INFORMATION SOCIETY TECHNOLOGIES (IST) PROGRAMME

AIDE

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Parameters and indicators of behavioural adaptation to ADAS/IVIS for inclusion in DVE model for preliminary design of AIDE system

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Activity No.	**A1.1.2**	Activity Title	**Identification and validation of a reference model of DVE**
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Executive Summary

This report consists of a review of the driver behaviour variables and parameters aimed to be used for the Driver – Vehicle – Environment (DVE) model. It specifically addresses the issue of behavioural adaptation to the use of Advanced Driver Assistance Systems (ADAS) and In-Vehicle Information systems (IVIS), reflecting its most important indicators.

The aim of AIDE project is to generate knowledge and methodologies and to develop human-machine interface technologies for safe and efficient integration into the driving environment of Advanced Driver Assistance Systems (ADAS) and In-vehicle Information Systems (IVIS), as well as nomad devices. Considering that this is the main general objective of AIDE project, the variables and indicators that are to be studied are those ones influencing drivers' behaviour, revealing likely behavioural changes associated to the use of these systems while driving.

Therefore, this report is part of the modelling work within AIDE SP1, in particular WP1.1, task 1.1.2, titled Identification and validation of the Driver-Vehicle-Environment model. It can be also understood as an update of previous deliverable D1.1.2 Preliminary model application to existing IVIS and ADAS and guidelines for implementation in design process, aiming to define and select the most relevant variables and parameters of DVE model.

Previous work is coming both from the modelling development part (WP1.1) and from the behavioural research part (WP1.2), and it is summarised at the beginning of the deliverable as an introduction and review of the most important contributions from the activities carried out along the first year of the project.

This deliverable is structured in nine sections, dealing with the following issues:

- Chapter 1: Introduction and Feedback from other SPs

  The objective and contents of the report are explained, together with references to previous activities contributing to it, from SP1 as well as from links to ongoing actions from other SPs of the AIDE Project,.

- Chapter 2: Behavioural Adaptation

  The term "behavioural adaptation" is defined and described in detail, addressing the issue of integration of new driver support systems into the driving activity and focusing on how to deal with the behavioural adaptation in the ongoing AIDE project.

- Chapter 3: DVE Modelling

  Some modelling requirements corresponding to Driver, Vehicle and Environment models are listed.
  In this Chapter, the conceptual limitations and boundaries of the "DVE Model" are discussed. In particular, the issues of validity and completeness of the

correlations proposed in the model with respect to real driving contexts and experimental evidence is discussed. The main conclusions of this Chapter are:

- The model is created with the goal of offering a framework to the development for a computerised tool to be utilised by designers for predictive simulation of DVE interactions.
- The main characteristic of the model is the reference to a generic Human-Machine Interaction architecture and the flexibility with respect to the correlations that characterise the Driver behaviour module.
- The correlations that are implemented as "defaults" in the basic version of the DVE model are only generic formulations. These can be adapted by each user to the parameters that suit best the experimental findings and the type of interactions that are under examination or study by means of the model.
- In this sense the "defaults" correlations implemented in the model do not reflect a particular experimental evidence or finding.

- Chapter 4: Parameters and Indicators of Behavioural Adaptation

  Open issues for Driver and Driver-Vehicle-Environment Modelling are included, together with definitions of driver parameters and relevant measurable variables. A detailed review of every driver behaviour parameter under study is made, outlining the most outstanding variables and indicators.

- Chapter 5: Experimental Design of Behavioural Adaptation

  An overview of the experimental plans within WP1.2 is given, showing the methodology for the study of long term effects in driving behaviour as a result of behavioural adaptation to a certain set of ADAS.

- Chapter 6: Conclusions and feed-forward to other SPs

  Some relevant findings are extracted from the report, showing the next steps inside the project and possible contributions to other actions and SPs within the overall AIDE Project.

- Chapter 7: Definitions

  Some referenced definitions from the report are included, coming from the AIDE Glossary.

- Chapter 8: References

  References used in the report are listed.

- Chapter 9: Annexes – Reports on Driver Parameters

  The research reports on the five driver parameters under study are included as attachment.

As a conclusion, this extensive review of driver parameters has tried to reveal correlations between parameters and measurable variables, as well as possible

relationships to the behaviour and performance of the driver. Thus, the DVE behaviour could be evaluated and the planned AIDE intervention could be defined. Specifically, some on-going and future activities within AIDE project would specially benefit from the D1.1.3 contribution, namely WP1.3 (DVE simulation) and SP3 (AIDE system design).