SWOT ANALYSIS OF THE CONSORTIUM SAGE DELIVERABLE 3.2

FINAL VERSION 20/3/2013

SAGE

Safe and Green Road Vehicles Europe

Document Information

Project	**SAGE**
Contract Number	Regions–CT–2011–285833–SAGE
Project website	www.sage-project.eu
Code	D3.2
WP and WP leader	WP3 City of Regensburg
Participant partners	CR, VGR, CTH, Mov'eo, CR, RUAS, Polito, RP, WUT
Author(s)	Luc Schmerber, Toni Lautenschläger, Hanna Blomdahl, Hans Fogelberg, Marc Charlet, Michel Gigou, Yuhua Chang, Christine Knorr
Contributors	
Reviewer	
Contractual date of delivery	2012-10-31
Actual date of delivery	2013-03-20
Audience	X Public o Internal
Abstract	
Key words	SWOT, cluster analysis

WP3 – SWOT Analysis of the consortium

Executive Summary

On the basis of the regional SWOTs performed by each cluster, a comparative SWOT analysis of the consortium cluster in the different dimensions of the SWOT has been performed by the SAGE partners with the aim to provide input for the elaboration of a joint action plan. The scope of the SWOT analysis of the consortium focused therefore on the following aspects:

- Cross comparison of the clusters SWOTs in the following dimensions:
  - Economy,
  - Innovation & Research and development,
  - Education & Human resources,
  - Policy / cluster environment,
  - Cluster organisation.
- Identification of education, research, innovation and policy gaps, overlaps, complementarities and synergies.

On the basis of the comparative analysis, the following topics and actions to be addressed in SAGE have been identified:

	Topics / Actions
ECONOMY	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.
	2. Strengthen / anchor new value chains in the regions.
INNOVATION / R&D	3. Establish roadmaps for new mobility solutions (new mobility services and new technologies).
	4. Increase the efficiency of campuses / technology transfer.
	5. Increase participation of SMEs in cooperative projects / increase technical partnerships among SMEs (see also cluster organisation) → develop tools, strategies to increase R&D investments and collaboration within SMEs.
	6. Identify & mobilise better or new funding sources for innovation.
EDUCATION / HR	7. Create / share a portfolio of new courses dedicated to vehicle electrification.
	8. Increase the attractiveness of the automotive / vehicle industry in general – safe and green in particular.

POLICY	9. Promote clusters / cluster policy at regional, national and European level. Create tools for that, e.g. impact measurement, etc (see also cluster organisation).
	10. Improve the coordination of funding mechanisms and policy on regional, national and European level.
CLUSTER ORGANISATION	11. Increase transparency of actors and activities within the clusters.
	12. Increase trust among the cluster actors.
	13. Create a common vision among the stakeholders.
	14. Transfer cluster management competence to Warsaw as well as among the SAGE clusters in general.
	15. Develop strategies for the financial sustainability of the clusters (e.g. how to demonstrate impact to stakeholders / public funders).

The suggested topics and actions listed here above have been transferred to WP4 and its different working groups, so as to be included in the activities towards the establishment of a Joint Action Plan for the SAGE clusters.

The further exploitation of the input provided in WP3 will be performed in WP4 and its working groups and will be part of the JAP.

Methodology

On the basis of the regional SWOTs performed by each cluster, a comparative SWOT analysis of the consortium cluster in the different dimensions of the SWOT has been prepared by the WP Leader – City of Regensburg.

This comparative view has been discussed first by the WP3 working group during a dedicated WP3 workshop held on 7 November 2012 in Paris and presented and discussed with all the partners in a WP3 session on 10 December 2012 at the occasion of the partner meeting in Paris.

The content was then reviewed and amended by the partners as necessary in a bilateral review process of the SWOTs, which took place at the occasion of the partner meeting in Regensburg from 19 to 22 February 2013.

The aim of this comparative analysis is not to perform a purely academic exercise but to provide input for the elaboration of a joint action plan in WP4. The scope of the SWOT analysis of the consortium focused therefore on the following aspects:

- Cross comparison of the clusters,
- Identification of education, research, innovation and policy gaps, overlaps, complementarities and synergies.

According to the adaptation of the overall SAGE work plan, the comparative SWOT analysis and WP4 – Joint Action Plan and Business Plan are running in parallel. In WP4, the partners are exploring in particular the focus areas Safe, Green, Connected and New Business Models and Mobility Solutions. The comparative SWOT analysis performed in WP3 focuses consequently on the overall aspects of the clusters in the following dimensions[1]:

- Economy,
- Innovation & Research and development,
- Education & Human resources,
- Policy / cluster environment,
- Cluster organisation.

The content of the SWOT in different technology areas as developed within WP3 and further developed in WP4 is provided for information in the Annex.

The present deliverable presents the results validated by each regional cluster and the Steering Committee.

[1] See also deliverable D3.1 – SWOT Analysis of each cluster

Comparative SWOT of the consortium

1. Overview of the comparative SWOT

In this chapter, an overview of the SWOT parameters is given for each of the dimensions in the scope of the analysis:

- Economy,
- Innovation & Research and development,
- Education & Human resources,
- Policy / cluster environment,
- Cluster organisation.

1.1. Overall overview of the SWOT

1.1.1. Strengths

SWOT	Västra Götaland	Mov'eo	Piemonte	Regensburg	Warsaw
ECONOMY	• Two strong OEMs that have shown long-term profitability. One still owned by Swedish interests. • Large private investments in the region in research by OEM's. • The automotive cluster includes all phases of vehicle R&D and manufacturing. • Heavy vehicle sector is strong on the global market. • History of innovative technology development, in safety, combustion engine technology, three-way catalysis, and electric and plug-in electric hybrid technology. • Emerging cluster of e-Mobility SME. • Firms working in the area of fossil free fuels have moved to the region. • More than 50% of the Swedish R&D funding ends up or passes through the automotive industry in the region. • Regional funding is a strategic complement to national funding.	• Participation in Mov'eo of the two French OEMs: PSA Peugeot Citroën and Renault • Presence of the main automotive suppliers • Location in the Paris Region of many scientific and business entities making a multi-sectorial ecosystem	• Automobiles and industrial vehicles manufacturers headquartered in the region • R&D and styling centers of other international vehicle manufacturers • Many large automotive suppliers • Large automotive engineering and design providers • Large number of SME's in the automotive business (products, processes, services) • Startup university incubators	• No OEM imposing his own technology solution or business model. • High density of suppliers (Tier 1 and downwards), offering a huge potential for cooperation also outside the "home cluster". • Engaged technology and market leaders (AVL, Continental, Vector...) • Strong diversification within the cluster / competences in all fields of electro mobility (except OEM, batteries) • Complementary competences within the cluster / low direct competition • Positive economic development in the area and the companies in the e-mobility cluster also (high density of research and development activities, investment potential high, companies are willing to come in the region, to invest here and are developing)	• FIAT Auto Poland S.A. is within the Cluster • Presence of Fabryka Samochodów Osobowych Spółka Akcyjna (FSO S.A.) in the Cluster • The Cluster is small, but has strong diversification in different field of e-mobility • Warsaw area attracts majority of international companies active in Poland • Polish economy maintains growth and Poland has stable currency. There is small unemployment in Warsaw area • WUT as the leading research institute in Poland is easy to get EU/National projects compared with other Polish institutes.

INNOVATION / R&D	• A long track record in the cluster of research and advanced engineering • Existing research centres are already built as public-private partnership cluster initiatives. • Several institutes and a strong technical university in the region • Västra Götaland is a high-ranked research-intensive region. • High number of on-going cooperative projects within the SAGE topics. • Strong R&D infrastructure for research, development, testing and demonstration in safety technology. • Two large science parks that organise technology-based cluster initiatives • Test environment for new vehicle technology and infrastructure organised by triple helix.	• High number of on-going cooperative projects on SAGE topics • Competences in SAGE domains • Creation of the VeDeCoM Institute • Involvement of the SMEs • A testing ground for future mobility • Existing automotive testing sites in the region • High concentration of research in the region • A dynamic ecosystem of innovation within Mov'eo	• Leading edge private R&D centers specifically focused on mobility research and innovation • Leading edge R&D centers with impact on mobility issues • Many national and international cooperative research projects on automotive/mobility issues • Strong IP position on automotive/mobility topics • Academic institutions with outstanding research activities in the automotive field and/or in technologies with potential high impact on mobility applications • Regional System for Research and Innovation	• Good technology transfer – dense network / circulation of information and knowledge. Smaller region easier to "grasp". • Quality innovation support infrastructure (e.g. business incubator)	• Main important R&D national institutes dedicated to automotive industry, motor and its controller, battery etc. are members of the Cluster • WUT has high number of EU and national projects on-going on SAGE topics (compared with other Polish institutes) • Main competences of the Cluster in SAGE domains • Existing institute within the Cluster which can do test for vehicles and their components and has the right to issue EU homologation • Existing institute which can do test for batteries

EDUCATION / HR	• The competence of people in the automotive sector in the region represent a large share of the total Swedish automotive sector competence, in particular of the higher educated people in this sector. • Chalmers University of Technology provides the regional automotive industry with master degree and PhD students. • Competence can be recruited locally.	• Existing campuses and technology parks • Good level of the students and their education in engineering schools and universities • Development of the Dual education system (academic level)	• Strong academic system in the region • Academic departments, advanced infrastructures and specific degree programs and courses connected with competences required by the automotive sector • High education on transportation design from private institutes • International initiatives on automotive technologies in cooperation with industry	• High competence at the Universities of Applied Sciences • Good quality of the graduates from the local higher education organisations • High attractiveness of the location for highly qualified staff (strong increase of academic population compared to other categories)	• Having the largest and Leading technology university in Poland – Warsaw University of Technology • Warsaw has extensive offerings from public and private universities: 78 higher education institutions, 161 specializations, and several dozen courses offered in English • Rich human resource of highly educated people, Warsaw as the capital city attracts people from all the country
POLICY	• Region Västra Götaland has since it was founded considered "Sustainable Transport" to be a prioritised area. The regional representatives have a close dialogue with national as well as regional stakeholders. • National technology R&D funding for the vehicle sector is very large.	• Public investment in transport and campuses • National and local support in the framework of the "poles de compétitivité" policy • Significant public funding for transport R&D • Tax Credit for Research (CIR)	• Piemonte Region Automotive Platform • National tax credit for research • National research programs • Internationalization initiatives	• Strong commitment of the City of Regensburg • Federal funding programmes – National Electromobility Development Plan • • Bavarian funding programmes	• Warsaw authorities support the organization and development of the Cluster • Poland as a member of international trade organizations focuses on environmental issues, Warsaw is involved in several environment responsibility projects

CLUSTER ORGANISATION	• The organic (ad hoc) development of cluster initiatives stimulates bottom-up initiatives and multiplicity. The development is driven by local engagement, it is not hierarchic, and it allows flexibility.	• Services dedicated to SMEs and Start-ups • Number and expertise of the people involved in Mov'eo • Mov'eo recognised as the leading French Automotive Cluster • The Mov'eo label gives access to funding • Many tools to support start-ups and SMEs • The Triple helix is well represented in Mov'eo • Cluster priorities, reviewed and agreed upon on a yearly basis, are mainly driven by companies • Mov'eo is a key player in cooperation / interaction facilitation among the actors in the region • Clear strategic planning and implementation plan • Dedicated management to animate the cluster	• Professional associations with the specific aim to promote and support the various business sectors and entrepreneurs in the automotive field • University/Industry campuses • Science and Technology Regional Parks • Regional Innovation Hubs • National accredited laboratories for testing • Many automotive testing facilities available for joint projects	• Complementary clusters (sensors, ICT…) / good collaboration across the local clusters • There is a cluster, with a clear focus, specific topics (working groups) which can generate a dynamic • Dedicated management to animate the cluster, supported by the City of Regensburg (pushing forward)	• There is clear organization and management team within the Cluster

1.1.2. Weaknesses

SWOT	Västra Götaland	Mov'eo	Piemonte	Regensburg	Warsaw
ECONOMY	• Volvo Cars is a comparably small manufacturer. Sweden is a small home market for OEM. • R&D investments and strategies are in the hands of a few players. • Relatively few Tier-1 and system suppliers in the industry and in the region. • Sweden has two heavy vehicles producers that have a tradition of competition rather than collaboration. New technologies may need a broader collaboration. • Emerging SME is not linked to existing OEM and supplier structure. • Funding is channelled through many different agencies. Low degree of coordination and centralised decision making and management. • There is a general lack of risk capital in the Swedish system.	• Market position of French OEMs is weak. Little impact in high-end segments means less opportunities for initially expensive features • Some decision centres are not located in the region • Some key actors in research and development are not located in the region • Lack of private funding • Size of the SMEs (too small)	• Weak diversification of vehicle manufacturers • Low vehicle production volumes in the region • Difficulties in funding due to the dimension of SME's • Difficulties for SME's in starting new businesses with large enterprises • The academic startups have systematic difficulties in becoming industrial startups	• No OEM or large company able to foster a market breakthrough or win / develop major development or demonstration projects. • Regensburg is not yet identified as a major technology spot – the area is too small for accessing large innovation programmes… • …On the same time the area is too well developed to receive significant ~~any~~ support from structural funds.	• Lack of large or competitive automotive R&D centres in Poland • FSO S.A. is a comparably small manufacturer • There is no Polish OEMs and Tier 1 in the Cluster • There are not many new start-ups appeared in this technology or business area • Main energy companies in Warsaw area is under the control of foreign entities • Lack of national funds for projects on SAGE topics • No any venture capital and loans invested in the Cluster • It's difficult to access EU projects for Polish institutes • It is more difficult to get public financial support for Warsaw than in less wealthy regions of the country

INNOVATION / R&D	• There is a lack of advanced competence among the intermediary actors in the value chain. Advanced R&D competence is primarily located in OEM and in university research centres. • Research and development is conducted by a relatively narrow group of industrial actors in the region. • Lack of producers of various components needed in future e-mobility. • Lack of sufficient infrastructure or infrastructure investments in order to make the regional and national 'living-lab' concept fly. • There is a lack of (fast) funding mechanisms for pursuing the innovation strategies that need investments in physical infrastructure.	• Technology transfer from public to private and between SMEs and large groups • Lack of competences in some SAGE domains. Gaps in the Value Chain • Lack of efficiency of the innovation process • Maturity of innovation infrastructures • Projects initiated in the cluster are not very attractive for private investors	• Private funding limitation • Lack of national and regional policies on R&D • Bureaucracy • Focus of R&D primarily on short term activities	• No R&D headquarters of very large company (except Continental Automotive for its Powertrain division) • No large University with significant research capacities • Lack of doctoral tracks • Networking and coordination of research activities within the Universities for Applied Sciences still in an early phase	• As a new member state of EU, Polish Institutes have much less chance to participate in EU projects compared with other EU countries • Lack of R&D demands from automotive industry in Poland • Lack of efficient technology transfer organizations • Lack of national investment in new technology on SAGE topics • Testing needs from Polish market is weak
EDUCATION / HR	• Sweden is a small country, consequently, the total number of people working in this area is limited. A vulnerable system. OEMs are the primary reason for this competence and the reason why the state fund universities in this area.	• Not enough bridges between university and industry in the career of a researcher • Lack of cross-skills education: technical &marketing	• PhD's not enough appraised by the industrial system	• International position of the UAS still to be further developed.	• Lack of systematic training program for technical staff and engineers in the field of E&HEVs • Lack of incentive mechanism and environment in Polish university to attract young talents dedicated to scientific research and innovation

POLICY	• There is a lack of policy for fast and large mobilisation. • Policy and public resources are distributed and uncoordinated.	• Complexity of the innovation system and lack of coordination between the different initiatives • Slow process of project funding and bureaucracy • Lack of support for the industrial phase (TRL6 to TRL9)	• Lack of long-term national and regional policies on R&D • Bureaucracy	•	• Lack of social capital or funds in Poland for cluster organisation or management • Lack of strategic policy to support or develop the Cluster • Lack of supportive policy or legislation related to green and safe road vehicles
CLUSTER ORGANISATION	• There are many cluster initiatives and some are small and there is little coordination in-between. Most actors are positive to some degree of coordination, but a stronger coordination function or role, is not supported by all actors.	• Lack of confidence: still difficult to share a common vision amongst the stakeholders • Lack of SMEs involved in the cooperative projects and difficulties to initiate technical partnerships between the SMEs • Lack of international cooperation • Impact of Mov'eo in terms of new products, new jobs and new businesses is not clear	• Lack of anorganized automotive cluster • Lack of interaction and coordination among the different entities	• Weak interaction between the different working groups of the cluster • Transparency on actors and activities in the cluster not sufficient	• Lack of professional team for Cluster management. • Lack of collective strategic plan or vision • Lack of knowledge and experience for cluster management • Lack of experience with cluster operation • Lack of trust towards implementation of projects in cluster formula • Lack of funds for participating in cluster activity

1.1.3. Opportunities

SWOT	Västra Götaland	Mov'eo	Piemonte	Regensburg	Warsaw
ECONOMY	• The two Swedish truck manufacturers are large enough to be able to influence de facto standards in new technology. • OEM capacity in e-mobility meets and interlocks with the growing ecosystem of E-mobility SME in the region. Increased financial coordination between national and regional actors. • Better integration between measures.	• Presence in the Region of large non-automotive firms: possibility to involve new actors in the cluster • New businesses and niches markets • Access to private funding	• Smart and cost-effective solutions driven by small vehicle segments • Initially expensive technologies driven by luxury segments • Mobility system solutions driven by commercial and industrial vehicles • Exploitation of a large spectrum of innovative technologies • Access to worldwide industrial network • New industrial players attracted by competences and infrastructures • Enterprise networking enabled by European public funding	• Large companies based on automotive electronics • Germany established as lead market for e-mobility • German's global leadership in motor-vehicle manufacturing, drive technology and power electronics • Germany leader in energy technology (particularly renewable energies)	• Presence of large non-automotive firms: possibility to involve new actors in the cluster • New market needs may attract large automotive and non-automotive firms to cooperate in new business area and new models within the cluster • Potential market and potential new business opportunities in e-mobility area • Increasing petrol and oil prices and forecast of decreasing prices of electricity in Europe (e.g. shown in prices of EEX Power Futures and Derivatives quoted on The European Energy Exchange AG (EEX)) • The growing potential market

INNOVATION / R&D	• Public-private partnership is already developed in R&D issues, which can be mobilised for innovation. • Research centres can become central competence nodes in roadmap strategies that is currently developed by stakeholders. • Real strengths in the region and in Sweden can be marketed better in order to attract key competences. • Near-term focus for cluster collaboration could be hybrid electric buses, electrification of roads for heavy vehicles and BRT. • Political commitment that test and demonstration is an important strategy for the future.	• New technologies and innovation in the automotive industry • New mobility services • Possibilities to develop cross-fertilization activities • Future mobility system around Paris-Saclay campus	• New players and new funding	• No dependency from one OEM • Innovatory impetus for German motor vehicle manufacturers, parts suppliers and ICT industries • Use Tech-Park at the TechCampus - Nibelungenkaserne (former military premises) for the e-mobility cluster.	• New technologies and innovation in the automotive industry • New market needs in future e-mobility which large OEMs cannot meet • Possibilities to develop the technology and e-mobility solutions based on European level • Sharing the facilities with SAGE partners and other European partners
EDUCATION / HR	• Small and large regions may not differ significantly in specialised advanced technology human capital resources (e.g. research group size does not vary that much between nations). • Leading or fast following development of primary future solutions may attract new business and people. • Attracting experienced researchers to the region and increasing the mobility of researchers in the region.	• Creation of new courses dedicated to vehicle electrification • Other relevant competences in the region • Paris-Saclay campus ecosystem	• International courses and agreements can stimulate international R&D business initiatives	• Creation / maintaining of jobs for highly qualified people (maintain of value creation through transfer from traditional automotive areas) • New graduates (Bachelor) coming earlier that before on the job market	• New subjects of crossing discipline dedicated to vehicle electrification • Large demand for workforce will continue to attract highly educated and efficient workforce in Warsaw

POLICY	• Sweden (and the region) can make a difference in certain technology areas • Better coordination between local, regional and national actors. Better alignment with the long and medium term strategies of major OEMs.	• French National plan for the automotive industry supporting deployment of low carbon vehicles • The Greater Paris Project • Access to European funding • Paris mobility development policy	• Need of a common vision • Simplification in public funding procedures can improve R&I in SME's	• German National Electromobility Development Plan • Bavarian innovation and technology policy	• Contribution to climate protection and reduction of local emissions • International cooperation may widen the view and mind of politicians
CLUSTER ORGANISATION	• The most relevant stakeholders are already active in cluster initiatives, there exist organisational commonalities, and stronger coordination is therefore possible. • The stakeholders in the region have a common vision on 'field operation testing and demonstration' in the safety area.	• Reinforce the cross-cutting action plans • Develop cooperation with SAGE partners	• Creation of an automotive cluster in the form of a legal entity	• Learn from the SAGE partners • Autonomous cluster management structure	• Learn from SAGE partners especially from Mov'eo • Cooperation with international clusters

1.1.4. Threats

SWOT	Västra Götaland	Mov'eo	Piemonte	Regensburg	Warsaw
ECONOMY	• A few OEM provide competence and capability to the cluster. If they leave the region that would fundamentally change the ecology of the cluster and its long term survival. • Beneficiaries are redistributed due to a system change in a way that affects the region negatively. • The system fails to act swiftly in a changing environment and to do so with larger sums. We remain in an uncoordinated, 'small funds', system.	• International competition: rise of the emerging countries • Low profitability of SMEs	• Uniqueness of national vehicle manufacturer • Low vehicle production volumes • Difficulties for SME's in following the technology evolution • Delocalization of reference customers have significant impact of SME's	• Faster progress made by competitors • Production facilities could move to other regions. • Reticence towards electric vehicles (e.g. costs, safety, range) • Unrealistic public expectations causing possible disappointment • Industrial investments might go to other regions, e.g. to OEM dominated clusters and areas or low salary regions	• FIAT Auto Poland S.A. is decreasing the production models and volume in Poland • The future of FSO S.A. is unclear • On one hand, low profitability of SMEs if they enter into the business too early regarding e-mobility • On the other hand, customers are waiting for the mature products, available service at a competitive price • Economic crisis might cause EU and national government to decrease the related project funds • High investment needs for the infrastructure of e-mobility

INNOVATION / R&D	• New core competence areas arise, but the regional clusters and the general national automotive cluster fails to keep up. • Changes in global technology development does not induce adequate financial and organisational response in the regional and nationally. • The region does not represent an identifiable and attractive location for the new technology that need to be developed for the future system of fossil free transportation. • The economy of the region is linked to progress in the vehicle sector. • System innovation requires a closer link between technology developers and infrastructure planners.	• Decrease of R&D investments of the large firms • Offshoring of R&D activities • Postponement of investments associated to restrictions of public funding • Inefficiency of campuses • Intellectual Property Rights might stay in other areas	• Medium-long term limitation of required competencies • Delocalization of automotive business.	• IPR not linked to the location Regensburg • Scarce investment in collaborative R&D with the RUAS • Public funds go to other regions, e.g. to OEM dominated clusters and areas	• New core competence areas arise both in Europe and out of Europe, but the cluster fails to keep up because it's small and young
EDUCATION / HR	• OEM disappears from the region. This affects the whole logic of the knowledge-based system in road vehicles. • Major suppliers of the pertinent systems and components of the required new technology do not locate development groups and production in the region. • Failing to connect researchers in the region to international networks and strategic areas.	• Lack of attractiveness of the automotive industry • Reduction of the number of R&D jobs in the region	• Reduction of interest in the automotive high education due to the lack of job perspectives • Brain drain	• Competition for qualified people / headhunting • New graduates (Bachelor) coming earlier that before on the job market	• Lack of motivation in Poland to study engineering subjects

POLICY	• Other regions are more efficient in coordinating their cluster resources. • Failing policy (and politics).	• Decrease of the public support (national and local authorities) • Decline or abandonment of the cluster policy • Durability of the public funding for projects	• Re-focus of public policies and funding on other, more responsive sectors	• Positioning in the Bavarian landscape • European and global standards and norms still unspecified	
CLUSTER ORGANISATION	• The regional cluster and innovation system is structured by short term funding opportunities, and it may fail to stabilise its function and role. Cluster management may remain weak and fail to support sustainable industrial development.	• Reduction of involvement and stagnation of the activity in the cluster • Financial sustainability of the cluster	• Lack of sustainability and effectiveness of the entities inside the “informal” cluster	• Young cluster / new market: structures are still instable	• The Warsaw E-Mobil Cluster might not operate efficiently or might go nowhere

2. SWOT at consortium level

The following table shows an overview of the strengths, weaknesses, opportunities and threats identified by the five regional clusters in the five dimensions of the analysis. This overview provides the basis for the identification of gaps, overlaps, complementarities and synergies, which are expressed in recommendations to be addressed in the Joint Action Plan; those recommendations are described in the next chapter.

	Strengths	Weaknesses	Opportunities	Threats
ECONOMY	• Presence of strong industrial players (OEMs, suppliers...) • Well functioning ecosystems – strong diversification of competences • Relative strong economic position • Automotive tradition	• Gaps in the value chain • Market positions	• New markets, products and services	• International competition, fast moving competitors • Slow development of the e-mobility market (“dead-end”)
INNOVATION / R&D	• Track record • Leading innovation capacities (public and private) • Industrial R&D activities • Number of projects ongoing • Good innovation support infrastructure (testing, coaching...)	• Technology transfer from public to private, especially SMEs not efficient enough • R&D capacities lacking in some areas • Lack of private funding / investment for R&D and innovation • Lack of venture capital	• Roadmapping for innovation / mobility services • Test and demonstration projects (also at European level) • Benefit from campuses, increase their efficiency in terms of technology transfer and innovation	• Off-shoring of R&D capacities - Decrease of R&D investments • New investments made in other regions
EDUCATION / HR	• Quality of human resources and competences available in the regions • Quality of education • Attractiveness of the location	• Some skills missing (technical & marketing combination)	• Creation of new courses (e.g. around vehicle electrification) • Involve new competences (sometimes already available in the region) in new value chains	• Lack of attractiveness of engineering studies and the automotive industry • Competition for qualified people • Reduction of R&D jobs

POLICY	• Availaibility of policy support for automotive and green in general	• Lack ofcoordination of policies and funding between regional, national and European levels • Complexity / bureaucracy of public funding schemes • Lack of support for (pre)industrial phase	• Coordination, strategy for better access to funding (regional, national, European)	• Decrease of public support, including for cluster policy
CLUSTER ORGANISATION	• High level of expertise available • Local commitment • Platforms for interactions in the region	• Common vision not always established • Sharing and confidence to be increased • Lack of transparency on actors and activities • Cluster structure and management not always mature	• Exchange / cooperation among cluster organisation	• Financial sustainability of the clusters • Decline of involvement of the members

Recommendations to be addressed in the Joint Action Plan (WP4)

In this chapter, recommendations for actions to be addressed and possibly taken up in WP4 are derived from the comparison above.

Those recommendations do focus on the generic aspects of the SWOT analysis. The recommendations related different focus areas of the SAGE project will be dealt with by the respective working groups established in WP4 and the results will be included in the Joint Action Plan.

1. Overall list of actions and topics for the Joint Action Plan

	Topics / Actions
ECONOMY	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.
	2. Strengthen / anchor new value chains in the regions.
INNOVATION / R&D	3. Establish roadmaps for new mobility solutions (new mobility services and new technologies).
	4. Increase the efficiency of campuses / technology transfer.
	5. Increase participation of SMEs in cooperative projects / increase technical partnerships among SMEs (see also cluster organisation) → develop tools, strategies to increase R&D investments and collaboration within SMEs.
	6. Identify & mobilise better or new funding sources for innovation.
EDUCATION / HR	7. Create / share a portfolio of new courses dedicated to vehicle electrification.
	8. Increase the attractiveness of the automotive / vehicle industry in general – safe and green in particular.
POLICY	9. Promote clusters / cluster policy at regional, national and European level → create tools for that, e.g. impact measurement, etc (see also cluster organisation).
	10. Improve the coordination of funding mechanisms and policy on regional, national and European level.
CLUSTER ORGANISATION	11. Increase transparency of actors and activities within the clusters.
	12. Increase trust among the cluster actors.
	13. Create a common vision among the stakeholders.
	14. Transfer cluster management competence to Warsaw as well as among the SAGE clusters in general.
	15. Develop strategies for the financial sustainability of the clusters (e.g. how to demonstrate impact to stakeholders / public funders).

2. Rationale / Short description of each topic or action suggested

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 goring markets in Asia and South-America, the clusters needs to contribute to the anchoring of activities 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 high 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 joint 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 emergence 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 sources 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 (e.g. JobVehelec) 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 registered 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 attractive 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 green 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.

See also suggestion 15

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 single 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 cross 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 strategies for financial sustainability beyond the short-term horizon of their current public funding streams. One aspect to 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.

Conclusions – next steps

It is not in the scope to prioritise or make a decision on actions to be implemented by the SAGE clusters. The suggested topics and actions described in the present document have been transferred to WP4 and its different working groups, so as to be included in the activities towards the establishment of a Joint Action Plan for the SAGE clusters.

The further exploitation of the input provided in WP3 will be performed in WP4 and its working groups and will be part of the JAP.

Annex – Technology SWOT in the SAGE focus areas

1. Overview of the comparative SWOT in the focus area SAFE

2.1.1. Strengths

SWOT	Västra Götaland	Mov'eo	Piemonte	Regensburg
	• A long track record in the cluster of research and advanced engineering in traffic- and vehicle safety and active safety (inc. vehicle-ICT). • History of innovative technology development and implementation in early development phase. • The safety area is mature and embedded in the automotive cluster (compare green). • Excellence centre (PPP) at CTH for vehicle and traffic safety (Safer). • Validation and development of crash test dummies. • Strong R&D infrastructure for research, development, testing and demonstration in safety technology. • The stakeholders in the region have a common vision on 'field operation testing and demonstration' in the safety area. • World leading companies in the area of safety. • Algoritm for automatic functions in active safety.	• Long tradition of public-private cooperation on passive safety, biomechanics and accidentology issues • Numerous projects on Safety in Mov'eo • "Road User Safety" as strategic field and working group in Mov'eo since the beginning • Active companies and labs in driver behaviour, vehicle simulation and image processing • SAFE-MOVE project • VeDeCoM Institute	• Safety of vulnerable road users (VRU): o New technologies progressively available on production vehicles o Improvements by advanced knowledge and modeling of human body • Safety of new vehicles: o Full-scale crash test facilities available in the area o Progressive extension of preventive, active and passive safety features on all new vehicles o Improvements in virtual testing methods o Participation to European projects • Advanced driver support: o Full range of driver-assist systems on production vehicles o Feasibility study of driver attention Support on commercial vehicles o Participation to several European research projects and initiatives o	• SAFE (general) o Labs and testing infrastructure at TÜV SÜD at 2 locations (Straubing, Garching); new battery test center in Garching o Continental o Bavarian IT-safety cluster, automotive forum • Cooperative systems o Vector Infomatik (cluster member) as a world market leader in communication protocols,… o Sensor application center at RUAS

	• Competence is often provided locally. Strong technical university in safety. Exceptionally long experience in field data from accidents used for developing total safety in actual traffic situations. • Electric architecture in vehicles and simulation of their functions. • High number of cooperative projects within the safety topic. • Top position when it comes to attracting national funding. • Expertise in safe coupling equipment for truck and heavy trailers. • Strong IT sector with expertise in active safety. • Institutes with strong expertise in safety (one important focus being testing and evaluation).		• Traffic Safety Analysis / Safe infrastructure: o Cooperation with road and motorway operators • Cooperative systems: o Great number of European research projects	• Functional Safety/safe & secure systems o SME in the Bavarian IT safety cluster (automotive forum) o RUAS: o Las3 – Lab for safe & secure systems (by and with software) o Competence centers: IT operation center, Competence Center Software Engineering (CCSE) o RUAS, education: Safety aspects covered in master studies and vocational trainings (e.g. automotive summer school) • HMI interface competence at University Regensburg and some companies • Biomechanical modelling: RUAS: research group Prof. Dendorfer, advanced human body models • Sensors: o Cluster Sensorik o Sensor application center at RUAS

2.1.2. Weaknesses

SWOT	Västra Götaland	Mov'eo	Piemonte	Regensburg
	• Traffic safety research relating to infrastructure is not a particular strength in the region. • Dependence on OEM presence. • Few non-Swedish partners present. • The region does not have particular strengths in sensors development area.	• High-end ADAS marketing difficult for French OEMs • Safety for 2 wheelers	• Safety of new vehicles: o Passive safety of electric and hybrid vehicles o Shrinkage of research laboratories on structural impact and biomechanics • Driver support: o Slow market introduction • High cost of safety applications	• Security is not a main focus of the cluster activities

2.1.3. Opportunities

SWOT	Västra Götaland	Mov'eo	Piemonte	Regensburg
	• Human factors design, sensors and communication systems will become increasingly important. • Research on the relationship between electrification and safety is still unexplored. • Academic collaboration • International opportunities for co-operation • Taking the lead on the smart integration of passive and active safety solutions.	• Driver Behaviour • Safety of new vehicles (small urban vehicles) • Safety for 2 wheelers • Using outside Europe our safety competences	• Safety of new vehicles: o Lightweight electric vehicles • Advanced driver support & Cooperative systems: o Performance and reliability o Business models and liability o Economy of scale • Secure road transportation: o Freight transport o Safe parking place o Vehicle and freight tracking • Integrated solutions to prevent theft and freight damage	• Involvement in safety questions as competent partner • Driver assistance projects and profile

2.1.4. Threats

SWOT	Västra Götaland	Mov'eo	Piemonte	Regensburg
	• Globalisation • Shift in safety paradigm	• Legal issues • Safety of hybrid and electric vehicles	• Safety of new vehicles: o Virtual modeling failures o Lightweight electric vehicles • Advanced driver support & Cooperative systems: • Liability issues	• Missing safety trends?

2. Overview of the comparative SWOT in the focus area GREEN

2.1.5. Strengths

SWOT	Västra Götaland	Mov'eo	Piemonte	Regensburg	Warsaw
	ICE: • Energy efficient powertrain for heavy vehicles (AB Volvo) • Energy efficient powertrain for passenger cars (VCC) • History of innovative technology development in combustion engine technology and three-way catalysis (AB Volvo and VCC). • Excellence centre (PPP) at CTH for combustion engine research ontrol systems. • Excellence centre (PPP) at CTH for catalysis **Renewable fuels** • Development of flexi-fuel vehicles (VCC), alternative fuel bus concepts (Volvo Buses) and liquefied gas truck (Volvo Trucks). • Excellence centre (PPP) at CTH for renewable fuels (f3) with focus on biogas and ethanol. • Strong local and regional public support for biogas (including procurement for public transport). • Regional infrastructure for public transport needs.	• "ICE Powertrains", "Mechatronics Systems", "Environmental Footprint" as strategic fields and working groups in Mov'eo since the beginning • Key competences in ICE (combustion, downsizing, after-treatment…) • Key competences in Mechatronics and vehicle electrification • Key competences in materials and lightweighting (composites and plastics) • Competences in simulation, modeling and validation tools • Competences in battery tests and chemical performance • Numerous projects related to Green in Mov'eo • VeDeCoM Institute • French market has lot of specific characteristics to become leader in electromobility	**Powertrain Technologies:** • ICEs o concrete, affordable and immediate technological solution o advanced competencies and R&D activities in the area • Electrified drivetrains o medium/long term solution o electric light commercial vehicles and city busses in production o electric vehicles low-volume production o technologies and scenarios analysis well covered in the area • Transmission and gearbox o AMT and DDCT in production and under development	• Electrical powertrain, hybridisation o Electrical powertrain is a main focus of automotive electronics, here Regensburg and is one of the competence centres in Germany and EU (Conti, AVL, Vector etc) o RUAS: study automotive electronics o Strong competence in powertrain • Testing facilities: New battery test center at TÜV SÜD (cluster member) • Main players Conti, AVL and several smaller companies in "green", ICT technologies e.g. battery management, on board charging	• Key competence in designing powertrain (including transmission and gearbox) for E&HEVs • Key competences in electric & hybrid vehicles integration • Key competences in vehicle and components modeling, simulation and validation test stand for E&HEVs and its main components • Competences in energy recovery, energy control strategy and management • Competences in battery tests and chemical materials for battery • Test facilities for vehicles and their components

	• Infrastructure for biogas more developed then in other parts of Sweden. • Firms working in the area of fossil free fuels have moved to the region (main example, Hardstaff AB). • PPP on hydrogen with headquarter in Gothenburg (Hydrogen Sweden). • Newly established facility for fuel cell testing in Gothenburg (Energiteknikcentrum). Development and testing (Powercell and Technical Research Institute of Sweden). **Electromobility** • Development and commercialisation of diesel plug-in hybrid and a battery only electric vehicle – general capacity in system optimisation and powertrain system design (VCC). • Development of a commercial hybrid, plug-in hybrid busses, and battery only electric busses (Volvo Buses). Future production only powertrains with electric components. • Development of a continuous charging electric truck concept (Volvo truck).	•	**Energy Technologies:** • Reduction of parasitic losses o advanced methodologies for aerodynamic drag and rolling resistance reduction • Energy recovery and Energy management o systems integrated with ICEs in production and under further development • Recharging of EV/PHEV o continuous recharging from the lane **Materials & Conception:** • Novel production technologies/green manufacturing process o best practices in use o research activities • Design for easy dismounting and green design; Recycling at the end of life o best practices in use o research activities • Light-weighting o HSS and UHSS in use •	• Complete value chain of e-mobility is present (renewable energy systems (PV-system planning & installation, wind power planning and installation, CPH, privat e and industrial installations) energy transmission & distribution, charging stations, E-vehicle)	•

	• Emerging cluster of e-Mobility SMEs. • Excellence centre (PPP) at CTH for hybrid vehicles (SHC) with a technical focus on system studies and tools, electric machines and drives and energy storage. • Competence within test and demonstration (Test Site Sweden). • Test centre for advanced batteries in NoI (Energiteknikcentrum).		**Environmental impact of new vehicle technologies:** • Assessment tools o participation to European initiatives on impact assessment of Electromobility • Expertise in standardization and regulation of emission levels of GHG/pollutants • Direct participation to round tables and initiatives for regulations and standardization		

2.1.6. Weaknesses

SWOT	Västra Götaland	Mov'eo	Piemonte	Regensburg	Warsaw
	ICE: • R&D capacity is distributed in Sweden (lack of concentration to vehicle producers' local setting). • The leading excellence centre in combustion is located outside the region (Lund), however the two centres are linked. **Renewable fuels** • Regional and national production not sufficient. • Unclear availability of biomass. **Electromobility** • Emerging SMEs is not linked to existing OEM and supplier structure. • Batteries are a key competence and there are no producers in the region (or in Sweden). • Lack of component producers. • Lack of infrastructure.	• Prominence of German actors for engine management systems • Competences in Fuel Cells • Production processes	**Powertrain Technologies:** • Electrified drivetrains • mass production far away • Electrified powertrains • Positive trend for batteries not fast enough	• No OEM with R&D in the region • No Battery research	• No Polish automotive or tier 1 players with the "Green" technology in the market • The know-how and technology of university couldn't be efficiently transferred into industry

2.1.7. Opportunities

SWOT	Västra Götaland	Mov'eo	Piemonte	Regensburg	Warsaw
	ICE: • Internal combustion engines still have the potential to become much more efficient. • Advanced diesel concepts are likely to be important in the future. **Renewable fuels** • Political commitment to support biogas in transportation. • Large domestic resources in forestry. **Electromobility** • The international market of plug-in hybrid and full electric buses increases rapidly and can become near-term focus for cluster collaboration. • Other possible areas for coordination between OEM and the public sector are electrification of roads for heavy vehicles and BRT. • OEM capacity meets and interlocks with the growing ecosystem of e-mobility SME in the region. • Funding for automotive R&D is very focused on electromobility. • Cluster building activities within electromobility. • Increased awareness in the industry.	• Health interactions • Energy recovery systems • Strong competences on batteries in different laboratories • Charging systems	**Powertrain Technologies:** • ICEs • CO2 standard in 2020/2050	• Cluster focus on e-mobility and thus on green powertrain • Project opportunities with OEM from other SAGE regions • Find partners in SAGE regions,	• Cooperation with SAGE partners • International cooperation

2.1.8. Threats

SWOT	Västra Götaland	Mov'eo	Piemonte	Regensburg	Warsaw
	ICE: • The role of larger engines decrease, new player enter that become strong in an emerging segment of smaller engines for hybrid configuration. **Renewable fuels** • The competence in biofuels in the region does not lead to new firms. • Demand of biomass-based fuels is larger than availability, and fossil gas become the primary option. • Infrastructure does not develop. **Electromobility** • Uncertainty about emerging trajectories in different hybrid solutions for passenger cars. In the case of a large technology shift that demands large investments, stakeholders in the region are comparatively small and might not be able to mobilise fast enough.	• Electromobility: emergence of Asian competitors • Urban policies	• Automotive market shrinkage	• Profile as automotive rather than green industry location	• European negative economic situations • Active and supportive policy from Asia and the USA

3. Overview of the comparative SWOT in the focus area CONNECTED

2.1.9. Strengths

SWOT	Västra Götaland	Mov'eo	Piemonte	Regensburg
	Vehicle Telematics sector • It is estimated that there are well over 100 companies working within the telematics sector in Sweden, and with a majority of those operating in West Sweden. Around 60 companies in the region act as suppliers to the automotive industry. A large share of the production of wireless technology at Ericsson is located to the region. System and software development companies include Mecel, Epsilon, HiQ, QRTECH, Pelagicore. • A new arena is currently being established at Lindholmen Science Park – CIA. It will allow small IT companies to develop and test applications in automotive industry development platforms. • Electric architecture in vehicles and the simulation of their functions is a strength within the OEM's.	• "Intelligent Mobility Solutions" as strategic field and working group in Mov'eo since the beginning • Projects related to Connectivity in Mov'eo • Key competences in artificial intelligence, robotics, autonomous vehicles (cybercars) • Key competences in Communication and HMI • VeDeCoM Institute • Key competences in Paris Region on ICT	**Vehicle2Vehicle:** • HMI • Awareness for driver • Information for vehicle · Long track record of European projects and initiatives **Vehicle2Infrastructure:** • Charging stations • Grid · Innovative solution of continuous recharging from the lane • Human • Home · Integration of personal devices with the on-board information system • Traffic operation centers • Services · Long track record of European projects and initiatives · Telecom operator active on new technologies for V2I and I2V • 5T information system already on place	• Connected (general) o Global market players: Conti, (AVL), Vector and many SME o Bavarian IT-safety cluster (safety aspect of connectivity systems) • Strong global and small players in Network "intelligent charging infrastructure" (Schneider El., many SME) • Competences in: o Vehicle to vehicle o Usability, HMI • Many stakeholders in charging infrastructure (safety & access, billing, control center, mobile applications,..)

	Intelligent Transportation Systems sector • Cooperative vehicle driving test environment, Test Site Sweden. • The Viktoria Institute was initiated partly by Ericsson. The institute conducts research at the intersection between 'vehicles' and 'ICT'. There are also other institutes with competences in cooperative systems. • Emerging SME's within fleet management solutions (Vecho and Pilotfish). • Automatic toll system is implemented in Gothenburg area for increased transport efficiency. **Advanced wireless (high-speed) communications system sector** • The region is a leading European node for research, development and business in the area of microwave technology. • Chalmers University of Technology is internationally recognised for research on microwave technology, antennas and communication systems	•	•	•

2.1.10. Weaknesses

SWOT	Västra Götaland	Mov'eo	Piemonte	Regensburg
	Vehicle Telematics • The main body of competence is concentrated to and located within the OEM. External competence is important but often very small firms doing specialized development tasks. **Intelligent Transportation Systems** • The industry mix is here, but the organisation to utilise the resources and competences are not. **Advanced wireless (high speed) Communications** • This industry has traditionally worked with military applications and other advanced high cost sectors. For transportation, cost reductions are probably needed.	• Lack of Telecom actors involved in Mov'eo • Lack of actors for short distance solutions involved in Mov'eo • Lack of decision in Europe regarding "eCall"	**Vehicle2Infrastructure:** • Current infrastructure is proprietary and closed. Investments are needed to update it and to make it open to the deployment new services	• No OEM, power of "standard setting" • Usability, HMI o Many different interfaces, no standardisation o No cross border compatibility, billing systems • access procedures to charging stations different, no compatibility between systems

2.1.11. Opportunities

SWOT	Västra Götaland	Mov'eo	Piemonte	Regensburg
	Vehicle Telematics • Trend towards telematics technology increasing its share of the value chain of a vehicle. • OEM's opening up platform visavi application boundaries for new stakeholders. **Intelligent Transportation Systems** • Deepened coordination on infrastructure, shared data and standardisation. **Advanced wireless (high speed) Communications** • Build on the competence developed originally for non-civil applications. Sensors, radar systems, advanced robust communication devices are needed for future active safety solutions and transport efficiency solutions.	• V2X Communication standardisation at the European level • Internet of Things (IOT), Cloud computing, big data • Strengthen the link with ICT actors in Paris Region to gain competence in connectivity • Reactivity of the French competences in this domain • Important possibilities for SMEs	• Charging from the lane o Same infrastructure for public and private transportation • Reduced need of energy storage on-board	• Foster standardisation through cross national activities

2.1.12. Threats

SWOT	Västra Götaland	Mov'eo	Piemonte	Regensburg
	Vehicle Telematics • Actors in the region have the competence, but fail to use it strategically. **Intelligent Transportation Systems** • Actors in the region have the competence, but fail to use it strategically. Lack of coordination on infrastructure, uncertainties on how to share data and standardise. **Advanced wireless (high speed) Communications** • Actors in the region have the competence, but fail to use it strategically.	• Asian Competitors (mainly Korea and Japan) • Google Car and others • Data reliability and safety	**Vehicle2Infrastructure:** • To enable widespread diffusion of services, in particular V2I and I2V, huge investments are needed to enlarge the area covered by connectivity services.	• Innovation barrier for charging/grid infrastructure because of lack of standardisation • Market for charging infrastructure grows very slowly

4. Overview of the comparative SWOT in the focus area NEW BUSINESS MODELS & MOBILITY SOLUTIONS

2.1.13. Strengths

SWOT	Västra Götaland	Mov'eo	Piemonte	Regensburg
	SME sector • Growing SME sector. Start-up of new OEM's with innovative electric vehicles (utility vehicles, three-wheelers, special vehicles). Examples are Nimbell, Clean Motion, Coman. **Networks of stakeholders** • Capacity to mobilise networks of stakeholders. • Platforms where new business models can be created are e.g. the very broad collaborative projects GoSmart, SendSmart (Closer) and SEVS.	• "Demonstrators" as strategic field and working group in Mov'eo since the beginning • Car sharing systems already available in Paris Region • Presence of companies with an offer of new specific vehicles • Paris Region: a testing ground for electromobility solutions • Projects to anticipate customer needs and foresee new Business Models • VeDeCoM Institute	**Vehicle System Integration:** • New concepts for vehicle architecture • Integration of new electrical and hybrid Powertrains · Full competencies and organizations available for the development, the industrialization and the low volume production **Demonstrations:** • Demonstration of new vehicles, experimental deployment of carbon-free vehicles · Example of a complex demonstration project: Phylla • Development and demonstration of infrastructures • Demonstration of Vehicle / Infrastructure interactions · SAFESPOT integrate project · 5T traffic management system · ecoFEVproject	• SFA1: Vehicle System Integration o Competence New vehicles – Conti, AVL o Strong RUAS activity, regenics racing team at RUAS and UAS Deggendorf • SFA2: Demonstrations o Fleet test city of Regensburg and in E-Wald region • SFA3: New Mobility Solutions & Value-Added services o No competence specifically on business models, but engaged cluster members in vehicle, charging infrastructure and smart grid o (E-WALD)

	System integration • Capacity to organise system integration • Biogas implementation in municipal bus system. Now the same integration occurs in electrified bus systems. Small-scale test fleets for electric vehicles and charging infrastructure at Lindholmen Science Park, Innovatum and local authorities. **New services** • Growing number of car-sharing companies, also electric vehicles, such as Sunfleet Carsharing, Move About AB. • Institute with competence in using ICT to enable cooperative systems and new business models e.g. Viktoria Institute. Two project examples are ELVIIS, economic transaction system for opportunity charging, and the pilot projects on new business models for electric vehicles, BeliEVe.	•	**New Mobility Solutions & Value-Added services:** • Devices, information, training and incentive to improve driver behavior · EcoDrive system • Improving life on board (new devices for comfort, safety, customization of the vehicle…) · Activities on European projects • Mobiles within an integrated multimodal trip chain · Integrated mobility services · Demand responsive transit · Car sharing · Multimodal hubs • Customized mobility services • STAR electric mini-bus lines	• SFA 4: societal impact o New competence center on empirical social studies (ELSA) and technology impact assessment at RUAS • Largest model region project in Germany started • Incubation programme for ICT companies • Large regional VC company (S-Refit)

2.1.14. Weaknesses

SWOT	Västra Götaland	Mov'eo	Piemonte	Regensburg
	SME sector • SME are still few and most are very small. **Networks of stakeholders** • Difficult to scale up networks to be able to launch larger initiatives. **System integration** • Difficult to mobilize for innovation through system integration on a larger scale. **New services** • The home market is small and the region is not in the forefront when it comes to new business models.	• Business model for the new mobility solutions • Ability to transform a concept into an industrial product or service • Network of SMEs • Lack of medium size enterprises to implement quickly the new solutions • Lack of boldness	• Public/private business models o Insufficient coordination • Legal and regulatory environment • Lack of integrated approach	• Regensburg is probably too small for profitable car-sharing business (see car2go), specific mobility/business model required • German VC market generally speaking is too weak

2.1.15. Opportunities

SWOT	Västra Götaland	Mov'eo	Piemonte	Regensburg

	SME sector
	• Regional policies to strengthen entrepreneurship.
	
	Networks of stakeholders
	• Collaborations can be enlarged to form real development driver for industry. Local networks can connect to the major international networks.
	• Increased political support for using the region / the city for demonstration of new technology solutions.
	
	System integration
	• System integration is traditional engineering strength in Sweden.
	
	New services
	• Increased transport efficiency models are built on novel schemes.
		• Partnership with local authorities
		• New usages and new expectations
			• Demonstrations
			  · Piemonte Region Automotive platform
			  · 5T system
			• Legal and regulatory environment
			  · Enforcement of the national law on mobility management
			• Economic and social impact
			  · Specific geographic situation of Turin
			• Impact on the economy and society
			• Transport planning
				• Test and install e-mobility mobility project with input and collaboration with other SAGE regions
				• New Techcentre planned for 2015 for cross over technologies
				• Good financial schemes for RTD on national level

2.1.16. Threats

SWOT	Västra Götaland	Mov'eo	Piemonte	Regensburg
	SME sector • New business models are often driven by SME, but the region have to few and too small SME's. **Networks of stakeholders** • Development centres arise in other regions, and local actors are disconnected. **System integration** • Crucial system integration development and competence development are made only outside the region. **New services** • Innovative solutions are primarily developed elsewhere.	• Lack of standardization and difficult deployment of new solutions within Europe • Regulation • Service providers become the only actors for the specification of the vehicle • New Business Models and New Services are realized somewhere else	• Negative impact of the lack of a medium/long term vision	• e-mobility hype weakens • Mobility solution for Regensburg region required, not yet clear • Low private equities for new enterprises • Until now no larger fleet test running

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

Hanna Blomdahl (SAGE coordinator)
hanna.blomdahl@vgregion.se

www.sage-project.eu

CAPACITIES

SAGE
Safe and Green Road Vehicles Europe