Publicly Available Specification

ISO/PAS 23735

First edition
2025-03

Road vehicles — Ergonomic design guidance for external visual communication from automated vehicles to other road users

Véhicules routiers — Lignes directrices de conception ergonomique de la communication visuelle extérieure du véhicule automatisé aux autres utilisateurs de la route

Reference number
ISO/PAS 23735:2025(en)

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Published in Switzerland

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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This document was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 39, *Ergonomics*.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

As the automotive industry develops automated driving systems (ADS), there continues to be discussion of the need for them to communicate with other road users. Other road users include, but are not limited to, pedestrians, bicyclists, motorcyclists and human drivers. Research suggests that visual communication from external displays on automated vehicles will be helpful to other road users in certain circumstances.[1]-[4] Common approaches to designing external communication systems should mitigate public confusion and enhance public acceptance and trust of automated vehicles (AVs). This document outlines design guidance on external visual communication to support future standardization.

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Road vehicles — Ergonomic design guidance for external visual communication from automated vehicles to other road users

1 Scope

The scope of this document encompasses design parameters of external visual communication used by single mode L4/L5 automated driving system-dedicated vehicles (ADS-DVs), as defined in SAE J3016. Guidance is given for passenger cars (including sport utility vehicles and light trucks) and commercial vehicles (including heavy trucks and buses), as well as derivatives of them that carry or do not carry compartments for occupants (i.e. driver or passengers). These vehicles can be operated in different domains, covering several alternative scenarios and use cases (e.g. open roads, motorways, urban environments, confined areas, geo-fenced areas with dedicated lanes, ports, terminals, pits). It is assumed that the design of ADS-DVs will be unique, thus making it readily apparent that the vehicle is an ADS-DV (see also Annex A for descriptions of use cases concerning the need for communication). The wide range of domains makes it important to consider users with different experiences and abilities, e.g. experienced and inexperienced drivers, elderly, people with disabilities and children.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
acoustic vehicle alerting system
AVAS
system for hybrid-electric and pure-electric vehicles, which provides sound to signal the vehicle's presence to pedestrians and other road users

3.2
acceptability
prospective judgment of a new concept

Note 1 to entry: A new concept means that the technology does not exist, or the subject has no experience with the technology.

3.3
acceptance
evaluation of an existing concept

Note 1 to entry: An existing concept is when the technology is already introduced into the subject's environment.

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