1. FINAL PUBLISHABLE SUMMARY REPORT

MODSafe - Modular Urban Transport Safety and Security Analysis - is one of the latest projects in the European Transport sector under the Seventh Framework Programme (FP7) for Research and Technological Development of the European Union.

The purpose of the MODSafe project is to undertake research of major steps of the Safety Life Cycle of urban guided transport systems in Europe. Even if the rail safety landscape in urban guided transport is highly diversified, the sector will benefit from some kind of harmonization. Furthermore, security items are considered more and more as vital for the urban transport sector. The 22 partners are from industry, associations, R&D organisations, consultants and operators.

The MODSafe project successfully started in 2008 with state of the art evaluations and initial models. Hazard analyses, safety requirements as well as functional and object models have been developed in the safety sector, while a life cycle approach proposal and an approval approach were established in the process sector. For the security sector, the existing means and technologies for security systems have been analysed, forming the base for a model reference under development.

MODSafe shall have given guidance on how to deal with the diversities, to find a common European strategy. Final results focus on cross acceptance of proven and certified technologies. The application of the work packages' deliverables and outcomes shall be straight forward, in order to reduce the efforts and manpower needs, even for a first certification.

These activities help to create common safety and security methods, in order to reduce barriers within the European Union. As a result, competition and common/ equal safety standards may be enabled. MODSafe however also shows the limits of standardization for technical safety functions and objects, as the consensus building process has shown. The networks and connections created for this project (e.g. network of operators, urban rail suppliers as well as transport research institutions and other related parties like an independent safety assessor) help to establish an on-going, target oriented discussion and therefore reveal common goals and a better understanding of different European procedures and needs.

The MODSafe results - same with other EU funded projects - may influence the potential future standardization for Urban Guided Transport. The principle suitability of the methods and results presented can be considered proven through application in more and more projects.

After the project closure in August 2012, one can expect reasonable suggestions for the future, aiming to contribute to the European drive for harmonize and to simplify the upgrade/modernization or new construction of urban guided transport systems. Cross-Acceptance is one of the key attempts to the benefit of all parties involved, be it the manufacturers and suppliers, the operators of the safety authorities.
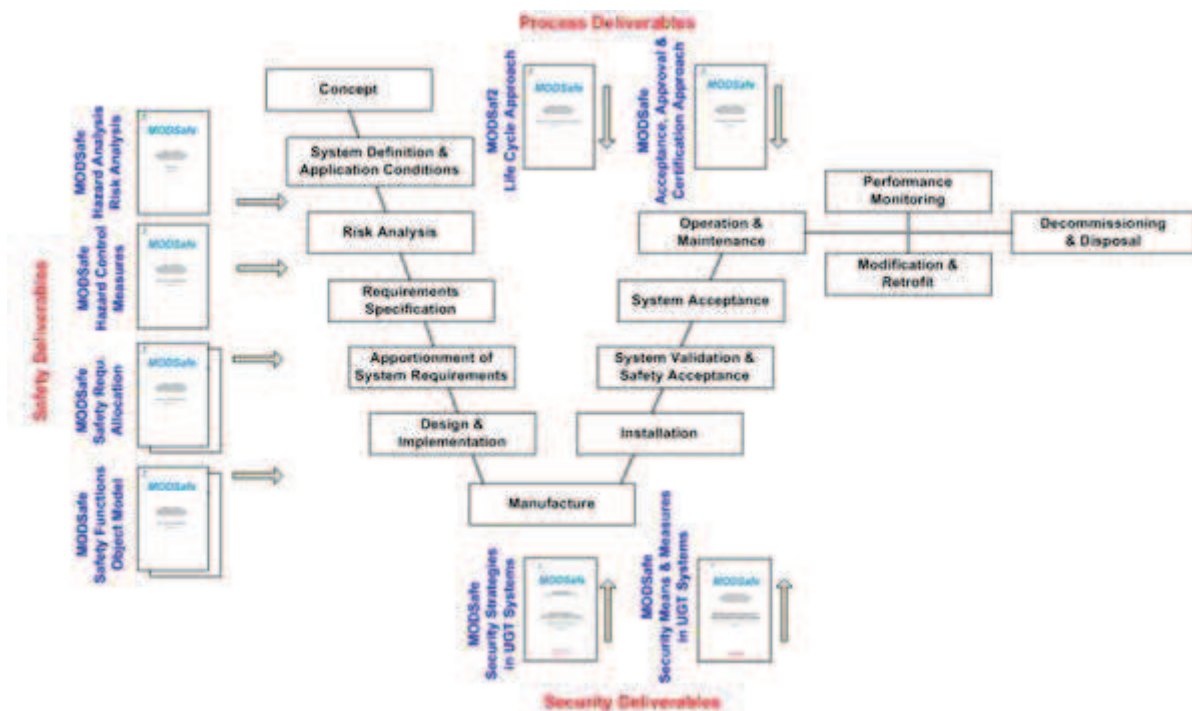
Benefits of MODSafe results for future users

The main objective of the MODSafe project was to develop a reference safety and security model (ref. DoW). Using this reference model is the major benefit with multiple implications for all parties involved, be it operators, suppliers, assessors or authorities. The following list (which does not claim completeness) may serve as examples:

- Operators may not have the detailed technical expertise (for example for modern CBTC systems for UTO operation) to specify the whole life cycle when it comes to tendering of new / extended / upgraded systems / sub-systems etc. Using the final MODSafe proposal deliverables as a model reference allows them to simply base their specifications thereon. This easily spares huge efforts when using the complex hazard and risk analysis and safety functions and the life cycle and approval process proposal and security deliverables as a base / as a guide. Work for tender specification through project follow up to final approval is limited to review and control and application specific adjustment, a start from scratch is not necessary.

- Suppliers can propose the MODSafe proposal deliverables as a base / as a guide when offering / implementing new / extended / upgraded systems / sub-systems etc. Using the final MODSafe proposal deliverables as a model reference allows them to simply base their design and evidence incl. documentation thereon. This easily spares huge efforts when using the complex hazard and risk analysis and safety functions and the life cycle and approval process proposal and security deliverables as a base / as a guide. When using pre-certified products, work for design specification through project follow up to final evidence is limited to review and control and application specific adjustment, a new design / start from scratch is not necessary. Once having adopted the supplier's standard documentation based on MODSafe, this can be re-used from project to project.

- Assessors can use the MODSafe proposal deliverables as a base / as a guide for their services. Cross-acceptance can be easily applied thereon.

- Authorities may not have the detailed technical expertise (for example for modern CBTC systems for UTO operation) to approve the whole life cycle when it comes to the approval of new / extended / upgraded systems / sub-systems etc. Using the final MODSafe proposal deliverables as a model reference allows them to simply base their approval process thereon. Work for specification approval through project follow up to final approval is limited to review and control and application specific adjustment, a start from scratch is not necessary.

- It finally goes without saying that when operators, suppliers, assessors and authorities will use the MODSafe proposal deliverables in the same project, the whole process well and easily fits. This may easily spare person-month / person-years of effort on all parties' side.

  To the Coordinators knowledge, the UGT systems (respectively the related stakeholders or at least one of them) already use / or plan to use the MODSafe model reference for their projects for example in Brussels, Helsinki, Copenhagen, Munich Airport, Macau, and potentially in Stockholm, Amsterdam, London, and elsewhere. Also - recognized via the access to the MODSafe web side – tremendous interest from outside of Europe is visible.

Recommendations to Standardization Bodies

In fact the MODSafe deliverables shall be analyzed and used when it comes to new standardization in the field of urban guided transport safety and security. EC mandates M486 for Safety and M487 for Security are already in place. The MODSafe project partners have been in contact with selected standardization body representatives and have given recommendations as per the attachments.

- MODSafe - Recommendations EC Mandate 486 - 2012-04-20

- MODSafe - Recommendations to standardisation in the field of security - 2012-04-04

Communication with and submission to the relevant bodies was done by UITP. Furthermore, communication and exchange took place with the SECUR-ED project.

To what extent the standardization bodies will use the MODSafe deliverables for potential new standards is of course outside the MODSafe project scope and visibility, in particular since this is a current / future issue while the MODSafe project has been finalized.

Supporting Information on Support and User Group

Deliverable D12.5 (Final Report on the activities of the SUG) describes and lists the so-called Support and User Group meetings, which were organized by UITP. The objective, methodology and (intermediate) results of the MODSafe project were presented by the Work Package leaders in multiple SUG meetings, followed by a Q&A and discussion session, each. Various technical issues were discussed and SUG participant's questions and opinions were noticed and further evaluated – if needed – within the Work Packages. For details please refer to D12.5.

Supporting Information on Review of External Parties

In addition to the SUG meetings, the (interim) MODSafe results were furthermore presented to interested external parties as appropriate by the Coordinator and / or the Work Package leaders. The following list (which dos not claim completeness) may serve as examples:

- The German Verband der Verkehrsunternehmen (VDV; German association of operators) publishes own regulations and guidelines and therefore had an interest in understanding whether and how the MODSafe deliverables do fit therewith. The Coordinator participated in VDV meetings and gave overview presentations on the MODSafe results. Furthermore, work package leaders / members were partly participating in these meetings since being VDV members / representatives as well. MODSafe has considered – beyond huge other material - various VDV documents as survey and base material. VDV has found the MODSafe deliverables as appropriate and useful, also in combination with the VDV regulations and guidelines. Individual external experts partly participated in the work package meetings.

- Siemens - not being a partner in the project – showed up with interest in the course of the project and was invited as external party / as external expert via UITP to participate in reviews and contributions. This in particular took place mainly in reviewing and contribution to the German case studies on life cycle and approval process (work packages 6 and 7) as well as in relation to safety functions, Safety Integrity Level allocation and functional / object modelling (work packages 4 and 5)

- The UITP sub-group Safety with various light rail system / tram system operators as members (thereunder Rheinbahn from Düsseldorf, Germany, Stuttgarter Straßenbahn from Stuttgart, Germany, Wiener Linien from Vienna, Austria) showed up with interest in the course of the project and were invited as external parties / as external experts via UITP to participate in reviews and contributions. This in particular took place mainly in reviewing and contribution to the life cycle and approval process (work packages 6 and 7) with focus on their interest to appropriately cover light rail / tram systems. Individual external experts partly participated in the work package meetings.

- The Coordinator as well as the Work Package leaders presented the (interim) MODSafe (work package) results at multiple occasions (refer to Work Package 12 deliverables for dissemination details), always followed by a Q&A session and discussion. Opinions, recommendations and supporting material was offered here and there and used within the work packages to the extent reasonable. Review support and contribution from the work package partner's organisations took also place to a certain extent.

Supporting Information on Cost Savings

In general, the following aspects are the main reasons for general cost savings:

- The Safety Work Packages 2 – 5 all started with a high level quality base / input material mainly from TUD (no need to start from scratch, usage of available material e.g. from MODURBAN project and IEEE CBTC standard, resulting in less effort for the development).

- The Safety Work Packages 6 – 7 both started with a high level quality base / input material mainly from TÜV Rheinland (no need to start from scratch, usage of available material from other projects and standards, resulting in less effort for the development).

- The Security Work Packages 8 – 9 both started with a high level quality base / input material (usage of available material from operators and consultants, resulting in reasonable effort for the development).

- Consensus building could be achieved with reasonable effort due to the above, resulting in less effort for review.

- Meetings were timely combined (joint EB / PG / WP10 meetings, joint WP2 / WP4 / WP5 meetings, joint WP6 / WP7 meetings, joint WP8 / WP9 meetings), resulting in a tremendous reduction of meeting preparation / reporting effort as well as travel time and travel costs.

- TÜV Rheinland combined the role and responsibility of the Coordinator and the Work Package 6 Leader to one person (resulting in reduced man-power and less trips).

- Due to the fact that the Final Conference was held at the end of June 2012 in Cologne, most of work of the work packages had been completed until then and the achieved relevant results were presented at the Final Conference. Therefore, in the last two months of the project (July, August 2012) there was not much need of effort of the partners.

Furthermore, in the course of the project, some budget shift took place resulting in the 2nd contract amendment. Respective justification was given accordingly and is therefore not repeated here.

MODSafe Consortium

The MODSafe consortium comprises 22 European partners, among them infrastructure managers, manufacturers, suppliers, universities and research institutes, led by the TÜV Rheinland InterTraffic GmbH (TRIT).

For more information

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