

Transmitted by the experts from The International  
Automotive Lighting and Light Signalling Expert  
Group (GTB)

Informal document GRE-81-23  
(81<sup>st</sup> GRE, 15-18 April 2019,  
agenda item 10)

# **GTB activity report for the 81<sup>st</sup> GRE session**

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**GTB**

*The International Automotive Lighting  
and Light Signalling Expert Group*

*Groupe de Travail "Bruxelles 1952"*

# Main working areas

- **Stage 2 Simplification:**
  - Support SLR and harmonisation with Chinese simplification of GB Standards.
- **AV Signalling:**
  - Support the GRE TF on Autonomous Vehicle Signalling Requirements (AVSR)
  - Consideration of the next steps in signalling and communication
- **New Lighting functions:**
  - Development of provisions for light projections on the road
  - Research Studies on New Functionalities in Automotive Lighting
- **LEDs retrofit:**
  - Support the GRE TF on Substitutes/Retrofits (TF S/R)
  - Consideration to have general requirements for new innovative Light Sources
- **Various:**
  - Consideration of sensors related to lighting and visibility functions (e.g. camera, LIDAR, radar, etc.), their integration in Headlamp/Rear Lamps and cleaning
  - Support SAE for NHTSA ADB NPRM requirements

# Focus on Research Studies on New Functionalities in Automotive Lighting

## New Functionalities :

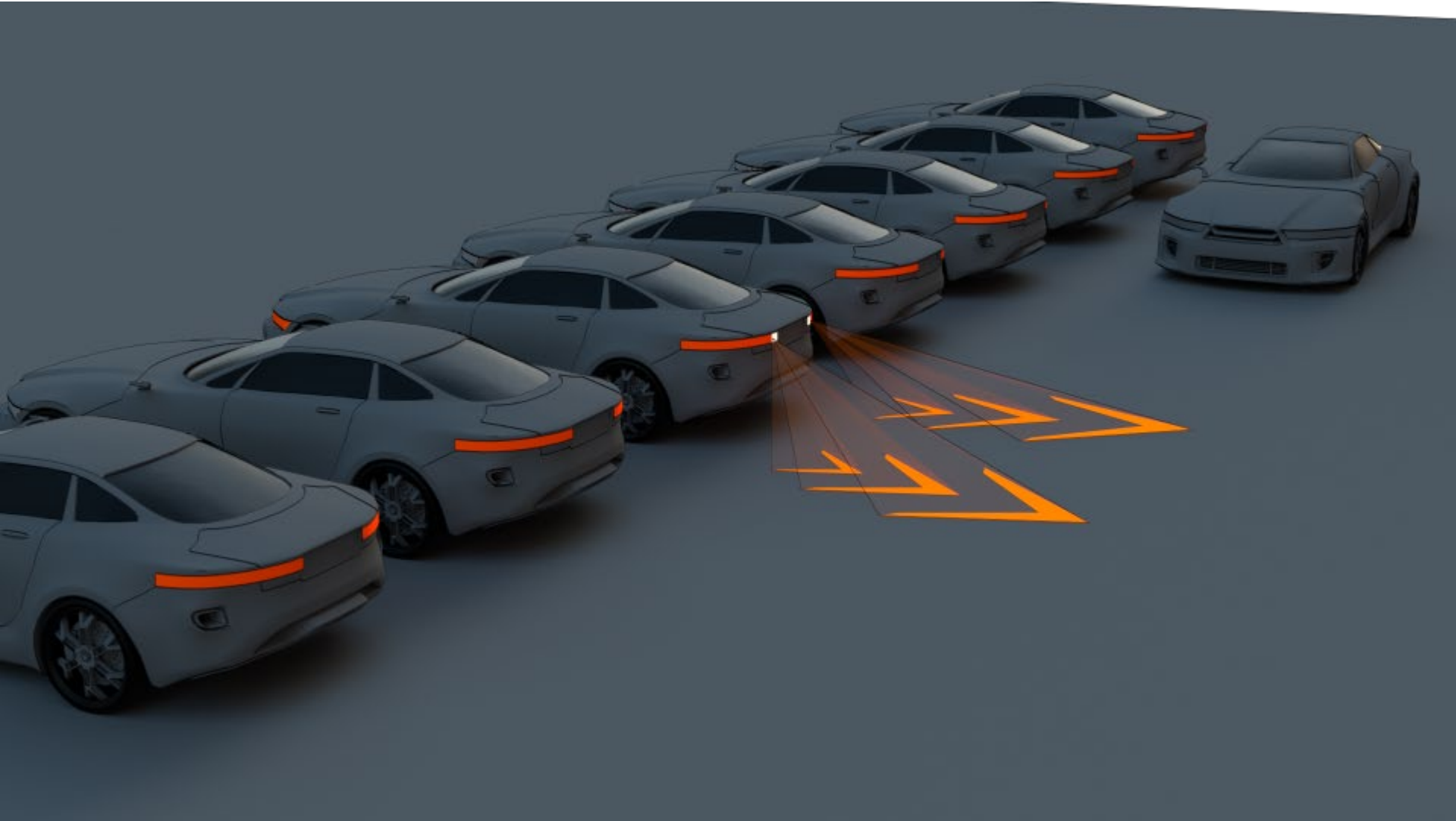
- Parking / Departing indication
- Driving through Construction Zones
- Projection of symbols as information for driver
- Identifier for vehicles running in autonomous mode
- Cultural aspects in understanding of symbols used in Car to Pedestrian Communication

# Target and Motivation to initiate and support research studies by GTB

Independent research studies by universities and institutes should investigate if a new function provides safety benefits, is a comfort feature and provides important information to the driver and to other road users.

Such studies shall also investigate whether a new function is disturbing or confusing other road users.

# Deparking Rear Light | Indication of the vehicle's movement direction



# Light-based driver assistance

## Construction zone lighting

- Projects a trajectory prediction of the car width on the basis of sensor data
- Purpose: assistance
- Target: driver
- Position: passing beam area (8-35 m)
- Addition to passing beam



# Guidelines in Construction Zone Areas



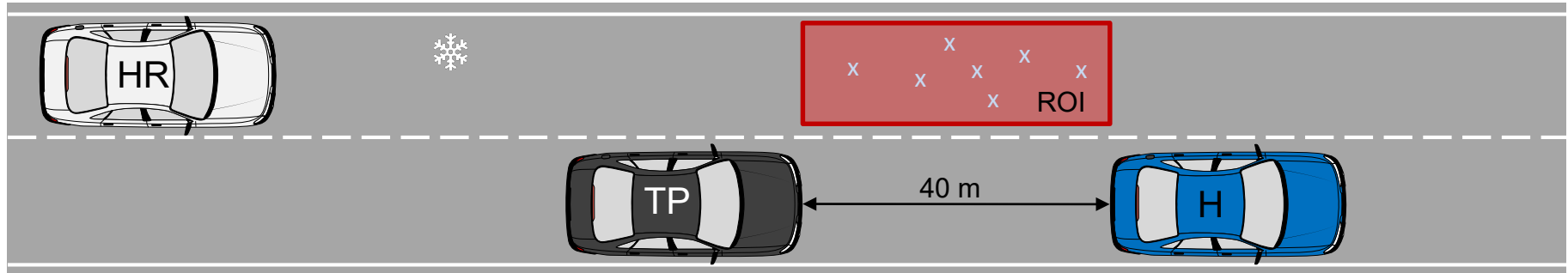
# New Functionalities: Snow Flake Projection

**CASE :** *VEHICLE WITH HIGH RESOLUTION HEADLIGHTS PROJECTS A SYMBOL WHILE OVERTAKING OTHER VEHICLES*





# HR (High Resolution) vehicle projecting a snowflake



## **HR VEHICLE**

- **OVERTAKING @ 100 KM/H**
- **RANDOM ORDER**
  - SNOWFLAKE
  - GUIDING LINES
  - CONSTRUCTION SITE
  - LOW BEAM

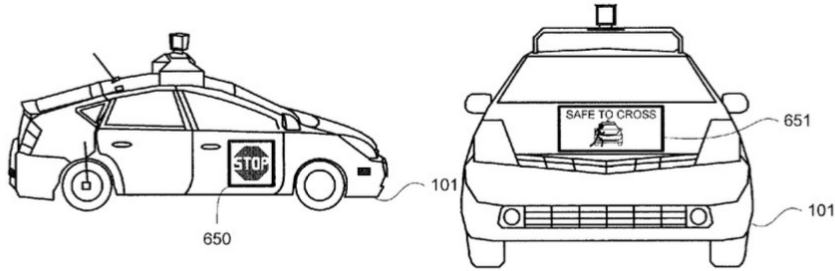
## **TP (TEST PERSON) VEHICLE**

- SUBJECT DRIVING
- FOLLOWING H
- GAZE BEHAVIOR
- FIXATIONS IN ROI
- TEST INSTRUCTOR

## **H (HARE) VEHICLE**

- PRECEDING
- **CONSTANT SPEED 80 KM/H**

# How to identify and inform the other traffic participants on the autonomous driving mode?



- The technology of autonomous driving cars is rapidly developing.
- The first cars will soon be on the road.
- A visual communication using light signalling between the vehicle in autonomous mode and the other road users has to be defined

# Cultural Aspects in Communication Car to Pedestrian using Symbols



Research Tests in Europe, Japan, China, South Korea, USA

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# Timing and Outlook

- **Research Studies will be completed in July 2019**
- **Results will be published**
- **Further studies are in preparation**