

AWARE2ALL

Project Summary

Safety systems and human-machine interfaces oriented to diverse population towards future scenarios with increasing share of highly automated vehicles



THE PROJECT IN A NUTSHELL

Topic: HORIZON-CL5 2022 D6-01-02: Reliable occupant protection technologies and HMI solutions to ensure the safety of highly

automated vehicles

Type of action: Research and Innovation Action (RIA)

Coordinator: VICOMTECH

Start date: 01/11/2022

End date: 31/10/2025

Duration: 36 months

Budget: 7,999,817.50 €

Project number: 101076868

https://cordis.europa.eu/project/id/101076868



MOTIVATION



In 2020 someone died on European roads every 25 minutes.

EU-wide, around 70% of road fatalities in urban areas involve vulnerable road users.

There is increased safety risk across age groups (children, adults, older adults), types of impairment (e.g., sensory, developmental, cognitive, physical impairments), and among users of mobility devices.

Most user studies in the field of automotive safety are conducted with predominantly young male and technologically educated participants.

AWARE2ALL will effectively address the changes in road safety derived from the introduction of Autonomous Vehicles, putting special focus on underrepresented populations (female, elderly, sensorial or physical disabilities, cultural minorities, low digital abilities) to ensure that results provide safety to any (type of) occupant and HRU¹.



AWARE2ALL acronym

It is an acronym including diversity of the AWARE2ALL project



OBJECTIVES



The main objective of AWARE2ALL is to address the new safety challenges posed by the introduction of HAVs² in mixed road traffic, through the development of inclusive and innovative safety (passive and active) and HMI³ (internal and external) systems that will consider the variety of population and will objectively demonstrate relevant improvements in mixed traffic safety.

- OBJ 1: Definition and prioritisation of relevant Use Cases.
- **OBJ 2:** Develop one virtual prototype of passive safety (D1), addressing the variety of possible occupant postures and orientations and taking a large diversity of occupants into account.
- **OBJ 3**: Develop two active safety physical prototypes (D2, D3) to ensure that the vehicle is able to anticipate hazardous situations and act proactively, considering that a driver is not available (D2) and situations with driver available (D3).
- **OBJ 4**: Development of a hybrid (virtual and physical) prototype (D3) of iHMI⁴ that will adapt, dynamically, the required bi-directional interaction with the driver/occupants.
- **OBJ 5**: Extension of the current ODD⁵ definition by including occupant/driver state definition.
- **OBJ 6**: Develop an eHMI⁶ physical prototype (D4) for effective communication and interaction with diverse HRU¹.
- OBJ 7: Develop innovative testing methods and tools for performance assessment of AWARE2ALL safety and HMI³ solutions.

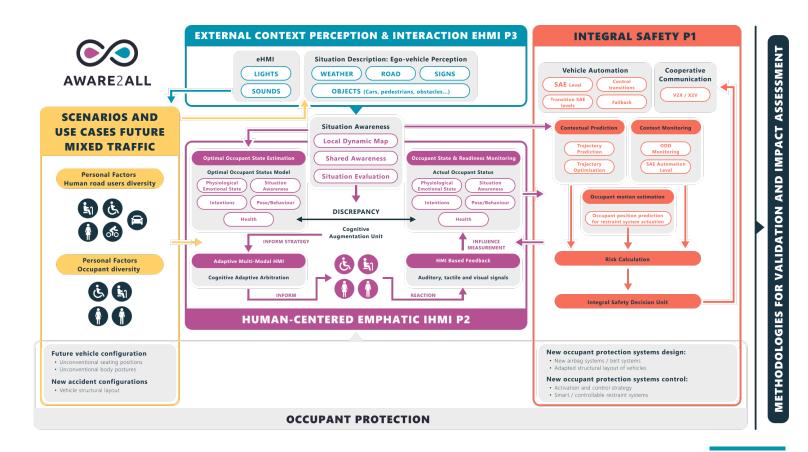


CONCEPT



AWARE2ALL concept is based on three pillars:

- **P1** Integral safety, to guarantee always that even if a crash is unavoidable, the severity is minimised.
- **P2** Interior situation awareness, to ensure that occupant alertness is adequate for the current driving mode.
- **P3** Exterior situation awareness, to inform road users about the vehicles state and intentions.



Pillars table

Summary table of the 3 project pillars



WORKPLAN



WP7 - Project coordination (VICOM)

T7.1 Project management and technical coordination

T7.2 Legal, financial, and administrative management of the project

T7.3 Risk management

T7.4 Data management

WP1 - Critical scenarios, new accident types, use cases and risks **(CERTH)**

T1.1 Critical scenarios and accidents types

T1.2 Occupants and VRUs safety parameters identification and high level system requirements with KPIs

T1.3 Unified approach for Use Cases and scenarios definition

T1.4 Risk analysis of HMI safety and HMI developments

WP4 - eHMI for interaction of HAVs with HRUs (CAP)

T4.1 Communication strategies

T4.2 Perception and real time analysis system

T4.3 eHMI communication system

T4.4 Systems Verification

WP3 Occupant monitoring and iHMI solutions (VICOM)

T3.1 Multimodal detection of the Occupant State and Behaviour

T3.2 Contextual Awareness & Scenarios

T3.3 Optimal Occupant State determination

T3.4 Adaptive Multimodal

T3.5 Systems verification

WP2 - (Passive and Active) Integral safety protection system **(THI)**

T2.1 Systems specification and requirements

T2.2 Perception and Active safety system

T5.3 Testing execution

T5.4 Analysis of results and impact assessment

WP5 Methodologies and tools for performance assessment of the new HMI and protection systems **(THI)**

T5.1 Common assessment framework

T5.2 Development/selection and validation of methods

T5.3 Testing execution

T5.4 Analysis of results and impact assessment

WP6 - Communication, Dissemination & Exploitation (CAP)

T6.1 C&D strategy plan and implementation

T6.2 International Cooperation

T6.3 Recommendations

T6.3 Innovation management (including IPR)



EXPECTED RESULTS



Systems developed in AWARE2ALL will be implemented in a total of four demonstrators:

DEMO 1 (D1)





Passive Safety virtual prototype

Occupant protection (restraint systems) + new vehicle interior

DEMO 2 (D2) ((2))

Active safety – no driver

available (shuttle)

physical prototype

AEB⁷ + Fallback /

Emergency

maneuvering







DEMO 3 (D3)







iHMI⁴, OMS⁸ and Active safety – driver available hybrid prototype

Handover / Handback + iHMI⁴ + OMS⁸

DEMO 4 (D4)









eHMI⁶ physical prototype

Perception system and eHMI6



Simulation











V2X9

Vehicle

CONTACTS



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ACRONYMS & TERMS

Abbreviations



ACRONYMS & TERMS



Acronym	Definition
HRU ¹	Human Road Users.
HAV ²	Highly Automated Vehicle.
HMI ³	Human Machine Interfaces.
iHMI ⁴	Internal Human Machine Interfaces.
ODD ⁵	Operational Design Domain.
eHMI ⁶	External Human Machine Interfaces.
AEB ⁷	Autonomous Emergency Braking.
OMS ⁸	Occupancy Monitoring Systems.
V2X ⁹	Vehicle to everything.
VRU ¹⁰	Vulnerable Road Users.

