

Special Light-Signalling Needs for Vehicles Equipped with ADS (Automated Driving Systems)

INTRODUCTION

GTB initiated a study in 2016 to understand the needs, and the associated implications, of special light-signalling for vehicles equipped with ADS and held a one day forum in The Hague (NL) on 27 February 2018. This paper presents a summary of the outcome of this forum and provides an overview of its literature survey and some initial conclusions concerning the way forward.

THE UNDERLYING QUESTIONS

- How to use lighting as an intuitive option to safeguard future autonomous and mixed traffic situations?

What are the special needs for automated vehicles or road users in interaction with them; e.g. Category A: Information about vehicle automation status, Category B: Information about AVs' next manoeuvres, Category C: Information about AVs' perception of environment, Category D: Information about AVs' cooperation capabilities (Anna Schieben, et.al.)

CURRENT STUDIES, INVOLVED REGULATORY AGENCIES AND NGO'S

Studies Underway or Planned (list not exhaustive)	Regulatory Agencies	NGO's
AVIP (Lagström, ... (2015),	GERMANY	CLEPA
CITYMOBIL2 (Merat, ... (2016)	UNECE WP.1	GTB
CLEPA-LSS (Light Sight Safety) (2017)	UNECE WP.29 (ITS GROUP)	ISO
GTB SVP (Safety and Visual Performance)	USA NHTSA	OICA
DUKE-DISPLAY (Clamann et.al. (2016)		SAE
GHOST DRIVER (Rothenbücher et.al (2016))		
ISO (Shutko ... (2017))		
INTERACT (Schieben ... (2017)		
NHTSA "AV INTENT" (2017)		

SOME INITIAL FINDINGS*

- Vulnerable Road Users (VRU) are cautious in interaction with ADS vehicles and worried about the "skills" of the ADS and appreciate messages and/or signals whether the car has detected them and what it intends to do
- However, which exact messages need to be provided and the method of communicating them are not yet settled and this requires further study.

*Vissers, L.; Kint, S. van der; Schagen, I. van; Hagenzieker, M.: Safe interaction between cyclists, pedestrians and automated vehicles - What do we know and what do we need to know?, SWOV Institute for Road Safety Research, The Hague, December 2016

WORK ON NATIONAL GUIDELINES FOR ADS

- US DOT/NHTSA: 2016 "Federal Automated Vehicles Policy": 2017 NHTSA "A Vision for Safety 2.0"
- 2018 NHTSA Request for Comments on "Removing Regulatory Barriers for Vehicles with ADS"
- The Ethics commission of the German Federal Ministry of Transport and Digital Infrastructure has created 20 rules

INITIAL CONCLUSION AND PROPOSAL

- Some basic communication signals need standardisation and should become mandatory for ADS and be visible during day and night-time.
- GTB would like to suggest that it is time to focus the efforts under the direction of the World Forum (WP.29) to develop one set of global technical requirements and to ensure that unnecessary regulatory hurdles and non harmonised solutions are not being created for the future.
- GTB is prepared to sponsor independent research to support an initiative under the direction of the World Forum and would also like to offer to present to WP29, possibly at its 2018 June session, an overview of its investigations.