# Humanist
## Virtual Centre of Excellence

# POSITION PAPER

### October 2021 |

# What is HUMANIST?

HUMANIST is an international association of research organisations, created in 2007 in Lyon, France and labelled as a Virtual Center of Excellence. It is composed by universities, research institutes and research intensive companies. HUMANIST aims to bring knowledge and expertise together to federate research through Europe in four main areas:

- HMI – Human Machine Interaction

- Human behaviour in Traffic

- ITS – Intelligent Transport Systems

- Vehicle automation

The Humanist members undertake research in these areas and in the interaction between them. The current list of Humanist members is included at the end of this paper. More information on Humanist and its activities can be found on the Humanist website www.humanist-vce.eu.

# Why a Position Paper?

In many Research Programmes, the Human Factor is neglected or does not get the attention it deserves.

There is a lot of transport research going on, funded by public authorities, companies, foundations and international organisations such as the European Commission via its HORIZON Europe programme. However, in many research programmes, the human factor is neglected or does not get the attention it deserves, due to its importance for acceptability and usability of technology design in addition to its impact on safety. Based on a broad consultation within its members, Humanist therefore puts forward in this paper a number of research topics and areas that are considered as playing an important part for Research & Development of future mobility.

The following are covered:

- Human behaviour in transport

- Sustainable transport

- Vehicle automation

- Transport safety

# Human behaviour in transport

Over the last decades, human behaviour in traffic has been investigated and several efficient methodologies have been developed.
But the transport environment is changing quite quickly due to implementation of innovative technologies.
It remains therefore of paramount important to improve our understanding of human behaviour when moving around, in order to improve safety of to avoid misuse and negative side effects of new transport developments.

## SPECIFICATION

of inappropriate behaviours in relation to specific characteristics of the environment (e.g. several types of road users using the same road)

## DEVELOPMENT

of innovative methodologies allowing to predict human reactions in complex contexts (e.g. complex traffic situations with semi-automated vehicles)

## IDENTIFICATION

of users needs and expectations to particular transport mode (e.g. cars, public transport, e-steps, etc)

## EFFECTIVENESS

of approaches for changing road users' behaviour (e.g. switch to a more ecological transport mode)

## PROTECTION

of people during road works

# Transport Safety

Safety in transport has always been a priority for the societies. Air, waterborne and rails transport of passengers is already very safe in Europe, and much progress has been made in road safety in terms of reducing road traffic injuries and deaths.

Nevertheless, the number of people injured and killed in road crashes is still unacceptably high. Moreover, in an evolving context new challenges are emerging.

More research is needed on the following:



Improvement of the safety of people using light and unprotected vehicles such as Personal Travel Vehicles, e-riders, e-steps, e-bikes, e-scooters, quads,…



Effectiveness of vehicle automation in improving road safety, with a specific focus on transition phases with back to manual control and the issue of driver's situation awareness.



Safety effects of innovative modes of communication such as Head Up Display and Augmented Reality.



Evaluation of acceptability and efficiency of safety technological solutions implemented in the vehicles for driver's diagnostic and monitoring to prevent impairment linked to alcohol, drugs and medicines, fatigues,…



Better communication and conflict-free interaction between different transport modes and types of road users - autonomous and manual controlled vehicles, pedestrians, cyclists, motorcyclists, users of personal mobile devices.

# Sustainable Transport

Making transport more sustainable is a major challenge for our societies, requiring a range of complementary approaches. These include:



## BALANCING

the benefits for society (environment, health, economic costs, …) and human risks (injuries, deaths, …) of new or emerging transport modes and vehicles, such as e-personal mobile devices

## MODELISATION

of sustainable transport systems for urban resilience, including traffic management for sustainability

## NEW APPROACHES

for improving the accessibility of mobility for senior and impaired people in the light of new transport services and possibilities

## INCLUSION

in transport, including in the area of mobility as a service

## EVALUATION

of the beneficial impact of electric mobility deployment, especially in urban areas

# Vehicle automation

Vehicle automation is a promising development for the mobility of the future, in particular given its potential to reduce road crashes that are due to human errors. However, given the novelty of the technology there is a risk that new types of road crashes may emerge, based on unforeseen interactions between vehicles and drivers.

Research on vehicle automation should therefore pay more attention to the following topics:



## Understanding

behaviour and behavioural adaptation of drivers and other road users with different levels of automation, in particular in relation to acceptability, over-trust, mistrust and handover.

## Optimisation

of the human-vehicle communication through human centred design, especially during the transition phases, based on analysis and monitoring of users behaviour. Specification of normalized symbols based upon human perception and understanding.

## Risk assessement

including interactions between autonomous vehicle and vulnerable road users, negative side effects such as new types of road crashes, caused by vehicle automation, and potential safety impact related to cybersecurity attacks.

## Mobility

improvement for persons without a driver license such as impaired users, seniors, young people or even traffic offenders.

## Assessment

of cost-effectiveness and overall societal benefits, such as environmental gains, sustainability of transport and integration in new mobility concepts such as Mobility As A Service.

## Analysis

of ethical issues, in relation to privacy, responsibility and inequality.

# HUMANIST MEMBERS

Ben Gurion University of the Negev, Israel
CDV, Czech Republic
CTAG, Spain
DeepBlue, Italy
DLR, Germany
DTU, Denmark
Fraunhofer IAO, Germany
HIT, Greece
KfV, Austria
Loughborough University, UK

RE:Lab, Italy
SWOV, The Netherlands
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