



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 44461.2-2024

**Intelligent and connected vehicles - Technical requirements and
test methods for combined driving assistance systems - Part 2:
Multi-lane driving control**

智能网联汽车 组合驾驶辅助系统技术要求及试验方法 第2部分：多车道行驶控制

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1 Scope

GB/T 44461.2-2024 is the second part of the Chinese standard for combined driving assistance systems and it covers multi-lane driving control: the function that changes lane, either at the driver's confirmation or on its own initiative. That is the point at which a driving assistance system stops merely holding a lane and starts making a decision, and it is where the requirements become materially harder. The standard sets the technical requirements for the lane change function, the conditions under which a lane change may be initiated and those under which it must be abandoned, the detection of vehicles approaching from behind in the target lane and the required gap, the indication and the timing, the driver confirmation where it is required and the monitoring that the driver is present, the abort strategy, the behaviour on failure and at the boundary of the operational domain, and the human-machine interface. It then gives the test scenarios, the test methods and the pass criteria. For a carmaker or a supplier bringing an automatic lane change function to China, this is the governing text.

This document specifies the general requirements and performance requirements and describes the test methods for the multi-lane manoeuvre of intelligent and connected

vehicles. This document is applicable to Category-M and Category-N vehicles equipped with multi-lane manoeuvre system. NOTE. in the absence of confusion, the "multi-lane manoeuvre system" in this document is referred to as the "system" in short.

2 Normative References

The contents of the following documents constitute indispensable clauses of this document through the normative references in the text. In terms of references with a specified date, only versions with a specified date are applicable to this document. In terms of references without a specified date, the latest version (including all the modifications) is applicable to this document.

GB 5768.3 Road Traffic Signs and Markings - Part

3 Terms and Definitions

The terms and definitions defined in GB/T 44373-2024 and GB/T 44461.1-2024, and the following are applicable to this document.

3.1 multi-lane manoeuvre system A combined driver assistance system that continuously controls the lateral and longitudinal motion of the vehicle in accordance with the surrounding driving environment and assists the change procedure, including the lane change preparation phase, lane change manoeuvre phase and lane change completion phase under other road conditions that do not fall into

a) and with no less than two lanes in the vehicle driving direction, then, it has the ability to detect and respond to motor vehicles, pedestrians and non-motor vehicles, and does not enter the lane change manoeuvre phase where the lane boundary line is a solid line.

4.1.2 During the lane change manoeuvre phase, the system shall ensure that a suitable safety space is maintained with forward and backward vehicles in the target lane.

4.1.3 In addition to the safety response strategy adopted to avoid special situations, for example, collision risks, the lateral motion of the system during the lane change preparation phase and lane change manoeuvre phase shall remain continuous.

4.1.4 In accordance with

6.6 and 6.7, carry out the test. The system shall only be able to trigger the lane change procedure when the single-lane driving control is activated; after the lane change procedure is completed, the vehicle shall automatically resume the single-lane driving control.

4.1.5 In accordance with 6.8, carry out the test. The system shall only be able to trigger the lane change procedure when no hands-off prompt signal is issued; after the lane change procedure is completed, the vehicle shall automatically resume the single-lane driving control.

4.1.6 While performing the lane change procedure, the system shall not continuously change two or more lanes.

4.1.7 When the vehicle speed is less than the v_{min-ML} declared by the vehicle manufacturer, the system shall not trigger the lane change procedure.

4.2 Self-inspection The system shall complete self-inspection before triggering the lane change procedure and be equipped with at least the following self-inspection functions. When an abnormal state is detected, it shall not enter the lane change preparation phase.

- a) Check whether the relevant electrical components have failed;
- b) Check whether the relevant sensing elements have failed.

4.3 Driver Operation

4.3.1 The system shall at least trigger the lane change procedure through the turn signal light control part.

4.3.2 The system shall respond to the driver's active intervention in vehicle motion control.

4.3.3 After the driver cancels the lane change procedure through a single operation at any time, the system shall cancel the current lane change procedure.

4.4 Cancellation of Lane Change Procedure

4.4.1 If any of the following situations occurs while the system executes the lane change procedure, the current lane change procedure shall be cancelled.

- a) The system's lane change wait reaches the upper limit of the time required in 5.3.2.
- b) When the lane change manoeuvre phase starts, a hands-off prompt signal is issued. If the cancellation of the lane change procedure due to
 - b) may bring potential safety risks to the self-propelled motion control or other traffic participants, then, the system may adopt other safety response strategies different from the cancellation of the lane change procedure.

4.4.2 If the current lane change procedure is cancelled, then, the system may enter a new lane change procedure after the driver executes the lane change procedure triggering mode.

4.5 Prompt Signal

4.5.1 The system shall continuously emit an optical prompt signal during the lane change procedure, and when executing the safety response strategy, it shall send out a prompt signal that is different from those in other states of the system.

4.5.2 If the lane change procedure is canceled, the system shall send out a prompt signal

that complies with the following requirements.

a) If the driver actively cancels the lane change procedure or the lane change procedure is canceled due to

4.4.1 a), the system shall at least notify the driver of the current system status through an optical signal;

b) If the lane change procedure is canceled due to reasons other than

4.4.1 a), the system shall at least notify the driver of the current system status through an optical signal, and additional acoustic and / or tactile signals.

4.5.3 Except for lane change wait, the system shall keep the turn signal light on during the lane change procedure and comply with the following requirements.

a) If the turn signal light control part is not in the locked position during the lane change procedure, the turn signal light shall be automatically turned off when the single-lane driving control is restored;

b) If the turn signal light control part is in the locked position during the lane change procedure, a lane change completion prompt signal shall be sent when the single-lane driving control is restored.

4.5.4 If a system fault occurs during the lane change procedure, the system shall send out an optical signal that is clearly different from other prompt signals of the system. If the system fault occurs during the lane change manoeuvre phase, additional acoustic and / or tactile signals shall be sent out; if the driver actively cancels the lane change procedure, the system's fault

b) During the wait, if the system automatically turns off the turn signal light, then, the vehicle shall automatically turn on the turn signal light again within 3 s ~ 5 s before entering the lane change manoeuvre phase;

c) After exceeding the upper limit of the lane change wait time, the system shall cancel the current lane change procedure.

5.4 Hands-off Prompt Signal In accordance with 6.13, carry out the test. During the lane change preparation phase, if the driver takes off his hands, the system shall send out a continuous optical prompt signal no later than 5 s after the hands-off. The signal shall include the basic constitutive elements representing the hands and the steering wheel, and may be accompanied by other auxiliary information, such as. explanatory text and graphics, etc.

5.5.1 If the system complies with the requirements of

4.1.1 b), in accordance with 6.14, carry out the test, and it shall comply with at least one of the following requirements.