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GB/T 44373-2024

**Intelligent and connected vehicles - Terminology and
definitions**

智能网联汽车 术语和定义

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1 Scope

GB/T 44373-2024 fixes the vocabulary of intelligent and connected vehicles in China, and it is the document the whole series rests on. Automated driving has generated more contested terminology than any recent technology: the levels of driving automation, the dynamic driving task and its fallback, the operational design domain, the minimal risk condition and manoeuvre, the driving automation system versus the driving assistance system, the roles of the driver, the user and the fallback-ready user, and the perception, localisation, decision and control functions inside the system. Each of those has a legal consequence in China as elsewhere, since who is responsible in a crash follows from which of them applies. This standard defines them, aligned with but not identical to the international vocabulary, together with the terms for connectivity, V2X, the roadside unit, the cloud platform and the data recorded. For a carmaker, a supplier, a regulator or a lawyer working on automated driving in China, this is the reference every other document points back to.

This Document defines the terms and definitions related to the underlying common, key technologies, system components and functional applications of intelligent and connected vehicles. This Document is applicable to Type-M, -N and -O vehicles.

2 Normative References

There are no normative references in this Document.

3 Underlying Common

3.1 Intelligent and connected vehicle; ICV A vehicle that has environmental perception, intelligent decision-making and automatic control, or interacts with external information, or even collaborative control functions. NOTE: As shown in Figure 1, vehicles that have any of the functions a, b, and c are called intelligent and connected vehicles. Vehicles that only

have the intelligent function (6.1) can also be called intelligent vehicles; vehicles that only have the connected function (6.2) can also be called connected vehicles. Key: a - intelligent function (6.1) b - connected function (6.2); Intelligent function Connected function c - with both intelligent function and connected function. Figure 1 - Schematic diagram of definition of intelligent and connected vehicle

3.2 Driverless vehicle Automated driving system-dedicated vehicle; ADS-DV A vehicle that is designed to be driven automatically and does not have steering, braking, acceleration and other driving-related controls for manual operation, except for devices for handling emergency situations and temporary operations. NOTE: "Driverless vehicles" may temporarily handle situations that are difficult for vehicles to handle automatically through remote control, but do not include vehicles that are designed to be driven by remote control all the time.

3.3 Functional safety There is no unreasonable risk of hazards caused by abnormal performance of the electrical/electronic system.

3.4 Safety of the intended functionality; SOTIF There is no unreasonable risk of hazard due to inadequacy of the intended functionality or the functionality it achieves.

3.5 Vehicle cybersecurity The state of the vehicle whose electronic and electrical systems, components and functions are protected so that its assets are not threatened. [SOURCE: GB/T 40861-2021, 3.1]

3.6 Multi-pillar approach A comprehensive verification and evaluation method for intelligent and connected vehicle (3.1). NOTE 1: The "multi-pillar approach" includes methods such as audit evaluation, simulation test, field test and road test, etc. NOTE 2: The "multi-pillar approach" is generally used for the verification and evaluation of level 3 and above driving automation systems (5.1) specified in GB/T 40429-2021.

3.7 Intervention The user's behavior that actively influences the driving automation system (5.1) in performing dynamic driving tasks in an effective manner that has been clearly defined by the system.

4.3 Prediction The technology of the intelligent and connected vehicle (3.1) that predicts potential changes in the driving environment around the vehicle. NOTE: "Surrounding driving environment" includes passable areas, road signs, road markings, traffic participants, obstacles, etc.

4.4 Localization The technology of the intelligent and connected vehicle (3.1) for determining vehicle location. NOTE: Common methods include simultaneous positioning and mapping technology, satellite navigation technology, inertial navigation technology, environmental feature matching technology, etc.

4.5 Decision The technology of the intelligent and connected vehicle (3.1) for determining vehicle driving behavior. NOTE: "Driving behavior" refers to behaviors such as following a

vehicle, lane centering, collision avoidance, obstacle avoidance, and lane changing, etc.

4.6 Planning The technology of the intelligent and connected vehicle (3.1) for determining the vehicle's intended driving trajectory.

4.7 Motion control The technology of intelligent connected vehicle (3.1) driving along the planning (4.6) trajectory through lateral/longitudinal driving maneuvers.

4.8 V2X vehicle to everything A technology that allows vehicles to communicate with the outside world. NOTE: "The outside world" refers to other vehicles, pedestrians, the cloud, infrastructure, etc. outside the vehicle.

4.9 Software update The process of upgrading a certain version of software to a new version (including changing the configuration parameters of the software) through an update package. NOTE 1: "Software update" is also called "software upgrade". NOTE 2: "Software update" includes over-the-air update (4.10) and offline update.

5 System Components

5.1 Driving automation system; DAS A system composed of hardware and software that realizes driving automation. [SOURCE: GB/T 40429-2021, 2.2]

5.2 Advanced driver assistance systems; ADAS A general term for various systems that use sensors, communications, decision-making and execution devices installed on the vehicle to monitor the driver, vehicle and its driving environment in real time, and assist the driver in performing driving tasks or actively avoiding/mitigating collision hazards through information and/or motion control. [SOURCE: GB/T 39263-2020, 2.1.1]

5.3 Automated driving system; ADS A system composed of hardware and software that realizes the automated driving function (6.4).

Note: "Automated driving system" refers to the level 3 and above driving automation system (5.1) specified in GB/T 40429-2021.

5.4 Camera A device that obtains image information through a photosensitive device.

5.5 Lidar A device that uses laser beams to detect targets and obtain target information.

5.6 Millimeter-wave radar A device that uses electromagnetic waves in the millimeter wave band to detect targets and obtain target information. complex. [SOURCE: GB/T 40856-2021, 3.1, modified]

5.12 On-board unit; OBU A device installed on a vehicle to enable communication between the vehicle and the outside world. NOTE: "The outside world" refers to other vehicles, pedestrians, the cloud, infrastructure, etc. outside the vehicle.

5.13 Data storage system for automated driving; DSSAD A system equipped on a vehicle with an automated driving function (6.4) that has the functions of monitoring, collecting and

storing data and supporting data reading during the activation of the automated driving system (5.3).

5.14 Cloud-based computing platform It provides dynamic basic data on vehicle operation, infrastructure, traffic environment, traffic management, etc. for intelligent and connected vehicle (3.1) and its users, management and service agencies; and has basic service mechanisms such as data storage, data operation and maintenance, big data analysis, cloud computing, and information security; and supports the basic support platform for the actual application needs of intelligent and connected vehicle (3.1).

5.15 Vehicle-dedicated operating system A collection of software that runs on the in-vehicle hardware and is used to manage hardware resources, provide software platforms, provide interfaces, and provide basic services for upper- layer applications. NOTE: "Vehicle-dedicated operating system" includes vehicle-control operating system (5.15.1) and vehicle-info operating system (5.15.2).

5.15.1 Vehicle-control operating system A collection of software that runs on-board computing platform (5.9) hardware and the automotive electronic control unit hardware, supporting the realization of driving automation functions and safe and reliable operation of intelligent and connected vehicle (3.1).

5.15.2 Vehicle-info operating system A collection of software that runs on-board information interactive system (5.11) and instrument hardware; manages and controls the on-board software and hardware resources of the intelligent and connected vehicle (3.1); and provides services other than the realization of driving automation functions for the intelligent and connected vehicle.

6 Function Application

6.1 Intelligence function Intelligent and connected vehicle (3.1) has environmental perception, intelligent decision- making, automatic control and other functions.

6.2 Connection function Intelligent and connected vehicle (3.1) uses communication technology to realize the function of information exchange between vehicles and the outside world. NOTE: "The outside world" refers to other vehicles, pedestrians, cloud, infrastructure, etc. outside the vehicle.

6.3 Advanced driver assistance function Driving automation system (5.1) is a function that assists the driver in performing some dynamic driving tasks under specific design operating conditions. NOTE: A general term for driving automation functions of level 2 and below specified in GB/T 40429- 2021, including "emergency assistance", "partial driving assistance" and "combined driving assistance" functions.

6.4 Automated driving function Driving automation system (5.1) is the function of replacing the driver to continuously and automatically perform all dynamic driving tasks under specific