



The EU Framework Programme for Research and Innovation

# HORIZON 2020

**Smart, green and  
integrated Transport**

***Work Programme  
2016-2017***

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European Commission DG RTD  
National Transport InfoDay 2016-17  
Lisbon, 05.10.2015**



- **Transport challenges, policy goals, R&I lines**
- **Budget & implementation overview.**
- **Call "Mobility for Growth"**
- **Call "Automated Road Transport"**
- **Call " Green Vehicles"**
- **Cross-cutting aspects & Rules for participation  
(separated presentation)**

- **GHG emissions – climate + health impacts**
- **Oil dependency - volatile oil prices**
- **Congestion – liveability of cities**
- **Urbanisation – role of public transport**
- **Infrastructure capacity vs mobility demand**
- **Demographic trends – ageing populations**
- **Global competition**

## Resource efficiency vs. climate change and oil dependency

*Transport accounts for 32% of all energy consumption*

- **Boost alternative fuels and infrastructure**

## Curb noxious emissions, improve air quality

*24% of CO<sub>2</sub>, 20% of GHG come from transport*

*400 000 premature deaths in EU, 1/5 due to transport*

- **Achieve the 2030 energy-climate targets: GHG -40%, 27% renewables, 27% energy savings**

## Network capacity and modal shift vs saturation and congestion

*Congestion costs: 1 to 2 % of GDP*

- **30% of road freight > 300 km moving to rail/water by 2030**

## Smart solutions for safety and security

*26000 road fatalities/year*

- **Vision zero: ½ road fatalities by 2020 (vs 2010), towards none by 2050**

## Fierce international competition

*Expanding markets but shrinking market shares*

- **Innovate to preserve market-shares and jobs**

## Transport Work Programme

### Calls for proposals:

- 1) Mobility for Growth
- 2) Automated Road Transport  **New**
- 3) European Green Vehicles Initiative

## Other activities

- Blue Growth (SC2/Food)
- ELENA Facility (SC3/Energy)
- SME Instrument
- Fast Track to Innovation
- LEIT/NMBP, ICT, Space; SC/Energy, Security, Climate; Smart Cities

***Plus other actions (public procurements, ...)***

***Complementarities with  
Clean Sky 2, SESAR, Shift2Rail, FCH2***

## **Objectives of Societal Challenge 4 'Smart, green and integrated Transport':**

Achieving a European transport system that is

- resource-efficient
- climate and environmentally friendly
- safe
- resilient
- seamless
- competitive

...and that benefits citizens, economy and society

## 4 lines of activities:

1. **Resource** efficient transport that respects the environment
2. Better **mobility**, less congestion, more safety and security
3. Global **leadership** for the European transport industry
4. **Socio-economic** and behavioural research and forward looking activities for policy making

- Improve **energy/resource efficiency**
- Accelerate **automation** in road transport
- Support deployment of **innovative mobility solutions**
- Modernise **infrastructure**, increase its resilience and optimise its use
- Optimise **efficiency and interoperability of transport systems**
- Improve **safety** across the transport system
- Anticipate **technological developments** and their impacts on **industrial competitiveness**
- Understand **demographic trends, societal developments**, and **future skills requirements**



## **2016-2017 WP: continuity...**

- Competitiveness + sustainability
- Systemic approach + modal specificities
- Research + Innovation = greater impact

## **...and novelties**

- New Call: Automation in Road Transport
- New area: safety
- An inducement prize for the cleanest engine
- Better embedding of user needs, SSH, gender...
- International cooperation in many selected topics

➤ **6339 M € for 7 years 2014-2020**

➤ **50/50 JTIs/collaborative calls**

- *Clean Sky*
- *SESAR*
- *Shift2Rail*
- *Fuel Cells & Hydrogen (contribution)*

➤ **938 M € for WP 2016-17**



- **Public calls, competitive selection, peer review**
- **Multi-partner transnational consortia**
- **Evaluation criteria:**
  - *Excellence, impact, implementation*
- **Work Programme cycle:**

1<sup>st</sup> 2014 2015

2<sup>nd</sup> 2016 2017

3<sup>rd</sup> 2018 2019 2020



# Types of Actions

Actions	Participants
<p><b>Research and Innovation Actions (RIAs)</b> Main focus on research</p>	<p><b>Consortia</b> of min. 3 partners from 3 different countries</p>
<p><b>Innovation Actions (IAs)</b> Main focus on close-to-market activities</p>	
<p><b>Coordination and Support Actions (CSAs)</b> Focus on coordination and networking of R&amp;I projects, programmes and policies</p>	<p><b>Single entities</b> or <b>consortia</b></p>

## Objectives

- **Reconcile competitiveness and sustainability, improved mobility and economic impact**
- Boost interconnection of infrastructure, transport means, travellers, goods
- Optimise door-to-door mobility, increase safety and resilience, reduce environmental impact and operational costs
- Make equipments and systems smarter, cleaner, quieter, more efficient, less dependent on fossil fuels
- Focus on aviation, waterborne, cross-modal aspects



## Contents and structure

### **A) Mode-specific challenges**

- 1) Aviation
- 2) Waterborne

### **C) Cross-cutting issues**

- 8) Socio-economic and behavioural research and forward-looking activities for policy making

### **B) Cross-modal / transport integration challenges**

- 3) Safety
- 4) Urban
- 5) Logistics
- 6) Intelligent Transport Systems
- 7) Infrastructure



*2016–17: **5 topics open***

***EUR 146 Mio** EU budget*

*Complements **Clean Sky 2** and **SESAR***

## Context

- Market **growth**: new **opportunities** for Europe
- Europe's **leadership** in products and services, but **challenges** arising from international competition
- Keyword: **sustainability** of growth (environmental concerns, safety, security )
- Rising **expectations** from users – **integration** with other transport modes needed

## Contents and structure

- WP complements **Clean Sky 2** and **SESAR**
- It addresses **medium to long-term R&I**
- Topics in line with H2020 Specific Programme, ACARE challenges (Flightpath 2050) and SRIA
- Focus on:
  - Reducing **energy** consumption, **environmental** impact and **noise**
  - Industrial **leadership** and breakthrough **technologies**
- **International cooperation** encouraged in 2 topics
- Relevant actions also under other H2020 Challenges: **Energy/Alt.Fuels** , **Security/Infrastructure & Cyber**.



# Aviation: topics and budget

*Total EU contribution: EUR 146 M € ( +15 M€ under Safety)*

Topic	Title	Type	Stages	Indicative Size (M€)	Budget (M €)	
					2016	2017
MG-1.1	Reducing <b>energy</b> consumption and <b>environmental</b> impact of aviation	RIA	2	5-9	40	
MG-1.2	Reducing aviation <b>noise</b>	RIA	2	5-9		20
MG-1.3	Maintaining <b>industrial leadership</b> in aeronautics	RIA	2	5-9		45
MG-1.4	<b>Breakthrough</b> innovation	RIA	2	2-4	15	15
MG-1.5	Identification of <b>gaps, barriers and needs</b> in aviation research	CSA	1	1-2	4	7
<i>MG-3.1</i>	<i>Safety / Aviation</i>	<i>RIA</i>	<i>1</i>	<i>5-9</i>	<i>15</i>	

**CSA = Coordination and Support Action**  
**RIA = Research and Innovation Action**

## Challenge

*Topic MG-1.1-2016 (RIA)*

- Increase resource efficiency, reduce energy consumption and emissions: CO<sub>2</sub>, NO<sub>x</sub>, particulate.

## Scope

- More **electric** aircraft - novel technologies
  - Core **engines: thermal efficiency** (Pressure ratio).
  - Integrated **aero-structures** with **self-sensing, morphing or multi-functional**.
  - Assessing the **impacts of alternative fuels**
- + regulations/standards/certification/qualification issues

## Expected impact

- Contribution to FlightPath2050 environmental goals

## Challenge

- Systematic approach to aviation noise management
- Coordination of:
  - Technology, operations and planning.
  - **National, EU and international R&I** activities

## Scope – enable 24/7 operations

- Noise reduction **at the source** (aircraft / engine)
- Assessing, managing, **monitoring** & planning noise
- Common **roadmap** for noise reduction
- Emerging issues e.g. sonic boom internationally

## Expected impact

- Reduce aviation noise nuisance



# Maintaining industrial leadership in aeronautics

## Challenge

*Topic MG-1.3-2017 (RIA)*

- Seize new opportunities for further growth of European aeronautics
- Further develop low maturity level technologies

## Scope

- From scheduled to **condition-based monitoring**
- Advancements in low TRL composite manuf. techs.
- Addressing **electromagnetic immunity**.
- **Multi-disciplinary Design Tools** & computing.

## Expected impact

- Help maintain the leadership of the European industry

*Topic particularly relevant to **SMEs***

## Challenge

- Explore breakthrough technologies as evolutionary ones come close to their maximum potential

## Scope

- Today up to TRL 3, by 2035 TRL 6
- Configurations & airframe: STOL, long span, PAV,...
- Propulsion: embedded, distributed, new, high-speed,...
- On-board systems: integrated multifunctional
- Autonomous, intelligent, evolving systems e.g. RPAS.
- & Barriers assessment (tech, socio-econ, regulatory).

## Expected impact

- Medium-term step-change improvement of environmental impact, competitiveness, safety



# Identification of gaps, barriers and needs in aviation research

## Challenge

*Topic MG-1.5-2016-2017 (CSA)*

- Facilitating achievement of Flightpath 2050 goals

## Scope

- 2016:
  - identify barriers & stimulate linkage and cooperation with lower participant regions and with recently associated countries (e.g. Ukraine).
  - R&I Infrastructure: status & options
- 2017: reviewing R&I state of the art; international benchmarking, identifying gaps & bottlenecks.

## Expected impact

- Assess progress towards Flightpath 2050
- Identify future needs, gaps, barriers and formulate recommendations to address them



*2016-2017: 4 topics open  
EUR 78 Mio EU budget*

## Context

- Economic, environmental and social sustainability are challenges for waterborne transport
- Need for a modern, resource-efficient, interconnected, safe, secure and resilient system
- Efficiency gains, improved use of energy sources, minimisation of environmental impacts desirable
- Competitors challenging Europe's leadership in design, production and operation of waterborne assets

# Waterborne: topics and budget

*Total EU contribution: EUR 78 Mio*

Topic	Title	Action type	Stages	Budget (EUR Mio)	
				2016	2017
MG-2.1	Innovations for <b>energy</b> efficiency and <b>emission</b> control in waterborne transport	IA	2		40
MG-2.4	Complex and value-added <b>specialised</b> vessels	IA	2		
MG-2.2	Development, production and use of high performance and <b>lightweight materials</b> for vessels and equipment	IA	2	38	
MG-2.3	New and improved transport <b>concepts</b> in waterborne transport	RIA	2		





*2016-17: 6 topics open  
EUR 66 Mio EU budget*

## Context

- Safety improved across all modes over last 10 years
- EU targets for transport safety: halving **road** casualties by 2020, towards zero fatalities by 2050
- Aim: reducing **accident** rates, **fatalities** and **injuries** in each mode
- Increasing knowledge and awareness, developing technologies, products, services, solutions

# Safety: topics and budget

*Total EU contribution: EUR 66 Mio*

Topic	Title	Action type	Stages	Budget (EUR Mio)	
				2016	2017
MG-3.1	Addressing <b>aviation</b> safety challenges	RIA	1	15	
MG-3.2	Protection of all <b>road</b> users in crashes	RIA	2		14
MG-3.3	Safer <b>waterborne</b> transport and maritime operations	RIA	2	22	
MG-3.5	<b>Behavioural</b> aspects for safer transport	RIA	2		
MG-3.4	Transport <b>infrastructure</b> innovation to increase the transport system safety at <b>modal and intermodal</b> level	RIA	2	12	
MG-3.6	Euro- <b>African</b> initiative on <b>road</b> safety and traffic management	CSA	1	3	

## Challenge

- Identifying and mitigating new risks
- Keeping Europe's excellent record in aviation safety

## Scope

- More robust and cost-efficient solutions
- Novel identification of **hazards** and handling of **data**
- Improve understanding of **environmental phenomena**
- **Explicit EASA commitment required**

## Expected impact

- Enhance safety levels, increase public trust
- Improve safety performance, lower complexity

***Estimated EC contrib. per proposal: EUR 5-9 Mio***



*2016-17: 5 topics open*

*EUR 36 Mio EU budget*

*Expanding the **CIVITAS initiative**; links with **Connecting Europe** and **ELENA Facilities***

## Context

- Transport White Paper targets:
  - By 2030: CO<sub>2</sub>-free city logistics in major centers
  - By 2050: phasing out of conventionally fuelled cars in cities
- Efficiency of urban transport, mitigation of its negative effects: crucial for performance of cities
- Need for change in use of vehicles patterns, more efficiency, less impacting city logistics

# Urban mobility: topics and budget

*Total EU contribution: EUR 36 Mio*

Topic	Title	Action type	Stages	Budget (EUR Mio)	
				2016	2017
MG-4.1	Increasing the <b>take up and scale-up</b> of innovative solutions to achieve sustainable urban mobility	IA	2		22
MG-4.2	Supporting " <b>smart electric</b> mobility" in cities	IA	2		
MG-4.3	Innovative approaches for <b>integrating urban nodes</b> in the <b>TEN-T core network corridors</b>	CSA	1		2
MG-4.4	Facilitating <b>public procurement</b> of innovative sustainable transport and urban mobility solutions	CSA	1	2	
MG-4.5	New ways of supporting development and implementation of <b>neighbourhood-level and urban-district-level</b> transport innovations	RIA	2	10	

**CSA = Coordination and Support Action**

**RIA = Research and Innovation Action; IA = Innovation Action**



*2016-17: 4 topics open*

*EUR 27 Mio EU budget*

*Complements relevant topics under **Urban Mobility** and **Intelligent Transport Systems***

## Context

- In 2012, **45%** of freight transport (tkm) on the road, **40%** by sea, **9%** by rail, **3%** by inland waterways
- **One in four** trucks in the EU **runs empty**, overall efficiency (weight-based) as low as 43%
- Need for an increase in **efficiency** and **sustainability**
- Opportunities provided by **digitalisation**
- Need to remove **bottlenecks**

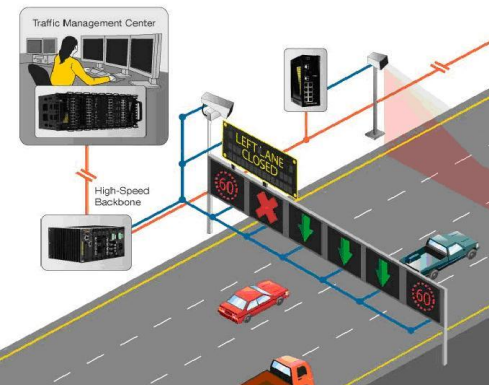
# Logistics: topics and budget

*Total EU contribution: EUR 27 Mio*

Topic	Title	Action type	Stages	Budget (EUR Mio)	
				2016	2017
MG-5.1	<b>Networked</b> and efficient logistics clusters	RIA	2	12	
MG-5.2	Innovative <b>ICT</b> solutions for future logistics operations	RIA	2		→ 12
MG-5.4	Potential of the <b>physical internet</b>	RIA + CSA	2 1		
MG-5.3	Promoting the deployment of <b>green</b> transport, towards <b>Eco-labels</b> for logistics	CSA	1	2	

**CSA = Coordination and Support Action**

**RIA = Research and Innovation Action**



*2016-17: 3 topics open*

*EUR 30 Mio EU budget*

*Complements topics under the Call on  
**Automated Road Transport***

## Context

- By connecting all elements of the transport system, ITS are key to achieving seamless passengers and goods transport
- ITS enable better use of existing infrastructure
- Need for Europe-wide real-time transport information data combining information from all transport modes



# ITS: topics and budget

*Total EU contribution: EUR 30 Mio*

Topic	Title	Action type	Stages	Budget (EUR Mio)	
				2016	2017
MG-6.1	Innovative concepts, systems and services towards ' <b>mobility as a service</b> '	RIA	2	25	
MG-6.2	Large-scale <b>demonstration(s) of cooperative ITS</b>	IA	2		
MG-6.3	Roadmap, <b>new business models, awareness raising</b> , support and incentives for the roll-out of ITS	CSA	1	5	

**CSA = Coordination and Support Action**

**RIA = Research and Innovation Action**

**IA = Innovation Action**



*2016-17: **3 topics open***

***EUR 38 Mio** EU budget*

*Proposals addressing Rail (in a multimodal approach) and Aviation infrastructure: **ensure complementarity** with activities in 'Shift to Rail' and 'SESAR' respectively*

## Context

- Growing need to make infrastructure more resilient, to keep pace with growing mobility needs and extreme events
- Coping with declining resources to maintain and upgrade transport infrastructure
- Challenge: identify innovative solutions to increase efficiency and robustness of transport infrastructure

# Infrastructure: topics and budget

*Total EU contribution: EUR 38 Mio*

Topic	Title	Action type	Stages	Budget (EUR Mio)	
				2016	2017
MG-7.1	<b>Resilience to extreme (natural and man-made) events</b>	RIA	2		
MG-7.2	<b>Optimisation</b> of transport infrastructure including <b>terminals</b>	RIA	2		→ 37
MG-7.3	The <b>Port</b> of the future	RIA	2		
		CSA	1	→	1

**CSA = Coordination and Support Action**

**RIA = Research and Innovation Action**

## Objectives

- Increase **safety, efficiency, user convenience**, livability of cities
- Meet the next **competitiveness** challenge: new frontier for industrial leadership, growth and **jobs**



# Automated Road Transport: topics and budget – Total EU contribution: EUR 114 Mio

Topic	Title	Action type	Stages	Budget (EUR Mio)	
				2016	2017
ART-01	ICT infrastructure to enable the <b>transition</b> towards road transport automation	IA	2		50
ART-03	Multi-Brand <b>platooning</b> in real traffic conditions	IA	2		
ART-07	Full-scale <b>demonstration</b> of <b>urban</b> road transport automation	IA	2		
ART-02	<b>Automation pilots</b> for passenger cars	IA	2	48	
ART-04	<b>Safety</b> and <b>end-user acceptance</b> aspects of road automation in the transition period	RIA	2		
ART-05	Road <b>infrastructure</b> to support the transition to automation and the <b>coexistence</b> of conventional and automated vehicles on the same network	RIA	2	13	
ART-06	<b>Coordination</b> of activities in support of road automation	CSA	1	3	

**CSA = Coordination and Support Action**

**IA = Innovation Action; RIA = Research and Innovation Action**

## Objectives

- **Boost competitiveness and growth**
- **Clean transport, de-carbonise society**
- Promote energy efficiency, use of non conventional energies (electricity, CNG, LNG, renewables), alternative fuels
- Reduce pollution, noise, impacts on health
- Improve engines, power-trains, vehicle architecture, manufacturing processes



# Green Vehicles [1/2]

*Total EU contribution: EUR 206,5 Mio*

Topic	Title	Action type	Stages	Budget (EUR Mio)
				2016
GV-02	Technologies for low <b>emission light duty powertrain</b>	RIA	1	65
GV-03	System and cost optimised <b>hybridisation</b> of road vehicles	IA	1	
GV-11	<b>Stimulating</b> European research and development for the implementation of <b>future</b> road transport technologies	CSA	1	3,5
GV-12	<b>ERA-NET Co-fund</b> on <b>electromobility</b>	ERA-NET	1	10

**CSA = Coordination and Support Action**

**RIA = Research and Innovation Action**

**IA = Innovation Action**

**ERA-NET = ERA-NET Cofund Action**



# Green Vehicles [2/2]

*Total EU contribution: EUR 206,5 Mio*

Topic	Title	Action type	Stages	Budget (EUR Mio)
				2017
GV-01	Optimisation of <b>heavy duty</b> vehicles for <b>alternative fuels</b> use	IA	1	128
GV-04	Next generation <b>electric drivetrains</b> for <b>fully electric vehicles</b> , focussing on high efficiency and low cost	RIA	1	
GV-05	<b>Electric vehicle user-centric design</b> for optimised energy efficiency	RIA	1	
GV-06	<b>Physical integration of hybrid and electric vehicles batteries</b> at pack level aiming at increased energy density and efficiency	IA	1	
GV-07	<b>Multi-level modelling and testing</b> of <b>electric</b> vehicles and their components	RIA	1	
GV-08	<b>Electrified urban</b> commercial vehicles <b>integration with fast charging infrastructure</b>	IA	1	
GV-09	<b>Aerodynamic</b> and <b>flexible trucks</b>	IA	1	
GV-10	<b>Demonstration</b> (pilots) for integration of <b>electrified L-category vehicles</b> in the <b>urban</b> transport system	IA	1	

*IA = Innovation Action; RIA = Research and Innovation Action*



# *Muito Obrigado*

# Thank you

# for your attention



*Find out more:*

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