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APROSYS Dissemination and Use Plan M1-M60

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A	29 Oct 2009	150	SP Leaders	√	A. Mahieu J. Wismans	√ √	M. van Schijndel-de Nooij	√
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Executive summary

In this plan for using and disseminating the knowledge generated in the project APROSYS, the project partners define in a detailed way how to effectively disseminate the results and all the knowledge gathered by all project partners. It is a challenge for the IP management to organize and manage these discussions within a project of this magnitude, in order to reach a common agreement on the dissemination plans in particular also to optimize the social and economical exploitation of the project results.

The discussions for this plan started in the first year of the project and resulted in continuous updates of this plan through the duration of the project until agreement on the final version, as presented here, was reached.

This document is organized primarily around the 10 Main exploitable Results (and its contributing sub results) of APROSYS. These results are the project results with the expected largest impact on the safety problem. The 10 Main Results are listed in Table 1 together with the original 7 project objectives of APROSYS. The 10 Main Results have largely contributed in achieving the main objectives of the project.

Table 1: General project objectives and Main Results APROSYS

General project objectives	APROSYS 10 Main Results
1. New injury criteria and injury tolerances	1. New human body mathematical models
2. New mathematical models of the human body	2. WorldSID 5th percentile female dummy for side impact
3. New world-wide harmonized crash dummy	3. Side impact protection system for car occupants
4. New knowledge and tools for intelligent safety systems	4. Generic assessment methodology for advanced safety systems,
5. Enhancement of virtual testing technology	5. Generic car mathematical models,
6. New test methods (for advanced safety systems)	6. Virtual testing methodology
7. Advanced protection systems for injury reduction in most relevant accident types	7. Test methods for vulnerable road users
	8. Full width frontal test for Europe
	9. New side impact test methods
	10. New protection systems for vulnerable road users

Main Result 1, new human body mathematical models, has contributed in particular to the objectives 1 and 2. It consists of 4 exploitable sub results (software and databases) owned by the developers in the project and protected by software license agreements. Future steps include developed of guidelines for model validation and virtual testing and the usage in the vehicle design process.

Main Result 2, WorldSID 5th percentile female dummy for side impact, concerns objective 3. It consists of 5 exploitable sub results including the physical dummy itself and its instrumentation as well as a mathematical model of this dummy. Owners include a dummy manufacturer (production and sales of the dummy, instrumentation and models) and R&D labs (commercialisation of models, application in engineering studies and vehicle rating). Future steps include international harmonisation activities and inclusion of the dummy in regulatory and consumer testing.

Main Result 3, side impact protection system for car occupants, has contributed in particular to the objectives 4 and 7. It consists of 11 exploitable sub results (various new technologies) protected partly by patents and intended as commercial available products owned by the developers (including suppliers). An important future step is the implementation of the new technologies in future vehicle designs.

Main Result 4, generic assessment methodology for advanced safety systems, deals in particular with objectives 4 and 6. It consist of 1 exploitable result (i.e. a generic assessment methodology) consisting of a number of different assessment methodologies like tests in a driving simulator. The methodology will be further developed in the FP7 project ASSESS and will be used as a starting point in EuroNCAP for the evaluation of new safety features (Beyond NCAP).

Main Result 5, generic car mathematical models, delivered an important contribution to objective 5. It consists of 7 exploitable results, i.e. computer models of various vehicle types like small mini and family cars as well as trucks. Owners are the developers of the motels including an OEM and R&D organisations. The models will be partially made public (APROSYS website) and others can be used by under agreement with the owners. They will be used and further developed in future R&D projects and will be also part of future virtual testing procedures.

Main Result 6, virtual testing methodology, contributed to the objectives 5 and 6. In total 32 exploitable results were generated partially owned by the developers including OEM's and R&D organisations. One of the results is a demonstration of the use of virtual testing for the evaluation of pedestrian protection in case of impacts with a vehicle front. The results are partially protected by license agreements. They will be used for instance as part of licensed commercial software and in consultancy projects. In future they will contribute to virtual testing procedures.

Main Result 7, test methods for vulnerable road users, has contributed in particular to objective 6. In total 16 exploitable results were developed partially owned by the developers. Some of the results will become available as future extensions of regulatory and consumer testing (vehicle safety assessment procedures).

Main Results 8 and 9, a full width frontal test for Europe and new side impact test methods, delivered a main contribution to objective 6. It consists of various exploitable results resulting in improved consumer and regulatory testing for front and side impacts. The new test procedures are expected to contribute to improved protection of car occupants in front and side impacts (objective 7).

Main Result 10, new protection systems for vulnerable road users, has contributed to objective 7 in particular. It consists of 10 exploitable results owned by the developers (suppliers, OEM's and R&D organisations) and partially protected by patents. A number of the results will become available on the market as commercial products.

In addition to the exploitable results of APROSYS this plan also provides an overview of the most important dissemination activities of APROSYS including presentations and paper, development of a corporate identity for APROSYS through logo's, report templates, flyers etc.., the set-up of the website (www.aprosys.com), newsletters and in particular also the final event in Feb. 2009 in Amsterdam.

The APROSYS website provides an entry to all public deliverables of the project in particular also the final APROSYS report, final reports of all the 7 sub projects in APROSYS and many presentations and reports including all presentations given at the final event. The website will be alive at least for 5 years and as such will provide a very important entrance for safety R&D information and documentation for project partners and the worldwide safety community.

1. Introduction

This plan for using and disseminating the knowledge generated in the APROSYS project defines in a detailed way the use and dissemination of the results of the project. The document has evolved during the course of the project based on regular updates within each reporting period. This final plan provides a detailed picture of the most important results obtained in the project and how this knowledge will be used further in the future. Furthermore the report contains an overview of which results have been disseminated by means of, for instance, presentations and publication during the project as well as future dissemination activities.

The report is organized in 3 Chapters in addition to this Introduction section. Chapter 2 deals with the exploitable knowledge resulting from the project and its use. It deals primarily with knowledge having a potential for industrial and commercial applications in research activities or for developing and marketing new products or services. This Chapter is organized around the 10 Main Results resulting from APROSYS that directly have contributed to fulfil the main objectives of the project:

1. New human body mathematical models
2. WorldSID 5th percentile female dummy for side impact
3. Side impact protection system for car occupants
4. Generic assessment methodology for advanced safety systems,
5. Generic car mathematical models,
6. Virtual testing methodology
7. Test methods for vulnerable road users
8. Full width frontal test for Europe
9. New side impact test methods
10. New protection systems for vulnerable road users

Additional APROSYS results not part of these 10 Main Results are covered in a separate section of Chapter 2. For the various exploitable results items to be specified in Chapter 2 include: way of exploitation, owner of the results, partners involved in the results, IPR measures, time-to-market, and potential customers.

Chapter 3 of this report deals with dissemination of the knowledge generated within APROSYS including some of the planned activities after the completion of the project. Items presented include presentation at various events like workshops and ISO meetings, conference publications, journal articles, special meeting and workshops as part of the APROSYS project, websites, flyers and the final event of APROSYS. The Chapter is organized in separate sections dealing with the various subprojects within APROSYS as well as a section dealing with general APROSYS dissemination activities. Within each section a subdivision is made in conference contribution, journal articles, presentations and other dissemination activities.

Finally Chapter 4 deals, like Chapter 2, also with the exploitable results of APROSYS but it a publishable format (in contrast to Chapter 2 which is confidential). This Chapter presents a summary of each exploitable result. The structure of this Chapter is similar to Chapter 2, in other words it is focussed on the 10 Main Results and its sub results. This Chapter includes, among others, possible market applications, collaborations offered or sought and who to contact for further information on the exploitable result.

2. Exploitable knowledge and use

This Chapter deals primarily with knowledge having a potential for industrial and commercial applications in research activities or for developing and marketing new products or services. The Chapter is split in 10 sections dealing with the 10 Main Results resulting from APROSYS:

1. New human body mathematical models
2. WorldSID 5th percentile female dummy for side impact
3. Side impact protection system for car occupants
4. Generic assessment methodology for advanced safety systems,
5. Generic car mathematical models,
6. Virtual testing methodology
7. Test methods for vulnerable road users
8. Full width frontal test for Europe
9. New side impact test methods
10. New protection systems for vulnerable road users

Additional APROSYS results not part of these 10 Main Results are covered in a separate section 2.11.

2.1 Main Result 1: New human body mathematical models

Exploitable Knowledge (description)	**Exploitable product(s) or measure(s)**	**Sector(s)** of application	**Timetable for commercial use**	**Patents or other IPR protection**	**Owner** & Other Partner(s) involved	**Originating SP**
1.1 Human modelling (mesh, material, simulation…)	Improved PAM HUMOS 50th percentile male model in sitting posture	Automotive	Available	IPR Database rights	**ESI**	5
1.2 Updated tools for Madymo HUMOS2 models	Positioning of Madymo HUMOS2 models.	Automotive	Already available	IPR source code	**TNO**	5
1.3 Controlled active arm model	Modelling of controlled active behaviour of the human arm in MADYMO	Automotive	2011	IPR source code	**TNO,** WUT, LMU	5
1.4 Human head FE model and criteria	FE model of the human head and injury criteria to specific injury mechanisms. With pre- and post processors	Automotive	2008	No, public	**ULP**, TRL	5

Exploitable result nr 1.1 Human modelling (mesh, material, simulation..)	
1.Functionality	Improved PAM HUMOS 50th percentile male model in sitting posture
2.Partners involved	ESI
3.Way of exploitation	License

Exploitable result nr 1.1 Human modelling (mesh, material, simulation..)		
4.Type of result	Database	
5.Current stage	Available	
6.Final stage	Current stage is final stage	
7.Signification	Commercial	
8.Non commercial use or impact	R&D	
9.Socio-economic impact	More accurate models for injury prediction	
10.Documents/deliverables supporting the result	Model	D5.3.1/D5.3.2/D5.3.3/D5.3.4/D5.3.5/D5.3.6/D5.3.1.3/D5.3.1.8/D5.3.1.9/D5.3.2.0/D5.3.2.1/D5.3.2.2/D5.3.2.3/D5.3.2.4 D5.3.2.5
11.Who will be the customer?	Automotive industry	
12. Time to market	Need of virtual testing integration in regulations	
13.Contacts towards potential users	End users in safety and medical field	
14.IPR. Have/will you protect this result? How? When	Yes, this model is protected by database rights, as a standard database, and encrypted	
15.Any obstacles	Need of virtual testing integration in regulations	
16.Additional research and development work	Additional enhancement of behaviour during loading (omni-directional)	
17.Technical and economic market considerations	None	

Exploitable result nr 1.2 Updated tools for positioning MADYMO HUMOS2 models		
1.Functionality	Positioning of MADYMO HUMOS2 models in a car seat or pedestrian position including mesh correction	
2.Partners involved	TNO	
3.Way of exploitation	Via sales of MADYMO human model licences by a TASS sales agent	
4.Type of result	Software	
5.Current stage	Commercial product that goes with the HUMOS2 model	
6.Final stage	Commercial product that goes with the HUMOS2 model	
7.Signification	Easier positioning for the users of HUMOS2 human model (time saving)	
8.Non commercial use or impact	Easier positioning for the users of HUMOS2 human model (time saving)	
9.Socio-economic impact	More accurate models for injury prediction	
10.Documents/deliverables supporting the result	Software product	
11.Who will be the customer?	OEM's and first tier suppliers	
12. Time to market	Already on the market	
13.Contacts towards potential users	Yes, via TASS already established	
14.IPR. Have/will you protect this result? How? When	IPR in source code	
15.Any obstacles	None	
16.Additional research and development work	None	
17.Technical and economic market considerations	None	

Exploitable result nr 1.3 Controlled active arm model		
1.Functionality	Realistic modelling of a human in a low severe car crash and pre-crash behaviour	
2.Partners involved	TNO, WUT, LMU	
3.Way of exploitation	Currently, the model is proposed to be used in customer projects	
4.Type of result	Software and know-how	
5.Current stage	Software product under development	
6.Final stage	Commercial product	
7.Signification	Commercial	
8.Non commercial use or impact	Research & Developement	
9.Socio-economic impact	Realistic modelling of a human in a low severe car crash and pre-crash behaviour by which restraints can be improved in order to reduce also medium severity injuries	
10.Documents/deliverables supporting the result	Pre-industrial product	
11.Who will be the customer?	OEM's and automotive industry	
12. Time to market	Know-how for now and in +/- 2011 a software model	
13.Contacts towards potential users	Not yet.	
14.IPR. Have/will you protect this result? How? When	IPR source code	
15.Any obstacles	More validation data is needed	
16.Additional research and development work	Validation and making more body parts active controlled	
17.Technical and economic market considerations	None	

Exploitable result nr 1.4 Human Head FE model and injury criteria		
1.Functionality	FE model of the human head and injury criteria to specific injury mechanisms. With pre- and post processors	
2.Partners involved	ULP, TRL	
3.Way of exploitation	Licence	
4.Type of result	Device; head FE model with pre- and post processor Method; full virtual or coupled experimental vs.numerical approach Functional specification; head injury prediction tool Standard; under progress Training programme; available	
5.Current stage	Head model. Model coupled to pre- and post processor for commercialisation	
6.Final stage	FE model of the human head	
7.Signification	Commercial; available Standards; discussions in progress Directives; discussions in progress	
8.Non commercial use or impact	Use for consumer tests in framework of comparative helmet evaluation	
9.Socio-economic impact	Improvement of head protection. Head protection optimisation and evolution of standards	
10.Documents/deliverables supporting the result	Model	D5.1.1.A/D5.1.1.B
11.Who will be the customer?	Automotive industry / Helmet industry	
12. Time to market	2008	
13.Contacts towards potential users	Yes, with Automotive industry and Helmet industry	

Exploitable result nr 1.4 Human Head FE model and injury criteria	
14.IPR. Have/will you protect this result? How? When	Via Licence agreement
15.Any obstacles	No
16.Additional research and development work	Discussion for implementation in standard
17.Technical and economic market considerations	None

2.2 Main Result 2: WorldSID 5th percentile female dummy for side impact

Exploitable Knowledge (description)	**Exploitable product(s) or measure(s)**	**Sector(s)** of application	**Timetable for commercial use**	**Patents or other IPR protection**	**Owner** & Other Partner(s) involved	**Originating SP**
2.1 Drawings, CAD models, work instructions, moulds, tools, fixtures, Manuals; Certification procedures and corridors	Anthropomorphic test device, with human-like biomechanical impact response and injury measurement systems	Automotive, Aerospace, Rail Industry; Research; Vehicle Regulation and Homologation; Consumer Information	2009	None. Public	**FTSS**	5
2.2 Drawings, CAD models, work instructions, Manuals	2 dimensional chest deflection measurement system, 2D IR tracc	Automotive, Aerospace, Rail Industry; Vehicle Regulation and Homologation; Consumer Information	2009	None. Public	**FTSS**	5
2.3 Dummy Biomechanical Responses Testing	WorldSID small female side impact Biomechanical responses	Automotive, Aerospace, Rail Industry; Research; Vehicle Regulation and Homologation; Consumer Information	2010	None. Public	**TRL, BASt, UPM-INSIA FTSS, INRETS**	5
2.4 Injury Criteria Development	Injury Risk Functions thorax, abdomen and pelvis for WorldSID small female side impact dummy	Automotive, Aerospace, Rail Industry; Research; Vehicle Regulation and Homologation;	2010	None. Public	**TRL, BASt, UPM-INSIA** FTSS	5

Exploitable Knowledge (description)	**Exploitable product(s) or measure(s)**	**Sector(s)** of application	**Timetable for commercial use**	**Patents or other IPR protection**	**Owner** & Other Partner(s) involved	**Originating SP**
2.5 Head neck human response in side impact	5th % female side impact dummy head & neck response requirements in NBDL test conditions	Crash dummy development and evaluation	2009	None. Public	**TNO**, FTSS	5

Exploitable result nr 2.1: Drawings, CAD models, work instructions, moulds, tools, fixtures, Manuals; Certification procedures and corridors		
1.Functionality	Anthropomorphic test device, with human-like biomechanical impact response and injury measurement systems	
2.Partners involved	FTSS	
3.Way of exploitation	Sales of dummies, spare parts, instrumentation, support equipment	
4.Type of result	Hardware	
5.Current stage	Pre-production version, validated, ready for further evaluation and precompetitive research	
6.Final stage	Regulated dummy	
7.Signification	Commercial	
8.Non commercial use or impact	Vehicle homologation and regulatory testing; Biomechanical research; Consumer occupant safety vehicle rating	
9.Socio-economic impact	Reduction in road vehicle fatalities and injuries worldwide	
10.Documents/deliverables supporting the result		D5.2.7/D5.2.10
11.Who will be the customer?	Automobile manufacturers and their suppliers; Commercial and Not-for-Profit test laboratories; Engineering Service Providers	
12. Time to market	2009	
13.Contacts towards potential users	Potential users were involved in evaluation. APROSYS results have been & will be disseminated within international working groups and platforms. Auto manufacturers and research groups outside APROSYS have already used the WorldSID small female dummy (JAMA-JARI, Ford USA, Transport Canada, NHTSA). Autoliv Sweden and Chalmers are interested in using the WorldSID small female for evaluation of rear seat passenger protection is side impact.	
14.IPR. Have/will you protect this result? How? When	None. Public	
15.Any obstacles	Worldwide governments may have various requirements before accepting the dummy for regulation	
16.Additional research and development work	Worldwide evaluation necessary: North American Japanese and European governments and automakers. Addressing concerns of these groups and Development of production version.	
17.Technical and economic market considerations	Worldwide Harmonisation of Crash dummies will reduce vehicle development costs and time to market, as vehicle designers do not have to deal with conflicting design constraint by having to meet different standards. The small female anthropometry will help manufacturers not to optimize for just one target size occupant, but for a larger part of the population and to focus on an occupant group currently at the highest risk in side impact collisions.	

Exploitable result nr 2.1: Drawings, CAD models, work instructions, moulds, tools, fixtures, Manuals; Certification procedures and corridors	
Exploitable result nr 2.2: Drawings, CAD models, work instructions, Manuals	
1.Functionality	2-dimensional chest deflection measurement system (2D-IR-Tracc) for WorldSID small female dummy
2.Partners involved	FTSS
3.Way of exploitation	Sales of instrumentation for crash dummies, spare parts. Use in other members of dummy family
4.Type of result	Hardware
5.Current stage	Pre-production version, validated, ready for further evaluation and precompetitive research
6.Final stage	Accepted for use in Regulated dummy
7.Signification	Commercial
8.Non commercial use or impact	Vehicle homologation and regulatory testing; Biomechanical research; Consumer occupant safety vehicle rating
9.Socio-economic impact	Reduction in road vehicle fatalities and injuries worldwide
10.Documents/deliverables supporting the result	D5.2.6/D5.2.8
11.Who will be the customer?	Research organisation universities for biomechanical testing; Automobile manufacturers and their suppliers; Commercial and Not-for-Profit test laboratories; Engineering Service Providers
12. Time to market	2009
13.Contacts towards potential users	Potential users were involved in the evaluation. APROSYS results have been and will be further disseminated within international working groups and platforms. Auto manufacturers and research groups outside APROSYS have already used the WorldSID small female dummy. Autoliv Sweden and Volvo are interested in 2D IR trcc for the WorldSID midsize male.
14.IPR. Have/will you protect this result? How? When	None. Public
15.Any obstacles	Development of injury criteria based on the measurement of the 2D IR tracc. Availability of oblique human impact response data is limited.
16.Additional research and development work	Development of injury criteria based on lateral and oblique impact human data. Development of 2D IR tracc for the mid size male WorldSID dummy.
17.Technical and economic market considerations	Worldwide Harmonisation of Crash dummies will reduce vehicle development costs and time to market, as vehicles designers do not have to deal with conflicting design constraint by having to meet different standards. Oblique impact component is quite common in side impact, due to position of the restraint system and variation of impact angle in various vehicle tests Better sensitivity to oblique impact will aid acceptance of the side impact dummies.

Exploitable result nr 2.3: Dummy Biomechanical Responses Testing	
1.Functionality	WorldSID small female side impact Biomechanical responses
2.Partners involved	TRL, BASt, UPM-INSIA FTSS, INRETS
3.Way of exploitation	1) Development of Injury Criteria and risk functions; 2) Evaluation of the final production dummy 3) Development of mathematical Computer model of the dummy
4.Type of result	Test data
5.Current stage	Test data of Pre-production version

Exploitable result nr 2.3: Dummy Biomechanical Responses Testing		
6.Final stage	1&2) Accepted injury risk functions for application in vehicle regulations. 3) Commercial FE model in various codes of final regulatory dummy	
7.Signification	Collaborative research; Commercial	
8.Non commercial use or impact	Vehicle homologation and regulatory testing; Biomechanical research;	
9.Socio-economic impact	Reduction in road vehicle fatalities and injuries worldwide	
10.Documents/deliverables supporting the result		D5.2.9
11.Who will be the customer?	Automobile manufacturers and their suppliers; Commercial and Not-for-Profit test laboratories; Engineering Service Providers	
12. Time to market	2010	
13.Contacts towards potential users	Potential users were involved in the evaluation. APROSYS results have been and will be further disseminated within international working groups and platforms. Auto manufacturers and research groups outside APROSYS have already used the WorldSID small female dummy (JAMA-JARI, Ford USA, Transport Canada, NHTSA).	
14.IPR. Have/will you protect this result? How? When	None. Public	
15.Any obstacles	None	
16.Additional research and development work	Development and evaluation of production version.	
17.Technical and economic market considerations	None	

Exploitable result nr 2.4: Injury Criteria Development		
1.Functionality	WorldSID small female Injury Risk Functions	
2.Partners involved	TRL, BASt, UPM-INSIA	
3.Way of exploitation	Assessment of vehicle for regulation and for consumer rating of vehicles	
4.Type of result	Injury Assessment Reference values, Injury Risk Functions	
5.Current stage	Preliminary risk functions based on small test data base	
6.Final stage	Accepted injury risk functions for application in vehicle regulations.	
7.Signification	Regulation	
8.Non commercial use or impact	Vehicle homologation and regulatory testing; Biomechanical research;	
9.Socio-economic impact	Reduction in road vehicle fatalities and injuries worldwide	
10.Documents/deliverables supporting the result		D5.2.11/D5.2.13
11.Who will be the customer?	Regulators, governments and consumer rating organisations; Automobile manufacturers and their suppliers; Commercial and Not-for-Profit test laboratories; Engineering Service Providers	
12. Time to market	2010	
13.Contacts towards potential users	Potential users were involved in the evaluation. APROSYS results have been and will be further disseminated within international working groups and platforms. Auto manufacturers and research groups outside APROSYS have already used the WorldSID small female dummy	
14.IPR. Have/will you protect this result? How? When	None. Public	
15.Any obstacles	Availability of injurious human test data for small female anthropometry	

Exploitable result nr 2.4: Injury Criteria Development	
16.Additional research and development work	Expansion of human test data base with more injurious data and specific for small anthropometry
17.Technical and economic market considerations	None

Exploitable result nr 2.5: Head neck human response in side impact		
1.Functionality	5th percentile female side impact dummy head & neck response requirements in NBDL test conditions	
2.Partners involved	TNO, FTSS	
3.Way of exploitation	Development of side impact dummies, human models and dummy models; development of head neck response corridors for other anthropometric sizes such as child dummies	
4.Type of result	Biomechanical response corridors	
5.Current stage	Research publication	
6.Final stage	Acceptance of response requirements for dummy development by stake holder groups such as EEVC WG12 and ISO/TC22/SC12/WG5, etc.	
7.Signification	Non commercial	
8.Non commercial use or impact	Research	
9.Socio-economic impact	Reduction in road vehicle fatalities and injuries worldwide	
10.Documents/deliverables supporting the result		D5.2.5
11.Who will be the customer?	EEVC WG12 and ISO/TC22/SC12/WG5, etc.	
12. Time to market	2009	
13.Contacts towards potential users	The method and results were presented at various occasions in stake holder groups	
14.IPR. Have/will you protect this result? How? When	None. Public	
15.Any obstacles	None	
16.Additional research and development work	Application of the method developed for development of head neck response corridors for other anthropometric sizes such as child dummies	
17.Technical and economic market considerations	Prediction and proper representation of kinematics of human head in lateral collisions is important, as the head is the most frequently injured body segment in side collisions, along with the thorax.	

2.3 Main Result 3: Side impact protection system for car occupants

Exploitable Knowledge (description)	**Exploitable product(s) or measure(s)**	**Sector(s)** of application	**Timetable for commercial use**	**Patents or other IPR protection**	**Owner** & Other Partner(s) involved	**Originating SP**
3.1 Near distance radar sensor system adapted for side pre-crash protection use	Side pre-crash protection system	Automotive industry	Depends on OEM order, earliest 2012	IPR by owner. Patent pending.	**Continental**	6
3.2 Concept /algorithms for data fusion module	Side pre-crash protection system	Automotive Industry	Depends on OEM order, earliest 2012	None	**Continental**, FhG-IITB	6

Exploitable Knowledge (description)	**Exploitable product(s) or measure(s)**	**Sector(s)** of application	**Timetable for commercial use**	**Patents or other IPR protection**	**Owner** & Other Partner(s) involved	**Originating SP**
3.3 Strategy and algorithms for the decision module	Side pre-crash protection system	Automotive industry	Depends on OEM order, earliest 2012	IPR by owner. Patent pending.	**Continental**	6
3.4 Shape Memory Alloy Side Pre-Crash Actuator	Side pre-crash protection system	Automotive industry	Depends on OEM order, earliest 2012	Yes, several. Some pending	**FhG-LBF**, Faurecia	6
3.5 Side Crash Protection System	Side pre-crash protection system	Automotive industry	Depends on OEM order, earliest 2012	Patent on transversal load transfer (Faurecia), some pending patents	**Faurecia**, FhG-LBF	6
3.6 Pattern of volunteer's behaviour recognized in AUTO-PW car simulator tests for side impacts	Knowledge about driver behaviour, including muscle activities measurements	Automotive industry, Science, Public awareness	No commercial use intended	Public, IPR stays with owner	**WUT**	6
3.7 Object tracking and classification based on stereo video sequences	Side pre-crash protection system	Automotive industry	Depends on OEM order, earliest 2012	No. IPR by owner	**FhG-IITB**	6
3.8 Simulation methodology to develop new adaptable protection systems	Engineering services	Automotive industry	2010	No. IPR by owner	**Cidaut**	6
3.9 Evaluation of a complete pre-crash occupant protection	Engineering services	Automotive industry	2010	No	**IST**, Faurecia, FhG-LBF	6
3.10 Conceptual design of adaptable protection systems	Side pre-crash protection concept	Automotive industry	2012	Patent pending	**IST**, Faurecia, FhG, Cidaut	6
3.11 Evaluation test method for a side impact protection system	Methodology / Code of Practice	Automotive industry	2009	No	**Daimler**, TNO FHG Conti, Cidaut	6

Exploitable result nr 3.1 Near distance radar sensor system adapted for side pre-crash protection use	
1.Functionality	Detect and track possibly impacting objects
2.Partners involved	Continental
3.Way of exploitation	Participation in the market of pre-crash protection systems
4.Type of result	Device/software

Exploitable result nr 3.1 Near distance radar sensor system adapted for side pre-crash protection use		
5.Current stage	Prototype	
6.Final stage	Commercial product	
7.Signification	Commercial	
8.Non commercial use or impact	Safety benefit	
9.Socio-economic impact	The next big step in the reduction of severe and fatal road accidents is expected from a broad introduction of pre-crash protection systems	
10.Documents/deliverables supporting the result	Prototype	D6.2.1/D6.2.4
11.Who will be the customer?	OEM's	
12. Time to market	Depends on OEM order, earliest 2012	
13.Contacts towards users	Request for information and discussion with an OEM ongoing	
14.IPR. Have/will you protect this result? How? When	Protection to be reconsidered as soon as product development starts, not necessary yet (Details are not disclosed, Knowledge belongs to one partner)	
15.Any obstacles	State-of-the-are near distance radar sensors are based on 24 GHz wide band technology. Restrictions due to frequency allocation might delay the market introduction of these systems in Europe. Currently there is a frequency authorisation until 2013. This might require further research and development activities to provide near distance radar sensors based on another technology, e.g. around 77GHz	
16.Additional research and development work	Concrete product concept and design, product development	
17.Technical and economic market considerations	Pre-crash protection systems are introduced into the market. They, and especially side pre-crash systems, require a highly reliable sensing system. Near distance radar sensors are one of the key enablers for this purpose	

Exploitable result nr 3.2 Concept and algorithms for the data fusion module		
1.Functionality	Fuse data from different sensor types in an optimal way for side impact protection	
2.Partners involved	Continental, FhG-IITB	
3.Way of exploitation	Participation in the market of pre-crash safety systems	
4.Type of result	Design/software	
5.Current stage	Prototype	
6.Final stage	Commercial product	
7.Signification	Commercial	
8.Non commercial use or impact	Safety benefit	
9.Socio-economic impact	The next big step in the reduction of severe and fatal road accidents is expected from a broad introduction of pre-crash protection systems	
10.Documents/deliverables supporting the result	Prototype	D6.2.3/D6.2.4
11.Who will be the customer?	OEMs	
12. Time to market	Depends on OEM order, earliest 2012	
13.Contacts towards potential users	No	
14.IPR. Have/will you protect this result? How? When	Protection to be reconsidered as soon as product development starts, not necessary yet (Details are not disclosed)	
15.Any obstacles		
16.Additional research and development work	Concrete product concept and design, product development	

Exploitable result nr 3.2 Concept and algorithms for the data fusion module	
17.Technical and economic market considerations	A highly reliable sensing system requires complementary data from different kinds of sensors, to be fed into one model of the environment. The experience with the concept and the algorithms developed in this project are valuable for future sensor system products.

Exploitable result nr 3.3 Strategy and algorithms for the decision module		
1.Functionality	Decide based on sensor input if a side impact is going to happen	
2.Partners involved	Continental	
3.Way of exploitation	Participation in the market of pre-crash safety systems	
4.Type of result	Design/software	
5.Current stage	Prototype	
6.Final stage	Commercial product	
7.Signification	Commercial	
8.Non commercial use or impact	Safety benefit	
9.Socio-economic impact	Next big step in the reduction of severe and fatal road accidents is expected from a broad introduction of pre-crash protection systems	
10.Documents/deliverables supporting the result	Prototype	D6.4.1/D6.4.1B
11.Who will be the customer?	OEM's	
12. Time to market	Depends on OEM order, earliest 2012	
13.Contacts towards users	No	
14.IPR. Have/will you protect this result? How? When	Protection to be reconsidered as soon as product development starts, not necessary yet (Details are not disclosed, knowledge belongs to one partner)	
15.Any obstacles		
16.Additional research and development work	Concrete product concept and design, product development	
17.Technical and economic market considerations	Based on the information of the sensor system, the decision module decides on the action of pre-crash system e.g. triggering of a suitable actuator	

Exploitable result nr 3.4 Shape Memory Alloy Side pre-crash Actuator		
1.Functionality	Very fast, electrically released and reversible actuator with linear or rotational movement. This actuator can be used especially as a crash actuator, but as well for any other type of locking or unlocking mechanism, e.g. structural parts can be connected to create new load paths at any driving situation, including crash situations.	
2.Partners involved	FhG-LBF, Faurecia	
3.Way of exploitation	Participation in the market of pre-crash (safety) protection systems	
4.Type of result	Device	
5.Current stage	Prototype	
6.Final stage	Commercial product	
7.Signification	Commercial	
8.Non commercial use or impact	Safety benefit	
9.Socio-economic impact	The next big step in the reduction of severe and fatal road accidents is expected from a broad introduction of pre-crash protection systems	
10.Documents/deliverables supporting the result	Prototype	D6.3.2/D6.3.2B
11.Who will be the customer?	OEM's	
12. Time to market	Depends on OEM order, earliest 2012	
13.Contacts towards users	First contacts established	

Exploitable result nr 3.4 Shape Memory Alloy Side pre-crash Actuator	
14.IPR. Have/will you protect this result? How? When	Several patents, some pending: • DE103 413 29B4; Vorrichtung und Verfahren zur Erhöhung des Insassenschutzes in einem Fahrzeug bei einem Seitenaufprall • DE 103 413 28 B4; Vorrichtung und zugehöriges Verfahren zum Insassenschutz in einem Fahrzeug • DE 102 005 011 162 B4; Vorrichtung für ein Kraftfahrzeug zum Insassenschutz bei einem kollisionsbedingten auf eine Kraftfahrzeugtür gerichteten Energieeintrag • DE 103 580 23 B4; Vorrichtung für ein Kraftfahrzeug zum Insassenschutz bei einem kollisionsbedingten auf eine Kraftfahrzeugtür gerichteten Energieeintrag • DE 202 006 014 549 U1; Vorrichtung für ein Kraftfahrzeug zum Insassenschutz bei einem kollisionsbedingten auf eine Kraftfahrzeugtür gerichteten Energieeintrag
15.Any obstacles	In parallel to the design of new actuators, the reliability of the new active materials under automotive conditions need to be investigated
16.Additional R&D work	Concrete product concept and design, product development
17.Technical and economic market considerations	To use the delivered information from the sensor system in an effective way, new actuators had to be developed. The new actuators, based on active materials, can act adaptively to the crash-scenario and are reversible.

Exploitable result nr 3.5 Side Crash Protection System		
1.Functionality	Increase structural stability of a car in case of imminent side collision	
2.Partners involved	Faurecia, FhG-LBF	
3.Way of exploitation	Participation in the market of safety systems	
4.Type of result	Device	
5.Current stage	Prototype	
6.Final stage	Commercial product	
7.Signification	Commercial	
8.Non commercial use or impact	Safety benefit	
9.Socio-economic impact	The next big step in the reduction of severe and fatal road accidents is expected from a broad introduction of pre-crash protection systems	
10.Documents/deliverables supporting the result	Prototype	D6.4.2/D6.5.4
11.Who will be the customer?	OEM's	
12. Time to market	OEM contribution needed 2012	
13.Contacts towards users	Not yet	
14.IPR. Have/will you protect this result? How? When	6 Patents (Faurecia and FhG-LBF), one of which pending. • DE 102006004171A1; Türmodul mit einem Träger und Fahrzeugtür (Türverriegelung) • DE XXXX; Energieübertragungselement für ein Kraftfahrzeug	
15.Any obstacles	No	
16.Additional R&D work	Final integration in car interior to be done.	
17.Technical and economic market considerations	Pre-crash systems are not yet recognized in safety requirements.	

Exploitable result nr 3.6 Pattern of volunteer's behaviour recognised in AUTO-PW car simulator tests for side impacts, including muscle activities measurements	
1.Functionality	Pattern of volunteer's behaviour recognized in AUTO-PW car simulator tests for side impacts, including muscle activities measurements
2.Partners involved	WUT

Exploitable result nr 3.6 Pattern of volunteer's behaviour recognised in AUTO-PW car simulator tests for side impacts, including muscle activities measurements		
3.Way of exploitation	Indirectly it may enhance the biomechanical knowledge of human muscle active system in pre-crash situations. Potentially may enhance human models	
4.Type of result	Method/know-how	
5.Current stage	Research report	
6.Final stage	Algorithms	
7.Signification	Long term commercial	
8.Non commercial use or impact	It is planned to use the information for at least one PhD at WUT (non commercial use) within one year time after investigation is finished	
9.Socio-economic impact	Future Improvement of side pre-crash side impact systems	
10.Documents/deliverables supporting the result		D6.3.1
11.Who will be the customer?	Automotive OEM's and First Tiers	
12. Time to market	None commercial use intended	
13.Contacts towards users	Not yet	
14.IPR. Have/will you protect this result? How? When	IPR at owner	
15.Any obstacles	Depending on future research	
16.Additional research and development work	Is needed for this result	
17.Technical and economic market considerations	Input such as human response in impact improve pre-crash systems needed	

Exploitable result nr 3.7 Object tracking and classification based on stereo video sequences		
1.Functionality	Estimate the motion of vehicles in traffic scenes, using depth measurements from stereo video processing. The functionality to estimate other vehicles' motion starts from depth measurements which may stem from a variety of sensors including active sensors such as time-of-flight-Cameras. For this reason its applicability is not limited to stereo video processing.	
2.Partners involved	FHG-IITB	
3.Way of exploitation	consultancy to customers from industry and government ; acquisition of industrial and publicly funded R&D projects to build on the existing functionality	
4.Type of result	Method ; Know-how	
5.Current stage	Prototype	
6.Final stage	Pre-industrial product	
7.Signification	Commercial	
8.Non commercial use or impact	Give young scientists the opportunity to do a PhD thesis in a research project that builds upon the functionality.	
9.Socio-economic impact	A correct description of other vehicles'' motion in an enabling capability for safety systems. It helps thus to reduce the number and the severity of road accidents. At the same time it helps to maintain and extend the world leadership of European automotive industry	
10.Documents/deliverables supporting the result	Prototype	D 6.2.2/D 6.2.4
11.Who will be the customer?	Partners from the automotive industry (OEMs and Suppliers).	
12. Time to market	Within 4 years or less	
13.Contacts towards users	Contacts with several first tiers already established	
14.IPR. Have/will you protect this result? How? When	No current plans to protect this result	

Exploitable result nr 3.7 Object tracking and classification based on stereo video sequences	
15.Any obstacles	A competing technology is car-to-car communication: if other cars submit their motion in real world coordinates to a wireless network, then there is no more need to estimate motion parameters. However, below 100 % market penetration of cars that do so, the estimation remains mandatory for safety functions.
16.Additional research and development work	Extend the functionality to other types of objects such as pedestrians, bicycles and motorcycles.
17.Technical and economic market considerations	We expect that by 2010, technology developments spurred by the 2001 White book of the European Commission will start to be integrated into commercial products. As a result, the market for comfort and safety functions that are based on environment perception will substantially increase starting in 2010.

Exploitable result nr 3.8 Simulation methodology to develop new adaptable protection systems		
1.Functionality	Revision and modification of current modelling and validation methodologies; Improved virtual testing methods to be applied in developing new advance protection systems	
2.Partners involved	CIDAUT	
3.Way of exploitation	Further research or internal development to be employed	
4.Type of result	Method /know-how	
5.Current stage	Other (technical specifications)	
6.Final stage	Other (technical specifications)	
7.Signification	Commercial/Standards	
8.Non commercial use or impact	Integration of virtual testing in regulatory tests procedures	
9.Socio-economic impact	Improvement in car safety and other transportation systems safety	
10.Documents/deliverables supporting the result	Technical specifications	D6.1.6/D6.3.4/D6.3.5/D654
11.Who will be the customer?	OEMs; First tiers	
12. Time to market	2010	
13.Contacts towards users	No	
14.IPR. Have/will you protect this result? How? When	None. IPR by owner	
15.Any obstacles	The lack of predictability of some simulation models is one of the major obstacles for using simulation in safety developments	
16.Additional research and development work	Material characterization, joint parameterization, failure analysis…	
17.Technical and economic market considerations	Virtual testing will reduce time-to-market for the development of new products	

Exploitable result nr 3.9 Evaluation of a complete pre-crash occupant protection	
1.Functionality	Advantages and disadvantages of a complete pre-crash systems in terms of occupant protection
2.Partners involved	IST, Faurecia, FhG-LBF
3.Way of exploitation	Further research or internal development to be employed
4.Type of result	Report
5.Current stage	Final
6.Final stage	Current stage
7.Signification	Commercial/Standards/Legislation/Directives
8.Non commercial use or impact	Consumer testing
9.Socio-economic impact	Reduce the number of accidents. Safer automobiles. Less passenger fatalities.

Exploitable result nr 3.9 Evaluation of a complete pre-crash occupant protection		
10.Documents/deliverables supporting the result		D6.3.3/D6.3.4
11.Who will be the customer?	Automotive industry	
12. Time to market	2010	
13.Contacts towards users	Existing. OEM's	
14.IPR. Have/will you protect this result? How? When	None. Public	
15.Any obstacles	Acceptation of new evaluation method	
16.Additional research and development work	None	
17.Technical and economic market considerations	Evaluation methodology needed for emerging technology	

Exploitable result nr 3.10 Conceptual design of adaptable protection systems		
1.Functionality	Side impact protection strategy	
2.Partners involved	Faurecia, FhG-LBF, IST, Cidaut	
3.Way of exploitation	Further research	
4.Type of result	Design	
5.Current stage	Verified concept	
6.Final stage	Validated approach	
7.Signification	Standards and Directives	
8.Non commercial use or impact	Standardize the way of designing cars for side impact protection	
9.Socio-economic impact	Lowering fatal and seriously injured people in road transportation	
10.Documents/deliverables supporting the result		D6.4.2/D6.5.4
11.Who will be the customer?	OEM's	
12. Time to market	2012	
13.Contacts towards users	No	
14.IPR. Have/will you protect this result? How? When	Patent pending	
15.Any obstacles	No	
16.Additional research and development work	Concept needs to be validated for arbitrary cars.	
17.Technical and economic market considerations	Improve advanced safety	

Exploitable result nr 3.11 Evaluation test method for a side impact protection system	
1.Functionality	Methodology/Test Protocol; Focus on side impact pre-crash applications (including the evaluation of environmental sensing technology)
2.Partners involved	Daimler, TNO, Continental, FhG-IITB, Cidaut
3.Way of exploitation	Transfer into development process, consumer oriented testing, standards.
4.Type of result	Methodology / Code of Practice → Standard
5.Current stage	Guideline / Process model
6.Final stage	Test protocol / Standard
7.Signification	Standards / Directives
8.Non commercial use or impact	Preparation and agreement on a general evaluation and assessment methodology for primary and secondary safety systems. Evaluation of real life effects and benefit.
9.Socio-economic impact	Public awareness concerning "e-safety". Promote market introduction of advanced / integrated safety systems. Confidence in benefit

Exploitable result nr 3.11 Evaluation test method for a side impact protection system		
	estimation of advanced safety systems.	
10.Documents/deliverables supporting the result	Guideline document	D6.5.1/D6.5.2/D6.5.3A/D6.5.3B/D6.5.4
11.Who will be the customer?	Industry, Consumer org., Legislation Bodies	
12. Time to market	2009	
13.Contacts towards users	OEMs, NCAP – Transfer to FP7 projects: euroFOT, ASSESS	
14.IPR. Have/will you protect this result? How? When	No → generic methodology → widespread use intended	
15.Any obstacles	Protectionist measures / - policies	
16.Additional research and development work	Method / Results transferred to FP7 projects for further development and improvement	
17.Technical and economic market considerations	Agreed and harmonised assessment methods will speed up market introduction of advanced systems	

2.4 Main Result 4: Generic assessment methodology for advanced safety systems

Exploitable Knowledge (description)	**Exploitable product(s) or measure(s)**	**Sector(s)** of application	**Timetable for commercial use**	**Patents or other IPR protection**	**Owner** & Partners involved	**Originating SP**
4.1 Generic methodology to assess advanced safety systems	A code of practice detailing generic methodology to assess advanced safety systems.	Automotive Industry	2009	No	**VW,** Daimler, TRL, TNO, Continental BASt	1
4.2 Timing identification, evaluation and definition of working parameters for triggering a new passive safety system.	Guidelines for designing innovative motorcyclist protective equipment	Protective equipment industry, Motorcycle industry, research centre's	2009	No	**Piaggio**, Cidaut, Dainese, Dekra, Fema, LMU, TNO, ALTAIR, Unifi	4

Exploitable result nr 4.1 Generic methodology to assess advanced safety systems with pre-crash sensing	
1.Functionality	Generic methodology to assess advanced safety systems which could be used as a code of practice by industry, a methodology for consumer testing and a basis to update and improve current crash safety regulation.
2.Partners involved	VW, Daimler, TRL, TNO, Continental BASt
3.Way of exploitation	Code of practice / consumer testing, in particular BEYOND NCAP / Regulation
4.Type of result	Method / technical specification
5.Current stage	Other (Draft code of practice)
6.Final stage	Other (Final code of practice)
7.Signification	Standards / Legislation/ Directives
8.Non commercial use or impact	Improvement of legislation / consumer rating
9.Socio-economic impact	The generic methodology will help to enable the introduction of advanced safety systems with pre-crash sensing into the market place, which in turn will help improve the safety performance of cars leading to reduction in accident casualties.

Exploitable result nr 4.1 Generic methodology to assess advanced safety systems with pre-crash sensing		
10.Documents/deliverables supporting the result	Reports	D.1.3.1/D1.3.2/D.1.3.3./D.1.3.4/D1.3.5
11.Who will be the customer?	Legal authorities, consumer organisations, industry	
12. Time to market	2009	
13.Contacts towards potential users	APROSYS SP 1.3 / PReVENT Workshop 2006, APROSYS SP 1.3 / APALACI / COMPOSE Workshop 2006, 7th European Vehicle Passive Safety Conference 2007, International Journal of Crashworthiness (Special APROSYS issue) Vol. 13 No. 6 2008, 21st ESV Conference 2009, APROSYS 'Final Event' 2009. Also, various contacts via people / companies who are APROSYS partners and also FP6 or FP7 EC project partners. Presentations of APROSYS results to relevant Euro NCAP technical working groups.	
14.IPR. Have/will you protect this result? How? When	No	
15.Any obstacles	No	
16.Additional research and development work	The generic methodology is the first step in this area of work. Methodologies for specific systems still need to be developed.	
17.Technical and economic market considerations	Generic methodology will help speed up introduction of advanced safety systems with pre-crash sensing into the market place and thus help the competiveness of the European automotive industry	

Exploitable result nr 4.2 Timing identification, evaluation and definition of working parameters for triggering a new passive safety system implemented in the vehicle or in the rider garment		
1.Functionality	Prior to the implementation of innovative protective devices both on the vehicle and on the rider garment, it is needed to control the accident dynamics. The timing identification, and the analysis of activation and working parameters provides the needed information to define the minimum times of operation and the suitable time to activate an innovative passive safety system.	
2.Partners involved	Piaggio, Cidaut, Dainese, Dekra, Fema, LMU, ALTAIR, TNO, Unifi	
3.Way of exploitation	Development of passive safety systems implemented on the vehicle or on the rider garment	
4.Type of result	Technical specification	
5.Current stage	Idea	
6.Final stage	Technical specification	
7.Signification	Technical specification	
8.Non commercial use or impact	Input to SIM project	
9.Socio-economic impact	The socio-economic impact will be important due to the high severity of the impacts of motorcyclists when an accidents happens	
10.Documents/deliverables supporting the result	Technical specification	D.4.3.4.A/D.4.3.4.B/D.4.3.4.C/D.4.3.4.D
11.Who will be the customer?	Protective equipment industry, Motorcycle industry, research centre's	
12. Time to market	2009	
13.Contacts towards users	SIM (Safety In Motion) project	
14.IPR. Have/will you protect this result? How? When	None	
15.Any obstacles	Applicability to other passive safety system presents on the market. Prioritization of signals in case that more than one passive safety system is implemented.	

Exploitable result nr 4.2 Timing identification, evaluation and definition of working parameters for triggering a new passive safety system implemented in the vehicle or in the rider garment	
16.Additional research and development work	None
17.Technical and economic market considerations	Not applicable

2.5 Main Result 5: Generic car mathematical models

Exploitable Knowledge (description)	**Exploitable product(s) or measure(s)**	**Sector(s)** of application	**Timetable for commercial use**	**Patents or other IPR protection**	**Owner** & Other Partners involved	**Originating SP**
5.1. Generic car model of a multi-purpose vehicle (GCM4)	RADIOSS FE model file	Automotive	2006	License agreement	**Polito**	7
5.2. GCM for class GCM1-supermini; GCM2 small family car ; GCM3-luxury/ executive car	RADIOSS and LS-DYNA FE model files	Research	2012+	License agreement	**CRF**	7
5.3. Generic Car Model for NEON	RADIOSS FE model file & PAMCRASH FE model file	Research	2006 (Radioss) 2008 (Pamcrash)	License agreement	**CIDAUT,** ALTAIR, **TUG**	7
5.4. Generic car MB model of GCM2 and GCM4	MADYMO model	Automotive / Research	2007+	License agreement	**TNO**	7
5.5 Generic car MB model of GCM1, GCM2 and GCM3	MADYMO model	Automotive / Research	2007+	License agreement	**IST**	7
5.6 Generic Model of Heavy Goods vehicle	PAMCRASH model	Automotive / OEM / Research / EVU	2007+	License agreement	**TUG**	7
5.7 GCMs representing recent vehicles with leading NCAP scores	Vehicle models	Research	2008	License agreement/ special agreement	**TNO,** IST	7

Exploitable result nr 5.1 Generic car model of a multi-purpose vehicle (GCM4)	
1.Functionality	Radioss FE model file
2.Partners involved	PoliTo
3.Way of exploitation	Commercial
4.Type of result	Research
5.Current stage	Reduction of injuries / deaths on the roads and their related social costs, via improvements in car safety
6.Final stage	Model
7.Signification	Universities, research centres, software developers, involved in automotive and the vehicle industries

Exploitable result nr 5.1 Generic car model of a multi-purpose vehicle (GCM4)		
8.Non commercial use or impact	2006	
9.Socio-economic impact	Publications in technical and scientific journals and newsletters, direct contacts with potential industrial partners	
10.Documents/deliverables supporting the result		D7.1.4A, Model
11.Who will be the customer?	Automotive industry	
12. Time to market	Improvement of the quality of the model by updates due to increased engineering knowledge	
13.Contacts towards potential users	Virtual testing will reduce time to market for the development of new products	
14.IPR. Have/will you protect this result? How? When	License agreement	
15.Any obstacles	None	
16.Additional research and development work	Model can be made available under special agreement	
17.Technical and economic market considerations	Improvement of Virtual Testing	

Exploitable result nr 5.2 Generic Car model for class GCM1-supermini and GCM2-small family car and GCM3-luxury/executive car		
1.Functionality	Generic Car Model for class GCM1-supermini ; GCM2-small family car ; GCM3-luxury/executive car).The generic car models are virtual prototypes that show realistic (state of the art) behaviours in crash conditions, due to their very detailed representation. They permit to perform realistic crash simulations and represent an innovative concept for the research work in this area	
2.Partners involved	CRF	
3.Way of exploitation	Generic car models are software tools, then the way of exploitation is the licensing: from free of charge licenses for the use within certain “environments” (e.g. APROSYS or other future research projects) to possible special fees for special applications, up to possible proper licenses for their availability as a part of commercial tool	
4.Type of result	Model / software / know-how	
5.Current stage	Available (model)	
6.Final stage	Available (model)	
7.Signification	Commercial	
8.Non commercial use or impact	Research	
9.Socio-economic impact	Contribution to the improvement of the safety level on the roads through the results achieved within research projects focussed on the passive safety field, in which these models are use.	
10.Documents/deliverables supporting the result	Model	D7.1.4.A
11.Who will be the customer?	Who in active in passive safety field and can become a partner of CRF in research projects dealing with related aspects (e.g. other OEMs, Research and Safety Centres, Universities, etc.)	
12. Time to market	2012+	
13.Contacts towards potential users	Contacts towards potential users are already active as the use of these generic car models is already planned in next research projects	
14.IPR. Have/will you protect this result? How? When	These generic car models are property of CRF: they can be made available under special agreement only; the models can in fact be shared in other projects (i.e. outside APROSYS) only if a part of the	

Exploitable result nr 5.2 Generic Car model for class GCM1-supermini and GCM2-small family car and GCM3-luxury/executive car	
	research activity (i.e. numerical simulations) for which they are needed is performed directly by CRF; moreover, the said research activity has to be aligned/coherent with CRF main field of interest
15.Any obstacles	The fact that generic car models are virtual, without their physical counterpart, can originate some doubts about the quality of results obtainable through them, because of the absence of physical tests for the traditional validation of the models
16.Additional research and development work	There is the need to increase the family of generic car model and to maintain them coherent with the state of the art of current real vehicles. This calls for further development work
17.Technical and economic market considerations	Generic car models are very useful for research activities: then there is a potential market in this field. The fact that they represent realistic but virtual vehicles (no corresponding marketed physical models) permits the general use without the typical problems that arise with existing makes/models

Exploitable result nr 5.3 Generic car model for NEON		
1.Functionality	The generic car models are virtual prototypes showing realistic (state of the art) behaviour in crash conditions, due to a very detailed representation. They permit to perform realistic crash simulations and represent an innovative concept for research work in this area	
2.Partners involved	CIDAUT, Altair, TUG	
3.Way of exploitation	Further research or internal development	
4.Type of result	model / software / know-how	
5.Current stage	available (model)	
6.Final stage	available (model)	
7.Signification	Commercial	
8.Non commercial use or impact	Research	
9.Socio-economic impact	Free research tool to improve road safety. Research towards improvement in side impact with targets cost reduction in terms of production costs and wealth costs	
10.Documents/deliverables supporting the result	Model (RADIOSS format, CIDAUT) and PAM-CRASH format (TUG)	D7.1.4.A
11.Who will be the customer?	European automotive industry.	
12. Time to market	2006 & 2008 respectively for RADIOSS and PAMCRASH model	
13.Contacts towards potential users	Partners already have contacts towards potential users.	
14.IPR. Have/will you protect this result? How? When	Publically available through license agreement; Defined in the GPL	
15.Any obstacles	No	
16.Additional research and development work	Model is used for further student research work.	
17.Technical and economic market considerations	Generic car models are very useful for research activities: then there is a potential market in this field	

Exploitable result nr 5.4 Generic car MB model of GCM2 and GCM4	
1.Functionality	Generic car MB model GCM2 and GCM4
2.Partners involved	TNO
3.Way of exploitation	New model sold with MADYMO
4.Type of result	model / software / know-how

Exploitable result nr 5.4 Generic car MB model of GCM2 and GCM4		
5.Current stage	available (model)	
6.Final stage	available (model)	
7.Signification	Commercial	
8.Non commercial use or impact	Research	
9.Socio-economic impact	Models / tools to improve road safety	
10.Documents/deliverables supporting the result	Model	D7.1.4.B
11.Who will be the customer?	Potential users within the world car industry	
12. Time to market	2007	
13.Contacts towards potential users	TNO Automotive already has contacts towards potential users	
14.IPR. Have/will you protect this result? How? When	Publicly available through license agreement	
15.Any obstacles	No	
16.Additional research and development work	Models are used for further research work related to vehicle front impact safety (of new hydride concepts)	
17.Technical and economic market considerations	Virtual testing will reduce time-to-market for the development of new products	

Exploitable result nr 5.5 Generic car MB model of GCM1 and GCM3		
1.Functionality	Generic car MB model GCM1 and GCM3	
2.Partners involved	IST	
3.Way of exploitation	Research activities in virtual testing	
4.Type of result	model / software / know-how	
5.Current stage	available (model)	
6.Final stage	available (model)	
7.Signification	Research / Commercial	
8.Non commercial use or impact	Defined in the GPL	
9.Socio-economic impact	Improve car safety	
10.Documents/deliverables supporting the result	Model	D7.1.4.B
11.Who will be the customer?	Automotive / Research design centres	
12. Time to market	2007	
13.Contacts towards potential users	Contacts were made to potential users at research centers	
14.IPR. Have/will you protect this result? How? When	model can be made available under special agreement	
15.Any obstacles	No	
16.Additional research and development work	Improvements in the models; Implement / enhance protections systems	
17.Technical and economic market considerations	Virtual testing will reduce time-to-market for the development of new products	

Exploitable result nr 5.6 Generic Model of Heavy Goods vehicle	
1.Functionality	Generic FE model of Heavy Truck
2.Partners involved	TUG
3.Way of exploitation	Spreading the model for research purposes
4.Type of result	Model / software / know-how
5.Current stage	Available (model)
6.Final stage	Available (model)
7.Signification	Commercial

Exploitable result nr 5.6 Generic Model of Heavy Goods vehicle		
8.Non commercial use or impact	Defined in the GPL;	
9.Socio-economic impact	Free research tool to improve road safety	
10.Documents/deliverables supporting the result	Model	D7.1.4.A
11.Who will be the customer?	European automotive industry, organisation EVU.	
12. Time to market	2007	
13.Contacts towards potential users	Vehicle Safety Institute from TUG already has contacts towards potential users.	
14.IPR. Have/will you protect this result? How? When	Publicly available through license agreement	
15.Any obstacles	No	
16.Additional research and development work	Model is used for further research work related to the development of the under run protection systems and protection system for VRU.	
17.Technical and economic market considerations	Virtual testing will reduce time-to-market for the development of new products	

Exploitable result nr 5.7 Generic vehicle models representing recent vehicles with leading NCAP scores		
1.Functionality	Generic vehicle models representing recent vehicles with leading NCAP scores	
2.Partners involved	TNO, IST	
3.Way of exploitation	Generic vehicle models are software tools, exploitation is in licensing: from free of charge licenses for the use within certain "environments" to possible special fees for special applications, up to possible proper licenses for their availability as a part of commercial tool	
4.Type of result	Virtual Vehicle Models / Tools	
5.Current stage	Commercial product	
6.Final stage	Commercial product	
7.Signification	Commercial	
8.Non commercial use or impact	Research	
9.Socio-economic impact	Models / Tools	
10.Documents/deliverables supporting the result	Report	D7.3.5.B
11.Who will be the customer?	Potential uses within European car industry	
12. Time to market	2008	
13.Contacts towards users	TNO Automotive already has contacts towards potential users	
14.IPR. Have/will you protect this result? How? When	Some models publicly available through licence agreement, some under special agreement	
15.Any obstacles	No	
16.Additional research and development work	Models are used for further research work related to vehicle front impact safety (of new hybrid concepts)	
17.Technical and economic market considerations	Virtual testing will reduce time-to-market for the development of new products	

2.6 Main Result 6: Virtual testing methodology

Exploitable Knowledge (description)	**Exploitable product(s) or measure(s)**	**Sector(s)** of application	**Timetable for commercial use**	**Patents or other IPR protection**	**Owner** & Partners involved	**Originating SP**

Exploitable Knowledge (description)	**Exploitable product(s) or measure(s)**	**Sector(s)** of application	**Timetable for commercial use**	**Patents or other IPR protection**	**Owner** & Partners involved	**Originating SP**
6.1. Honeycomb material model	software	Automotive, Aeronautical, Naval, Defence	2006	Binary licensed software	**ALTAIR**	7
6.2. Spotweld model	software	Automotive, Aeronautical, Naval, Defence	2005	Binary licensed software	**ALTAIR**	7
6.3. Airbag deployment theory	software	Automotive	2006	Binary licensed software	**ALTAIR**	7
6.4. Airbag models	FE model	Automotive	2006	IPR by owner	**ALTAIR, TNO, CRF**	7
6.5. Parameterized aluminium foam model and material properties	Model files	Automotive, Aeronautical, Naval, Defence, General Engineering	2007	Licensed software	**PoliTo, FhG**	7
6.6. Material scatter database data	Database	Automotive, Aeronautical	2006	None	**PoliTo**	7
6.7. Spot-weld, rivets, clinching failure criteria and models	Report	Automotive, Aeronautical, Naval	2007	Licensed software	**PoliTo,** ALTAIR	7
6.8. Robustness and reliability methods of virtual testing	Methodology	Automotive industry, Automotive suppliers	2007	None	**CIDAUT**	7
6.9 Barrier Test Results	Test results	Vehicle Development	2005	IPR by owner	**CIC**	7
6.10. ADVISER: stochastic and rating software	Software	Numerical mechanics, Virtual testing	2006	Licensed commercial product	**ALTAIR**	7
6.11 Modelling of Aluminium Barrier Models	LS-DYNA keyword files	Crash Testing with Aluminium Barriers	2007	No	**CIC**	7
6.12. Stochastic Models	Stochastic compartment and full car models	Automotive	n/a	IPR by owner	**TNO,** CIDAUT, CRF, PoliTo	7
6.13. ADVISER Templates for VT applications	ADVISER files	Automotive	2005	Licensed software	**ALTAIR**	7

6.14. MADYMO AE-MDB barrier model	MADYMO model	Automotive	2006	License agreement	**TNO**	7
6.15 Robust design method	Report	Automotive / Research	2006	No	**TNO**	7
6.16 Enhanced methods to compare (rate) signals	Report	Automotive / Research	2006	Protected by owner of licensed software	**TNO**	7
6.17 Motorcycle accident reconstruction tool	Software for accident reconstruction	Automotive / Research	2008	License agreement	**TNO, TUG**	7
6.18 General guidelines for filtering and rating of all applicable signals in frontal impact.	Report	Automotive / Research	n/a	Protected by owner of licensed software	**TNO**	7
6.19 Road Map Virtual Testing in Regulations	Reference document for establishment of a Road Map Virtual Testing in Regulations	Automotive / Research	2009	No	**ALTAIR** FAURECIA CRF, CIC, INRETS, TNO	7
6.20 Feasibility Report of VT in a selected regulated or consumer testing procedure	Feasibility Report	Automotive / Research	2008	No	**TNO,** ALTAIR Cidaut, Faurecia, CRF, TUG	7
6.21 Reliability-based methods	Software for reliability analysis	Automotive, Aeronautical, Naval, Defence, general	2008	Licensed software	**ALTAIR,** IFTR	7

6.22 Robust Optimization package	Software for robust optimization	Automotive, Aeronautical, Naval, Defence, general engineering	2008	Licensed software	**ALTAIR,** IFTR	7
6.23 Automatic Identification of simplified models	Methods or Software tools for simplified models identification	Automotive, Aeronautical, Naval, Defence, general	2008	Licensed software	**ALTAIR, IST, TNO**	7
6.24 Aluminium foam modelling techniques	Guidelines for simulation of Al foam parts incl. local density variation, scatter	Automotive, Aeronautical, Naval, Defence, general engineering	2008	None	**FhG, PoliTo**	7
6.25 Materials / Material Models Database	Database for storage of materials data, material model parameters	Automotive, Aeronautical, Naval, Defence, general	2009	License agreement	**FhG**, ALTAIR	7
6.26 Translation of LS-DYNA results into ADVISER	Software Code	Automotive, Aeronautical, Naval, Defence, general	2007	Licensed software	**CIC,** ALTAIR	7
6.27 RADIOSS AE-MDB model and experimental tests	Software Code Test results	Virtual Testing Crash Safety, Virtual testing	2007	Licensed FE model	**ALTAIR**	7
6.28 Standing up dummy for motorcycle safety modelling	Dummy model	Virtual testing Motorcyclist safety analysis	2008	Licensed	**CIDAUT**	7
6.29 Virtual testing benchmarks	Guidelines for verification of numerical codes	Virtual Testing Crash Safety	2009	No	**PoliTO,** CIC, CIDAUT	7
6.30 Cost Benefit Study	Statistical Techniques	Virtual Testing and other Crash related methodologies	2009	No	**CIC**	7
6.31. Finite element model for simulating impacts on laminated glass	Model	Automotive R&D (OEM as well as First Tier)	2008	No	**TNO**	**3**
6.32. Modelling techniques for simulating impacts on glass	Model	Automotive R&D	2008	Licensed agreement	**Altair**	**3**

Exploitable result nr 6.1 Honeycomb material model		
1.Functionality	Honeycomb material model	
2.Partners involved	Altair	
3.Way of exploitation	Licensed software	
4.Type of result	Software	
5.Current stage	Commercial product	
6.Final stage	Commercial product	
7.Signification	Commercial	
8.Non commercial use or impact	No	
9.Socio-economic impact	Support sales of the software	
10.Documents/deliverables supporting the result	Commercial product	D7.1.5.A
11.Who will be the customer?	RADIOSS FE simulation users	
12. Time to market	2006	
13.Contacts towards potential users	Current RADIOSS FE solver users base	
14.IPR. Have/will you protect this result? How? When	Licensed binary software (material law implemented in software)	
15.Any obstacles	No	
16.Additional research and development work	Constantly improving capabilities of the software	
17.Technical and economic market considerations	Improved modelling capabilities to simulate honeycomb (used in barriers)	

Exploitable result nr 6.2 Spotweld model		
1.Functionality	Spotweld model with failure criteria	
2.Partners involved	Altair	
3.Way of exploitation	Licensed software	
4.Type of result	Software	
5.Current stage	Commercial product	
6.Final stage	Commercial product	
7.Signification	Commercial	
8.Non commercial use or impact	No	
9.Socio-economic impact	Support sales of the software	
10.Documents/deliverables supporting the result	Commercial product	D7.1.5.B
11.Who will be the customer?	FE simulation users	
12. Time to market	2005	
13.Contacts towards potential users	Not yet	
14.IPR. Have/will you protect this result? How? When	Licensed binary software (spotweld property implemented in software)	
15.Any obstacles	No	
16.Additional research and development work	Improvement of the modelling techniques for sportweld failure	
17.Technical and economic market considerations	Improved modelling capabilities to simulate honeycomb (used in barriers)	

Exploitable result nr 6.3 Airbag Deployment Theory	
1.Functionality	New airbag simulation method
2.Partners involved	Altair
3.Way of exploitation	Licensed software

Exploitable result nr 6.3 Airbag Deployment Theory		
4.Type of result	Method / know-how / software	
5.Current stage	Commercial product	
6.Final stage	Commercial product	
7.Signification	Commercial	
8.Non commercial use or impact	No	
9.Socio-economic impact	No	
10.Documents/deliverables supporting the result	Commercial product	D7.1.2
11.Who will be the customer?	FE simulation users	
12. Time to market	2006	
13.Contacts towards users	Current RADIOSS FE solver users base	
14.IPR. Have/will you protect this result? How? When	Licensed binary software (modelling option implemented in the software)	
15.Any obstacles	No	
16.Additional research and development work	Improve the modelling techniques. Investigate alternative options for airbag modelling	
17.Technical and economic market considerations	Improved modelling capabilities to simulate airbag deployment and increase injury prediction	

Exploitable result nr 6.4 Airbag models		
1.Functionality	Airbag models	
2.Partners involved	ALTAIR, TNO, CRF	
3.Way of exploitation	Licensed software or models	
4.Type of result	Models / know-how	
5.Current stage	Model	
6.Final stage	Model	
7.Signification	Commercial	
8.Non commercial use or impact	No	
9.Socio-economic impact	No	
10.Documents/deliverables supporting the result	Model / Report	D7.1.2
11.Who will be the customer?	Internal use	
12. Time to market	2006	
13.Contacts towards users	None	
14.IPR. Have/will you protect this result? How? When	Result is a series of airbag models developed for APROSYS related activities and further internal research work. No disclosure. Models owned by their respective developers	
15.Any obstacles	No	
16.Additional research and development work	No	
17.Technical and economic market considerations	No	

Exploitable result nr 6.5 Parameterized aluminium foam model	
1.Functionality	Parameterization of aluminium foam model including influence of hydrostatic-deviator components of stress. Material properties for the developed models obtained from tests in various configurations.
2.Partners involved	PoliTo, FhG
3.Way of exploitation	Provision/licensing of material model parameters to interested parties in engineering design, Products: new effective energy absorbing components in car and in other transportation systems, lightweight design components based on aluminium foams

Exploitable result nr 6.5 Parameterized aluminium foam model		
4.Type of result	Model / know-how	
5.Current stage	Model	
6.Final stage	Model	
7.Signification	Commercial	
8.Non commercial use or impact	Increase of knowledge in material behaviour	
9.Socio-economic impact	Improvement in car safety and other transportation systems safety	
10.Documents/deliverables supporting the result	Model	D.7.1.5.A
11.Who will be the customer?	Developers of products using aluminium foams for energy absorption in impacts	
12. Time to market	2007	
13.Contacts towards users	Publication in scientific journals and website	
14.IPR. Have/will you protect this result? How? When	License agreement	
15.Any obstacles	No	
16.Additional research and development work	Modelling of other types of foam	
17.Technical and economic market considerations	Improved safety levels at / and reduced weight are advantageous for customers and thus as marketing argument for industry	

Exploitable result nr 6.6 Material scatter database		
1.Functionality	Material scatter database data	
2.Partners involved	PoliTo	
3.Way of exploitation	Processes: new virtual testing methodologies	
4.Type of result	Database	
5.Current stage	Prototype	
6.Final stage	Prototype	
7.Signification	Commercial	
8.Non commercial use or impact	Research in the development of stochastic design methods	
9.Socio-economic impact	Improvement in car design to gain better quality	
10.Documents/deliverables supporting the result	Prototype	D7.2.1
11.Who will be the customer?	Researchers in the structural design field; engineers in automotive and other industries (transportation, medical …)	
12. Time to market	2006	
13.Contacts towards users	Publication in scientific papers	
14.IPR. Have/will you protect this result? How? When	No	
15.Any obstacles	No	
16.Additional research and development work	No	
17.Technical and economic market considerations	Improved stochastic simulation method will add values to engineered products (vehicles or other)	

Exploitable result nr 6.7 Spotweld, rivets, clinching failure criteria and models	
1.Functionality	Development of new failure criteria for spot-weld, rivets, clinching and other connection systems; experimental data; implementation of the models into crash simulation codes
2.Partners involved	PoliTo, ALTAIR
3.Way of exploitation	Processes: crash simulation in car design for passive safety
4.Type of result	Know-how

Exploitable result nr 6.7 Spotweld, rivets, clinching failure criteria and models		
5.Current stage	Report	
6.Final stage	Report	
7.Signification	Commercial	
8.Non commercial use or impact	Increase of knowledge in joining systems behaviour	
9.Socio-economic impact	Improving vehicles quality is beneficial for the customers and industry	
10.Documents/deliverables supporting the result	Models	D7.1.5.C
11.Who will be the customer?	Engineers in automotive	
12. Time to market	2007	
13.Contacts towards potential users	Scientific publications and websites	
14.IPR. Have/will you protect this result? How? When	Report is public. Implementation in the software is protected (licensed commercial software)	
15.Any obstacles	No	
16.Additional R&D work	Additional research work may be carried on spotweld modelling	
17.Technical and economic market considerations	Improving vehicles quality is beneficial for customers and industry	

Exploitable result nr 6.8 Robustness and Reliability methods of Virtual Testing		
1.Functionality	Improved virtual testing methods to be applied in product development processes	
2.Partners involved	CIDAUT	
3.Way of exploitation	Further research or internal development to be employed in our clients	
4.Type of result	know-how	
5.Current stage	methodology in place	
6.Final stage	methodology in place	
7.Signification	Commercial/Standards/Legislation/Directives	
8.Non commercial use or impact	Integration of virtual testing in regulatory tests procedures	
9.Socio-economic impact	Research towards Improvement in virtual testing methods regarding pedestrian with targets cost reduction in terms of production costs and wealth costs	
10.Documents/deliverables supporting the result	Report	D7.2.2.A
11.Who will be the customer?	New EC funded projects as IMVITER (leader CIDAUT)	
12. Time to market	2007	
13.Contacts towards users	OEMs, suppliers and scientific and partners of IMVITER	
14.IPR. Have/will you protect this result? How? When	Related with APROSYS Consortium Agreement for developed know-how within the project	
15.Any obstacles	Not defined for the moment	
16.Additional research and development work	Within IMVITER project	
17.Technical and economic market considerations	Promote simulation of good quality (higher predictability) according to industrial necessities	

Exploitable result nr 6.9 Barrier test results	
1.Functionality	Dynamic tests have been conducted on Frontal and Side Impact Aluminium Honeycomb Barrier samples
2.Partners involved	CIC
3.Way of exploitation	Use in impact Barrier FE modelling
4.Type of result	test results

Exploitable result nr 6.9 Barrier test results		
5.Current stage	lab result	
6.Final stage	lab result	
7.Signification	Commercial	
8.Non commercial use or impact	May be used for research into new barrier design	
9.Socio-economic impact	Improved barrier design	
10.Documents/deliverables supporting the result	Report / Test results	D7.1.5.C
11.Who will be the customer?	Test houses, OEMs	
12. Time to market	2005	
13.Contacts towards users	APROSYS partners, Research organisations	
14.IPR. Have/will you protect this result? How? When	Test results are owned by APROSYS partners	
15.Any obstacles	None	
16.Additional research and development work	Further tests could be conducted on the new side impact barrier	
17.Technical and economic market considerations	Data needs to be used with background knowledge of report and not in isolation	

Exploitable result nr 6.10 ADVISER stochastic and rating software		
1.Functionality	Stochastic and rating functionality for numerical mechanical software	
2.Partners involved	ALTAIR	
3.Way of exploitation	Software licenses	
4.Type of result	Software	
5.Current stage	Commercial product	
6.Final stage	Commercial product	
7.Signification	Commercial	
8.Non commercial use or impact	No	
9.Socio-economic impact	Improve software product capabilities; increase sales	
10.Documents/deliverables supporting the result	Commercial product	D7.3.1.A/D7.3.1B
11.Who will be the customer?	VT users	
12. Time to market	2006	
13.Contacts towards potential users	Test houses, OEMs	
14.IPR. Have/will you protect this result? How? When	ADVISER is a licensed software (commercial product)	
15.Any obstacles	No	
16.Additional research and development work	Improvement to the software (methods, user interface)	
17.Technical and economic market considerations	Support for use of VT related methods promoted in SP7. Large market potential for the tool.	

Exploitable result nr 6.11 Modelling of aluminium barrier models	
1.Functionality	The Computer files can be used to develop LS-DYNA simulation models of aluminium honeycomb barrier models
2.Partners involved	CIC
3.Way of exploitation	Further research into performance of barriers in test conditions
4.Type of result	Model
5.Current stage	Prototype
6.Final stage	Prototype
7.Signification	Commercial

Exploitable result nr 6.11 Modelling of aluminium barrier models		
8.Non commercial use or impact	Improved FE modelling techniques	
9.Socio-economic impact	More efficient modelling methodology	
10.Documents/deliverables supporting the result	Report	None
11.Who will be the customer?	VT Users	
12. Time to market	2007	
13.Contacts towards users	APROSYS partners, Research organisations	
14.IPR. Have/will you protect this result? How? When	No	
15.Any obstacles	Users should have access to the software code LS-DYNA	
16.Additional R&D work	Further physical test results would improve the results	
17.Technical and economic market considerations	Further research into performance of barriers in test conditions	

Exploitable result nr 6.12 Stochastic models		
1.Functionality	Tools (FE/MBD models) for stochastic analysis	
2.Partners involved	TNO, CIDAUT, CRF, Polito	
3.Way of exploitation	Licensed software	
4.Type of result	Models	
5.Current stage	Available models	
6.Final stage	Available models	
7.Signification	Commercial	
8.Non commercial use or impact	Increase of knowledge with stochastic design analysis / mehtods	
9.Socio-economic impact	Improvement in car safety and other transportation systems safety	
10.Documents/deliverables supporting the result	Report	D7.2.2.A
11.Who will be the customer?	Engineers in automotive and other occupant transport areas	
12. Time to market	N/a	
13.Contacts towards users	Scientific publications and websites	
14.IPR. Have/will you protect this result? How? When	Licensed protected. Internal models used by their respective owners	
15.Any obstacles	Protected by owner of licensed software	
16.Additional R&D work	No	
17.Technical and economic market considerations	Stochastic methods can be used for further research work related to the development of virtual tools	

Exploitable result nr 6.13 ADVISER templates for Virtual Testing applications		
1.Functionality	ADVISER Templates for VT applications	
2.Partners involved	ALTAIR	
3.Way of exploitation	Licensed software or models	
4.Type of result	Software files	
5.Current stage	Prototype	
6.Final stage	Prototype	
7.Signification	Commercial	
8.Non commercial use or impact	No	
9.Socio-economic impact	No	
10.Documents/deliverables supporting the result	Report / Software files	D7.2.2.A
11.Who will be the customer?	VT users using ADVISER	
12. Time to market	2005+	
13.Contacts towards users	APROSYS partner using this for APROSYS related works	

Exploitable result nr 6.13 ADVISER templates for Virtual Testing applications		
14.IPR. Have/will you protect this result? How? When	Licensed software	
15.Any obstacles	No	
16.Additional R&D work	If needed, templates can be updated during APROSYS	
17.Technical and economic market considerations	No	

Exploitable result nr 6.14 MADYMO AE-MDB barrier model		
1.Functionality	MADYMO AE-MDB barrier model	
2.Partners involved	TNO	
3.Way of exploitation	New model sold with MADYMO, PAM-Crash model for research	
4.Type of result	Software model file	
5.Current stage	Commercial product	
6.Final stage	Commercial product	
7.Signification	Commercial	
8.Non commercial use or impact	Better understanding of vehicle side impact	
9.Socio-economic impact	Improved vehicle platform constructions for side impact protection	
10.Documents/deliverables supporting the result	Commercial product	D7.1.3.B
11.Who will be the customer?	European automotive industry.	
12. Time to market	2006	
13.Contacts towards users	Partners already have contacts towards potential users.	
14.IPR. Have/will you protect this result? How? When	License agreement	
15.Any obstacles	No	
16.Additional R&D work	Model is used for further research work related to the side protection	
17.Technical and economic market considerations	Virtual testing will reduce time-to-market for the development of new products.	

Exploitable result nr 6.15 Robust Design Method		
1.Functionality	Method for robust design optimization	
2.Partners involved	TNO	
3.Way of exploitation	Software sales & services	
4.Type of result	Increased know-how translated in improved methods / guidelines	
5.Current stage	Methodology / guidelines to perform robust design analysis ready	
6.Final stage	Research report	
7.Signification	Commercial	
8.Non commercial use or impact	Better understanding of the VT results / analyses	
9.Socio-economic impact	Improved use of VT in future regulations	
10.Documents/deliverables supporting the result	Report	D7.2.2.A
11.Who will be the customer?	VT model developers	
12. Time to market	2006	
13.Contacts towards users	TNO already has contacts towards potential (Madymo) users	
14.IPR. Have/will you protect this result? How? When	None	
15.Any obstacles	No	
16.Additional research and development work	Methods / Guidelines may be used for further research work related to the Virtual Testing in industry and regulative bodies.	
17.Technical and economic market considerations	Facilitate the deployment of VT techniques in regulations. Input for new research projects (IMVITER)	

Exploitable result nr 6.16 Enhanced methods to compare/rate signals		
1.Functionality	Enhanced methods to compare (rate) signals	
2.Partners involved	TNO	
3.Way of exploitation	Software sales	
4.Type of result	Methods / Guidelines	
5.Current stage	Methodology to compare / rate signals ready	
6.Final stage	Research report	
7.Signification	Commercial	
8.Non commercial use or impact	Better understanding of the VT results / analyses	
9.Socio-economic impact	Improved use of VT in future regulations	
10.Documents/deliverables supporting the result	Report	D7.3.4.A
11.Who will be the customer?	VT model developers	
12. Time to market	2006	
13.Contacts towards users	TNO has contacts towards potential (Madymo) users	
14.IPR. Have/will you protect this result? How? When	Protected by owner of licensed software	
15.Any obstacles	No	
16.Additional research and development work	Methods / Guidelines may be used for further research work related to the Virtual Testing in industry and regulative bodies	
17.Technical and economic market considerations	Facilitate the deployment of VT techniques in regulations. Input for new research projects (IMVITER)	

Exploitable result nr 6.17 Motorcycle Accident reconstruction tool		
1.Functionality	Provide tool for SP4 activities	
2.Partners involved	TNO, TUG	
3.Way of exploitation	Licensed software	
4.Type of result	Software	
5.Current stage	Prototype	
6.Final stage	Prototype	
7.Signification	Commercial	
8.Non commercial use or impact	Better understanding of motorcycle accidents world wide	
9.Socio-economic impact	Contribution to motorcycle accident investigations	
10.Documents/deliverables supporting the result	Report / Commercial product	D7.3.2A / D7.3.2.B
11.Who will be the customer?	European automotive industry, organisation EVU.	
12. Time to market	2008	
13.Contacts towards potential users	Vehicle Safety Institute from TUG already has contacts towards potential users.	
14.IPR. Have/will you protect this result? How? When	License agreement	
15.Any obstacles	No	
16.Additional research and development work	Model is used for further research work on motorcycle protection systems and motorcycle accident reconstruction.	
17.Technical and economic market considerations	Virtual testing will reduce time-to-market for the development of new products.	

Exploitable result nr 6.18 Guidelines for filtering and rating	
1.Functionality	General guidelines for filtering and rating of all applicable signals in frontal impact.
2.Partners involved	TNO

Exploitable result nr 6.18 Guidelines for filtering and rating		
3.Way of exploitation	Promotion of software & services	
4.Type of result	know-how ; methodology	
5.Current stage	Report	
6.Final stage	Final report	
7.Signification	Commercial/Standards/Legislation/Directives	
8.Non commercial use or impact	Know how is important for European regulatory bodies	
9.Socio-economic impact	Improve vehicle simulation models / tools	
10.Documents/deliverables supporting the result	Report	D7.3.4.B
11.Who will be the customer?	FE/MB simulation developers	
12. Time to market	N/A	
13.Contacts towards users	TNO already has contacts towards potential (Madymo) users	
14.IPR. Have/will you protect this result? How? When	Protected by owner of licensed software	
15.Any obstacles	No	
16.Additional research and development work	Guidelines may be used for further research work related to the Virtual Testing in industry and regulative bodies	
17.Technical and economic market considerations	General guidelines for filtering and rating of all applicable signals in frontal impact	

Exploitable result nr 6.19 Road Map Virtual Testing in regulations		
1.Functionality	Road Map Virtual Testing in Regulations	
2.Partners involved	ALTAIR, CRF, CIC, INRETS, TNO, Faurecia	
3.Way of exploitation	N/A	
4.Type of result	Know how	
5.Current stage	Report	
6.Final stage	Report	
7.Signification	Standards and Legislation	
8.Non commercial use or impact	Legislators	
9.Socio-economic impact	Yes, through possible evolution proposed regarding creation of a VT organisation. More cost efficient regulations and safer cars	
10.Documents/deliverables supporting the result	Report	D7.4.1B / D7.4.5
11.Who will be the customer?	VT users, regulatory bodies	
12. Time to market	2009	
13.Contacts towards potential users	Workshops held in APROSYS and Final Event. Potential continuation	
14.IPR. Have/will you protect this result? How? When	Public	
15.Any obstacles	Acceptance of new VT methods	
16.Additional research and development work	ISN activities, IMVITER project, Partners own research activities; Develop new demonstrators to improve confidence in techniques	
17.Technical and economic market considerations	Facilitate deployment of VT techniques in regulations. Input for new projects (IMVITER)	

Exploitable result nr 6.20 Feasibility report of Virtual Testing in a selected regulated or consumer testing procedure	
1.Functionality	Feasibility Report of Virtual Testing in a selected regulated or consumer testing procedure
2.Partners involved	TNO, ALTAIR, CIDAUT, FAURECIA, CRF, TUG
3.Way of exploitation	N/A

Exploitable result nr 6.20 Feasibility report of Virtual Testing in a selected regulated or consumer testing procedure		
4.Type of result	Know-how	
5.Current stage	Report	
6.Final stage	Report	
7.Signification	Standards and Legislation	
8.Non commercial use or impact	Know how is important for European regulatory bodies.	
9.Socio-economic impact	Indirectly; improvement of regulation will aim at reducing fatalities and then societal costs	
10.Documents/deliverables supporting the result	Report	D7.4.1
11.Who will be the customer?	All VT users	
12. Time to market	2008	
13.Contacts towards potential users	Partners already have contacts towards potential users.	
14.IPR. Have/will you protect this result? How? When	Public information	
15.Any obstacles	No	
16.Additional research and development work	Model is used for further research work related to the Virtual Testing in industry and regulative bodies.	
17.Technical and economic market considerations	Support the deployment of VT in regulations.	

Exploitable result nr 6.21 Reliability-based methods		
1.Functionality	Software tool for Reliability Analysis	
2.Partners involved	ALTAIR, IFTR	
3.Way of exploitation	Licensed software	
4.Type of result	Software / know-how	
5.Current stage	Prototype	
6.Final stage	Commercial product	
7.Signification	Commercial	
8.Non commercial use or impact	No	
9.Socio-economic impact	Software sales	
10.Documents/deliverables supporting the result	Prototype	D7.2.2.B
11.Who will be the customer?	Engineers / analysts in the CAE domain	
12. Time to market	2008	
13.Contacts towards users	Software customers	
14.IPR. Have/will you protect this result? How? When	Licensed software	
15.Any obstacles	No	
16.Additional R&D work	Improvement of methods	
17.Technical and economic market considerations	Bring reliability analysis technique to VT users	

Exploitable result nr 6.22 Robust Optimization package	
1.Functionality	Software tool for Robust Optimization
2.Partners involved	ALTAIR, IFTR
3.Way of exploitation	Licensed software
4.Type of result	Software / know-how
5.Current stage	Prototype
6.Final stage	Commercial product

Exploitable result nr 6.22 Robust Optimization package		
7.Signification	Commercial	
8.Non commercial use or impact	No	
9.Socio-economic impact	Software sales	
10.Documents/deliverables supporting the result	Prototype	D7.3.4.B
11.Who will be the customer?	Engineers / Analysts in the CAE domain	
12. Time to market	2008	
13.Contacts towards potential users	Software customers	
14.IPR. Have/will you protect this result? How? When	Licensed software	
15.Any obstacles	No	
16.Additional research and development work	Improvement of methods	
17.Technical and economic market considerations	Bring robust optimization technique to VT users	

Exploitable result nr 6.23 Automatic identification of simplified models		
1.Functionality	Methods and Software tool for Automatic Identification of simplified models	
2.Partners involved	ALTAIR, IST, TNO	
3.Way of exploitation	Methods, Licensed software or models	
4.Type of result	Software / know-how	
5.Current stage	Prototype / report	
6.Final stage	Prototype	
7.Signification	Commercial	
8.Non commercial use or impact	No	
9.Socio-economic impact	No	
10.Documents/deliverables supporting the result	Report	D7.3.5.A / D7.3.5B
11.Who will be the customer?	Design engineers / developers in the CAE domain	
12. Time to market	2008	
13.Contacts towards potential users	Software customers	
14.IPR. Have/will you protect this result? How? When	Licence agreement	
15.Any obstacles	No	
16.Additional research and development work	Developments / improvements in progress	
17.Technical and economic market considerations	Major contribution to the Virtual Testing market	

Exploitable result nr 6.24 Aluminium foam modelling techniques	
1.Functionality	Aluminium foam modelling techniques
2.Partners involved	FhG, PoliTo
3.Way of exploitation	Simulation services offered to interested parties, Products: new effective energy absorbing components in car and in other transportation systems, lightweight design components based on aluminium foams
4.Type of result	Know-how
5.Current stage	Model
6.Final stage	Model

Exploitable result nr 6.24 Aluminium foam modelling techniques		
7.Signification	Commercial	
8.Non commercial use or impact	Improved understanding of material properties and specifically scatter in properties	
9.Socio-economic impact	Improvement in car safety and other transportation systems safety	
10.Documents/deliverables supporting the result	Model / Report	D7.1.5.A
11.Who will be the customer?	Researchers in structural design; engineers in automotive industries	
12. Time to market	2008	
13.Contacts towards potential users	Publications in scientific journals, inclusion of models in commercial FE codes	
14.IPR. Have/will you protect this result? How? When	No	
15.Any obstacles	No	
16.Additional research and development work	Size effects are not covered sufficiently yet, and extension of work to other foam matrix alloys/foam types should be considered	
17.Technical and economic market considerations	Incorporation of density variation effects in aluminium foam part simulation will lead to higher reliability of simulation results, especially with respect to prediction of scatter in properties	

Exploitable result nr 6.25 Materials / Material Models Database		
1.Functionality	Database for storage of materials data, material model parameters. Basic tool for usage in simulation/virtual testing, link to MATFIT tool for automatic material model parameter determination	
2.Partners involved	FhG, ALTAIR	
3.Way of exploitation	Binary, licensed.	
4.Type of result	Database	
5.Current stage	Prototype	
6.Final stage	Prototype	
7.Signification	Commercial	
8.Non commercial use or impact	No	
9.Socio-economic impact	To be defined upon actual use of the database	
10.Documents/deliverables supporting the result	Report / Prototype	D7.3.3.D
11.Who will be the customer?	CAE engineers, Material specialists	
12. Time to market	2009	
13.Contacts towards potential users	No	
14.IPR. Have/will you protect this result? How? When	Licence agreement to be defined in the database evolves	
15.Any obstacles	Will to continue to maintain the database. Availability of data (beyond data gathered by APROSYS)	
16.Additional research and development work	Improve database structure	
17.Technical and economic market considerations	Facilitated access to basic information needed for material modelling/simulation	

Exploitable result nr 6.26 Translation of LS-DYNA results into ADVISER	
1.Functionality	Add on software code to ADVISER software to improve import of LS-DYNA results
2.Partners involved	CIC, ALTAIR
3.Way of exploitation	Binary, licensed
4.Type of result	Software / know-how

Exploitable result nr 6.26 Translation of LS-DYNA results into ADVISER		
5.Current stage	Commercial product	
6.Final stage	Commercial product	
7.Signification	Commercial	
8.Non commercial use or impact	Aid transfer of data between software codes	
9.Socio-economic impact	Reduction in modelling costs	
10.Documents/deliverables supporting the result	Prototype	D7.3.1.B
11.Who will be the customer?	OEMs	
12. Time to market	2007	
13.Contacts towards potential users	Future software	
14.IPR. Have/will you protect this result? How? When	Licensed software	
15.Any obstacles	No	
16.Additional research and development work	Could be adapted to other codes	
17.Technical and economic market considerations	Needs to be updated for changes in software codes	

Exploitable result nr 6.27 RADIOSS AE-MDB model and experimental tests		
1.Functionality	AE-MDB barrier RADIOSS model and experimental tests	
2.Partners involved	ALTAIR	
3.Way of exploitation	Binary, licensed	
4.Type of result	Software model	
5.Current stage	Model	
6.Final stage	Model	
7.Signification	Commercial	
8.Non commercial use or impact	No	
9.Socio-economic impact	Sales of the mode	
10.Documents/deliverables supporting the result	Commercial product	D7.3.1B
11.Who will be the customer?	Engineers in the crash simulation community	
12. Time to market	2007	
13.Contacts towards potential users	Current customer base	
14.IPR. Have/will you protect this result? How? When	Licensed FE model. Confidential test results.	
15.Any obstacles	No	
16.Additional research and development work	Evolution of the mode to keep increasing its quality constantly	
17.Technical and economic market considerations	Need to be updated if the physical model evolves	

Exploitable result nr 6.28 Standing up dummy for motorcycle safety modelling	
1.Functionality	Standing up dummy suitable for motorcycle safety modelling in RADIOSS
2.Partners involved	CIDAUT
3.Way of exploitation	Further research or internal development
4.Type of result	Model
5.Current stage	Model
6.Final stage	Model

Exploitable result nr 6.28 Standing up dummy for motorcycle safety modelling		
7.Signification	Commercial	
8.Non commercial use or impact	Research	
9.Socio-economic impact	Increase the knowledge of the behaviour of the motorcyclist in motorcycle impacts and then be able to protect them and reduce injuries and fatalities	
10.Documents/deliverables supporting the result	Model	D7.1.1
11.Who will be the customer?	Research projects related with motorcycle safety accidents, road furniture studies	
12. Time to market	2008	
13.Contacts towards potential users	Several contacts at Spanish level	
14.IPR. Have/will you protect this result? How? When	Licensed	
15.Any obstacles	Not defined at the moment	
16.Additional research and development work	Accidentology analysis focused on motorcycle accidents, road furniture studies	
17.Technical and economic market considerations	Currently there is a big lack of knowledge of motorcyclist impacts and very high number of fatalities of this users	

Exploitable result nr 6.29 Virtual testing benchmarks		
1.Functionality	VT Benchmarks	
2.Partners involved	Polito, CIC, CIDAUT	
3.Way of exploitation	Use of the VT benchmarks as a tool for “electronic certification” of engineers working on simulation and codes for crash simulations	
4.Type of result	Method / know-how	
5.Current stage	Model / report	
6.Final stage	Model / report	
7.Signification	Directives	
8.Non commercial use or impact	Test exercise for engineers and technician in the field	
9.Socio-economic impact	Improvement of the capacities of structural engineers and researchers in their job	
10.Documents/deliverables supporting the result	Report	D7.4.3B
11.Who will be the customer?	Engineers working in crash simulations, mostly in automotive industries and other transportation industries	
12. Time to market	2009	
13.Contacts towards potential users	Publications in scientific/technical journal and conferences	
14.IPR. Have/will you protect this result? How? When	No	
15.Any obstacles	No	
16.Additional research and development work	The VT benchmarks are an open set of test cases, to be continuously integrated and updated	
17.Technical and economic market considerations	Improved simulation capabilities will add value to the product of automotive industries	

Exploitable result nr 6.30 Cost Benefit Analysis	
1.Functionality	Cost Benefit Analysis
2.Partners involved	CIC
3.Way of exploitation	Techniques of Analysing Costs of Virtual Testing
4.Type of result	Website, methodology, know-how

Exploitable result nr 6.30 Cost Benefit Analysis		
5.Current stage	Prototype	
6.Final stage	Commercial product	
7.Signification	Commercial	
8.Non commercial use or impact	Understanding of the cost implication of VT	
9.Socio-economic impact	With the ability to identify the costs of introducing VT, legislators, engineers and OEM's can justify and implement VT in a shorter timescale	
10.Documents/deliverables supporting the result	Report / Prototype tool	D7.4.6
11.Who will be the customer?	Legislator, OEMs, researchers	
12. Time to market	2009	
13.Contacts towards users	Papers published	
14.IPR. Have/will you protect this result? How? When	No	
15.Any obstacles	Lack of data from OEM's	
16.Additional R&D work	With additional data the techniques can be developed	
17.Technical and economic market considerations	There is a lack of knowledge of how much VT costs to implement into current regulations	

Exploitable result nr 6.31 Finite element model for simulating impacts on laminated glass		
1.Functionality	Finite element model for simulating impacts on laminated glass	
2.Partners involved	TNO	
3.Way of exploitation	Consultancy jobs, product sale of model.	
4.Type of result	Method/ software/ know-how	
5.Current stage	Commercial product	
6.Final stage	Commercial product	
7.Signification	Commercial	
8.Non commercial use or impact	Not foreseen	
9.Socio-economic impact	The glass model will be a good instrument to help increase pedestrian safety by reducing the injuries caused in e.g. a head impact.	
10.Documents/deliverables supporting the result	Model	D3.2.5
11.Who will be the customer?	Vehicle OEMs, glass Tier one suppliers	
12. Time to market	2008	
13.Contacts towards users	With some universities and 2 OEMs	
14.IPR. Have/will you protect this result? How? When	It was chosen not to patent the modelling	
15.Any obstacles	None	
16.Additional research and development work	The glass model will time by time be updated, based on new materials and experiments.	
17.Technical and economic market considerations	The numerical glass model can be used to determine influence of parametric changes, without the need to perform a large amount of experimental tests.	

Exploitable result nr 6.32 Modelling techniques for simulating impacts on glass	
1.Functionality	Finite element model for simulating impacts on laminated glass
2.Partners involved	Altair
3.Way of exploitation	Consultancy jobs, software sale.
4.Type of result	Method/ software/ know-how
5.Current stage	Pre-industrial product
6.Final stage	Commercial product

Exploitable result nr 6.32 Modelling techniques for simulating impacts on glass		
7.Signification	Commercial	
8.Non commercial use or impact	Research, Academic/teaching	
9.Socio-economic impact	Contribution to understanding how windscreens behave during impacts and then exploration of what developments could improve VRU safety.	
10.Documents/deliverables supporting the result	Model	D3.2.5
11.Who will be the customer?	Vehicle OEMs, glass Tier one suppliers	
12. Time to market	2008	
13.Contacts towards potential users	RADIOSS FE code customers	
14.IPR. Have/will you protect this result? How? When	Licence agreement	
15.Any obstacles	None	
16.Additional research and development work	General developments based on future test data.	
17.Technical and economic market considerations	The numerical glass model can be used to determine influence of parametric changes, without the need to perform a large amount of experimental tests.	

2.7 Main Result 7: Test methods for vulnerable road users

Exploitable Knowledge (description)	**Exploitable product(s) or measure(s)**	**Sector(s)** of application	**Timetable for commercial use**	**Patents or other IPR protection**	**Owner** & Other Partner(s) involved	**Originating SP**
7.1 Proposal of a new standard for impacts of motorcyclists against metal barriers	Test method to assess guardrails behaviour in terms of motorcyclists' protection	Road safety (infrastructure) on a pan- European level	2009	None	**Cidaut,** Dekra, Hiasa, LMU, ALTAIR, Fema	4
7.2 Revision of helmets testing current standard	Reviewed standard	Helmet industry	2009	None	**Cidaut,** Dainese, TNO, Unifi, LMU	4
7.3 Development of road and misuse tests	Road and misuse tests standard for the development of passive safety systems in the motorcycle industry	Motorcycle industry, passive safety systems manufacturers	2009	None	**Piaggio,** Cidaut, Dekra	4

Exploitable Knowledge (description)	**Exploitable product(s) or measure(s)**	**Sector(s)** of application	**Timetable for commercial use**	**Patents or other IPR protection**	**Owner** & Other Partner(s) involved	**Originating SP**
7.4 New or amended car front test procedures	Test procedures for the APROSYS new or improved test methods for VRU	Consumer testing, Regulatory	2010	None	**TRL,** TKP, INSIA, Toyota, CIC,TNO ULP, ika BASt	3
7.5 New head form impactor	Specification and hardware	Consumer testing, Regulatory, Automotive R&D	2012	Discussed among partners	**IKA**	3
7.6 New head form and neck impactor	Specification and hardware	Consumer testing, Regulatory, Automotive R&D	2012	Discussed among partners	**TK-P**	3
7.7 New upper body mass for EEVC pedestrian lower leg impactor	Specification and hardware	Consumer testing, Regulatory, Automotive R&D	2012	Discussed among partners	**INSIA**	3
7.8 New upper body mass for FLEX PLI	Specification and hardware	Consumer testing, Regulatory, Automotive R&D	2012	Discussed among partners	**IKA, BASt**, Toyota	3
7.9 Heavy Vehicle Aggressivity Index	Guideline for evaluating the index	Truck/Trailer industry	No direct commercial use	None	**TUG, IKA, Dekra, IDIADA**	2
7.10. Test procedures for the APROSYS new or improved test methods for VRU	New or amended car front test procedures	Consumer testing, Regulatory	2010	None	**TRL,** ika, TKP, INSIA, Toyota, CIC,TNO ULP, BASt	3
7.11. New head form impactor	Specification and hardware	Consumer testing, Regulatory, Automotive R&D	2012	Discussed among partners	**IKA**	3
7.12. New head form and neck impactor	Specification and hardware	Consumer testing, Regulatory, Automotive R&D	2012	Discussed among partners	**TK-P**	3

Exploitable Knowledge (description)	**Exploitable product(s) or measure(s)**	**Sector(s)** of application	**Timetable for commercial use**	**Patents or other IPR protection**	**Owner** & Other Partner(s) involved	**Originating SP**
7.13. New upper body mass for EEVC pedestrian lower leg impactor	Specification and hardware	Consumer testing, Regulatory, Automotive R&D	2012	Discussed among partners	**INSIA**	3
7.14. New upper body mass for FLEX PLI	Specification and hardware	Consumer testing, Regulatory, Automotive R&D	2012	Discussed among partners	**IKA, BASt**, Toyota	3

Exploitable result nr 7.1 Proposal of a new standard form impact of motor cyclists against metal barriers		
1.Functionality	It is intended to give technical indications that could help in the development of a European standard in the short time	
2.Partners involved	Cidaut, Dekra, Fema, Hiasa, LMU, ALTAIR	
3.Way of exploitation	To produce a draft of a European scope standard related to accidents of motorcyclists against roadside barriers	
4.Type of result	Method/technical specification	
5.Current stage	Idea	
6.Final stage	Method/technical specification	
7.Signification	Standards	
8.Non commercial use or impact	Standard development	
9.Socio-economic impact	The socio-economic impact of this standard will be important due to the high severity of the impact of motorcyclists against road infrastructure	
10.Documents/deliverables supporting the result	Method/technical specification	D4.2.3A
11.Who will be the customer?	Road safety (infrastructure) on a pan- European level	
12. Time to market	2009	
13.Contacts towards potential users	Dissemination within CEN Technical Committee 226	
14.IPR. Have/will you protect this result? How? When	No	
15.Any obstacles	Development of a real standard could be achieved in the long term. Not immediate actions are expected	
16.Additional research and development work	Harmonization with EN-1317 standard	
17.Technical and economic market considerations	None	

Exploitable result nr 7.2 Revision of helmets testing current standard	
1.Functionality	To give technical indications that could help in the development of a reviewed standard for helmet testing
2.Partners involved	Dainese, TNO, Unifi, LMU, Cidaut, Fema
3.Way of exploitation	To give technical support for the updating of standards concerning helmet testing
4.Type of result	Method/technical specification

Exploitable result nr 7.2 Revision of helmets testing current standard		
5.Current stage	Idea	
6.Final stage	Method/technical specification	
7.Signification	Standards	
8.Non commercial use or impact	The results can be exploited through standard updating	
9.Socio-economic impact	Improvement of standards to make better products for the motorcyclists' protection	
10.Documents/deliverables supporting the result	Method / Technical specification	D4.3.2C
11.Who will be the customer?	Helmet industry	
12. Time to market	2009	
13.Contacts towards users	CEN TC 226	
14.IPR. Have/will you protect this result? How? When	No	
15.Any obstacles	None	
16.Additional research and development work	None	
17.Technical and economic market considerations	Commercial use is not applicable to this result.	

Exploitable result nr 7.3 Development of road and misuse tests		
1.Functionality	To know the performance of some physical sensors implemented in the vehicle during normal and anomalous driving conditions	
2.Partners involved	Piaggio, Cidaut, Dekra,	
3.Way of exploitation	Information is useful for passive safety systems manufacturers and also for the motorcycle industry	
4.Type of result	Method/technical specification	
5.Current stage	Method/technical specification	
6.Final stage	Method/technical specification	
7.Signification	Standards	
8.Non commercial use or impact	No	
9.Socio-economic impact	The socio-economic impact of this standard will be important due to the high severity of the impacts of motorcyclists when an accidents happens	
10.Documents/deliverables supporting the result	Method / Technical specification	D4.3.4.C
11.Who will be the customer?	Motorcycle industry, passive safety systems manufacturers, …	
12. Time to market	2009	
13.Contacts towards users	SIM (Safety In Motion) project	
14.IPR. Have/will you protect this result? How? When	No	
15.Any obstacles	None	
16.Additional research and development work	No	
17.Technical and economic market considerations	No	

Exploitable result nr 7.4 New or amended car front test procedures	
1.Functionality	Test procedures for the APROSYS new or improved test methods for VRU
2.Partners involved	TRL, IKA Aachen, TKP, INSIA, Toyota, CIC,TNO, ULP, BASt
3.Way of exploitation	Inclusion of new methods in consumer testing and vehicle type approval process.

Exploitable result nr 7.4 New or amended car front test procedures		
4.Type of result	Technical specification/standard	
5.Current stage	Draft	
6.Final stage	Regulation	
7.Signification	Legislation/Directives	
8.Non commercial use or impact	Basis for upgrade of current test methods to reflect real world accident scenarios (current methods based on EEVC WG10/17 in 1990s)	
9.Socio-economic impact	Reduction in VRU casualties as new vehicle designs have to demonstrate compliance with new test criteria	
10.Documents/deliverables supporting the result	Report	D3.3.3.F/D3.3.3.G/D3.3.3.B/D3.3.3.C/ D3.3.3.D/D3.3.3.E/D3.3.3.H
11.Who will be the customer?	Consumer testing organisations, Regulatory authorities	
12. Time to market	2010	
13.Contacts towards potential users	Workshop for feedback from industry, consumer groups, regulators (EC and National)., Euro NCAP, UK Department for Transport	
14.IPR. Have/will you protect this result? How? When	No	
15.Any obstacles	Car Industry lobby, Car manufacturers, adoption of legislation.	
16.Additional research and development work	Development by future EU projects on VRU safety.	
17.Technical and economic market considerations	Adoption by consumer and regulatory organisations will be a process of consultation, cooperation and compromise.	

Exploitable result nr 7.5 New head form impactor		
1.Functionality	New head form impactor – pendulum head form impactor with a force sensor	
2.Partners involved	IKA IKA	
3.Way of exploitation	Products, licensing.	
4.Type of result	Device/ technical specification	
5.Current stage	Prototype	
6.Final stage	Commercial product	
7.Signification	Commercial/Legislation/Directives	
8.Non commercial use or impact	Basis for upgrade of pedestrian head test methods to cover vehicles with deployable/pop-up bonnets	
9.Socio-economic impact	Contribution to reduced VRU injury severity.	
10.Documents/deliverables supporting the result	Prototype	D3.3.3H
11.Who will be the customer?	Consumer testing organisations, Regulatory authorities, vehicle OEMs	
12. Time to market	2012	
13.Contacts towards potential users	APROSYS final event exhibition	
14.IPR. Have/will you protect this result? How? When	To be considered as designs are developed.	
15.Any obstacles	Changes in vehicle styling and construction may be required. Car manufacturers may concentrate on active safety measures to prevent impacts.	
16.Additional research and development work	Further research on the application, internationally accepted skull penetrative injury risk criteria/functions, cost/benefit of this new impactor could be necessary.	
17.Technical and economic market considerations	Adoption by consumer and regulatory organisations will be a process of consultation, cooperation and compromise.	

Exploitable result nr 7.6 New head form and neck impactor		
1.Functionality	New head form and neck impactor	
2.Partners involved	TK-P	
3.Way of exploitation	Products, licensing.	
4.Type of result	Device/ technical specification	
5.Current stage	Prototype	
6.Final stage	Commercial product	
7.Signification	Commercial/Legislation/Directives	
8.Non commercial use or impact	Basis for upgrade of pedestrian head test methods address real world head injuries caused by rotational accelerations (in addition to linear accelerations)	
9.Socio-economic impact	Contribution to reduced VRU injury severity.	
10.Documents/deliverables supporting the result	Prototype	D3.3.3.C
11.Who will be the customer?	Consumer testing organisations, Regulatory authorities, vehicle OEMs	
12. Time to market	2012	
13.Contacts towards potential users	APROSYS final event exhibition	
14.IPR. Have/will you protect this result? How? When	To be considered	
15.Any obstacles	Car Industry lobby, Car manufacturers, adoption of legislation, internationally accepted rotational motion and brain injury risk criteria/functions	
16.Additional research and development work	Further research and development on the application and equipment, cost/benefit of this new impactor could be necessary.	
17.Technical and economic market considerations	Adoption by consumer and regulatory organisations will be a process of consultation, cooperation and compromise.	

Exploitable result nr 7.7 New upper body mass for EEVC pedestrian lower leg impactor		
1.Functionality	New upper body mass for EEVC pedestrian lower leg impactor – upper body mass-part which can be fixed to the top of the EEVC lower leg impactor to better reproduce impact kinematics especially for SUVs	
2.Partners involved	INSIA	
3.Way of exploitation	Products, licensing.	
4.Type of result	Device/ technical specification	
5.Current stage	Prototype	
6.Final stage	Commercial product	
7.Signification	Commercial/Legislation/Directives	
8.Non commercial use or impact	Basis for upgrade of pedestrian lower leg test methods address real world accident scenarios involving SUVs and other high bumper vehicles	
9.Socio-economic impact	Contribution to reduced VRU injury severity.	
10.Documents/deliverables supporting the result	Prototype	D3.3.3.B
11.Who will be the customer?	Consumer testing organisations, Regulatory authorities, vehicle OEMs	
12. Time to market	2012	
13.Contacts towards potential users	APROSYS final event exhibition	
14.IPR. Have/will you protect this	To be considered	

Exploitable result nr 7.7 New upper body mass for EEVC pedestrian lower leg impactor	
result? How? When	
15.Any obstacles	Car Industry lobby, Car manufacturers, adoption of legislation
16.Additional research and development work	Further research and development on the application and equipment, cost/benefit of this new impactor could be necessary.
17.Technical and economic market considerations	Adoption by consumer and regulatory organisations will be a process of consultation, cooperation and compromise.

Exploitable result nr 7.8 New upper body mass for Flex PLI		
1.Functionality	New FlexPLI upper body mass – upper body mass-part which can be fixed to the top of the flexible lower legform (Flex PLI) to better reflect impact kinematics especially for SUVs	
2.Partners involved	IKA IKA, BASt, Toyota	
3.Way of exploitation	Products, licensing.	
4.Type of result	Device/ technical specification	
5.Current stage	Prototype	
6.Final stage	Commercial product	
7.Signification	Commercial/Legislation/Directives	
8.Non commercial use or impact	Basis for upgrade of pedestrian lower leg test methods address real world accident scenarios involving SUVs and other high bumper vehicles	
9.Socio-economic impact	Contribution to reduced VRU injury severity.	
10.Documents/deliverables supporting the result	Prototype	D3.3.3.H / D3.4.3.B
11.Who will be the customer?	Consumer testing organisations, Regulatory authorities, vehicle OEMs	
12. Time to market	2012	
13.Contacts towards potential users	APROSYS final event exhibition	
14.IPR. Have/will you protect this result? How? When	To be considered as designs are developed.	
15.Any obstacles	Changes in vehicle styling and construction may be required. New requirements for front bumpers of SUVs may be conflicting with existing solutions.	
16.Additional research and development work	Further research on the application, cost/benefit of this new impactor could be necessary.	
17.Technical and economic market considerations	Adoption by consumer and regulatory organisations will be a process of consultation, cooperation and compromise.	

Exploitable result nr 7.9 Heavy vehicle aggressivity index	
1.Functionality	Set of guidelines and procedures to evaluate the aggressivity of heavy good vehicle design toward pedestrians and cyclists
2.Partners involved	TUG, IKA, Dekra, IDIADA
3.Way of exploitation	Promotion in journals, conferences and European politicians
4.Type of result	method
5.Current stage	prototype/other (draft of guideline)
6.Final stage	other (implementation into regulations or rating procedures)
7.Signification	Standards/Legislation/Directives
8.Non commercial use or impact	Support of promoting pedestrian and cyclist friendly design of truck / trailers
9.Socio-economic impact	Reduction of injuries and related costs on European roads by new designs; environmental impact by streamline designs (less fuel consumption)

Exploitable result nr 7.9 Heavy vehicle aggressivity index		
10.Documents/deliverables supporting the result	Draft of guideline	D2.1.1.A/D2.1.1.B/D2.1.1.C/D2.1.4/ D2.1.7
11.Who will be the customer?	Rating agencies, EEVC working groups	
12. Time to market	Protocol is free available	
13.Contacts towards potential users	No direct contact; protocol is free available.	
14.IPR. Have/will you protect this result? How? When	No	
15.Any obstacles	Safety needs a certain willingness to pay or regulations.	
16.Additional research and development work	Update of HVAI, based on feedbacks of users	
17.Technical and economic market considerations	Safety needs a certain willingness to pay or regulations.	

Exploitable result nr 7.10 Test procedures for the APROSYS new or improved test methods for VRU		
1.Functionality	Test procedures for the APROSYS new or improved test methods for VRU	
2.Partners involved	TRL, IKA Aachen, TKP, INSIA, Toyota, CIC,TNO, ULP, BASt	
3.Way of exploitation	Inclusion of new methods in consumer testing and vehicle type approval process.	
4.Type of result	Technical specification/standard	
5.Current stage	Draft	
6.Final stage	Regulation	
7.Signification	Legislation/Directives	
8.Non commercial use or impact	Basis for upgrade of current test methods to reflect real world accident scenarios (current methods based on EEVC WG10/17 in 1990s)	
9.Socio-economic impact	Reduction in VRU casualties as new vehicle designs have to demonstrate compliance with new test criteria	
10.Documents/deliverables supporting the result	Reports	D3.3.3.F/D3.3.3.G/D3.3.3.B/ D3.3.3.C/D3.3.3.D/ D3.3.3.E/D3.3.3.H
11.Who will be the customer?	Consumer testing organisations, Regulatory authorities	
12. Time to market	2010	
13.Contacts towards potential users	Workshop for feedback from industry, consumer groups, regulators (EC and National)., Euro NCAP, UK Department for Transport	
14.IPR. Have/will you protect this result? How? When	No	
15.Any obstacles	Car Industry lobby, Car manufacturers, adoption of legislation.	
16.Additional research and development work	Development by future EU projects on VRU safety.	
17.Technical and economic market considerations	Dedicated towards consumer and legislative testing	

Exploitable result nr 7.11 New head form impactor	
1.Functionality	New head form impactor – pendulum head form impactor with a force sensor
2.Partners involved	IKA IKA
3.Way of exploitation	Products, licensing.
4.Type of result	Device/ technical specification
5.Current stage	Prototype
6.Final stage	Commercial product
7.Signification	Commercial/Legislation/Directives

Exploitable result nr 7.11 New head form impactor		
8.Non commercial use or impact	Basis for upgrade of pedestrian head test methods to cover vehicles with deployable/pop-up bonnets	
9.Socio-economic impact	Contribution to reduced VRU injury severity.	
10.Documents/deliverables supporting the result	Prototype	D3.3.3H
11.Who will be the customer?	Consumer testing organisations, Regulatory authorities, vehicle OEMs	
12. Time to market	2012	
13.Contacts towards users	APROSYS final event exhibition	
14.IPR. Have/will you protect this result? How? When	To be considered as designs are developed.	
15.Any obstacles	Changes in vehicle styling and construction may be required. Car manufacturers may concentrate on active safety measures to prevent impacts.	
16.Additional research and development work	Further research on the application, internationally accepted skull penetrative injury risk criteria/functions, cost/benefit of this new impactor could be necessary.	
17.Technical and economic market considerations	Impact testing for industry, consumer organisations and legislative bodies.	

Exploitable result nr 7.12 New head form and neck impactor		
1.Functionality	New head form and neck impactor	
2.Partners involved	TK-P	
3.Way of exploitation	Products, licensing.	
4.Type of result	Device/ technical specification	
5.Current stage	Prototype	
6.Final stage	Commercial product	
7.Signification	Commercial/Legislation/Directives	
8.Non commercial use or impact	Basis for upgrade of pedestrian head test methods address real world head injuries caused by rotational accelerations (in addition to linear accelerations)	
9.Socio-economic impact	Contribution to reduced VRU injury severity.	
10.Documents/deliverables supporting the result	Prototype	D3.3.3C
11.Who will be the customer?	Consumer testing organisations, Regulatory authorities, vehicle OEMs	
12. Time to market	2012	
13.Contacts towards users	APROSYS final event exhibition	
14.IPR. Have/will you protect this result? How? When	To be considered	
15.Any obstacles	Car Industry lobby, Car manufacturers, adoption of legislation, internationally accepted rotational motion and brain injury risk criteria/functions	
16.Additional research and development work	Further research and development on the application and equipment, cost/benefit of this new impactor could be necessary.	
17.Technical and economic market considerations	Impact testing for industry, consumer organisations and legislative bodies.	

Exploitable result nr 7.13 New upper body mass for EEVC pedestrian lower leg impactor	
1.Functionality	New upper body mass for EEVC pedestrian lower leg impactor; upper body mass-part which can be fixed to the top of EEVC lower leg impactor to better reproduce impact kinematics especially for SUVs

Exploitable result nr 7.13 New upper body mass for EEVC pedestrian lower leg impactor		
2.Partners involved	INSIA	
3.Way of exploitation	Products, licensing.	
4.Type of result	Device/ technical specification	
5.Current stage	Prototype	
6.Final stage	Commercial product	
7.Signification	Commercial/Legislation/Directives	
8.Non commercial use or impact	Basis for upgrade of pedestrian lower leg test methods address real world accident scenarios involving SUVs and other high bumper vehicles	
9.Socio-economic impact	Contribution to reduced VRU injury severity.	
10.Documents/deliverables supporting the result	Prototype	D3.3.3B
11.Who will be the customer?	Consumer testing organisations, Regulatory authorities, vehicle OEMs	
12. Time to market	2012	
13.Contacts towards users	APROSYS final event exhibition	
14.IPR. Have/will you protect this result? How? When	To be considered	
15.Any obstacles	Car Industry lobby, Car manufacturers, adoption of legislation	
16.Additional research and development work	Further research and development on the application and equipment, cost/benefit of this new impactor could be necessary.	
17.Technical and economic market considerations	Impact testing for industry, consumer organisations and legislative bodies.	

Exploitable result nr 7.14 New upper body mass for Flex PLI		
1.Functionality	New FlexPLI upper body mass – upper body mass-part which can be fixed to the top of the flexible lower legform (Flex PLI) to better reflect impact kinematics especially for SUVs	
2.Partners involved	IKA IKA, BASt, Toyota	
3.Way of exploitation	Products, licensing.	
4.Type of result	Device/ technical specification	
5.Current stage	Prototype	
6.Final stage	Commercial product	
7.Signification	Commercial/Legislation/Directives	
8.Non commercial use or impact	Basis for upgrade of pedestrian lower leg test methods address real world accident scenarios involving SUVs and other high bumper vehicles	
9.Socio-economic impact	Contribution to reduced VRU injury severity.	
10.Documents/deliverables supporting the result	Prototype	D3.3.3H/D3.4.3B
11.Who will be the customer?	Consumer testing organisations, Regulatory authorities, vehicle OEMs	
12. Time to market	2012	
13.Contacts towards users	APROSYS final event exhibition	
14.IPR. Have/will you protect this result? How? When	To be considered as designs are developed.	
15.Any obstacles	Changes in vehicle styling and construction may be required. New requirements for front bumpers of SUVs may be conflicting with existing solutions.	
16.Additional research and development work	Further research on the application, cost/benefit of this new impactor could be necessary.	
17.Technical and economic market considerations	Impact testing for industry, consumer organisations and legislative bodies.	

2.8 Main Result 8 Full width frontal test for Europe

Exploitable Knowledge (description)	**Exploitable product(s) or measure(s)**	**Sector(s)** of application	**Timetable for commercial use**	**Patents or other IPR protection**	**Owner** & Other Partner(s) involved	**Originating SP**
8.1 Full width frontal impact (AE-FW) test procedure development and evaluation.	Test procedure for car frontal impact protection systems to improve Reg 94 and Euro NCAP consumer testing.	Automotive industry	2010	None	**TRL,** TNO, VW, CRF, Toyota, IDIADA, BAST, TUG, Nissan	1

Exploitable result nr 8.1 Full with frontal impact (AE-FW) test procedure development and evaluation		
1.Functionality	Test procedure for car frontal impact protection systems to improve Reg 94 and Euro NCAP consumer testing.	
2.Partners involved	TRL, TNO, CRF, Toyota, VW, IDIADA, BAST, TUG, Nissan	
3.Way of exploitation	Regulation / consumer testing	
4.Type of result	Method / technical specification	
5.Current stage	Draft test procedure	
6.Final stage	Final test procedure	
7.Signification	Standards / Legislation	
8.Non commercial use or impact	Improvement of legislation / consumer testing	
9.Socio-economic impact	Improved car frontal impact protection leading to reduction in accident casualties.	
10.Documents/deliverables supporting the result	Reports	D1.2.1/D1.2.2/D1.2.3.A/D1.2.3.B
11.Who will be the customer?	Legal authorities, consumer organisations, industry	
12. Time to market	2010	
13.Contacts towards potential users	7th European Vehicle Passive Safety Conference 2007, 21st ESV Conference 2009, APROSYS 'Final Event' 2009. Presentation and discussion of results at EEVC WG15 meetings and further contacts via people who are APROSYS partners and also EEVC WG15 members. Presentation of results at GRSP Frontal Impact Informal Working group meeting to review Regulation 94, Dec 2008. APROSYS partners, FIMCAR partners. Direct contact with individual OEMs involved with APROSYS, whilst not being a partner.	
14.IPR. Have/will you protect this result? How? When	No	
15.Any obstacles	EEVC WG15, automotive lobby, legislation	
16.Additional research and development work	Likely to be performed by EEVC WG15 members and EC 7th Framework project (FIMCAR)	
17.Technical and economic market considerations	Full width test procedure will help bring cars with improved safety into the market place and thus help competiveness of the European automotive industry	

2.9 Main Result 9: New side impact test methods

Exploitable Knowledge (description)	**Exploitable product(s) or measure(s)**	**Sector(s)** of application	**Timetable for commercial use**	**Patents or other IPR protection**	**Owner** & Other Partner(s) involved	**Originating SP**
9.1 AE-MDB test procedure development and evaluation	AE-MDB test procedure	Automotive	2010	None	**TRL,** TNO, Toyota, VW, UPM, IDIADA, BASt, Cellbond, TK-P	1
9.2 Side impact pole test evaluation	Side Impact pole test procedure	Automotive	2010	None	**TNO**, CRF, TRL, IDIADA, BASt, TKP, CRF	1
9.3 Side impact FMH test development and evaluation	FMH test procedure	Automotive	2010	None	**BASt,** TRL, CRF, IDADA, TUG	1
9.4 Side impact OOP test development and evaluation	Side impact OOP test procedure	Automotive	2010	None	**TNO,** Toyota IDIADA, TUG,TP	1
9.5 Non-struck side occupant	Outline proposal for Non-Struck Side occupant test procedure	Automotive	2015	None	**TUG,** CRF, TRL	1
9.6 Understanding of major influencing factors in side impact compatibility	Concept for test procedure assess a vehicle's side impact compatibility performance	Automotive	2015	None	**TRL,** CRF, INSIA-UPM	1

Exploitable result nr 9.1 AE-MDB test procedure development and evaluation		
1.Functionality	Test procedure for car side impact protection systems to improve Reg 95 and Euro NCAP consumer testing.	
2.Partners involved	TRL, TNO, Toyota, VW, INSIA-UPM, IDIADA, BASt, Cellbond, TK-P	
3.Way of exploitation	Regulation / consumer testing	
4.Type of result	Method / technical specification	
5.Current stage	Draft test procedure	
6.Final stage	Final test procedure	
7.Signification	Standards / Legislation / Directives	
8.Non commercial use or impact	Improvement of legislation / consumer testing	
9.Socio-economic impact	Improved side impact protection leading to reduction in accident casualties	
10.Documents/deliverables sup-	Reports	D1.1.1.B/D1.1.1.C parts 1 and 2

Exploitable result nr 9.1 AE-MDB test procedure development and evaluation		
porting the result		
11.Who will be the customer?	Legal authorities, consumer organisations, industry	
12. Time to market	2010	
13.Contacts towards potential users	APROSYS/EEVC WG13 workshop 06, APSN/APROSYS conference 06, 20th ESV Conference 2007, APROSYS 'Final Event' 2009. Presentation and discussion of results at EEVC WG13 meetings and specially arranged workshops with further contacts via people who are APROSYS partners and also EEVC WG13 members. Direct contact with individual OEMs who were involved with APROSYS, whilst not being a partner.	
14.IPR. Have/will you protect this result? How? When	None	
15.Any obstacles	EEVC WG13, automotive lobby, legislation	
16.Additional research and development work	Likely to be performed by EEVC WG13 members	
17.Technical and economic market considerations	AE-MDB test procedure will help bring cars with improved safety into the market place and thus help competiveness of the European automotive industry	

Exploitable result nr 9.2 Side impact pole test evaluation		
1.Functionality	Test procedure for car side impact protection systems to improve Reg 95 and Euro NCAP consumer testing.	
2.Partners involved	TNO, CRF, TRL, IDIADA, BASt, TK-P, CRF	
3.Way of exploitation	Regulation / consumer testing	
4.Type of result	Method / technical specification	
5.Current stage	Draft test procedure	
6.Final stage	Final test procedure	
7.Signification	Standards / Legislation	
8.Non commercial use or impact	Improvement of legislation / consumer testing	
9.Socio-economic impact	Improved side impact protection leading to reduction in accident casualties	
10.Documents/deliverables supporting the result	Reports	D1.1.2.A / D1.1.2.B
11.Who will be the customer?	Legal authorities, consumer organisations, industry	
12. Time to market	2010	
13.Contacts towards potential users	APROSYS / EEVC WG13 Workshop 2006, APSN / APROSYS Conference 2006, 20th ESV Conference 2007, APROSYS 'Final Event' 2009. Presentation and discussion of results at EEVC WG13 meetings and specially arranged workshops with further contacts via people who are APROSYS partners and also EEVC WG13 members. Direct contact with individual OEMs who were involved with APROSYS, whilst not being a partner.	
14.IPR. Have/will you protect this result? How? When	None	
15.Any obstacles	EEVC WG13, automotive lobby, legislation	
16.Additional research and development work	Likely to be performed by EEVC WG13 members	
17.Technical and economic market considerations	Pole test procedure will help bring cars with improved safety into the market place and thus help competiveness of the European automotive industry	

Exploitable result nr 9.3 Side impact FMH test development and evaluation		
1.Functionality	Test procedure for car side impact protection systems to improve Reg 95 and Euro NCAP consumer testing.	
2.Partners involved	BASt, TRL, CRF, IDADA, TUG	
3.Way of exploitation	Regulation / consumer testing	
4.Type of result	Method / technical specification	
5.Current stage	Draft test procedure	
6.Final stage	Final test procedure	
7.Signification	Standards / Legislation	
8.Non commercial use or impact	Improvement of legislation / consumer testing	
9.Socio-economic impact	Improved side impact protection leading to reduction in accident casualties	
10.Documents/deliverables supporting the result	Reports	D1.1.3.A /D1.1.3.B
11.Who will be the customer?	Legal authorities, consumer organisations, industry	
12. Time to market	2010	
13.Contacts towards potential users	APROSYS/EEVC WG13 Workshop 2006, APSN / APROSYS Conference 2006, 21st ESV Conference 2009, APROSYS 'Final Event' 2009. Presentation and discussion of results at EEVC WG13 meetings and specially arranged workshops with further contacts via people who are APROSYS partners and also EEVC WG13 members. Direct contact with individual OEMs who were involved with APROSYS, whilst not being a partner.	
14.IPR. Have/will you protect this result? How? When	None	
15.Any obstacles	EEVC WG13, automotive lobby, legislation	
16.Additional R&D work	Likely to be performed by EEVC WG13 members	
17.Technical and economic market considerations	FMH test procedure will help bring cars with improved safety into the market place and thus help competiveness of the European automotive industry	

Exploitable result nr 9.4 Side impact test OOP test development and evaluation		
1.Functionality	Test procedure for car side impact protection systems to improve Reg 95 and Euro NCAP consumer testing.	
2.Partners involved	TNO, Toyota IDIADA, TUG, TK-P	
3.Way of exploitation	Regulation / consumer testing	
4.Type of result	Method / technical specification	
5.Current stage	Draft test procedure	
6.Final stage	Final test procedure	
7.Signification	Standards / Legislation	
8.Non commercial use or impact	Improvement of legislation / consumer testing	
9.Socio-economic impact	Improved side impact protection leading to reduction in accident casualties	
10.Documents/deliverables supporting the result	Reports	D1.1.4
11.Who will be the customer?	Legal authorities, consumer organisations, industry	
12. Time to market	2010	
13.Contacts towards potential users	APROSYS/EEVC WG13 Workshop 2006, APSN / APROSYS Conference 2006, APROSYS 'Final Event' 2009. Presentation and discussion of results at EEVC WG13 meetings and specially arranged workshops with further contacts via people who are APROSYS partners and also EEVC WG13 members. Direct contact with OEMs who were involved with APROSYS, whilst not being a partner.	

Exploitable result nr 9.4 Side impact test OOP test development and evaluation		
14.IPR. Have/will you protect this result? How? When	None	
15.Any obstacles	EEVC WG13, automotive lobby, legislation	
16.Additional R&D work	Likely to be performed by EEVC WG13 members	
17.Technical and economic market considerations	Will help bring cars with improved safety into the market place and thus help competiveness of the European automotive industry	

Exploitable result nr 9.5 Non-stuck side occupant		
1.Functionality	Outline of concept for test procedure for car side impact protection systems to improve Reg 95 and Euro NCAP consumer testing.	
2.Partners involved	TUG, CRF, TRL	
3.Way of exploitation	Basis for further research	
4.Type of result	Method / technical specification	
5.Current stage	Concept	
6.Final stage	Final test procedure	
7.Signification	Standards / Legislation	
8.Non commercial use or impact	Improve car crash safety research knowledge	
9.Socio-economic impact	Improved side impact protection for reduction in accident casualties	
10.Documents/deliverables supporting the result	Report	D1.1.5.A
11.Who will be the customer?	Legal authorities, consumer organisations, industry	
12. Time to market	2015	
13.Contacts towards potential users	APROSYS Final Event 2009. Presentation and discussion of results at EEVC WG13 meetings and specially arranged workshops with further contacts via people who are APROSYS partners and also EEVC WG13 members. Direct contact with individual OEMs who were involved with APROSYS, whilst not being a partner.	
14.IPR. Have/will you protect this result? How? When	None	
15.Any obstacles	EEVC WG13, automotive lobby, legislation	
16.Additional R&D work	Likely to be performed by EEVC WG13 members	
17.Technical and economic market considerations	Will improve car crash safety research knowledge and thus help European automotive industry competiveness	

Exploitable result nr 9.6 Understanding of major influencing factors in side impact compatibility		
1.Functionality	Outline of concept of test procedure for car side impact protection systems to improve Reg 95 and Euro NCAP consumer testing.	
2.Partners involved	TRL, CRF, INSIA-UPM	
3.Way of exploitation	Basis for further research	
4.Type of result	Method / technical specification	
5.Current stage	Concept outline	
6.Final stage	Final test procedure	
7.Signification	Standards / Legislation	
8.Non commercial use or impact	Improve car crash safety research knowledge	
9.Socio-economic impact	Improved side impact protection for reduction in accident casualties	
10.Documents/deliverables supporting the result	Report	D1.1.5.B
11.Who will be the customer?	Legal authorities, consumer organisations, industry	
12. Time to market	2015	
13.Contacts towards potential users	APROSYS 'Final Event' 2009. Presentation and discussion of results at EEVC WG13 meetings and specially arranged workshops with further contacts via people who are APROSYS partners and	

Exploitable result nr 9.6 Understanding of major influencing factors in side impact compatibility	
	also EEVC WG13 members. Direct contact with individual OEMs involved with APROSYS, whilst not being a partner.
14.IPR. Have/will you protect this result? How? When	None
15.Any obstacles	EEVC WG13, automotive lobby, legislation
16.Additional R&D work	Likely to be performed by EEVC WG13 members
17.Technical and economic market considerations	Will improve car crash safety research knowledge and thus help European automotive industry competiveness

2.10 Main Result 10: New protection systems for vulnerable road users (VRU)

Exploitable Knowledge (description)	**Exploitable product(s) or measure(s)**	**Sector(s)** of application	**Timetable for commercial use**	**Patents or other IPR protection**	**Owner** & Other Partner(s) involved	**Originating SP**
10.1 Motorcyclist protective system; motorcyclist friendly barriers	Demonstrator of a safe roadside barrier	Road safety (infrastructure)	2009	None	**Hiasa**, Cidaut, Dekra, LMU, Altair, Fema	4
10.2 Development of thorax protector prototypes (male and female versions)	Thorax protector prototypes (male and female)	Protective equipment industry, further research	2009	None	**Dainese**, LMU, Unifi Cidaut, ALTAIR, Fema	4
10.3 Development of a helmet prototype with improved performance	Helmet prototype with improved performance	Motorcycle and helmet industry, further research	2011	Italian patent (International patent in process)	**Dainese**, **Unifi**, TNO, Cidaut, LMU	4
10.4 Passive Safety GridLoad Bonnet	Specification and hardware	Industry	2010	To be considered	**Cellbond**	3
10.5. Energy absorbing windscreen mounting system	Specification and hardware	Industry	2013	Patent applied	**CIC**	3
10.6 Integrated head protection system	Specification and hardware	Industry	2013	Patent	**TK-P**, CRF	3
10.7. Car front design concepts (active/adaptive)	Hardware	Industry	2013+	To be considered	**CRF,** Altair, Chalmers	3
10.8 HGV-Car Side under run protection	Guidelines for PC friendly lateral design of HGV & Demonstrators	Heavy good vehicles manufacturers (truck & trailer)	2019+	One underrun protection principle is patented by CRF	TUG, Dekra CRF, GDV, Altair, IFAM, IDIADA, SCB, TNO, TRL	2

Exploitable Knowledge (description)	**Exploitable product(s) or measure(s)**	**Sector(s)** of application	**Timetable for commercial use**	**Patents or other IPR protection**	**Owner** & Other Partner(s) involved	**Originating SP**
10.9 HGV-Car Side under run protection	Guidelines for VRU friendly frontal design of HGV & Demonstrators	Heavy good vehicles manufacturers (truck & trailer)	2019+	No	ika, TUG, Polito, CRF, Bolton, Daimler, TRL, Dekra, GDV, Altair	2
10.10. Simplified adaptive bumper concept	Prototype	Industry	2013+	To be considered	**CRF,** Altair, Chalmers	2

Exploitable result nr 10.1 Motorcyclist protective system; motorcyclist friendly barriers (roadside infrastructure)		
1.Functionality	To be attached to the current metal guardrails to offer protection to the motorcyclist when impacting the roadside barrier	
2.Partners involved	Hiasa, Cidaut, Dekra, Fema, LMU, ALTAIR	
3.Way of exploitation	This result could originate in a new product to be used in the roads	
4.Type of result	Device	
5.Current stage	Prototype	
6.Final stage	Pre-industrial product	
7.Signification	Standard/ Commercial	
8.Non commercial use or impact	Governmental use	
9.Socio-economic impact	Protective device will be important due to the high severity of the impact of motorcyclists against road infrastructure	
10.Documents/deliverables supporting the result	Prototype/Pre-industrial product	D4.4.4.A
11.Who will be the customer?	Road administrations	
12. Time to market	2009	
13.Contacts towards potential users	Technical Group at European level	
14.IPR. Have/will you protect this result? How? When	No	
15.Any obstacles	Technical possibility and feasibility to attach the new system at current roadside barrier systems	
16.Additional research and development work	No	
17.Technical and economic market considerations	Potential for development and implementation of new protective devices for motorcyclist to be set in safety barriers	

Exploitable result nr 10.2 Development of thorax protector prototypes (male and female versions)	
1.Functionality	Thorax protector including lateral protection to side ribs
2.Partners involved	Dainese, Unifi, LMU, Cidaut, ALTAIR, Fema
3.Way of exploitation	Commercial exploitation by DAINESE (industrial partner)
4.Type of result	Device
5.Current stage	Prototype
6.Final stage	Prototype
7.Signification	Commercial

Exploitable result nr 10.2 Development of thorax protector prototypes (male and female versions)		
8.Non commercial use or impact	Fully industrial use	
9.Socio-economic impact	The protector will reduce the effect of thorax impact that are quite common accordingly to the accidentology analysis	
10.Documents/deliverables supporting the result	Prototype	D4.3.3/D4.3.3.A/D4.3.3.B/D4.3.3.C
11.Who will be the customer?	Protective equipment industry, further research	
12. Time to market	2009	
13.Contacts towards potential users	None	
14.IPR. Have/will you protect this result? How? When	No	
15.Any obstacles	No	
16.Additional research and development work	Adaptation of thorax protector prototype to already existing garments	
17.Technical and economic market considerations	Potential for development new thorax protector for motorcyclists	

Exploitable result nr 10.3 Development of a helmet prototype with improved performance		
1.Functionality	Helmet prototype with improved safety on chin part and better behaviour against impacts	
2.Partners involved	Dainese, Unifi, TNO, LMU, Cidaut	
3.Way of exploitation	Commercial exploitation by DAINESE (industrial partner)	
4.Type of result	Device	
5.Current stage	Prototype	
6.Final stage	Prototype	
7.Signification	Commercial	
8.Non commercial use or impact	Fully industrial use	
9.Socio-economic impact	This helmet will reduce the injuries due to impact in the chin part as well as the effect of rotational acceleration. The socio-economic impact of this will be important due to the high severity of head damages suffered by motorcyclists when an accidents happens.	
10.Documents/deliverables supporting the result	Prototype	D4.3.2.A/D4.3.2.B/D4.3.2.C
11.Who will be the customer?	Motorcycle industry, helmet industry, further research	
12. Time to market	2011	
13.Contacts towards potential users	R22 regulation. WP29 of the United Nations Economic Commission for Europe	
14.IPR. Have/will you protect this result? How? When	Italian patent (International patent in process)	
15.Any obstacles	Cost of the final product	
16.Additional research and development work	Impact protection can be further improved in future research activities	
17.Technical and economic market considerations	Potential for development new helmet for motorcyclists	

Exploitable result nr 10.4 Passive Safety Grid Load Bonnet	
1.Functionality	Passive Safety GridLoad Bonnet
2.Partners involved	Cellbond
3.Way of exploitation	Products, licensing.
4.Type of result	Device/ technical specification
5.Current stage	Prototype
6.Final stage	Commercial product

Exploitable result nr 10.4 Passive Safety Grid Load Bonnet		
7.Signification	Commercial	
8.Non commercial use or impact	None	
9.Socio-economic impact	Contribution to reduced VRU injury severity.	
10.Documents/deliverables supporting the result	Prototype	D3.4.2C, D3.4.2E
11.Who will be the customer?	Vehicle manufacturers and Tier 1 suppliers	
12. Time to market	2010	
13.Contacts towards potential users	Vehicle manufacturers and Tier 1 suppliers	
14.IPR. Have/will you protect this result? How? When	To be considered as designs are developed. PressLoad and Grid-Load already Patented..	
15.Any obstacles	Car manufacturers may concentrate on active safety measures to prevent impacts and active safety systems to create under-bonnet clearance.	
16.Additional research and development work	Normal commercial product development.	
17.Technical and economic market considerations	Economic downturn may delay uptake of technology	

Exploitable result nr 10.5 Energy absorbing windscreen mounting system		
1.Functionality	Energy absorbing windscreen mounting design concept – developments to reduce VRU head injuries	
2.Partners involved	CIC	
3.Way of exploitation	Products, licensing.	
4.Type of result	Device/ technical specification	
5.Current stage	Prototype	
6.Final stage	Commercial product	
7.Signification	Commercial	
8.Non commercial use or impact	None	
9.Socio-economic impact	Contribution to reduced VRU injury severity.	
10.Documents/deliverables supporting the result	Prototype	D3.4.2.C
11.Who will be the customer?	Vehicle OEMs	
12. Time to market	2013	
13.Contacts towards potential users	Vehicle manufacturers and Tier 1 suppliers	
14.IPR. Have/will you protect this result? How? When	Patent applied	
15.Any obstacles	Changes in vehicle styling and construction may be required. OEMs may concentrate on active safety measures to prevent impacts. No regulatory pass/fail approval testing requirement on the windscreen.	
16.Additional research and development work	Normal commercial product development.	
17.Technical and economic market considerations	Economic downturn may delay uptake of technology	

Exploitable result nr 10.6 Integrated head protection airbag	
1.Functionality	Integrated head protection airbag – development of inflatable energy absorption devices for the windscreen region
2.Partners involved	TK-P, CRF
3.Way of exploitation	Products, licensing.
4.Type of result	Device/ technical specification
5.Current stage	Prototype

Exploitable result nr 10.6 Integrated head protection airbag		
6.Final stage	Commercial product	
7.Signification	Commercial	
8.Non commercial use or impact	None	
9.Socio-economic impact	Contribution to reduced VRU injury severity.	
10.Documents/deliverables supporting the result	Prototype	D3.4.2.C/D3.4.2.E
11.Who will be the customer?	Vehicle OEMs	
12. Time to market	2013	
13.Contacts towards potential users	vehicle manufacturers	
14.IPR. Have/will you protect this result? How? When	Patent	
15.Any obstacles	OEMs may concentrate on active pre-crash safety measures. No requirement for consumer or regulatory testing on windscreen region yet.	
16.Additional research and development work	Normal commercial product development.	
17.Technical and economic market considerations	Economic downturn may delay uptake of technology	

Exploitable result nr 10.7 Car front design concepts (active/adaptive)		
1.Functionality	Simplified adaptive bumper concept (or SABC): bumper that moves forward in order to improve the deformation space available to soften the leg impact; bumper extraction operated through gas-spring units that act as energy absorbers during the impact; retraction via four Bowden cables connected to an electric motor that recalls the four gas springs; adaptive control, based essentially on the vehicle speed; only simple sensors needed, slow actuation.	
2.Partners involved	CRF, Altair, Chalmers	
3.Way of exploitation	Products, licensing.	
4.Type of result	Device/ technical specification	
5.Current stage	Prototype	
6.Final stage	Commercial product	
7.Signification	Commercial	
8.Non commercial use or impact	None	
9.Socio-economic impact	Contribution to a reduction in the number of killed and injured pedestrians; and to reduction in the severity of injuries sustained by pedestrians.	
10.Documents/deliverables supporting the result	Prototype	D3.4.2.B/D3.4.2.E/D3.4.3.A
11.Who will be the customer?	Fiat (and other OEM‘s)	
12. Time to market	2013+	
13.Contacts towards potential users	Increasing based on conference presentations	
14.IPR. Have/will you protect this result? How? When	To be considered as designs are developed.	
15.Any obstacles	Agreement on the tests procedures for deployable systems. Car manufacturers may concentrate on active safety measures to prevent impacts and on purely passive safety solutions if other vehicle constraints/performances requires too complex to put into the adaptive systems (w.r.t. the simplified concept delivered by the project).	

16.Additional research and development work	Additional industrial product research and development is required if the adoption of a complete fully integrated system of this type is chosen for a new vehicle model
17.Technical and economic market considerations	Potential for development and implementation of new protective devices for pedestrian protection on cars , Potential for an highly distinctive styling characterization of the vehicle (static/dynamic styling variations) Need to consider complete systems fully integrated in the vehicle since the beginning of the design phase.

Exploitable result nr 10.8 HGV-Car Side under run protection		
1.Functionality	Guidelines, tests and performance criteria for car side underrun protection of HGV and demonstration of effectiveness	
2.Partners involved	TUG, CRF, Dekra, GDV, IFAM, IDIADA, Altair, Schmitz-Cargobull, TNO, TRL	
3.Way of exploitation	Guidelines will be available to the European community, exhibition of demonstrations, workshops, conferences, media;	
4.Type of result	Guidelines and Demonstration	
5.Current stage	other (guidelines, tests and performance criteria; demonstration)	
6.Final stage	other (final test and performance criteria)	
7.Signification	Legislation/Directives	
8.Non commercial use or impact	The analysis performed in deriving the design of the demonstrator can be used to update European regulations on heavy good vehicle homologation.	
9.Socio-economic impact	Improvements of heavy good vehicle safety design regarding car side impacts reduce road fatalities and mitigate injuries. This effects the social costs for the European community.	
10.Documents/deliverables supporting the result	Guidelines, tests and performance criteria; demonstration	D2.2.1/D2.2.2/D2.2.3/D2.2.4/D2.2.5
11.Who will be the customer?	Regulatory entities	
12. Time to market	2019+, depending on political decisions	
13.Contacts towards potential users	Not applicable	
14.IPR. Have/will you protect this result? How? When	One under run protection device idea is patented by CRF.	
15.Any obstacles	Willingness to pay for safety; political decisions;	
16.Additional research and development work	New design of truck/trailer structure to integrated a full under run protection instead of using add-on solutions;	
17.Technical and economic market considerations	Redesign of truck/trailer concept to get an integrated under run protection instead of an add-on device; Add-on results always in extra weight and is without regulation not really considered by the market.	

Exploitable result nr 10.9 HGV-VRU protection system	
1.Functionality	Guidelines for designing VRU friendly front structure of HGV and demonstration of effectiveness as well as additional benefits (e.g. less fuel consumption)
2.Partners involved	IKA-Aachen, TUG, CRF, Bolton, Dekra, Polito, Daimler, TRL, GDV, Altair
3.Way of exploitation	Guidelines will be available to the European community, exhibition of demonstrators, workshops, conferences, media Presentation of road map to politicians to promote research activities and measures for safer European roads;

Exploitable result nr 10.9 HGV-VRU protection system		
4.Type of result	Guidelines / Demonstration	
5.Current stage	Guidelines	
6.Final stage	Guidelines	
7.Signification	Standards	
8.Non commercial use or impact	The analysis performed in deriving the design of the demonstrator can be used to update European regulations on heavy good vehicle homologation	
9.Socio-economic impact	Improvements of heavy good vehicle safety design regarding vulnerable road users will reduce road fatalities and mitigate injuries. This will reduce the social costs for the European community.	
10.Documents/deliverables supporting the result	Prototype / Guidelines	D2.2.1/D.2.2.2/D2.2.3/D2.2.4/D2.2.5
11.Who will be the customer?	Truck / trailer manufacturers	
12. Time to market	Ready for use	
13.Contacts towards potential users	No	
14.IPR. Have/will you protect this result? How? When	No	
15.Any obstacles	Industry could not accept cost; regulation could support introduction of beneficial design; best way is to have an integrated design with other benefits (e.g. less fuel consumption)	
16.Additional research and development work	No; development by manufacturers (application of research work / HVAI index)	
17.Technical and economic market considerations	Only if other benefits are there beside passive safety; active safety measures will provide additional benefits to reduce fatalities.	

Exploitable result nr 10.10 Simplified adaptive bumper concept		
1.Functionality	Simplified adaptive bumper concept (or SABC): bumper that moves forward in order to improve the deformation space available to soften the leg impact; bumper extraction operated through gas-spring units that act as energy absorbers during the impact; retraction via four Bowden cables connected to an electric motor that recalls the four gas springs; adaptive control, based essentially on the vehicle speed; only simple sensors needed, slow actuation.	
2.Partners involved	CRF, Altair, Chalmers	
3.Way of exploitation	Products, licensing.	
4.Type of result	Device/ technical specification	
5.Current stage	Prototype	
6.Final stage	Commercial product	
7.Signification	Commercial	
8.Non commercial use or impact	None	
9.Socio-economic impact	Contribution to a reduction in the number of killed and injured pedestrians; and to reduction in the severity of injuries sustained by pedestrians.	
10.Documents/deliverables supporting the result	Prototype	D3.4.2B/D3.4.2.E/D3.4.3.A
11.Who will be the customer?	OEM (Fiat)	
12. Time to market	2013+	
13.Contacts towards potential users	APROSYS final event exhibition	

14.IPR. Have/will you protect this result? How? When	To be considered as designs are developed.
15.Any obstacles	Agreement on the tests procedures for deployable systems. Car manufacturers may concentrate on active safety measures to prevent impacts and on purely passive safety solutions if other vehicle constraints/performances requires too complex to put into the adaptive systems (w.r.t. the simplified concept delivered by the project).
16.Additional research and development work	Additional industrial product research and development is required if the adoption of a complete fully integrated system of this type is chosen for a new vehicle model
17.Technical and economic market considerations	Potential for development and implementation of new protective devices for pedestrian protection on cars , Potential for an highly distinctive styling characterization of the vehicle (static/dynamic styling variations) Need to consider complete systems fully integrated in the vehicle since the beginning of the design phase.

2.11 Other results – other

Exploitable Knowledge (description)	**Exploitable product(s) or measure(s)**	**Sector(s)** of application	**Timetable for commercial use**	**Patents or other IPR protection**	**Owner** & Other Partner(s) involved	**Originating SP**
11.1. In depth accident database for vulnerable road users	Database	Motorcycle industry, standard development, protective equipment industry	2007	IPR to owner	**BASC,** Chalmers, DC, INSIA, TRL	3
11.2 Injury criteria developed for motorcyclists	Criteria to develop regulations and standards	Motorcycle & industry, protective equipment industry	2009	None	**LMU,** Cidaut, ALTAIR, Dekra	4
11.3 AgedMAT	Software application	Motorcycle and protective equipment industry, standard development	2009	IPR via Source code	**UPM-INSIA**, TRL	5
11.4 Statistical methods for injury risk functions	Best practice guidelines	Automotive safety	2009	None	**TRL**	5

Exploitable result nr 11.1 In depth accident database for vulnerable road users	
1.Functionality	In depth accident database for vulnerable road users
2.Partners involved	BASC, Chalmers, DC, INSIA, TRL
3.Way of exploitation	Exploitable only within APROSYS Consortium
4.Type of result	Database
5.Current stage	Confidential information for APROSYS Consortium only
6.Final stage	Confidential information for APROSYS Consortium only
7.Signification	Commercial/Standards/Legislation/Directives

Exploitable result nr 11.1 In depth accident database for vulnerable road users		
8.Non commercial use or impact	R&D, future EU projects	
9.Socio-economic impact	Greater understanding of VRU impacts, recognition of full range of real world injuries leading to improved test methods and reduced injury levels.	
10.Documents/deliverables supporting the result	Database	D3.1.1, D3.1.3
11.Who will be the customer?	R&D, future EU projects	
12. Time to market	2007	
13.Contacts towards users	Future FP7 projects	
14.IPR. Have/will you protect this result? How? When	IPR at owner	
15.Any obstacles	No	
16.Additional research and development work	Additional of more accident cases (including cyclists) to expand scope and improve ability to accurately represent the real world.	
17.Technical and economic market considerations	Public information	

Exploitable result nr 11.2 Injury criteria developed for motorcyclists		
1.Functionality	Dedicated injury criteria for motor cyclists.	
2.Partners involved	LMU, Cidaut, Dekra, ALTAIR	
3.Way of exploitation	These injury criteria can be used in the future standards related with motorcyclists' protection	
4.Type of result	Technical specification	
5.Current stage	Idea	
6.Final stage	Model	
7.Signification	Standards	
8.Non commercial use or impact	Commercial use is not applicable to this result. Exploitation will be based through the use of injury criteria in standards.	
9.Socio-economic impact	Improvement of standards	
10.Documents/deliverables supporting the result	Model	D4.4.2.2
11.Who will be the customer?	Research centre and Universities.	
12. Time to market	2009, commercial use is not applicable to this result.	
13.Contacts towards users	CEN TC 226 (Road project)	
14.IPR. Have/will you protect this result? How? When	No	
15.Any obstacles	No	
16.Additional research and development work	These criteria will be focused on impact of motorcyclists against barriers.	
17.Technical and economic market considerations	Some standards would need to be reviewed.	

Exploitable result nr 11.3 AgedMAT	
1.Functionality	Modifications of FE human models to take into account the age dependency of human tissue.
2.Partners involved	UPM-INSIA and TRL
3.Way of exploitation	Freeware
4.Type of result	software
5.Current stage	pre-industrial product
6.Final stage	commercial product
7.Signification	Commercial/Standards/Legislation/Directives

Exploitable result nr 11.3 AgedMAT		
8.Non commercial use or impact	Tool to be free distributed through the research community to improve the quality of FE human body models used in safety having into account the age effect in the human tissue properties.	
9.Socio-economic impact	More accurate human models for injury prediction and design safer vehicles for a wider range of population. Increase the virtual testing possibilities to take into account the special safety requirements of elderly people.	
10.Documents/deliverables supporting the result		D5.1.2.C
11.Who will be the customer?	Potentially any interested party in the research community	
12. Time to market	Ready for market – commercial use (2009)	
13.Contacts towards users	Research and Universities	
14.IPR. Have/will you protect this result? How? When	The source code is the IPR of UPM-INSIA. The development work contributing to the know-how of UPM-INSIA and TRL	
15.Any obstacles	Apart from the development, the tool makes use of existing information available in the literature.	
16.Additional R&D work	More widespread evaluation by commercial organisations?	
17.Technical and economic market considerations	Improve modelling of age effect	

Exploitable result nr 11.4 Statistical methods for injury risk functions		
1.Functionality	Best practice guidelines on statistical derivation of injury risk functions for crash test dummies, human body models and other test tools	
2.Partners involved	TRL	
3.Way of exploitation	Future work programmes, application within the European Enhanced Vehicle-safety Committee	
4.Type of result	method/process know-how	
5.Current stage	Idea	
6.Final stage	Ratified idea	
7.Signification	Standards/Legislation/Directives	
8.Non commercial use or impact	Cost-benefit of proposed and new test procedures, for instance for new regulations or consumer information test procedures	
9.Socio-economic impact	Definition of new safety systems, and test procedures to encourage the development of new safety systems, that deliver the predicted injury reduction benefit	
10.Documents/deliverables supporting the result		D5.1.2B
11.Who will be the customer?	Research groups within the automotive safety field and potentially also applicable for wider biomechanical research	
12. Time to market	2009	
13.Contacts towards users	Dummy and Human body model suppliers	
14.IPR. Have/will you protect this result? How? When	No	
15.Any obstacles	None	
16.Additional R&D work	No	
17.Technical and economic market considerations	None	

3 Dissemination of knowledge

This Chapter deals with dissemination of the knowledge generated within APROSYS including some of the planned activities after the completion of the project. The Chapter is organized in separate sections dealing with the various subprojects within APROSYS as well as a section dealing with SP8 and general APROSYS management dissemination activities. Within each section a subdivision is made in conference contribution, journal articles, presentations and other dissemination activities.

3.1 SP1 Dissemination activities

3.1.1 SP1 Conference papers

Title	Authors	Conference	Town	Country	Year	MR
Development and evaluation of the side impact test procedure proposed by IHRA	T Versmissen, M van Schijndel, M Edwards, T Langner	20th ESV conference	Lyon	France	2007	9
Development of a high deceleration full width frontal impact test for Europe	M Edwards	21th ESV conference	Stuttgart	Germany	2009	8
A generic evaluation methodology for advanced safety systems	M McCarthy	21th ESV conference	Stuttgart	Germany	2009	4
Evaluation of the performance of competitive head forms as test tools for interior head form testing	T Langner	21st ESV Conference	Stuttgart	Germany	2009	9

3.1.2 SP1 Journal papers

Title	Authors	Journal	Year	MR
A generic evaluation methodology for advanced safety systems	M McCarthy, R de Lange	International Journal of Crashworthiness Vol 13, No 6	2008	4

3.1.3 SP1 Presentations

Title	Authors	Conference	Town	Country	Year	MR
Development of the generic evaluation methodology	SP1 partners	Joint workshop with members of PREVENT	Brussels	Belgium	2006	4
Development of the generic evaluation methodology	SP1 partners	Joint workshop with members of PREVENT sub-projects APALCI and COMPOSE	Brussels	Belgium	2006	4
Development and evaluation of the side impact test procedure proposed by IHRA	M Bosch-Rekveldt, M Edwards	APSN / APROSYS Conference	Vienna	Austria	2006	9
Development of a full width frontal impact test for	M Edwards	7th European Vehicle Passive Safety	Maastricht	The Netherlands	2007	8

Title	Authors	Conference	Town	Country	Year	MR
Europe		Conference				
Development and initial evaluation of a generic evaluation methodology for advanced safety systems	R de Lange	7th European Vehicle Passive Safety Conference	Maastricht	The Netherlands	2007	4
Results of APROSYS	M Edwards	GRSP Informal Working Group	Genève	Switzerland	2008	8

3.1.4 SP1 Others

Description of activity	Date	Countries addressed	Size of audience	Type of audience	Partners responsible	Related to MR
PReVENT / APROSYS SP1.3 workshop	March 2006	Europe	40	Research organisation / Industry	VW	4
EEVC WG13 Workshop – Review of AE-MDB test	July 2006	EEVC WG13 member countries	20	Research organisation / Industry	BASt, TNO, TRL	9
APROSYS SP1.3 / APALACI / COMPOSE joint workshop	November 2006	Europe	40	Research organisation / Industry	VW	4
WP1.3 presented generic methodology at SP6 road show on adaptive safety systems	June 2007	Europe	100	Research organisation / Industry	Daimler, VW	4

3.2 SP2 Dissemination activities

3.2.1 SP2 Conference papers

Title	Authors	Conference	Town	Country	Year	MR
Fußgänger- und Radfahrer Schutz bei Nutzfahrzeugen	F. Feist, E. Mayrhofer	DEKRA/VDI Symposium Sicherheit von Nutzfahrzeugen	Neumünster	Germany	2006	10
Interaction between Vulnerable Road Users and Heavy Truck Front	F. Feist	Printed in Journal of Crashworthiness Presented at ICrash	Athens	Greece	2006	10
Heavy Vehicle Accidents Involving Pedestrians & Cyclists	R. Puppini, P. Smeriglio, L. Consano, E. Mayrhofer	TRA 2006 Conference proceedings	Gothenburg	Sweden	2006	7
Improvements to the protection of vulnerable road users: retrofit table, energy absorbing front-end for heavy goods vehicles	F. Feist, J. Gugler, A. Giorda, M. Avalle, R. Puppini	Journal of Crashworthiness, Presented at Icrash	Kyoto	Japan	2008	10

3.2.2 SP2 Journal papers

Title	Authors	Journal	Year	MR
Unfallrisiken minimieren und Sicherheit steigern	IKA	ika 2006 Automotive Trends	2006	7
Bewertungsmethoden und Verbesserungspotenziale für fußgängerfreundliche LkwBewertungsmethoden und Verbesserungspotenziale für fußgängerfreundliche	IKA	OEM & Lieferant 2006 · Messeausgabe ika	2006	7
Hemisphären Tests einer LKW Fahrerkabine	TUG	Forschungsjournal TU Graz, ISBN: 3-902465-18-2	2005	7
Interaction between Vulnerable Road Users and Heavy Truck Front	TUG	Printed in Journal of Crashworthiness Presented at ICrash	2006	10
The heavy goods vehicle aggressivety index	F. Feist, J. Gugler, T. Robinson, S. Faßbender, W. Niewöhner, J. Barrios, A. Aparicio	ESV 2009	2009	7
Pedestrian collisions with flat-fronted vehicles: injury patterns and importance of rotational accelerations as a predictor for traumatic brain injury	F. Feist, C. Arregui-Dalmases, E. Del pozo, F. López-Valdés, C. Deck, R. Willinger, J.Gugler	ESV 2009	2009	10

3.2.3 SP2 Presentations

Title	Authors	Conference	Town	Country	Year	MR
Fußgänger-LKW Unfälle: Relevanz, Bewertung und Simulation	TUG	Zweiter Nutzfahrzeug Workshop - Graz	Graz	Austria		7
Relevance, Evaluation of Structural Aggressivity and Numerical Simulation	TUG	APSN/APROSYS conference	Vienna	Austria	2006	7
Hemisphere Testing of a Heavy Goods Vehicle	F. Feist	Joint Workshop WP 4.2 and UG 5.3 on Test Procedures of Heavy Goods Vehicles	Aachen	Germany	2006	10

3.2.4 SP2 Others

Description of activity	Date	Countries addressed	Size of audience	Type of audience	Partners responsible	Related to MR
Aggressivity index addressed at TRUM (Torino Radioss Users meeting)	October 2006	Europe	80	Research organization, Industry	CRF	7
Poster on Structural Aggressivity of a HV Driver Cabin at Young APSN conference in Warsaw	2006	Europe	20	Young researchers	TUG	7
Workshop Vulnerable Road User Protection for Heavy Goods Vehicles	2008	World-wide	30	Industries, Research organisa-	TUG, Dekra	7, 10

Description of activity	Date	Countries addressed	Size of audience	Type of audience	Partners responsible	Related to MR
				tions, Public organisations		
Workshop on Partner Protection for Heavy Goods Vehicles with focus on Side Underrun Protection	2008	World-wide	30	Industries, Research organisations, Public organisations	TUG, IDIADA	10

3.3 SP3 Dissemination activities

3.3.1 SP3 Conference papers

Title	Authors	Conference	Town	Country	Year	Related to MR
Accident reconstruction - reconstruction of head to bonnet impact in child pedestrian to passenger car collisions	J. Yang, D. Otte	IRCOBI Conference	Prague	Czech Republic	2005	7 and 10
Pedestrian and cyclist safety in APROSYS	R.N. Hardy	Aachen Colloquium	Aachen	Germany	2005	7
Glass testing	J. Gruenert	APSN/APROSYS Conference	Vienna	Austria	2006	Other
Pedestrian Protection in Case of Windscreen Impact	IKA Aachen, BASt, BASC	Crash.tech Conference session "Pedestrian Safety"	Leipzig	Germany	2007	10
Towards an improved pedestrian legform test procedure	INSIA	APROSYS 4th General Assembly	Florence	Italy	2007	7
APROSYS European In-Depth Pedestrian Database	BASC, CIC	ESV Conference	Lyon	France	2007	7 and 10
Stiffness corridors of the European fleet for pedestrian simulations	INSIA, Chalmers	ESV Conference	Lyon	France	2007	Other
Pedestrian safety enhancement using numerical methods	D. Baumgartner, D. Marjoux, R. Willinger, E. Carter, C.Neal-Sturgess, L. Guerra, L. Martinez, R. Hardy	ESV Conference	Lyon	France	2007	7
Pedestrian accident reconstructions methodology using detailed vehicle models and age-dependent leg fracture limits on the pedestrian	L. Martínez, L. Guerra, G. Ferichola, A. García	IRCOBI Conference	Maastricht	The Netherlands	2007	7 and 10
Evaluating the influence of rotational kinematics on pedestrian head to windshield impacts	J. Mordaka, S. Kleiven, M. van Schijndel, R. de Lange, L. Guerra, E. Carter, H. von Holst	IRCOBI Conference	Maastricht	The Netherlands	2007	7
An Investigation into cyclist	J.W. Watson,	7th European Pas-	Maas-	The Neth-	2007	7

Title	Authors	Conference	Town	Country	Year	Related to MR
accident kinematics and injuries	R.N. Hardy	sive Safety Conference	tricht	erlands		
Vulnerable road user safety in APROSYS	R.N. Hardy	Aachen Colloquium	Aachen	Germany	2007	7
APROSYS SP3: A pedestrian and cyclist perspective	R.N. Hardy	SP7 workshop	Helmond	The Netherlands	2008	7
Finite element analysis of car to cyclist accidents	J.W. Watson, R.N. Hardy	Multi-strand Conference	Cranfield	UK	2008	7
Influence of vehicle shape and stiffness on the pedestrian lower extremity injuries: review of current pedestrian lower leg test procedure	L. Martínez, S Compigne, L.. Guerra	IRCOBI Conference	Bern	Switzerland	2008	7 and 10
Evaluation of a flexible pedestrian legform impactor (Flex-PLI) for the implementation within legislation on pedestrian protection	O. Zander, D. Gehring, P. Leßmann, J. Bovenkerk	ESV Conference	Stuttgart	Germany	2009	7
New Modular assessment concept for Pedestrian Protection in the event of Head Impacts in the Windscreen Area	J. Bovenkerk, O. Zander, I. Kalliske	ESV Conference	Stuttgart	Germany	2009	7
Safety requirements for cyclists during car impacts to the legs	R.N. Hardy, J.W. Watson, K. Kayvantash	ESV Conference	Stuttgart	Germany	2009	7
Understanding the nature of cyclists' head impacts	J.W. Watson, R.N. Hardy, K. Kayvantash	IRCOBI Conference	York	UK	2009	7
Safety requirements for cyclists during car impacts to the legs	R.N. Hardy, J.W. Watson, K. Kayvantash	IRCOBI Conference	York	UK	2009	7

3.3.2 SP3 Journal papers

Title	Authors	Journal	Year	MR
Vulnerable road user safety in APROSYS	R.N. Hardy	ATZ Auto technology	2008	7
Influence of pedestrian head surrogate and boundary conditions on head injury risk prediction	V. Tinard, C. Deck, F. Meyer, N. Bourdet, R. Willinger	Int. J. Crashworthiness	2008	7
Improved Head Injury Criteria Based on Head FE Model	C. Deck, R. Willinger	Int. J of Crashworthiness	2008	7
APROSYS in-depth database of serious pedestrian and cyclist impacts with vehicles	E.L. Carter, C.E. Neal-Sturgess, R.N. Hardy	Int. J of Crashworthiness	2008	7, 10
MADYMO reconstruction of a real-world collision between a vehicle and cyclist	E. Carter, C. E. Neal-Sturgess	Int. J of Crashworthiness	2009	7, 10

3.3.3 SP3 Presentations

Title	Authors	Conference	Town	Country	Year	MR
Accident reconstruction - reconstruction of head to bonnet impact in child pedestrian to passenger car collisions	J. Yang, D. Otte	IRCOBI Conference	Prague	Czech Republic	2005	7, 10
Pedestrian and cyclist safety in APROSYS	R.N. Hardy	Aachen Colloquium	Aachen	Germany	2005	7
Pedestrian Protection in Case of Windscreen Impact	IKA	Crash.tech Conference session "Pedestrian Safety"	Leipzig	Germany	2007	10
Towards an improved pedestrian legform Test Procedure	INSIA	APROSYS 4th General Assembly	Florence	Italy	2007	7
APROSYS European In-Depth Pedestrian Database	BASC, CIC	ESV Conference	Lyon	France	2007	7, 10
Stiffness corridors of the European fleet for pedestrian simulations	L. Martínez, L. Guerra, G. Ferichola, A. García, J. Yang	ESV Conference	Lyon	France	2007	7, 10
Pedestrian safety enhancement using numerical methods	D. Baumgartner, D. Marjoux, R. Willinger, E. Carter, C. Neal-Sturgess, L. Guerra, L. Martinez, R. Hardy	ESV Conference	Lyon	France	2007	7
Active pedestrian head protection against windscreen impact	V. Tinard, N. Bourdet, C. Deck, R. Willinger	Enhanced Safety of Vehicles Conference.	Lyon	France	2007	10
Pedestrian accident reconstructions methodology using detailed vehicle models and age-dependent leg fracture limits on the pedestrian	L. Martínez, L. Guerra, G. Ferichola, A. García	IRCOBI Conference	Maastricht	The Netherlands	2007	7

Title	Authors	Conference	Town	Country	Year	MR
Evaluating the influence of rotational kinematics on pedestrian head to windshield impacts	J. Mordaka, S. Kleiven, M. van Schijndel, R. de Lange, L. Guerra, E. Carter, H. von Holst	IRCOBI Conference	Maastricht	The Netherlands	2007	7
An Investigation into cyclist accident kinematics and injuries	J.W. Watson	7th European Passive Safety Conference	Maastricht	The Netherlands	2007	7
Vulnerable road user safety in APROSYS	R. Hardy	Aachen Colloquium	Aachen	Germany	2007	7
APROSYS SP3: A pedestrian and cyclist perspective	R. Hardy	SP7 workshop	Helmond	The Netherlands	2008	7
Opportunities for improved safety from pedestrian test procedures	R. Hardy	SP3 VRU workshop	Brussels	Belgium	2008	7
Crash friendlier cars for cyclists	C. Rodarius	SP3 VRU workshop	Brussels	Belgium	2008	7
Head injury criteria	R. Willinger	SP3 VRU workshop	Brussels	Belgium	2008	7
Edge testing for head impacts	J. Bovenkerk	SP3 VRU workshop	Brussels	Belgium	2008	7
Head-Neck testing	J. Fernandez	SP3 VRU workshop	Brussels	Belgium	2008	7
Leg impacts	L. Martinez, S. Compigne	SP3 VRU workshop	Brussels	Belgium	2008	7
Current status of the Flex PLI evaluation	O. Zander	SP3 VRU workshop	Brussels	Belgium	2008	7
Hybrid test procedure	R. Meijer	SP3 VRU workshop	Brussels	Belgium	2008	7
Testing procedures relating to cyclists	R. Hardy	SP3 VRU workshop	Brussels	Belgium	2008	7
Finite element analysis of car to cyclist accidents	J.W. Watson, R.N. Hardy	Multi-strand Conference	Cranfield	UK	2008	7
Influence of vehicle shape and stiffness on the pedestrian lower extremity injuries: review of current pedestrian lower leg test procedure	L. Martínez, S. Compigne, L. Guerra	IRCOBI Conference	Bern	Switzerland	2008	7
New test methods for pedestrians and cyclists - developments to more widely address real world accident scenarios	R.N. Hardy	APROSYS Final Event	Amsterdam	The Netherlands	2009	7
Advanced protection systems for pedestrians – solutions implemented on the Fiat Stilo prototype	R. Puppini	APROSYS Final Event	Amsterdam	The Netherlands	2009	10
Evaluation of a flexible pedestrian legform impactor (FlexPLI) for the implementation within legislation on pedestrian protection	O. Zander, D. Gehring, P. Leßmann, J. Bovenkerk	ESV Conference	Stuttgart	Germany	2009	7
New Modular Assessment Methods for Pedestrian Protection in the event of Head impacts in windscreen area	J. Bovenkerk, O. Zander I. Kalliske	ESV Conference	Stuttgart	Germany	2009	7
Safety requirements for cyclists during car impacts to the legs	R.N. Hardy, J.W. Watson, K. Kayvantash	ESV Conference	Stuttgart	Germany	2009	7
Understanding the nature of cyclists' head impacts	J.W. Watson, R.N. Hardy, K. Kayvantash	IRCOBI Conference	York	UK	2009	7

3.3.4 SP3 Others

Description of activity	Date	Countries addressed	Size of audience	Type of audience	Partners responsible	Related to MR
VRU Accidentology Workshop, Brussels	September 2006	Europe	22	Technical/ Research/Road safety	CIC, BASC, Daimler, INSIA, Chalmers, TRL, TU Graz,	7
Workshop on initial concepts for new or improved VRU test methods, Brussels	June 2008	Europe	42	EC and National administrations / regulatory bodies / Universities / Research Institutes	CIC, IKA Aachen, TRL, TNO, ULP, TK-P, Toyota, INSIA, BASt,	7

3.4 SP4 Dissemination activities

3.4.1 SP4 Conference papers

Title	Authors	Conference	Town	Country	Year	MR
Powered Two-Wheeler Accidents – First Results of APROSYS SP4 Implying GIDAS 2002 Data“ and speech	Dekra	2nd ESAR Conference	Hannover	Germany	2006	All
Erste Ergebnisse des Europäischen Projekts zur Erhöhung der passiven Sicherheit motorisierter Zweiräder” and speech	Dekra	6th International Motorcycle Conference	Cologne	Germany	2006	All
Basic work on injury mechanisms related to motorcyclists and roadside barriers	LMU	Congress of the German Society of Traffic Medicine	Hamburg	Germany	2007	1
Methodology used for development of test standard for barriers.	LMU, Cidaut, Dekra	20th Enhanced Saftey of Vehicles Conference	Lyon	France	2007	7, 10
Technical bases for the development of a test standard for impacts of powered two-wheelers on roadside barriers	S. Peldschus, E. Schuller, J. Koenig, M. Gaertner, D. Garcia, A. Mansilla	20th Enhanced Saftey of Vehicles Conference	Lyon	France	2007	7, 10
Application of numerical simulation of thoracical injury mechanisms in the development of protective systems for powered two-wheelers	S. Peldschus, K. Merten, E. Schuller	6th International VDI Congress Car Safety	Dusseldorf	Germany	2007	1
Application of a FE human model to the simulation of motorcycle accidents involving roadside barriers	S Peldschus, E Schuller	5th International Forum of Automotive Traffic Safety	Changsha	China	2007	1, 7, 10

Title	Authors	Conference	Town	Country	Year	MR
APROSYS SP4: Advanced testing procedures for protective measures on rider equipment and road furniture	S. Peldschus, E. Schuller, B. Pérez-Magallón, D. García, A. Mansilla, M. Pierini, N. Baldanzini S. Bidal, D. Manzardo V. Tinard, R. Willinger	7th International Motorcycle Conference	Cologne	Germany	2007	7
Development of a thorax protector for motorcyclists	D. Manzardo S. Peldschus, S. Bidal, D. Garcia, A. Delhaye, M. Pierini	21st Enhanced Safety of Vehicles Conference	Stuttgart	Germany	2009	10

3.4.2 SP4 Journal papers

Title	Authors	Journal	Year	MR
Accidents of motorcyclists against roadside infrastructure	F. López-Valdés, F. García, J. Moreno, J. Pedrero	IUTAM, Symposium on Impact Biomechanics: from fundamental insights to applications	2005	7, 10
Overview on the development of a test standard for the evaluation of motorcyclists´ impacts on road infrastructure elements	D. García-Ruiz, B. Pérez-Magallón , S. Peldschus, E. Schuller , A. Mansilla Gallo	International Journal of Crashworthiness	2009	7

3.4.3 SP4 Presentations

Title	Authors	Conference	Town	Country	Year	MR
APROSYS within the ISO 13232 group. Mr Jens König is the regional accident database manager for Europe in ISO 13232 group	J. König	ISO 1332 group	Brussels	Belgium	2006	All
SP4 activities	Cidaut	TRA Conference (Transport Research Arena Europe)	Goteborg	Sweden	2006	All
Presentation of basic work on injury mechanisms related to motorcyclists and roadside barriers	LMU	6th International Motorcycle Conference	Cologne	Germany	2006	1, 7
Accident research	Dekra	2nd ESAR Conference	Hannover	Germany	2006	All
Motorcycle research	Dekra	6th International Motorcycle Conference	Cologne	Germany	2006	All
Simulation of motorcyclists' impacts on roadside barriers using a numerical human	S. Peldschus, E. Schuller	6th International Motorcycle Conference	Cologne	Germany	2006	1, 7

Title	Authors	Conference	Town	Country	Year	MR
model						
Paper of basic work on injury mechanisms related to motorcyclists and roadside barriers	Cidaut, Dekra	Congress of the German Society of Traffic Medicine	Hamburg	Germany	2007	1, 7
Presentation of SP4 results	Cidaut, Piaggo	PReVENT final event	Versailles	France	2007	All
Presentation of SP4 results	Piaggo	Technical working group of ISO/TC22/SC22/WG 22	Brussels	Belgium	2008	All
Presentation of SP4 results	SP4 partners	Final SP4 Workshop: 'Passive Safety Systems for Motorcycles'	Neumünster	Germany	2009	All
Presentation of the prototype thorax protector developed in APROSYS	Dainese	Working Group 'CEN/TC 162 - WG9' for the definition of a new 'European Standard for thorax protectors'	Brussels	Belgium	2009	10

3.4.4 SP4 Others

Description of activity	Date	Countries addressed	Size of audience	Type of audience	Partners responsible	Related to MR
Article about APROSYS activities in the CIDAUT magazine (CABIRO)	2006	Spain	600	Internal as well as different stakeholders in the automotive sector	Cidaut	All
CIDAUT webpage describing APROSYS work	2006	World-wide	200	General public	Cidaut	All
Conference in the 1st APSN Workshop on PTW Safety.	2006	World-wide	50	Research / Industry / Associations	Unifi	7, 10
Accidentology analysis related to PTWs in Italy and in Europe. VIII Workshop on traffic safety organized in the Lombardia Region	December 2006	Italy	50	Researchers	Unifi	10
Improving motorcyclist safety. Web publication in AMI (Italian Association of Safe Motorcyclist)	January 2007	Italy	500	Associations / Researchers	Unifi	All
Dissemination activities of APROSYS SP4 results within SIM project (6FP)	January 2007	World-wide	25	SIM partners	Piaggio, Cidaut, Dekra	7, 10
Workshop "Impacts of motorcyclists into road infrastructure"	June 2007	World-wide	150	National administrations / EC / regulatory bodies / road infrastructure manufacturers / Universities / Re-	Cidaut, LMU	7, 10

Description of activity	Date	Countries addressed	Size of audience	Type of audience	Partners responsible	Related to MR
				search Institutes / Motorcycle manufacturers		
Participation in Workshop 'SIM / PISa: Presentation of SP4 WP43 and SIM WP4 cooperation.	May 2008	World-wide	30	Motorcycle engineers	Piaggio, UNIFI	7, 10
Participation in 'INTE-ROUTE VILLE 2008': Presentation of French barrier together with Motorcyclists Protective Device developed in SP4.	September 2008	World-wide	50	General public	HIASA	7, 10
Presentation of APROSYS results in 'FISITA Congress': Exhibition of thorax protector prototype developed in SP4.	September 2008	World-wide	250	Automotive engineers	TNO	All
Poster with some pictures from APROSYS SP4 activities in the stand of Regional Government of Valencia during 'Motorcycle World Championship'.	October 2008	World-wide	5000	General public	CIDAUT	7, 10
Presentation of the development of a new helmet at the '6th SISS International Show on Road Safety'.	November 2008	World-wide	50	General public	UNIFI	10
Final SP4 Workshop: 'Passive Safety Systems for Motorcycles'	January 2009	World-wide	50	OEM's First Tiers, R&D, press	DEKRA	All
Presentation on the Regional Spanish TV Channel 'TVCyL' of the Standard Proposal for testing MPD	March 2009	Regional (Spanish region of Castilla y León)	Regional significance	General public	CIDAUT	7, 10

3.5 SP5 Dissemination activities

3.5.1 SP5 Conference papers

Title	Authors	Conference	Town	Country	Year	MR
Characterisation of the compressive behaviour of brain tissue and constitutive modelling	M. Hrapko, H. Gervaise, J. van Dommelen, G. Peters, J. Wismans.	Conference on Biomechanics of impact	Maastricht	The Netherlands	2007	1
Characterization of the compressive behaviour of brain tissue and constitutive modelling	M. Hrapko, J. Van Dommelen, G Peters	4th Annual European Rheology Conference	Naples	Italy	2007	1

Title	Authors	Conference	Town	Country	Year	MR
Mechanics of traumatic brain injury: influence of the sub-structure	J. van Dommelen, R. Cloots, M. Lauret, M. Hrapko, G. Peters , M.Geers	ASME Applied Mechanics and Materials Conference, McMat	Austin	USA	2007	1
The mechanical behaviour of brain tissue, large strain response	M. Hrapko, J. Van Dommelen G. Peters, J. Wismans	International Conference on the Biomechanics of Impact	Prague	Czech Republic	2005	1
The large strain response and constitutive modelling of brain tissue	J. van Dommelen, M. Hrapko, G. Peters, J. Wismans	15th US National Congress on Theoritical and applied Mechanics	Boulder	USA	2006	1
Large strain behaviour of brain tissue in shear and compression	J. van Dommelen, M. Hrapko, G. Peters, J. Wismans	5th World congress of biomechanics	Munich	Germany	2006	1
Characterization of soft tissues; the mechanical response of brain tissue	J. van Dommelen, M. Hrapko, G. Peters, J. Wismans	2nd workshop on Biomechanical Experiments with Human Subjects	Madrid	Spain	2006	1
The mechanical behaviour of brain tissue: large strain response and constitutive modelling	J. van Dommelen, M. Hrapko, G. Peters	The Society of Rehology 78th Annual meeting	Portland	USA	2006	1
Identifying the mechanical behaviour of brain tissue I both shear and compression	J. van Dommelen, M. Hrapko, G. Peters	XVth International Congress on Rheology	Monterey	USA	2008	1
Mechanics of traumatic brain injury at multiple length scales	J. van Dommelen, R. Chloots, M. Hrapko, G. Peters, J. Wismans, M. Geers	XXII International Congress of Theoretical and Applied Mechanics	Adelaide	Australia	2008	1
Influence of rotational acceleration on intra-cranial mechanical parameters under accidental circumstances	D. Deck D, D. Baumgartner	IRCOBI 2007	Maastricht	The Netherlands	2007	22
WorldSID Small Female Side Impact Dummy Specifications and Prototype Evaluation	B. Been, F. Bermond, K. Bortenschlager, D. Hynd, L. Martinez, G. Ferichola, R. Meijer	ESV2007	Lyon	France	2007	2
Biofidelity of the WorldSID Small Female Revision 1 Dummy	A. Eggers, B. Schnottale, B. Been, K. Waagmeester, D. Hynd, J. Carroll, L. Martinez	ESV2009	Stuttgart	Germany	2009	2
WorldSID 5th Percentile Prototype Dummy Development'	J. Zhenwen W. Wang, B. Been, A. Barnes, M. Burleigh, A. Schmidt, M.	SAE congress	Detroit	USA	2007	2

Title	Authors	Conference	Town	Country	Year	MR
	Dotinga, M. van Ratingen					
Numerical simulations of shoulder lateral impacts for shoulder injury prediction",	S. Duprey, K. Bruyere, JP. Verriest	IRCOBI Conference	Maas-tricht	The Neth-erlands	2007	1
Development of a predictive driver's position system in real time	M. Hetier, I. Aillerie, M. Du-raz, X. Wang, H. Morvan	20th International Technical Confer-ence on the En-hanced Safety of Vehicles	Lyon	France	2007	1
Structural characterisation of the human thorax response to dynamic belt loading	F. Berthet, R. Dumas, M. Beaugonin L. Cheze, P. Vezin	20th International Technical Confer-ence on the En-hanced Safety of Vehicles	Lyon	France	2007	2
WorldSID Small Female Two Dimensional Chest Deflection Sensors and Sensitivity to oblique impacts	B. Been, K. Waagmeester, X. Trosseille, J. Carroll, D. Hynd	21st International Technical Confer-ence on the En-hanced Safety of Vehicles	Stuttgart	Germany	2009	2
Injury Threshold for Sagittal Plane Rotational Induced Dif-fuse Axonal Injuries	J. Davidsson, M. Angeria and M. G. Ris-ling	IRCOBI 2009	York	UK	2009	1

3.5.2 SP5 Journal papers

Title	Authors	Journal	Year	MR
On the characterization of the mechanical properties of brain tissue: the influence of test conditions	M. Hrapko, J. van Dommelen, G. Peters, J. Wismans	Journal of Biomechanical Engineering	2007	1
Towards a reliable characterization of the mechanical behaviour of brain tissue: the effects of post-mortem time and sample preparation, Biorheology	A. Garo, M. Hrapko, J. Van Dommelen, G. Peters	Biorheology	2007	1
On the influence of boundary conditions on the shear material properties of soft biological tissues	S. Nicolle, J. Palierne, P. Vezin	Journal of biomechanics, vol 39	2006	1
Constitutive laws of soft abdominal tissues	S. Nicolle, J. Palierne, P. Vezin	Journal of biomechanics	Submitted	1
Human shoulder response to side impacts: a finite element study	S. Duprey, K. Bruyere, JP Verriest	Computer Methods in Biomechanics and Biomedical engineering, Vol 10, n°5, pp361-370	2007	1
Head Injury Criteria Based on Head FE Model	C. Deck, R. Willinger	Int J of Crashworthiness, 2008, Vol 13, N°6, pp 667-679	2008	1
The mechanical behaviour of brain tissue, large strain response and constitutive modelling	M. Hrapko, J. van Dommelen, G. Peters, J. Wismans	Bioheology	2006	1

Title	Authors	Journal	Year	MR
Optical characterization of acceleration-induced strain fields in inhomogeneous brain slices	C. Lauret, M. Hrapko, J. Van Dommelen, G. Peters, J. Wismans	Medical Engineering & Physics	2009	1
On the consequence of non-linear constitutive modelling of brain tissue for injury prediction with numerical head models	M. Hrapko, J. van Dommelen, G. Peters, J. Wismans	International Journal of Crashworthiness	2009	1
Characterization of the mechanical behaviour of brain tissue in compression and shear	M. Hrapko, J. van Dommelen, G. Peters, J. Wismans	Biorheology	2008	1
Scaling Head-Neck response data and derivation of 5th Percentile Female Side Impact Dummy Head Neck Response Requirements in NBDL Test conditions	R. Meijer, R. Wigerhof, J. Wismans, B. Been	International of Crashworthiness 2009	2009	2

3.5.3 SP5 Presentations

Title	Authors	Conference	Town	Country	Year	MR
Head injury criteria based on head FE modelling	C. Deck, R. Willinger	EEVC WG12 meeting	Madrid	Spain	2008	1
Results of APROSYS WP5.2	B. Been	ISO WG5 meeting	San Diego	USA	2007	2
Crash dummy materials	B. Been	APSN workshop	Athens	Greece	2006	2
APROSYS Kick off	B. Been, M van Ratingen	26th WorldSID Task Group	Berlin	Germany	2004	2
APROSYS Update	M. van Ratingen	IHRA SI WG and 27th WorldSID Task Group	Nashville, TN	USA	2004	2 and 9
Rib deflection measurement progress	B. Been	27th WorldSID Task Group	Detroit, MI	USA	2005	2
WorldSID 5th female design	W. Wang, B. Been	28th WorldSID Task Group	Detroit, MI	USA	2005	2
Rib deflection measurement progress	B. Been	28th WorldSID Task Group	Detroit, MI	USA	2005	2
WorldSID 5th female update	W. Wang	29th WorldSID Task Group	Detroit, MI	USA	2005	2
Model study of WorldSID instrumented Rib load sensitivity	M. Philippens, B. Been	30th WorldSID Task Group	Detroit, MI	USA	2005	2
WorldSID 5th female update	W. Wang	30th WorldSID Task Group	Southfield, MI	USA	2005	2
WorldSID 5th female APROSYS update	B.Been	30th WorldSID Task Group	Southfield, MI	USA	2005	2
WorldSID 5th female development APROSYS WP 5.2.3 progress	B. Been	ISO/TC22/SC12/WG5	Suresnes	France	2006	2
APROSYS WP5.2 WorldSID 5th percentile female progress	B. Been	ISO/TC22/SC12/WG5	Detroit	USA	2006	2

Title	Authors	Conference	Town	Country	Year	MR
WorldSID 5th female dummy. Overview of Prototype testing APROSYS	B. Been, F. Bermond, K. Bortenschlager, Damm, D. Hynd, L. Martines, R. Meijer	32nd WorldSID TG	Southfield, MI	USA	2007	2
WorldSID Small female dummy. Prototype Evaluation and update4 plan	B. Been	33rd WorldSID Task Group meeting	Southfield, MI	USA	2007	2
WorldSID 5th female Rev 1 update	B. Been, J. Wang	Joint EEVC WG12 & 34th WorldSID Task Group meeting	Madrid	Spain	2008	2
Validation of head-neck biomechanics of 5th WorldSID	R. Meijer	Joint EEVC WG12 & 34th WorldSID Task Group meeting	Madrid	Spain	2008	2
WorldSID small female update progress	B. Been	ISO/TC22/SC12/WG 5 meeting	London	UK	2008	2
WorldSID 5th small female	J. Wang	35th WorldSID Task Group meeting	Tokyo	Japan	2008	2
WorldSID 5th female progress	B. Been	36th WorldSID Task Group meeting	Southfield, MI	USA	2008	2
WorldSID 5th female Rev 1 update	B. Been, K. Waagmeester	ISO/TC22/SC12.WG 5 meeting	San Antonio	USA	2008	2

3.5.4 SP5 Others

Description of activity	Date	Countries addressed	Size of audience	Type of audience	Partners responsible	Related to MR
Add improved PAM HUMOS 50th male model in sitting posture in ESI biomechanical proposal	April 2009	World wide	n/a	Potential clients in automotive field as well as other field interested in biomechanical model	ESI	1
6th European Vehicle passive safety conference in Vienna Austria on "Development of WorldSID small female dummy	2006	Europe	100	Technical experts passive safety researchers	FTSS	2
Testing Expo, Aschaffenburg, Germany Exhibition of WorldSID prototype	2006	Europe	100	Automotive Testing experts	FTSS	2

3.6 SP6 Dissemination activities

3.6.1 SP6 Conference papers

Title	Authors	Conference	Town	Country	Year	MR
SP6 and actuator	B. Seipel	Adaptive Safety	Hanau	Germany	2006	3
Layout of a Pre-crash Actuator for Side Impact	Zimmerman, Muntean	Adaptronik Kongress	Göttingen	Germany	2007	3

Title	Authors	Conference	Town	Country	Year	MR
Generic FE-Simulation Model for the Layout of Pre-crash Actuators in Side Impact	E. Zimmerman, V. Muntean	Transfac Conference	San Sebastian	Spain	2006	3
Pre-crash Actuator to Improve Structural Performance in Side Impact	E. Zimmerman, V. Muntean	EAEC Conference	Budapest	Hungary	2007	3
Novel SMA-Actuator System for Enhancing Side Impact Safety	E. Zimmerman, V. Muntean	WIT Konferenz	Hamburg	Germany	2008	3
Ein integriertes Sicherheitssystem für Seitenkollisionen	D. Willersinn, M. Grinberg, J. Tandler, C. Mayer, B. Seipel, T. Koch, E. Zimmerman V. Muntean	Conference „ Integrierte Sicherheit und Fahrerassisenzsysteme“	Wolfsburg	Germany	2008	3
Data Analysis of a Side Pre-Crash Sensing System	Continental	IV 2007	Istanbul	Turkey	2007	3
Smart Material based Actuators for an Intelligent Safety System	B. Seipel	IV 2007	Istanbul	Turkey	2007	3
The APROSYS Side Pre-Crash Test Rig and Benchmark Dataset	D. Willersinn	IV 2007	Istanbul	Turkey	2007	3

3.6.2 SP6 Journal papers

Title	Authors	Journal	Year	MR
Bolzenschutz fürs Auto	FhG-LBF	Fraunhofer Magazin		3
SP6 general article	Continental	New Scientist	2006	3
Data Analysis of a Side Pre-Crash Sensing Syste	Continental	IV 2007	2007	3
Smart Material based Actuators for an Intelligent Safety System	B. Seipel	IV 2007	2007	3
The APROSYS Side Pre-Crash Test Rig and Benchmark Dataset	D. Willersinn	IV 2007	2007	3
Ein Beitrag zur Entwicklung von adaptiven Seitenaufprallschutzsystemen für Kraftfahrzeuge	E. Zimmerman	Dissertation, TU Darmstadt	2009	3
A pre-crash system for side impact protection	J. Tandler, E. Zimmerman, V. Muntean, T. Melz, B. Seipel, T. Koch, D. Willersinn, M. Grinberg	Vision Zero	2009	3
A new pre-crash system for side impact protection	J. Tandler, E. Zimmerman, V. Muntean, T. Melz, B. Seipel, T. Koch, D. Willersinn, M. Grinberg, C. Mayer, M. Diez	International Journal of Crashworthiness	2009	3
European Pre-Crash System Signposts the Future of Side Impact Protection	Fraunhofer Faurecia	Auto 2008	2008	3
Smart Material based Actuator for an Intelligent Safety System	B. Seipel	Auto Technology	2007	3

3.6.3 SP6 Presentations

Title	Authors	Conference	Town	Country	Year	MR
Presentation	FhG-LBF	Adaptive Safety	Hanau	Germany	2007	3
Pre-crash Actuators for Side Impact	E. Zimmerman, J. Dias	Congress "Fahrzeugtüren" Haus der Technik"	Essen	Germany	2006	3
Schnell schaltende SMA-Aktuatoren für die Fahrzeugsicherheit	E. Zimmerman	Adaptronik Workshop	Würzburg	Germany	2007	3
Integrated Safety for Improved Structural Crashworthiness	E. Zimmerman, V. Muntean	Conference Safe Highways of the Future	Brussels	Belgium	2008	3
Development of a Pre-crash System for Side Impact Protection	V. Muntean	CTI Forum	München	Germany	2008	3
Development of a Pre-crash System for Side Impact Protection	V. Muntean	CTI Forum	Nürnberg	Germany	2008	3
Crashaktuatorik auf Basis von Formgedächtnislegierungen	T. Koch, B. Seipel	CTI Forum	Nürnberg	Germany	2008	3
Overview paper/presentation of SP6 also indicating future trends	TNO	Ircobi	Maastricht	The Netherlands	2007	3

3.6.4 SP6 Others

Description of activity	Date	Countries addressed	Size of audience	Type of audience	Partners responsible	Related to MR
IRCOBI 2005 conference in Prague, Presentation about passenger behaviour	September 05	General Public, Higher Education	100	Safety Experts, Engineers	WUT	3
Joint APROSYS-PReVENT workshop, Identification of possible synergies, action list for cooperation	March 2005	Europe	100	Safety Experts	FhG-LBF, SVDO	3
Intelligent vehicles, Tokio, Japan: Modeling depth estimation errors for side looking stereo video systems	June 2006	World-wide	100	Safety Experts, Engineers	FhG-IITB	3
Intelligent vehicles, Tokio, Japan: Side Pre-Crash Sensing System Specification	June 2006	World-wide	100	Safety Experts, Engineers	Continental, FhG-IITB	3
SafetyExpo, Aschaffenburg, Germany	July 2006	Europe	100	Safety experts, Engineers	FhG-LBF	3
Show the actuator development workflow and how to bring the actuator in the car at Automotive Industry Conference EAEC	2007	Europe	100	Safety Experts, Engineers	Faurecia	3
Participation in PReVENT exhibition, dedicated APROSYS tent.	September 2007	World-wide	200	Safety Experts, Public	Continental	3

Description of activity	Date	Countries addressed	Size of audience	Type of audience	Partners responsible	Related to MR
SP6 Workshop Test Methods for Pre-Crash Testing	January 2008	International	20	Safety Experts, Engineers	TNO, Continental	3
SP6 Workshop A New Pre-Crash System for Side Impact Protection – Final Crash Test	March.2008	International	38	Safety Experts, Engineers	Cidaut, Continental	3
Feature in Germanys VOX TV programme "Auto Mobil" (6 minutes)	March 2008	Germany	100	Safety Experts, Engineers	Continental, Faurecia, Fraunhofer LBF	3
Several interviews with journalists	2008	Germany, Spain, International	100	Safety Experts, Engineers	Cidaut, Continental, Faurecia, Fraunhofer IITB, others	3
Article in German engineering magazine “ATZ” about SP6	November 2008	Germany and International	100	Safety Experts, Engineers	Continental	3

3.7 SP7 Dissemination activities

3.7.1 SP7 Conference papers

Title	Authors	Conference	Town	Country	Year	MR
Evaluation and Improvement of side impact occupant safety using optimization and stochastic analysis	N. Rutjes, E. van Hassel, R. Happee	SAE 2007	Detroit	USA	2007	6
Stochastic crash analysis of vehicle models for sensitivity analysis and optimization	M. Avalle, G. Belingardi, A. Ibba, F. Delcroix, F. Delcroix	20th ESV Conference	Lyon	France	2007	6
Development of Validated Generic Road Vehicles for Crashworthiness Through Optimization Procedures	L. Sousa, P. Verissimo, J. Ambrósio	European Conference on Computational Mechanics	Lisbon	Portugal	2006	5
Development of a Validated Generic Road Vehicle Multibody Model for Crashworthiness	L. Sousa, P. Veríssimo, J. Ambrósio	ICRASH2006 International Conference on Crashworthiness	Athens	Greece	2006	5
Vehicle Model for Crashworthiness	J. Ambrósio, M. Carvalho, N. Ruben, P. Veríssimo, L. Sousa	5th International Conference on Mechanics and Materials in Design	Porto	Portugal	2006	5
Demonstrator for virtual testing procedure. Application to pedestrian adult head impacts,	M. Diez, J. J. Ferrer, J. García, R. Martín, A. Negro	21st ESV Conference	Stuttgart	Germany	2009	6

3.7.2 SP7 Journal papers

Title	Authors	Journal	Year	MR
The mechanical behaviour of aluminium foam structures in different loading conditions	Peroni, L., Avalle, M., Peroni, M.	International Journal of Impact Engineering, 35	2008	6
AlSi7 Metallic Foams – Aspects of Material Modelling for Crash Analysis.	M. Avalle, G. Belingardi, D. Lehmhus, L. Peroni, H. Pleteit, M. Busse, P. Schmiechen	International Journal of Crashworthiness – special issue	2008	6
Influence of density variation on mechanical properties and modelling of aluminium foams	D. Lehmhus, H. Pleteit, M. Avalle, L. Peroni, M. Busse, G. Belingardi	International Journal of Crashworthiness - submitted	2009	6
Development of Generic Road Vehicle Models for Crashworthiness, Multibody Systems Dynamics,	L. Sousa, P. Veríssimo and J. Ambrósio	Multibody Systems Dynamics, 19(1), 135-158	2006	5
Sensitivity and stochastic analysis in a crash simulation environment. Vehicle System Dynamics	A. Ibba; M. Avalle; F. Delcroix; G. Belingardi; K. Kayvantash	Vehicle System Dynamics, Vol. 44, p. 443-454	2006	6
High strain-rate compression test on metallic foam using a multiple pulse SHPB apparatus	M. Peroni; L. Peroni; M. Avalle	JOURNAL DE PHYSIQUE IV, Vol. 134, p. 609-616	2006	6

3.7.3 SP7 Presentations

Title	Authors	Conference	Town	Country	Year	MR
The Mechanical Behaviour Of Aluminium Foam Structures In Different Loading Conditions	L. Peroni, M. Avalle, M. Peroni	ASME Conference on Engineering Systems Design and Analysis (ESDA 2006)	Torino	Italy	2006	6
APROSYS contributions to improvement of safety on the roads	M. Avalle,	European “Night of the Researchers 2007”	Vercelli	Italy	2007	6
APROSYS contributions to improvement of safety on the roads	M. Avalle,	European “Night of the Researchers 2008”	Alessandria	Italy	2008	6
Adviser presentation	A. Dalenoort	At Daimler	Stuttgart	Germany	2006	6

3.7.4 SP7 Others

Description of activity	Date	Countries addressed	Size of audience	Type of audience	Partners responsible	Related to MR
IX SUSI (Structures under Shock and Impact 2006)	2006	World-wide	50	Research	Polito	5, 6
VT workshop	2006	World-wide	45	Regulation stakeholders	Altair, TNO	6
Adviser workshop	2006	Europe	15	Partners SP7	TRL	5, 6
Workshop on Road Map Virtual Testing in Regulations	2007	World-wide	30	Industry, Research, Regulation etc	TNO	6
VT workshop	2008	World-wide	50	Regulation Stakeholders	Altair, TNO	6

Description of activity	Date	Countries addressed	Size of audience	Type of audience	Partners responsible	Related to MR
VT workshop	March 2009	World-wide	40	Regulation Stakeholders	CIC	6

3.8 SP8 and IP management dissemination activities

3.8.1 Conference papers

Title	Authors	Conference	Town	Country	Year	MR
APROSYS – Filling gaps in secondary (or passive) safety	M. van Schijndel-de Nooij, G. Kellendonk, J.Wismans	TRA 2008	Ljubljana	Slovenia	2008	all
F2008-08-103, APROSYS: Future safety needs actions today	M. van Schijndel-de Nooij	FISITA 2008	Munchen	Germany	2008	all
General APROSYS poster	M. van Schijndel-de Nooij	EUCAR annual conference	Brussels	Belgium	2008	all
APROSYS; Advanced Protection Systems; poster	G.Kellendonk, M.van Schijndel-de Nooij	EUCAR annual conference	Brussels	Belgium	2007	all
APROSYS; poster	G.Kellendonk	ITS conference	London	UK	2006	all
The future of secondary (or passive) safety	G.Kellendonk, J.Wismans	FISITA	Yokohama	Japan	2006	All
Advanced Protection Systems (APROSYS)	G.Kellendonk, J.Wismans	TRA	Gothenborg	Sweden	2006	all
APROSYS introduction poster	M. van Ratingen	EUCAR annual conference	Brussels	Belgium	2003	all

3.8.2 Journal papers

Title	Authors	Journal	Year	MR
The science of safety	M. van Schijndel-de Nooij	Public Service Review: Science & Technology issue 03	2009	all
APROSYS, leading to increased road safety	M. van Schijndel-de Nooij	Public Service Review, EU 18	2009	all
Reducing the death toll on roads with car safety design	M. van Schijndel-de Nooij	eStrategies/Projects 09, British Publishers	2009	all
Advancing systems for safer roads	C. Buter	Vision Zero International launch issue	2009	all
APROSYS final results; research and rescue	M. van Schijndel-de Nooij	Vision Zero International	2009	all
An effective response to road safety	A. Elahmin & M. van Schijndel-de Nooij	Web-based publication on EU Transport Research site	2009	all
APROSYS: advances in secondary safety research, bringing it to a higher level	M. van Schijndel-de Nooij, J Wismans	International Journal of Crashworthiness	Volume 13(6) 2008	all
APROSYS: increasing road safety for all European citizens	M. van Schijndel-de Nooij	the Parliament Magazine, Issue 265	2008	all
APROSYS: increasing road safety for all European citizens	M. van Schijndel-de Nooij	Research Review	May 2008	all
Advanced protection systems,	M. van Schijndel-de Nooij	Public Service Review: Science	2008	All

Title	Authors	Journal	Year	MR
Increasing road safety		& Technology issue 02		
Halvering aantal verkeersdoden komt in zicht dankzij groot Europees veiligheidsproject	M. van Schijndel-de Nooij	Financieel Dagblad	2009	All
Leaving the car unscathed after a collision	M. van Schijndel-de Nooij	TNO magazine	2009	all

3.8.3 Presentations

Title	Authors	Conference	Town	Country	Year	MR
APROSYS; Future safety needs actions today – Advanced Protection Systems	M.van Schijndel-de Nooij	APROSYS Final Event	Amsterdam	Netherlands	2009	all
APROSYS: Future safety needs actions today	M.van Schijndel-de Nooij	ATC conference	Helmond	Netherlands	2009	all
APROSYS – Filling gaps in secondary (or passive) safety	M. van Schijndel-de Nooij	TRA 2008	Ljubljana	Slovenia	2008	all
F2008-08-103, APROSYS: Future safety needs actions today	M. van Schijndel-de Nooij	FISITA 2008	Munchen	Germany	2008	all
APROSYS, general introduction to the project		SP 2 workshop	Neumunster	Germany	2008	all
APROSYS; FP 6 project	G.Kellendonk	EUCAR annual conference	Brussels	Belgium	2006	all
APROSYS integrated project; project general overview	G.Kellendonk	APSN/APROSYS conference	Vienna	Austria	2006	all
Advanced Protection Systems (APROSYS)	G.Kellendonk, J.Wismans	TRA	Gothenborg	Sweden	2006	all
APROSYS Integrated Project	R. Puppini	European Automotive Safety	Bad Nauheim	Germany	2005	all
APROSYS Project	M. van Ratingen, J. Wismans	EUCAR annual conference	Brussels	Belgium	2004	all
Advanced Protective Systems; APROSYS integrated project	Cidaut	ITS world congress	Madrid	Spain	2003	all

3.8.4 Others

Activity	Description	Type of audience
Logo and templates	In order to support internal and external communication an APROSYS corporate style was developed. This includes for instance a logo (see Fig. below) and several templates for reports, workshops and for flyers.	Project partners and safety community
Dissemination database	To efficiently distribute information within the consortium, a database of contact details was created. As it is vital for the project that the information reaches the appropriate people, the details were regularly updated. The database has been further developed and implemented within the electronic newsletter module, in which a segmented database is saved for further use	Project partners and safety community
Flyer and newsletters	A general flyer was developed and widely disseminated. This flyer was complemented with flyers per sub-project. General printed newsletters (internal: six, external: three) were published with updates on the pro-	Project partners and safety

Activity	Description	Type of audience
	gress of the project for a targeted public. A special electronic newsletter for direct mailing purposes has been developed. The electronic newsletter was mainly used for announcing workshops and the Final Event.	community
APROSYS magazine	The first APROSYS magazine was issued at the PReVENT event in September 2007 in Versailles. More than 500 magazines were distributed at this occasion. The second APROSYS magazine was distributed in February 2009 during the Final Event. This magazine focussed on the main project results. The latter magazine is available both in hardcopy and on the APROSYS website.	Safety community
Homepage	An APROSYS homepage was designed and regularly updated. The homepage is devoted to the activities of the project and other relevant topics, relevant events and documents of interest placed on it. The address is www.APROSYS.com. The homepage will continue to exist after the closure of the project. The website contains: • a summary of the project; • a presentation of the project objectives (power point format) and the possibility to use the logo; • an explanation of the structure of the IP and a summary of the work per sub project; • links to relevant other APROSYS related projects and interesting sites; • The APROSYS participants' details and links to the participants' websites; • a list of deliverables. The public deliverables can be downloaded directly from the sites, the non-public will be summarized with the details of the sub-project-leaders details for further inquiries; • all proceedings and posters from the final event. In addition an internal "project server" for management purposes was set up.	Project partners and safety community
Final event	At the end of the project, a final event was organized on 17 and 18 February 2009 in Amsterdam (see Figures below). The event aims were: • stimulating interest in APROSYS project and the results achieved; • ensuring dissemination towards a wide and varied target audience from different backgrounds; • stimulating discussion and feedback on the project results and further use of the knowledge, information and materials. The results of the project have been demonstrated and presented. On the first day the main conclusions of the project have been shown. A panel discussed how the APROSYS results can be implemented to address the challenges articulated by industry and the EU. On the second day two parallel interactive workshop sessions were organized focusing on how the new technologies and methods developed in the APROSYS project can be used to influence and improve the protection of all road users. Attention has been given to the regulatory, infrastructural, technical and commercial aspects. Also, the process after the White Paper on European transport policy for 2010 has been addressed. 170 people participated in this event. Part of the APROSYS Final Event was dedicated to the exhibition, where the results of the project were demonstrated. A selection of the APROSYS results was shown. An impression of the exhibition is shown below. Presentations at the final event can be downloaded at the APROSYS website.	Project partners and safety community

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Figure 1: APROSYS logo

Figure 2: Impressions from the final event

4. Publishable results

This Chapter presents a summary of each exploitable result. The Chapter is similar organized as Chapter 2 namely around the 10 Main Results, with an additional coverage of other results of APROSYS. For each of the (sub)results a Table is included describing, among others, possible market applications, collaborations offered or sought and who to contact for further information on the exploitable result.

Result number and title	**Exploitable result 1.1: Human modelling (mesh, material, simulation.)**	
Result description	Improved PAM HUMOS 50th percentile male model in sitting position	
Possible market applications	Safety, military and medical field	
Stage of development	Prototype	
Collaboration sought or offered	Further research or development / Available for consulting / Participation in call for proposal / License agreement	
Collaborator details	Academic/industrial for improvement in terms of injury prediction tool for industry applications	
Intellectual property rights **granted** or published	None	
Subject Descriptors	Bioengineering/ Safety accident prevention	
Contact details	Address	Parc d'Affaires SILIC, 99 rue des Solets, BP 80112 94513 Rungis cedex FRANCE Phone: Fax:
	City	Rungis
	Contact name	Muriel Beaugonin
	Contact organization	ESI Group
	Country	France
	Department	Virtual Human CoE
	Fax nr	+33 (0)1 46 87 72 02
	Email	mbe@esi-group.com
	Postcode	10
	Position of contact person	Biomechanics R&D Manager
	Phone number	+33 (0)1 41 73 58 00
	Contact org. url	www.esi-group.com

Result number and title	**Exploitable result 1.2: Updated tools for positioning MADYMO HUMOS2 models**	
Result description	Positioning of MADYMO HUMOS2 models in a car seat or pedestrian position including mesh position	
Possible market applications	Automotive	
Stage of development	Final	
Collaboration sought or offered	None	
Collaborator details	N/a	
Intellectual property rights **granted** or published	IPR source code	
Subject Descriptors	Safety	
Contact details	Address	Steenovenweg 1

Result number and title	**Exploitable result 1.2: Updated tools for positioning MADYMO HUMOS2 models**	
	City	Helmond
	Contact name	Riske Meijer
	Contact organization	TNO
	Country	The Netherlands
	Department	Integrated safety
	Fax nr	+31 (0) 40 265 2601
	Email	Riske.meijer@tno.nl
	Postcode	5700 AT
	Position of contact person	Project manager
	Phone number	+31 (0) 40 265 2636
	Contact org. url	www.tno.nl

Result number and title	**Exploitable result 1.3: Controlled active arm model**	
Result description	Realistic modelling of a human in a low severe car crash and pre-crash behaviour	
Possible market applications	Automotive	
Stage of development	Software product under development	
Collaboration sought or offered	None	
Collaborator details	N/a	
Intellectual property rights **granted** or published	IPR on source code	
Subject Descriptors	Safety	
Contact details	Address	Steenovenweg 1
	City	Helmond
	Contact name	Riske Meijer
	Contact organization	TNO
	Country	The Netherlands
	Department	Integrated safety
	Fax nr	+31 (0) 265 2601
	Email	Riske.meijer@tno.nl
	Postcode	5700 AT
	Position of contact person	Project manager
	Phone number	+31 (0) 40 265 2636
	Contact org. url	www.tno.nl

Result number and title	**Exploitable result 1.4: Human Head FE model and injury criteria**
Result description	FE model of the human head with pre and post processor for assessment of head injury risk Head injury prediction tool for FE simulation or for coupling with experimental head impact Improved head injury criteria especially for moderate neurological injury and skull fracture
Possible market applications	Automotive safety, helmet industry, military and sport environment Full FE simulation of coupled head-protective system Experimental head impact result introduced into the head FE model for injury prediction

Result number and title	**Exploitable result 1.4: Human Head FE model and injury criteria**	
	Available since 2008	
Stage of development	industrial product	
Collaboration sought or offered	information exchange with standard organizations training courses available consultancy for head protection systems expertise in legal medicine	
Collaborator details	None	
Intellectual property rights **granted** or published	Head model with pre and post processor available under license	
Subject Descriptors	Head protection to impact	
Contact details	Address	Univ Strasbourg, 2 rue Boussingault
	City	Strasbourg
	Contact name	Remy WILLINGER
	Contact organization	University Strasbourg
	Country	France
	Department	biomechanics
	Fax nr	+ 33 3 88 61 43 00
	Email	willi@imfs.u-strasbg.fr
	Postcode	67 000
	Position of contact person	Professor
	Phone number	+33 3 90 24 29 23
	Contact org. url	www.biomechanics-strasbourg.com

Result number and title	**Exploitable result 2.1 : Drawings CAD models, work instructions, moulds, tools, fixtures, manuals, certification procedures and corridors**	
Result description	Anthropomorphic test device, with human-like biomechanical impact and response and injury measurement systems	
Possible market applications	Automotive	
Stage of development	Validation pre production version	
Collaboration sought or offered	None	
Collaborator details	N/a	
Intellectual property rights **granted** or published	No. Public	
Subject Descriptors	Safety	
Contact details	Address	Kleveringweg 6/8
	City	Delft
	Contact name	B. Been
	Contact organization	FTSS
	Country	The Netherlands
	Department	
	Fax nr	+31 15 219 2050
	Email	b.been@ftss.com
	Postcode	2616 LZ
	Position of contact person	Projectmanager
	Phone number	+31 15 219 2040
	Contact org. url	www.ftss.com

Result number and title	**Exploitable result 2.2 : Drawings, CAD models, work instructions, manuals**	
Result description	Two dimensional chest deflection measurement system (2D-IR-Tracc) for WorldSID small female dummy	
Possible market applications	Automotive / Testing	
Stage of development	Validated pre production version	
Collaboration sought or offered	None	
Collaborator details	N/a	
Intellectual property rights **granted** or published	None. Public	
Subject Descriptors	Safety	
Contact details	Address	Kleveringweg 6/8
	City	Delft
	Contact name	B. Been
	Contact organization	FTSS
	Country	The Netherlands
	Department	
	Fax nr	+31 15 219 2050
	Email	b.been@ftss.com
	Postcode	2616 LZ
	Position of contact person	Projectmanager
	Phone number	+31 15 219 2040
	Contact org. url	www.ftss.com

Result number and title	**Exploitable result 2.3 : Dummy biomechanical responses testing**	
Result description	WorldSID small female side impact Biomechanical responses	
Possible market applications	Automotive / Testing	
Stage of development	Test data of pre production version	
Collaboration sought or offered	None	
Collaborator details	N/a	
Intellectual property rights **granted** or published	None. Public	
Subject Descriptors	Safety	
Contact details	Address	Kleveringweg 6/8
	City	Delft
	Contact name	B. Been
	Contact organization	FTSS
	Country	The Netherlands
	Department	
	Fax nr	+31 15 219 2050
	Email	b.been@ftss.com
	Postcode	2616 LZ
	Position of contact person	Projectmanager
	Phone number	+31 15 219 2040
	Contact org. url	www.ftss.com

Result number and title	**Exploitable result 2.4 : Injury criteria development**	
Result description	WorldSID small femal injury risk functions	
Possible market applications	Automotive / Testing	
Stage of development	Preliminary risk function based on small test database	
Collaboration sought or offered	None	
Collaborator details	N/a	
Intellectual property rights **granted** or published	None. Public	
Subject Descriptors	Safety	
Contact details	Address	Kleveringweg 6/8
	City	Delft
	Contact name	B. Been
	Contact organization	FTSS
	Country	The Netherlands
	Department	
	Fax nr	+31 15 219 2050
	Email	b.been@ftss.com
	Postcode	2616 LZ
	Position of contact person	Projectmanager
	Phone number	+31 15 219 2040
	Contact org. url	www.ftss.com

Result number and title	**Exploitable result 2.5 : Head neck human response in side impact**	
Result description	5^{th} percentile female side impact dummy head & neck response requirements in NBDL test conditions	
Possible market applications	Automotive / Testing / Simulation	
Stage of development	Research publication	
Collaboration sought or offered	None	
Collaborator details	N/a	
Intellectual property rights **granted** or published	None. Public	
Subject Descriptors	Safety	
Contact details	Address	Kleveringweg 6/8
	City	Delft
	Contact name	B. Been
	Contact organization	FTSS
	Country	The Netherlands
	Department	
	Fax nr	+31 15 219 2050
	Email	b.been@ftss.com
	Postcode	2616 LZ
	Position of contact person	Projectmanager
	Phone number	+31 15 219 2040
	Contact org. url	www.ftss.com

Result number and title	**Exploitable result 3.1: Near distance radar sensor system adapted for side pre-crash protection application**	
Result description	Detect and track possible impacting objects	
Possible market applications	Automotive Industry, Side pre-crash Systems	
Stage of development	Prototype	
Collaboration sought or offered	OEM order	
Collaborator details	Automotive supplier	
Intellectual property rights **granted** or published	IPRs will be addressed with the start of a series project	
Subject Descriptors	Safety	
Contact details	Address	Kemptener Str. 99
	City	Lindau
	Contact name	Dr. Joachim Tandler
	Contact organization	Continental
	Country	Germany
	Department	Algorithms & Functions
	Fax nr	
	Email	
	Postcode	-88131
	Position of contact person	-
	Phone number	
	Contact org. url	

Result number and title	**Exploitable result 3.2: Concept and algorithms for the data fusion module**	
Result description	Fuse data from different sensor types in an optimal way for side impact protection	
Possible market applications	Automotive Industry, Side pre-crash Systems	
Stage of development	Prototype	
Collaboration sought or offered	OEM order	
Collaborator details	Automotive supplier	
Intellectual property rights **granted** or published	IPRs will be addressed with the start of a series project	
Subject Descriptors	Safety	
Contact details	Address	Kemptener Str. 99
	City	Lindau
	Contact name	Dr. Joachim Tandler
	Contact organization	Continental
	Country	Germany
	Department	Algorithms & Functions
	Fax nr	
	Email	Joachim.tandler@continental-corporation.com
	Postcode	88131
	Position of contact person	
	Phone number	
	Contact org. url	

Result number and title	**Exploitable result 3.3: Strategy and algorithms for the decision module**	
Result description	Decide based on sensor input if a side impact is going to happen	
Possible market applications	Automotive Industry, Side pre-crash Systems	
Stage of development	Prototype	
Collaboration sought or offered	OEM order	
Collaborator details	Automotive Supplier	
Intellectual property rights **granted** or published	IPRs will be addressed with the start of a series project	
Subject Descriptors	Safety	
Contact details	Address	Kemptener Str. 99
	City	Lindau
	Contact name	Dr. Joachim Tandler
	Contact organization	Continental
	Country	Germany
	Department	Algorithms & Functions
	Fax nr	
	Email	Joachim.tandler@continental-corporation.com
	Postcode	88131
	Position of contact person	
	Phone number	
	Contact org. url	

Result number and title	**Exploitable result 3.4: Shape memory alloy side pre-crash actuator**	
Result description	Very fast, electrically released and reversible actuator with linear or rotation movement. This actuator can be used especially as a crash actuator, but as well for any other type of locking or unlocking mechanism, e.g. structural parts can be connected to create new load paths at any driving situation, including crash situations.	
Possible market applications	Automotive Industry, Side pre-crash Systems	
Stage of development	Prototype	
Collaboration sought or offered	None	
Collaborator details	n/a	
Intellectual property rights **granted** or published	Several patents	
Subject Descriptors	Safety	
Contact details	Address	Bartningstraße 47
	City	64289 Darmstadt
	Contact name	Dr. Tobias Melz
	Contact organization	Fraunhofer-Institute LBF
	Country	Germany
	Department	Mechatronics / Adaptronics
	Fax nr	
	Email	tobias.melz@lbf.fraunhofer.de
	Postcode	
	Position of contact	

Result number and title	**Exploitable result 3.4: Shape memory alloy side pre-crash actuator**	
	person	
	Phone number	+49 6151 - 705 - 252
	Contact org. url	

Result number and title	**Exploitable result 3.5: Side pre-crash protection system**	
Result description	Side Crash Protection System, increase the structural stability of a car in case of an imminent side collision	
Possible market applications	Automotive / OEM's – Crash safety	
Stage of development	Prototype	
Collaboration sought or offered	None	
Collaborator details	n/a	
Intellectual property rights **granted** or published	Patents	
Subject Descriptors	Safety	
Contact details	Address	Industriestrasse 5
	City	57584 Scheuerfeld
	Contact name	E. Zimmerman
	Contact organization	Faurecia Innenraum Systeme GmbH
	Country	Germany
	Department	
	Fax nr	+49 2741 929 103
	Email	eric.zimmerman@faurecia.com
	Postcode	
	Position of contact person	Manager Innovation Advanced & Methods
	Phone number	+49 2741 929 175
	Contact org. url	

Result number and title	**Exploitable result 3.6 Pattern of volunteer's behavior recognized in AUTO-PW car simulator tests for side impacts, including muscle activities measurements**	
Result description	Pattern of volunteer's behaviour recognized in AUTO-PW car simulator tests for side impacts, including muscle activities measurements	
Possible market applications	Automotive	
Stage of development	Finalised	
Collaboration sought or offered	None	
Collaborator details	n/a	
Intellectual property rights **granted** or published	IPR at owner	
Subject Descriptors	Safety	
Contact details	Address	Ul. Nowowieskjka 24
	City	Warswa
	Contact name	T. Dziewonski
	Contact organization	WUT – University of Warsaw
	Country	Poland
	Department	

Result number and title	**Exploitable result 3.6 Pattern of volunteer's behavior recognized in AUTO-PW car simulator tests for side impacts, including muscle activities measurements**	
	Fax nr	+48 22 628 2587
	Email	tomekn@meil.pw.edu.pl
	Postcode	P-00-665
	Position of contact person	Researcher
	Phone number	+ 48 22 660 7992
	Contact org. url	http://eng.pw.edu.pl/

Result number and title	**Exploitable result 3.7: Object tracking and classification based on stereo video sequenced**	
Result description	Estimate the motion of vehicles in traffic scenes, using depth measurements from stereo video processing. The functionality to estimate other vehicles' motion starts from depth measurements which may stem from a variety of sensors including active sensors such as time-of-flight-Cameras. For this reason its applicability is not limited to stereo video processing	
Possible market applications	Automotive	
Stage of development	Prototype	
Collaboration sought or offered	None	
Collaborator details	N/a	
Intellectual property rights **granted** or published	None. Public	
Subject Descriptors	Safety	
Contact details	Address	Fraunhoferstraße 1
	City	Karlsruhe
	Contact name	Dr. Dieter Willersinn
	Contact organization	Fraunhofer- Institut für Informations- und Datenverarbeitung (IITB)
	Country	Germany
	Department	ASM
	Fax nr	+49 721 60 91 233
	Email	dieter.willersinn@iitb.fraunhofer.de
	Postcode	
	Position of contact person	Research group leader
	Phone number	+49 721 60 91 387
	Contact org. url	www.iitb.fraunhofer.de

Result number and title	**Exploitable result 3.8: Simulation methodology to develop new adaptable protection systems**
Result description	Revision and modification of current modelling and validation methodologies; Improved virtual testing methods to be applied in developing new advance protection systems
Possible market applications	Simulation methodology to develop new adaptable protection systems
Stage of development	Automotive Industry (Further research or internal development to be employed in our clients)
Collaboration sought or offered	Technical specifications
Collaborator details	n/a
Intellectual property rights	IPR at owner.

Result number and title	**Exploitable result 3.8: Simulation methodology to develop new adaptable protection systems**	
granted or published		
Subject Descriptors	Safety	
Contact details	Address	Parque Tecnológico de Boecillo, P209
	City	Boecillo (Valladolid)
	Contact name	Mónica Diez
	Contact organization	Fundación para la Investigación y Desarrollo en Transporte y Energía - CIDAUT
	Country	Spain
	Department	Crash Safety Division
	Fax nr	+34 983 548062
	Email	mondie@cidaut.es
	Postcode	47151
	Position of contact person	Senior Researcher Project Manager
	Phone number	+34 983 548035
	Contact org. url	www.cidaut.es

Result number and title	**Exploitable result 3.9: Evaluation of a complete pre-crash occupant protection**	
Result description	Advantages and disadvantages of a complete pre-crash systems in terms of occupant protection	
Possible market applications	Automotive	
Stage of development	Further research needed	
Collaboration sought or offered	None	
Collaborator details	N/a	
Intellectual property rights **granted** or published	None. Public	
Subject Descriptors	Safety	
Contact details	Address	Avenida Rovisco Pais, 1
	City	Lisbon
	Contact name	Jorge Ambrósio
	Contact organization	Instituto Superior Técnico
	Country	Portugal
	Department	Mechanical Engineering Department
	Fax nr	+351 21 841 7915
	Email	jorge@dem.ist.utl.pt
	Postcode	1049-001 Lisboa
	Position of contact person	Associate Professor
	Phone number	+351 218417680
	Contact org. url	www.dem.ist.utl.pt

Result number and title	**Exploitable result 3.10: Conceptual design of adaptable protection system**
Result description	Side impact protection concept
Possible market applications	Automotive
Stage of development	Verified concept
Collaboration sought or offered	None
Collaborator details	N/a

Result number and title	**Exploitable result 3.10: Conceptual design of adaptable protection system**	
Intellectual property rights **granted** or published	Patent pending	
Subject Descriptors	Safety	
Contact details	Address	Avenida Rovisco Pais, 1
	City	Lisbon
	Contact name	Jorge Ambrósio
	Contact organization	Instituto Superior Técnico
	Country	Portugal
	Department	Mechanical Engineering Department
	Fax nr	+351 21 841 7915
	Email	jorge@dem.ist.utl.pt
	Postcode	1049-001 Lisboa
	Position of contact person	Associate Professor
	Phone number	+351 218417680
	Contact org. url	www.dem.ist.utl.pt

Result number and title	**Exploitable result 3.11 Evaluation test method for a side impact protection system**	
Result description	Methodology / Test Protocal – Focus on side impact pre-crash applications (including the evaluation of environmental sensing technology)	
Possible market applications	Industry, Consumer org., Legislation Bodies Code of Practice, Assessment methods, test protocol	
Stage of development	Guideline (Document on draft method / protocol)	
Collaboration sought or offered	All stakeholder in vehicle safety area	
Collaborator details	Research projects (→ ASSESS, euroFOT))	
Intellectual property rights **granted** or published	No.	
Subject Descriptors	Safety	
Contact details	Address	050 / G023
	City	71059 Sindelfingen
	Contact name	Christian Mayer
	Contact organization	Daimler AG
	Country	Germany
	Department	Group Research
	Fax nr	
	Email	Christian.c.mayer@daimler.com
	Postcode	
	Position of contact person	
	Phone number	
	Contact org. url	

Result number and title	**Exploitable result 4.1: Generic assessment methodology for advanced safety systems**
Result description	Generic methodology to assess advanced safety systems with pre-crash sensing
Possible market applications	Road, rail vehicles (Automotive – Could be used as code of practice and/ or a basis to update and improve current crash safety regulation and consumer rating methodologies.)

Result number and title	**Exploitable result 4.1: Generic assessment methodology for advanced safety systems**	
Stage of development	New generic assessment method	
Collaboration sought or offered	Further research or development support, financial support, other (Further development and application of generic methodology to development assessment methodologies for specific systems and their implementation.)	
Collaborator details	National governments, EC ,EEVC, Euro NCAP, GRSP and industry	
Intellectual property rights **granted** or published	None	
Subject Descriptors	Safety accident prevention, Standards, Transport	
Contact details	Address	Mobile Life Campus Hermann-Münch-Str. 1
	City	Wolfsburg
	Contact name	Thomas Wohllebe
	Contact organization	Volkswagen AG
	Country	Germany
	Department	Group Research - Integrated Safety and Light
	Fax nr	n/a
	Email	thomas.wohllebe@volkswagen.de
	Postcode	D-38440
	Position of contact person	Research Engineer
	Phone number	+49 (5361) 896-2364
	Contact org. url	www.volkswagen.de

Result number and title	**Exploitable result 4.2 Timing identification, evaluation and definition of working parameters for triggering a new passive safety system implemented in the vehicle or in the rider garment.**	
Result description	The timing identification, and the analysis of activation and working parameters provides to APROSYS the needed information to define the minimum times of operation and the suitable time to activate an innovative passive safety system. Therefore, the achievement of this result will be important (from a safety point of view) due to the high severity of the impacts of motorcyclists when an accident happens.	
Possible market applications	Protective equipment industry, Motorcycle industry, research centers	
Stage of development	Technical specification	
Collaboration sought or offered	Partners from SIM project	
Collaborator details	Partners from SIM project	
Intellectual property rights **granted** or published	None	
Subject Descriptors	Information acquisistion, information analysis, inpection / testing. Knowlegde engineering / knowledge based system. Product development.	
Contact details	Address	Viale Rinaldo Piaggio, 25
	City	Pontedera
	Contact name	Paolo Cravini
	Contact organization	Dainese S.p.A.
	Country	Italy
	Department	Vehicle Technical Innovation
	Fax nr	+39 0587 272033
	Email	paolo.cravini@piaggio.com
	Postcode	56025

Result number and title	**Exploitable result 4.2 Timing identification, evaluation and definition of working parameters for triggering a new passive safety system implemented in the vehicle or in the rider garment.**	
	Position of contact person	Project Engineer
	Phone number	+39 0587 272349
	Contact org. url	www.piaggio.com

Result number and title	**Exploitable result 5.1 Generic car model of a multi-purpose vehicle (GCM4)**	
Result description	A generic car model (GCM) is the numerical model of a virtual vehicle. It is not the model of a real vehicle, but a realistic one, made to be freely shared among partners of research programs without confidentiality restrictions. A GCM is validated against results of tests on vehicles of the same category (from Euro NCAP or other publicly available resources). The GCM4 is a FE model of a MPV class vehicle, developed in Radioss. It has similarities (shape, size, weight..) with the MPV currently in the European market	
Possible market applications	The GCM4 is made to study innovative passive (and active) solutions in the automotive field.	
Stage of development	The GCM4 is a fully functional model for impact simulations	
Collaboration sought or offered	Use outside the APROSYS consortium to be regulated through an agreement for non-disclosure. The software is provided as is and there is no responsibility from the provider for the use of the software.	
Collaborator details	-	
Intellectual property rights **granted** or published	Property of the model remains to Polito. It can be freely modified for internal use. The model can be given only with prior communication to the owner. The modified model cannot distributed unless with previous permission by the owner.	
Subject Descriptors	Safety Accident Prevention	
Contact details	Address	Corso Duca degl Abruzzi 24
	City	Torino
	Contact name	Massimiliano Avalle
	Contact organization	Polito
	Country	Italy
	Department	Dipartimento di Meccanica
	Fax nr	+ 39 011 0906999
	Email	massimiliano.avalle@polito.it
	Postcode	10129
	Position of contact person	Associated professor
	Phone number	+ 39 011 0906900
	Contact org. url	www.dimec.polito.it

Result number and title	**Exploitable result 5.2: Generic Car model for class GCM1-supermini and GCM2-small family car and GCM3-luxury/executive car**
Result description	Generic Car Model for class GCM1-supermini; GCM2-small family car'; GCM3-luxury/executive car). The generic car models are virtual prototypes that show realisti (state of the art) behaviours in crash conditions, due to their very detailed representation. They permis to perform realistic crash simulations and represent an innovative concept for the research work in this area

Result number and title	**Exploitable result 5.2: Generic Car model for class GCM1-supermini and GCM2-small family car and GCM3-luxury/executive car**	
Possible market applications	Numerical crash analyses for research work in the automotive sector	
Stage of development	The above mentioned GCMs are currently available in RADIOSS and LS-DYNA versions	
Collaboration sought or offered	Said GCM FE models can be shared in other projects (i.e. outside APROSYS) only if a part of the research activity (ie numerical simulations) for which they are needed is performed directly by the owner (CRF), moreover, the said research activity has to be aligned coherent with CRF main field of interest	
Collaborator details	Industry and research institutes involved in automotive sector	
Intellectual property rights **granted** or published	These generic car FE models are property of CRF. They can be made available under special agreement only. The models can in fact be shared in other project (i.e. outside APROSYS) only if a part of the research activity (i.e. numerical simulations) for which they are needed is performed directly by CRF. Moreover, the said research activity has to be aligned / coherent with CRF main field of interest	
Subject Descriptors	Transport / Safety accident prevention / Product development / Product design / Standards	
Contact details	Address	Strada Torino 50
	City	Orbassano
	Contact name	Roberto Puppini
	Contact organization	CRF
	Country	Italy
	Department	Body Architectures Design and Engineering
	Fax nr	+ 39 011 908 3672
	Email	roberto.puppini@crf.it
	Postcode	10043
	Position of contact person	Crash & Biomechanics Unit Manager
	Phone number	+39 011 908 3697
	Contact org. url	www.crf.it

Result number and title	**Exploitable result 5.3: Generic car model for NEON**	
Result description	The generic car models are virtual prototypes that show realist (state of the art) behaviours in crash conditions, due to their very detailed representation. They permit to perform realist crash simulations and represent an innovative concept for the research work in this area	
Possible market applications	Research by means of numerical analyses in automotive sector	
Stage of development	Model version in RADIOSS, validated for Side impact	
Collaboration sought or offered	This model is usable within research projects in which CIDAUT is a consortium partner. Also it could be used in other research projects of CIDAUT w/wo additional industrial partners	
Collaborator details	Industry and research institutes involved in automotive sector	
Intellectual property rights **granted** or published	Related with APROSYS consortium agreement for developed know how within the project	
Subject Descriptors	CAD/CAM/CAE	
Contact details	Address	ParqueTechnologico de Boecillo P209
	City	Boecillo (Valladolid)
	Contact name	Monica Diez
	Contact organiza-	Fundacion para la Investigacion y Desarollo en

Result number and title	**Exploitable result 5.3: Generic car model for NEON**	
	tion	Transporte y Energia – CIDAUT
	Country	Spain
	Department	Crash Safety Division
	Fax nr	+34 983 54 8062
	Email	mondie@cidaut.es
	Postcode	47151
	Position of contact person	Senior Researcher Project Manager
	Phone number	+ 34 983 548 035
	Contact org. url	www.cidaut.es

Result number and title	**Exploitable result 5.4: Generic car MB model of GCM2 and GCM4**	
Result description	Generic Car Models	
Possible market applications	The models are developed to use for further investigations into the virtual automotive testing field	
Stage of development	Virtual Demonstrators	
Collaboration sought or offered	Information exchange, training and consultancy	
Collaborator details	Potential users with in the world car industry	
Intellectual property rights **granted** or published	Models are free to public	
Subject Descriptors	CAD/CAE	
Contact details	Address	Steenovenweg 1
	City	Helmond
	Contact name	Cees Huijskens
	Contact organiza-tion	TNO Automotive
	Country	The Netherlands
	Department	Integrated Safety
	Fax nr	+31 40 265 26 01
	Email	cees.huijskens@tno.nl
	Postcode	5700 AT
	Position of contact person	Consultant
	Phone number	+31 40 265 26 22
	Contact org. url	www.automotive.tno.nl

Result number and title	**Exploitable result 5.5: Generic car MB model for GCM1 and GCM3**	
Result description	Generic car model GCM1 (small city car) and GCM3 (large car)	
Possible market applications	GCM MB models are useful for early design stages of new vehicles in frontal and side crash, for fast analysis and responses to changes in design parameters	
Stage of development	Virtual Demonstrators	
Collaboration sought or of-fered	Consultancy in vehicle crash virtual simulations. Developments in virtual testing for vehicles.	
Collaborator details	Industry design centers; testing centers	
Intellectual property rights **granted** or published	Models are owned by the developers, to be used according defined contract. Results published in scientific papers.	
Subject Descriptors	Safety Accident Prevention	
Contact details	Address	Avenida Rovisco Pais, 1
	City	Lisbon
	Contact name	Jorge Ambrósio

Result number and title	**Exploitable result 5.5: Generic car MB model for GCM1 and GCM3**	
	Contact organization	Instituto Superior Técnico
	Country	Portugal
	Department	Mechanical Engineering Department
	Fax nr	+351 21 841 7915
	Email	jorge@dem.ist.utl.pt
	Postcode	1049-001 Lisboa
	Position of contact person	Associate Professor
	Phone number	+351 218417680
	Contact org. url	www.dem.ist.utl.pt

Result number and title	**Exploitable result 5.6: Generic Model of Heavy Goods vehicle**	
Result description	Pam Model of a Generic Heavy duty truck	
Possible market applications	Road, rail vehicles	
Stage of development	Finite Element Model	
Collaboration sought or offered	Further research or development support	
Collaborator details	Distributed for future research work under a GPL license	
Intellectual property rights **granted** or published	GPL License	
Subject Descriptors	CAD/CAM/CIM	
Contact details	Address	Inffeldgasse 11/II
	City	Graz
	Contact name	Herman Steffan
	Contact organization	TUG
	Country	Austria
	Department	Vehicle Safety Institute
	Fax nr	+43 316 873 9402
	Email	office.vsi@tugraz.at
	Postcode	8010
	Position of contact person	Head of Institute
	Phone number	+43 316 873 9401
	Contact org. url	www.vsi.tugraz.at

Result number and title	**Exploitable result 5.7: Generic vehicle models representing recent vehicles with leading NCAP scores**
Result description	Generic vehicle models representing recent vehicles with leading NCAP scores
Possible market applications	Commercial simulation models for the European automotive industry
Stage of development	Industrial products
Collaboration sought or offered	Use outside the APROSYS consortium to be regulated through an agreement for non-disclosure. The software is provided as is and there is no responsibility from the provider for the use of the software.
Collaborator details	Potential users with in European car industry
Intellectual property rights **granted** or published	Property of the models remains to TNO Automotive. It can be freely modified for internal use. The model can be given only with prior communication to the owner. The modified model cannot distributed unless with previous permission by the owner.

Result number and title	**Exploitable result 5.7: Generic vehicle models representing recent vehicles with leading NCAP scores**	
Subject Descriptors	CAD/CAE	
Contact details	Address	Steenovenweg 1
	City	Helmond
	Contact name	Cees Huijskens
	Contact organization	TNO Automotive
	Country	The Netherlands
	Department	Integrated Safety
	Fax nr	+31 40 265 26 01
	Email	cees.huijskens@tno.nl
	Postcode	5700 AT
	Position of contact person	Consultant
	Phone number	+31 40 265 26 22
	Contact org. url	www.automotive.tno.nl

Result number and title	**Exploitable result 6.1 Honeycomb material model**	
Result description	Law for modelling honeycomb material	
Possible market applications	FE simulation in crash / safety	
Stage of development	implemented	
Collaboration sought or offered	None	
Collaborator details	n/a	
Intellectual property rights **granted** or published	Protected result; implemented in a binary licensed software	
Subject Descriptors	CAD/CAM	
Contact details	Address	2, Rue de la Renaissance
	City	Antony
	Contact name	Franck Delcroix
	Contact organization	Altair
	Country	France
	Department	
	Fax nr	+ 33 1 46 74 62 50
	Email	fdelcroix@altair.com
	Postcode	92184
	Position of contact person	Program manager
	Phone number	+ 33 1 41 33 02 80
	Contact org. url	www.altair.com

Result number and title	**Exploitable result 6.2: Spotweld model**
Result description	Modelling of spotwelds, inclusing failure for FE simulations
Possible market applications	FE simulation in crash/safety
Stage of development	implemented in RADIOSS FE code
Collaboration sought or offered	none
Collaborator details	n/a
Intellectual property rights **granted** or published	Protected result : implemented in a binary licensed software

Result number and title	**Exploitable result 6.2: Spotweld model**	
Subject Descriptors	CAD/CAM	
Contact details	Address	2, rue de la Renaissance
	City	Antony
	Contact name	Franck Delcroix
	Contact organization	Altair Development France
	Country	France
	Department	
	Fax nr	+33.1.46.74.62.50
	Email	fdelcroix@altair.com
	Postcode	92184
	Position of contact person	Program Manager
	Phone number	+33.1.41.33.02.80
	Contact org. url	www.altair.com

Result number and title	**Exploitable result 6.3: Airbag deployment theory**	
Result description	Modelling of airbag deployment if FE code	
Possible market applications	FE simulation in crash/safety	
Stage of development	implemented in RADIOSS FE code	
Collaboration sought or offered	none	
Collaborator details	no	
Intellectual property rights **granted** or published	Protected result : implemented in a binary licensed software	
Subject Descriptors	CAD/CAM	
Contact details	Address	2, rue de la Renaissance
	City	Antony
	Contact name	Franck Delcroix
	Contact organization	Altair Development France
	Country	France
	Department	
	Fax nr	+33.1.46.74.62.50
	Email	fdelcroix@altair.com
	Postcode	92184
	Position of contact person	Program Manager
	Phone number	+33.1.41.33.02.80
	Contact org. url	www.altair.com

Result number and title	**Exploitable result 6.4: Airbag models**
Result description	Airbag models
Possible market applications	Promotion of software & services
Stage of development	Available models; licensed software
Collaboration sought or offered	Know-how; consultancy
Collaborator details	Potential users with in the world car industry
Intellectual property rights **granted** or published	No disclosure. Models owned by their respective developers
Subject Descriptors	Safety accident prevention

Result number and title	**Exploitable result 6.4: Airbag models**	
Contact details	Address	2, rue de la Renaissance
	City	Antony
	Contact name	Franck Delcroix
	Contact organization	Altair Development France
	Country	France
	Department	
	Fax nr	+33.1.46.74.62.50
	Email	fdelcroix@altair.com
	Postcode	92184
	Position of contact person	Program Manager
	Phone number	+33.1.41.33.02.80
	Contact org. url	www.altair.com

Result number and title	**Exploitable result 6.5: Parameterized Aluminium foam model and material properties**	
Result description	Aluminium foam is a very interesting new family of materials. It has the advantages of foams (lightweight, energy absorption capabilities...) without the drawbacks of other (e.g. thermoplastic) foams. However, aluminium foams, like other innovative materials, are very difficult to design due to their complex behaviour. Based on an extensive experimental test campaign, a fully functional and complete description of the material behaviour was developed and a model was identified.	
Possible market applications	Aluminium foams have potential for application in many industrial fields: automotive, aerospace, manufacturing. Applications range from energy absorption to structural reinforcement, and sandwich panel construction. Modelling is a basic stage in optimal design of these components.	
Stage of development	These models come from a large series of experimental tests and it is ready to use in some FE commercial codes, specifically Abaqus/explicit.	
Collaboration sought or offered	Support to the design phase is offered. Further improvement in modelling is possible, and collaboration to this is welcome.	
Collaborator details	Developers of products using aluminium foams for energy absorption in impacts (OEMs, suppliers etc., see above)	
Intellectual property rights **granted** or published	published in scientific journals	
Subject Descriptors	CAD/CAM	
Contact details	Address	Wiener Straße 12
	City	Bremen
	Contact name	Dirk Lehmhus
	Contact organization	Fraunhofer IFAM
	Country	Germany
	Department	
	Fax nr	+49 (0)421 2246 300
	Email	Dirk.lehmhus@ifam.fraunhofer.de
	Postcode	28359
	Position of contact person	project manager
	Phone number	+49 (0)421 2246 215
	Contact org. url	www.ifam.fraunhofer.de

Result number and title	**Exploitable result 6.6: Material scatter database**	
Result description	A collection of data regarding some materials of interest in the automotive constructions, with regards to the scatter of mechanical properties. Data come from ADVANCE and APROSYS results (experimental tests) and other sources (public and internal).	
Possible market applications	Vehicles design, other mechanical construction fields, aeronautics.	
Stage of development	The database is a work-in-progress, and could be improved with more material data	
Collaboration sought or offered	More data, from whatever source, is welcome to improve the database qualitatively and quantitatively	
Collaborator details	Researchers, engineers, etc.	
Intellectual property rights **granted** or published	Properties remain to the providers of the data	
Subject Descriptors	CAD/CAM	
Contact details	Address	Corso Duca degli Abruzzi, 24
	City	Torino
	Contact name	Massimiliano Avalle
	Contact organization	Politecnico di Torino
	Country	Italy
	Department	Dipartimento di Meccanica
	Fax nr	+39-011-0906999
	Email	massimiliano.avalle@polito.it
	Postcode	10129
	Position of contact person	Associate Professor
	Phone number	+39-011-0906900
	Contact org. url	http://www.dimec.polito.it/

Result number and title	**Exploitable result 6.7: Spot-weld rivets, clinching failure criteria and models**	
Result description	Synthetic model of spot-welds for simulation in explicit FE codes and data about spot-welds and clinched joints	
Possible market applications	Road, rail vehicles	
Stage of development	Material data and analytical models available	
Collaboration sought or offered	Development of the models for simulations in crash	
Collaborator details	Potential users in the automotive industry	
Intellectual property rights **granted** or published	Results published in scientific papers.	
Subject Descriptors	Product development	
Contact details	Address	Corso Duca degli Abruzzi, 24
	City	Torino
	Contact name	Massimiliano Avalle
	Contact organization	Politecnico di Torino
	Country	Italy
	Department	Dipartimento di Meccanica
	Fax nr	+39-011-0906999
	Email	massimiliano.avalle@polito.it

Result number and title	**Exploitable result 6.7: Spot-weld rivets, clinching failure criteria and models**	
	Postcode	10129
	Position of contact person	Associate Professor
	Phone number	+39-011-0906900
	Contact org. url	http://www.dimec.polito.it/

Result number and title	**Exploitable result 6.8: Robustness and reliability methods of virtual testing**	
Result description	Improved virtual testing methods to be applied in product development processes	
Possible market applications	Automotive Industry (Further research or internal development to be employed in our clients)	
Stage of development	Methodology	
Collaboration sought or offered	CIDAUT internal research activities	
Collaborator details	No additional info by the moment	
Intellectual property rights **granted** or published	Related with APROSYS Consortium Agreement for developed know-how within the project	
Subject Descriptors	CAD/CAM	
Contact details	Address	Parque Tecnológico de Boecillo, P209
	City	Boecillo (Valladolid)
	Contact name	Mónica Diez
	Contact organization	Fundación para la Investigación y Desarrollo en Transporte y Energía - CIDAUT
	Country	Spain
	Department	Crash Safety Division
	Fax nr	+34 983 548062
	Email	mondie@cidaut.es
	Postcode	47151
	Position of contact person	Senior Researcher Project Manager
	Phone number	+34 983 548035
	Contact org. url	www.cidaut.es

Result number and title	**Exploitable result 6.9: Barrier test results**	
Result description	Dynamic tests conducted on Frontal and Side Impact Aluminium Honeycomb Barrier samples	
Possible market applications	Road, Rail Vehicles	
Stage of development	Completed	
Collaboration sought or offered	No	
Collaborator details	None	
Intellectual property rights **granted** or published	Results can be used for research if referenced	
Subject Descriptors	CAD	
Contact details	Address	Building 61, Cranfield University, Bedford, MK43 8TA,
	City	Bedford
	Contact name	James Watson
	Contact organiza-	Cranfield Impact Centre

Result number and title	**Exploitable result 6.9: Barrier test results**	
	tion	
	Country	UK
	Department	
	Fax nr	+44 1234 751671
	Email	j.w.watson@cranfield.ac.uk
	Postcode	MK43 8TA
	Position of contact person	Senior Project Engineer
	Phone number	+44 1234 754149
	Contact org. url	www.cicl.co.uk

Result number and title	**Exploitable result 6.10: ADVISER stochastic and rating software**	
Result description	ADVISER Software for rating and stochastic analysis	
Possible market applications	Analysis tool for CAE market domains, including crash and safety.	
Stage of development	commercial product	
Collaboration sought or offered	N/A	
Collaborator details	N/A	
Intellectual property rights **granted** or published	Commercial software, licensed product	
Subject Descriptors	CAD/CAM	
Contact details	Address	2, rue de la Renaissance
	City	Antony
	Contact name	Franck Delcroix
	Contact organization	Altair Development France
	Country	France
	Department	
	Fax nr	+33.1.46.74.62.50
	Email	fdelcroix@altair.com
	Postcode	92184
	Position of contact person	Program Manager
	Phone number	+33.1.41.33.02.80
	Contact org. url	www.altair.com

Result number and title	**Exploitable result 6.11: Modelling of Aluminium Barrier models**	
Result description	FE Models of Aluminium Barriers	
Possible market applications	Road, rail Vehicles	
Stage of development	Completed	
Collaboration sought or offered	Collaborates can assist in improving Fe modelling techniques	
Collaborator details	N/A	
Intellectual property rights **granted** or published	Results can be used for research if referenced	
Subject Descriptors	CAD	
Contact details	Address	Building 61, Cranfield University, Bedford, MK43 8TA,
	City	Bedford

Result number and title	**Exploitable result 6.11: Modelling of Aluminium Barrier models**	
	Contact name	James Watson
	Contact organization	Cranfield Impact Centre
	Country	UK
	Department	
	Fax nr	+44 1234 751671
	Email	j.w.watson@cranfield.ac.uk
	Postcode	MK43 8TA
	Position of contact person	Senior Project Engineer
	Phone number	+44 1234 754149
	Contact org. url	www.cicl.co.uk

Result number and title	**Exploitable result 6.12: Stochastic models**	
Result description	FE/MBD models for stochastic analysis	
Possible market applications	Promotion of software & services	
Stage of development	Models available	
Collaboration sought or offered	Use outside the APROSYS consortium to be regulated through an agreement for non-disclosure. The software is provided as is and there is no responsibility from the provider for the use of the software.	
Collaborator details	Potential users with in European car industry	
Intellectual property rights **granted** or published	Property of the models remain to TNO Automotive. It can be freely modified for internal use. The model can be given only with prior communication to the owner. The modified model cannot distributed unless with previous permission by the owner.	
Subject Descriptors	CAD/CAE	
Contact details	Address	Schoemakerstraat 97
	City	Delft
	Contact name	Richard Lancashire
	Contact organization	TNO / TASS
	Country	The Netherlands
	Department	Engineering & Applications
	Fax nr	+31 888 277 003
	Email	info@tass-safe.com support@tass-safe.com richard.lancashire@tass-safe.com
	Postcode	2628 VK
	Position of contact person	Manager Engineering & Applications
	Phone number	+31 888 277 051
	Contact org. url	www.tass-safe.com

Result number and title	**Exploitable result 6.13: ADVISER templates for Virtual Testing applications**
Result description	ADVISER templates for VT applications
Possible market applications	VT & Safety results analysis
Stage of development	prototype templates circulated to partners
Collaboration sought or offered	N/A
Collaborator details	N/A
Intellectual property rights	Templates used by APROSYS partners. No disclosure beyond the pro-

Result number and title	**Exploitable result 6.13: ADVISER templates for Virtual Testing applications**	
granted or published	ject.	
Subject Descriptors	CAD/CAM	
Contact details	Address	2, rue de la Renaissance
	City	Antony
	Contact name	Franck Delcroix
	Contact organization	Altair Development France
	Country	France
	Department	
	Fax nr	+33.1.46.74.62.50
	Email	fdelcroix@altair.com
	Postcode	92184
	Position of contact person	Program Manager
	Phone number	+33.1.41.33.02.80
	Contact org. url	www.altair.com

Result number and title	**Exploitable result 6.14: Madymo AE-MDB barrier model**	
Result description	New AE-MDB barrier simulation model sold/licensed with MADYMO	
Possible market applications	It is expected that the AEMDB barrier model will be used as a new VT tool in future regulatory and/or consumer (Euro NCAP) testing	
Stage of development	The simulation model can (also) be used for further research work related to vehicle side protection systems.	
Collaboration sought or offered	Use outside the APROSYS consortium to be regulated through an agreement for non-disclosure. The software is provided as is and there is no responsibility from the provider for the use of the software.	
Collaborator details	Potential users with in European car industry	
Intellectual property rights **granted** or published	Property of the models remain to TNO Automotive. It can be freely modified for internal use. The model can be given only with prior communication to the owner. The modified model cannot distributed unless with previous permission by the owner.	
Subject Descriptors	CAD/CAE	
Contact details	Address	Steenovenweg 1
	City	Helmond
	Contact name	Cees Huijskens
	Contact organization	TNO Automotive
	Country	The Netherlands
	Department	Integrated Safety
	Fax nr	+31 40 265 26 01
	Email	cees.huijskens@tno.nl
	Postcode	5700 AT
	Position of contact person	Consultant
	Phone number	+31 40 265 26 22
	Contact org. url	www.automotive.tno.nl

Result number and title	**Exploitable result 6.15: Robust design method**
Result description	Method for robust design optimization
Possible market applications	Design optimization / Analysis in CAE related domains

Result number and title	**Exploitable result 6.15: Robust design method**	
Stage of development	The method developed is used for further optimization of VT procedures in existing crash safety standards.	
Collaboration sought or offered	Use outside the APROSYS consortium to be regulated through an agreement for non-disclosure. The software is provided as is and there is no responsibility from the provider for the use of the software.	
Collaborator details	Potential users with in European car industry	
Intellectual property rights **granted** or published	External use to be regulated through proper tools (e.g. non disclosure undertaking documents)	
Subject Descriptors	CAD/CAE	
Contact details	Address	Schoemakerstraat 97
	City	Delft
	Contact name	Richard Lancashire
	Contact organization	TNO/TASS
	Country	The Netherlands
	Department	Engineering & Applications
	Fax nr	+31 888 277 003
	Email	info@tass-safe.com support@tass-safe.com richard.lancashire@tass-safe.com
	Postcode	2628 VK
	Position of contact person	Manager Engineering & Applications
	Phone number	+31 888 277 051
	Contact org. url	www.tass-safe.com

Result number and title	**Exploitable result 6.16: Enhanced methods to compare/rate signals**	
Result description	Enhanced methods to compare signal rating scores and injury predictions.	
Possible market applications	Promotion of software & services	
Stage of development	In MADYMO R6.4.1 the anti-aliasing filter has been implemented as part of this APROSYS deliverable.	
Collaboration sought or offered	Use outside the APROSYS consortium to be regulated through an agreement for non-disclosure. The software is provided as is and there is no responsibility from the provider for the use of the software.	
Collaborator details	Potential users with in European car industry	
Intellectual property rights **granted** or published	External use to be regulated through proper tools (e.g. non disclosure undertaking documents)	
Subject Descriptors	CAD/CAE	
Contact details	Address	Schoemakerstraat 97
	City	Delft
	Contact name	Richard Lancashire
	Contact organization	TNO/TASS
	Country	The Netherlands
	Department	Engineering & Applications
	Fax nr	+31 888 277 003
	Email	info@tass-safe.com

Result number and title	**Exploitable result 6.16: Enhanced methods to compare/rate signals**	
		support@tass-safe.com richard.lancashire@tass-safe.com
	Postcode	2628 VK
	Position of contact person	Manager Engineering & Applications
	Phone number	+31 888 277 051
	Contact org. url	www.tass-safe.com

Result number and title	**Exploitable result 6.17: Motorcycle accident reconstruction tool**	
Result description	MADYMO motorcyclist reconstruction tool (for APROSYS/SP4 activities)	
Possible market applications	Model.	
Stage of development	The motorcyclist reconstruction tool is used for further research work related to the development of the motorcycle protection systems and development of new knowledge related to the motorcycle accident reconstruction	
Collaboration sought or offered	Use outside the APROSYS consortium to be regulated through an agreement for non-disclosure. The software is provided as is and there is no responsibility from the provider for the use of the software	
Collaborator details	Potential users with in European car industry	
Intellectual property rights **granted** or published	External use to be regulated through proper tools (e.g. non disclosure undertaking documents)	
Subject Descriptors	CAD/CAE	
Contact details	Address	Schoemakerstraat 97
	City	Delft
	Contact name	Richard Lancashire
	Contact organization	TNO/TASS
	Country	The Netherlands
	Department	Engineering & Applications
	Fax nr	+31 888 277 003
	Email	info@tass-safe.com support@tass-safe.com richard.lancashire@tass-safe.com
	Postcode	2628 VK
	Position of contact person	Manager Engineering & Applications
	Phone number	+31 888 277 051
	Contact org. url	www.tass-safe.com

Result number and title	**Exploitable result 6.18: Guidelines for filtering and rating**
Result description	General guidelines for filtering and rating of all applicable signals in frontal impact.
Possible market applications	Promotion of software & services
Stage of development	Methodology
Collaboration sought or offered	Use outside the APROSYS consortium to be regulated through an agreement for non-disclosure. The software is provided as is and there is no responsibility from the provider for the use of the software.
Collaborator details	Potential users with in European car industry
Intellectual property rights **granted** or published	External use to be regulated through proper tools (e.g. non disclosure undertaking documents)

Result number and title	**Exploitable result 6.18: Guidelines for filtering and rating**	
Subject Descriptors	CAD/CAE	
Contact details	Address	Schoemakerstraat 97
	City	Delft
	Contact name	Richard Lancashire
	Contact organization	TNO/TASS
	Country	The Netherlands
	Department	Engineering & Applications
	Fax nr	+31 888 277 003
	Email	info@tass-safe.com support@tass-safe.com richard.lancashire@tass-safe.com
	Postcode	2628 VK
	Position of contact person	Manager Engineering & Applications
	Phone number	+31 888 277 051
	Contact org. url	www.tass-safe.com

Result number and title	**Exploitable result 6.19: Road Map Virtual Testing in regulations**	
Result description	Reference document for establishment of a Road Map Virtual Testing in regulations. The road map presents a promising strategy towards the use of VT in future crashworthiness regulations.	
Possible market applications	All existing crashworthiness regulations/directives	
Stage of development	The strategy developed may be used for further promoting of VT procedures in existing crash safety standards.	
Collaboration sought or offered	Research agreements on investments to further investigate into the cost benefits of VT.	
Collaborator details	R&D related expert groups (EEVC WG22, ISO TC22/SC10-12/WG4, IMVITER) with the mandate to evaluate and to implement the APROSYS/SP7 vision/strategy	
Intellectual property rights **granted** or published	Public (APROSYS deliverable rules apply)	
Subject Descriptors	Standards	
Contact details	Address	2, rue de la Renaissance
	City	Antony
	Contact name	Franck Delcroix
	Contact organization	Altair Development France
	Country	France
	Department	
	Fax nr	+33.1.46.74.62.50
	Email	fdelcroix@altair.com
	Postcode	92184
	Position of contact person	Program Manager
	Phone number	+33.1.41.33.02.80
	Contact org. url	www.altair.com

Result number and title	**Exploitable result 6.20: Feasibility report of VT in a selected regulated or consumer testing procedure**
Result description	The report presents a demonstration of an integrated VT & RT development approach in pedestrian crashworthiness.

Result number and title	**Exploitable result 6.20: Feasibility report of VT in a selected regulated or consumer testing procedure**	
Possible market applications	The head and leg demonstrators developed can be used as a good starting point for future research in this field	
Stage of development	The research performed showed that further work is still needed for the shared definition of their contents (i.e. use of precise and common correlation criteria for the check of RT versus VT) or because of time constraints.	
Collaboration sought or offered	Consortium agreements on investments to organize specific VT research projects to investigate into the technical locks (short & medium term)	
Collaborator details	R&D related expert groups (EEVC WG22, ISO TC22/SC10-12/WG4, IMVITER) with the mandate to evaluate and to implement the APROSYS/SP7 vision/strategy	
Intellectual property rights **granted** or published	published report	
Subject Descriptors	standards / legislation / CAD/CAE	
Contact details	Address	Steenovenweg 1
	City	Helmond
	Contact name	Cees Huijskens
	Contact organization	TNO Automotive
	Country	The Netherlands
	Department	Integrated Safety
	Fax nr	+31 40 265 26 01
	Email	cees.huijskens@tno.nl
	Postcode	5700 AT
	Position of contact person	Consultant
	Phone number	+31 40 265 26 22
	Contact org. url	www.automotive.tno.nl

Result number and title	**Exploitable result 6.21: Reliability based-methods**	
Result description	Software for Reliability Analysis	
Possible market applications	Reliability Analysis in CAE related domains	
Stage of development	Implemented in commercial software	
Collaboration sought or offered	N/A	
Collaborator details	N/A	
Intellectual property rights **granted** or published	Licensed commercial product	
Subject Descriptors	CAD/CAM	
Contact details	Address	2, rue de la Renaissance
	City	Antony
	Contact name	Franck Delcroix
	Contact organization	Altair Development France
	Country	France
	Department	
	Fax nr	+33.1.46.74.62.50
	Email	fdelcroix@altair.com
	Postcode	92184

Result number and title	**Exploitable result 6.21: Reliability based-methods**	
	Position of contact person	Program Manager
	Phone number	+33.1.41.33.02.80
	Contact org. url	www.altair.com

Result number and title	**Exploitable result 6.22: Robust Optimization**	
Result description	Software for robust optimization	
Possible market applications	Optimization / Analysis in CAE related domains	
Stage of development	implemented in commercial software	
Collaboration sought or offered	N/A	
Collaborator details	N/A	
Intellectual property rights **granted** or published	Licensed commercial product	
Subject Descriptors	CAD/CAM	
Contact details	Address	2, rue de la Renaissance
	City	Antony
	Contact name	Franck Delcroix
	Contact organization	Altair Development France
	Country	France
	Department	
	Fax nr	+33.1.46.74.62.50
	Email	fdelcroix@altair.com
	Postcode	92184
	Position of contact person	Program Manager
	Phone number	+33.1.41.33.02.80
	Contact org. url	www.altair.com

Result number and title	**Exploitable result 6.23: Automatic identification of simplified models**	
Result description	Methods or software tools for simplified models identification	
Possible market applications	Software design applications. Methodologies for identification	
Stage of development	Implementation on design codes	
Collaboration sought or offered	Collaboration on projects in the virtual testing field	
Collaborator details	Research centers	
Intellectual property rights **granted** or published	APROSYS deliverable is public. Each partner implementation is protected (licensed software where applicable)	
Subject Descriptors	CAD/CAE	
Contact details	Address	Avenida Rovisco Pais, 1
	City	Lisbon
	Contact name	Jorge Ambrósio
	Contact organization	Instituto Superior Técnico
	Country	Portugal
	Department	Mechanical Engineering Department
	Fax nr	+351 21 841 7915
	Email	jorge@dem.ist.utl.pt
	Postcode	1049-001 Lisboa

Result number and title	**Exploitable result 6.23: Automatic identification of simplified models**	
	Position of contact person	Associate Professor
	Phone number	+351 218417680
	Contact org. url	www.dem.ist.utl.pt

Result number and title	**Exploitable result 6.24: Aluminium foam modelling techniques**	
Result description	Guidelines for simulation of al foam parts incl. local density variation, scatter	
Possible market applications	Aluminium foams have potential for applications in various industrial fields: automotive, aerospace, manufacturing. Applications range from energy absorption to structural reinforcement, and sandwich panel construction. Modelling is a basic stage in optimal design of these components.	
Stage of development	The aluminium foam models come from a large series of experimental tests and it is ready to use in some FE commercial codes, specifically Abaqus/explicit.	
Collaboration sought or offered	Support to the design phase is offered. Further improvement in modelling is possible, and collaboration to this is welcome.	
Collaborator details	Developers of products using aluminium foams for energy absorption in impacts (OEMs, suppliers etc., see above)	
Intellectual property rights **granted** or published	To be published in scientific journals	
Subject Descriptors	CAD/CAM	
Contact details	Address	Wiener Straße 12
	City	Bremen
	Contact name	Dirk Lehmhus
	Contact organization	Fraunhofer IFAM
	Country	Germany
	Department	
	Fax nr	+49 (0)421 2246 300
	Email	Dirk.lehmhus@ifam.fraunhofer.de
	Postcode	28359
	Position of contact person	project manager
	Phone number	+49 (0)421 2246 215
	Contact org. url	www.ifam.fraunhofer.de

Result number and title	**Exploitable result 6.25: Materials/Material mode database**	
Result description	Database for storage of materials data, material model parameters	
Possible market applications	Basic tool for usage in simulation/virtual testing, link to MATFIT tool for automatic material model parameter determination	
Stage of development	prototype	
Collaboration sought or offered	suppliers of public materials data	
Collaborator details	suppliers of materials data, as users, companies designing components inc	
Intellectual property rights **granted** or published	licensed	
Subject Descriptors	CAD/CAM	
Contact details	Address	Wiener Straße 12

Result number and title	**Exploitable result 6.25: Materials/Material mode database**	
	City	Bremen
	Contact name	Dirk Lehmhus
	Contact organization	Fraunhofer IFAM
	Country	Germany
	Department	
	Fax nr	+49 (0)421 2246 300
	Email	Dirk.lehmhus@ifam.fraunhofer.de
	Postcode	28359
	Position of contact person	project manager
	Phone number	+49 (0)421 2246 215
	Contact org. url	www.ifam.fraunhofer.de

Result number and title	**Exploitable result 6.26: Software code**	
Result description	Translation of LS-DYNA results into ADVISER	
Possible market applications	Computer aided translation	
Stage of development	Completed	
Collaboration sought or offered	No	
Collaborator details	Altair Development France	
Intellectual property rights **granted** or published	Licensed	
Subject Descriptors	CAD	
Contact details	Address	Building 61, Cranfield University, Bedford, MK43 8TA,
	City	Bedford
	Contact name	James Watson
	Contact organization	Cranfield Impact Centre
	Country	UK
	Department	
	Fax nr	+44 1234 751671
	Email	j.w.watson@cranfield.ac.uk
	Postcode	MK43 8TA
	Position of contact person	Senior Project Engineer
	Phone number	+44 1234 754149
	Contact org. url	www.cicl.co.uk

Result number and title	**Exploitable result 6.27: RADIOSS AEMDB model and experimental tests**
Result description	RADIOSS AE-MBD model and experimental tests
Possible market applications	crash and safety FE analysis
Stage of development	commercial product
Collaboration sought or offered	N/A
Collaborator details	N/A
Intellectual property rights **granted** or published	Licensed commercial product
Subject Descriptors	CAD/CAM

Result number and title	**Exploitable result 6.27: RADIOSS AEMDB model and experimental tests**	
Contact details	Address	2, rue de la Renaissance
	City	Antony
	Contact name	Franck Delcroix
	Contact organization	Altair Development France
	Country	France
	Department	
	Fax nr	+33.1.46.74.62.50
	Email	fdelcroix@altair.com
	Postcode	92184
	Position of contact person	Program Manager
	Phone number	+33.1.41.33.02.80
	Contact org. url	www.altair.com

Result number and title	**Exploitable result 6.28: Dummy model**	
Result description	Standing up dummy suitable for motorcycle safety modelling in RADIOSS	
Possible market applications	PTW OEMs, PTW associations (Further research or internal development)	
Stage of development	Model	
Collaboration sought or offered	This model is usable within research projects in which CIDAUT is a consortium partner. Also it could be used in other research projects of CIDAUT w/wo additional industrial partners	
Collaborator details	Industry and research institutes involved in automotive sector	
Intellectual property rights **granted** or published	Related with APROSYS Consortium Agreement for developed know-how within the project	
Subject Descriptors	CAD/CAM/CAE	
Contact details	Address	Parque Tecnológico de Boecillo, P209
	City	Boecillo (Valladolid)
	Contact name	Mónica Diez
	Contact organization	Fundación para la Investigación y Desarrollo en Transporte y Energía - CIDAUT
	Country	Spain
	Department	Crash Safety Division
	Fax nr	+34 983 548062
	Email	mondie@cidaut.es
	Postcode	47151
	Position of contact person	Senior Researcher Project Manager
	Phone number	+34 983 548035
	Contact org. url	www.cidaut.es

Result number and title	**Exploitable result 6.29: Virtual testing benchmarks**
Result description	Guidelines for the verification of numerical codes
Possible market applications	Road, rail vehicles
Stage of development	First stage proposal available; continuous addition of new test cases foreseen
Collaboration sought or offered	New test cases welcome

Result number and title	**Exploitable result 6.29: Virtual testing benchmarks**	
Collaborator details	Researchers working in the automotive field from universities, research centres, software developers and industry	
Intellectual property rights **granted** or published	Published results	
Subject Descriptors	Method, work study	
Contact details	Address	Corso Duca degli Abruzzi, 24
	City	Torino
	Contact name	Massimiliano Avalle
	Contact organization	Politecnico di Torino
	Country	Italy
	Department	Dipartimento di Meccanica
	Fax nr	+39-011-0906999
	Email	massimiliano.avalle@polito.it
	Postcode	10129
	Position of contact person	Associate Professor
	Phone number	+39-011-0906900
	Contact org. url	http://www.dimec.polito.it/

Result number and title	**Exploitable result 6.30: Cost Benefit study**	
Result description	A Cost Benefit study of Virtual Testing, including website, process maps and societal costs	
Possible market applications	Road Rail Vehicles	
Stage of development	Research Tool	
Collaboration sought or offered	Further research or development support	
Collaborator details	VT user, test house or safety legislator	
Intellectual property rights **granted** or published	Papers detailing methodology and results licensed	
Subject Descriptors	Process Engineering	
Contact details	Address	Building 61, Cranfield University, Bedford, MK43 8TA,
	City	Bedford
	Contact name	James Watson
	Contact organization	Cranfield Impact Centre
	Country	UK
	Department	
	Fax nr	+44 1234 751671
	Email	j.w.watson@cranfield.ac.uk
	Postcode	MK43 8TA
	Position of contact person	Senior Project Engineer
	Phone number	+44 1234 754149
	Contact org. url	www.cicl.co.uk

Result number and title	**Exploitable result 6.31 Finite element model for simulating impacts on laminated glass**
Result description	This result is a finite element model which can be used in computer simulations. It represents the windshield glass of a passenger car.

Result number and title	**Exploitable result 6.31 Finite element model for simulating impacts on laminated glass**	
	Properties of the 3 layers of the glass can be changed, including changes in e.g. thickness. The model can be used to determine the effect of such changes on the head injury sustained by a pedestrian or cyclist impacting the windscreen. Thus, for new windscreens, an optimum of materials and thicknesses can be determined. Simulations have to be supported by experimental testing for e.g. visibility.	
Possible market applications	Sector for applications mainly is automotive, for optimising new glass for windscreens. Maritime application is possible in the future.	
Stage of development	Working model	
Collaboration sought or offered	Best option is if the model is used in a joint effort of a car manufacturer and a glass supplier	
Collaborator details	OEM, 1st Tier in windscreen glass	
Intellectual property rights **granted** or published	None, nothing planned	
Subject Descriptors	Transport safety	
Contact details	Address	Steenovenweg 1
	City	Helmond
	Contact name	Margriet van Schijndel-de Nooij
	Contact organization	TNO
	Country	The Netherlands
	Department	Automotive
	Fax nr	0031 40 265 26 01
	Email	Margriet.vanschijndel@tno.nl
	Postcode	5708 HN
	Position of contact person	Project Manager
	Phone number	0031 40 265 2639
	Contact org. url	www.tno.nl

Result number and title	**Exploitable result 6.32 Modelling techniques for simulating impacts on glass**	
Result description	Methodology for simulating impacts on laminated glass	
Possible market applications	Automotive sector, possibly Construction (buildings) sector	
Stage of development	Methodology	
Collaboration sought or offered	None	
Collaborator details	Not applicable	
Intellectual property rights **granted** or published	None	
Subject Descriptors	Transport safety	
Contact details	Address	2 rue de la renaissance
	City	Antony
	Contact name	Franck NJILIE
	Contact organization	Altair development France
	Country	France
	Department	Safety
	Fax nr	+33 1 46746250
	Email	fnjilie@altair.com

Result number and title	**Exploitable result 6.32 Modelling techniques for simulating impacts on glass**	
	Postcode	92184
	Position of contact person	Safety & Biomechanics Manager
	Phone number	+33 1 41330286
	Contact org. url	www.altair.com

Result number and title	**Exploitable result 7.1 Proposal of a new standard for impacts of motorcyclists against metal barriers.**	
Result description	The achievement of this result means the description of the testing procedure to be followed to assess the performance of road furniture in terms of motorcyclists' protection. The standard is applicable to the scenario in which a motorcyclist slides on the ground and impacts against the road element.	
Possible market applications	Road safety (infrastructure) on a pan- European level	
Stage of development	Method/technical specification	
Collaboration sought or offered	None	
Collaborator details	n/a	
Intellectual property rights **granted** or published	None	
Subject Descriptors	Inspection / testing. Knowledge engineering / knowledge based system	
Contact details	Address	Parque Tecnológico de Boecillo, parcela 209
	City	Boecillo
	Contact name	Aquilino Molinero
	Contact organization	CIDAUT
	Country	Spain
	Department	Accident Analysis and Human Factor
	Fax nr	+34 983 548062
	Email	aqumol@cidaut.es
	Postcode	47151
	Position of contact person	Project Engineer
	Phone number	+34 983 548035
	Contact org. url	www.cidaut.es

Result number and title	**Exploitable result 7.2 Revision of helmets testing current standard**
Result description	To give technical indications that could help in the development of a reviewed standard for helmet testing. The aim is to propose some amendments to the R22 regulation after comparing the real impact conditions taking place in real accidents (COST 327 report) with the impact conditions included in the R22. Then, some realistic modifications in the R22 have been suggested with the purpose of making the regulation closer to true conditions. These modifications have been given in a double way. From one side, a first approach has been explained, based on slight modifications in the R22 which can be easily put into practice in the mid term. From other side, a more innovative way of testing the helmets behaviour has been proposed for the long term.
Possible market applications	Helmet industry
Stage of development	Method/technical specification
Collaboration sought or of-	None

Result number and title	**Exploitable result 7.2 Revision of helmets testing current standard**	
fered		
Collaborator details	n/a	
Intellectual property rights **granted** or published	None	
Subject Descriptors	Inspection / testing. Knowlegde engineering / knowledge based system	
Contact details	Address	Parque Tecnológico de Boecillo, parcela 209
	City	Boecillo
	Contact name	Aquilino Molinero
	Contact organization	CIDAUT
	Country	Spain
	Department	Accident Analysis and Human Factor
	Fax nr	+34 983 548062
	Email	aqumol@cidaut.es
	Postcode	47151
	Position of contact person	Project Engineer
	Phone number	+34 983 548035
	Contact org. url	www.cidaut.es

Result number and title	**Exploitable result 7.3 Development of road and misuse tests**	
Result description	In order to develop advanced protection equipment for motorcycle riders “Misuse” tests are necessary to adjust the sensors system of vehicle. So it is very important to provide the system with parameters preventing the unintended deployment of the protective device. This result actually contributes to APROSYS objectives through a better knowledge about the performance of some physical sensors implemented (related to future passive safety systems) in the motorcycle during normal and anomalous driving conditions.	
Possible market applications	Motorcycle industry, passive safety systems manufacturers, …	
Stage of development	Method/technical specification	
Collaboration sought or offered	None	
Collaborator details	n/a	
Intellectual property rights **granted** or published	Piaggo	
Subject Descriptors	Inspection / testing. Knowledge engineering / knowledge based system	
Contact details	Address	Viale Rinaldo Piaggio, 25
	City	Pontedera
	Contact name	Paolo Cravini
	Contact organization	Dainese S.p.A.
	Country	Italy
	Department	Vehicle Technical Innovation
	Fax nr	+39 0587 272033
	Email	paolo.cravini@piaggio.com
	Postcode	56025
	Position of contact person	Project Engineer
	Phone number	+39 0587 272349
	Contact org. url	www.piaggio.com

Result number and title	**Exploitable result 7.4 New or amended car front test procedures**	
Result description	Test procedures for the APROSYS new or improved test methods for VRU	
Possible market applications	Inclusion of new test procedures in consumer testing and vehicle type-approval process for cars and light goods vehicles	
Stage of development	Draft test methods	
Collaboration sought or offered	Research, consultancy	
Collaborator details	Consumer testing organisations, Regulatory authorities, other research organisations	
Intellectual property rights **granted** or published	Yes	
Subject Descriptors	Transport safety	
Contact details	Address	Crowthorne House, Nine Mile Ride
	City	Wokingham
	Contact name	Brian Hardy
	Contact organization	TRL Limited
	Country	UK
	Department	Vehicle Engineering
	Fax nr	+44 (0)1344 770356
	Email	bhardy@trl.co.uk
	Postcode	RG40 3GA
	Position of contact person	Senior Scientist
	Phone number	+44 (0)1344 770675
	Contact org. url	www.trl.co.uk

Result number and title	**Exploitable result 7.5 : New head form impactor**	
Result description	Pendulum head form impactor with a force sensor to evaluate dynamic edge impact (e.g. exposed rear gap of deployable bonnet)	
Possible market applications	Consumer testing organisations, Regulatory authorities, vehicle OEMs	
Stage of development	Laboratory prototype, demonstrator	
Collaboration sought or offered	Financial support or investment, information exchange, training	
Collaborator details	Support of testing organisations, specialist Working Groups like EEVC and/or FP research projects	
Intellectual property rights **granted** or published		
Subject Descriptors	Transport sector	
Contact details	Address	Steinbachstr. 7
	City	Aachen
	Contact name	Jens Bovenkerk
	Contact organization	ika IKA University
	Country	Germany
	Department	Body Department
	Fax nr	+49 241 80 22 147
	Email	bovenkerk@ika.ika-aachen.de
	Postcode	52074
	Position of contact person	Project Manager Pedestrian Safety
	Phone number	+49 241 80 25 610
	Contact org. url	www.ika.ika-aachen.de

Result number and title	**Exploitable result 7.6 : New head form and neck impactor**	
Result description	Currently only head linear acceleration (HIC) is used to evaluate the pedestrian friendliness of car front ends by using a headform impactor. Accident/biomechanical studies show that beside the linear accelerations also the angular accelerations are very important to comprehensively assess head injury probability. A new impactor is developed to assess the pedestrian friendliness of the car front end by addressing not only linear but also angular acceleration of the head. By considering the effective mass of the pedestrian body connected via the neck to the head a more realistic kinematics happens.	
Possible market applications	Impactor for legislative and consumer testing to assess the pedestrian friendliness of the car front end. The basic impactor design is done but details on the test procedure and the calibration method have to be further investigated. Additional work of about one year is necessary. That means the procedure could be ready (start to solve the open points from now on) beginning of 2010. After an assessment phase the earliest possible application (probably in consumer tests) might be in 2012.	
Stage of development	Laboratory prototype	
Collaboration sought or offered	We are open to share the information with all interested stakeholders to finalize necessary activity and push the application of the final test method to be part of car assessments in future (legislative or consumers)	
Collaborator details	Partners are necessary which are capable to: - to check the necessary design for the car classes which are not investigated within the framework of APROSYS - define test method details - validate probably based on real accident cases which are reconstructed - design the impactor till final stage (sellable)	
Intellectual property rights **granted** or published	none	
Subject Descriptors	Transport safety	
Contact details	Address	Hussitenstraße 34
	City	Berlin
	Contact name	Ingo Kalliske
	Contact organization	Takata-Petri AG
	Country	Germany
	Department	R&D Group / Advanced Safety Systems
	Fax nr	+49 30 47407 – 4181
	Email	Ingo.kalliske@eu.takata.com
	Postcode	13355
	Position of contact person	Team leader “Passive Safety”
	Phone number	+49 30 47407 – 4343
	Contact org. url	None

Result number and title	**Exploitable result 7.7: New upper body mass for EEVC pedestrian lower leg impactor**
Result description	New upper body mass for EEVC pedestrian lower leg impactor – upper body mass-part which can be fixed tot the top of the EEVC lower leg impactor to better reproduce impact kinematics especially for SUV’s

Result number and title	**Exploitable result 7.7: New upper body mass for EEVC pedestrian lower leg impactor**	
Possible market applications	Consumer testing organizations. Regulatory bodies and technical services, Vehicle OEMs	
Stage of development	Laboratory prototype, demonstrator.	
Collaboration sought or offered	Financial support or investment, information exchange, training	
Collaborator details	Support of testing organisations, specialist Working Groups like EEVC and/or FP research projects	
Intellectual property rights **granted** or published	None	
Subject Descriptors	Transport safety	
Contact details	Address	INSIA. CAMPUS SUR UPM. Ctra de Valencia km 7.
	City	Madrid
	Contact name	Luis Martínez Sáez
	Contact organization	UPM-INSIA
	Country	Spain
	Department	Biomechanics Unit
	Fax nr	+34 91 336 53 02
	Email	Luis.martinez@upm.es
	Postcode	28031
	Position of contact person	Head of Biomechanics Unit
	Phone number	+34 91 336 53 27
	Contact org. url	www.insia.upm.es

Result number and title	**Exploitable result 7.8 : New upper body mass for the Flex PLI**	
Result description	Upper body mass-part which can be fixed to the top of the flexible lower legform (Flex PLI) to better reflect impact kinematics especially for SUVs	
Possible market applications	Consumer testing organisations, Regulatory authorities, vehicle OEMs	
Stage of development	Laboratory prototype, demonstrator	
Collaboration sought or offered	Financial support or investment, information exchange, training	
Collaborator details	Support of testing organisations, specialist Working Groups like EEVC and/or FP research projects	
Intellectual property rights **granted** or published	None	
Subject Descriptors	Transport safety	
Contact details	Address	Steinbachstr. 7
	City	Aachen
	Contact name	Jens Bovenkerk
	Contact organization	ika IKA University
	Country	Germany
	Department	Body Department
	Fax nr	+49 241 80 22 147
	Email	bovenkerk@ika.ika-aachen.de
	Postcode	52074
	Position of contact	Project Manager Pedestrian Safety

Result number and title	**Exploitable result 7.8 : New upper body mass for the Flex PLI**	
	person	
	Phone number	+49 241 80 25 610
	Contact org. url	www.ika.ika-aachen.de

Result number and title	**Exploitable result 7.9 : Heavy Vehicle Aggressivity Index**	
Result description	Set of guidelines and procedures to evaluate the aggressivity of heavy good vehicle design toward pedestrians and cyclists	
Possible market applications	Support of promoting pedestrian and cyclist friendly design of truck / trailers, Reduction of injury's and related costs on European roads by new designs; environmental impact by streamline designs (less fuel consumption)	
Stage of development	Protocol	
Collaboration sought or offered	other	
Collaborator details	implementation into regulations or rating procedures	
Intellectual property rights **granted** or published	Protocol is free available	
Subject Descriptors	Safety	
Contact details	Address	Inffeldgasse 11/II
	City	Graz
	Contact name	Juergen Gugler
	Contact organization	Technical University Graz
	Country	Austria
	Department	Vehicle safety institute
	Fax nr	+43 316 873 9402
	Email	Office.vsi@tugraz.at
	Postcode	8010
	Position of contact person	Senior researcher
	Phone number	+43 316 873 9401
	Contact org. url	www.vsi.tugraz.at

Result number and title	**Exploitable result 7.10 New or amended car front test procedures**	
Result description	Test procedures for the APROSYS new or improved test methods for VRU	
Possible market applications	Automotive	
Stage of development	Draft regulation	
Collaboration sought or offered	None	
Collaborator details	N/a	
Intellectual property rights **granted** or published	None	
Subject Descriptors	Safety	
Contact details	Address	Crowthorne House, Nine Mile Ride
	City	Wokingham
	Contact name	Brian Hardy
	Contact organization	TRL Limited
	Country	UK
	Department	Vehicle Engineering
	Fax nr	+44 (0)1344 770356
	Email	bhardy@trl.co.uk

Result number and title	**Exploitable result 7.10 New or amended car front test procedures**	
	Postcode	RG40 3GA
	Position of contact person	Senior Scientist
	Phone number	+44 (0)1344 770675
	Contact org. url	www.trl.co.uk

Result number and title	**Exploitable result 7.11 New head form impactor**	
Result description	Pendulum head form impactor with a force sensor to evaluate dynamic edge impact (e.g. exposed rear gap of deployable bonnet)	
Possible market applications	Consumer testing organisations, Regulatory authorities, vehicle OEMs	
Stage of development	Laboratory prototype, demonstrator	
Collaboration sought/offered	Financial support or investment, information exchange, training	
Collaborator details	Support of testing organisations, specialist Working Groups like EEVC and/or FP research projects	
Intellectual property rights **granted** or published	Not yet	
Subject Descriptors	Safety	
Contact details	Address	Steinbachstr. 7
	City	Aachen
	Contact name	Jens Bovenkerk
	Contact organization	ika IKA University
	Country	Germany
	Department	Body Department
	Fax nr	+49 241 80 22 147
	Email	bovenkerk@ika.ika-aachen.de
	Postcode	52074
	Position of contact person	
	Phone number	+49 241 80 25 610
	Contact org. url	www.ika.ika-aachen.de

Result number and title	**Exploitable result 7.12 New headform and neck impactor**
Result description	Currently only head linear acceleration (HIC) is used to evaluate the pedestrian friendliness of car front ends by using a headform impactor. Accident/biomechanical studies show that beside the linear accelerations also the angular accelerations are very important to comprehensively assess head injury probability. A new impactor is developed to assess the pedestrian friendliness of the car front end by addressing not only linear but also angular acceleration of the head. By considering the effective mass of the pedestrian body connected via the neck to the head a more realistic kinematics happens.
Possible market applications	Impactor for legislative and consumer testing to assess the pedestrian friendliness of the car front end. The basic impactor design is done but details on the test procedure and the calibration method have to be further investigated. Additional work of about one year is necessary. That means the procedure could be ready (start to solve the open points from now on) beginning of 2010. After an assessment phase the earliest possible application (probably in consumer tests) might be in 2012.
Stage of development	Laboratory prototype

Result number and title	**Exploitable result 7.12 New headform and neck impactor**	
Collaboration sought or offered	We're open to share information with interested stakeholders to finalize necessary activity and push the application of the final test method to be part of car assessments in future (legislative or consumers)	
Collaborator details	Partners are necessary which are capable to: - to check the necessary design for the car classes which are not investigated within the framework of APROSYS - define test method details - validate probably based on real accident cases which are reconstructed - design the impactor till final stage (sellable)	
Intellectual property rights **granted** or published	none	
Subject Descriptors	Safety	
Contact details	Address	Hussitenstraße 34
	City	Berlin
	Contact name	Ingo Kalliske
	Contact organization	Takata-Petri AG
	Country	Germany
	Department	R&D Group / Advanced Safety Systems
	Fax nr	+49 30 47407 – 4181
	Email	Ingo.kalliske@eu.takata.com
	Postcode	13355
	Position of contact person	Team leader "Passive Safety"
	Phone number	+49 30 47407 – 4343
	Contact org. url	

Result number and title	**Exploitable result 7.13: New upper body mass for EEVC pedestrian lower leg impactor**	
Result description	New upper body mass for EEVC pedestrian lower leg impactor – upper body mass-part which can be fixed to top of the EEVC lower leg impactor to better reproduce impact kinematics especially for SUV's	
Possible market applications	Automotive	
Stage of development	Prototype	
Collaboration sought or offered	Not yet	
Collaborator details	N/a	
Intellectual property rights **granted** or published	To be considered	
Subject Descriptors	Safety	
Contact details	Address	INSIA. CAMPUS SUR UPM. Ctra de Valencia km 7.
	City	Madrid
	Contact name	Luis Martínez Sáez
	Contact organization	UPM-INSIA
	Country	Spain
	Department	Biomechanics Unit
	Fax nr	+34 91 336 53 02
	Email	Luis.martinez@upm.es
	Postcode	28031

Result number and title	**Exploitable result 7.13: New upper body mass for EEVC pedestrian lower leg impactor**	
	Position of contact person	Head of Biomechanics Unit
	Phone number	+34 91 336 53 27
	Contact org. url	www.insia.upm.es

Result number and title	**Exploitable result 7.14 New upper body mass for Flex PLI**	
Result description	Upper body mass-part which can be fixed to the top of the flexible lower legform (Flex PLI) to better reflect impact kinematics especially for SUVs	
Possible market applications	Consumer testing organisations, Regulatory authorities, vehicle OEMs	
Stage of development	Laboratory prototype, demonstrator	
Collaboration sought or offered	Financial support or investment, information exchange, training	
Collaborator details	Support of testing organisations, specialist Working Groups like EEVC and/or FP research projects	
Intellectual property rights **granted** or published	None	
Subject Descriptors	Safety	
Contact details	Address	Steinbachstr. 7
	City	Aachen
	Contact name	Jens Bovenkerk
	Contact organization	ika IKA University
	Country	Germany
	Department	Body Department
	Fax nr	+49 241 80 22 147
	Email	bovenkerk@ika.ika-aachen.de
	Postcode	52074
	Position of contact person	
	Phone number	+49 241 80 25 610
	Contact org. url	www.ika.ika-aachen.de

Result number and title	**Exploitable result 8.1: Full width frontal test for Europe**	
Result description	Test procedure for car frontal impact protection systems to improve Reg 94 and Euro NCAP consumer testing	
Possible market applications	Road, rail vehicles (Automotive – Could be used as a basis to update and improve current crash safety regulation and/or consumer testing)	
Stage of development	New test procedure	
Collaboration sought or offered	Financial support , other (Financial support and/or collaboration for implementation of procedure into regulatory and/or consumer testing)	
Collaborator details	European national governments, EC, EEVC, Euro NCAP, GRSP and industry	
Intellectual property rights **granted** or published	None	
Subject Descriptors	Safety accident prevention, Standards, Transport	
Contact details	Address	Crowthorne House Nine Mile Ride
	City	Wokingham
	Contact name	Mervyn Edwards
	Contact organiza-	TRL

Result number and title	**Exploitable result 8.1: Full width frontal test for Europe**	
	tion	
	Country	United Kingdom
	Department	Vehicle Engineering
	Fax nr	+44 (0) 1344 770356
	Email	medwards@trl.co.uk
	Postcode	RG40 3GA
	Position of contact person	Senior Acadamy Fellow
	Phone number	+44 (0) 1344 770723
	Contact org. url	www.trl.co.uk

Result number and title	**Exploitable result 9.1 AE-MDB test procedure development and evaluation**	
Result description	AE-MDB test procedure	
Possible market applications	Automotive	
Stage of development	Road, rail vehicles (Automotive - Could be used as a basis to update and improve current crash safety regulation and/or consumer testing)	
Collaboration sought or offered	Draft test procedure	
Collaborator details	Further research or development support, financial support, other (Financial support and/or collaboration for further development of procedure and its implementation into regulatory and/or consumer testing)	
Intellectual property rights **granted** or published	European national governments, EC, EEVC, Euro NCAP, GRSP and automotive industry	
Subject Descriptors	None	
Contact details	Address	Crowthorne House Nine Mile Ride
	City	Wokingham
	Contact name	Mervyn Edwards
	Contact organization	TRL
	Country	United Kingdom
	Department	Vehicle Engineering
	Fax nr	+44 (0) 1344 770356
	Email	medwards@trl.co.uk
	Postcode	RG40 3GA
	Position of contact person	Senior Academy Fellow
	Phone number	+44 (0) 1344 770723
	Contact org. url	www.trl.co.uk

Result number and title	**Exploitable result 9.2: Side impact pole test evaluation**
Result description	Test procedures for car side impact protection systems to improve Reg 95 and Euro NCAP consumer testing
Possible market applications	Road, rail vehicles (Automotive – Could be used as a basis to update and improve current crash safety regulation.)
Stage of development	New draft test methods
Collaboration sought or offered	Further research or development support, financial support, other (Financial support and/or collaboration for further development of procedure and its implementation into regulatory and/or consumer testing)
Collaborator details	European national governments, EC, EEVC, Euro NCAP, GRSP and automotive industry
Intellectual property rights	None

Result number and title	**Exploitable result 9.2: Side impact pole test evaluation**	
granted or published		
Subject Descriptors	Safety accident prevention, Standards, Transport	
Contact details	Address	Steenovenweg 1 P.O. Box 756 5700 AT HELMOND
	City	Helmond
	Contact name	Ton Versmissen
	Contact organization	TNO Science and Industry
	Country	The Netherlands
	Department	Automotive Business Unit
	Fax nr	n/a
	Email	ton.versmissen@tno.nl
	Postcode	5700
	Position of contact person	Research Engineer
	Phone number	+31 (0) 40 26 52667
	Contact org. url	www.automotive.tno.nl

Result number and title	**Exploitable result 9.3 Side impact FMH test development and evaluation**	
Result description	FMH test procedure	
Possible market applications	Automotive	
Stage of development	Road, rail vehicles (Automotive - Could be used as a basis to update and improve current crash safety regulation)	
Collaboration sought or offered	Draft test procedure	
Collaborator details	Further research or development support, financial support, other (Financial support and/or collaboration for further development of procedure and its implementation into regulatory and/or consumer testing)	
Intellectual property rights **granted** or published	European national governments, EC, EEVC, Euro NCAP, GRSP and automotive industry	
Subject Descriptors	Safety accident prevention, Standards, Transport	
Contact details	Address	Bruderstrasse 53 – 51427, Bergisch Gladbach
	City	Koln
	Contact name	Tobias Langner
	Contact organization	BASt
	Country	Germany
	Department	Passive Vehicle Safety
	Fax nr	N/A
	Email	Langner@bast.de
	Postcode	51427
	Position of contact person	Research Engineer
	Phone number	+49 (2204) 43 659
	Contact org. url	www.bast.de/

Result number and title	**Exploitable result 9.4: Side impact OOp test development and evaluation**
Result description	Side impact OOP test procedure
Possible market applications	Road, rail vehicles (Automotive - Could be used as a basis to update

Result number and title	**Exploitable result 9.4: Side impact OOp test development and evaluation**	
	and improve current crash safety regulation if needed).	
Stage of development	Draft test procedure	
Collaboration sought or offered	Further research or development support, financial support, other (Financial support and/or collaboration for further development of procedure and its implementation into regulatory and/or consumer testing if needed)	
Collaborator details	European national governments, EC, EEVC, Euro NCAP, GRSP and automotive industry	
Intellectual property rights **granted** or published	None	
Subject Descriptors	Safety accident prevention, Standards, Transport	
Contact details	Address	Steenovenweg 1 P.O. Box 756 5700 AT HELMOND
	City	Helmond
	Contact name	Ton Versmissen
	Contact organization	TNO Science and Industry
	Country	The Netherlands
	Department	Automotive Business Unit
	Fax nr	N/A
	Email	ton.versmissen@tno.nl
	Postcode	5700
	Position of contact person	Research Engineer
	Phone number	+31 (0) 40 26 52667
	Contact org. url	www.automotive.tno.nl

Result number and title	**Exploitable result 9.5 Non-struck side occupant**	
Result description	Outline proposal for non struck side occupant test procedure	
Possible market applications	Road, rail vehicles (Automotive)	
Stage of development	Concept	
Collaboration sought or offered	Further research or development support, financial support, participation in call for proposal or tender (Financial support and/or collaboration for further development of concept test procedure).	
Collaborator details	European national governments, EC, EEVC, Euro NCAP and automotive industry	
Intellectual property rights **granted** or published	None	
Subject Descriptors	Safety accident prevention, Standards, Transport	
Contact details	Address	Inffeldgasse 11/II
	City	Graz
	Contact name	Florian Feist
	Contact organization	Technical University Graz
	Country	Austria
	Department	Vehicle safety institute
	Fax nr	+43 316 873 9402
	Email	Office.vsi@tugraz.at
	Postcode	8010

Result number and title	**Exploitable result 9.5 Non-struck side occupant**	
	Position of contact person	Senior Researcher
	Phone number	+43 (316) 873 9408
	Contact org. url	www.vsi.tugraz.at

Result number and title	**Exploitable result 9.6 Understanding of major influencing factors in side impact compatibility**	
Result description	Concept for test procedure to assess a vehicle's side impact compatibility performance	
Possible market applications	Road, rail vehicles (Automotive).	
Stage of development	Concept	
Collaboration sought or offered	Further research or development support, financial support, participation in call for proposal or tender (Financial support and/or collaboration for further development of concept ideas).	
Collaborator details	European national governments, EC, EEVC, Euro NCAP and automotive industry	
Intellectual property rights **granted** or published	None	
Subject Descriptors	Safety accident prevention, Standards, Transport	
Contact details	Address	Crowthorne House Nine Mile Ride
	City	Wokingham
	Contact name	Mervyn Edwards
	Contact organization	TRL
	Country	United Kingdom
	Department	Vehicle Engineering
	Fax nr	+44 (0) 1344 770356
	Email	medwards@trl.co.uk
	Postcode	RG40 3GA
	Position of contact person	Head of Structural Crashworthiness
	Phone number	+44 (0) 1344 770723
	Contact org. url	www.trl.co.uk

Result number and title	**Exploitable result 10.1 Motorcyclist protective system; motorcyclist friendly barriers (roadside infrastructure)**
Result description	This new protective device (MPD) has been developed to be attached to the current European metal guardrails to offer protection to the motorcyclist when impacting the roadside barrier. For the design of this device, a factor such as reducing the consequences for the motorcyclist leaving the road and impacting against an obstacle was taken into account. This obstacle could be protected related to other road user impacts (cars, buses and trucks) by means of safety barriers (Road Restraint Systems), although these pose a hazard for motorcyclists. This means it is necessary to work just to protect the motorcyclists from the possible impact of the motorcyclist against MPD posts or obstacles beyond the MPD in case the motorcyclist passes between the two MPD posts. Work has been done on a continuous MPD.
Possible market applications	Road safety (infrastructure)

Result number and title	**Exploitable result 10.1 Motorcyclist protective system; motorcyclist friendly barriers (roadside infrastructure)**	
Stage of development	Prototype	
Collaboration sought or offered	None	
Collaborator details	n/a	
Intellectual property rights **granted** or published	Yes, by HIASA	
Subject Descriptors	Product development	
Contact details	Address	Polígono Industrial de Cancienes P.O. Box 252
	City	Avilés
	Contact name	Ángel V. Martínez
	Contact organization	HIASA
	Country	Spain
	Department	Road Safety Division
	Fax nr	(+ 34) 985 50 53 61
	Email	amartinez_hiasa@gonvarri.com
	Postcode	33470
	Position of contact person	European Project Manager
	Phone number	(+ 34) 985 12 82 00
	Contact org. url	www.hiasa.com

Result number and title	**Exploitable result 10.2 Development of thorax protector prototypes (male and female versions)**	
Result description	The aim of the thorax protector (male and female version and in different garments) is to reduce the risk of suffering injuries in the thoracic body region in case of accidents	
Possible market applications	The application of this result is: • Protective equipment industry. Further research	
Stage of development	Prototype	
Collaboration sought or offered	None	
Collaborator details	n/a	
Intellectual property rights **granted** or published	None	
Subject Descriptors	Product development	
Contact details	Address	Via dell'artigianato, 35
	City	Molvena
	Contact name	David Manzardo
	Contact organization	DAINESE S.p.A.
	Country	Italy
	Department	Dainese Technology center
	Fax nr	+39 0424 410700
	Email	david.manzardo@dainese.com
	Postcode	36060
	Position of contact person	Project Engineer
	Phone number	+39 0424 410711
	Contact org. url	www.dainese.com

Result number and title	**Exploitable result 10.3 Development of a helmet prototype with improved performance**	
Result description	This result actually contributes to APROSYS Main Results through the development of this new protective and advanced device, related directly to minimize the risk of suffering injuries on head through better protection on chin part and better behaviour against impacts. The aim is to obtain a helmet prototype with improved safety on chin part and better behaviour against impacts.	
Possible market applications	Motorcycle industry, helmet industry, further research	
Stage of development	Prototype	
Collaboration sought or offered	Further research or development support	
Collaborator details	ULP (University of Louis Pasteur)	
Intellectual property rights **granted** or published	Italian patent (International patent in process in process between Dainese and Piaggo)	
Subject Descriptors	Product development	
Contact details	Address	Via dell'artigianato, 35
	City	Molvena
	Contact name	David Manzardo
	Contact organization	DAINESE S.p.A.
	Country	Italy
	Department	Dainese Technology center
	Fax nr	+39 0424 410700
	Email	david.manzardo@dainese.com
	Postcode	36060
	Position of contact person	Project Engineer
	Phone number	+39 0424 410711
	Contact org. url	www.dainese.com

Result number and title	**Exploitable result 10.4 : Passive Safety Grid Load Bonnet**
Result description	Specification and hard ware passive safety grid load bonned
Possible market applications	Specification and hardware of passive safety GridLoad bonnet. Utilises patented energy absorbing materials to reduce VRU head injuries whilst maintaining practical levels of stiffness, and reducing weight.
Stage of development	Automotive Sector Passive and Passive/ active bonnets. May also be useable for types of vehicles other than cars e.g. commercial vehicles, boats etc… Technology could also be applied to different scenarios. e.g. already been exploited for occupant head protection, doors, adaptive bumper, anti-blast floor etc…
Collaboration sought or offered	Proven Prototype, tested, and supporting FE models. Energy Absorbing materials also proven for different uses.
Collaborator details	Development & application of principle in a real life vehicle development programme. Also interested in: further prototypes, physical evaluation, theoretical evaluation, exploration of uses, manufacturing agreement and financial support or investment.
Intellectual property rights	Capabilities to facilitate with all or some of the above.

Result number and title	**Exploitable result 10.4 : Passive Safety Grid Load Bonnet**	
granted or published	Specific knowledge, capabilities or contacts to help develop & manufacture the solution. Requirement for a specific vehicle development case/ programme for which to develop this new passive safety bonnet.	
Subject Descriptors	Existing Patents for all functional material concepts. Namely GridLoad and Pressload	
Contact details	Address	5 Stukely Business Centre, Blackstone Rd
	City	Huntingdon
	Contact name	Petros Goutas
	Contact organization	Cellbond
	Country	United Kingdom
	Department	
	Fax nr	+44 (0)1480 450181
	Email	p.goutas@cellbond.com
	Postcode	PE29 6EF
	Position of contact person	Business Development Manager
	Phone number	T: +44 (0)1480 435302 D: +34 914451374
	Contact org. url	www.cellbond.com

Result number and title	**Exploitable result 10.5 : Energy absorbing windscreen mounting system**	
Result description	Energy absorbing windscreen mounting design concept – developments to reduce VRU head injuries	
Possible market applications	Automotive sector (time to market 2013+)	
Stage of development	Prototype	
Collaboration sought or offered	Financial support or investment, manufacturing capability, sales	
Collaborator details	Development of principle, including further prototypes, physical evaluation, manufacturing agreement, financial support or investment.	
Intellectual property rights **granted** or published	Patent pending (application during APROSYS)	
Subject Descriptors	Transport safety	
Contact details	Address	Centre for Automotive Technology Bld. 61, Cranfield University
	City	Bedford
	Contact name	Roger Hardy
	Contact organization	Cranfield Impact Centre
	Country	United Kingdom
	Department	
	Fax nr	+44 1234 751671
	Email	r.n.hardy@cranfield.ac.uk
	Postcode	MK43 0AL
	Position of contact person	Project Manager
	Phone number	+44 1234 754970
	Contact org. url	www.cicl.co.uk

Result number and title	**Exploitable result 10.6 : Integrated head protection system**	
Result description	Development of an external airbag capable to realize sufficient protection in car front end areas potentially struck by the head of vulnerable road users and achieve 3 main functions: - lifting the rear end of the hood and therefore realizing additional deformation stroke for a human head in case of contact with the bonnet - closing the gap rearwards of the bonnet (between bonnet rear end and windscreen) which is created due to hood lifting offering protection in the relevant impact area rear of the bonnet (covering windscreen frame and covering stiff areas of the outer windscreen which are supported by A-pillar)	
Possible market applications	Device (time to market: 2013)	
Stage of development	Proven prototype	
Collaboration sought or offered	Customer needed willing to use such a technology within their cars	
Collaborator details	Customer needed willing to use such a technology within their cars	
Intellectual property rights **granted** or published	Yes (before APROSYS activities)	
Subject Descriptors	Transport safety	
Contact details	Address	Hussitenstraße 34
	City	Berlin
	Contact name	Ingo Kalliske
	Contact organization	Takata-Petri AG
	Country	Germany
	Department	R&D Group / Advanced Safety Systems
	Fax nr	+49 30 47407 – 4181
	Email	Ingo.kalliske@eu.takata.com
	Postcode	13355
	Position of contact person	Team leader “Passive Safety”
	Phone number	+49 30 47407 – 4343
	Contact org. url	None

Result number and title	**Exploitable result 10.7: Car front design concepts (active/adaptive)**	
Result description	Simplified adaptive bumper concepts (or SABC): bumper that moves forward in order to improve the deformation space available to soften the leg impact; bumper extraction operated through gas-spring units that act as energy absorbers during the impact; retraction via four Bowden cables connected to an electric motor that recall the four gas springs; adaptive control, based essentially on the vehicle speed; only simple sensors needed, slow actuation	
Possible market applications	Automotive sector	
Stage of development	Demonstrator prototype	
Collaboration sought or offered	None	
Collaborator details	Not applicable	
Intellectual property rights **granted** or published	No	
Subject Descriptors	Transport safety	
Contact details	Address	Strada Torino 50

Result number and title	**Exploitable result 10.7: Car front design concepts (active/adaptive)**	
	City	ORBASSANO
	Contact name	Roberto PUPPINI
	Contact organization	Centro Ricerche Fiat S.C.p.A.
	Country	ITALY
	Department	Body Architectures Design & Engineering
	Fax nr	+390119083672
	Email	roberto.puppini@crf.it
	Postcode	10043
	Position of contact person	Crash & Biomechanics Unit Manager
	Phone number	+390119083697
	Contact org. url	www.crf.it

Result number and title	**Exploitable result 10.8: HGV-Car Side under run protection**	
Result description	Guidelines, tests and performance criteria for car side underrun protection of HGV and demonstration of effectiveness	
Possible market applications	Road, rail vehicles	
Stage of development	Protocol, demonstrator	
Collaboration sought or offered	Further research or development support	
Collaborator details	None	
Intellectual property rights **granted** or published	IPR by owner	
Subject Descriptors	Safety accident prevention; Standards; Transport	
Contact details	Address	Inffeldgasse 11/II
	City	Graz
	Contact name	Juergen Gugler
	Contact organization	Technical University Graz
	Country	Austria
	Department	Vehicle safety institute
	Fax nr	+43 316 873 9402
	Email	Office.vsi@tugraz.at
	Postcode	8010
	Position of contact person	Senior researcher
	Phone number	+43 316 873 9401
	Contact org. url	www.vsi.tugraz.at

Result number and title	**Exploitable result 10.9: HGV- VRU protection system**
Result description	Guidelines for designing VRU friendly front structure of HGV and demonstration of effectiveness as well as additional benefits (eg. less fuel consumption)
Possible market applications	Road, rail vehicles
Stage of development	Protocol, demonstrator
Collaboration sought or offered	Further research or development support
Collaborator details	none
Intellectual property rights	Published

Result number and title	**Exploitable result 10.9: HGV- VRU protection system**	
granted or published		
Subject Descriptors	Safety accident prevention; Standards; Transport; Pollution	
Contact details	Address	Inffeldgasse 11/II
	City	Graz
	Contact name	Juergen Gugler
	Contact organization	Technical University Graz
	Country	Austria
	Department	Vehicle safety institute
	Fax nr	+43 316 873 9402
	Email	Office.vsi@tugraz.at
	Postcode	8010
	Position of contact person	Senior researcher
	Phone number	+43 316 873 9401
	Contact org. url	www.vsi.tugraz.at

Result number and title	**Exploitable result 10.10 Integrated head protection airbag – inflatable protection device to realize sufficient protection in car front end areas potentially struck by the head of vulnerable road users**	
Result description	Development of an external airbag capable to realize 3 main functions: - lifting the rear end of the hood and therefore realizing additional deformation stroke for a human head in case of contact with the bonnet - closing the gap rearwards of the bonnet (between bonnet rear end and windscreen) which is created due to hood lifting - offering protection in the relevant impact area rear of the bonnet (covering windscreen frame and covering stiff areas of the outer windscreen which are supported by A-pillar)	
Possible market applications	Device (time to market: 2013)	
Stage of development	Proven prototype	
Collaboration sought or offered	Customer needed willing to use such a technology within their cars	
Collaborator details	Customer needed willing to use such a technology within their cars	
Intellectual property rights **granted** or published	IPR by owner	
Subject Descriptors	Safety	
Contact details	Address	Hussitenstraße 34
	City	Berlin
	Contact name	Ingo Kalliske
	Contact organization	Takata-Petri AG
	Country	Germany
	Department	R&D Group / Advanced Safety Systems
	Fax nr	+49 30 47407 – 4181
	Email	Ingo.kalliske@eu.takata.com
	Postcode	13355
	Position of contact person	Team leader “Passive Safety”
	Phone number	+49 30 47407 – 4343
	Contact org. url	

Result number and title	**Exploitable result 11.1 : In depth accident database for vulnerable road users**	
Result description	In depth accident database for vulnerable road users	
Possible market applications	Automotive	
Stage of development	Confidential	
Collaboration sought or offered	None	
Collaborator details	n/a	
Intellectual property rights **granted** or published	IPR at owner	
Subject Descriptors	Safety	
Contact details	Address	
	City	Birmingham
	Contact name	C. Neal Sturgess
	Contact organization	BASc – University of Birmingham
	Country	United Kingdom
	Department	
	Fax nr	+ 44 121 414 4180
	Email	c.e.n.sturgess@bham.ac.uk
	Postcode	UK-B15 2TT
	Position of contact person	Researcher
	Phone number	+ 44 121 414 4144
	Contact org. url	http://www.barc.bham.ac.uk/

Result number and title	**Exploitable result 11.2 Injury criteria developed by motorcyclists**	
Result description	The aim of this result is to provide a basis for the future development of an impact-test standard. Until now, injury criteria have not been developed specifically for motorcyclists, although the peculiarities of these road users need to be addressed. This result is related to sliding impacts of motorcyclists on roadside barriers. The 'PAMCrash HUMOS2 model' has been successfully applied to the simulation of injury mechanisms associated to sliding impacts of motorcyclists on roadside barriers. This result actually contributes: • The possibility of applying new mathematical models of the human body to motorcyclists in specific type of accidents (sliding impacts against roadside barriers). - Knowledge of the injury criteria for motorcyclists' impacts.	
Possible market applications	Motorcycle industry, standard development, protective equipment industry, …	
Stage of development	Model	
Collaboration sought or offered	None	
Collaborator details	n/a	
Intellectual property rights **granted** or published	None	
Subject Descriptors	Knowledge engineering / knowledge bases system. Medicine. Anatomy.	
Contact details	Address	Nussbaumstr.26
	City	Munich

Result number and title	**Exploitable result 11.2 Injury criteria developed by motorcyclists**	
	Contact name	Steffen Peldschus
	Contact organization	Institut für Rechtsmedizin / Institute of Legal Medicine Ludwig-Maximilians-Universität
	Country	Germany
	Department	Abteilung Biomechanik / Biomechanics
	Fax nr	+49-89-2180-73009
	Email	steffen.peldschus@med.uni-muenchen.de
	Postcode	D-80336
	Position of contact person	Dipl.-Ing.
	Phone number	+49-89-2180-73361
	Contact org. url	

Result number and title	**Exploitable result 11.3: AgedMAT**	
Result description	Modification of FE human models wrt age dependency of human tissue	
Possible market applications	Academy research bodies, Institutions performing FE models	
Stage of development	Software utility and end user level	
Collaboration sought or offered	Development of automatic model upgrade for different source codes or FEM human models	
Collaborator details	Companies distributing FEM packages or with IPR on FEM human models	
Intellectual property rights **granted** or published	None	
Subject Descriptors	Transport safety. Human body models	
Contact details	Address	INSIA. CAMPUS SUR UPM. Ctra de Valencia km 7.
	City	Madrid
	Contact name	Luis Martínez Sáez
	Contact organization	UPM-INSIA
	Country	Spain
	Department	Biomechanics Unit
	Fax nr	+34 91 336 53 02
	Email	Luis.martinez@upm.es
	Postcode	28031
	Position of contact person	Head of Biomechanics Unit
	Phone number	+34 91 336 53 27
	Contact org. url	www.insia.upm.es

Result number and title	**Exploitable result 11.4 Statistical methods for injury risk functions**
Result description	Best practice guidelines on statistical derivation of injury risk functions for crash test dummies, human body models and other test tools
Possible market applications	Automotive
Stage of development	First stages
Collaboration sought or offered	None
Collaborator details	n/a
Intellectual property rights **granted** or published	No
Subject Descriptors	Safety

Result number and title	**Exploitable result 11.4 Statistical methods for injury risk functions**	
Contact details	Address	Crowthorne House, Nine Mile Ride
	City	Wokingham
	Contact name	Brian Hardy
	Contact organization	TRL Limited
	Country	UK
	Department	Vehicle Engineering
	Fax nr	+44 (0)1344 770356
	Email	bhardy@trl.co.uk
	Postcode	RG40 3GA
	Position of contact person	Senior Scientist
	Phone number	+44 (0)1344 770675
	Contact org. url	www.trl.co.uk