JOINT ACTION PLAN AND BUSINESS PLAN
SAGE DELIVERABLE 4.3

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REGION VÄSTRA GÖTALAND
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REGIONE PIEMONTE
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POLITECNICO DI TORINO

SAGE

Document Information

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Content

Executive summary

The aim of SAGE project is to strengthen regional capacity in research and innovation of road vehicles for passenger and goods transport by focusing on a systemic approach and strategic cluster management. In order to address common challenges and promote smart specialization, SAGE is built on a core network comprising some of Europe's most important industrial centres for road vehicles. SAGE will enable societal and technical, as well as public and private actors to co-operate and meet international targets to decrease emissions and reduce the numbers of deaths and serious injuries in traffic. The project represents a network of regional research driven clusters with strong automotive industry, Västra Götaland (Sweden), Paris/Normandie (France), Regensburg (Germany), Piemonte (Italy) and Warsaw (Poland).

The SAGE project is financed by the EU 7th Framework Programme within the Regions of Knowledge theme. This Joint Action Plan & Business Plan (JAP & BP) concerns the strategic areas for collaborations and further actions for the development and financing of a durable, strong and trustful collaboration platform after the SAGE project ends.

Chapter 2 presents the common Vision of SAGE and provides background information to the various chapters in this JAP&BP. The common **vision** of SAGE is to: "deliver a significant contribution to a sustainable and modern mobility and transport system with green, safe and connected road vehicles as well as to increase the competitiveness of the European automotive industry". This will be achieved by establishing a strong and trustful SAGE Collaboration Platform.

In order to develop this JAP&BP several teams were established, including a Strategic Group, four thematic teams (Safe, Green, Connected and New Business Models & Mobility Services), an Education team, an Open Innovation Platform (OIP) team and finally a Funding team.

The present JAP&BP is based partly on the regional SWOT analyses performed by each cluster, and partly on a comparative SWOT analysis of the consortium. An initial structure for cooperation between the clusters has been developed during the progress of the project.

Chapter 3 deals with the next steps i.e. the Joint Actions (JA). An overview of all joint actions is shown in Table 1.

Table 1. Overview of Joint Actions

Joint Action	
1	Set-up a SAGE cluster management organisation
2	Improve traffic safety by joint research & innovation to reduce road fatalities and injuries
3	Reduce the GHG emissions and improve the energy efficiency by developing Green technologies
4	Contribute to connected vehicles and infrastructure and by that improve the energy efficiency and traffic safety
5	Develop New Business Models and Mobility Services
6	Increase the collaboration and development within joint educational activities
7	Strengthen the "Triple Helix" cluster development within SAGE and beyond
8	Implement smart specialization strategies within and between the SAGE clusters
9	Involve SMEs in collaborative RDI
10	Increase collaboration on RDI according to SAGE International Strategies
11	Mentor emerging clusters

The main Research Development and Innovation (RDI) areas of the future SAGE strategic collaboration are Safe, Green, Connected and New Business Models & Mobility Services (NBM&MS). The first three areas focus on technology while the NBM&MS is of cross-cutting nature concentrating on the impacts of the new technologies on markets, businesses and future mobility. For each of these 4 areas potential topics and projects for cooperation have been defined, as described in various tables included in Chapter 3 (i.e. joint action tables JA-2 to JA-5). These joint action Tables also include a mission statement, involved clusters, a timeline and possibilities for funding. A summary of the identified topics and projects for cooperation is shown in Table 2.

Next to RDI, Education is crucial for a well-functioning European Innovation System (Education, Research and Innovation together constitute the Knowledge Triangle). The joint actions regarding Education are specified in Chapter 3; JA-6.

Cluster Development & Smart Specialisation is a strategic approach to economic development through targeted support to RDI. It will be the basis for Structural Fund investments in RDI as part of the future Cohesion Policy's contribution to the Europe 2020 jobs and growth agenda. For more information see Appendix E: Cluster Development & Smart Specialisation. Some of the recommendations of this report have been or will be addressed in the joint actions described in Chapter 3 and in particular in JA-8. The Strategic group within SAGE has, in parallel to the thematic teams, discussed and defined in detail the remaining joint actions shown in Table 1, in particular dealing with actions related to policy and cluster management and cooperation.

Table 2. Topics and Projects within SAGE

Safety	Green	Connected	New Business Models and Mobility services
2-wheeler safety	Ultra-light Vehicles	Creation of an HMI network/ergonomist network	Integrated impact assessment of electro mobility on different dimensions
Safety of new vehicles	Last mileage transport	Advanced information system to connect electric vehicles over a backend system	e-Mobility Car sharing service for medium sized cities
Biomechanics	Advanced Concepts for ICE's	Intelligent interaction between autonomous vehicles	Mobility service centre (mobility broker)
Interfaces	City Demo Area Project	Smart Integration of e-vehicles into the smart grid	New taxis services and associated smart reservation platform
Functional Safety	Biogas market		Last mile delivery of parcels and goods in cities
Automated Driving			E-Mobility in historical cities or theme parks with autonomous shuttle

During the SAGE project regional, national as well as EU and other funding possibilities were identified and compiled. These funding possibilities have been taken into account in the various joint actions defined in Chapter 3.

IPR issues were handled by the Open Innovation Platform (OIP) team. The team took into consideration the existing EU documentation regarding IPR regulations and other national agreement templates (e.g. Swedish Vinnova/FFI) and concluded that the existing documents were applicable and sufficient to SAGE with some minor adaptations, so no further actions have been defined.

Chapter 4 deals with financial aspects of the future SAGE cooperation. It contains an initial financial estimate. A distinction is made between three different funding streams (with an increasing degree of uncertainty):

1. SAGE project funds available for the second half of the project.

2. Resources available within each cluster targeting region internal cluster development and capacity building.

3. External funding provided by regional, national and European funding organisations. Primary sources are competitive calls for research and innovation projects and resources made available through European cohesion policy funds.

1. Introduction

The Safe and Green Road Vehicles Europe (SAGE) partnership consists of five European research driven automotive clusters located in the regions: Västra Götaland, Sweden; Paris/Normandie, France; Regensburg, Germany; Piemonte, Italy and Warsaw, Poland. The aim of SAGE is to strengthen regional capacity in research and innovation of road vehicles for passenger and goods transport by focusing on a systemic approach and strategic cluster management. SAGE is built on a core network comprising of some of Europe's most important industrial centres for road vehicles. SAGE will enable societal and technical, as well as public and private actors to co-operate and meet international targets to decrease emissions and reduce the numbers of deaths and serious injuries in traffic.

The SAGE project is financed by the EU 7th Framework Programme within the Regions of Knowledge theme. This Joint Action Plan & Business Plan (JAP&BP) concerns the strategic areas for collaborations and Joint Actions (JA) as well as the development of a durable, strong and trustful Collaboration Platform (CP) after the SAGE project ends.

Even though the original SAGE focus was on Green and Safe technologies, the SAGE partners have also recognized the importance of two additional focus areas: Connectivity and New Business Model and Mobility Services (NBM&MS). The Connectivity area includes the enabling technologies aimed at achieving new products and new services that can make vehicles more safe and environmentally friendly.

The JAP&BP has been developed jointly by the project partners and is based on the results of regional inventories (Delivery 2.1), Global Synthesis (Delivery 2.3), regional and consortium SWOT analyses (Delivery 3.1 and Delivery 3.2) benchmarking on Asians clusters (Delivery 7.1) and several European as well as national research guidelines and Roadmaps (e.g. ERTRAC[1]).

The JAP&BP was devised through a concerted effort of several cross-regional teams, focusing on:

- A strategic overview
- Research Development & Innovation (RDI) in the focus areas: Safe, Green, Connected and NBM&MS
- Education
- Funding
- Open Innovation

To facilitate the process and to help in consensus building, a number of workshops have been organized.

[1] The European Road Transport Research Advisory Council

2. Background

2.1. Common Vision

The common **vision** of SAGE is:

“To deliver a significant contribution to a sustainable and modern mobility and transport system with green, safe and connected road vehicles as well as to increase the competitiveness of the European automotive industry”

This will be achieved by establishing a durable, strong and trustful SAGE Collaboration Platform.

2.2. Collaboration Platform & Desired State

The desired state of the SAGE Collaboration Platform at the end of the SAGE project can be summarized as follows:

- is based on detailed analysis of the regions and their weaknesses and strengths
- has full triple helix representation from each region
- gathers strong and engaged players with potential to contribute to change and with access to European policy-makers
- offers networking opportunities and matchmaking on international level
- welcomes cooperation with other clusters/regions with complementing competences from inside and outside the EU
- has established strong cooperation with important automotive clusters in China, Japan and Korea
- has developed common tools for knowledge exchange and open innovation
- has secured funding for platform activities and can support to find funding opportunities for projects
- facilitates the dissemination of results from existing best practise and aims to implement this in other regions
- supports the involvement of SME’s in collaborative research and development projects
- offers guidance to regional decision-makers on policies and research agendas for safe and green road vehicles

2.3. Research, Development and Innovation – Thematic areas for collaboration

The RDI focus areas of future SAGE strategic cooperation are: Safe, Green, Connected and NBM&MS. The first three focus on technology while the NBM&MS is of cross-cutting nature concentrating on the impacts of the new technologies on markets, businesses and future mobility.

For each RDI area, a cross-regional team has, in close co-operation with stakeholders in each region, worked-out their joint action tables (**JA-2** to **JA-5**) according to the process shown in Figure 1. See also Appendix C: main focus and sub-focus areas.

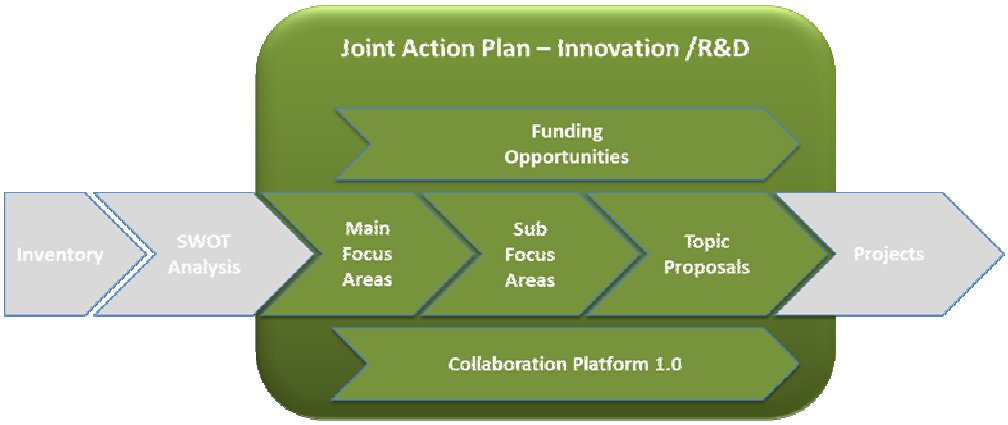

Figure 1: Thematic process

In parallel to the thematic team work, the Funding team made an inventory regarding possible funding, both on regional, national as well as on EU-level. When elaborating the thematic JA's, the results from the Funding team were taken into consideration.

2.4. Education

Education activities are crucial for a well-functioning European Innovation System. In SAGE the focus is on the technical areas within Safe, Green and Connected Road Vehicles. A number of Master Programs are run by the universities in the SAGE regions with topics closely related to these technical areas. It is believed that SAGE collaboration within well-defined areas will strengthen the interaction between research and educational activities. In addition, these educational programs will benefit from research influence through a better understanding of innovative ideas and common challenges within the clusters. Via the network in SAGE it is possible to connect scientists with the same areas of interest across the clusters, thus facilitating the exchange of students and researchers. The joint actions regarding Education are specified in **JA-6**.

2.5. Policy & Cluster management

Cluster initiatives play an important role in the new EC programming period 2014-2020. Cluster Development & Smart Specialisation is a strategic approach to economic development through targeted support to Research and Innovation. It will be the basis for Structural Fund investments in RDI as part of the future Cohesion Policy's contribution to the Europe 2020 jobs and growth agenda. For more information see Appendix E: Cluster Development and Smart Specialisation.

The Strategic group within SAGE has in parallel to the thematic teams discussed and worked out several of the joint actions (**JA-1**, **JA-7** - **JA-11**) related to policy

and cluster management. These joint actions are almost a direct answer to several of the recommendations from the SWOT analysis (see 2.7).

2.6. Funding and IPR aspects

During the SAGE project the regional as well as EU and other funding possibilities were identified and compiled, see Appendix B: Funding possibilities. These funding possibilities have been considered when elaborating this JAP&BP. Funding opportunities include private funding organisations in each country. They fund a wide variety of projects and play an important role, especially for start-ups and SMEs in their development phase. It is important for the clusters to know these investors in order to redirect the relevant projects for this kind of funding.

IPR issues were handled by the Open Innovation Platform (OIP) team. The team took into consideration the existing EU documentation regarding IPR regulations[1] and other national agreement templates e.g. Vinnova/FFI[2] and concluded that this was applicable and sufficient to SAGE, with minor adaptations, when initiating SAGE projects. Thus, no further actions were defined.

2.7. Outcomes of the cluster inventory and SWOT analyses

The present JAP&BP is based partly on regional SWOT analyses performed by each cluster, and partly on a comparative SWOT analysis of the consortium. An analysis of these has resulted in a number of recommendations. For details see Appendix A: SWOT analysis and recommendations to WP4.

The SWOT recommendations, complemented with the input from the international cluster benchmarking (see 2.8) and the mentoring activities have served as an input for the definition of the scope of the collaboration within SAGE and the definition of joint actions.

2.8. Benchmarking international clusters

Benchmarking on International clusters has been carried out within WP 7 and the results are described in report D7.1. The aim of this report is to present a mapping and analyse the research and innovation “ecosystem” of nine different automotive research driven clusters in Asia. The regions selected for the analysis are: Beijing, Shanghai and Xi’an in China; Tokyo and Nagoya in Japan; Mumbai/Pune and Bangalore in India, and finally Daejeon and Busan/Ulsan in South Korea. Focus has been on mapping clusters with respect to their ability in the area of Green and Safe road vehicle development.

[1] ftp://ftp.cordis.europa.eu/pub/fp7/docs/ipr_en.pdf
[2] http://www.vinnova.se/sv/ffi/Att-soka-finansiering/

2.9. European Research agendas

Important European research agenda's with a large impact on the European research funding programs for road transport have been developed by ERTRAC, the European Road Transport Research Advisory Council.

In a recent ERTRAC document Multi-Annual Plan for implementation of Horizon 2020, (March 2013)[1], that was prepared to identify the most important RDI topics for Horizon 2020 (the upcoming RDI funding program of the European Commission), overall efficiency targets for improvement of the European road transport system have been identified. They have been defined for 3 societal needs: decarbonisation, reliability and safety as illustrated in Table 3.

Table 3: ERTRAC Multi-Annual Implementation Plan for Horizon 2020

	Indicator	Guiding objective
Decarbonization	Energy efficiency: urban passenger transport	+80% (pkm/kWh) *
	Energy efficiency: long-distance freight transport	+40% (tkm/kWh) *
	Renewables in the energy pool	Biofuels: 25% Electricity: 5%
Reliability	Reliability of transport schedules	+50% *
	Urban accessibility	Preserve Improve where possible
Safety	Fatalities and severe injuries	-60% *
	Cargo lost to theft and damage	-70% *

* Versus 2010 baseline

For **Safety** the target is to reduce the number of fatalities and severe injuries by 60% in 2030 compared to 2010 as a baseline and for **Green** (decarbonisation) there should be an increase in 80% in energy efficiency of urban passenger transport in this period. Important RDI efforts needed to reach the targets are described in roadmap mentioned above.

For the focus area **Green** also the EGCI (European Green Cars Initiative[2]) PPP and CARS 21[3] should be mentioned here. The European Green Cars initiative has consistently taken a relatively long-term perspective of how to create a truly sustainable Mobility and Transportation system for the future, recognising that the biggest challenge for the industry is the reduction of GHG emissions by improving energy efficiency. The PPP EVGI (European Green Vehicle Initiative) will be the continuation of the EGCI in Horizon 2020 and will focus on Energy Efficiency of Vehicles & Alternative Powertrain. Through the CARS21 process, the manufacturers of vehicles in Europe have reached a common agreement with the European Commission on how to regularly monitor and evaluate developments in

[1] http://www.ertrac.org/pictures/downloadmanager/1/56/ertrac-map-h2020_67.pdf
[2] http://www.green-cars-initiative.eu/public/
[3] http://ec.europa.eu/enterprise/sectors/automotive/competitiveness-cars21/cars21/

competitiveness in relation to the car industry. The basic premise is that, apart from the vehicles themselves, other means of reducing CO2 emissions should be part of an Integrated Approach to reducing CO2 emissions from the road transport sector, in order to attain sustainable solutions which assist the European Automotive industry to improve its competitiveness rather than being detrimental to it.

3. Joint Actions

The Joint Actions given below are proposed as the basis for future SAGE co-operation strategy, both during the second phase of the project as well as after the end of the SAGE project. In total 11 actions have been defined as summarized below.

3.1. Joint Action 1: Set-up a SAGE cluster management organisation

In order for SAGE to live on after the end of the current project period, a lean management organisation needs to be put in place. The primary function of this organisation is to make sure that the results from the SAGE project are put to use, to keep the doors open between the regions and to support, as well as monitor the implementation of the JAP&BP.

Title	SAGE Cluster Management Organisation
Mission	Continue to build a strong and trustful SAGE Collaboration Platform by implementation of a lean SAGE cluster management organisation and collaboration tools. On a continuous basis and in co-operation identify and follow-up the international competition (regions and clusters, technology and societal trends), as well as possible co-operations.
Description	A lean management organisation for SAGE, to be implemented within WP5 and maintained after the formal end of the project, should have at least the following features: • Committed resources from each partner organisation • A coordinator from each SAGE region • A management team with the regional coordinators including a rotating chairmanship and regular meetings In addition to this, each region will keep a thematic responsibility for the transnational project development within SAGE. This thematic responsibility is divided according to the smart specialisation approach by SAGE. The responsibilities of the management organisation include: • Support and monitor the implementation of the JAP and its project portfolio • Initiate and facilitate new joint actions within the scope of this JAP&BP • Identify relevant European calls and consortiums and connect with on-going initiatives in the respective regions • Support project implementation, for example concerning IPR issues • Arrange matchmaking opportunities for stakeholders within the

	SAGE regions and facilitate new relations • Manage strategic partnerships with other clusters (WP6, WP7) and follow up on the International Strategy (D7.2) and Mentoring Action Plan (D6.2) • Position SAGE as well as the respective SAGE regions in the forefront within sustainable transport R&I, according to the SAGE communication strategy (D8.2) and the SAGE exploitation plan (D8.10) • Maintain the SAGE website • Further develop and implement CP tools (e.g. CP2.0, Science Router (matchmaking)). See also Appendix F. • Continue to develop and up-date the funding database (developed in WP4) – regional, national and European funding opportunities • Aim to influence decision-makers on regional, national and International level • Arrange a yearly conference and other seminars and workshops where applicable
Stakeholders	Each SAGE region; Mov'eo, Regensburg, Torino, Västra Götaland Regionen and Warsaw.
Expected output / impact	A strong Collaboration Platform; • A lean SAGE cluster management organisation • Applicable collaboration tools
Steps to implementation	On a continuous basis: • Commitment from each region regarding "in-kind" resources. • Describe the organisation and different roles • Describe competence requirements and other resources • Evaluate the pilot tool "CP1.0" and describe functional and technical requirements on collaboration platform tools • Identify possible funding / "In-kind" • Set-up working group / initial consortium • Allocate champion • Develop and implement a CP2.0
Champion	VGR (+ each region)
Timeline	For transnational activities: • Initiated within WP5 from May 2013 to October 2014 • Dealt within the SAGE lean management structure after November 2014

	For regional activities: • Initiated by each region, starting in May 2013
Costs & Funding	A pre-requisite for the level of ambition for this management is what is achievable within the existing resources of the participating partners. If SAGE is able to attract funding for platform activities, the ambition could be additionally raised. The best case scenario outcome of the SAGE project is to have funding both for platform activities and for specific R&I projects, complementing each other and creating synergies and strength. **For transnational activities: 100 k€ per annum** • Included in SAGE budget until October 2014 (SAGE resources) • Funded through own cluster resources after October 2014 **For regional activities: 100 k€ per annum** • Own resources of each region (about 1 person, 20% "in-kind", per year) • Funding opportunities: regional and national grants, structural funds

3.2. Joint Action 2: Joint research and innovation on traffic safety

The European research agendas e.g. ERTRAC, clearly stress the importance of the topic Safety for a sustainable future European transport system. Therefore new safety technologies for the vehicle have to be developed. Since significant expertise is present within the various SAGE clusters in the field of Safety, it was clear from the beginning of the SAGE project that Safety should be one of the strategic areas for future cooperation.

Title	Main Focus Area SAFE
Mission	To deliver a significant contribution to the ERTRAC targets for 2030 (i.e. 60% reduction of European road fatalities and injuries in 2030 compared to 2010) by carrying out joint research and innovation projects based on the strengths and competences available in the SAGE consortium and others. These activities will lead to new products and new services, which make driving more safe, more environmental friendly and more comfortable and ensure an European leadership position in these developments.
Guidelines	Main guidelines are ERTRAC roadmaps and strategic agenda's and national research agenda's.

Strategic Areas	Within the strategic area of Safety the below sub-focus areas have been identified: S-SF1: Safety of vulnerable road users (VRU) S-SF2: Safety of new vehicles S-SF3: Advanced driver support S-SF4: Traffic Safety Analysis S-SF5: Safe infrastructure For more details see Appendix C: main focus areas and sub-focus areas.
Description	In 2030 the vehicles on the road will be quite different from the current situation. There will be shift to lighter environmental friendly vehicles with alternative propulsion systems. The reduction in vehicle weight without compromising safety and cost, nor recycling ability, is a top priority in this context, and appropriate solutions in terms of advanced materials and corresponding process technologies has to be developed to generate the required economies of scale and make them truly viable. There will also be a shift to alternative means of transport including public transport, walking and use of pedal cycles The SAGE consortium has long experience and strong competence within the safety theme, but with new type of vehicles, drivelines, structures, materials etc, additional competence and experience are required. By co-operation on a SAGE consortium level, more resources are available, e.g. competence, test arenas, which make it possible to perform projects in a cost efficient way. Safety is taken well care of by focussing on accident avoidance and by decreasing the severity of the accident conditions in case an accident would happen (integrated safety). Protection of people in lighter (and due to this more vulnerable) vehicles will get high priority including protection with heavier more aggressive vehicles (compatibility in crashes). Protection of vulnerable road users (pedestrians and cyclists) is another important priority area. During the SAGE project several Topic Proposals have been identified, all well anchored in the regions, and in line with the ERTRAC agenda. The following topics of cooperation have already been acknowledged: • **2-wheeler safety** • **Safety of new vehicles** • **Biomechanics** • **Interfaces** • **Functional Safety** • **Automated Driving** The holistic impact assessment and demonstration of the innovative solutions which are being proposed is also fundamental in order to quantifying the benefits and costs so that the investments required for wide-scale implementation can be fully determined. One example of this is the Asta Zero, an environment for road safety research, where

	the authorities, academia, research institutions and industry can create competitive developments together. **Transnational activities:** Set-up, implement and manage a collaborative process enabling the development of joint research, innovation and demonstration activities involving members of the different SAGE clusters in the area of Safety. • Based on the JAP&BP, funding opportunities and the SAGE cluster partner engagements, review the topic proposals and define Projects • Define at least one project to be implemented during the SAGE project WP5 (one topic proposal or a combination of several topic proposals) • Arrange a first workshop and invite possible stakeholders to participate to elaborate a project plan to be implemented in WP5 • Involve new actors and new competences if needed (also outside EU as a results of WP7) • Identify, implement and monitor relevant actions • On a continuously basis match existing regional agendas and initiatives with the SAGE consortium strategic areas and propose additional topic proposals. • Arrange matchmaking activities on a regular basis • On a continuously basis, listen to the regional stakeholders interest and needs. Share knowledge, promote transparency and propose additional topic proposals. This can be performed by inviting different stakeholders into workshops. • Assess continuously the level of cluster development and management.
Stakeholders	All the stakeholders identified in the inventory phase having a relevant competence in Safety.
Expected output / impact	• At least one project will be selected and initiated/implemented during the SAGE project • One or several topic proposals will be combined into one project and initiated during the SAGE project or after the closure of the project, dependent on available resources and funding opportunities • A Project Portfolio (as a Gantt scheme) including an overview of on-going and planned projects as well as funding opportunities, will be held up-to date on a continuously basis. • A lean SAGE management organisation will be implemented with the main responsibility for each Main Focus Area, to collect and disseminate information, activities, calls, project initiatives etc. • Generation of new businesses for the stakeholders of the SAGE clusters. • Long-term cooperation between SAGE partners build on transparency and trust.
Champion	SAFER and the Västra Götaland SAFETY Cluster
Timeline	• Prioritized projects will be initiated within WP5 from May 2013 to October 2014 • Other projects will be initiated when funding is available, either by regional, national or EU programs or “in-kind” • Dealt within the lean SAGE Management Cluster Organisation

	after November 2014
Costs & Funding	**Estimated resources:** • Project initiation and development of projects 100 k€ (including 2 initial workshops x 10 k€. 40 k€ within SAGE budget) • Project work funded through external sources Funding opportunities for the projects: • Europe: Horizon 2020 • National and regional grants, cities

3.3. Joint Action 3: Joint research and innovation on reduced GHG emissions and improved energy efficiency

The European research agendas e.g. ERTRAC, clearly stress the importance of the topic Green for a sustainable future European transport system. Therefore new GREEN technologies for the vehicle have to be developed. Since significant expertise is present within the various SAGE clusters in the field of Green it was clear from the beginning of the SAGE project that Green should be one of the strategic areas for future cooperation.

Title	**Main Focus Area Green**
Mission	To deliver a significant contribution to the ERTRAC targets for 2030 (i.e. Decarbonisation by energy efficiency of urban passenger transport and long distance freight transport in 2030 compared to 2010) by carrying out joint research and innovation projects based on the strengths and competences available in the SAGE consortium and others. These activities will lead to new products and new services, which make driving more green, energy efficient, more environmental friendly and more comfortable and ensure an European leadership position in these developments.
Guidelines	Main guidelines are ERTRAC roadmaps and strategic agenda's and national research agenda's.
Strategic Areas	Within the strategic area of Green the below sub-focus areas have been identified: G-SF1: Powertrain Technologies G-SF2: Energy Technologies G-SF3: Green Production G-SF4: Robustness and Reliability G-SF5: Environmental impact of new vehicle technologies G-SF6: Demonstration For more details see Appendix C: main focus areas and sub-focus areas.
Description	In 2030 the vehicles on the road will be quite different from the current situation. There will be shift to lighter environmental friendly vehicles with alternative propulsion systems. The next decade is likely to witness further segmentation between

	vehicles for the urban environment (e.g. battery electric vehicles, two-wheelers) vs. longer distance applications (e.g. conventional and hybrid powertrains). Over the medium-term, stricter regulations on CO2 emissions in Europe are likely to lead to further growth in related components and technologies and the optimization of vehicles and their propulsion with respect to their mission will be a key issue.
	
	The reduction in vehicle weight without compromising safety and cost, nor recycling ability, is a top priority in this context, and appropriate solutions in terms of advanced materials and corresponding process technologies has to be developed to generate the required economies of scale and make them truly viable. The holistic impact assessment and demonstration of the innovative solutions which are being proposed is also fundamental in order to quantifying the benefits and costs so that the investments required for wide-scale implementation can be fully determined. During the SAGE project several Topic Proposals have been identified, all well anchored in the regions, and in line with the ERTRAC agenda.
	
	The following topics of cooperation have already been acknowledged:
	
	• **Ultra Light Vehicles**
	• **Last mileage transport**
	• **Advanced Concepts for ICE's**
	• **City Demo Area Project**
	  ○ **Electric vehicle fleets**
	  ○ **Medium range Hybrid Powertrain**
	  ○ **Inductive Charging – plug-less hybrid**
	• **Biogas market**
	
	Transnational activities:
	Set-up, implement and manage a collaborative process enabling the development of joint research, innovation and demonstration activities involving members of the different SAGE clusters in the area of Green.
	• Based on the JAP&BP, funding opportunities and the SAGE cluster partner engagements, review the topic proposals and define Projects
	• Define at least one project to be implemented during the SAGE project WP5 (one topic proposal or a combination of several topic proposals)
	• Arrange a first workshop and invite possible stakeholders to participate to elaborate a project plan to be implemented in WP5
	• Involve new actors and new competences if needed (also outside EU as a results of WP7)
	• Identify, implement and monitor relevant actions
	• On a continuously basis match existing regional agendas and initiatives with the SAGE consortium strategic areas and propose additional topic proposals.
	• Arrange matchmaking activities on a regular basis
	• On a continuously basis, listen to the regional stakeholders interest and needs. Share knowledge, promote transparency and propose additional topic proposals. This can be performed by inviting different stakeholders into workshops.
	• Assess continuously the level of cluster development and management.

Stakeholders	All the stakeholders identified in the inventory phase having a relevant competence in Green.
Expected output / impact	• At least one project will be selected and initiated/ implemented during the SAGE project • One or several topic proposals will be combined into one project and initiated during the SAGE project or after the closure of the project, dependent on available resources and funding opportunities • A Project Portfolio (as a Gantt scheme) including an overview of on-going and planned projects as well as funding opportunities, will be held up-to date on a continuously basis. • A lean SAGE management organisation will be implemented with the main responsibility for each Main Focus Area, to collect and disseminate information, activities, calls, project initiatives etc. • Generation of new businesses for the stakeholders of the SAGE clusters with a significant impact for the regions • Long-term cooperation between SAGE partners build on transparency and trust.
Champion	The Torino Cluster
Timeline	• Prioritized projects will be initiated within WP5 till October 2014 • Other projects will be initiated when funding is available, either by regional, national or EU programs or “in-kind” • Dealt within the lean SAGE Management Cluster Organisation after November 2014
Costs & Funding	**Estimated resources:** • Project initiation and development of projects 100 k€ (including 2 initial workshops x 10 k€, 40 k€ within SAGE budget) • Project work funded through external sources Funding opportunities for the projects: • Europe: Horizon 2020, Intelligent Energy for Europe, Smart Cities and Communities • National and regional grants, cities

3.4. Joint Action 4: Joint research and innovation on vehicle/infrastructure connectivity

The European research agendas e.g. ERTRAC do not classify **Connected** as a societal need, but it is seen as a very important technology to improve Safety and Reliability of the transport system as well in meeting the Decarbonisation targets. The connectivity is regarded as a mega trend and an important technology for a sustainable future European transport system. Therefore new technologies in the field of connected for the vehicle and the infrastructure have to be developed.

Title	Main Focus Area Connected
Mission	To deliver a significant contribution to that new as well as ”old” vehicles; are connected, understand each other and by that significant contribute the ERTRAC targets for 2030; zero-accident & eco-friendly mobility. This will be achieved by carrying out joint research and

	innovation projects based on the strengths and competences available in the SAGE consortium and others. These activities will lead to new products and new services, which make driving more green, energy efficient, more environmental friendly and more comfortable. Completely new concepts of mobility, including user-friendly and cost-efficient charging infrastructure, will be developed to ensure an European leadership position in these developments.
Guidelines	There are several guidelines from EU referring to connected including ERTRAC roadmaps and strategic research agenda's, the Smart-Grid Research Agenda 2035, the Digital Agenda for Europe 2020 and the Strategic Research Agenda for Robotics in EU 2009.
Strategic Areas	Within the strategic area of Connected the below sub-focus areas have been identified: C-SF1: Cooperative ITS C-SF2: Automated Driving and Platooning C-SF3: Connectivity for EV C-SF4: HMI C-SF5: Inter-vehicular network technologies For more details see Appendix C: main focus areas and sub-focus areas.
Description	In 2030 the vehicles on the road will be quite different from the current situation. There will be shift to lighter environmental friendly vehicles with alternative propulsion systems. The next decade is likely to witness further segmentation between vehicles for the urban environment (e.g. battery electric vehicles, two-wheelers) vs. longer distance applications (e.g., conventional and hybrid powertrains). Over the medium-term, stricter regulations on CO2 emissions in Europe are likely to lead to further growth in connectivity technologies and traffic optimization management systems. According to the Oliver Wyman Study "In-Car IT – Trends, Opportunities, and Challenges for Automotive Suppliers"[1] from 2011, 80% of all new vehicles will be connected in 2016. Of course there is in addition the need to make all the "old" vehicles, which are already on the road before 2016, connected too. For vehicles it means that either the vehicle is connected to another vehicle (V2V) or the vehicle is connected to infrastructure (V2I). Infrastructure can be e.g. a traffic operation centre, services (route maps, advertisements), workshops, the OEM, humans (via smart phone, PC) or the charging infrastructure and electricity grid for e-vehicles. Connectivity can optimize traffic management between all these vehicles and its infrastructure and make a contribution to clean power at the same time make road traffic more safe and comfortable for the driver. Connectivity increases traffic safety as vehicles can communicate with each other and pass warnings on dangerous situations or communicate with the infrastructure in case of an

[1] http://www.oliverwyman.com/index.html

	accident. The Human Machine Interface (HMI) is an important topic of connectivity. HMI has to ensure usability and reduce distraction of the driver and is in this way also closely related to the Safety topic. The following topics of cooperation have already been acknowledged: • **Creation of an HMI network/ergonomist network** • **Advanced information system to connect electric vehicles over a backend system** • **Intelligent interaction between autonomous vehicles** • **Smart Integration of e-vehicles into the smart grid** The holistic impact assessment and demonstration of the innovative solutions which are being proposed is also fundamental in order to quantifying the benefits and costs so that the investments required for wide-scale implementation can be fully determined. **Transnational activities:** Set-up, implement and manage a collaborative process enabling the development of joint research, innovation and demonstration activities involving members of the different SAGE clusters in the area of Connected. • Based on the JAP&BP, funding opportunities and the SAGE cluster partner engagements, review the topic proposals and define Projects • Define at least one project to be implemented during the SAGE project WP5 (one topic proposal or a combination of several topic proposals) • Arrange a first workshop and invite possible stakeholders to participate to elaborate a project plan to be implemented in WP5 • Involve new actors and new competences if needed (also outside EU as a results of WP7) • Identify, implement and monitor relevant actions • On a continuously basis match existing regional agendas and initiatives with the SAGE consortium strategic areas and propose additional topic proposals. • Arrange matchmaking activities on a regular basis • On a continuously basis, listen to the regional stakeholders interest and needs. Share knowledge, promote transparency and propose additional topic proposals. This can be performed by inviting different stakeholders into workshops. • Assess continuously the level of cluster development and management.
Stakeholders	All the stakeholders identified in the inventory phase having a relevant competence in Connected.
Expected output / impact	• At least one project will be selected and initiated/ implemented during the SAGE project • One or several topic proposals will be combined into one project and initiated during the SAGE project or after the closure of the project, dependent on available resources and funding

	opportunities • A Project Portfolio (as a Gantt scheme) including an overview of on-going and planned projects as well as funding opportunities, will be held up-to date on a continuously basis. • A lean SAGE management organisation will be implemented with the main responsibility for each Main Focus Area, to collect and disseminate information, activities, calls, project initiatives etc. • Generation of new businesses for the stakeholders of the SAGE clusters with a significant impact for the regions • Long-term cooperation between SAGE partners build on transparency and trust.
Champion	Regensburg e-mobility cluster
Timeline	• Prioritized projects will be initiated within WP5 from May 2013 to October 2014 • Other projects will be initiated when funding is available, either by regional, national or EU programs or "in-kind" • Dealt within the lean SAGE Management Cluster Organisation after November 2014
Business Plan: Costs / Funding/ Resources	**Estimated resources:** • Project initiation and development of projects 100 k€ (including 2 initial workshops x 10 k€, 40 k€ within SAGE budget) • Project work funded through external sources Funding opportunities for the projects: • Europe: Horizon 2020, Smart Cities and Communities • National and regional grants, cities

3.5. Joint Action 5: Develop New Business Models and Mobility Services

This area concentrates on the impacts of the new technologies on markets, businesses and future mobility. Due to the various application cases of future mobility solutions, numerous business models can emerge leading to new shares in the value creation and involving new participating players.

Title	**Main Focus Area New Business Models & Mobility Services**
Mission	Thanks to open innovation and cross-cutting exchanges between different technical and social domains, the mission is to establish new products, new services and new business models in mobility to ensure an European leadership position in these developments.
Guidelines	For instance ERTRAC roadmaps and Strategic Research Agenda's and national agenda's.
Strategic Areas	Within the strategic area of NBM&MS the below sub-focus areas have been identified: NBM-SF1: Vehicle System Integration and new architectures: NBM-SF2: Individual and societal demand on sustainable transport and mobility services

	NBM-SF3: New Mobility Solutions & Value-Added services NBM-SF4: Economic and social impact For more details see Appendix C: Main Focus Areas and Sub-focus Areas
Description	Vehicle system integration and interfaces are influenced by new usages. In parallel, new added value mobility services are needed not just for mature, but also for emerging markets. New technical solution and new business models will emerge. Europe must reach leadership positions in these developments to ensure the competitiveness for its road transport industry. Based on the work realized in WP4 the activities will be to set-up, implement and manage a collaborative process enabling the development of joint research, innovation and demonstration activities involving members of the different SAGE clusters in the area of New Business Models & Mobility Services. Workshops and matchmaking events will be organized. Specific efforts will be made to involve relevant stakeholders and to identify possible funding for the projects. 6 topics of cooperation have already been acknowledged: • **Integrated impact assessment of electromobility on different dimensions** • **Car sharing service based on e-Mobility for medium sized cities** • **Mobility service centre (mobility broker)** • **New taxis services (green taxis, flexible taxis…) and associated smart reservation platform** • **Last mile delivery of parcels and goods in cities** • **E-Mobility in historical cities or theme parks with autonomous shuttle** The holistic impact assessment and demonstration of the innovative solutions which are being proposed is also fundamental in order to quantifying the benefits and costs so that the investments required for wide-scale implementation can be fully determined. **Transnational activities:** Set-up, implement and manage a collaborative process enabling the development of joint research, innovation and demonstration activities involving members of the different SAGE clusters in the area of NBM&MS. • Based on the JAP&BP, funding opportunities and the SAGE cluster partner engagements, review the topic proposals and define Projects • Define at least one project to be implemented during the SAGE project WP5 (one topic proposal or a combination of several topic proposals) • Arrange a first workshop and invite possible stakeholders to participate to elaborate a project plan to be implemented in WP5 • Involve new actors and new competences if needed (also outside EU as a results of WP7)

	• On a continuously basis match existing regional agendas and initiatives with the SAGE consortium strategic areas and propose additional topic proposals. • Arrange matchmaking activities on a regular basis • On a continuously basis, listen to the regional stakeholders interest and needs. Share knowledge, promote transparency and propose additional topic proposals. This can be performed by inviting different stakeholders into workshops.
Stakeholders	All the stakeholders identified in the inventory phase having a relevant competence in NBM&MS.
Expected output / impact	• At least one project will be selected and initiated/ implemented during the SAGE project • One or several topic proposals will be combined into one project and initiated during the SAGE project or after the closure of the project, dependent on available resources and funding opportunities • A Project Portfolio (as a Gantt scheme) including an overview of on-going and planned projects as well as funding opportunities, will be held up-to date on a continuously basis. • A lean SAGE management organisation will be implemented with the main responsibility for each Main Focus Area, to collect and disseminate information, activities, calls, project initiatives etc. • Creation of new projects consortiums, on intelligent and sustainable mobility solutions, able to address the future European calls • Dissemination of new mobility services already developed in some European regions and implementation of those new business opportunities in other regions • Generation of new businesses for the stakeholders of the SAGE clusters with a significant impact for the regions • Long-term cooperation between SAGE partners build on transparency and trust.
Champion	Mov'eo
Timeline	• Initiated within WP5 from May 2013 to October 2014 – prioritized "topic proposals" • Initiated when the funding is available, either by regional, national or EU programs or "in-kind" • Dealt within the SAGE lean management structure after November 2014
Costs & Funding	**Estimated resources:** • Project initiation and development of projects 100 k€ (including 2 initial workshops x 10 k€. 40 k€ within SAGE budget) • Project work funded through external sources Funding opportunities for the projects: • Europe: Horizon 2020, Intelligent Energy for Europe, Smart Cities and Communities • National and regional grants, cities

3.6. Joint Action 6: Joint educational activities

The knowledge level within the Automotive and Transport area in Europe is very high. The different competences are spread along the universities throughout Europe. By connecting these clusters/regions possessing different skills the SAGE consortium is able to spread the knowledge more effectively in Europe.

Title	Main Focus Area Education
Mission	The mission is to increase collaboration and encourage development of new educational activities which are promoting the knowledge level in SAGE´s key areas. The educational projects developed in SAGE are aiming to encourage the collaboration and thereby contributing to raise the educational level more evenly among partner regions. The ultimate goal is to deliver the most appropriate engineers and researchers to the employers.
Guidelines	The educational system of European higher education has been further developed through EU programmes and includes today, e.g. Erasmus Mundus, Leonardo, Unitech, Marie Curie, The Jean Monnet Program among others.
Strategic Areas	Within the thematic focus areas of SAGE the following strategic areas could be explored. • **Exchange of students/researchers** • **Development of new programs/courses** • **Integrate skills in entrepreneurship and innovation system** • **Raising awareness of Automotive and Transport educations and job opportunities**
Description	SAGE universities have well defined competences about specific key technologies that can be enabling factors for the success of future Automotive education, but that are not fully included in current Automotive program yet or they are not included with the right level of detail. From the SWOT analysis the following technical areas are still needed to be developed within the university programs: • New battery technologies; materials for electrolytes and electrochemical applications; technique and impact of materials recycling; • Project management in Automotive manufacturing and R&D • Automotive Functional Design • Applied Automotive Electronics and Mechatronics • Automotive Control Systems Besides technical competences, non-technical competences such as language skills, methodological, social and entrepreneurial competences need also to be developed. The following project proposals could contribute to bridging the gap mentioned.

	• Set-up a Master Thesis and PhD Projects Pool (data base), to promote the mobility of students among the SAGE cluster
	• Joint activities with e-gomotion (a CSA action under EU 7FP/Green Car):
	  ○ Arranging seminars of job opportunities within electrification of road vehicles
	  ○ Exchange of courses and Master Programs
	  ○ Co-arranged demonstration of electromobility; Tables of information, test driving and invitations to BSc and MSc thesis.
	  ○ Dissemination to students, university staff, industrialists, governmental officials and alumni
	• Set up a common SAGE European Transport Master Program including the following activities:
	  ○ Guest Lecturers
	  ○ Field Trips to automotive industries, e.g. companies
	  ○ Mini projects emanating from companies. This can both be smaller projects (5-20 weeks) as well as longer systematic studies.
	  ○ Joint activities involving industry/academia regarding recruitment of new students
	  ○ Introduction to Entrepreneurship and Innovation Systems in each regional context, respectively.

Stakeholders	Politecnico di Torino, Chalmers University of Technology, Regensburg University of Applied Sciences, Paris Tech
Expected output / impact	• Increase awareness of job opportunities and educational programs in Green and Safe Transport • Attractive advanced educational programs in Automotive and Transport Field • Increased number of exchanged researches among the SAGE clusters • Increase the link and collaboration between academia and industry • Contribute to secure the knowledge base within the Automotive/Transport area In addition, arrangement of seminars, conferences and courses (both Master and courses for professionals) will also contribute to increase the knowledge transfer in SAGE´s technical areas.
Champion	Politecnico di Torino
Timeline	Prioritized projects will be initiated within WP5 from May 2013 to October 2014. 0-2 year: Start Master Thesis/PhD-project pools (data bases) 2-4 years: Start joint European Master Programs Other projects will be initiated when funding is available, either by regional, national or EU programs or “in-kind”
Costs & Funding	Cost to manage the new educational activities; adopt existing courses to additional students (European Master Thesis Program), start up one/two

	data basis (Thesis work). **Estimated resources:** • Project initiation 20 k€ (2 initial workshops x 10) Included in SAGE budget • Project work funded through external sources Funding opportunities: • Erasmus for All, EIT, Horizon 2020

3.7. Joint Action 7: Strengthen the Triple Helix cluster development within SAGE and beyond

The SAGE clusters recommend that policy makers at all levels increasingly take into account suggestions and recommendations coming from cluster organisations when setting up programmes relevant to businesses and territories

Title	Cluster Development
Mission	Strengthen the organization and management capability of technology-based triple helix clusters within the SAGE regions. Support technology-based triple helix cluster development in Europe. Promote cluster organisations as vehicles for: • Regional innovation policy • Smart specialisation policies at regional, national and European level.
Description	The recommendation of the SAGE partners is for every technology-based triple-helix cluster to initiate a strategic process involving the members and aiming at defining the strategic objectives and the fields of action for the cluster. This process should be industry driven, so as to ensure a good translation into economic activities and continuous, e.g. on a yearly basis, in order to ensure a high correlation with the members' needs. On the basis of the knowledge and experiences available within the SAGE cluster organisations, the SAGE partners aim at: • Improve the cluster management organisation and processes within the SAGE clusters • Transfer their knowledge to further automotive clusters • Increase the level of acknowledgment of cluster organisation in the definition of innovation policies at regional, national and European level.

	In order to do so the followings activities will be implemented: **Transnational activities:** • Exchange on cluster management practices, • Develop and share strategies for the financial sustainability of cluster organisations, • Promote cluster management excellence (label) as a vehicle for innovation policy making. This action have to be linked with other European projects / networks: • European Strategic Cluster Partnerships (ESCP) • European Cluster Excellence Initiative (ECEI)
Stakeholders	Cluster organisations and triple helix stakeholders: • Within the SAGE cluster regions • In further regions identified for mentoring activities
Expected output / impact	• Increased cluster management competence with the SAGE regions, • Increased cluster management competence within the 4 "mentoring regions"
Strategic Areas	N/A
Champion	City of Regensburg / Mov'eo (SAGE existing triple helix clusters)
Timeline	**For transnational activities:** • Initiated in WP3 – comparative SWOT analysis – continued in WP5 and WP6 (see also mentoring) • After November 2014, in collaboration with further European initiatives, such as European Strategic Cluster Partnerships (ESCP), European Cluster Excellence Initiative (ECEI)
Costs & Funding	**Estimated resources for transnational activities: 100 k€** • Included in SAGE budget until October 2014 • Funding opportunities: COSME (Programme for the Competitiveness of Enterprises and Small and Medium-sized Enterprises), (ESCP) European Strategic Cluster Partnership, Interreg C

3.8. Joint Action 8: Implement smart specialization strategies within and between the SAGE clusters

The European Commission acknowledges cluster initiatives as key players in the process of defining, implementing and monitoring RDI strategies for smart specialization (RIS3). RIS3 is an ex ante conditionality in designing ERDF programmes and it also provides regions with a good tool in order to focus their participation within Horizon 2020. See also Appendix E. SAGE aims to continue building smart specialization strategies within sustainable transport, on a regional as well as on a European level.

Title	Smart Specialization
Mission	Further develop smart specialization strategies within and between the SAGE clusters by putting the results from the design/definition phase to use in the implementation phase.
Description	SAGE has, during the first 18 months of the project, to a large extent covered the definition phase of smart specialization, both on a regional and on a transnational level. SAGE has through its different work packages identified strengths and assets in the regions as well as international trends, in addition to the mobilization of different actors within the triple helix structure. Actions include cluster mapping, benchmarking, consensus aiming forums and analyses of value chains. Now SAGE aims to continue building smart specialization strategies within sustainable transport, on a regional as well as on a European level. Again, cluster initiatives are seen by the European Commission as efficient platforms for the implementation phase of RIS3, because of their proximity to business, their capability for inter-sectorial cooperation and their potential to absorb EU funds through concrete projects. Activities within this action are cross-cutting and relate to the other joint actions. They include: **Transnational level:** • Transnational project development based on the specific competences of each region • Distribution of tasks within SAGE actions and projects based on the specific competences of each region • Marketing the unique strengths of each region • Marketing the complementing strengths of the SAGE consortium as a whole • Performing complementing SWOT analysis in specific technology competence areas • Identifying and examining how gaps in regional value chains can be complemented by collaboration with other regions **Regional level:** • Performing complementing analysis in specific technology competence areas • Contributing to the RIS3 in the development of the regional ERDF priorities • Initiating (or strengthening) joint strategic roadmaps for R&I • Providing a forum for strategic discussions on future regional priorities • Supporting the involvement of business in policy discussions
Stakeholders	Primary actors for this action are the cities and regions together with the cluster initiatives.
Expected output / impact	• Projects developed within SAGE has larger potential for regional impact than other projects because of the smart specialization approach • Coherent communication message to the outside world about the

	specific competences of each region • Enhanced analytical capability within the regions • Continued consolidation of the clusters based on strategic discussions between the triple helix actors
Strategic Areas	All
Champion	City of Regensburg + (each region)
Timeline	**For transnational activities:** Initiated within WP5 from May 2013 to October 2014 Dealt within the SAGE collaboration platform after November 2014 **For regional activities:** On-going
Costs & Funding	**Estimated resources: 50 k€** Included in SAGE budget until October 2014 **Funding opportunities:** Interreg C, (ESCP) European Strategic Cluster Partnerships **For regional activities:** Dealt with within each region **Funding opportunities:** Regional and national grants, ERDF

3.9. Joint Action 9: Involve SMEs in collaborative RDI

One of the recommendations from the SWOT analysis is to increase participation of SMEs in cooperative projects / increase technical partnerships among SMEs / tools, strategies to increase RDI investments and collaboration within SMEs. This is also in line with the European Commission's strategies to achieve sustainable prosperity in Europe.

Title	SME involvements
Mission	Offer a specific support to European innovative SMEs in order to help them in their development and increase their level of participation in EU funding schemes (e.g. Horizon 2020, COSME) Encourage and promote the involvement of SMEs in collaborative projects.
Description	Thanks to their triple-helix organization, their collaborative approach and their knowledge of the territory, the SAGE partners have a relevant access to innovative SMEs. During the analysis, all the SAGE partners have identified a need to foster the participation of SMEs in cooperative projects in general and to foster partnerships among SMEs in particular, in order to avoid a too large dependence of the activities from large companies and to foster the emergence of new solutions and markets which will benefit to the regions.

	To take into account this recommendation, the following activities will be implemented: **Transnational activities:** • Aim for SME involvement in all RDI projects developed within SAGE • Invite SME's to SAGE matchmaking events and workshops • Give SME's visibility within SAGE (collaboration platform, newsletter, website, annual conference) • Offer SME's to use SAGE tools and connect with the SAGE international network • Arrange joint business trips (e.g. to visit the international strategic areas Nagoya, Daejeon, Shanghai, Beijing etc) **Regional activities:** • Promote EU funding and identify relevant calls for our SMEs • Support SME's to participate in joint R&I • Develop more fluid relationships between SMEs and large manufacturers • Facilitate for large companies to use the skills and products of the SMEs • Establish a directory of competences to target the right SMEs to involve in the emerging projects This action have to be linked with other European projects / networks: • **INTRASME** (Innovative Transport SME Support Action): improving the capacity and capability of European SMEs to more rapidly develop and implement products and services in the low carbon transportation and smart mobility sectors (www.intrasme.eu**)** • **EEN** (Enterprise Europe Network) helps small business to make the most of the European marketplace. Working through local business organisations, they help SMEs to develop their business in new markets, to source or license new technologies, to access EU finance and EU funding (http://een.ec.europa.eu)
Stakeholders	All the SMEs identified in the SAGE inventory phase (D2.1)
Expected output / impact	• Increased participation of innovative SMEs in cooperative projects. Each cluster brings in at least one SME in a project initiated within the focus areas. • Long-term cooperation with strategic partners from other countries • Easier access to financing
Strategic Areas	Safe, Green, Connected & NBM&MS
Champion	Mov'eo
Timeline	**For transnational activities:** • Initiated within WP5 from May 2013 to October 2014 • Dealt within the SAGE lean management structure after Nov. 2014 **For regional activities:**

	• Initiated by each region, starting in May 2013
Costs & Funding	**Estimated resources for transnational activities: 100 k€** • Include in SAGE budget until October 2014 • Funding opportunities: COSME (Programme for the Competitiveness of Enterprises and Small and Medium-sized Enterprises), European Strategic Cluster Partnerships, (ESCP) **For regional activities: 100 k€** • Own resources of each region • Funding opportunities: regional and national grants, structural funds, Horizon 2020/Innovation in SMEs

3.10. Joint Action 10: Increase international collaboration

During the SAGE project the work package 7 (WP7), parallel to WP4, conducted a benchmarking toward Korea, Japan, India and China. The result is several possible co-operations with international clusters and joint actions, similar to the thematic RDIs (see D7.1 of SAGE).

Title	**SAGE – International Strategies**
Mission	To increase collaboration on research and innovation, between selected Asian regions and the SAGE regions in Europe.
Description	Explore possibilities in basic research, demonstration activities and field operational tests in the selected regions Nagoya, Daejeon, Shanghai and Beijing. Identify business opportunities for the stakeholders
Stakeholders	SAGE partners and (initially) triple helix stakeholders in Nagoya, Daejeon, Shanghai and Beijing.
Expected output / impact	Map the opportunities of collaborative research and innovation activities.
Strategic Areas	
Steps to implementation	Activities for implementation in the selected regions. • Benefit from established contacts where applicable • Identify and connect to relevant stakeholders • Identify possible funding / In-kind • Formulate tentative project proposals • Manage & follow-up It is difficult to predict how far the collaboration with the selected regions can be developed at this early stage
Champion	N/A
Timeline	• Continuation of WP7 until Nov 2013 • Initiated when the funding is available, either by regional, national or EU programs or “in-kind”
Costs & Funding	**Estimated resources: 30 k€** (2 initial workshops x 15)

	• Included in SAGE budget until October 2014 (SAGE resources available for the SAGE partners) • Own resources of the relevant stakeholders for the workshops and matchmaking events Funding opportunities for the projects: • Europe: Horizon 2020, Intelligent Energy for Europe, Smart Cities and Communities • National and regional grants, cities • See also D7.2 from WP7 that has identified some funding opportunities.

3.11. Joint Action 11: Mentoring emerging clusters

The SAGE consortium will support developing regions with mentoring activities by offering a selected number of regions to take part in the SAGE activities and benefit from the network and experience of SAGE partners.

The first emerging cluster identified is Warsaw, four more automotive clusters have been contacted, i.e. Kragujevac (Serbia), Pitesti (Romania), IAM (Italy) and Galicia (Spain). The methodology developed during the collaboration with Warsaw will be applied to other recently emerged regions and will be continuously developed during contacts with new regions.

Title	Mentoring
Mission	In order to enhance and strengthen the automotive knowledge and using the available resources, SAGE has to involve and support the emerging clusters within Europe. By acting as mentoring clusters for the emerging ones SAGE speed up the pace of knowledge transfer from mature to emerging clusters. The SAGE consortium will collaborate in order to facilitate the formation of a mentoring organization.
Description	Set-up, implement and manage a collaborative process enabling the development of joint research, innovation and demonstration activities involving members of the different SAGE clusters in the area of Mentoring. To allow developing regions to recover the main gaps toward more mature regions, a methodology; *A Knowledge Assessment Methodology (KAM)* has been developed in WP6. The KAM is needed to assess the maturity of regions in a comparable way. This will also be the basis in prioritization of the mentoring activities. The KAM is designed to be a tool for the regions for exchange of knowledge in identified areas or topics. This will be useful in the forthcoming decisions of mentoring investments within SAGE. The mentoring group has developed a list of possible activities, some

	examples: • Create the structure of the cluster • Organize the management and the governance • Make an inventory of the competences • Define a strategy and the services that the cluster can offer to its members • Find funding possibilities for the cluster organization • Develop international cooperation • Develop policy instruments and financing mechanisms for automotive cluster activities • How to put innovation to the market • Matchmaking • Coaching to the management team The activities will partly be performed by bi-lateral collaboration and partly by larger collaborations platforms such as international seminars, conferences and joint courses. In particular a specific list of activities is based on the Warsaw needs and on their core competencies. The complete list has been created to collect all offers by main mature clusters. Warsaw was chosen from the list due to their needs and prioritized activities.
Stakeholders	Mature SAGE partners and developing regions in Europe.
Expected output / impact	The aim of the mentoring activities is to involve and enlarge the automotive cluster SAGE from the present five clusters, in the first step, to eight clusters including an additional three clusters. On longer terms the aim is to involve the major automotive clusters in Europe, developing as well as mature clusters. By adopting the KAM-method to developing clusters and using the key elements; importance, maturity and focus areas, SAGE will in an effective way quickly introduce and incorporate the developing cluster.
Champion	Torino (CRF and Polito)
Timeline	Core activity of WP6 Dealt within the SAGE lean management structure
Costs & Funding	The costs comprise mainly of; personnel costs, travelling expenses, workshops After the conclusion of SAGE, external funding could be applied for: • Horizon 2020, EIT and structural funds

4. Business Plan

From a business planning perspective, the main challenges of SAGE are two-fold, namely to achieve sufficient funding to provide for substantial development work, and to establish an efficient organisation (the collaboration platform) able to collaborate around producing excellent research and innovation results and achieving an industrial impact.

The business model of the SAGE collaboration platform is to leverage the initial project funding by using the momentum achieved thus far. The potential for strengthening European competitiveness has been clearly shown through the inventories and SWOT analyses, and this will enable the platform to tap further into regional resources to build a durable structure for actual research and innovation based on the joint actions proposed in the present report. In turn, this will greatly increase the chances for SAGE partners to come out successfully in competitive calls of Horizon 2020 and similar programmes, as preparedness and tight networks are keys for winning such bids.

4.1. Financial plan

The funding resources estimated to realise the proposed joint actions are summarised in table below. As outlined above, it is necessary to distinguish between three different funding streams:

1. SAGE project funds available within WP5 and WP6 for the second half of the project. These can be used mainly for “soft” transnational trust and collaboration building and specific mentoring activities.
2. Resources available within each cluster targeting region internal cluster development and capacity building. These can be used as support in order to “mirror” transnational cluster development and strengthening, primarily, each regional site.
3. External funding provided by regional, national and European funding organisations. Primary sources are competitive calls for research and innovation projects and resources made available through European cohesion policy funds. These can be used for actual research, innovation, market replication and business development work.

The categories above come with an increasing degree of uncertainty. SAGE funds are already contracted, regional funds are likely to be raised (and to some extent already have been), while projected external funds are merely educated estimates at this point. The European funding landscape is somewhat unclear at the moment, as the budget and detailed content of Horizon 2020 remain to be decided. Furthermore, at each point in time, the available funding program must match each partner’s strategic plans. However, to summarise the estimated funding streams, a regional support of around 100 k€ per annum and region will be required to maintain and develop the transnational cluster. If this can be achieved, it is not unreasonable to expect a substantial leveraging of resources.

Table 4. Financial estimation for SAGE collaboration platform 2013 – 2018

		2013	2014	2015	2016	2017	2018
JA1	Set up a SAGE cluster management organisation						
	Transnational activities	45	100	100	100	100	100
	Regional activities	45	100	100	100	100	100
JA2	Joint research and innovation on traffic safety						
	Initial workshops and prep.	20	20	20	20	20	
	Project 1		300	800	800	300	
	Project 2			500	1000	1000	1000
	Project 3				500	1500	1500
JA3	Joint research and innovation on reduced GHG emissions and improved energy						
	Initial workshops and prep.	20	20	20	20	20	
	Project 1		300	800	800	300	
	Project 2			500	1000	1000	1000
	Project 3				500	1500	1500
JA4	Joint research and innovation on vehicle/infrastructure connectivity						
	Initial workshops and prep.	20	20	20	20	20	
	Project 1		300	800	800	300	
	Project 2			500	1000	1000	1000
	Project 3				500	1500	1500
JA5	Develop New Business Models and Mobility Services						
	Initial workshops and prep.	20	20	20	20	20	
	Project 1		300	800	800	300	
	Project 2			500	1000	1000	1000
	Project 3				500	1500	1500
JA6	Joint educational activities						
	Initial workshops and prep.	10	10	10	10	10	
	Master/PhD theses pool		20	20			
	European Masters			100	100	100	100
	Additional projects			50	50	50	50
JA7	Strengthen the Triple Helix cluster development within SAGE and beyond						
	Transnational activities	40	60	100	100	100	200
	Specific projects			N/A	N/A	N/A	N/A
JA8	Implement smart specialization strategies within and between the SAGE clusters						
	Transnational activities	20	30	50	50	50	50
	Regional activities	50	50	50	50	50	50
	Additional projects			N/A	N/A	N/A	N/A
JA9	Involve SMEs in collaborative RDI						
	Transnational activities	40	60				
	Regional activities	50	50				
	Specific SME RDI projects			N/A	N/A	N/A	N/A
JA10	Increase international collaboration						
	Initial workshops	15	15				
JA11	mentoring						
	WP6 activities	10	10				

Required funding						
From SAGE	260	365				
From regions/clusters	145	200	490	490	490	500
From external sources		1220	5370	9350	11350	10150

Figures in kEURO.
Funding stream 1= GREEN
Funding stream 2= BLUE
Funding stream 3= RED

In JA2-5, it is assumed that research efforts can be scaled up as partnership is developed and trust is built.

Not Applicable= Integrated in other activities or will be elborated in coming WPs

4.2. Funding possibilities

A comprehensive review of existing and future expected funding opportunities is given in appendix B: Funding possibilities, covering public funding at regional, national and European level, and to some extent also private sources.

The natural focal point for a European partnership seeking research and innovation funding will be the Horizon 2020 programme. A clearer view of its content is expected during the fall of 2013 and as soon as that is on the table, a

more detailed strategy will be elaborated by the SAGE collaboration platform. In this respect, it is particularly important to observe whether or not the European Institute of Innovation & Technology (EIT) opens the possibility for bidding on a Knowledge Innovation Community (KIC) on mobility issues.

The SAGE partnership is also closely following the process of the ERDF programme. In particular, Interreg C is likely to provide a funding opportunity for European cluster initiatives such as SAGE.

Notations

BEV	Battery Electrical Vehicle
BP	Business Plan
CNG	Compressed Natural Gas
CP	Collaboration Platform, a physical and virtual area for collaboration
EMTP	European Master Transport Program
EV	Electrical Vehicle
GHG	Green House Gases (eg. CO2, CH4, N2O have the strongest impact on the climate)
HEV	Hybrid Electrical Vehicle
HMI	Human Machine Interface
ICT	Information Communication Technologies
JAP	Joint Action Plan
JA	Joint Action
OIS	Open Innovation System, “Innovating with partners by sharing risk and sharing reward”
PPP	Private Public Partnership
R&D	Research and Development
R&I	Research and Innovation
RDI	Research, Development and Innovation
SME	Small and medium sized enterprises
SWOT	Strengths, Weakness, Opportunities and Threats
WP	Work Package

Appendix A: SWOT analysis and recommendations to WP4

In the following, the recommendations from the SWOT analysis are described, including initial suggestions for actions.

1. **Identify and follow-up the international competition (regions and clusters, technology and societal trends), especially with respect to the development of new mobility trends such as e-mobility.**

Identifying and following up the international competition in terms of clusters, but also in terms of technology and societal trends, is essential for the clusters in order to anticipate the evolution in their relevant markets and be able to take appropriate measures.

Such a work requires compiling a large number of data, which might be available to some of the cluster actors or require further research. Doing this at single actor or even cluster level might not be sufficient. On the other hand, bringing together information available in the different SAGE clusters is a complex task.

The SAGE partners could set-up an initiative aiming at collecting the relevant information and make it available to the clusters and their actors.

2. **Strengthen / anchor new value chains in the regions.**

Facing a possible decrease of activities in the road vehicles sector or a transfer of those activities towards growing markets in Asia and South-America, the clusters needs to contribute to the anchoring of activties related to green and safe vehicles in their home regions. This might lead to the development of new value chains and accompany the transfer of present value chains towards new ones in order for instance to keep a hig level of R&D activities in the home regions of the clusters.

In order to do this, the SAGE clusters need to identify rapidly which value chains are strategic for their own regions and for the cluster in general. Joint activities aiming at facilitating this process should be established.

3. **Roadmap strategies / new mobility services – new technologies / new solutions.**

Roadmapping is not an activity limited to single actors in the clusters. In the course of the analysis of the clusters and their organisations, it appears that part of them have formally formulated strategic domains (mov'eo, e-mobility cluster Regensburg).

In order to better foster the development of new activities, the SAGE partners have expressed the need to go further (see also suggestion 1) and establish strategic roadmaps in their selected areas of relevance for the development of new technologies but also new mobility services and solutions.

This exercise should be performed within each cluster bust also at consortium level.

4. **Increase the efficiency of campuses / technology transfer.**

Most of the SAGE regions have seen / plan the emergence of large campuses bringing together education, research and industry. There is still a lack of visibility and evidence for the efficiency of those campuses in terms of technology transfer and contributions to the development of the regional economies.

The SAGE partners could work jointly on this issue, share their experience and set-up a joitn initiative on the development and organisation on such campuses from the perspective of the cluster development.

5. **Increase participation of SMEs in cooperative projects / increase technical partnerships among SMEs (see also cluster organisation) / tools, strategies to increase R&D investments and collaboration within SMEs.**

The SAGE partners have identified a need to foster the participation of SMEs in cooperative projects in general and to foster partnerships among SMEs in particular, in order to avoid a too large dependence of the activities from large companies and to foster the ermergence of new solutions and markets which will benefit to the regions.

Building on the experiences in the SAGE clusters, a specific work could be undertaken in order to leverage such activities at the level of SAGE and in each of the clusters.

6. **Identify & mobilise better or new funding sources for innovation**

The lack of funding is a recurrent obstacle to innovation activities, it is especially acute for SMEs. The SAGE clusters could share their activities in exploring the options for funding soruces for innovation, including working on new / innovative models (crowd sourcing? Etc.).

7. **Create / share a portfolio of new courses dedicated to vehicle electrification**

Vehicle electrification is gaining relevance in the education of engineers / vocational training for professionals. Building on existing initiatives (JobVehelec/e-gomotion) and existing working relations among the higher education organisations involved in the SAGE activities, a high-quality portfolio of courses dedicated to vehicle electrification could be created / shared by the SAGE partners.

8. **Increase the attractiveness of the automotive / vehicle industry in general – safe and green in particular.**

Many European regions have constated a lack of interest of young people for engineering studies in general, an issue with is bigger that the framework of SAGE. However, the SAGE clusters might address the specific issues of the automotive industry and work together at identifying and implementing initiatives making it attractice for qualified working force.

9. **Promote clusters / cluster policy at regional, national and European level - create tools for that, e.g. impact measurement, etc (see also cluster organisation).**

The SAGE partners aim at contributing, beyond their own organisations, to the further development of clusters and clusters policies in the safe and gren vehicle sector (and beyond). In order to do so, the SAGE partners could share their tools / contribute to the development of new activities and tools demonstrating the impact of clusters (and cluster policies?), e.g. tools for input and impact measurement.

10. Better coordination of funding mechanisms and policy on regional, national and European level

Funding relevant to the SAGE cluster activities is channelled through many different agencies on regional, national and European level (this is not specific to SAGE, but mobility and road transport appears to be a topic relevant to many policy and funding areas). Even at national level, an insufficient degree of coordination and centralised decision making and management can be observed.

As part of their feedback to policy makers on regional, national and European level, the SAGE partners might try to develop suggestions related to Safe and Green Vehicles on the one side and cluster policy on the other side on a better coordination of funding mechanisms and / or funding topics.

11. Increase transparency of actors and activities within the clusters

Depending on their level and nature or organisation, it appears that for many of the cluster actors themselves it is not easy to have a clear overview of the actors and the activities in the clusters. This can be due e.g. to a low level of organisation and coordination but also to a lack of resources within businesses (e.g. SMEs) or a high level of complexity in very large clusters. On the level of the SAGE consortium, this is even more complex.

Building on their respective experiences, the SAGE clusters could develop joint initiatives to increase transparency of actors and activities within the signle SAGE clusters as well as consortium level.

12. Increase trust among the cluster actors.

The development of clusters and collaborative projects depend to a large extent on the level of trust among the cluster actors. Fear of competition represents hereby a major obstacle, especially for SMEs. Trust needs to be developed among the actors at institutional level but mainly between the persons involved in the cluster activities.

The SAGE partners should exchange their experience with this respect and as necessary set-up specific activities so as to increase the level of trust in each of the clusters and at consortium level.

13. Create a common vision among the stakeholders.

Clusters in the field of automotive tend to be dominated by large players (OEMs, large suppliers) having their own agenda and roadmaps. Lack of trust and fear of competition (see above) might also lead further smaller actors to be reluctant to share information.

For a sound development of the cluster beyond the opportunity to take part in funding programmes, it is essential that the stakeholders representing the triple helix develop and share a common vision for the development of the cluster.

The SAGE partners could take the opportunity of the project to:

- Exchange on the processes for the development of such visions,
- Contribute to the development of such visions within the SAGE clusters and at consortium level.

14. Transfer cluster management competence to Warsaw / among the SAGE clusters in general.

The work programme of SAGE foresees mentoring activities targeted at the Warsaw cluster first and further clusters in a second step.

The analysis of the clusters performed in WP2 and WP3 has shown that the "established" SAGE clusters have developed different organisation and working mechanisms, which are not only relevant to further clusters, but could also be shared among the SAGE clusters themselves in order to increase their performance and foster corss border collaboration.

15. Strategies for the financial sustainability of the clusters, e.g how to demonstrate impact to stakeholders / public funders

Cluster organisations such as the ones involved in SAGE depend on public funding for a significant part (direct funding and / or in-kind resources). This funding is usually connected with to a specific funding programme / policy measures limited in time. On the other hand, cluster activities need time to generate significant impacts and need a minimum level of continuity in the activities.

The SAGE partners could take the opportunity of their different situations in order to explore possible startegies for financial sustainability beyond the short-term horizon of their current public fundng streams. One aspect to be be specifically explored hereby is to demonstrate the impact of the cluster activities to stakeholders and public funders even on a short to mid-term time scale.

Appendix B: Funding possibilities

The SAGE partners have made an extensive inventory of funding possibilities for SAGE[1]. A distinction is made into (1) funding opportunities at local, regional and national levels and (2) European levels. Concerning local, regional and national level both public and private actors have been identified and described in the report.

Concerning European level, among others, the following funding opportunities may be of interest for SAGE:

- Horizon 2020 which is the next EU Framework Programme for Research and Innovation. It will run from 2014 – 2020. One of the focus area's (challenges) in Horizon 2020 is: Smart, green and integrated transport.
- Public Private Partnerships PPP EGVI (European Green Vehicle Initiative) which is part of Horizon 2020. The objective of the initiative is to support R&D on technologies and infrastructures that are essential for achieving breakthroughs in the use of renewable and non-polluting energy sources, safety and traffic fluidity.
- COSME, the new Programme for the Competitiveness of Enterprises and Small and Medium-sized Enterprises (COSME) will run from 2014 to 2020. It will ensure continuity with initiatives and actions already undertaken under the Entrepreneurship and Innovation Program (EIP)
- The European Institute of Innovation & Technology (EIT) and in particular the Knowledge and Innovation Communities (KICs). KICs are legally and financially structured entities of internationally distributed but thematically convergent partners (businesses; entrepreneurs; research and technology organisations; higher education institutions; investment communities; research funders). A possible KIC on the topic of mobility may offer very interesting opportunities for SAGE.
- The European Regional Development Fund (ERDF) that aims to strengthen economic and social cohesion in the European Union by correcting imbalances between its regions. It funds the INTERREG G program, aiming to improve the effectiveness of regional policies and instruments. Details for cohesion policy after 2014 are currently under discussion.
- The ERANET program and in particular ERANET Transport. The objective is to develop and strengthen the coordination of national and regional research programmes through specific actions. It will continue in Horizon 2020 but the details are not known yet.

Other programs included in the inventory include EUREKA, IEE (Intelligent Energy Europe, URBACT (European exchange and learning programme promoting sustainable urban development), JTIs (Joint Technology Initiatives), ESCP (European Strategic Cluster Partnerships), the Lifelong Learning Programme consisting of different programmes as Comenius, Erasmus, Leonardo da Vinci, Grundtvig, Jean Monnet. Finally also the Unitech program and Marie Curie can be mentioned here.

[1] Funding possibilities for SAGE. SAGE report, 2013

Appendix C: Main Focus Areas and Sub-focus Areas

SAFE: Sub-Focus Areas and Topic proposals

In the discussions within the Safety focus team, 6 Safety sub-focus areas have been identified. These sub-focus areas are based on, and in line with, the ERTRAC safety roadmap. One of the subjects mentioned in the ERTRAC safety roadmap i.e. Cooperative systems is also important for the SAGE consortium and in particular also for safety, but this will be handled under the focus area Connected. Consequently 5 sub-focus areas remain within SAGE and are described below:

S-SF1: Safety of vulnerable road users (VRU)
Pedestrians, cyclists, children playing on the road, motorcyclists, mobility scooters etc…VRU detection systems for accident avoidance, methods and technologies to mitigate the consequences of VRU collisions etc..

S-SF2: Safety of new vehicles
Biomechanical models and injury prediction, crash compatibility and improved crashworthiness of light and/or new vehicle concepts, solutions for low acoustic perception of FEVs, advanced passenger protection systems including elderly/more fragile people, integrated safety concepts etc…

S-SF3: Advanced driver support
Vehicle dynamics monitoring and control, driver support for collision avoidance drivers inattention and impairment monitoring and support, automated systems, driver coaching, Human-Machine Interaction etc..

S-SF4: Traffic Safety Analysis
Road accident monitoring and investigation, Naturalistic Driving Studies, Road user modeling and simulation, impact assessment and cost benefit etc.

S-SF5: Safe infrastructure
Real time road status monitoring, towards zero maintenance roads, self-explaining roads, forgiving Infrastructure, advanced incident and traffic management, conception and design for elderly, vulnerable and users with specific needs, automated road etc..

Table 1: Topics Proposal - Safe

	Description
Topic1	**2-wheeler safety** • Better understanding of the behaviour of 2-wheelers in various traffic conditions and specifically in critical situations with focus on road users' interaction. For instance a joint naturalistic cycling/riding-study could be set-up for a better understanding of the behavior of 2-wheelers • Improved active safety systems for cars and trucks to detect 2-wheelers to avoid the accident with the 2-wheeler and passive safety systems to reduce "aggressivity" towards VRUs
Topic 2	**Safety of new vehicles** • **D**evelop knowledge and methods to win acceptance and confidence for high performance composites and mix material LWD (light-weight-design) - solutions in crashworthy automotive applications

	• Develop knowledge and methods to design the vehicle architecture of future electric small vehicles (City Movers) for an increased protection of its occupants in a crash (in comparison with the protection offered by current vehicle designs) and to protect batteries during a crash in an optimal way
Topic 3	**Biomechanics** The first objective of research projects should be to define methods and develop the numerical and physical tools necessary to protect the whole range of road users. These developments should be driven and prioritized by the crash induced injuries identified from field data analysis. A second objective should be to define methods for the evaluation of the assessment tools in relation to the real world
Topic 4	**Interfaces** Understanding the changes in driver behavior when new interfaces are integrated into the vehicle, especially in the cockpit. The goal is to improve our knowledge of the prerequisites for safe and efficient driving, in particular regarding the design of the human-machine interface (HMI), and to design future research projects
Topic 5	**Functional Safety** Functional safety in automotive applications is aimed at limiting risk related to systems within an acceptable budget. This topic aims to develop enhanced standards and modular architecture concepts for e-mobile specific safety related applications
Topic 6	**Automated Driving** The aim is to build a common vision by focusing initially on defining a roadmap, identifying technological and non-technical barriers and the selection of the highest priority scenarios, taking into account the dependability and human factors at all levels

GREEN : Sub-Focus Areas and Topic proposals

In the discussions within the Green focus team, six Green sub-focus areas have been identified. The resulting sub-focus areas are described below:

G-SF1: Powertrain Technologies
Technologies required to improve transport energy efficiency, emissions, and fuel flexibility incl. Internal Combustion Engines (ICEs), Electrified drivetrains, exhaust aftertreatment systems and transmissions (and gearboxes)

G-SF2: Energy Technologies
Reduction of parasitic losses, Vehicle electrification, Integration of mechatronics systems, energy recovery, energy management and recharging

G-SF3: Green Production
Adaptation of advanced material and production technologies including Cost-effective integration of advanced materials and devices, novel production technologies/Green manufacturing process, design for easy dismantling and green design, lightweighting and a new generation of tool for conception and design

G-SF4: Robustness and Reliability

Component, organ and system failure mechanisms, Physical and chemical aspects of the failure, test methods for new products and systems, industrialization and system Reliability

G-SF5: Environmental impact of new vehicle technologies
Assessment tools (Well-to-Wheel (WTW), Life Cycle Analysis (LCA)) for valuing alternative vehicle/fuel pathways, expertise in standardization and regulation of emission levels of GHG/pollutants

G-SF6: Demonstration
System Integration, Impact of Logistic and Transport solutions

Table 2: Topics Proposed - Green

	Description
Topic 1	**Ultra-Light Vehicles** Development and market introduction of a new generation of (also electrically driven) micro cars for different market applications, driven and led by European car manufacturers and suppliers. Integration of innovation aspects of larger cars into this car class. Development of frame conditions to vitalize the ULV market in EU by legislative measures
Topic 2	**Last mileage transport** Solutions for the last mileage transport towards the working places (their jobs). Solutions might be multi-modal, include cycles (electric), public transport and cars (electric). **Subtopic 3.1**: EVs for short and medium distance commuters Develop and to implement in a common partnership between larger employers and commuting employees a large scale fleet test based on electric vehicles
Topic 3	**Advanced Concepts for ICEs** Development of new ICE concepts based on alternative fuels or new/advanced powertrain concepts to reduce significantly greenhouse emissions at ICE driven vehicles
Topic 4	**City Demo Area Project** Set up a demonstration area in cities, include housing and buildings in general, infrastructure, transportation and mobility solutions in order to create a sustainable city district **Subtopic 5.1**: Under the sun Develop an urban mobility system characterized by a light electric vehicle fleet to connect city campuses of universities and student residences; develop a recharging infrastructure based on photovoltaic panel; **Subtopic 5.2**: Medium Range Hybrid Powertrain Modify a small ICE powertrain (small size and not turbocharged gasoline/alternative fuel engine) by connecting an electric motor to the gearbox input shaft, to be fitted into a city car. Establish a hybrid city car test service to connect university city campus and university campuses out

	of the urban areas. **Subtopic 5.3**: Inductive charging – plug less Hybrid Develop a for A/B segment HEV with the goal of reduction of 12% in CO2 in real-life through coordinated energy recuperation and generation extended EV range (based on inductive charging concepts). Feasibility study for a service to connect urban and extra-urban university campuses or a fleet for short and medium distance commuters (see also topic 5).
Topic 5	**Biogas market** Promote the use of organic urban waste, agricultural fields and other sources for biogas production in European cities, in order to inject bio methane into the natural gas grid and to use it in transports. The specific objective is to define an executive plan to satisfy 10-15% of the urban transport demand (private and public transport) of three European cities by the use of CNG/biogas vehicles.

CONNECTED: Sub-Focus Areas and Topic proposals

In the discussions within the Connected focus team, five Connected sub-focus areas have been identified. The resulting sub-focus areas are described below:

C-SF1: Cooperative ITS
Services based on cooperative information like navigation, crowd-sourcing, traffic planning, traffic control, eco-driving and basic applications (warnings)

C-SF2: Automated Driving and Platooning
Applications based on intelligent communication where road users are able to interact and negotiate like cooperative intersections, cooperative adaptive cruise control and cooperative collision avoidance

C-SF3: Connectivity for EV
Interfaces which connect the e-vehicle with the outside world like AC-, DC-, inductive charging stations, public/semi-public charging, controlled charging, smart grid integration of EV, renewable energy sources, systemic services (route planning, charging station maps, mobility services, roaming, intermodal traffic), smart-phone applications, standardization & interoperability of infrastructure and data protection & data security

C-SF4: HMI
HMI interfaces in vehicle as well as outside the vehicle.

C-SF5: Inter-vehicular network technologies
Inter-vehicular networking, computing, and sensing technologies for next generation smart vehicles like ethernet technologies in the vehicle (real time, safety/security → overlap group safety), embedded and distributed computing, data-mining and cloud integration.

Table 3: Topics Proposed – Connected

	Description
Topic 1	Creation of an HMI network/ergonomist network to share good practices and defend European point of views

Topic 2	Advanced information system to connect electric vehicles over a back-end server: Launch an e-vehicle fleet with different vehicle types and create an open platform using a backend server system for applications as smart charging or mobile services. Test interoperability and transnational compatibility in a reported transnational field trial.
Topic 3	Intelligent interaction between autonomous vehicles: Develop an autonomous functional architecture enabling distributed cooperative behaviour based on sensor signals and wireless communication between autonomous vehicles and/or infrastructure. Develop a demonstration vehicle for a closed work yard.
Topic 4	Smart Integration of e-vehicles into the smart grid: Combine small and medium powerplants based on renewable energy with a fleet of e-vehicles via intelligent charging infrastructure. Building a live-map of the energy-availability in different territories.

New Business Models & Mobility Services: Sub-Focus Areas and Topic proposals

In the discussions within this team, four sub-focus areas have been identified. The resulting sub-focus areas are described below:

NBM-SF1: Vehicle System Integration and new architectures:

- Integration of new electrical and hybrid Powertrains and their interfaces in the vehicle: EV, HEV, PHEV, range extender, FCV…
- Integration of multiple systems and platforms for mobile devices, content and Apps
- New concepts for vehicle architecture: dedicated platform, modular concepts, new design employing novel materials …
- Development of new vehicles dedicated to specific usages: innovative urban vehicles, niche markets, small public transport vehicles, autonomous shuttle..

NBM-SF2: Individual and societal demand on sustainable transport and mobility solutions

This sub-focus area is related to research on “real life” usages to identify new practices, validate new business models and study customer behavior (socio-economical evaluation), on short as well as long term.

- Research and analysis of customer demands and usages of new vehicle concepts, experimental deployment of carbon-free vehicles
- Development and demonstration of infrastructures
- Demonstration of Vehicle / Infrastructure interactions
- App & mobile device testing
- Large scale demonstrations of new services, field operational testing…
- Measurement of the customer acceptance
- Definition of the marketing strategy

NBM-SF3: New Mobility Solutions & Value-Added services

- Mobiles within an integrated multimodal trip chain: inter-modality and co-modality, innovating mobility services such as car-sharing, car-pooling and shared taxis, car rental, shared ownership, smart infrastructure (multimodal hub, high-service-level car park, smart bus stops…), pooling

and dynamic allocation of resources (infrastructure, vehicle…), last mile delivery, traffic management, etc…
- The legal and regulatory environment: urban planning and climate plans, taxation, congestion charging, accessibility issues, legislation evolution, standardization, data (open data, meta-data…)
- Public/private business models: value creation, ecosystems, usage scenarios, functionality economy, social economy and solidarity, value chains
- Auto apps stores: user-experience design & design thinking, personalized car portals, cloud hosted services, development of data plans and roaming charges that are acceptable to the consumer and OEMs
- Devices, information, training and incentive to improve driver behavior
- Customized mobility services: services dedicated to children, woman, businessman, tourism, elderly people, disable people…
- Improving life on board (new devices for comfort, safety, customization of the vehicle…)

NBM-SF4: Economic and social impact

- Measurement, assessment and impact on the economy and society (eco-driving, positive and negative external costs…)
- Mobility for everyone: mobiles including environmental and social considerations, enjoyable mobility, technologies and services for everyone and for all purposes (including people with special needs, elderly and disabled travelers…)
- Social networks: The role of social networking in developing communities to offer services targeted to electromobility services users and traveler-to-traveler interactions and gaming
- Understand the underlying factors, challenges and opportunities linked to the transition to electromobility from an economic, social and economic point of view

Table 4: Topics Proposal - New Business Models & Mobility Services

	Description
Topic 1	Research on integrated impact assessment of electromobility on different dimensions: Market penetration, Economy, Environmental impacts, Social impacts
Topic 2	Development of a car sharing service based on e-Mobility for medium sized cities in Europe
Topic 3	Development of a Mobility service center (mobility broker)
Topic 4	Implementation of new taxis services and associated smart reservation platform
Topic 5	Development of innovative solutions for last mile delivery of parcels and goods in cities
Topic 6	Use of autonomous shuttle for green, safe and intelligent solutions in historical cities or theme parks

Appendix D: Example Topic Proposals from New Business Models & Mobility Services

GENERAL INFORMATION	
Topic title	**Research on integrated impact assessment of electromobility on different dimensions: Market penetration, Economy, Environmental impacts, Social impacts…**
Focus Area	New Business Models and Mobility Services
Sub-focus areas(s)	NBM.SF3: New Mobility Solutions & Value-Added services NBM.SF4: Economic and social impact
Possible leader/referent, Contact details	Marco DIANA – Politecnico di Torino - marco.diana@polito.it orElse-Marie MALMEK – SAFER - else-marie.malmek@malmeken.se
Time Frame	*2014-2016*

DESCRIPTION

Aim of the topic:

The purpose of this topic is to strengthen the SAGE cluster ability to analyze and address complex global societal and technological challenges related to the transition to a sustainable mobility and transport system by short, medium and long term (2030+), as one part to achieve a sustainable city solution. This involves many different actors, also outside the automotive industry, since a transition of the road transport system requires the knowledge and active involvement of many different stakeholders in "quadruple helix".

As ultimately the (road) transport system in 2050 will be highly user-centric, it is very important to understand the causes and sources of freight and passenger movement and the drivers that determine the 'optimal choice' for the various groups of users and environments. This is very complex and therefore we need to develop methods and models to be able to handle this in a very systematic way.

Examples of methodologies might be to develop an analysis model explaining the key driving forces and how they influence both the today as well as the future road transport system. A driving force model might be used together with scenario thinking and use case methodologies. The uses cases and actors have to be selected and based upon the most urgent and/or difficult questions the involved actors have on their agendas. The proposed mobility and transport solutions will be based upon electromobility as one of the main Key Technologies, but also other technologies e.g. ICT, autonomous driving, light weight design, soft services etc. The analysis aims at finding the system consequences of electromobility and what is required (both technological as well as societal factors), to achieve an effective and affordable transport and mobility system by 2030+, in different future scenarios. Equal important is to analyze the societal and economic factors, customer's behavior and values, political incentives, regulations and legislations, urban development and city planning etc. Included in this topic could also be a "common methodology" to measure relatively sustainability; defining different indicators etc.

To be able to perform this topic we have to use already existing knowledge from a wide set of actors but also to develop new common knowledge. For example we might use the different SAGE clusters to investigate and research on different customer and markets preferences of today. Common qualitative as well as quantitative studies may be performed in each cluster and aggregated and analyzed on a consortium level.

The implementation of this topic might be in two steps:

1. Short term – present situation of today (year 2013)
2. Long term – scenarios by year 2030+

Benefits of the project are answers to questions on what is required for electromobility to be one of the main road transport solution and how it can be implemented from both societal and technological point of view. Equally important are the model of key driving forces, the experience and method for how to address complex transformation challenges cross regions and finally how to manage open innovation in a multidisciplinary team in triple helix.

Evaluate the impact of electromobility on the following dimensions:

- Market penetration compared to fossil fuels vehicles, given the state of the art in technology and a few realistic future scenarios and the resulting vehicle performances
- Resulting modal shares from the new market equilibrium
- Economic analysis: equipment and operation costs of electromobility services
- Industrial maturity: number of standard and patents per key subsystems (batterie, plugging interfaces, charger, ECV, electrical engines)
- Environmental impacts: well-to-wheels emissions, life-cycle analysis of vehicles and dedicated infrastructures (charging stations etc.)
- Social impacts: social inclusion, accessibility issues and social equality.
- Analysis of different actors (e.g. families, small goods delivery company, waste.) and so called "use cases" in city environments
- Legal aspects: regulations and taxes
- Analysis and comparison of "sustainability" of different mobility solutions
- Characterization of the exchanges between the different actors: data flow, economic flows, sharing of safety rules, responsibilities, investments…

State of the Art or examples of on-going projects or reference documents: SEVS project: www.sevs.se

Expected results / Impacts:

- Contribute to a better understanding of the impacts of electromobility by providing relevant information & data
- Create a basis for smart electromobility solutions, adapted to drivers' needs, easy to use and affordable

POSSIBLE PARTNERS – COMPETENCES IN SAGE REGIONS

Location	*Organization*	*Main competences*	*Corresponding contact Person*	*Email*
Paris-Rouen	VeDeCoM Institute	Innovative eco-mobility solutions	Jean-Laurent FRANCHINEAU	xx@veolia.com
Paris-Rouen	IMD (Sustainable Mobility Institute)	Management of Innovative projects. Sustainable Mobility	Romain BEAUME	xx@polytechnique.org
Paris-Rouen	IFSTTAR	Industry relationship development	Philippe DUPUY	xx@ifsttar.fr
Paris-Rouen	Chaire Armand Peugeot			
Regensburg	RUAS	Small and big user surveys	Prof Sonja Haug	
Regensburg	City of Regensburg	User of mobility solutions		
Regensburg	E-Mobility cluster		C. Knorr	
Gothenburg	Chalmers/SAFER/SHC /Mistra Urban Futures/Physical Resource Theory/Transport Area of advance/ Northern Lead	Safety, Driving Force Model, Sustainability measurement (LCA), Electromobility, energy efficiency, logistics, city planning, energy modeling	Anders Grauers, SHC Sönke Behrends	xx@chalmers.se xx@chalmers.se
Gothenburg	G University	Personal values, behavior, social equality, logistics, new business models	Cecilia Bergstad Jakobsson	xx@psy.gu.se
Gothenburg	VTI	Infrastructure (roads), mobility patterns in time and geography. (daily life and mobility chains)	Åsa Aretun	xx@vti.se
Gothenburg	City of Gothenburg	City planning, Political incentives, legal aspects	Mikael Ivari	xx@trafikkontoret.se

Gothenburg	OEMs, VCC, AB Volvo, Scania,	Transport and mobility solutions, soft offers		
Gothenburg	Lindholmen Science Park, Infrastructure	Infrastructur	Peter Öhman	xx@lindholmen.se
Gothenburg	VGR	Policies, political		
Gothenburg	Wireless Car? (Volvo)	In.vehicle Std Communication Platform (e.g OSGI), embedded systems, wireless communication, e-call etc		
Gothenburg	Commute Greener (Volvo)?	Seamless travelling, app development		xx@volvo.com
Stockholm	KTH ? (not in our region, but part in SEVS project)			
Gothenburg	Viktoria Institute	Electromobility, infrastructure (information, charging, billing)	Stefan Pettersson	xx@viktoria.se
Gothenburg	Ericsson?	Telecom, embedded systems, connected devices, intrastructure communication		
Gothenburg	IBM?	e-commenrce, smart cities, ICT…	Mikael Haglund	xx@se.ibm.com
Gothenburg	SMEs	Entrepreneurship,		
Torino	Regione Piemonte	Policies, political		
Torino	Politecnico di Torino	Modelling the use of electric vehicles and resulting modal share, quantitative analysis of environmental and social impacts, market segmentation	Marco Diana	xx@polito.it
Torino	5T			
Torino	Torino Wireless			

Missing Competences:

- VTT in Helsinki: E-charging / E-storage / E-vehicle (large national program around electrical vehicle). *Contact: Nylund Nils-Olof xx@vtt.fi. They have started a large identification of worldwide technologies and standard developed for electrical vehicle. They have also evaluated the energy performance of Electrical vehicles due to the large experience and historical data that they had in thermic* ***vehicles***

FUNDING POSSIBILITIES	
Name	*Description*
Horizon 2020	European Green Vehicles Initiative
FFI	Vinnova (Sweden)
InMotion	VGR (Sweden)

COMMENTS (e.g. policy statements, stakeholders' strategic agenda, time perspectives, etc..)

Appendix E: Cluster Development & Smart Specialisation

Role of clusters in European and Regional innovation policy making

Smart Specialisation is a strategic approach to economic development through targeted support to Research and Innovation (R&I). It will be the basis for Structural Fund investments in R&I as part of the future Cohesion Policy's contribution to the Europe 2020 jobs and growth agenda.

More generally, smart specialisation involves a process of developing a vision, identifying competitive advantage, setting strategic priorities and making use of smart policies to maximise the knowledge-based development potential of any region, strong or weak, high-tech or low-tech[1].

Consequently, in order to encourage the regions to move towards a model of smart specialisation, the Commission has made the smart specialisation strategies (RIS3) in ex ante conditionality to access ERDF in the areas of R&D and innovation and ICT (Digital Agenda) for the new programming period 2014-2020[2]

Cluster initiatives contribute to increase the connectivity inside the quadruple helix, identify and map the specialisation patterns, exploit the related variety promoting the processes of entrepreneurial discovery and facilitate the open economy through the intercluster dynamics and global value chain. However the launching and support of “cluster just to clusterise” is not the solution: the clusters are mechanisms not goals on their own.

Cluster Initiatives play an important role in the new programming period 2014-2020

HORIZON 2020: Cluster initiatives can contribute to increase the excellence of companies at an international level providing the stable generation of European partnerships (European value chains) through technological hybridization projects and entrepreneurial discoveries that identify new projects possibilities.

COSME: Cluster initiatives are adequate to identify new collaboration possibilities with SMEs and the R&D+I agents of other European regions through intercluster projects with a significant innovation component (in contrast to R+D based projects), and have, in this case, an easier access to financing.

REGIONAL POLICY: Cluster initiatives play an important role in promoting the regional capability of absorbing R&D+I funding from the Structural Funds, for their

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[1] See: http://s3platform.jrc.ec.europa.eu/de (Platform established by the European Commission to provide professional advice to EU Member States and regions for the design of their innovation strategies for smart specialisation.)

[2] See: Regulation of the European Parliament and of the Council on Specific provisions concerning the European Regional Development Fund and the Investment for growth and jobs goal and repealing Regulation (EC) No 1080/2006

capability to mobilize companies and key regional actors around the priorities and instruments of a RIS3.

Cluster initiatives can play a key role in the process of definition, implementation and monitoring of the new RIS3 strategies to contribute to overcoming the barriers that regions find when facing transformation challenges towards smart specialisation: ”

- Due to their inherent ability to support cooperation between the different actors of innovation (triple / quadruple helix),
- Because of their huge potential for related diversification processes from existing specialisations,
- Because of their unique ability to promote intersectoral cooperation and facilitate technological hybridization,
- Because of their potential as a channel to facilitate internationalization,
- Due to their capillarity over the territory, they easily reach the business and have access to SMEs.”[1]

Defining the scope and objectives of a triple helix based cluster and cluster organisation

The scope and objectives of a triple helix technology-based cluster shall encompass the following items:

- Thematic focus
- Geographical territory
- Nature of the Membership
- Mission statement
- Strategy
- Measurable objectives (success indicators)
- Action plan (short and medium term)
- Economic model

[1] POLICY INSTRUMENTS FOR RIS3 CLUSTERS, INFYDE Working Paper Series, Year 3 – Vol. 1 No.1

Appendix F: A Collaboration Platform pilot- CP1.0

During the SAGE project, several functional requirements on collaboration platform tools were identified. The purpose with the tools it to support a lean cluster organisation that in parallel is as transparent as possible. Within WP4 a pilot was set-up (CP1.0) as an example to show how an existing application on the market (e.g. Mindmanager), can be used as a powerful tool. By gathering data on an electronical collaboration platform with links to other identified sources, the data management will be easy to handle and the information will be held up-dated.

Some of the functional requirements are listed below:

About the SAGE cluster

This function includes basic information about the cluster; e.g. link to external homepage, link to Webforum, contact information to all members, cluster rules and policies, cluster management organisation chart

Cluster competences

This function includes links to all the reports created during the SAGE project, all regional reports as well as the consortium reports.

JAP and Business plan

This function includes information about all proposed joint actions. The purpose is to make it very easy to propose new topics and to promote transparency. The aim is also to add links to on-going SAGE projects, and to encourage the involvement of SMEs and other stakeholders.

Funding Management

The inventory of possible funding for the Road Transport sector, made by the SAGE partners, shows that it exists in each country numerous public initiatives, support measures, agencies, programs and policies. The CP1.0 includes both the SAGE funding and links and descriptions to most of the identified funding organisations.

Other Services

This function includes links to so called Other Services e.g. process descriptions, templates, IPR handling etc.

Bridge to other collaboration platforms

One very important function of the SAGE cluster is to involve SMEs and other stakeholders in the regions. Today it might be difficult to know which are the interesting actors and/or the competences available. There is also a need for the

industry and academy to match competences. This Bridge function includes links and description to other collaboration platforms identified during the SAGE project. An example is the European Cluster Collaboration Platform (http://www.clustercollaboration.eu/welcome). This platform provides online quality information and networking support for clusters (organisations and members) aiming to improve their performance and increase their competitiveness through the stimulation of trans-national and international cooperation.

Competence management

This function includes links and descriptions to academic training and courses identified during the SAGE project. By using the links the SAGE cluster will continuously be up to date regarding new courses and educational programs. An example is SAFER Insight. The function of this portal is to offer seminars and courses in vehicle and traffic safety arranged by the education providers connected to SAFER Insight. See: http://www.saferinsight.se.

Interested in knowing more or taking part in the project?
Please don't hesitate to contact us.

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CAPACITIES

SAGE
Safe and Green Road Vehicles Europe