: It is expected that the project will increase aircraft availability, reduce maintenance costs, set-up training methods making use of modern ICT tools and ensure awareness of abnormal operations within airlines. The project should deliver a first corner stone towards the extended enterprise for maintenance and operations.

AAT.2013.4-6. Integrated thermal analysis and design for aircraft

Level 2 - CP-IP - Call: FP7-AAT-2013-RTD-1

Content and scope: The research and development work will target the extension of the Behavioural Digital Aircraft (BDA) concept with enhanced models and capabilities, evolving towards multilevel and multidisciplinary design, in particular the design of the thermal environment of the aircraft. Research will develop innovative technologies and concepts to introduce:

- Super-integration combining physical and functional designs allowing the platform to have a capacity to act early in the architecture phase.
- New approach to aircraft definition allowing the management of different definition levels, maturity levels (e.g. design, technology, integration) and granularity levels (from component level to global architecture level) in an incremental, flexible and traceable approach.
- Dynamic interconnections between the different scientific disciplines (aerodynamics, structures, acoustics, etc.) allowing the aircraft definition to evolve in a more robust way thanks to earlier multidisciplinary analysis and optimisations.
- Particular focus on the thermal modelling design aspects to answer the challenges of composites fuselage and the more electric aircraft and to optimise the overall thermal energy management and needs.

The effectiveness of this enhanced BDA platform will be demonstrated on a thermal use case. Particular attention will be dedicated to identify and resolve where appropriate aspects that could prevent innovation such as collaborative management of the platform, interfaces the handling of partners IPR and security in a shared platform.

Expected impact: The work will aim at extending the collaborative multi-partner European aircraft design capacity to the architecture phase, to enhance the simultaneous handling of different levels, the multidisciplinary design and optimisation capacity, in particular for thermal modelling.

AAT.2013.4-7. Large scale demonstration of extended Distributed Modular Electronics

Level 2 - CP-IP - Call: FP7-AAT-2013-RTD-1

Content and scope: The research and development work will target the extension of the avionics related Distributed Modular Electronics (DME) concept to non-avionics related electronic equipment. The proposed project will aim at rationalising and standardising on-board databases and include servers interconnection. It includes, for example, open world communications, cabin electronics, wireless links, smart sensors, power distribution systems and remote cabinets thus extending the DME approach to all aircraft domain. The network will be designed to ease inclusion/removal of elements allowing fast and flexible upgrades and or extensions and make the best use of digital communications technologies.

The concept will be tested on a large scale demonstrator including state of the art hardware and commercial off the shelf electronics in an environment that is representative of the aircraft.

The consortium should gather the research community in the field together with suppliers (of systems, functions, equipment, IT, sensors, etc.) and aircraft manufacturers, and will be connected to airlines and certification authorities. The large scale demonstration will also aim at quantifying the benefits for all the suppliers and stakeholders involved. Barriers to innovation and associated potential solutions will be identified.

Expected impact: The work will aim at reducing significantly the needed volume and weight of electronics while enlarging the scope of applications for operations, maintenance and to answer passenger ICT needs.

AAT.2013.4-8. Seamless aeronautical networking through integration of data links, radios and antennas extended beyond ATM

Level 2 - CP-IP - Call: FP7-AAT-2013-RTD-1

Content and scope: Research and innovation actions will target the extension of the seamless aeronautical networking concept to communication, navigation and surveillance applications. In the view of modularity, flexibility and cost efficiency (acquisition and maintenance), approaches should be based as much as possible on compatible sets of hardware and software and use commercial of the shelf components. These will be integrated in a flexible architecture allowing re-configurability for optimum use, implementation of redundancy and application on a wide number of aircraft types (e.g. commercial air transport, rotorcraft, regional aircraft and business jets). As the architecture evolves and matures, the project will envisage how to achieve the certification.

The robustness and effectiveness of developed architecture will be demonstrated on representative communication, navigation and surveillance (CNS) applications. The demonstration should assess quantitatively the gains obtained and prove the benefits of the approach to the actors involved.

Expected impact: It is expected that this extended reconfigurable architecture will not only cut significantly costs but also minimise weight, space usage and energy consumption.

Activity 7.1.5. Protection of aircraft and passengers

No topic is open in 2013.

Activity 7.1.6. Pioneering the air transport of the future

Exploring more radical, environmentally efficient, accessible and innovative technologies that might facilitate the step change required for air transport in the second half of this century and beyond. Research will address aspects such as new propulsion and lifting concepts, new ideas for the interior space of airborne vehicles including design, new airport concepts, new methods of aircraft guidance and control, alternative methods of air transport system operation and their integration with other transport modes[28].

Expected impact: Proposals should investigate breakthrough technologies and concepts that have the capacity to cause a step change in aeronautics and air transport in the second half of this century.

AAT.2012.6-1. Breakthrough and emerging technologies

Level 0 - CP-FP - Call: FP7-AAT-2012-RTD-L0

Content and scope: Investigation of emerging technologies or technologies from other sectors which have the potential to bring radical new approaches to the vehicles, the propulsion technology, the energy needed for the flight, the tools to provide guidance and control to the vehicles, the ground infrastructures for passengers and freights and the impact of the air transport on the environment. The research work will make the best use leading-edge facilities and/or simulation tools. At the end of the project, the progress against the technology readiness scale will be evaluated, the potential of the technologies to be developed at further technology readiness level will be assessed and barriers that could prevent such development identified.

AAT.2012.6-2. Radical new concepts for air transport

Level 0 - CP-FP - Call: FP7-AAT-2012-RTD-L0

Content and scope: Investigation of radical new concepts for the air transport system. The research work will propose and assess new approaches to systems for the air transport such as new approaches to the control and guidance of vehicles, the way passengers or freight access the vehicle, the way air transport is connected with other modes and the way travel information is handled. The functioning of the concept should be technically proven. The performance will be assessed preferably quantitatively against the relevant criteria such as for example economic viability, time efficiency, safety, environmental friendliness, energy sustainability, etc. Qualitative assessment will be done for non-quantifiable criteria such as for example potential to cope with evolutions of current regulations, passenger friendliness, social acceptance etc. The investigation will also address the evolution from / compatibility with today's transport system.

[28] The above text is a reproduction of the text included in the Council Decision on the Specific Programme Cooperation regarding this activity. The topics and areas open in each call for proposals do not necessarily have to cover all the issues mentioned in this text.

CROSS-CUTTING ACTIVITIES FOR IMPLEMENTING THE SUB-THEME PROGRAMME

Cross-cutting activities in the Aeronautics and Air Transport Work Programme 2013 support the achievement of actions which help meeting the three socio-economic Challenges.

Coordination of research and innovation

AAT.2013.7-1. Coordinating research and innovation in the field of Aeronautics and Air Transport

CSA-CA - Call: FP7-AAT-2013-RTD-1

Content and scope: The action will provide on an annual basis a review of the state of the art of research and innovation (capacity, main performers), identify of gaps in the research landscape, bottlenecks to innovation (regulation, financing) and formulate strategic recommendations to address these. On the basis of on-going and completed projects, the action will also assess the impact of the EU-funded projects and their contribution to progress towards ACARE goals or other relevant goals. The action will develop a web-site that centralises information and links to the relevant project in a comprehensive way, consider the relevance of setting-up a central database for projects. Dissemination of the findings will be organised through workshops. The action will also favour joint dissemination events for projects dealing with similar fields and will examine and promote conferences. The partnership will be solely composed of stakeholders that are actively engaged in research in the domain of the coordination action and represent industry, academia and research centres. The action will ensure close coordination with similar initiatives of this type in the same domain or in connected domains.

A proposal should address no more than one of the following domains:

1) Environmental related research and innovation (CO_2, NO_x, noise, recyclability, air transport system modelling (incl. technology evaluation), typically gathering project results from topics such as Flight Physics, Aerostructures, Propulsion, Noise, and some ATM and Airports)
2) Cost Efficiency (Design Systems and Tools, Production, and Avionics)
3) Time Efficiency (Airports, ATM, aircraft separation, etc.)
4) Safety research (Coordination of Safety research, support to Safety Management System for Europe, and ATM). Security aspects can be addressed, but safety should remain the main focus.

Up to one project per domain is expected to be funded (see section III.1.1). A duration of 4 years is recommended.

Expected impact: It is expected that the actions will enhance the coherence of strategic research policy making, impact assessment and dissemination in the field of aeronautics and air transport.

AAT.2013.7-2. Coordinating research and innovation in the field of sustainable alternative fuels for Aviation

CSA-CA - Call: FP7-AAT-2013-RTD-1

Content and scope: The coordination action will address the research and innovation in the field of sustainable alternative fuels for aviation, including related technical, environmental, business and economic aspects. It will assemble and link initiatives and projects in the EU Member States and at the EU level in that field. More specifically the action should:

1) Develop and implement a strategy:
   - for sharing information and where appropriate coordinating initiatives, projects and results/data, helping in building relationships and public-private cooperation;
   - to identify needs in research, standardisation, innovation/deployment, and policy measures at European level and for this liaise with the European Biofuels Flight Path initiative, the European Biofuel Technology Platform (EBTP) and with relevant initiatives at international level (e.g. USA and Brazil); and
   - to promote the specific needs of the aviation sector in the energy and other relevant communities across Europe, (energy at large, bio-energy and fuels, agriculture, chemistry, bio-chemistry, the financing sector).
2) Establish and implement a strategy in liaison with the European Bio-Technology Platform for the independent mapping and assessment of projects in this field with collection of the lessons learned. For this assessment, experts from industry, science, NGOs and other relevant background, as well as policy makers, might participate. The results should be accessible to public decision makers, and also to private, subject to a strategy on confidentiality and IPR.
3) Organise the collection of information from related workshops and other events; make information available to public and private decision makers. Organise dedicated workshops if appropriate.

The partnership will be composed of key stakeholders that are actively engaged in research and innovation in the field of sustainable alternative fuel for aviation and include industry, academia and/or research centres and relevant public authorities. The action will build on the recommendations of the SWAFEA report, the ACARE Strategic Research and Innovation Agenda, the European energy, climate and transport policy framework and the SET-Plan.

Expected impact: It is expected that the actions will enhance the knowledge of decision makers on sustainable alternative fuels for aviation and their use, the coherence of strategic research policy making, impact assessment and dissemination in the field of sustainable alternative fuels for aviation.

Actions in support of research and innovation

AAT.2013.7-3. Communication of EU funded RTD project results to targeted audience

CSA-SA - Call: FP7-AAT-2013-RTD-1

Content and scope: The goal is to disseminate publicly funded research results in a targeted manner to secondary and engineering schools. The project is expected to produce attractive educational materials, such as videos or serious games explaining simple physical principles, experiments and results, based on at least 20 Aeronautics and Air Transport RTD projects.

They would be adapted for use by teachers in secondary or engineering schools and be produced at least in English, in a way which would allow easy transformation to other languages. They would be distributed via targeted social networking platforms. The consortium should include experts in aviation and education.

Expected impact: The action is expected to raise the interest of young Europeans and promote scientific and technical studies and careers in aeronautics and air transport research and industry.

AAT.2013.7-4. Creating cohesive links and common knowledge between potential partners in EU Framework Programme Collaborative Projects

CSA-SA - Call: FP7-AAT-2013-RTD-1

Content and scope: The goal of the action is to put in direct contact potential coordinators and potential partners in EU Framework Programme Collaborative Projects in the field of Aeronautics and Air Transport (AAT), which are established in regions that lack of mutual knowledge. The project will first establish a thematic mapping of regional capacities and identify the regions which have a low participation in Collaborative Projects compared to their capacity and which would benefit from better connections in the different technology areas, in particular between Eastern and Western Europe. The major part of the action effort should bear on the organisation of workshops, plant and factory tours centred on defined technology areas of common interest (e.g. engine, aero-structures, avionics, etc.), organised locally and aiming at creating direct links between research stakeholders from industry, academia and research centres. The consortium partnership should be composed of regional associations, with a suitable balance between the regions.

Expected impact: The action is expected to reinforce networks of actors and widening opportunities in research and innovation, thus strengthening the European Research Area in the field of AAT.

AAT.2013.7-5. Conference: support for the organisation of Aerodays

CSA-SA - Call: FP7-AAT-2013-RTD-1

Content and scope: The action will prepare and provide support to the European Aeronautics Days, a conference which brings typically together over 800 representatives of Aeronautics and Air Transport (AAT) stakeholders from all over Europe and beyond around research and innovation results and policy. The objective of the conference is to provide a platform for discussing political, industrial and research issues on a European and global scheme, assisting a policy, which pursues a smart combination of top-down and bottom-up approaches. In line with previous Aeronautics Days, the event should address the technological and industrial developments of the aviation sector providing a high-level, future oriented perspective coming from politics, the industry and the research community, in response to Europe’s social needs and expectations. The conference should also offer a forum for government officials, decision makers, managers, researchers, engineers and journalists from all over Europe and beyond to discuss and reflect on an RTD roadmap for aeronautics in line with Europe's Vision for Aviation 'Flightpath 2050'. In collaboration with the relevant actors, such as the European Commission services, the action will define the overall planning of the conference, structure the technical and political sessions of the event, contribute to select the appropriate location for the venue and offer operational IT tools for the registration of participants, the handling of speakers’ contributions, etc. Specific attention should be put on the participation of students and young researchers.

Expected impact: The action will contribute to disseminate the results of AAT EU funded research and to raise the visibility and weight of the EU policy in the field. It will allow creating links and exchanges between research and innovation stakeholders and policy makers.

AAT.2013.7-6. Enhancing coordination and stimulating cooperation in research and innovation among EU Member States and Associated States to the EU Framework Programme

CSA-SA - Call: FP7-AAT-2013-RTD-1

Content and scope: The action will set up a platform of communication between national organisations and governmental institutions supporting research and innovation in the EU Member States and Associated States to the EU Framework Programme in the field of Aeronautics and Air Transport (AAT), in particular considering AAT intensive regions. The activities will include the organisation of workshops and studies on areas of common interest. Win-win situations, barriers and solutions for improved trans-national cooperation in research, technological developments and innovation will be identified and recommendations made for future actions. The action will focus on AAT, encompass interested EU Member States and Associated States and contribute to:

- strengthening and widening the network established under previous ERA-NET schemes;
- providing an overview of the different types of actions, their focus and the financial resources provided by public authorities (including for transnational joint calls where relevant);
- stimulating practical opportunities to develop cooperation in research and innovation;
- strengthening and widening coordinated approaches towards international co-operation;
- supporting transnational cooperation in education and workforce mobility;
- enhancing transnational cooperation for infrastructure;
- acting as a vehicle for stimulating co-operation of national funded research in support of technology initiatives on European scale such as Horizon 2020, Clean Sky, SESAR, etc.;
- maintaining an active exchange of information and acting as linkage to avoid duplication of effort between different networks and institutions in AAT; and
- creating means of communication among national mirror groups of ACARE.

Expected impact: It is expected that the support action will maintain existing links and establish new links between EU Member States and Associated States and stimulate the creation of transnational cooperation mechanisms in AAT.

AAT.2013.7-7. Exploring opportunities and stimulating cooperation in research and innovation with China

CSA-SA - Call: FP7-AAT-2013-RTD-1

Content and scope: The action will set up a platform of communication between research and innovation oriented organisations (industry, research establishments and academia) and institutions in Europe and China in the field of Aeronautics and Air Transport (e.g. environmental impact, safety, security and the interoperability of operational systems). The activities should include the joint organisation of workshops and studies to identify preferred areas of common interest and win-win situations with a forward looking perspective. Barriers

preventing cooperation in research, technological developments and innovation will be identified. Solutions will be proposed and recommendations made for future actions. The action will also stimulate practical opportunities to develop cooperation in research and innovation, taking into account the on-going cooperation initiatives.

Expected impact: It is expected that the action will identify on a win-win basis research and innovation topics of common interest in the field of AAT and stimulate the creation of cooperation mechanisms.

COORDINATED CALLS FOR INTERNATIONAL COOPERATION

AAT.2013.8-1. Coordinated call with Russia

Level 1 - CP-FP - Call: FP7-AAT-2013-RTD-RUSSIA

Content and scope: In the proposed research and development work, proposals should fully target one of the following domains of common interest and demonstrate the complementarity with past and on-going projects in the field in Europe and the Russian Federation.

1) *Reliable novel composite aircraft structures based on geodesic technology*. The proposed work should increase the Technical Readiness Level (TRL) of the geodesic technology and deploy its full potential. While the global structural behaviour of composite geodesic structures is investigated and understood, for higher TRL the understanding of the local structural behaviour, which is different from today's aircraft structures, is necessary. Of particular interest is the robust design, manufacturing and structural behaviour of the grid nodes and the rib-skin interface of the composite geodesic structure. The work should include numerical analysis as well as impact and fatigue testing from coupon to detail level. New confident and suitable repair concepts of these structures should also be envisaged
2) *Theoretical and experimental study of flow control for improved aircraft performance*. The proposed work should investigate theoretically and experimentally flow control strategies using for example, mechanical means, jets and/or plasmas in order to improve the performance of the aircraft in all phases of flight (take-off, cruise, landing). For the take-off and landing phases, emphasis will be put on improved safety while manoeuvring under high angles of attacks. During the cruise phase, the impact of active flow control (e.g. employing tangential blowing of a jet over the rear portion of the fixed wing) on the performance of high-speed/high-lift supercritical airfoil sections and swept wings will be investigated in particular in the perspective of allowing an increase of the cruise Mach number (up to 0.85–0.9 and higher).
3) *Rational architecture of aircraft control system actuation part for more electrical aircraft*. The proposed work should contribute to analyse different architectures involving more electric technologies for the aircraft control system making enhanced use of smart electrical actuators. The requirements in terms of power and dynamic characteristics of the electrical actuators will be determined for the different control surfaces. Enhanced electrical actuators capable of answering these requirements will be investigated.
4) *Computer aided design (CAD)-generated modular avionics*. The proposed work should develop the scientific and technological fundamentals needed to evolve towards CAD-generated modular avionics based on the principles of a uniform set of hardware and

software components. The research and developments will target the next generation of airborne systems with open architecture including, for example diagnostics, in particular using self-conditioning means, observation and control functions, on board situation awareness for improved safety, etc.

5) *Innovative counter-rotating fan system with high by-pass ratio*. The proposed research and development work should focus on counter-rotating fan systems with high by-pass ratio and target high fuel efficiency, competitive with levels of open rotors, and a low acoustic signature, taking advantage of the existence of a nacelle to include acoustic treatments. Proposals will involve multidisciplinary research and propose solutions for enhanced integration of the propulsion system with the airframe.

6) *Enhanced compressor performance*. The proposed research and development work will targets the improvement of the efficiency of compressor for advanced turbofan and enhanced stability margin. It will involve both experimental and computational studies. Steady and unsteady phenomena will be investigated, in particular under conditions representative of a highly loaded compressor. Specific attention will be paid to the robustness of the compressor behaviour when experimenting inlet distortions. A selection of casing treatment configurations that have the potential to enhance the compressor stability will be investigated and validated on a test rig.

Expected impact: It is expected that the project will enhance further the cooperation in research and innovation between EU and the Russian Federation in the field of civil transport aircraft.

AAT.2013.8-2. International cooperation on civil high speed air transport research

Level 1 - CP-FP - Call: FP7-AAT-2013-RTD-HIGH SPEED

Content and scope: The project goal is to perform flight testing of (a) multidisciplinary optimised model vehicle(s) in the hypersonic range relevant to an environmentally and economically sustainable civil high-speed passenger transport aircraft. The flight test(s) will aim at validating a range of concepts such as integrated aerodynamic design of vehicles, propulsion systems (including intakes), aero-propulsive balance, sonic boom reduction, high temperature materials and structures, flight control, etc. The model will be equipped with the relevant instrumentation in the view of comparing measurements with predictions. While the development of a high speed transport aircraft is to be envisaged on a long term perspective, the proposal will also highlight spin-off applications to other sectors in a shorter term.

The proposal shall be established together with coordinated, compatible, balanced and coherent proposals or projects from at least two of the following countries: Australia, Japan and the Russian Federation. It is required that before the signature of the EU grant agreement a coordination agreement encompassing IPR, ownership, risk sharing and coordination issues is signed between the entities participating in the EU and in the complementary Third Countries' projects. The submission, together with the EU proposal, of a formal signed commitment to conclude this coordination agreement by the entities participating in the Third Countries' complementary proposals/projects will be positively evaluated.

Expected impact: The project will allow gathering the critical mass and the means to perform flight testing for long term high speed aircraft developments and will create durable links between the EU and the international partners.

7.2. SUSTAINABLE SURFACE TRANSPORT (INCLUDING THE 'EUROPEAN GREEN CARS INITIATIVE')

I.2. CONTEXT

This introduction is complementary to the general one (section I.0). The strategy for 2013 is summarised there, including the new innovation dimension of the activities, SME relevant research, international cooperation, cross-thematic approaches and societal aspects. Only the specificities of the sub-theme are presented here.

The information provided in this introduction as well as in the content of calls for 2013 shall not be considered as eligibility criteria (unless it is explicitly indicated) but shall be taken into account during the evaluation for the respective evaluation criteria. For eligibility criteria and additional information, e.g. funding schemes, budget limits, etc., please refer to section III.

I.2.1. Specific approach for Sustainable Surface Transport

The scope of the research covers the entire Surface Transport System and embraces all its elements: products (vehicles, vessels and infrastructures), services, operations and users integrating organisational, legal and policy frameworks. The 2013 work programme is divided into two major action lines:

1) The three **Socio-economic Challenges** indicated in section I.0.2 are addressed by five **Activities**, which are in line with those of the Specific Programme:
    1. The greening of surface transport
    2. Encouraging modal shift and decongesting transport corridors (co-modality)
    3. Ensuring sustainable urban mobility
    4. Improving safety and security
    5. Strengthening competitiveness

    In addition to the above activities, issues cross-cutting the three Socio-economic Challenges, e.g. for structuring European surface transport research and supporting programme implementation are also addressed in this work programme.

2) **Actions supported under the 'European Green Cars Initiative' (EGCI) and the 'Ocean of Tomorrow'**, which are also cross-cutting the three Socio-economic Challenges.

The Sustainable Surface Transport (SST) work programme covers a comprehensive and co-related spectrum of the innovation cycle, from basic and applied research to large scale and multi-disciplinary technology and socio-economic integration, validation and demonstration, including standardisation and certification where appropriate. Coordination and support actions contribute also to the structuring of European Surface Transport research and support for programme implementation.

The activities/actions are further divided in **topics** calling for **proposals**. Most topics are classified in two levels of categories according to the degree of specification of the topic

descriptions: **Level 1** (generic) and **Level 2** (specific). Funding schemes for each topic and eligibility criteria (including funding limits) are indicated in the call fiches (section III.2).

Topics in Level 1 are technology driven. Proposals may approach these topics with some degree of flexibility, by addressing only part of topic content. Research and development activities within Level 1 will contribute to the technological foundation of the sub-theme. Topics in Level 2, being specific, refer to well identified industrial, policy and socio-economic matters. They are mission driven, explicit in their formulation. They may for example give indications concerning the type of activity, the research approach, characteristics of the partnership and expected outcomes. Proposals addressing Level 2 topics will cover it entirely.

Standardisation and certification are part of the content and scope of topics at any level where appropriate (see section I.0.3).

The major part of the indicative budget allocated to the main call (section III.2) has been distributed into the following groups of topics:

- Group of topics N° 1: Increasing railway capacity
- Group of topics N° 2: Ensuring safe, green and competitive waterborne transport
- Group of topics N° 3: Implementing research for the 'European Green Car Initiative'
- Group of topics N° 4: Ensuring sustainable urban mobility, improving surface transport through ITS, safety and security, and infrastructures.

The rest has been distributed into the topics concerning cross-cutting and horizontal activities for implementing the Transport programme (see details in section III.2.1).

Topics belonging to groups 1, 2 and 4 are described under the five activities of the work programme. Topics belonging to group 3 are described in a separate sub-division under the heading 'European Green Cars Initiative'.

I.2.2. The 'European Green Cars Initiative'

The 'European Green Cars Initiative' belongs to the '**European Economic Recovery Plan',** an initiative to coordinate efforts and implement joint actions to contain the scale of the economic downtown and to stimulate demand and confidence. Within the Recovery Plan, the **'European Green Cars Initiative'** is a series of measures boosting research and innovation aiming at facilitating the deployment of a new generation of passenger cars, trucks and buses that will safeguard our environment and lives and ensure jobs, economic activity and competitive advantage to car industries in the global market. A series of different measures are proposed: support to research and innovation through FP7 funding schemes, specific EIB loans to car and other transport industries and their suppliers, in particular for innovative clean road transport, and a series of legislative measures to promote the greening of road transport (circulation and registration taxes, scrapping of old cars, procurement rules, CARS21 initiative).

II.2. CONTENT OF CALLS FOR 2013

CHALLENGE 1. ECO-INNOVATION

The decarbonisation of the transport system and an efficient use of natural resources, i.e. eco-innovation in all transport modes and the continuation of the development of clean vehicles and vessels.

This challenge will be addressed by Activity 7.2.1 as well as by Areas 7.2.7.1 (Development of electric vehicles for road transport) and 7.2.7.2 (Research for heavy duty vehicles for medium and long distance road transport) of the European Green Cars Initiative.

Activity 7. 2. 1. The greening of surface transport

Developing technologies and knowledge for reduced pollution (air including greenhouse gases, water and soil) and environmental impact on such areas as climate change, health, biodiversity and noise. Research will improve the cleanliness and energy-efficiency of power trains (e.g. hybrid solutions) and promote the use of alternative fuels, including hydrogen and fuel cells as mid and long-term options, taking into account cost efficiency and energy efficiency considerations. Activities will cover infrastructure, vehicles, vessels and component technologies, including overall system optimisation. Research in developments specific to transport will include manufacturing, construction, operations, maintenance, diagnostics, repair, inspection, dismantling, disposal, recycling, end of life strategies and interventions at sea in case of accident[29].

SST.2013.1-1. Railway infrastructure optimisation and monitoring for further noise reduction

Level 2 - CP-FP - Call: FP7-SST-2013-RTD-1

Content and scope: It is fully understood that the noise level to which populations along the railway lines are submitted is largely generated and/or amplified by the infrastructure and this total noise emission is subject to limitation coming from national environmental regulations, harmonised under other European legislative instruments. Even if noise-reduced solutions for tracks and infrastructure are partly available from the design solutions, new solutions addressing the whole life of the infrastructure and its component have to be developed.

The research activities should include:

- Better understanding of the track contribution in the total pass-by noise of the train.
- Harmonisation of monitoring of track roughness and average characteristic wheel roughness.
- Monitoring track dynamic properties with respect to noise emission.

[29] The above text is a reproduction of the text included in the Council Decision on the Specific Programme Cooperation regarding this activity. The topics and areas open in each call for proposals do not necessarily have to cover all the issues mentioned in this text.

- Optimisation of track vibration and noise radiation in relation either by combining of already prototype solutions developed separately or by radical design (including slab track).
- Investigation of influence of track characteristics on aerodynamic noise sources.
- Investigation of influence of ground geometry and characteristics close to the track on noise propagation at low frequency.
- Investigation of influence of infrastructure maintenance and consideration of the whole life cycle in relation to noise emission
- Development of noise management tools, and determination of best-test methods for characterisation of Noise Reducing Devices Insertion Loss.

Expected impact:

- Development and standardisation of operational monitoring systems for track based on the track emissions parameters identified in the Noise Technical Specification for Interoperability (TSI): Acoustic roughness and Track Decay Rates.
- Development of innovative solutions (design) for a reduction of track related noise.
- Development of concepts and tools for economic maintenance of track considering the whole life-cycle with the aim to achieve a track optimisation and further noise reduction.
- Contribution to the expected revision of TSI – noise.
- Development of a test procedure for in situ characterisation of NRD Insertion Loss.

SST.2013.1-2. Towards the zero emission ship

Level 2 - CP - Call: FP7-SST-2013-RTD-1

Content and scope: Research will focus on the optimisation of the energy chain of a ship (maritime or inland waterway), including the integration of renewable energy systems, on energy recovery systems from the main and auxiliary engines with the aim to significantly reduce CO_2 emissions as well as SO_x, NO_x, particulate matter (PM), etc. Solutions will be implemented on ships with optimised propulsion chains.

Activities will include:

- Optimal integration of renewable energy systems in the energy chain of complex ships.
- Development of optimised solutions for a wider use of alternative fuels including deployment options.
- Development of innovative technologies for energy recovery, in particular in the low range temperature, and energy integration and respective deployment options, including storage.
- Development of novel after-treatment technologies for CO_2 reductions, taking into account energy optimisation, further development and optimal integration of existing technologies for the treatment of other types of emissions (i.e. SO_x, NO_x, PM, etc.).
- Development of concepts for an optimal integration of the energy chain of complex ships including their validation with data obtained from measurements under realistic conditions, including ice conditions. Physical mock-ups on critical parts of the energy chain will be built and demonstrated.
- Modelling of fully optimised complex ships in various operation conditions, including ice conditions, taking into account all appropriate measures for CO_2 reduction as well as measures to reduce other emission types.

- Development of reliable methods and tools for the assessment of CO_2 emission over the entire life time of a ship, including cost-effectiveness assessment.
- Assessment of the potential for market uptake and business potential of the different technologies developed and expected market barriers or bottlenecks. Development of a concept for raising the awareness of industry and public administrations regarding the potential of these new technologies for the reduction of ship emissions.

Activities will take into account the latest technology development in the field, in particular EU-funded research projects. Participation of SMEs active in equipment design, production and/or installation will be considered an asset. Proposals will clearly indicate the baseline in terms of CO_2 emissions as well as other emissions and the progress (reduction %) expected as a result of research. Targets will be benchmarked against existing "green vessels" concepts.

Expected impact: This research is expected to reduce energy consumption and thus CO_2 emissions by at least 20% compared to state-of-the art vessel technology through an optimal integration of leading edge technologies for emission reduction and energy efficiency without compromising ship safety or security, whereas other emission types will be reduced to a minimum. This will contribute to the roadmap to a single European Transport Area, which sets an ambitious target to reduce the EU CO_2 emissions for maritime transport by 40% (if feasible 50%) by 2050 compared to 2005 levels.

SST.2013.1-3. ERA-NET Plus 'Advanced systems, materials and techniques for next generation infrastructure'

Call: FP7-ERANET-2013-RTD (see Annex 4)

Content and scope: A fundamental shift in the performance of road transport requires a new generation of infrastructure. The main aim of this ERA-NET Plus is to launch a joint transnational call for proposals for research, development and innovation in the field of advanced systems, materials and techniques for next generation road infrastructure. The joint call will focus on techniques using advanced materials, including those from other industries or from using conventional materials in an innovative way. Actions under this joint call will include the development of sophisticated modelling techniques or the testing and monitoring of novel techniques with regard to its impacts on reliability, safety and environment.

Cooperation with the USA in the respective areas should be sought. Care should be taken to ensure complementarities with the activities carried out in the ERA-NET ROAD.

The thematic focus of this joint transnational call should be proportionate with the funds available in order to ensure a reasonable rate of success in the call. Details on the topics covered by the call will be decided by the participants in due time but shall be selected upon consultation with the concerned Commission services. Funding of projects will be on the basis of a common pot.

Additional information: The deadline included in the call FP7-ERANET-2013-RTD applies for this topic. More information about the ERA-NET Plus actions (including eligibility criteria) can be found in Annex 4 of the work programme.

Expected impact:

- Improving coordination and reduce overlap in research and innovation in the field of affordable green materials and technologies for reliable road infrastructure.

- Achieving critical mass and ensure better use of limited resources in fields of mutual interest. A significant participation of Member States and Associated States is expected.
- Sharing good practices in implementing research programmes.
- Promoting transnational collaboration and generating new knowledge and innovation
- Mobilising SMEs in transnational projects to enhance innovation.

CHALLENGE 2. SAFE AND SEAMLESS MOBILITY

The optimisation of the global efficiency and safety of the transport system (by application of Intelligent Transport Systems and logistics), making efficient use of infrastructure and network capacity , with the aim of offering safe and seamless transport and mobility to all European citizens, as transport is also crucial for social inclusion.

This challenge will be addressed by Activities 7.2.2, 7.2.3 and 7.2.4, as well as by the European Green Cars Initiative.

Activity 7.2.2. Encouraging modal shift and decongesting transport corridors

Developing and demonstrating seamless door-to-door transport for people and goods as well as technologies and systems to ensure effective intermodality, including in the context of rail and waterborne transport competitiveness. This includes activities addressing the interoperability and operational optimisation of local, regional, national and European transport networks, systems and services and their intermodal integration in an integrated approach. The activities will aim at European-wide strategies, optimised use of infrastructure including terminals and specialised networks, improved transport, traffic and information management, enhanced freight logistics, passenger intermodality and modal shift strategies to encourage energy efficient means of transport. Intelligent systems, new vehicle/vessel concepts and technologies including loading and unloading operations as well as user interfaces will be developed. Knowledge for policy making will include infrastructure pricing and charging, assessments of European Union transport policy measures and trans-European networks policy and projects[30].

SST.2013.2-1. Next generation of train control systems in the domain of urban and main line European railway systems

Level 2 - CP - Call: FP7-SST-2013-RTD-1

Content and scope: The research focuses on the next generations of train control systems for the two domains of urban and main line European railway systems. The goal of the project is to deliver specifications describing the new features of these next generations, leading to common technical architecture and associated standard interfaces within each of the two domains.

The research activities should include:

[30] The above text is a reproduction of the text included in the Council Decision on the Specific Programme Cooperation regarding this activity. The topics and areas open in each call for proposals do not necessarily have to cover all the issues mentioned in this text.

- Introduction of new technologies in the ERTMS (European Rail Traffic Management System) standard architecture to fit further requirements from railways undertakings.
- Investigation of next generation of ERTMS common technical specifications and their associated standard interfaces.
- Further development of CBTC (Communication Based Train Control) based control systems including both on-board and wayside equipment and associated standard interfaces.
- Investigation of various possible higher industrial synergies between the control systems of the two domains, in terms of specifications for on-board and wayside equipment, certification processes, as well as facilitation of trans-border operations between the main line and sub-urban systems.

Expected impact:

- Delivery of Functional Requirement Specifications (FRS), Systems Requirements Specification (SRS) and Functional Interface Specification (FIS) for the next generation of ERTMS.
- Development of a common technical architecture and its associated standard interfaces for urban train control systems including delivery of related FRS, SRS and FIS specifications.
- Development of assessment methods and installation procedures for next generation of ERTMS and CBTC.
- Harmonisation of main line / urban rail train control systems development.
- Increase of capacity, reliability and availability for regional lines, freight lines and high-density lines and for urban rail systems.

SST.2013.2-2. New concepts for railway infrastructure and operation: adaptable, automated, resilient and high-capacity

Level 2 - CP - Call: FP7-SST-2013-RTD-1

Content and scope: The project should pave the way for an affordable railway infrastructure (low maintenance and rapid construction) and operations concept that is resilient to extreme weather and other hazards, designed for automated maintenance and operations (e.g. automated coupling, brake testing), and adaptable to different route characteristics including (very) high speed. At the same time, it should contribute to an increase of capacity of freight transport.

The research activities could include:

- Infrastructure for medium/long distance mixed traffic – designs for low maintenance, low carbon, rapid construction including prefabricated track with provision for integrated power systems and communications
- Very high speed track - for speeds over 350km/h, requirements for structures design criteria related to dynamic analysis: bridge-vehicle interaction, transition zones, damping considerations and the effect of track irregularities. Compatibility with high-speed freight should be investigated.
- Switches and Crossings for the railway of the future - the development and demonstration of alternative designs for switches and crossings phasing out all currently known failure modes and incorporating optimised sensor technologies.
- Development of innovative and cost effective technologies for collecting real-time data on the train operation (current train position, the current delay, reason of delays, details

on operational problems and the estimated time of arrival at relevant operation points) as well as technical data (train weight, wagon list, etc.).

- Development of innovative solutions for traffic capacity computation for freight and passengers based on data gathering, analysing and utilising processes. Determination of data requirements and models to improve rail punctuality and level of service.
- Development of innovative operational measures and technologies reducing the time and operational cost related to the transhipment between rail and other modes
- Development of joint requirements and testing for incident management plans.
- Structural health monitoring for railway infrastructure.
- Longer trains and/or high-speed freight, addressing automated coupling, improved braking technology and planning aspects allowing the interleaving of slower freight trains with regular and high-speed passenger traffic.

Expected impact:

- Contribution to the development of future specifications for technologies and systems.
- Development of guidance documents setting out the above and identifying the technologies and systems that should be developed to ensure their delivery.
- Practical demonstration that step change in railway infrastructure and operations may be achieved within the constraints of the need to maintain railway services. Case studies for selected sites, including one or more European Rail Freight Corridors are desirable.
- The project is expected to identify possible follow-up actions to be supported through other sources of funding, thus widening opportunities for future deployment.

Activity 7.2.3. Ensuring sustainable urban mobility

Focusing on the mobility of people and goods by research on the 'next generation vehicle' and its market take-up, bringing together all elements of a clean, energy efficient, safe and intelligent transport system. Research on new transport and mobility concepts, innovative organisational and mobility management schemes and high quality public transport will aim at ensuring access for all and high levels of intermodal integration. Innovative strategies for clean urban transport[31] will be developed and tested. Particular attention will be paid to non-polluting modes of transport, demand management, rationalisation of private transport, and information and communication strategies, services and infrastructures. Tools and models supporting policy development and implementation will cover transport and land use planning including the relationship with growth and employment[32].

SST.2013.3-1. Managing integrated multimodal urban transport network

Level 2 - CP - Call: FP7-SST-2013-RTD-1

Content and scope: Research will aim at developing, demonstrating and validating strategies and tools (technological and methodological), which contribute to integrated multimodal network management for cities and their hinterland. Strategies can address the movements of goods and people on the network as well as the improvement of the accessibility.

[31] Building upon the experiences of the CIVITAS initiative (www.civitas-initiative.org).

[32] The above text is a reproduction of the text included in the Council Decision on the Specific Programme Cooperation regarding this activity. The topics and areas open in each call for proposals do not necessarily have to cover all the issues mentioned in this text.

The project will develop an integrated approach and will focus its research and demonstration activities on the following areas of innovation:

- Data creation and use: innovative and cost-effective detection technologies leading to create, share, disseminate and use real-time data collection on people and vehicle movements, particularly for soft modes and public transport; open data systems - approaches, business models and contractual arrangements.
- Open ITS systems:
  - opened standards and specifications for data exchange, including open traffic and communication systems; and
  - generic interface between digital applications relating to future urban infrastructures and ITS reference architecture inside vehicles.
- Decision support tools for city operators, citizens, industries (both transport mobility user and supplier):
  - innovative operational and strategic decision-support systems, which can balance safety, environment and efficiency aspects of traffic and infrastructure management;
  - integrated traffic control involving real time coordination among road and transport operators and emergency services; and
  - multimodal modelling and simulation covering road vehicles (including public transport), road infrastructures and soft modes oriented to different user categories.
- New mobility information services for passengers and freight transport including multimodal cooperative mobility for local authorities (with migration scenarios). The aim is to develop and integrate the best mobility solutions for an optimum between mobility demand and supply activities; especially, to ensure coherence between the different level of governance for both freight and passengers.

The project will include demonstrations of several of the above areas of innovation in different pilot cities across Europe. Each demonstration will involve several modes of transport including public transport. Pilot cities would preferably be characterised by different: topologies, means of transports, urban dynamics, socio-economic and cultural trends, city growth and development profiles. The outcomes should be the development of new integrated mobility services and associated products (e.g. predictive and decision support tools for city authorities, personal travel assistant and IT tools for users,…). The project will also develop guidelines for network managers on the research actions listed above.

Strategies can address the movements of goods and people on the network. Specific technological, operational and governance aspects have to be taken into account as well as efficient use of existing services, platforms and solutions already tested and capable to provide some of the key functionalities.

The project will gather multi stakeholder partnerships including local authorities (as policy/decision makers, infrastructure managers, traffic operators, and mobility services providers), public transport authorities/operators, information service providers, traffic system suppliers and technology developers. It will establish links with the Digital Agenda, the EC open data strategy and the ITS and Urban Mobility Action Plans (it should be based on and take into account the work and guidelines developed by the Urban ITS Expert Group) and build on past and existing research activities on urban network management (CONDUITS,

EBSF, CVIS, SMARTFREIGHT, 2DECIDE, EU-SPIRIT[33]). Appropriate links with CIVITAS activities should be established.

Expected impact:

- Contribute to more efficient integrated multimodal network management for cities and their hinterland.
- Upgraded methodologies and tools for traffic planning and operations enabling integrated and multi-modal management.
- Progress towards open systems for traffic solutions enabling a faster market deployment of ITS in urban areas.
- Improved understanding of people mobility behaviour and freight movements across the modes, especially public transport and soft modes.
- Integration of public transport and soft modes in traffic planning and operations, including in supporting ITS.
- Improved user experience in multimodal transport services
- Support the use of standards to achieve open traffic systems (in particular for data model and data exchange interfaces) in order to accelerate dissemination.
- The project is expected to identify possible follow-up actions to be supported through other sources of funding, thus widening opportunities for future deployment.

SST.2013.3-2. Implementing innovative and green urban transport solutions in Europe and beyond

Level 1 - CSA-CA - Call: FP7-SST-2013-RTD-1

Content and scope: The active take up and transfer of experience between European cities and cities across the world can accelerate the deployment of innovative and green urban transport solutions.

The aim of this action is twofold:

1) To develop and implement the take-up of innovative and green urban transport solutions (e.g. network management, clean vehicles, public transport, transport infrastructure, city logistics) which are adapted to the specific framework conditions of cities across the world. Beyond a structured take up of innovative solutions, the action will develop recommendations for future cooperation between European cities and cities across the world and in particular from Latin American Countries, China and Singapore.
2) To share experiences of topic of common interest and propose innovative and green urban transport solutions (e.g. in the area of public transport, transport infrastructure, city logistics) which are adapted to the specific framework conditions of cities from Mediterranean partner countries. The action will develop recommendations for future research cooperation.

The proposal should take into account the results of previous and on-going EU research activities on international cooperation[34] and other projects which have developed results at

[33] More information on the projects can be found on the website of the Transport Research Knowledge Centre (http://www.transport-research.info)

[34] Such as the FP7 projects SIMBA, VIAJEO and STADIUM on ITS, TRANSAFRICA on public transport, TURBLOG on city logistics, and EUTRAIN on international cooperation in transport research. More information on the projects can be found on the website of the Transport Research Knowledge Centre (http://www.transport-research.info).

European level of great interest for international cooperation.[35] Appropriate links with the related bilateral research cooperation frameworks should be established.

Expected impact:

- Foster the deployment of innovative transport solutions in Europe and across the world to address global challenges and contribute to reach the objectives set up by the European Union in terms of sustainable urban mobility, energy efficiency and fight against climate change.
- Support the structured transfer of innovative transport solutions promoted by the European industry to other regions of the world, thus contributing to the competitiveness of European companies.
- Contribute to a better global dialogue among policy makers and practitioners in urban transport from Europe and other industrialised and emerging countries.
- Develop research cooperation with Mediterranean partner countries in the field of urban transport.

SST.2013.3-3. Capitalising CIVITAS knowledge and experience

CSA-CA - Call: FP7-TRANSPORT-2013-MOVE-1

Content and scope: The aims are to capitalise knowledge gained in previous CIVITAS ('City-Vitality-Sustainability' or 'Cleaner and Better Transport in Cities' initiative) phases, strengthen the role of public authorities in stimulating transport innovation, and provide a bridge to the Union's next research and innovation programme. This action should promote wider uptake of CIVITAS measures and develop capabilities relevant to the transport White Paper goals, building on existing support actions - including POINTER, VANGUARD and CATALIST - as well as relevant projects funded under CIVITAS, ELTIS, etc. Actions should include:

1) Development of CIVITAS Thematic Groups: Centred around a core of CIVITAS cities, Thematic Groups comprising a broad range of interested stakeholders will be established for the eight CIVITAS measure categories and for areas such as transport planning, citizen engagement, etc. Thematic Groups will stimulate programme-level knowledge transfer, dissemination, and long-term evaluation.

2) Establishment of CIVITAS Advisory Groups: Based upon CIVITAS experiences, Advisory Groups will support development and implementation of strategic initiatives, anticipating the Union's next research and innovation programme, and informing EU urban mobility policies in the Action Plan on Urban Mobility and the White Paper 'Towards a single European transport area", etc. Advisory Group coverage should include, but not be limited to:

- Sustainable Urban Mobility Plans, urban mobility performance audits and Urban Mobility Scoreboard
- Quality public transport and co-modality
- New mobility concepts for personal transport
- Sustainable urban logistics
- Access restrictions

[35] Such as NICHES and NICHES + on the take up of innovation for a more sustainable urban mobility, EBSF on public transport, and CITYMOVE, CITYLOG and SMARTFREIGHT on urban logistics. More information on the projects can be found on the website of the Transport Research Knowledge Centre (http://www.transport-research.info).

- Safe walking and cycling
- Understanding and promoting behavioural change
- Role of public procurement schemes in stimulating market introduction of innovative transport systems
- International co-operation
- Other such working groups as may be relevant to White Paper objectives

The coordination action will provide the secretariat for groups. Each Advisory Group should include, as appropriate, public- and private-sector experts, the research community and legal and financial expertise. Activities could include reviews, surveys of CIVITAS Forum cities, elaborating deployment strategies covering the full innovation cycle; identifying RTD&I priorities; assessing technical and non-technical barriers and policy options and delivery mechanisms that could accelerate deployment, such as public procurement schemes. Sufficient budget should be foreseen to cover experts' expenses associated with the work of the Advisory Groups and to provide for supporting studies, etc.

3) Professional Placements / Exchanges: Support for short-duration placements and exchanges for transport practitioners should be offered on a competitive basis. Placements may involve “lead” cities from the CIVITAS network, able to offer exchanges and /or host training to “learning” city practitioners.

4) Take-up actions: Building on CATALIST, GUARD and NICHES+, this action will develop suitable implementing procedures, involving experienced “lead” cities from the CIVITAS network willing to offer support for transferring know-how of successful measures to “learning” cities – based on competitive calls and on analysis of transferability potential. A CIVITAS Activity Fund will be managed to provide partial financial support to beneficiaries of take-up activities (typically entities from small and medium sized cities not actively participating in CIVITAS). The consortium will build on the approach followed for the previous CIVITAS Activity Fund. This activity should assimilate the results and establish links with the projects under topic SST.2012.3.1-3 “Take-up of transport innovation in urban and regional transport”. This take-up action shall be managed in conformity with the provisions set out in the Financial Regulation and implementing rules applicable to the general budget of the European Communities.

5) CIVITAS National/regional Networks: Budget will be set aside to establish complementary or maintain existing national/regional networks to promote awareness, ensure results dissemination and take-up following the approach taken in already established CIVINET networks.

The coordination action will initiate establishment of the groups in consultation with the Commission – including drafting terms of reference, initiating and managing requests for expressions of interest to participate, convening and managing group meetings, and preparation of group strategy documents. Deliverables will depend on the activity / theme, but will normally include an international state of the art review, technical reports and a strategic plan (action plan) including recommendations for priority actions and indicative budgets for future actions. This support action is required to establish links with the support actions POINTER, VANGUARD, CATALIST and projects supported under topic SST.2012.3.1-3.

Expected impact:

- Stimulate public authorities to introduce innovative transport technologies and systems.

- Detailed recommendations and strategy for priority actions which support delivery of the White Paper and Action Plan goals for sustainable urban mobility.
- Further dissemination, transfer and replication of successful CIVITAS measures.
- Consolidation and structuring of experience and knowledge developed in CIVITAS with a view to informing policy at EU, national and local levels.
- Exploit linkages with other relevant FP7 activities related to urban mobility.
- Grow CIVITAS national networks and CIVITAS Forum membership.
- Capacity building through short duration professional exchange/placement activities.
- Concepts for public procurement schemes and their potential impact on transport system innovation.

Activity 7.2.4. Improving safety and security

Developing technologies and intelligent systems to protect vulnerable persons such as drivers, riders, passengers, crew, and pedestrians. Advanced engineering systems and risk analysis methodologies will be developed for the design and operation of vehicles, vessels and infrastructures. Emphasis will be placed on integrative approaches linking human elements, structural integrity, preventive, passive and active safety including monitoring systems, rescue and crisis management. Safety will be considered as an inherent component of the total transport system embracing infrastructures, freight (goods and containers), transport users and operators, vehicles and vessels and measures at policy and legislative levels, including decision support and validation tools; security will be addressed wherever it is an inherent requirement to the transport system[36].

SST.2013.4-1. Ships in operation

Level 2 - CP - Call: FP7-SST-2013-RTD-1

Content and scope: The aim of this research is to ensure the safety of ship operations in view of the introduction of new IMO (International Maritime Organisation) standards related to energy efficiency, in particular the EEDI (Energy Efficiency Design Index). Starting from the new IMO regulations, particular focus will be given to the development of right methods, tools and procedures to facilitate and support the safe design and operation of a wide range of ships in compromised situations, in severe seaways, in restricted waters and during manoeuvring, accounting also for interaction with other vessels, maritime structures and the environment. Furthermore, focus should also be placed on the necessary safety requirements of other types of vessels, currently not covered by the EEDI, such as tugs and offshore service vessels in anticipation of future energy efficiency requirements for these segments.

Activities will include:

- The development of high fidelity tools and processes for accurate and efficient analysis of safety and performance sensitive hydrodynamic problems in complex and/or extreme sea operational conditions, including intact stability performance (surfing/broaching, rolling, extreme motions) and added resistance.
- Extension and validation of hydrodynamic analysis codes for ships manoeuvring performance in safety-sensitive environment such as confined waterways, including

[36] The above text is a reproduction of the text included in the Council Decision on the Specific Programme Cooperation regarding this activity. The topics and areas open in each call for proposals do not necessarily have to cover all the issues mentioned in this text.

particular aspects of shallow water hydrodynamics and slow speed behaviour as well as the interaction with other vessels and stationary structures in diverse environment and weather conditions.
- Adaptation of multi-objective optimisation and integrated design environments for holistic operational performance and minimum powering requirement predictions to ensure safe application of the design rules guaranteeing at the same time the right balance between safety, economic efficiency and greenness.
- The provision of technical input position paper to the Commission based on the project results to support, when requested, the activities of EU services within the IMO framework.

Research can address all ship types, including non-cargo ships such as tugs and offshore service vessels, but proposals should clearly identify the ship type(s) as well as the condition of operation concerned by the research project. Participation of ship owners and operators, classification societies and ports will be considered as an asset.

Expected impact: Results should contribute to enhance the safety of vessels in compromised situations while respecting regulatory environmental constraints. Projects will contribute to the strengthening of technical knowledge as inputs to negotiations in IMO.

SST.2013.4-2. Inspection capabilities for enhanced ship safety

CP - Call: FP7-TRANSPORT-2013-MOVE-1

Content and scope: The last decade has seen a surge in the shipbuilding markets placing the shipbuilding process and its monitoring by administrations and classification societies under unprecedented strain not only in terms of technology and resources, but also in terms of quality management and risk management. These changes need to be taken into account to improve the EU capabilities to manage ship safety and environmental risks especially (but not only) for long-term prevention. There is a need to critically consider the circumstances and changes which have taken place in the industry in the past decade and develop methodologies to identify vulnerabilities and associated risks for safety and put in place the necessary corrective actions. This should transcend the actors' routine quality and risk management practices and should be integrated as appropriate in their usual activities.

The proposals should consider:
- How to involve the key stakeholders to coordinate their efforts towards a more horizontal and harmonised approach instead of individualistic and isolated strategies for safety procedures.
- Ways to collect and use knowledge and experience gained by real incidents and near-loss cases, which currently remain neglected and unaccounted for, leaving room for these unsuppressed risks to reoccur.
- Results of relevant projects (including failures).
- Other practices (and technologies) from other sectors facing matters of compliance with safety regulation such as air transport, nuclear and refinery industries.

The aim is to provide appropriate support to recognised organisations, port state control authorities, coastal and flag administrations and shipyards by:
- Developing methodologies for improving existing risk management procedures and processes for inspections, incident detection and recording, compliance monitoring,

contingency plans and emergency responses which address risk issues arising from the current practices in shipbuilding and certification.
- Addressing the technical capabilities needed to support the implementation of the above mentioned enhanced methodologies, including the dynamic collection processing and use of real time information.

Through the close cooperation and involvement of the relevant actors, the prospective project should assist the recognised organisations to fulfil their obligations under Regulation (EC) nº 391/2009 to improve the effectiveness of ship plan approval, certification and inspection, and to assist the identification and monitoring of high-risk ships.

Active participation of class, ship-owners, shipyards, equipment manufacturers, maritime authorities and researchers would be a critical success factor. The review of the above mentioned actors' current policies, strategies and the operational responses will be fundamental for this activity. The results should lead to the development of a comprehensive preventive policy.

Expected impact: The expected impacts are the enhancement of the above mentioned actors' current policies, strategies and the operational responses and the development of a comprehensive preventive policy, which will be based on:
- Methodologies and tools:
  - Enabling recognised organisations and regulatory authorities to assess and upgrade their risk management processes in a way that any risks generated as a result of the strain suffered by the shipbuilding and certification process as described above will be properly addressed.
  - Enabling more efficient coordination of inspection scheduling, and monitoring/managing vulnerabilities particularly by sharing information on incidents and near-loss cases.
  - Identifying and monitoring ships at risk.
  - Defining preventive actions over time, performing risk analysis, evolving risk control options, cost benefit analysis and decision making recommendations.
- Improved technologies in inspection, repair and verification of ship structures, also considering vessel health-status information through real time information from 'intelligent' sensors, enabling the realisation of more targeted and time efficient inspection processes.
- Formulation of unified risk-management tools like vulnerability databases recording critical information such as risk sources, risk evolution trajectories, near-loss incidents and efficiency of contingency procedures.

SST.2013.4-3. Biomechanics and advanced digital human body models and testing for vehicle safety

Level 1 - CP-FP - Call: FP7-SST-2013-RTD-1

Content and scope: Advanced vehicle safety systems of the future will have to be able to provide optimum protection to occupants of all sizes, weights and constitutions including children and elderly people with their specific biomechanical characteristics and physical movements in critical pre-crash and crash situations. For this purpose, numerical and experimental tools of the human body with increased level of details are needed. The use of digital human body models (DHBMs) and virtual testing allows covering a wide range of traffic scenarios, vehicle designs and equipment, and human diversity (size, age, gender,

disabilities, etc.) and also to develop procedures to validate vehicle subsystems such as the restraint systems.

Research will cover the following aspects:

- Development of advanced DHBMs with a clear focus on model robustness and acceptance by the industry, regulatory bodies and consumer organisations. Work should also include validation procedures and tools, standardised range of biofidelic human occupant models and statistical modelling strategies to be possibly used also for further development of crash test dummies. A clear focus on uncovered population segments such as females, children or elderly people, and uncovered characteristics in accidents conditions like submarining or misuse of restraint systems should be given.
- Virtual testing methods with a high bio-fidelity and injury prediction capability which will help to get a better understanding of human-like reactions and injury risks in road accidents. Current findings from ergonomics studies should be taken into account and be integrated into existing DHBMs to make them more suitable for virtual design of passive safety systems and for virtual crash tests.
- Methodologies, tools and numeric solutions allowing time and cost effective extension of biomechanical databases with new biomechanical properties of human bodies (like physical and physiological parameters, movements) in respect to age, sex, posture, etc. Methodologies should also be found to create and efficiently maintain a database of general motions of human bodies. A sustainable business model, including licensing of data, should be elaborated.

For the implementation of the research findings close cooperation with European and international stakeholder groups representing industry, governments and customer organisations is a prerequisite to ensure that these research outcomes will deliver future products, more effective regulatory procedures and customers' acceptance. Cooperation with partners from other parts of the world (e.g. US, Japan) should be considered.

Expected impact:

- Contribute to the best possible level of road safety, even beyond the common objective proposed by the European Commission in 2010[37].
- Build critical mass around International research investments in Open Source Virtual environments to develop improved injury criteria
- Better understanding of the specific biomechanical characteristics and physical movements of occupants in critical situations and accidents.
- Developing numerical tools with biofidelic kinematics and realistic injury predictions for the design and assessment of integrated safety systems.
- Recommendations and proposed methods for the implementation of numerical tools in regulations and consumer testing.
- Developing a methodology for the validation of vehicle restraint systems using virtual testing tools.

[37] Towards a European road safety area: policy orientations on road safety 2011-2020.

CHALLENGE 3. COMPETITIVENESS THROUGH INNOVATION

The strengthening of the competitiveness of European transport industry through innovation**,** as competition from developed and emerging economies is intensifying in a global economy.

Activity 7.2.5. Strengthening competitiveness

Improving the competitiveness of transport industries, ensuring sustainable, efficient and affordable transport services and creating new skills and job opportunities by research and developments. Technologies for advanced industrial processes will include design, manufacturing, assembly, construction and maintenance and will aim at decreasing life cycle costs and development lead times. Emphasis will be placed on innovative and improved product and system concepts and improved transport services ensuring higher customer satisfaction. New production organisation including the supply chain management and distribution systems will be developed[38].

SST.2013.5-1. Technical requirements for the certification of new materials for railway rolling stock

Level 2 - CP-FP - Call: FP7-SST-2013-RTD-1

Content and scope: The necessary decrease of the energy consumption, as well as the increase of capacity for high speed and high capacity freight trains, must be supported by lightweight railway rolling stock. Therefore the evolution of the rolling stock requires the implementation of new materials similar to those used in other industries. The first step will be to face the challenge of certification of safety related components that will make use of innovative material in an industry where safety is of primary importance.

The research activities should include:

- Benchmarking the most promising materials (being) developed in other sectors able to be implemented in the railway rolling stock industry.
- Gaining a better understanding of new materials behaviour and consequences of their use given the specific safety standards and conditions of the railway sector. Specific attention should be paid to the impact of ballast, especially by modelling.
- Investigation of the influence of the characteristics of new materials on the maintainability of rolling stock, in order to consider their use in the overall vehicle life cycle.

Expected impact:

- Identification of the requirements for the new materials in terms of reliability, maintainability and safety.
- Development of standards, especially in terms of safety, for railway rolling stock, able to allow and support the development and use of new lightweight materials.
- Reduced energy consumption of rolling stock by introduction of new lightweight materials.

[38] The above text is a reproduction of the text included in the Council Decision on the Specific Programme Cooperation regarding this activity. The topics and areas open in each call for proposals do not necessarily have to cover all the issues mentioned in this text.

SST.2013.5-2. Low cost flexible automation and mechanisation in small to medium shipyards

Level 1 - CP-FP - Call: FP7-SST-2013-RTD-1

Content and scope: The objective of this topic is to strengthen the competitiveness of shipbuilding industries, in particular SMEs, through innovative and cost-effective processes while developing new skills and job opportunities in this sector. Focus will be put on low cost automation and mechanisation for shipyards processes including design, engineering, basic material processing, assembly and outfitting.

For defined processes, activities should include:

- The identification of technical needs and development of cost models for low cost, flexible automation and mechanisation based on typical production volume throughput of European small-medium size shipyards building, repairing, converting and maintaining ships.
- The identification of automation solutions matching the technical requirements for design, engineering, basic material processing, assembly and outfitting, which have proven reliability within the large shipyards and are relevant for the needs of European small-medium size shipyards, including solutions from outside the shipbuilding industry.
- The development and testing of business models that include cost-effective flexible solutions for shared facilities, equipment and/or human resources.
- Demonstration of selected automation and mechanisation solutions in small-medium size shipyards with subsequent evaluation of the relevance and efficiency of these technologies, including cost-benefit aspects and human skills requirements.
- Establishment of a development scheme for adapting promising automation and mechanisation solutions to the needs of European small-medium size shipyards with focus on material processing, assembly and outfitting.
- Development of specific training programmes in the domain of mechanisation and automation specific to the shipbuilding industry.

SMEs active in the shipbuilding sector should have major roles in the consortium and share around 50% of the requested EU funding. The participation of a major shipyard will be considered as an asset.

Expected impact: Results are expected to raise the competitiveness of small-medium shipyards, reinforce the role of SMEs, and increase the availability of technical skills suitable for the shipbuilding industries. All solutions should ensure a minimal environmental impact in shipyards.

SST.2013.5-3. Innovative, cost-effective construction and maintenance for safer, greener and climate resilient roads

Level 1 - CP-FP - Call: FP7-SST-2013-RTD-1

Content and scope: Challenges currently facing Europe's road infrastructure network include investment at a time of economic stringency, deterioration of existing infrastructure and the susceptibility of today's road systems to climate change. Research will focus on the development and demonstration of more effective and safer design, construction and maintenance processes which will address both the renovation of existing road infrastructure

and the construction of new road infrastructure. Inherent to this is the need for common measurement systems to assess road surfaces for new and maintenance work approval. Only an optimised interaction between functional properties of roads (such as skid, rolling resistance and noise characteristics) can lead to a high level of road safety while ensuring the most positive greening effect, through reduction of CO_2 output and noise emissions, and adaptation to climate change, contributing to the health and well-being of road users and those in the neighbourhood.

Activities will cover one of the following subjects:

1) Measurement systems: Definition of standards and test methods to measure the impact of road pavement characteristics on safety, fuel consumption and environment. Two key strategic components are:

- The development of guidelines and standards supporting the objectives of European road network development and related EC priorities in terms of safety, noise, environment and energy consumption.
- The provision of harmonised measurement tools to enable consistent assessment of road surfaces properties and tyres.

Complementarity with previous activities, such as TYROSAFE[39], should be ensured. The participation of standardisation bodies is to be encouraged.

2) Design, construction, maintenance and management:

- Tools and techniques of road asset management and renewal, including aspects such as structures, road durability and time stability, energy consumption and environmental impact.
- The development and demonstration of products, services and guidelines for cost-effective construction and maintenance of infrastructure that address one or more of the White Paper issues such as:
  - specially developed freight corridors optimised in terms of energy use and emissions, minimising environmental impacts, improved reliability, limited congestion and low operating and administrative costs;
  - infrastructure upgrades which are resilient to foreseen negative impact of climate change such as rising sea level and more extreme weather including floods, extreme precipitation, droughts and more frequent storms; and
  - maximisation of the positive impact on economic growth while minimising the negative impact of the environment.
- Road infrastructure eco-innovation in areas such as life cycle assessment (LCA), recycling and waste management, and eco-labels for road products and infrastructure.

Selected projects which would address development and deployment of pavement assessment techniques related to moisture in pavements in the context of flooding and/or performance of Warm Mix Asphalt should capitalise on the existing experience available in the USA. It is expected that the US Department of Transportation will fund US projects on these topics and EU selected projects addressing these topics are expected to cooperate closely with the relevant US funded projects. Part of the budget of the EU funded projects should be set aside for associated coordination activities[40].

[39] http://tyrosafe.fehrl.org/
[40] http://www.fhwa.dot.gov/research/partnership/eu-collaboration/

Expected impact:

- Contribute to the objectives of the strategy for a greener, smarter, healthier and more resilient European transport network as set out in the EU Transport White Paper: Roadmap to a Single European Transport Area.
- Products and services that bring about considerable cost-reductions for road authorities and industries and ensuring a wide-European application.
- Guidelines and recommendations for the application and adoption of cost-effective innovation in the road infrastructure sector.
- Standards for the determination of road infrastructure influence on important vehicle performance characteristics (such as safety, fuel consumption and noise).
- Supporting the extension of EU transport and infrastructure policy to our immediate neighbours, to deliver improved infrastructure connections and closer market integration.
- The project is expected to identify possible follow-up actions to be supported through other sources of funding, thus widening opportunities for future deployment.

CROSS-CUTTING ACTIVITIES FOR IMPLEMENTING THE SUB-THEME PROGRAMME

Cross-cutting activities in the Sustainable Surface Transport Work Programme 2013 support the achievement of modal or cross-modal actions which help meeting the three socio-economic Challenges.

SST.2013.6-1. Strengthening the research and innovation strategies of the transport industries in Europe

Level 1 - CSA-SA - Call: FP7-SST-2013-RTD-1

Content and scope: The objective of this action is to strengthening the effectiveness of research and innovation capacities of the transport industries in Europe through improved cooperation between stakeholders, including decision-makers, and enhanced definition of strategic research and innovation needs. The action will assist the transport-related European technology platforms (ETP), the European Commission (EC) and Member States and Associated States (MS/AS) in defining research needs for their strategies and programmes in order to realise the objectives of the Europe-2020 strategy and further on the vision of the White Paper 2011 for a competitive and resource-efficient future transport system.

The action should undertake where appropriate the following activities:

- Updating of research agendas and roadmaps. This includes multi-modal research and innovation areas, which will be elaborated in cooperation with other transport modes.
- The establishment of thematic technological groups on the most relevant technologies to ensure innovative advances by pooling together leading European experts in selected fields, in particular those involved in EU and national research projects and programmes.
- Monitoring of transport research projects from relevant programmes (such as FP7, ENT, JU, etc.), and organisation of workshops to foster innovation aspects.
- Defining implementation plans, including innovation roadmaps and business implementation, based on the research agendas and roadmaps and on the monitoring of

the existing programmes (starting from FP6); this would be an input for the EC and MS/AS.
- Developing links and coordination strategies between the transport-related ETPs and technology platforms existing at national level in MS/AS, in order to avoid duplication of efforts.
- Increasing visibility of research and innovation activities, and contributing to the dissemination of results, through large conferences, thematic events, show cases, databases, website support, newsletters and other publications. Coordination with other large transport events, such as TRA, and cooperation with the Transport Research Knowledge Centre and relevant ERA-NETs need to be ensured.

Three support actions are expected focusing on road, rail and waterborne transport, respectively. Strong and focused consortia must be made-up of leading European experts for transport technologies from both industry and research providers. The implementation of this action requires close collaboration with the ETPs dealing with transport research and innovation (particularly with ERTRAC, ERRAC and Waterborne TP), as well as with other related initiatives and entities. Cooperation with EU services will be an essential element in this support action.

For waterborne transport, dedicated resources and a specific work package should aim to cluster on-going and recently concluded e-Maritime related projects. The purpose is to consolidate and align their developments and support the definition of an EU e-Maritime Framework that will ensure the interoperability of new information systems services for maritime transport and facilitate their take-up in the marketplace.

Note: The project must not subsidise any direct or indirect costs (e.g. secretariat) of the ETP organisations. In kind contributions from additional stakeholders are welcome.

Expected impact: Projects will bring together the leading European stakeholders in transport research to monitor projects, develop roadmaps, and support their implementation. They will contribute to an optimisation of research and innovation strategies, to the improvement of communication, dissemination and use of results as well as to the definition of relevant transport policies.

SST.2013.6-2. Towards a competitive and resource efficient port transport system

CP/CSA-CA - Call: FP7-TRANSPORT-2013-MOVE-1

Content and scope: The objectives of the action are to facilitate ports (maritime or inland waterway) to efficiently handle the increasing freight volumes; to enable seamless logistics chains; to review the restrictions on provisions for port services; to enhance the transparency on ports' financing, highlighting the destination of public funding to the different port activities with a view to avoid any distortion of competition; and to "establish a mutually recognisable framework on the training of port workers in different fields of port activities[41]". The same objectives are at the forefront of the EU transport policy actions[42].

[41] See the 'Social Agenda for maritime transport' of the 2011 White Paper on Transport policy.
[42] The 2011 White Paper on Transport policy identifies the need for a strong and highly specialised labour force to tackle the expected growth and change of job profiles in ports.

This topic is aiming to address two particular challenges through two distinct projects. The first focuses on significant differences in current practice in collecting and interpreting ports data that restrict the ability to monitor the evolution, developments and needs of the EU port system. The second is examining the tremendous impacts of innovation[43] dynamics as they become critical for the sustainable development of EU ports. Technological changes and market pressures will drive requirements for mastering innovative port operations and generating the necessary human resources, i.e. people with the right skills, training and qualifications to understand, master and exploit all the advantages provided by the new technologies.

A collaborative project is expected to develop a ports observatory with a set of indicators measuring EU ports performance, activities and developments. The results of the PPRISM project and other relevant work[44], including failures from past projects, should be taken into account. Indicators should initially be identified across five different categories: 1) market trends and structure; 2) logistic chain and operational performance; 3) environment; 4) governance; and 5) socio-economic issues. Starting from a limited set, focussing on the five different categories, forward-thinking should seek possible extensions and elaborations of the set of indicators. This collaborative action should go beyond the port authorities and develop an approach to obtain data from the whole port community: port authorities, terminal operators, shipping lines calling to the different ports, etc. At the same time, it should ensure that inland ports are also covered by the observatory. The implementation will demonstrate that it satisfies stakeholder confidentiality concerns in the management of data. The indicators will be weighted and aggregated in order to have a comprehensive and meaningful output. A balanced representation of ports and port actors across the EU, and possibly the neighbouring countries, will be demonstrated and an easy to use interface for the collection of the data implemented.

To meet the second challenge another project will address sectorial changes and human issues, specifically needed skills, as a component of wider efforts to make EU ports more competitive and resource efficient. The competitiveness of European ports will depend on the ability to innovate and to apply new technologies in an effective and efficient way. The human element is one of the key factors of success. Port industries employees should not only be able to use new systems but to guide innovation. Core elements of the project then should consider processes of terminals and ports, new techniques and technology changes, impacts on performance and evaluate staff development requirements to ensure safe and efficient operations but also to support career development and knowledge building. Relevant results of EU projects should be considered. The action should ensure the active participation of the key stakeholders and facilitate an effective, broad and open dialogue between the social partners within the port sector for pan-European solutions.

Expected impact:

- The first action should produce a knowledge and management tool for monitoring the efficiency and performance of sea and inland ports. It will allow a comprehensive view on port activities, developments and performance and, at the same time, allow for individual ports to compare their activities and operations with the EU average and with

[43] Highly sophisticated port handling equipment technologies and innovations in port processes and logistics.

[44] The EUROSTAT Transport Working Groups, the ECOPorts initiative, individual reporting by ports, the Germanischer Lloyd 'Container Terminal Quality Indicator Standard', the experiences of the shipping-KPI project and others.

ports in other important regions like Asia and the Americas. The results should include appropriate mechanisms to collect, manage and distribute the data on a long term and to show trends over a substantial timeline and a business case to ensure sustainable continuity. For this activity, collaboration with Mediterranean Partner Countries would be welcome.

- The second action should support both the implementation of the International Labour Organization 'Guidelines for Training of Workers in the Port Sector' and the objective of the 'Social Agenda for maritime transport' for the establishment of a mutually recognisable framework on the training of port workers in different fields of port activities. It should identify anticipated human resource demand profiles, skill and training needs for EU ports in the 2030 horizon. It should facilitate consensus building on the next steps that need to be made in accomplishing the objectives of a sustainable and efficient EU port system.

SST.2013.6-3. Organisation of Transport Research Awards for the Transport Research Arena (TRA) conference

Level 2 - CSA-SA - Call: FP7-SST-2013-RTD-1

Content and scope: The objective of this action is to organise two competitions for transport research awards to be announced at the TRA conference in 2014:

- A research student competition with the goal of stimulating the interest among young researchers/students in the field of sustainable surface transport.
- A competition for senior researchers in the field of innovative surface transport concepts based on results only from EU-funded projects.

Both competitions will cover all surface transport modes (road, rail and waterborne) and cross-cutting issues in line with the EC policy objectives for smart, green and integrated transport. The organisation of these awards should ensure high-quality competition and very good media coverage before, during and after the TRA conference.

Expected impact:

- Stimulate young researchers/students to submit their research work to the competition.
- Encourage partners from EU-funded projects to further develop innovative ideas from their projects.
- Directly support the TRA conference as a successful, high quality scientific event which is considered as the first Transport research conference in Europe.
- Efficiently disseminate knowledge and results of European and National research projects in the area of Sustainable Surface Transport and thus improve the coordination of research, technology development and innovation in the Surface Transport sector in Europe.

THE 'EUROPEAN GREEN CARS INITIATIVE'

The 'European Green Cars Initiative' includes three major research and development areas within its RTD pillar: 1) development of electric vehicles for road transport; 2) research for heavy duty vehicles for medium and long distance road transport; and 3) logistics and co-modality.

GC.SST.2013-1. Feasibility analysis and technological development of on-road charging for long term electric vehicle range extension

Level 2 - CP - Call: FP7-SST-2013-RTD-1

Contents and scope: Wide-scale adoption of pure Electric Vehicles (EVs) requires advanced charging solutions which provide a user experience similar to today's cars, particularly in terms of range. In the long term, electric vehicles might be able to collect energy from the road, be it in a conductive or contactless fashion. Compared to the current paradigm of larger installed storage capacity or fast charge or switchable batteries, advanced charging solutions might improve driving range and battery lifetime of the full electric vehicle (FEV) as well as its energy efficiency and price, given the need for a smaller battery.

Research will address the following aspects at the system level:

- Analysis of the feasibility of the possible technological options of on-road charging (including transferring solutions currently proposed for stationary or rail mobile applications to light duty vehicles and possible extension to buses and medium trucks for urban applications) and their testing and comparison in terms of the main parameters such as cost, transferable power and efficiency, and infrastructure requirements.
- The impact on the vehicle in terms of architecture and capacity of the on-board energy storage systems should be assessed.
- The ergonomics of driving while in charging mode and potential links with (semi) automated driving benefiting from the presence of the charging line; the potential of related technologies like platooning should be explored.
- Development and technological demonstration of one selected charging option in terms of the required on-board and on-infrastructure energy transfer technology, maximizing efficiency and instantaneous energy transfer rates.
- A comprehensive assessment of impacts of the selected on-road charging option related to:
  - Economics (capital and operating cost impacts on the vehicle and on the infrastructure) including business cases for the gradual introduction in urban and extra-urban roads
  - The distribution network and the electricity generation. High power connections will be required for on road charging and some of the power use may be shifted to peak hours. The assessment should include opportunities for renewable energy use in different stages of deployment.
  - Assessment of pavement construction and maintenance requirements, including interaction with other technological infrastructure in or below it. Assessment of impacts on road infrastructure should be part of the demonstration of the charging technology.
  - Environment, including a life cycle assessment of environmental impacts, risks and benefits of the entire proposed solution for continuous charging of the vehicle, including the vehicles, the infrastructure and the energy production and distribution, comparing it with the current reference cases of slow and fast charging FEVs and range extended/plug in hybrids.
  - Safety (including EMC) and health impacts on electronic systems, vehicle occupants and on persons and animals close to the infrastructure.
- Assessment of the needed ICT solutions to support the driver and charging energy costs, including data security and privacy issues.
- Measures enabling the staged deployment of charging infrastructure and the required harmonisation and standardisation

Strong links should be established with running EU and national funded projects in the same area, particularly as far as charging technologies are concerned. Furthermore, the project is expected to establish cooperation and to coordinate with relevant projects under the NMP, Environment, ICT and Energy programme to jointly support the 'European Green Cars Initiative'. The participation of SMEs is particularly encouraged.

The projects financed under this topic will contribute to the objectives of the Smart Cities and Communities Initiative.

Expected impact:

- A global feasibility and demonstration study of the on-road charging concept capable of orienting future activities while highlighting the relevant social, environmental and economic issues and any technological gaps.
- Provide evidence on environmental, economic and energy system benefits of advanced on-road charging options.
- Advanced steps for bridging technological gaps and bringing about a rational solution for both the grid and the road infrastructure.

GC.SST.2013-2. Next generation electric motors

Level 2 - CP-FP - Call: FP7-SST-2013-RTD-1

Contents and scope: The energy efficiency and affordability of pure electric vehicles can be improved by next generation of electric motors. Improved materials or substitutes could deliver higher and tailored output while reducing weight and volume. The scarcity and the recyclability of such materials should also be addressed considering the mass introduction of next generation electric vehicles.

Research will focus on:

- Weight reduction and power density increase.
- Increased efficiency, including smart packaging of power electronics and integrated thermal management.
- Optimised design and processes for manufacturing and dismantling.
- Novel or substantially improved materials for permanent magnets replacing or greatly reducing rare earths content, or innovative magnet-free designs.

Expected impact:

- Increased energy efficiency over a wide range of EV operating conditions.
- Reducing cost towards mass use in next generation electric vehicles.

GC.SST.2013-3. Future light urban electric vehicles

Level 1 - CP-FP - Call: FP7-SST-2013-RTD-1

Contents and scope: The objective is to close the gap between bikes/mopeds and cars by developing light, affordable, safe, ergonomic and energy efficient electric vehicles (at least two seats and three wheels) meeting customer expectations in all weather conditions. The focus is on passenger applications (although freight delivery derivatives can be expected) and on the global vehicle architecture and design.

Research under this topic will use technologies and components which are either off-the-shelf or covered in previous calls (no specific technology development of components) to address collectively the following aspects:

- Optimised weight through innovative materials and system integration.
- Safe and integrated chassis and body shell design to achieve similar occupant safety level than in normal passenger cars despite worse conditions by using optimised crash detection mechanisms and actuators (restraints and structures); high compatibility design.
- Extremely low energy consumption with purely electrical braking providing enhanced recuperation capability with respect to the state of the art and advanced stability systems. This research should also consider the possible failure modes and give attention to any regulatory requirements for such systems.
- Assembly line capable designs based on low energy consuming manufacturing processes.
- New business approaches, based on reasonably low budgets and leading to novel supply chains

Expected impact: Vehicle prototypes will demonstrate the following performance:

- 40-80 Wh/km energy consumption in real urban driving corresponding to the given weight bracket.
- At least 150 km pure electric range in real urban driving including the use of comfort accessories.
- Compelling acceleration (0 to 100 km/h in 10 s).
- Best in class protection for the driver and passenger and for pedestrians in EURONCAP crash tests, with highly compatible design.

GC.SST.2013-4. Demonstration of electric buses as urban public transport

CP - Call: FP7-TRANSPORT-2013-MOVE-1

Contents and scope: The White Paper 'Roadmap to a single European transport area' calls for a transition from a car based personal mobility to a public transport based mobility. Public transport plays also an important role in mitigating the negative effects of transport in urban areas such as congestion, greenhouse gases and pollutants emissions. Clean, energy efficient and silent buses will contribute to meet these objectives. A large demonstration project will facilitate the market take up of electric buses in Europe. The fleets of urban buses will include the main types of electrification technologies dealing with different scenarios of interaction with the electricity grid. The proposal time frame should be designed to take on board latest development in EU or national programs and latest available innovative industrial technologies for all vehicle categories considered. Existing local or regional demo projects and new projects could be coordinated in this demonstration project.

The activities to be carried out should include:

- Demonstration of the use of electricity as energy vector for urban buses in a wide range of real-life operating conditions. The project could demonstrate innovative electric buses with different types of electrical power train systems covering plug in hybrid to full electric technologies. Fuel cells buses should be excluded from the proposal. Focus should be on vehicles with interaction with the grids. The demonstration sites should provide various climatic and geographical conditions. Coordination of existing local, regional or national demonstration programs is an asset.
- Assessment of the infrastructure optimisation and bus-to-grid interaction scenarios.

- Development of standards, investigation of safety issues, and technology validation for performance, durability and costs.
- Assessment of the impact on energy and environment, including a well-to-wheels analysis.
- Communication, dissemination of information, and education.

The project should have a predominant demonstration component. The marginal cost associated with the innovation element compared to state-of-the-art vehicles will be considered as eligible cost. A typical consortium could include cities or regional authorities, fleet operators, vehicle and equipment manufacturers, utilities, research centres and universities.

This activity should assimilate the results of previous FP7 research projects on buses and establish links with the projects under topic SST.2012.3.2-1 'Coordinating innovation for efficient bus systems in the urban environment', topic GC-SST.2012.1-7 'Demonstration of urban freight electric vehicles for clean city logistics', and FP7 project 'Green emotion'.

The projects financed under this topic will contribute to the objectives of the Smart Cities and Communities Initiative.

Expected impact: This project should clarify the viability of the different types of electrical buses for immediate market introduction within urban areas. The expected impact of this project is an acceleration of the market roll-out of electric buses in order to meet EU policy objectives. The project should facilitate pre-commercial procurement and foster innovation in the public sector. The project should also help to clarify possible support for further deployment of electric buses in European cities through European Investment Bank instruments.

GC.SST.2013-5. Configurable and adaptable truck

Level 2 - CP - Call: FP7-SST-2013-RTD-1

Contents and scope: Today trucks are designed and optimised towards a limited variance set of usage and for maximum payload. In the future there will be an increasing need for optimised load efficiency for each mission of a truck, and for optimising the freight carried on a finite length of road. The objective of research is to develop innovation solutions for the truck and load carrier design to have an integrated approach on configuration and adaptation of the vehicle concepts. Both the design phase (e.g. new tractor-trailer architecture) and the operation phase should be considered. A key aspect in the design phase is to have a modular drive line for rightsizing the vehicle combination with respect to the transport assignment while keeping vehicle performance (e.g. stability). In the operation phase, the vehicle combination should be adapted to the actual driving environment (i.e. traffic situation, topology, and payload). The implications of vehicle and convoying concepts for the infrastructure should also be considered. The project should also investigate legal constraints and harmonisation issues across the EU, e.g. engine certification, vehicle combination dimensions, etc. and identify possible deployment scenarios.

The following issues should be addressed by research:

- Optimised trucks design for transport mission.
- Configurable truck (tractor and trailer) and load carrier concepts.
- Energy tailored driveline, with a modular approach for rightsizing.

- Total truck – trailer architecture including modular powertrain.
- Distributed driveline including high level of hybridisation.
- Consideration of the infrastructure (pavement and bridge) needs: including methods to overcome any negative consequences from future types of trucks which may result from different distributions of axle loading (distributed driveline) or overall weights and dimensions.

The project should include the development of a demonstrator of complete vehicle combination and requirements on modular tractor and trailer design.

Expected impact: Viable concepts for better matching and combination of truck and load carrier to different types of transport assignments together with the infrastructure construction and maintenance aspects that will lead to an improved load efficiency both from an energy (estimated to 25% less energy/t.km, drag reduction, driveline and transport mission rightsizing,) and infrastructure service usage point of view.

GC.SST.2013-6. High efficiency energy conversion for future heavy duty transport

Level 1 - CP-FP - Call: FP7-SST-2013-RTD-1

Contents and scope: The aim of research is to develop innovative complete high efficient energy conversion concepts for heavy duty trucks.

Research may include:

- innovative power converters (with a level of demonstration, and therefore funding, coherent with the level of maturity of the concept);
- engine downsizing concepts, e.g. dynamic cylinder deactivation;
- refined combined cycle systems, with e.g. heat, steam or fuel cell systems;
- drive train concepts reducing the transient environment for the engine, e.g. by dynamic energy storage offering optimisation potential of the engine; etc.

These converters must be designed to be operated in combinations with highly efficient integrated after-treatment solutions. A new generation of total driveline control architectures should be developed which utilise the potential of the new energy converter concept in an optimal combination with truck energy usage and energy recovery systems on-board.

Expected impact: Demonstration of new innovative energy conversion concepts which reach a system efficiency well above 50% at acceptable costs with the capability of achieving Euro VI emission levels in real life by PEMS[45] measurements with a 1.2 multiplier.

GC.SST.2013-7. Technical and operational connectivity in intermodal freight transport

Level 1 - CP-FP - Call: FP7-SST-2013-RTD-1

Contents and scope: Ports, freight terminals and the transport industry are confronted with

- ever increasing volumes to handle (continuous volume growth over the years as well as increased vessel sizes);

[45] Portable Emissions Measurement Systems

- new logistic concepts applied by shippers such as co-modality and synchro-modality, the latter offering companies the ability to time and again select the most appropriate mode of transport for a particular moment and circumstances;
- the need for innovative transhipment technologies allowing cost efficient integration of small and voluminous container flows and the sharing of transport volumes which may e.g. require stop and go operations in addition to point to point shuttle services;
- the fast growing development of e-freight applications and networks for a secure, reliable and efficient platform for digital information exchange for global trade and logistics; and
- the growing development of port - hinterland networks.

The objective of this topic is to increase the individual and co-operative performance quality and throughput of ports and terminals through the development of innovative technologies, infrastructures and e-freight solutions. Research under this topic will address the following aspects:

- Next generation of environmental friendly safe and efficient "Automated Guided Vehicles" for the transport of goods within ports/terminals or beyond fenced spaces, i.e. between ports/terminals, and supportive infrastructure.
- New transhipment technologies, new management and software tools, including information systems to improve visibility and access to data in order to promote the generation and use of multimodal routes for goods transport.
- Low-cost innovative connectivity solutions based on existing, freely available components, which may include upload and download facilities, document sharing facilities with access authorisation mechanisms, electronic document readers, a basic data model that is in line with existing international standards, and dashboard functionality. Functional requirements and main components for modular connectivity solutions in international trade should be addressed.

Cooperation with Mediterranean partner countries is encouraged.

Expected impact:

- Efficient and safe port and terminal operations.
- Efficient, safe low environment impact use of transport means within and between ports and terminals.
- Contribution to the open up of e-freight developments to a wider community, notably SMEs and link them up with networks that are being developed predominantly by big companies.
- Development of easy to use and affordable software solutions and demonstrate connectivity solutions (in particular for SMEs in the transport sector) in different trade lanes, within the European Union, and between European Union and third countries, for different purposes, with special attention for the ease of use, low entry barrier, possibilities for quick connect and disconnect, and possible business models.
- Assessment of the benefit for international trade of a general roll out of this type of connectivity solution.

"THE OCEAN OF TOMORROW – 2013: JOINING RESEARCH FORCES TO MEET CHALLENGES IN OCEAN MANAGEMENT"

Fostering research and innovation on marine technologies

Aims of the call

The EU Strategy for Marine and Maritime Research[46] supports the EU integrated maritime policy's objective of a thriving and sustainable maritime economy. It is a key component in reconciling the growth of maritime activities with environmental sustainability and thus it contributes to the 'Europe 2020' goal of smart, inclusive and sustainable growth for Europe. In this context, "The Ocean of Tomorrow" calls for proposals aim to foster multidisciplinary approaches and cross-fertilisation between various scientific disciplines and economic sectors on key cross-cutting marine and maritime challenges.

"The Ocean of Tomorrow 2013" third cross-thematic call will focus on marine technologies. The development of competitive and innovative marine technologies is necessary to assess and monitor the good environmental status of the seas, monitor current and new activities and contribute to their sustainable operation. "The Ocean of Tomorrow 2013" call will therefore aim at pooling the efforts of stakeholders from various disciplines and sectors in order to develop innovative marine technologies for a wide range of applications.

Three key areas will be tackled: sensing technologies that are necessary to improve reliable measurements of key parameters in the sea, new materials that can avoid bio-fouling on mobile and stationary structures, and innovative transport and deployment systems for the offshore energy sector.

The call will be implemented jointly between Theme 2 "Food, Agriculture and Fisheries, and Biotechnology" (FAFB), Theme 4 "Nanosciences, Nanotechnologies, Materials and new Production Technologies" (NMP); Theme 5 "Energy", Theme 6 "Environment (including climate change)" and Theme 7 "Transport (including Aeronautics)".

"The Ocean of Tomorrow 2013" call fiche with all relevant information can be found in the Work programme of Theme 2 "Food, Agriculture, Fisheries and Biotechnology" (FAFB), as well as on the Participant Portal under the call page FP7-OCEAN-2013.

OCEAN 2013.1. Biosensors for real time monitoring of biohazard and man-made chemical contaminants in the marine environment

Call: FP7-OCEAN-2013

Due to growing concerns about the health of the oceans and their capacity to continue to provide resources, goods and services as well as associated risks to the human health, there is an increasing demand for real-time monitoring of the environmental status of marine water quality and the provision of early warning systems. Real-time in situ monitoring of marine chemical contaminants (including emerging pollutants, biohazards e.g. algal toxins) is of

[46] COM (2008) 534 final of 3.9.2008 - Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions: "A European Strategy for Marine and Maritime Research: A coherent European Research Area framework in support of a sustainable use of oceans and seas".

utmost importance for the sustainable management and exploitation of the seas and their resources.

Technology wise, marine biosensors have the potential to offer unique features for highly specific and precise measurements, including under multi-stressor conditions, by combining technological elements (including nanotechnologies) and bio-receptors in a single measurement device. Thus they could open new avenues to respond to the growing need for accurate real time monitoring of the quality of sea water and marine ecosystems to support relevant EU legislations such as the Marine Strategy Framework Directive (MSFD)[47].

Based on most recent knowledge on genomics and physiology as well as on materials, nanotechnology, information technologies and relevant existing detection/monitoring technologies, the research under this topic should aim at developing innovative real-time, in situ biosensors, taking advantage of nanotechnology when applicable. These sensors should target the detection and monitoring of high impact and presently difficult to measure emerging pollutants and other substances, such as algal toxins and their producers, synthetic organics, herbicides/pesticides and persistent organic pollutants (POP), including polycyclic aromatic hydrocarbons (PAH) and should enable early diagnosis of deterioration of the environmental status of the marine waters in multi-stressor conditions.

The proposals should include a test phase to demonstrate the potential of these biosensor(s) for in situ environmental and/or aquaculture related applications. Measurement devices should show ability to compete with/complement non real time alternatives and provide faster, less expensive, and less time-consuming measurements than the currently available instrumental analytical methods. A proof of concept in terms of product and/or process should be delivered within the project demonstrating industrial manufacturability.

The multi-disciplinary approach of the research undertaken is essential to address the topic. It will be considered during the evaluation under the criterion *Scientific and/or technological excellence.*

The multi-sectoral composition of the partnership and the participation of industrial partners and relevant end-users, in particular SMEs, are essential for the implementation of the project. It will be considered during the evaluation under the criterion *Implementation*.

Funding scheme: Collaborative project
Several projects may be funded within the total budget of the topic (EUR 15 000 000).

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 6 000 000 per proposal.
- Projects will only be selected for funding on the condition that the requested EU contribution going to SME(s) is 25% or more of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

[47] Directive 2008/56/EC of the European Parliament and of the Council establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive), OJ L 164 of 25 June 2008.

Expected impact: New biosensors in the field of marine environmental monitoring will:

- Enable early detection and more effective monitoring of the marine environment and its status and implementation of appropriate management actions in line with the Marine Strategy Framework Directive (MSFD).
- Improve sustainable management and exploitation of marine resources (such as fisheries and aquaculture) in particular the monitoring of quality of shellfish waters and minimise risks to human health.
- Provide competitive advantage and leadership to European industry, for example within the fields of biotechnology, sensor development, diagnostic technologies and nanotechnology.

OCEAN 2013.2. Innovative multifunctional sensors for in-situ monitoring of marine environment and related maritime activities

Call: FP7-OCEAN-2013

There is an urgent need to improve the in-situ component of the ocean observing systems to achieve an appropriate and comprehensive understanding of the functioning of the marine environment at different geographic, temporal scales and the monitoring of marine and maritime activities to ensure their sustainable development. As commercially available sensors tend to be too large, expensive, and power-hungry for widespread use, reducing the cost for acquisition of data is a key priority in order to implement EU legislations such as the Marine Strategy Framework Directive (MSFD), the Common Fisheries Policy CFP), support international initiatives such as the Global Ocean Observing System (GOOS) and the Global Earth Observation System of System (GEOSS).

In this context the topic seeks to develop robust, easily usable across multiples platforms, cost effective multifunctional sensors and their packages that provide reliable in-situ measurements of key parameters. Research and demonstration activities under this topic shall address in a comprehensive manner all the following aspects:

1) Developing cost-effective sensors suitable for large-scale production, taking advantage of "new generation" technologies such as within the fields of miniaturisation, communication, positioning systems, disposable technologies, and IT tools, software, energy storage and usage.

2) Sensors should be compact, autonomous multifunctional integrated packages that could be deployed using free floating devices or, buoys, platforms, or ships of opportunities including fishing vessels. The sensors must be developed as precompetitive prototypes and field tested in close cooperation with stakeholders such as sensor designers, SMEs, managers of monitoring/observing systems, marine industry e.g. fishermen and end-users. An essential part of this topic will be to ensure technology transfer through an integrated approach, bridging between laboratory testing and commercially viable product.

3) Addressing data flow issues, including data acquisition, access and retrieval, storage, transmission, standardisation, and pre-processing. The projects should take advantage of the latest web enablement technology for setting up sensors' networks suitable for open access and data sharing.

4) Making the sensors fully interoperable with existing observing systems and compatible with standard requirement such as the EU Fisheries Data Collection Framework, the Marine

Strategy Framework Directive, the INSPIRE directive[48], the GMES and GOOS/GEOSS initiatives.

The multi-disciplinary approach of the research undertaken is essential to address the topic. It will be considered during the evaluation under the criterion *Scientific and/or technological excellence*.

The multi-sectoral composition of the partnership and the participation of industrial partners and relevant end-users, in particular SMEs, are essential for the implementation of the project. It will be considered during the evaluation under the criterion *Implementation*.

Funding scheme: Collaborative project
Several projects may be funded within the total budget of the topic (EUR 15 000 000).

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 6 000 000 per proposal.
- Projects will only be selected for funding on the condition that the requested EU contribution going to SME(s) is 30% or more of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Expected impact: The projects will:

- Provide a large increase in the temporal and geographic coverage from in-situ marine sensors to enhance the European contribution to Global Monitoring of the Oceans.
- Increase availability of standardised in-situ data that is suitable for integration within key marine observation, modelling and monitoring systems and reduce ocean modelling uncertainty.
- Reduce cost of data collection system in support of fisheries management.
- Advance competitiveness for European Industry and particularly SMEs within the Marine sensing sector.
- Enable better cooperation between key sectors (Manufacturing Industry, ICT, Maritime Industry, Marine Science, Fisheries, etc.).
- Support implementation of European Maritime Policies (MSFD, CFP, IMP, etc.).
- Promote new discoveries leading to better understanding of the seas.

OCEAN 2013.3. Innovative antifouling materials for maritime applications

Call: FP7-OCEAN-2013

Biofouling is a major concern for mobile (e.g. ships) and stationary (e.g. aquaculture cages or offshore power generation systems) maritime structures, sensors and equipments. It negatively affects marine and maritime activities by creating a need for regular maintenance, which is costly, might disrupt operations and is potentially polluting. With the purpose of avoiding toxic biocides and heavy metals used in antifouling coatings, novel alternative cost-efficient and environmentally friendly approaches are needed.

[48] Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE).

The proposals under this topic should focus on developing new, well beyond the state of the art, antifouling materials and should address in an integrative way mobile and stationary maritime applications.

On the basis of a thorough analysis of the state of the art, research could draw on the whole range of antifouling materials e.g. foul release approach, biomimetics, marine biotechnology based coatings, polymers, etc. The proposals should include benchmarking of existing materials, technologies and on-going research. In this sense environmental and economic factors, as well as performance, must be duly considered.

Improvement in the understanding of marine biofouling processes, including their relation with biocorrosion, with respect of the developed materials should be an integral part of the proposals. For the resolution of the technological bottlenecks impeding the achievement of well performing final materials and products, applicants are welcome to investigate and exploit the potential offered by converging technologies such as e.g. materials science and engineering, maritime technology, nanotechnology and biotechnology.

The proposals should include relevant field testing for all the selected applications. Development, improvement and/or standardisation of relevant protocols should be included. Proof of concept in terms of product and/or process should be delivered within the project, excluding commercially usable prototypes (in compliance with European Commission Communication 2006/C323/01), but convincingly proving scalability towards industrial needs.

In the case of marine biotechnology based approaches the issues of supply and the need for the biobased active antifouling compounds to be produced in bulk, as required for final commercial production should be given due consideration.

The proposals should follow a life cycle approach for the new materials and their selected applications also taking into account issues of cost efficiency, effective life span, production, handling, maintenance, environmental impact, ecotoxicological profile and end of life. The proposals should include assessment of the environmental, health and toxicological effects according to REACH[49], OECD Guidelines for the Testing of Chemicals and/or relevant international standards.

The multi-disciplinary approach of the research undertaken is essential to address the topic. It will be considered during the evaluation under the criterion *Scientific and/or technological excellence.*

The multi-sectoral composition of the partnership and the participation of industrial partners and relevant end-users, in particular SMEs, are essential for the implementation of the project. It will be considered during the evaluation under the criterion *Implementation*.

[49] Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

Funding scheme: Collaborative project
Several projects may be funded within the total budget of the topic (EUR 15 000 000).

Additional eligibility criteria:

- The requested European Union contribution shall not exceed EUR 8 000 000 per proposal.
- Projects will only be selected for funding on the condition that the requested EU contribution going to SME(s) is 25% or more of the total requested EU contribution. This will be assessed at the end of the negotiation, before signature of the grant agreement. Proposals not fulfilling this criterion will not be funded.

Expected impacts: The projects will:

- Increase efficiency and competitiveness of maritime activities based on mobile and/or stationary maritime structures (transport, aquaculture, fisheries, marine energy) by reducing operation and life-cycle-costs, negative impacts on the marine environment and, in particular, for the transport sector, CO_2 emissions.
- Enhance competitiveness and sustainability of the European biotechnology, and/or materials related industry.
- Better understanding/assessment the scope of existing antifouling materials and technologies.
- Contribute to the implementation of EU policies, Environment policy (e.g. the Marine Strategy Framework Directive, REACH), Transport policy (Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system) as well as industrial and innovation policy, such as the EU Strategy for Key Enabling Technologies and the Lead Market Initiative on Bio-based products.

OCEAN 2013.4. Innovative transport and deployment systems for the offshore wind energy sector

Call: FP7-OCEAN-2013

In its Communication ‘Offshore Wind Energy: Action needed to deliver on the Energy Policy Objectives for 2020 and beyond’, the Commission underlines that the exploitable potential of offshore wind by 2020 is likely to be 30-40 GW, and in the 2030 time horizon it could be up to 150 GW.

In 2007, the Energy Wind Association assessed that achieving 40 GW by 2020 will mean that 7,800 turbines of 5 MW need to be built over the next 13 years. Those turbines have to be assembled, transported and installed on sites.

The Strategic Energy Technology Plan (SET-Plan) European Wind Initiative identifies transport and logistic issues as key elements for the deployment and maintenance of offshore wind farms. The TP Wind Strategic Research Agenda also points to research needs both in relation to the cost-effective installation, maintenance, operation and decommissioning of large offshore wind farms as well as to transport, logistics and equipment needs.

In its Communication on Strategic goals and recommendations for the EU's maritime transport policy until 2018, the Commission stresses that maritime transport is an important instrument of the European energy policy. Amongst others offshore servicing vessels are considered as increasingly important aspect for ensuring the well functioning of the energy market.

Research activities under this topic shall address the following aspects:

- Development of innovative and cost-effective deployment strategies for large-scale turbines, including building and testing onshore.
- Elaboration of optimal logistical processes and on-land transport links for large offshore structures.
- Design of novel vessel types and equipment for installation, maintenance and decommissioning and validation at reduced scale.
- Development of safety procedures for installation, operation and maintenance activities, regarding both offshore wind structures and the vessels.
- Improved operations and maintenance including the enhanced role of remote condition monitoring and systems with reduced human intervention.
- Development of new business models at European level for large offshore systems based on integrated life-cycle approaches.
- Development of methods and tools to assess the field performance of offshore wind farms servicing vessels and for optimised service activities in terms of lead time and energy usage.

Proposals are expected to include validation activities at reduced but industrially relevant scale using testing models and where possible tests at real scale using existing infrastructure and equipment, adapting those to validate models and management tools. Tests should also address extreme conditions. The proposal should cover both ground based and floating wind parks.

The multi-disciplinary approach of the research undertaken is essential to address the topic. Knowledge exchange with oil/gas and maritime sectors is expected. These aspects will be considered during the evaluation under the criterion *Scientific and/or technological excellence.*

The multi-sectoral composition of the partnership and the participation of industrial partners and relevant end-users, in particular SMEs, are essential for the implementation of the project. It will be considered during the evaluation under the criterion *Implementation*.

In the framework of the SET-Plan European Industrial Initiatives, a specific monitoring and knowledge sharing mechanism will be established under the auspices of the Commission and the selected project will be expected to participate.

Funding Scheme: Collaborative project
Up to one project may be funded.

Additional eligibility criteria:
The requested European Union contribution shall not exceed EUR 10 000 000 per proposal.

Expected impact*:* The project will:

- Contribute to the implementation of the roadmap activity of the European Wind Initiative aiming at supporting offshore take-off in the medium-term.
- Contribute to the development of new niche markets for the European shipbuilding and shipping industries thereby contributing to competitiveness of the sector and to the creation of new jobs.

7.3. HORIZONTAL ACTIVITIES FOR IMPLEMENTING THE TRANSPORT PROGRAMME

I.3. CONTEXT

Topics addressing all at once the three socio-economic challenges: eco-innovation; safe and seamless mobility; and competitiveness and growth through innovation (see section I.0) have been included in the AAT and SST 'cross-cutting activities' chapters of this 2013 Transport work programme (see table of contents).

In addition to these topics of cross-cutting character, the Transport (including Aeronautics) theme aims to support horizontal activities that address "cross-modal" issues common to the two Transport sub-themes AAT and SST, and/or that exploit the synergies between transport modes. These activities will make a contribution to the strategic research and innovation priorities for 2013 and help also meeting the socio-economic challenges.

In previous years, the horizontal activities were included in a separate call (TPT call). For the sake of simplification, in WP 2013 these activities will be included in call FP7-SST-2013-RTD-1.

II.3. CONTENT

TPT.2013-1. Technology transfer in the area of Transport

CP-FP - Call: FP7-SST-2013-RTD-1

Content and scope: Technology transfer is a very efficient way to foster innovation and market take-up. In the transport sector this is particularly relevant since some trends towards the use of the same materials, processes or solutions in different modes and sectors are evident, with a certain time shift due to cost or maturity issues.

The aim of this topic is to develop and implement concepts of technology transfer or cross fertilisation of technical solutions between transport modes or sectors in areas such as sustainable and light materials and their processing, human factors, lean manufacturing, passenger comfort and safety, energy efficient components, etc.

This topic accepts bottom-up proposals in which a potential user or group of users in any transport sector develops in cooperation with partners in another transport sector/application the use of a technology for their intended application. Special attention should be given to possibilities of technology transfer from aeronautics to other transport modes in the areas of new and intelligent materials, composites, sensor systems, etc. Proposals should satisfy important needs for one or more surface transport SMEs and help widening the participation of weaker players of enlarged Europe in innovation.

Expected impact: It is expected an increased efficiency of research and innovation efforts by enhancing co-operation and sharing of technology between surface transport modes and aeronautics. In particular, SMEs are expected to benefit from this approach, since most of them have difficulties in developing technologies in-house but are normally very good at applying or adapting existing technologies.

TPT.2013-2. Mapping regional capacities in transport research and innovation

CSA-SA - Call: FP7-SST-2013-RTD-1

Content and scope: Regions are increasingly recognised as important players in the EU's research and development landscape. They provide the real space for creative exploration of integration and synergies between various programmes. At the same time, evidence indicates that investment in R&D makes regions more attractive and local businesses more competitive. However, despite the efforts that have been made at various levels, there are still huge differences between European regions, including differences between regions within the same Member State. According to Eurostat figures, only 27 of the 260 regions spend the equivalent of over 3% of their GDP on research and development whilst over 40% of the EU's total R&D expenditure of around EUR 200 billion is generated in these regions. In seeking to stimulate regional potential for research and innovation actions will be needed that support the continuing development of Europe's strongest regions and that can release the latent potential existing in less advanced regions. Regional efforts to stimulate research and innovation should play to their strengths and opportunities, as well as tackling identified weaknesses. A solid evidential base is required in order to identify the strengths, weaknesses and opportunities at regional level.

The aim of this exercise is to map the regional capacities in transport research and innovation in order to identify and position evidence, actors and interactions in transport research and innovation, as well as opportunities for follow-up actions to be supported through other sources of funding, thus widening opportunities for future deployment; more concretely:

- The framework within which transport research and innovation takes place (institutional, policy, programmes and financing, skills base, infrastructure, etc.) as well as existing strategies at regional level.
- The actors involved at various levels in regional transport research and innovation, as well as co-operation and collaboration patterns within the region and the linkages out of the regions ("collaborating to compete").
- The main transport research and innovation activities at regional level as well as their impact (for instance on the regional competitiveness), areas of distinct specialisation, and either established or potential areas of excellence.
- The strengths, weaknesses, opportunities and threats at regional level, as well as main drivers and obstacles to innovation.
- To provide concrete recommendations for strengthening the role of transport research and innovation at regional level for example in form of road maps.
- To develop a series of specific, quantitative and qualitative indicators describing the transport research and innovation performance at regional level.

Particular attention should be given to the role and needs of SMEs. Relevant findings from previous projects such as TransNEW, DETRA and MARKET-UP should be taken into consideration.

Expected impact: The action should contribute to:

- gaining a fundamental understanding of the regional transport research and innovation activities and its unique characteristics, assets and shortcomings;
- diagnosing the regional transport research and innovation landscape in a fashion that helps point the way to where comparative and competitive advantages lie; and

- in a further step, helping regions to create a strategy that build upon existing and potential areas of comparative advantage, avoiding fragmentation (i.e. individuals and organisations pursue their own agenda of individual projects disconnected from a broader regional strategy) and insularity (i.e. pursuing old strategies without learning that the rules guiding global competition are changing in a fundamental way), and linking and leveraging the assets in new and different ways.

TPT.2013-3. Ex-post evaluation of the Transport (including Aeronautics) theme of the FP7 'Cooperation' specific programme

CSA-SA - Call: FP7-SST-2013-RTD-1

Content and scope: The objective of the ex-post evaluation will be to assess the overall implementation and management, as well as the achievements and impacts of the transport research co-financed by FP7 with respect to its specific objectives, their economic, social and environmental impacts, the efficiency, effectiveness, relevance of the funding and the sustainability and utility of the different transport research programmes. The evaluation will also give conclusions and recommendations for potential improvements.

The study should allow for:

- Identifying and listing the concrete results of the research funding and assessing positive and negative outcomes (promising technologies, operational services, patents, etc.).
- Quantitative and qualitative evaluation of significant economic, social and environmental impacts, measured via predefined indicators.
- Measuring the added value of EU-scale research funding in transport, with particular focus on excellent science, industrial leadership and societal challenges.
- Comparative analysis of Europe's research funding and scientific, technological and economic performance in transport versus other major economies (e.g. US, other OECD, BRIC, etc.).
- Measuring the relation of the scientific and technological objectives with the achievement of the major EU policies (Europe 2020, Innovation Union and the 'grand challenges', and the White Paper on Transport.

This evaluation should cover all research and innovation programme activities under the Seventh Framework Programme related to the theme 'Transport (including Aeronautics)', with the exception of Galileo and SESAR. The methodology to be applied in this evaluation is to be elaborated by the contractor, who will combine innovative approaches, allowing both qualitative and quantitative assessment. The evaluation will rely on previous assessments such as the 'Interim Evaluation for FP7' and the 'Impact Assessment to Horizon 2020'.

The duration of the support action shall not exceed 12 months.

Expected impact: This support action will evaluate to which extent the FP7 investment in Transport research and innovation has contributed to greener, smarter and more integrated transport systems, to the Europe 2020 goals of smart, sustainable and inclusive growth, to the objectives of the Innovation Union (excellent science, industrial leadership and societal challenges), and to the implementation of the White Paper on Transport.

7.4. GALILEO

I.4. CONTEXT

The European Global Navigation Satellite System, encompasses Galileo and EGNOS, and provides a worldwide positioning and timing infrastructure.

In parallel to the development phase, which is demonstrating the technical feasibility and the European capacity of implementing an independent satellite navigation infrastructure, the deployment of the full Galileo satellite constellation and the associated ground segment started in 2008. The procurement activities include full system validation and are foreseen to lead in 2014 to an operational infrastructure owned by the European Union.

The main objective of the deployment phase is to procure and set up the various elements that constitute the Galileo infrastructure, in particular the completion of the space and ground infrastructures, system support tasks, launch and operation of services, as well as the development of external interfaces for the future service/application systems and test receivers. Beyond manufacturing of equipment, the procurement activities encompass trade-offs and analysis, simulations, testing, demonstration, in-orbit validation, and other activities that increase competencies of European companies in satellite navigation.

According to the European GNSS Regulation[50], the financial envelope foreseen to implement the above activities (EUR 3.4 billion for EGNOS and Galileo) includes the sum of EUR 400 million made available from the Seventh Framework Programme for the period 2007-2013.

A delegation agreement between the European Commission and the European Space Agency was concluded in the course of 2008, pursuant to Article 54(2) of the EC Financial Regulation, allowing ESA to procure the Galileo deployment in the name and on behalf of the Commission. Therefore, the implementation of the above activities will not be detailed in this Work Programme. Finally, the Commission will procure performance monitoring facilities.

New satellite navigation applications are being developed every day, covering numerous sectors of the world economy. The expected global market in products and services will likely reach EUR 244 billion in 2020. The activities will give European industries the right opportunities to acquire the knowledge and expertise required in a strong international competing environment. Small and Medium Enterprises are key players for innovation in this sector.

The European infrastructure is being implemented in an incremental way. The overall GNSS performances will gradually improve, allowing the smooth development of receiver technologies and applications. The set of R&D activities will follow the incremental build-up of the infrastructure, i.e. EGNOS in 2009, four satellites for in orbit validation in 2011, and an 18 satellites initial operative constellation in 2014. The activities will build on existing infrastructure elements, including ground-based test and verification facilities.

[50] Council Regulation (EC) 683/2008 of 9 July 2008 (OJ L 196 24.07.2008).

The ‘GNSS Evolution programme’ of the European Space Agency will maintain the technology at the state-of-the-art level. The activities within European GNSS Supervisory Authority and European Space Agency are coordinated.

The European GNSS, as a global navigation system, has a strong international dimension. All R&D activities will fully take into consideration the cooperation frame established with partner countries in order to promote the use of the European Navigation system worldwide.

The financial envelope foreseen to implement Galileo deployment activities (EUR 3.4 billion for EGNOS and Galileo), does not allow any more calls after the call 2011. **As a result there will be no calls for Galileo under the Theme Transport of the 2013 Work Programme.**

III.1. IMPLEMENTATION OF CALLS: AERONAUTICS AND AIR TRANSPORT – DG RTD

III.1.1. FP7- AERONAUTICS and AIR TRANSPORT (AAT)-2013-RTD-1 (Main call)

- **Call identifier: FP7-AAT-2013-RTD-1**
- **Date of publication[51]:** 10 July 2012
- **Deadline[52]:** 14 November 2012 at 17.00.00 (Brussels local time)
- **Indicative budget[53]**: EUR 134.95 million
  The indicative distribution of the call budget is as follows:
  - EUR 37.91 million for topics funded via CP-FP (Level 1).
  - EUR 88.04 million for topics funded via CP-IP (Level 2).
  - EUR 6.00 million for CSA-CA.
  - EUR 3.00 million for CSA-SA.

  The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:
  - The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
  - Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.
  - In case the budget of one or more funding schemes above could not be consumed (totally or partially), the remaining budget shall be transferred to the other funding schemes in accordance with the opinion of the evaluation review panel.

- **Topics called:**

CHALLENGE / ACTIVITY / Topics	**Funding Schemes & eligibility criteria**
CHALLENGE 1. ECO-INNOVATION	
ACTIVITY 7.1.1. THE GREENING OF AIR TRANSPORT	
AAT.2013.1-1. Flight physics	CP-FP *The requested EU contribution shall not exceed EUR 5 000 000*
AAT.2013.1-2. Aerostructures	CP-FP *The requested EU contribution shall not exceed EUR 5 000 000*
AAT.2013.1-3. Low pressure system for Ultra High By-Pass Ratio Engine. *Up to 1 project is expected to be funded.*	CP-IP *The requested EU contribution shall exceed EUR 5 000 000*
AAT.2013.1-4. Maturation of an integrated set of active flow, load and noise control technologies for the next generation of active wing, including in-flight demonstration.	CP-IP *The requested EU contribution shall exceed EUR 5 000 000*

[51] The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.
[52] The Director-General responsible may delay this deadline by up to two months.
[53] Under the condition that the draft budget for 2013 is adopted without modifications by the budget authority.

Up to 1 project is expected to be funded.	
CHALLENGE 2. SAFE AND SEAMLESS MOBILITY	
ACTIVITY 7.1.2. INCREASING TIME EFFICIENCY	
AAT.2013.2-1. Airports	CP-FP *The requested EU contribution shall not exceed EUR 5 000 000*
ACTIVITY 7.1.3. ENSURING CUSTOMER SATISFACTION AND SAFETY	
AAT.2013.3-1. Human factors	CP-FP *The requested EU contribution shall not exceed EUR 5 000 000*
CHALLENGE 3. COMPETITIVENESS THROUGH INNOVATION	
ACTIVITY 7.1.4. IMPROVING COST EFFICIENCY	
AAT.2013.4-1. Systems and equipment	CP-FP *The requested EU contribution shall not exceed EUR 5 000 000*
AAT.2013.4-2. Design systems and tools	CP-FP *The requested EU contribution shall not exceed EUR 5 000 000*
AAT.2013.4-3. Production	CP-FP *The requested EU contribution shall not exceed EUR 5 000 000*
AAT.2013.4-4. Maintenance, repair and disposal	CP-FP *The requested EU contribution shall not exceed EUR 5 000 000*
AAT.2013.4-5. Integrated environment for optimised airline maintenance and operations. *Up to 1 project is expected to be funded.*	CP-IP *The requested EU contribution shall exceed EUR 5 000 000*
AAT.2013.4-6. Integrated thermal analysis and design for aircraft. *Up to 1 project is expected to be funded.*	CP-IP *The requested EU contribution shall exceed EUR 5 000 000*
AAT.2013.4-7. Large scale demonstration of extended Distributed Modular Electronics. *Up to 1 project is expected to be funded.*	CP-IP *The requested EU contribution shall exceed EUR 5 000 000*
AAT.2013.4-8. Seamless aeronautical networking through integration of data links, radios and antennas extended beyond ATM. *Up to 1 project is expected to be funded.*	CP-IP *The requested EU contribution shall exceed EUR 5 000 000*
CROSS-CUTTING ACTIVITIES FOR IMPLEMENTING THE SUB-THEME PROGRAMME	
AAT.2013.7-1. Coordinating research and innovation in the field of Aeronautics and Air Transport. *Up to 1 project per domain is expected to be funded (see topic description).*	CSA-CA *The requested EU contribution shall not exceed EUR 1 200 000*

AAT.2013.7-2. Coordinating research and innovation in the field of sustainable alternative fuels for Aviation. *Up to 1 project is expected to be funded*	CSA-CA *The requested EU contribution shall not exceed EUR 1 200 000*
AAT.2013.7-3. Communication of EU funded RTD project results to targeted audience. *Up to 1 project is expected to be funded.*	CSA-SA *The requested EU contribution shall not exceed EUR 600 000*
AAT.2013.7-4. Creating cohesive links and common knowledge between potential partners in EU Framework Programme Collaborative Projects. *Up to 1 project is expected to be funded.*	CSA-SA *The requested EU contribution shall not exceed EUR 600 000*
AAT.2013.7-5. Conference: support for the organisation of Aerodays. *Up to 1 project is expected to be funded.*	CSA-SA *The requested EU contribution shall not exceed EUR 600 000*
AAT.2013.7-6. Enhancing coordination and stimulating cooperation in research and innovation among EU Member States and Associated States to the EU Framework Programme. *Up to 1 project is expected to be funded.*	CSA-SA *The requested EU contribution shall not exceed EUR 600 000*
AAT.2013.7-7. Exploring opportunities and stimulating cooperation in research and innovation with China. *Up to 1 project is expected to be funded.*	CSA-SA *The requested EU contribution shall not exceed EUR 600 000*

- **Eligibility conditions:**
  - The general eligibility criteria are set out in Annex 2 to this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.
  - Table of standard minimum number of participating legal entities for all funding schemes used in the call, in line with the Rules for Participation:

Funding scheme	Minimum conditions
Collaborative Projects - large scale integrating projects (CP-IP) Collaborative Projects - small or medium-scale focused research projects (CP-FP)	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and Support Actions aiming at coordinating research activities (CSA-CA)	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and Support Actions aiming at supporting research activities (CSA-SA)	At least 1 independent legal entity.

  - Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

- **Evaluation procedure:**
  - There will be four ranking lists: list 1 CP-FP (Level 1); list 2 CP-IP (Level 2); list 3 CSA-CA; and list 4 CSA-SA.

- The evaluation criteria and scoring scheme are set out in Annex 2 to the work programme. Nonetheless, for list 1 CP-FP (Level 1), the highest rated proposal above thresholds in each topic will have priority over all the other proposals in this list.
- Proposal page limits: Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.
- The Commission will instruct the experts to disregard any pages exceeding these limits.
- The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left, right) should be at least 15 mm (not including any footers or headers).
- The evaluation shall follow a single stage procedure.
- Experts will not carry out the individual evaluation of proposals remotely.
- The procedure for prioritising proposals with equal scores is described in Annex 2 to the work programme.
- The evaluation will produce three ranked lists of proposals retained for funding with the corresponding reserve lists:
  - CP-FP (Level 1) and CSA-CA (coordinating)
  - CP-IP (Level 2)
  - CSA-SA (supporting)

- **Indicative timetable:**
  - Intended period for on-site (Brussels) evaluation / panel meetings: February 2013
  - Intended start date for grant agreement negotiations: March 2013

- **Consortia agreements:** participants in Collaborative Projects are required to conclude a consortium agreement; participants in Coordination and Support Actions are encouraged, but not required, to conclude a consortium agreement.

- **The forms of grants and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.

- **Flat rates to cover subsistence costs**: In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at:
  http://ec.europa.eu/research/participants/portal/page/fp7_documents
  under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

III.1.2. FP7- AERONAUTICS and AIR TRANSPORT (AAT)-2013-RTD-L0 (Open call for long term innovation)[54]

- **Call identifier: FP7-AAT-2012-RTD-L0**
- **Date of publication[55]:** 20 July 2011
- **Deadline[56]:** 14 March 2013 at 17.00.00 (Brussels local time) – **Open Call**
- **Indicative budget[57]**: EUR 5.00 million[58].

  The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary by up to 10% of the total value of the indicated budget for the call.
  In case the budget cannot be consumed (totally or partially), the remaining budget will be returned to FP7-AAT-2013-RTD-1

- **Topics called:**

CHALLENGE / ACTIVITY / Topics	**Funding Schemes & eligibility criteria**
CHALLENGE 3. COMPETITIVENESS THROUGH INNOVATION	
ACTIVITY 7.1.6. PIONEERING THE AIR TRANSPORT OF THE FUTURE	
AAT.2012.6-1. Breakthrough and emerging technologies	CP-FP *The requested EU contribution shall not exceed EUR 600 000*
AAT.2012.6-2. Radical new concepts for air transport	CP-FP *The requested EU contribution shall not exceed EUR 600 000*

- **Eligibility conditions:**
  - The general eligibility criteria are set out in Annex 2 to this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.
  - Table of standard minimum number of participating legal entities for all funding schemes used in the call, in line with the Rules for Participation:

Funding scheme	Minimum conditions
Collaborative Projects - small or medium-scale focused research projects (CP-FP)	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC

[54] This is the continuation/extension of a call launched in Work Programme 2012.
[55] The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.
[56] The Director-General responsible may delay this deadline by up to two months.
[57] Under the condition that the draft budget for 2013 is adopted without modifications by the budget authority.
[58] An additional amount of EUR 5 million was allocated to this call from the 2013 budget; thus, in total EUR 10 million will be spent on this open call, approximately half of which has already been committed for proposals selected in the two first batches.

- Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

- **Evaluation procedure:**
  - The evaluation criteria and scoring scheme are set out in Annex 2 to the work programme.
  - The submission of proposals and evaluation shall follow a single stage procedure.
  - Pages limitations apply for the proposal: 10 pages for section 1 (excluding tables, etc.), 5 pages for section 2, and 5 pages for section 3.
  - The Commission will instruct the experts to disregard any pages exceeding these limits.
  - Weighting will be applied on the evaluation criteria as follows: 1) Scientific and Technological Excellence: 70%; 2) Implementation: 10%; and 3) Potential Impact: 20%.
  - The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left and right) should be at least 15 mm (not including any footers or headers).
  - In order to provide the necessary agility, it is strongly advised that *the numbers of applicants in a proposal does not exceed 7* and that *the project duration does not exceed 24 months*; deviations from this recommendation should be justified in the proposal.
  - Applicants must ensure that proposals conform to the page limits and layout given here, which details are provided in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.
  - Experts may carry out the individual evaluation of proposals remotely.
  - The procedure for prioritising proposals with equal scores is described in Annex 2 to the work programme.

- **Indicative timetable:**

  The open call will examine the submitted proposals in two batches with the following tentative deadlines: 25/10/2011 – 15/03/2012 – 4/10/2012 – 14/03/2013 (the two first tentative deadlines have been exceeded by now).

- **Consortia agreements:** participants in Collaborative Projects are required to conclude a consortium agreement.

- **The forms of grants and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.

- **Flat rates to cover subsistence costs**: In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at:
  http://ec.europa.eu/research/participants/portal/page/fp7_documents
  under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

III.1.3. FP7-AERONAUTICS and AIR TRANSPORT (AAT)-2013-RTD-RUSSIA

- **Call identifier: FP7-AAT-2013-RTD-RUSSIA**
- **Date of publication[59]:** 10 July 2012
- **Deadline[60]:** 14 November 2012 at 17.00.00 (Brussels local time)
- **Indicative budget[61]**: EUR 4.50 million
  The budget for this call is indicative. The final budget of the call may vary by up to 10% of the total value of the indicated budget for the call. In case the total budget could not be consumed, the remaining amount shall be transferred to the main call (Call identifier: FP7-AAT-2013-RTD-1).
- **Notes:**
  1. The indicative budget of EUR 4.5 million will be used to fund the participants from the EU and Associated Countries.
  2. The Department of Aviation Industry (Ministry for Industry and Trade of the Russian Federation) will dedicate to this call a similar budget of EUR 4.5 million for the funding of the Russian participants, in accordance with the Russian Federation laws and regulations[62].

- **Topics called:**

CHALLENGE / ACTIVITY / Topics	**Funding Schemes & eligibility criteria**
COORDINATED CALLS FOR INTERNATIONAL COOPERATION	
AAT.2013.8-1. Coordinated call with Russia. *Up to 1 project per domain is expected to be funded (see topic description).*	CP-FP *The requested EU contribution shall not exceed EUR 1 200 000*

- **Eligibility conditions:**
  - The general eligibility criteria are set out in Annex 2 to this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.
  - Table of standard minimum number of participating legal entities for the funding scheme used in the call, in line with the Rules for Participation:

Funding scheme	**Minimum conditions**
Collaborative Projects - small or medium-scale focused research projects (CP-FP)	At least 3 independent legal entities, each of which is established in a MS or AC, and no two of which are established in the same MS or AC. At least 2 independent legal entities established in the Russian Federation.

[59] The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.
[60] The Director-General responsible may delay this deadline by up to two months.
[61] Under the condition that the draft budget for 2013 is adopted without modifications by the budget authority.
[62] Under the condition that the corresponding annual budget is adopted by the Russian Federation budget authority.

- Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

- **Additional eligibility criterion:**
  - At least 2 independent legal entities established in the Russian Federation.

- **Evaluation procedure:**
  - The evaluation criteria and scoring scheme are set out in Annex 2 to the work programme.
  - Proposal page limits: Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.
  - The Commission will instruct the experts to disregard any pages exceeding these limits.
  - The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left, right) should be at least 15 mm (not including any footers or headers).
  - The evaluation shall follow a single stage procedure.
  - Experts will not carry out the individual evaluation of proposals remotely.
  - The procedure for prioritising proposals with equal scores is described in Annex 2 to the work programme.
  - In addition, the Russian proposal part of the proposal relevant to Russian work in the project will be evaluated by the Department of Aviation Industry (Ministry for Industry and Trade of the Russian Federation) according to its procedures.
  - Only proposals which have passed satisfactorily both the EC and Russian evaluations may be selected for funding.

- **Indicative timetable:**
  - Intended period for on-site (Brussels) EC evaluation / panel meetings: February 2013
  - Intended start date for grant agreement negotiations: June 2013

- **Consortia agreements:** participants in Collaborative Projects are required to conclude a consortium agreement.

- **The forms of grants and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.

- **Flat rates to cover subsistence costs**: In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at:
  http://ec.europa.eu/research/participants/portal/page/fp7_documents
  under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

III.1.4. FP7-AERONAUTICS and AIR TRANSPORT (AAT)-2013-RTD-HIGH SPEED (Coordinated call with Australia, Japan and the Russian Federation, and possibly other Third Countries, on civil high speed air transport research)

- **Call identifier: FP7-AAT-2013-RTD-HIGH SPEED**
- **Date of publication[63]:** 10 July 2012
- **Deadline[64]:** 29 March 2013 at 17.00.00 (Brussels local time)
- **Indicative budget[65]**: EUR 5.00 million
  The budget for this call is indicative. The final budget of the call may vary by up to 10% of the total value of the indicated budget for the call. In case the total budget could not be consumed, the remaining amount shall be transferred to the main call (Call identifier: FP7-AAT-2013-RTD-1).

- **Notes:**
  1. This coordinated call foresees to lead to the funding of a coherent research programme on Civil High Speed Aircraft, consisting of one project financed by the European Union and **at least two complementary projects** funded either by the Australian, Japanese or the Russian Federation authorities / funding organisations.
  2. Provided that the additional eligibility criterion stipulated in the call fiche is met (i.e. coordination of the EU proposal with at least two complementary proposals or projects from the following countries: Australia, Japan and the Russian Federation), the involvement of other Third Countries' additional participants is a priori not excluded, provided that such participation is justified and complies fully with the requirements of this call.
  3. In parallel to the present European call for proposals, the Ministry of Economy, Trade and Industry of Japan (METI) and the Ministry of Industry and Trade of the Russian Federation are expected to publish in due time coordinated calls according to their own rules and procedures for the selection of complementary research projects which, once approved by the relevant authorities, will run in parallel to the European project in a harmonised and synchronised way. Likewise, Australia is expected to set up a complementary project according to its rules and procedures.
  4. The detailed information relative to these coordinated calls or projects is expected to be provided in due time on the relevant web site in each of the concerned Ministries or funding organisations of the Countries involved. Further details will be provided in the Guide for Applicants (specific part).
  5. The indicative EU budget of EUR 5 million will be used to fund one EU project according to the Seventh Framework Programme (FP7) rules of participation. In addition to this public funding, a contribution is expected from the partners involved in this project according to the FP7 funding rules. Such contribution to the project could possibly bring another EUR 2.5 million leading to a total budget for the EU project of around EUR 7.5 million (see also items 6 and 7 below).
  6. The concerned funding authorities/organisations (public and /or private) of Australia, Japan, the Russian Federation and possibly of other Third Countries will dedicate as far

[63] The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.
[64] The Director-General responsible may delay this deadline by up to two months.
[65] Under the condition that the draft budget for 2013 is adopted without modifications by the budget authority.

as possible to a complementary national project an equivalent amount of resources[66], in order to have a balanced and synchronised effort from all parties involved.

7. In order to ensure that these projects from Australia, Japan, the Russian Federation and possibly from other Third Countries are technically complementary to form a coherent research programme and represent, as far as possible, a similar budget (around EUR 7.5 million, total cost for each project), in a spirit of balanced cooperation and efforts, the preparation of the project proposals needs clearly to be closely coordinated between the concerned stakeholders of the countries involved.
8. The EU proposal and more widely the coherent research programme resulting from this set of complementary research projects shall build upon and be complementary to, as far as possible, already running (or finished projects) and avoid duplication of research work.

- **Topics called:**

CHALLENGE / ACTIVITY / Topics	**Funding Schemes & eligibility criteria**
ACTIVITY 7.1.6. PIONEERING THE AIR TRANSPORT OF THE FUTURE	
AAT.2013.8-2. International cooperation on civil high speed air transport research. *Up to 1 project is expected to be funded.*	Collaborative Project *The requested EU contribution shall not exceed EUR 5 000 000*

- **Eligibility conditions:**
  - The general eligibility criteria are set out in Annex 2 to this work programme and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.
  - Table of standard minimum number of participating legal entities for the funding scheme used in the call, in line with the Rules for Participation:

Funding scheme	**Minimum conditions**
Collaborative Projects (CP)	At least 3 independent legal entities, each of which is established in a EU MS or AC, and no two of which are established in the same EU MS or AC.

  - Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

- **Additional eligibility criterion:**

A proposal submitted to the European Commission (EC) will be eligible only if it is coordinated with **at least two** complementary proposals either submitted in parallel or to be

[66] Under the condition that the corresponding annual budget or overall budget is adopted by the Australian, Japanese and the Russian Federation budget authorities/organisations, respectively.

submitted afterwards to the corresponding funding authorities/organisations of Australia, Japan or the Russian Federation **or with at least two** complementary projects already selected for funding by these Third Countries to be synchronised in time with the EU project.

- **Evaluation procedure:**
  - The evaluation criteria and scoring scheme are set out in Annex 2 to the work programme.
  - In addition, proposals should contain in their description of work (Part B) the following information which will be evaluated against criterion 1 (S/T excellence):
    1. the common objectives, the scope and content of the intended international cooperation;
    2. all activities that will be carried out by the participants in the EU proposal, including the work schedule, deliverables, milestones and budget;
    3. all activities that will be carried out in the Australian, Japanese, the Russian Federation or other Third Country proposal, including the work schedule, deliverables, milestones and budget;
    4. the interdependencies between the R&D activities carried out by the European and each of other countries' participants respectively, in terms of deliverables, milestones, etc.; and
    5. a formal signed commitment from the other complementary proposals or projects representatives that they will conclude between them a coordination agreement prior to the start of the research programme.

    By and large, the Description of work (Part B) of the project proposal should constitute a coherent and ambitious research programme providing a complete overview of the research to be carried out in all complementary projects.
  - The balancing between the EU total research effort and budget (EU funding + participant funding) and the total research effort and budget of the complementary projects will be evaluated against criterion 2 (quality and efficiency of the implementation and the management).
  - Proposal page limits: Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.
  - The Commission will instruct the experts to disregard any pages exceeding these limits.
  - The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left, right) should be at least 15 mm (not including any footers or headers).
  - The evaluation shall follow a single stage procedure and may be carried out remotely.
  - Proposals submitted to the present European call for proposals will be evaluated according to the FP7 rules by independent experts, as far as possible involving experts from the Third Countries taking part in this coordinated call.
  - The procedure for prioritising proposals with equal scores is described in Annex 2 to the work programme.
  - In addition, the evaluation and selection of the complementary Australian, Japanese, the Russian Federation or other Third Country national project proposals, when applicable, will be carried out by the concerned authorities/organisations respectively, according to their own rules and procedures.
  - EU selected proposals will be funded only if their complementary Third Countries' proposals will also be successfully selected for funding in due time and forming altogether a coherent research programme.

- **Indicative timetable:**
  - Evaluations are expected to be carried out in April/May 2013.
  - It is expected that the negotiations for the selected proposals will open by May/June 2013.
  - Negotiations are expected to be carried out in parallel by the European Commission and the authorities/organisations concerned in Australia, Japan, the Russian Federation and other possible Third Countries in order to have, as far as possible, a simultaneous start of the respective grant agreement, tentatively by July-September 2013.

- **Consortia agreements:** participants in the EU collaborative project are required to conclude a consortium agreement prior to the signature of the grant agreement.

- **Coordination agreements**: Participants in the EU collaborative project are required to conclude, prior to the signature of the EU Grant Agreement, a coordination agreement with the participants in the other complementary national projects which are part of this coherent research programme on Civil High Speed Aircraft.

- **The forms of grants and maximum reimbursement rates** which will be offered for EU participants are specified in Annex 3 to the Cooperation work programme.

- **Flat rates to cover subsistence costs for EU participants**: In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at:
  http://ec.europa.eu/research/participants/portal/page/fp7_documents
  under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

III.2. IMPLEMENTATION OF CALLS: SUSTAINABLE SURFACE TRANSPORT – DG RTD

III.2.1. FP7- SUSTAINABLE SURFACE TRANSPORT (SST)-2013-RTD-1 (including the 'European Green Cars Initiative')

- **Call identifier: FP7-SST-2013-RTD-1**
- **Date of publication[67]:** 10 July 2012
- **Deadline[68]:** 14 November 2012 at 17.00.00 (Brussels local time)
- **Indicative budget[69]:** EUR 110.95 million
  The indicative distribution of the call budget is as follows:
  - EUR 23.00 million for Group of topics (GT) Nº 1: Increasing railway capacity.
  - EUR 17.00 million for Group of topics (GT) Nº 2: Ensuring safe, green and competitive waterborne transport.
  - EUR 38.95 million for Group of topics (GT) Nº 3: Implementing research for the 'European Green Car Initiative'.
  - EUR 20.40 million for Group of topics (GT) Nº 4: It includes sustainable urban mobility, improving surface transport through ITS, infrastructures, safety and security.
  - EUR 7.20 million for topic SST.2013.6-1: Strengthening the research and innovation strategies of the transport industries in Europe.
  - EUR 0.40 million for topic SST.2013.6-3: Organisation of Transport Research Awards for the Transport Research Arena (TRA) conference.
  - EUR 3.00 million for topic TPT.2013-1: Technology transfer in the area of Transport.
  - EUR 0.50 million for topic TPT.2013-2: Mapping regional capacities in transport research and innovation.
  - EUR 0.50 million for topic: TPT.2013-3: Ex-post evaluation of the Transport (including AAT) theme of the FP7 'Cooperation' specific programme.

  The budget for this call is indicative. The final budget awarded to actions implemented through calls for proposals may vary:
  - The final budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
  - Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.
  - In case the budget of one or more sub-divisions could not be consumed (totally or partially), the remaining budget shall be transferred to the other sub-divisions in accordance with the opinion of the evaluation review panel.

- **Topics called:**

CHALLENGE / ACTIVITY / Topics	**GT Nº**	**Funding Schemes &eligibility criteria**
CHALLENGE 1. ECO-INNOVATION		

[67] The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.
[68] The Director-General responsible may delay this deadline by up to two months.
[69] Under the condition that the draft budget for 2013 is adopted without modifications by the budget authority.

ACTIVITY 7.2.1. THE GREENING OF SURFACE TRANSPORT		
SST.2013.1-1. Railway infrastructure optimisation and monitoring for further noise reduction	1	CP-FP *The requested EU contribution shall not exceed EUR 3 000 000*
SST.2013.1-2. Towards the zero emission ship. *Up to 1 project is expected to be funded*	2	CP *The requested EU contribution shall not exceed EUR 9 000 000*
CHALLENGE 2. SAFE AND SEAMLESS MOBILITY		
ACTIVITY 7.2.2. ENCOURAGING MODAL SHIFT AND DECONGESTING TRANSPORT CORRIDORS		
SST.2013.2-1. Next generation of train control systems in the domain of urban and main line European railway systems. *Up to 1 project is expected to be funded.*	1	CP *The requested EU contribution shall not exceed EUR 7 000 000*
SST.2013.2-2. New concepts for railway infrastructure and operation: adaptable, automated, resilient and high-capacity. *Up to 1 project is expected to be funded.*	1	CP *The requested EU contribution shall not exceed EUR 10 000 000*
ACTIVITY 7.2.3. ENSURING SUSTAINABLE URBAN MOBILITY		
SST.2013.3-1. Managing integrated multimodal urban transport network. *Up to 1 project is expected to be funded.*	4	CP *The requested EU contribution shall not exceed EUR 9 000 000*
SST.2013.3-2. Implementing innovative and green urban transport solutions in Europe and beyond	4	CSA-CA *The requested EU contribution shall not exceed EUR 2 000 000*
ACTIVITY 7.2.4. IMPROVING SAFETY AND SECURITY		
SST.2013.4-1. Ships in operation. *Up to 1 project is expected to be funded.*	2	CP *The requested EU contribution shall not exceed EUR 5 000 000*
SST.2013.4-3. Biomechanics and advanced digital human body models and testing for vehicle safety	4	CP-FP *The requested EU contribution shall not exceed EUR 3 000 000*
CHALLENGE 3. COMPETITIVENESS THROUGH INNOVATION		
ACTIVITY 7.2.5. STRENGTHENING COMPETITIVENESS		
SST.2013.5-1. Technical requirements for the certification of new materials for railway rolling stock	1	CP-FP *The requested EU contribution shall not exceed EUR 3 000 000*
SST.2013.5-2. Low cost flexible automation and mechanisation in small to medium shipyards	2	CP-FP *The requested EU contribution shall not exceed EUR 3 000 000*
SST.2013.5-3. Innovative, cost-effective construction and maintenance for safer, greener and climate resilient roads	4	CP-FP *The requested EU contribution shall not exceed EUR 3 000 000*

CROSS-CUTTING ACTIVITIES FOR IMPLEMENTING THE SUB-THEME PROGRAMME		
SST.2013.6-1. Strengthening the research and innovation strategies of the transport industries in Europe. *Up to 1 project per surface transport mode is expected to be funded (see topic description).*		CSA-SA
SST.2013.6-3. Organisation of Transport Research Awards for the Transport Research Arena (TRA) conference *Up to 1 project is expected to be funded.*		CSA-SA *The requested EU contribution shall not exceed EUR 400 000*
THE 'EUROPEAN GREEN CARS INITIATIVE'		
GC.SST.2013-1.Feasibility analysis and technological development of on-road charging for long term electric vehicle range extension. *Up to 1 project is expected to be funded.*	3	CP *The requested EU contribution shall not exceed EUR 10 000 000*
GC.SST.2013-2. Next generation electric motors	3	CP-FP *The requested EU contribution shall not exceed EUR 3 000 000*
GC.SST.2013-3. Future light urban electric vehicles	3	CP-FP *The requested EU contribution shall not exceed EUR 3 000 000*
GC.SST.2013-5. Configurable and adaptable truck. *Up to 1 project is expected to be funded.*	3	CP *The requested EU contribution shall not exceed EUR 8 000 000*
GC.SST.2013-6. High efficiency energy conversion for future heavy duty transport	3	CP-FP *The requested EU contribution shall not exceed EUR 3 000 000*
GC.SST.2013-7. Technical and operational connectivity in intermodal freight transport	3	CP-FP *The requested EU contribution shall not exceed EUR 3 000 000*
HORIZONTAL ACTIVITIES FOR IMPLEMENTIG THE TRANSPORT PROGRAMME		
TPT.2013-1. Technology transfer in the area of Transport		CP-FP *The requested EU contribution shall not exceed EUR 3 000 000*
TPT.2013-2. Mapping regional capacities in transport research and innovation. *Up to 1 project is expected to be funded.*		CSA-SA *The requested EU contribution shall not exceed EUR 500 000*
TPT.2013-3. Ex-post evaluation of the Transport (including AAT) theme of the FP7 'Cooperation' specific programme. *Up to 1 project is expected to be funded.*		CSA-SA *The requested EU contribution shall not exceed EUR 500 000. The duration of the support action shall not exceed 12 months.*

- **Eligibility conditions:**

- The general eligibility criteria are set out in Annex 2 to this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B of the proposal shall be readable, accessible and printable.
- Table of standard minimum number of participating legal entities for all funding schemes used in the call, in line with the Rules for Participation:

Funding scheme	Minimum conditions
Collaborative Projects (CP) Collaborative Projects - large scale integrating projects (CP-IP) Collaborative Projects - small or medium-scale focused research projects (CP-FP)	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and Support Actions aiming at coordinating research activities (CSA-CA)	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and Support Actions aiming at supporting research activities (CSA-SA)	At least 1 independent legal entity.

- Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

- **Evaluation procedure:**
  - The evaluation criteria and scoring scheme are set out in Annex 2 to the work programme.
  - Proposal page limits: Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.
  - The Commission will instruct the experts to disregard any pages exceeding these limits.
  - The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left, right) should be at least 15 mm (not including any footers or headers).
  - The evaluation shall follow a single stage procedure.
  - Proposals may be evaluated remotely
  - The procedure for prioritising proposals with equal scores is described in Annex 2 to the work programme.
  - No hearings are foreseen.
  - The evaluation will produce the following ranked lists of proposals retained for funding with the corresponding reserve lists:
    - Group of topics Nº 1
    - Group of topics Nº 2
    - Group of topics Nº 3
    - Group of topics Nº 4
    - Topic SST.2013.6-1
    - Topic SST.2013.6-3
    - Topic TPT.2013-1
    - Topic TPT.2013-2
    - Topic TPT.2013-3

- **Indicative timetable:**
  - Intended period for evaluation and panel meetings: January to March 2013
  - Intended start date of grant agreement negotiations: April 2013

- **Consortia agreements:** participants in Collaborative Projects are required to conclude a consortium agreement; participants in Coordination and Support Actions are encouraged, but not required, to conclude a consortium agreement.

- **The forms of grants and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.

- **Flat rates to cover subsistence costs:** In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at:
  http://ec.europa.eu/research/participants/portal/page/fp7_documents
  under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

III.3. IMPLEMENTATION OF CALLS: TRANSPORT – DG MOVE

- **Call identifier: FP7-TRANSPORT-2013-MOVE-1**
- **Date of publication[70]:** 10 July 2012
- **Deadline[71]:** 14 November 2012 at 17.00.00 (Brussels local time)
- **Indicative budget[72]:** EUR 25.00 million
  The final budget awarded to actions implemented through this call for proposals may vary:
  - The final budget of the call may vary by up to 10% of the total value of the call; and
  - Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.

Topics called:

CHALLENGE / ACTIVITY / Topics	**Funding Schemes &eligibility criteria**
CHALLENGE 2. SAFE AND SEAMLESS MOBILITY	
ACTIVITY 7.2.3. ENSURING SUSTAINABLE URBAN MOBILITY	
SST.2013.3-3. Capitalising CIVITAS knowledge and experience	CSA-CA *The requested EU contribution shall not exceed EUR 4 000 000*
ACTIVITY 7.2.4. IMPROVING SAFETY AND SECURITY	
SST.2013.4-2. Inspection capabilities for enhanced ship safety. *Up to 1 project is expected to be funded.*	CP *The requested EU contribution shall not exceed EUR 3 000 000*
CROSS-CUTTING ACTIVITIES FOR IMPLEMENTING THE SUB-THEME PROGRAMME	
SST.2013.6-2. Towards a competitive and resource efficient port transport system. *Up to 1 CP and 1 CSA-CA are expected to be funded.*	CP / CSA-CA *The requested EU contribution for a CP shall not exceed EUR 3 000 000 and its duration 48 months. The requested EU contribution for a CSA-CA shall not exceed EUR 1 500 000 and its duration 30 months*
THE 'EUROPEAN GREEN CARS INITIATIVE'	
GC.SST.2013-4. Demonstration of electric buses as urban public transport. *Up to 1 project is expected to be funded.*	CP *The requested EU contribution shall not exceed EUR 13 500 000*

- **Eligibility conditions:**
  - The general eligibility criteria are set out in Annex 2 to this work programme, and in the guide for applicants. Please note that the completeness criterion also includes that part B

[70] The Director-General responsible for the call may publish it up to one month prior to or after the envisaged date of publication.
[71] The Director-General responsible may delay this deadline by up to two months.
[72] Under the condition that the draft budget for 2013 is adopted without modifications by the budget authority.

of the proposal shall be readable, accessible and printable.
- Table of standard minimum number of participating legal entities for all funding schemes used in the call, in line with the Rules for Participation:

Funding scheme	Minimum conditions
Collaborative Projects (CP)	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC
Coordination and Support Actions aiming at coordinating research activities (CSA-CA)	At least 3 independent legal entities, each of which is established in a MS or AC, and no 2 of which are established in the same MS or AC

- Only information provided in part A of the proposal will be used to determine whether the proposal is eligible with respect to budget thresholds and/or minimum number of eligible participants.

- **Evaluation procedure:**
  - The evaluation criteria and scoring scheme are set out in Annex 2 to the work programme.
  - Proposal page limits: Applicants must ensure that proposals conform to the page limits and layout given in the Guide for Applicants, and in the proposal part B template available through the electronic Submission Services of the Commission.
  - The Commission will instruct the experts to disregard any pages exceeding these limits.
  - The minimum font size allowed is 11 points. The page size is A4, and all margins (top, bottom, left, right) should be at least 15 mm (not including any footers or headers).
  - The evaluation shall follow a single stage procedure.
  - Proposals may be evaluated remotely.
  - The procedure for prioritising proposals with equal scores is described in Annex 2 to the work programme.
  - No hearings are foreseen.

- **Indicative timetable:**
  - Intended period for evaluation and panel meetings: January to March 2013.
  - Intended start date of grant agreement negotiations: April 2013

- **Consortia agreements:** participants in Collaborative Projects are required to conclude a consortium agreement; participants in Coordination and Support Actions are encouraged, but not required, to conclude a consortium agreement.

- **The forms of grants and maximum reimbursement rates** which will be offered are specified in Annex 3 to the Cooperation work programme.

- **Flat rates to cover subsistence costs:** In accordance with Annex 3 of this work programme, this call provides for the possibility to use flat rates to cover subsistence costs incurred by beneficiaries during travel carried out within grants for indirect actions. For further information, see the relevant Guides for Applicants for this call. The applicable flat rates are available on the Participant Portal at:
  http://ec.europa.eu/research/participants/portal/page/fp7_documents
  under 'Guidance documents for FP7/Financial issues/Flat rates for daily allowances'.

V. INDICATIVE BUDGET FOR TRANSPORT (INCLUDING AERONAUTICS) THEME FOR THE 2013 WORK PROGRAMME

A. DG RTD indicative budget for the 2013 Work Programme[73]

European Commission - DG Research	2013 (million EUR)
FP7-AERONAUTICS and AIR TRANSPORT (AAT)-2013-RTD-1	134.95
FP7-AERONAUTICS and AIR TRANSPORT (AAT)-2013-RTD-L0	5.00
FP7-AERONAUTICS and AIR TRANSPORT (AAT)-2013-RTD-RUSSIA	4.50
FP7-AERONAUTICS and AIR TRANSPORT (AAT)-2013-RTD-HIGH SPEED	5.00
FP7-SUSTAINABLE SURFACE TRANSPORT (SST)- 2013-RTD-1 (including the 'European Green Cars Initiative')	110.95
'The Ocean of Tomorrow 2013' (FP7-OCEAN-2013)[74]	10.00
FP7-ERANET-2013-RTD[75]	4.00*
FP7-TRANSPORT-2013-MOVE-1	25.00
Total for calls for proposals	**299.40**
General activities (cf. Annex 4) (details below)	5.04
Other activities:	
Evaluations, monitoring and review	1.12
Estimated total budget allocation	**305.56**

* Indicative amount for ERA-NET. An ERA-NET Plus is included in Work Programme 2013 for Transport (including Aeronautics): SST.2013.1-3 - ERA-NET Plus 'Advanced systems, materials and techniques for next generation infrastructure'; which is part of the FP7-ERANET-2013-RTD joint call.

[73] Under the condition that the draft budget for 2013 is adopted without modifications by the budgetary authority.

[74] The call fiche with all relevant information can be found in the Work Programme of Theme 2 (Food, Agriculture, Fisheries and Biotechnology) as well as on the Participant Portal under the call page FP7-OCEAN-2013.

[75] See Annex 4 to the Cooperation work programme.

B. DG MOVE indicative budget for the 2013 Work Programme[76]

European Commission - DG Mobility and Transport	2013 (million EUR)
General activities (cf. Annex 4) (details below)	0.00
Other activities:	
SESAR	60.01
Evaluation	0.00
Monitoring	0.50
Audits	0.30
Estimated total budget allocation	**60.81**

C. DG ENTR indicative budget for the 2013 Work Programme[77]

European Commission - DG Enterprise and Industry	2013 (million EUR)
General activities (cf. Annex 4) (details below)	2.41
Galileo delegation agreement ESA to cover the deployment phase of the GNSS programme, as stated in the introduction of chapter 7.4	147.15
Estimated total budget allocation	**149.56**

All budgetary figures given in this work programme are indicative. The final budgets may vary following the evaluation of proposals.

The final budget awarded to actions implemented through calls for proposals may vary:

- The total budget of the call may vary by up to 10% of the total value of the indicated budget for each call; and
- Any repartition of the call budget may also vary by up to 10% of the total value of the indicated budget for the call.

For actions not implemented through calls for proposals:

- The final budgets for evaluation, monitoring and review may vary by up to 20% of the indicated budgets for these actions;
- The final budget awarded for all other actions not implemented through calls for proposals may vary by up to 10% of the indicated budget for these actions.

[76] Under the condition that the draft budget for 2013 is adopted without modifications by the budgetary authority.

[77] Under the condition that the draft budget for 2013 is adopted without modifications by the budgetary authority.

D. Summary of RTD budget allocation to general activities for 2013 (cf. Annex 4)

European Commission - DG Research	2013 (million EUR)
Cordis	0.790
Eureka / Research organisations	0.040
COST	4.203
Experts (evaluators and reviewers)	0.010
Total	**5.043**

E. Summary of MOVE budget allocation to general activities for 2013 (cf. Annex 4)

European Commission - DG Mobility and Transport	2013 (million EUR)
Cordis	0.00
Eureka / Research organisations	0.00
COST	0.00
Strategy oriented support actions	0.00
Total	**0.00**

F. Summary of ENTR budget allocation to general activities for 2013 (cf. Annex 4)

European Commission - DG Enterprise and Industry	2013 (million EUR)
Cordis	0.282
Eureka/Research organisations	0.014
COST	2.110
Experts (evaluators and reviewers)	0.004
Total	**2.410**