

Guidelines for Public Road Testing of Automated Driving Systems

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National Police Agency

1. Purpose

The purpose of these Guidelines is to contribute to the proper and safe implementation of demonstration testing where motor vehicles are driven using automated driving systems (systems that simultaneously perform two or more functions among acceleration, steering and braking; the same hereinafter) on Japanese public roads (“roads” as defined in Article 2(1)-1 of the Road Traffic Act [Law No. 105 of 1960]; the same hereinafter) (such demonstration testing is hereinafter referred to “public road testing”) through indicating the matters to bear in mind from a standpoint of ensuring safe and smooth traffic(*).

Note that these Guidelines are not intended to prohibit public road testing conducted using procedures that are different from those indicated herein, but rather are intended to, in view of the relevant laws and based on the results of studies on the demonstration testing of automated driving systems on public roads, offer information that would be useful to entities implementing or planning to implement public road testing (“Implementing Entities”), thereby supporting their efforts. Those planning to perform public road testing that does not comply with these Guidelines are advised to consult well in advance with the police in the jurisdiction of the location where such testing will be conducted (i.e., Traffic Planning [General Affairs] Section, Traffic Division, Prefectural Police Headquarters).

* The provisions in these Guidelines that include the phrase “... is required to ...” refer to matters that are legally mandatory.

2. Basic System

Under the current law, it is possible to perform public road testing regardless of time and place, provided that:

- The vehicle used for public road testing (“test vehicle”) complies with the requirements of the Safety Regulations for Road Vehicles (Ministry of Transport Ordinance No. 67 of 1951) (including those specially approved by the Director of a District Transport Bureau as specified in Article 55(1) or by the Minister of Land, Infrastructure, Transport and Tourism as specified in Article 56(4) of the said Regulations);
- The person who assumes the role of the driver is seated in the driver’s seat of the test vehicle, monitors the surrounding traffic as well as the vehicle’s condition at all times, and in the event of an emergency operates the vehicle as necessary in order to ensure safety and thus prevent damage to others(*); and
- The test vehicle is driven in compliance with the relevant laws including the Road Traffic Act.

- * To meet this condition, the automated driving system of the vehicle must be a system that allows the driver to operate the vehicle as necessary in the event of an emergency as specified in 6.(1).

3. Basic Responsibilities of Implementing Entities

Implementing Entities should be aware that driving motor vehicles on public roads used for travel by general road users (e.g., pedestrians, cyclists, children, elderly people, and people with disability) with an automated driving system that is not yet put into practical use may compromise safe and smooth traffic and therefore should take adequate measures to ensure safety.

4. Measure to Ensure Safety Based on What Will Be Tested in Public Road Testing

- (1) Implementing Entities should, prior to testing on public roads and based on what they will test in public road testing, conduct sufficient driving testing at test facilities, etc. (*) assuming a variety of conditions and situations that may be encountered on public roads so as to verify that the test vehicle can be driven safely on public roads using the automated driving system.

- * In addition to the proving grounds owned by Implementing Entities themselves, test facilities, etc. include the following:

- Japan Safe Driving Center's Central Training Academy for Safe Driving
- National Agency for Automobile and Land Transport Technology (National Traffic Safety and Environment Laboratory)
- National Institute of Advanced Industrial Science and Technology
- Japan Automobile Research Institute
- Designated driving schools
- Race tracks

- (2) For a certain period of time after completing the safety verification process at test facilities, etc. in (1), public road testing should be conducted in an environment where unpredicted situations are relatively unlikely to occur (*). The environment for public road testing should be changed gradually only after its safety is verified sufficiently; that is, public road testing should be implemented in stages while verifying safety in view of what will be tested.

Furthermore, in the case of conducting public road testing using a new automated driving system (including when a new function is added to an automated driving system whose safety has already been verified to a certain extent in public road testing), Implementing Entities should newly perform the safety verification at test facilities, etc. in (1) according to the automated driving system's new functions and what will be tested in the public road testing.

- * Appropriate places for public road testing may include parts of general roads with little pedestrian/cyclist traffic and expressways with no pedestrian/cyclist traffic.

- (3) Implementing Entities should check in advance the traffic environment of the public road where they plan to conduct public road testing and, if deemed necessary in view of the objectives and

procedures of the public road testing as well as the condition of the public road, should take appropriate measures to ensure safety(*).

* Examples of appropriate measures to be taken, in particular, for a certain period of time after completing the safety verification process at test facilities, etc. in (1) (whether or not each of these measures will be specifically implemented will be determined individually based on the objectives, procedures, etc. of the public road testing to be conducted):

- To have, in addition to the person to be seated in the driver's seat to operate the vehicle as necessary in the event of an emergency ("test driver"), another person aboard the test vehicle so that the monitoring role can be divided into the role of monitoring the automated driving system's performance, which is to be assumed by this person, and the role of monitoring the surrounding traffic, which is to be assumed by the test driver;
- To arrange to have a vehicle that will travel, for example, side-by-side with the test vehicle to ensure safety;
- To mark the body of the test vehicle with information indicating that it is being subjected to the public road testing of an automated driving system (in this case, the possibility of this indication causing changes in the behavior of general road users around the test vehicle should be taken into account); and
- To announce in advance the date and place of the public road testing using flyers, notice boards, etc. in order to inform local residents and road users thereof.

(4) Implementing Entities should create a document describing the matters that should be known by all of the relevant parties of the public road testing (including the person to be aboard the test vehicle) (e.g., what to do specifically and whom to contact in the event of an emergency such as a failure of the automated driving system or occurrence of a traffic accident) and make this document known to everyone involved.

5. Test Driver Requirements

- (1) The test driver is required to have the driver's license required under law to drive the vehicle type of the test vehicle.
- (2) The test driver has the responsibilities of the driver under the relevant laws including the Road Traffic Act at all times and is required to acknowledge that he or she will be held responsible as the driver at all times if a traffic accident or traffic violation should occur.

Where the test driver is not a member of the Implementing Entity, the Implementing Entity should have the test driver sign a document stating that he or she acknowledges the above matters. (Note that this does not preclude the possibility of the Implementing Entity or insurance covering any financial liability.)

(3) Implementing Entities should verify that the following requirements are met by the test driver for a certain period of time after completing the safety verification process at test facilities, etc. in 4.(1):

- Has a significant amount of driving experience and is a skilled driver;

- Understands well the mechanism and characteristics of the automated driving system of the test vehicle; and
 - Has driven vehicles using the automated driving system of the test vehicle at test facilities, etc. prior to the public road testing so as to familiarize himself or herself with the system and learn how to operate it in the event of an emergency.
- (4) If a person that does not meet the requirements in (3) assumes the role of the test driver in, for example, verification procedures for the practical application of the automated driving system, Implementing Entities should take the following measures:
- To make sure that the automated driving system of the test vehicle operates safely on public roads through performing public road testing repeatedly with a test driver that meets the requirements in (3); and
 - To take adequate safety measures, for example, by having, prior to the public road testing, a person that understands well the mechanism and characteristics of the system explain well to that test driver the relevant matters including the characteristics of the system and what to do specifically in the event of possible emergencies until the test driver understands all this well and by having, in addition to the test driver, a person with sufficient knowledge of the mechanism and characteristics of the system aboard the test vehicle to assist the test driver in operating the vehicle as necessary in the event of an emergency.
- (5) While driving using the automated driving system, the test driver is not necessarily required to hold the steering device such as the steering wheel, but is required to monitor the surrounding traffic as well as the vehicle's condition at all times and to be able to operate the vehicle immediately as necessary in the event of an emergency.

Accordingly, the test driver may be in a relaxed position, for example, with his or her arms on the armrests or his or her hands in his or her lap in situations where the probability of an emergency operation being required is low, such as when driving in places with good visibility and little traffic, but should hold the steering device or keep the hands close to the device so as to be able to hold it instantly in situations where the probability of an emergency operation being required is high, such as when driving in places with poor visibility or heavy traffic.

6. Requirements of Automated Driving System Related to the Test Driver

- (1) Automated driving systems used in public road testing are required to be such that the test driver can operate the system, in the event of an emergency, as necessary to ensure safety.
- (2) Automated driving systems used in public road testing should be such that the authority to operate the test vehicle can be switched between the system and the test driver in an appropriate manner, which may be done by giving an audible alarm at the start or end of automated driving, thereby clearly indicating such start or end to the test driver.

In particular, if a person that does not meet the requirements in 5.(3) assumes the role of the test driver, for example, the automated driving system should be able to request that the test driver take over the operation well in advance so that the test driver can operate the vehicle smoothly, when the system is detected to have reached or to be close to reaching its functional limit or when the system is detected to have failed.

(3) Based on the relevant laws such as the Basic Act on Cybersecurity (Law No. 104 of 2014), Implementing Entities should work to ensure appropriate cybersecurity so as to perform public road testing safely.

7. Record of Various Data on Test Vehicles During Public Road Testing and Maintenance of Such Data

Implementing Entities should implement the following measures to make it possible to investigate sufficiently any traffic accident or violation that has taken place during public road testing:

- To install in the test vehicle a drive recorder, event data recorder or similar device that records information on what is happening around the vehicle and how the vehicle is. (It is desirable that not only events in front of the vehicle but also events behind and inside the vehicle be recorded); and
- To record and maintain various data, including information on the condition of the vehicle, obtained by sensors, etc. relating to the test vehicle during public road testing as well as the operational status of the sensors, etc. in an appropriate manner that would allow such data to be utilized for the investigation of any traffic accident or violation that may occur during the testing.

8. Measures to Be Taken in the Event of a Traffic Accident

- (1) In the event of a traffic accident, pursuant to Article 72 of the Road Traffic Act, the test driver is required to stop driving immediately, to take the necessary actions such as giving aid to the injured and preventing dangers on the road, and to report the details of the accident to police officers.
- (2) When a traffic accident may have been caused by the malfunction of an automated driving system or the driver's over-reliance on the system, the relevant Implementing Entity should refrain from conducting the same type of public road testing until the cause of the accident is investigated and the necessary recurrence prevention measures are taken.

9. Ensuring the Ability to Pay Damages

Implementing Entities should ensure the appropriate ability to pay damages by, for example, buying voluntary insurance in addition to compulsory automobile liability insurance.

10. Advance Notification to the Related Agencies

When conducting public road testing of an automated driving system using very new technology or large-scale public road testing, according to the procedures, Implementing Entities should issue a notification of the Public Road Testing Plan(*) well in advance to the police (i.e., Traffic Planning [General Affairs] Section, Traffic Division, Prefectural Police Headquarters), the applicable road administrator, and the applicable District Transport Bureau (including the relevant Transport Branch Office) or Okinawa General Bureau in the jurisdiction of the location where such testing will be conducted, in order to seek advice relating to the testing in view of the functions of the test vehicle/automated driving system, traffic accident/congestion status, scheduled road construction work, road environment/structure, etc. of the location where such testing will be conducted.

- * The implementation period, place and system of the testing, the functions of the test vehicle/automated driving system, details of the safety measures, and so on.