

Annex:

## **Detailed Implementing Rules on Road Test Management of Automated Vehicle in Beijing (Trial)**

### **Chapter One: General Rules**

Article 1: In order to promote development and application of automated driving technique in China, improve the level of scientific and technological innovation in the transportation industry, and standardize the road tests of automated vehicles, these detailed implementation rules are formulated in accordance with the *Guiding Opinions on Related Work of Accelerating Road Test of Automated Vehicles in Beijing (Trial)*.

Article 2: Independent legal entities (hereinafter referred to as the "test subjects") that carry out relevant scientific researches and finalization tests of automated vehicles within the city and that need to conduct temporary road tests of automated vehicles shall obey these implementation rules.

Article 3: Led by Beijing Municipal Commission of Transport, and together with Beijing Traffic Management Bureau and Beijing Municipal Bureau of Economy and Information Technology, Beijing Joint Working Group for Automated Driving Tests Management (hereinafter referred to as the "Joint Working Group") has been established, which is responsible for unified implementation, supervision and administration of these implementation rules.

### **Chapter Two: Responsibilities of Management Institution**

Article 4: The joint working group is the management institution of automated driving tests in Beijing, and it is responsible for organizing and carrying out road tests of automated vehicles in the city. The joint working group will hold joint meetings regularly to confirm relevant application work of test subjects in the form of meeting minutes, coordinate to solve the problems arising in the process of implementation.

Article 5: The joint working group shall organize an expert committee of automated driving tests, which is composed of experts in the fields of transportation, communication, automobile, electronics, computer, law and other related fields, and it shall be responsible for demonstration and evaluation of the applications submitted by the test subjects and then issue the opinions of experts.

Article 6: The joint working group authorizes a third party (hereinafter referred to as "the third authorized party") to be responsible for the whole process of road tests of automated vehicles, including application processing, organizing the experts for demonstration and evaluation, test tracking, data collection and daily supervision of the road tests of automated vehicle.

## Chapter Three: Basic Requirements and Application Process for Tests

Article 7: The road test of automated vehicles is one type of test activity aiming at carrying out the scientific test of automated driving system. It includes general technical test, special technical test and trial operation test.

Article 8: The test subject shall meet the following basic requirements:

(I) It shall have the technical and management ability to carry out road tests of automated driving.

(II) It shall provide the basic information of the vehicle for automated driving test, including but not limited to the name of the vehicle manufacturer, date of manufacture, vehicle model, vehicle identification code, engine number (or motor number), vehicle color and so on.

(III) It shall provide the introduction and operation instructions of the automated driving system, including the communication system of automated driving (including two-way communication system supporting the test vehicle and the data center of test subject), the operating system of automated driving, the safety system, the monitoring system of automated vehicle and so on.

(IV) It shall provide the installation certificate of automated driving data recording device.

(V) It shall install the supervision device and connect it to the supervisory platform, and shall also be subject to daily supervision of a third authorized party.

(VI) It shall purchase a traffic accident liability insurance of no less than 5 million yuan per vehicle or provide an accident compensation guarantee of no less than 5 million yuan per vehicle for road tests of automated driving, and shall submit the *Self-proof of Test Subject's Compensation Ability* (see Annex 4).

Article 9: The automated vehicles (hereinafter referred to as the "test vehicles") applying for road tests of automated driving refer to passenger vehicles or commercial vehicles that meet the requirements of *Technical Specifications for Safety of Power-driven Vehicles Operating on Road* (GB7258) and that are also provided with the automated driving functions, excluding low-speed vehicles and motorcycles. The test vehicles shall meet the following basic requirements:

(I) Motor vehicles that have not been registered.

(II) The requirements of compulsory inspection items other than durability of the corresponding vehicle type shall be met. For some items that cannot meet the requirements of compulsory inspection due to the realization of automated driving function, the test subject shall prove that it does not reduce the safety performance of the vehicle.

(III) It should be equipped with two modes of manual operation and automated driving, and the mode conversion can be realized in a safe, fast and simple way with corresponding prompts, so as to guarantee that the vehicle can be converted into manual operation mode immediately under any circumstances.

(IV) In order to meet relevant testing and evaluation requirements and meet the conditions for road tests, a certain mileage of tests shall be completed through real vehicle or real vehicle plus simulation at the closed test site for automated vehicles identified by the joint working group (hereinafter referred to as the "closed test site").

(V) It shall be equipped with the automated driving data recording device with recording and storage functions of the vehicle state, which can automatically record and store the following information and data at least 90 seconds before and 30 seconds after the occurrence of collision, accident, detachment from automated driving or failure of the vehicle, and the storage time of the data is not less than three years. It shall also be equipped with the supervision device, which can send back no less than 1-9 items of information below to the supervisory platform in real time, accept daily supervision of a third authorized party.

1. Control mode of the vehicle (automated driving and manual operation);
2. The vehicle's position;
3. The speed, accelerated speed and other motion status of the vehicle;
4. External environment perception and response status (other traffic participants and obstacle target data);
5. Real-time status of vehicle lights and signals;
6. 360-degree video monitoring of exterior of the vehicle;
7. The in-car video and voice monitoring that reflect the situation of testing driver and human-computer interaction state.
8. In the unmanned test, the non-driver control commands received by the vehicle and their sources, including those sent from other seats in the vehicle or remote test seats.
9. Failure condition of the vehicle.
10. Other information.

Article 10: The driver to be tested should meet the following basic requirements:

(I) The driver should be in good health, has not reached the national legal retirement age and has signed a labor contract with the test subject.

(II) The driver should hold corresponding driving license of quasi-driving type with

more than three years of safe driving experience and abide by laws and regulations. He/she should have no record of drunk driving or drugged driving and no criminal record of traffic accident or dangerous driving. The driver should be proficient in road traffic safety laws and regulations, driving theory, traffic safety psychology and other safe driving knowledge.

(III) After the automated driving training provided by the test subject, the driver should be familiar with the automated driving test procedures, master operating methods of the automated driving test, and have the ability of safe operation of the automated vehicle and emergency response under the state of emergency.

(IV) No full marks have been recorded in the last three consecutive scoring periods.

(V) Within the last one year, the driver has no records of serious traffic violations such as exceeding the speed limit by 50% or more and shooting traffic lights violation.

(VI) The driver has no liability record for a traffic accident-causing death or serious injury.

(VII) Other conditions stipulated by laws, regulations and rules.

Article 11: The procedures for the test subject to apply for automated driving test qualification:

(I) The test subject shall apply to the third authorized party and submit the application materials at the same time. The test subject whose review opinions are due can apply for extension if there is no major upgrading, no traffic accident with main responsibility and out of control or no major violation and the like. The third authorized party shall complete the preliminary examination of the materials within ten working days after receiving the materials.

(II) After the materials have passed the preliminary examination, the third authorized party shall organize on-site examination within five working days to review the consistency of the automated driving test vehicle and related functions provided by the test subject with description of the materials.

(III) The test subject that has passed the on-site examination shall install the supervision device that meets the technical requirements before the evaluation of expert group, and then connect it to the daily supervision platform of the third authorized party. Meanwhile the third authorized party shall issue the access certificate of the supervision device.

(IV) After the on-site examination has been passed, the third authorized party shall organize the experts to evaluate the testing application. The expert group shall demonstrate, evaluate and issue expert opinions based on the application materials, on-site examination materials and on-site demonstration of the test subject. Members of the expert group shall be the members from the expert committee of automated driving tests.

(V) The joint working group meeting shall be held within five working days after the expert evaluation. The joint working group will issue the review opinions and provide the automated driving test marks based on the expert opinions. The validity of the review opinions passing the testing application is two years.

Article 12: For the test subject applying for the first time, according to the handling requirements of temporary vehicle license plate for the test, the test subject shall go to the traffic administrative department of the municipal public security organ to apply for a temporary driving license plate for the test with review opinions within 30 days.

Article 13: The test subject shall, within ten working days before the expiry of temporary driving license plate for the test, apply to the traffic administrative department of municipal public security organ for renewal of temporary license plate for the test.

Article 14: The third authorized party shall conduct random checks on the test subject from time to time as per requirements of the joint working group. If the automated driving system is found to be inconsistent with the application and there is a major upgrading, it should be timely reported to the joint working group who will treat the test subject as a major violation. At the same time, the traffic administrative department of the public security organ will take back and suspend the issuance of temporary driving license plate for the test.

Article 15: A batch of vehicles applied by the test subject should conform to the "Principle of Three Consistencies", namely, the principle of consistent vehicle model, automated driving system and system configuration. There should be no more than five automated vehicles in one batch for the initial application.

Article 16: If the test subject meets the following conditions, more than five test vehicles can be applied for one batch:

(I) It has obtained the temporary driving license plate for the road test of automated vehicles in Beijing, and has also completed the automated driving test mileage of no less than 5000 kilometers (not limited to the vehicle accumulation with "Principle of Three Consistencies").

(II) Within the last one year, there was no accident in automated driving road test in which the test subject took the main responsibility.

(III) Within the last one year, no serious violations occurred in the supervision process of the third authorized party.

Article 17: If the test vehicle for which the review opinions have been obtained is subject to one of the following circumstances, the test subject shall apply for vehicle registration change fifteen working days in advance and submit the Test Change Information Form of the Test Subject (see Annex 7). The test shall be reviewed and approved by the third authorized party

before proceeding.

(I) The color of the vehicle has been changed.

(II) The information of the testing driver has been changed.

(III) Hardware components have been changed and also ensure that it does not trigger a major upgrading of the automated driving system.

Article 18: If the automated driving system of the test vehicle that has obtained the review opinions is significantly upgraded, the test subject shall take the initiative to stop the tests of relevant test vehicles and simultaneously notify the third authorized party to return the temporary driving license plates for relevant tests. If the test is required, the automated driving test application should be resubmitted.

## Chapter Four: Application Requirements for General Technical Tests

Article 19: The general technical test refers to the road test of the test vehicle on the permitted urban road section for the purpose of carrying out universal driving function of the automated driving system.

Article 20: In addition to meeting the basic requirements, the test vehicle applied by the test subject shall also meet relevant test and evaluation requirements in the closed test site by means of real vehicle or real vehicle plus simulation test. The applied test vehicle shall complete an automated driving test of no less than 5,000 kilometers in total in the closed test site, in which each vehicle shall complete no less than 100 kilometers and at least one vehicle shall complete an automated driving test of no less than 1,000 kilometers. If the applied test vehicles have obtained the road test qualification and meet the "Principles of Three Consistencies", each vehicle shall complete the automated driving test with no less than 100 kilometers in the closed test site.

Article 21: In addition to meeting the basic requirements, the test driver should also complete no less than 50 hours of real vehicle operation training for automated driving test, including no less than 10 hours of training to take over the test vehicle under dangerous scenario.

Article 22: The test subject should submit the following application materials:

(I) List of Application Materials for Automated Driving Test (see Annex 1).

(II) Application for Automated Driving Test (see Annex 2).

(III) The certificate of technical inspection of motor vehicle safety issued by Beijing technical inspection institution for motor vehicle safety.

(IV) Basic information of the test vehicle for automated driving. If it is a domestic motor

vehicle, the factory certificate of finished motor vehicle shall be provided. If it does not belong to the announced model, the factory certificate and the mandatory inspection report of the corresponding model issued by the third-party testing laboratory recognized by the state shall be provided. If it is an imported motor vehicle, the mandatory product certificate of the imported motor vehicle, the on-board inspection sheet and the importation certificate of the goods shall be provided.

(V) Introduction to automated driving system, operating instructions and the certificate of no reduction in vehicle safety performance. The system introduction includes the automated driving function and the corresponding design and operation conditions (including the range of design and operation, vehicle state, status of driver and passenger, etc.), fault handling, minimum risk control and the like.

(VII) Introduction and operating instructions for installing a data recording device of automated driving by the test vehicle of automated driving.

(VII) Response Explanation to Test Scenario of Automated Driving System (see Annex 3).

(VIII) The approved closed test site shall issue a test report according to relevant requirements. The report shall cover the operation state and test evaluation of automated driving system in the designated test scenario of automated driving.

(IX) The report in (VIII) may not be provided in the case of an application for extension of review opinions. Relevant supporting materials of system consistency and the third-party's test report of the system with no major upgrading shall be required. The test contents should include main components and layout of the hardware architecture of automated driving system, the software architecture of automated driving system, the dynamic driving task and take-over of dynamic driving task, the range of design and operation, the control strategy, the minimum risk manoeuvre, safe operation and other comparison tests.

(X) The test driver's valid ID card, driving license, certificate of employment, certificate of training and operating capability of automated driving system and so on.

(XI) Valid traffic accident liability insurance or letter of guarantee during the test period.

(XII) Letter of commitment shall be provided by the test driver who will voluntarily assume the responsibility of the accident as determined and handled by the traffic administrative department according to law when the test vehicle being operated involves in an accident during the test. Letter of commitment shall be provided by the test subject who will voluntarily undertake the compensation liability of the test driver under its name when the test vehicle involves in an accident during the test.

(XIII) Self-proof of Test Subject's Compensation Ability (see Annex 4).

(XIV) Letter of commitment of installing supervision devices and accepting routine

supervision by the third authorized party.

## Chapter Five: Application Requirements for Special Technical Tests

### Part One Application Requirements for special weather tests

Article 23: The special weather test refers to the road test conducted under specific light or meteorological conditions for the purpose of carrying out the scientific test of automated driving system.

Article 24: The test vehicle applied by the test subject has passed the general technical test and evaluation in the closed test site and the test capability is assessed at level T3 or above. After obtaining the temporary driving license plate for the test, the test subject should also meet the following requirements:

(I) The accumulative mileage of the road test of automated driving of the applied test vehicle should exceed 10,000 kilometers. During the test, no major violations occurred, and no traffic accidents and out-of-control conditions for which the subject assumes liability occurred.

(II) Complete the special weather scene test in the closed test site and pass the evaluation.

Article 25: In addition to meeting the requirements of general technical test regulations, the test driver should also complete at least 10 hours of real vehicle operation training under corresponding special weather scenario.

Article 26: In addition to the application materials stipulated in the general technical test, the test subject shall also submit the following supplementary application materials:

(I) The test plan shall include test purpose, test route, test time, test items and test procedures.

(II) Qualification documents of the test vehicle, such as temporary vehicle license plate and others;

(III) Test report of the corresponding special weather scenario in the closed test site;

(IV) Proof materials of training and operation ability of the test driver;

(V) Safeguard measures, risk analysis, emergency measures and others of special weather tests;

(VI) Other relevant materials;

### Part Two Application Requirements for Highway Tests

Article 27: The highway test refers to the road test of the test vehicle on the permitted

highway section for the purpose of carrying out the scientific test of automated driving system.

Article 28: The test vehicle applied by the test subject has passed the general technical test and evaluation in the closed test site and the test capability is assessed at level T1 or above. The test subject should also meet the following requirements:

(I) Complete the highway scene test in the closed test site and pass the evaluation.

(II) Purchase traffic accident liability insurance of no less than 10 million yuan per vehicle or submit letter of indemnity of no less than 10 million yuan per vehicle for the accident of road test of automated driving.

Article 29: In addition to meeting the requirements of general technical test regulations, the test driver should also complete at least 10 hours of real vehicle operation training under the highway scenario.

Article 30: In addition to the application materials stipulated in the general technical test, the test subject shall also submit the following supplementary application materials:

(I) The test plan shall include test purpose, test route, test time, test items and test procedures;

(II) Test report of the highway scene in the closed test site;

(III) Proof materials of training and operation ability of the test driver;

(IV) Safeguard measures, risk analysis, emergency measures and others of highway tests;

(V) Other relevant materials;

### Part Three Application Requirements for Unmanned Tests

Article 31: The unmanned test refers to the road test in which the test driver can monitor and control the test vehicle on the driving seat, other seats in the vehicle or on the remote test seat outside the vehicle according to the performance of the test vehicle for the purpose of carrying out the scientific test of automated driving system.

Article 32: The test vehicle applied by the test subject has passed the general technical test and evaluation in the closed test site and the test capability is assessed at level T3 or above. After obtaining the temporary driving license plate for the test, the test subject should also meet the following requirements:

(I) The accumulative mileage of the road test of automated driving of the applied test vehicle should exceed 30,000 kilometers. During the test, no major violations occurred, and no traffic accidents and out-of-control conditions for which the subject assumes liability occurred.

(II) Complete the unmanned tests in the closed test site and pass the evaluation.

(III) There shall be at least one test driver for each test vehicle. Before each test, one test driver should be identified for each vehicle and the corresponding test plan should also be

signed. The test plan signed by the test driver should be kept for more than three years.

(IV) The maximum number of vehicles applied for unmanned tests for the first time is five. If the unmanned testing mileage exceeds 40,000 km and there is no responsible traffic accident or out-of-control situation, the additional test vehicles can be applied. The specific number will be arranged by the joint working group according to the carrying capacity of the road section for tests.

(V) Before and during each unmanned test, the transmission quality of mobile communication signals in the test area and the contact status between them and the vehicles shall be inspected and monitored to ensure normal operation of the remote control equipment. Inspection and monitoring data should be kept for no less than three months.

Article 33: In addition to the basic requirements, the test vehicles should also meet the following requirements:

(I) The remote control equipment shall be installed and meet the following requirements:

1. In the automated driving mode, the test driver inside or outside the vehicle can quickly and safely convert the test vehicle mode into manual mode for remote control by remote control device.

2. It can transmit real-time data and information of speed, acceleration, light, real-time state of the signals, external 360-degree video monitoring status of the vehicle, environmental perception and response status, failure and other situations of the test vehicle.

(II) It can clearly identify the vehicle control commands as originating from the driver's seat in the vehicle, other seats in the vehicle, or remote test seats outside the vehicle, and be fed back to the supervisory platform.

Article 34: In addition to meeting specified requirements of general technical tests, the test driver shall also meet the following requirements:

(I) One test driver shall not monitor more than one test vehicle at the same time.

(II) Complete more than 50 hours of remote control operation of the test vehicle for automated driving.

Article 35: In addition to the application materials stipulated in the general technical test, the test subject shall also submit the following supplementary application materials:

(I) The introduction and operation instructions of remote equipment, including communication system (including two-way communication system supporting the test vehicle and the data center of test subject), operating system, security system, monitoring system and the like.

(II) The test plan shall include test purpose, test route, test time, test items and test procedures;

(III) Qualification documents of the test vehicle, such as temporary vehicle license plate and others;

(IV) Unmanned test report in the closed test site;

(V) Proof materials of training and operation ability of the test driver;

(VI) Safeguard measures, risk analysis, emergency measures and others of unmanned tests;

(VII) Other relevant materials.

#### Part Four Application Requirements for Formation Driving Test

Article 36: The formation driving test refers to the test of intelligent connected vehicles with the function of formation driving on the road by installing intelligent connected equipment, and it aims at carrying out scientific experiments.

Article 37: The test vehicle applied by the test subject has passed the general technical test and evaluation in the closed test site and the test capability is assessed at level T1 or above. The test subject should also meet the following requirements:

(I) The test vehicle shall be tested in formation in the closed test site and pass the evaluation.

(II) At least one test driver shall be assigned to each test vehicle for formation driving test.

(III) There should be no more than 6 vehicles to be tested simultaneously for driving in formation.

(IV) Before and during each formation test, the transmission quality of communication signals in the test area and the contact status between them and the vehicles shall be inspected and monitored to ensure the normal operation of formation driving function. Inspection and monitoring data should be kept for no less than three months.

Article 38: In addition to meeting the requirements of the general technical test

regulations, the test driver shall also have at least 50 hours of training related to formation driving test and real vehicle operation.

Article 39: In addition to the application materials stipulated in the general technical test, the test subject shall also submit the following supplementary application materials:

(I) Introduction and operation instructions of formation driving system, which includes communication system, operating system, security system, monitoring system and the like;

(II) The test plan shall include test purpose, test route, test time, test items and test procedures;

(III) The test report of formation driving in the closed test site;

(IV) Proof materials of training and operation ability of the test driver;

(V) Safeguard measures, risk analysis, emergency measures and others of formation driving tests;

(VI) Other relevant materials.

## Chapter Six: Application Requirements for Trial Operation Test

### Part One Application Requirements for Manned Test

Article 40: The manned test refers to the road test conducted for the purpose of improving and optimizing the ride sensation, human-computer interaction performance, operation mode and other scientific experiments of automated vehicles.

Article 41: The test vehicle applied by the test subject has passed the general technical test and evaluation in the closed test site and the test capability is assessed at level T3 or above. After obtaining the temporary driving license plate for the test, the test subject should also meet the following requirements:

(I) For the test vehicle with more than seven seats, the adequate half-load and full-load tests of real vehicle shall be performed in a closed test site and pass the evaluation.

(II) Test vehicles shall not be used for transportation and business activities.

(III) If manned test volunteers are to be recruited, the test volunteers shall meet the following conditions:

1. The volunteer must be at least 18 years of age with full capacity for civil conduct and be in good health.

2. The volunteer should abide by the laws and regulations of the People's Republic of China and have no criminal records.

3. The volunteer should sign a test commitment with the test subject, fully understand requirements of the manned test, contents of the manned test and risk of the test, and voluntarily abide by relevant safety regulations of the test and bear corresponding risks, and agree to timely provide manned test feedback (or reports) upon completion of the test.

(IV) Effective measures should be taken to ensure the personal safety of test volunteers, and seat insurance with no less than two million yuan per vehicle per seat or necessary commercial insurance (such as personal accident insurance, etc.) with no less than two million yuan per person should be purchased.

(V) The test commitment signed with the test volunteers should be kept for more than three years.

Article 42: The test driver shall, in addition to meeting the requirements of general technical test regulations, complete at least 100 hours of road tests of automated driving for the same vehicle model.

Article 43: The applicant for manned test shall conduct the test in phases as per requirements of the test phases, the requirements of test phases are as follows:

(I) If the test of previous phase has been completed, the test subject is not primarily responsible for traffic accidents and violations of laws and regulations, and the temporary driving license plate for the test vehicle is within the validity period and meets the application conditions for the test of next phase, the relevant materials can be submitted to the third authorized party to apply for the test of next phase and will be reviewed and approved by the joint working group. The previous phase of phase one is general technical test.

(II) According to the requirements of test phases, the test subject shall be equipped with test drivers, test engineers and test vehicles meeting corresponding conditions, and recruit the volunteers of manned tests meeting corresponding conditions. The specific number of test vehicles will be arranged by the joint working group according to the carrying capacity of the test road.

Table 1 Phase Requirements for Manned test

Manned test phase	Minimum mileage accumulated in the previous phase of road tests of automated	Test driver	Test engineer	Recruitment scope of manned test volunteers
Phase I	2	Must be equipped	Must be equipped	Only those who sign labor or service contracts with the test subject can be recruited
Phase II	5	Must be equipped	Must be equipped	Can be recruited from the community
Phase III	10	Must be equipped	Not provided with the written consent of the manned test volunteer	Can be recruited from the community

Article 44: In addition to the application materials of general technical test, the test subject shall also submit the following application materials:

(I) Submit the test plan, which shall include the test purpose, test route, test scope, test content as well as the scope, number and requirements of the recruited manned test volunteers;

(II) Qualification documents of the test vehicles, such as temporary vehicle license plate and others;

(III) Reports of corresponding half-load and full-load tests in the closed test site (test vehicle with more than seven seats);

(IV) Proof materials of training and operation ability of the test driver;

(V) Safeguard measures, risk analysis, emergency measures and others of manned tests;

(VI) Other materials, such as sample of test commitment, manned test feedback sample and other relevant labor contract or service contract for the test engineer and so on.

(VII) Preservation plan and commitment of relevant materials. The preservation plan and commitment shall include test commitment, manned test feedback, insurance, labor

contract or service contract and relevant image data and the like. The preservation period shall be more than three years.

## Part Two Application Requirements for Loading Test

Article 45: The loading test refers to the road test which is carried out for the purpose of optimizing the performance and trial operation capability of the automated vehicle under the load condition, and for the purpose of scientific experiments.

Article 46: The test vehicle applied by the test subject has passed the general technical test and evaluation in the closed test site, and the test capability is assessed at level T3 or above. After obtaining the temporary driving license plate for the test, the test subject should also meet the following requirements.

(I) The adequate half-load and full-load tests of real vehicles for the test vehicle shall be performed in a closed test site and pass the evaluation.

(II) Test vehicles shall not be used for transportation and business activities.

(III) Relevant provisions for motor vehicle loading of the Road Traffic Safety Law shall be observed. Dangerous goods shall not be carried.

Article 47: The test driver shall in addition to meeting the requirements of general technical test regulations, complete at least 100 hours of road tests of automated driving for the same vehicle model.

Article 48: The application for loading test shall be conducted in phases according to phase requirements of the test. The requirements for the test phase are as follows:

(I) If the test of previous phase has been completed, the test subject is not primarily responsible for traffic accidents and violations of laws and regulations, and the temporary driving license plate for the test vehicle is within the validity period and meets the application conditions for the test of next stage, the relevant materials can be submitted to the third authorized party to apply for the test of next phase and will be reviewed and approved by the joint working group. The previous phase of phase one is general technical test.

(II) According to the requirements of test phases, the test subject shall be equipped with test drivers, test engineers and test vehicles meeting corresponding conditions, and the matching weight of the counterweight items should be carried. The specific number of test vehicles will be arranged by the joint working group according to the carrying capacity of the test road

Table 2 Phase Requirements for Loading Test

Loading test phase	Minimum mileage accumulated in the previous phase of road tests of automated driving (thousands of kilometers)	Test driver	Test engineer	Counterweight requirements
Phase I	2	Must be equipped	Must be equipped	Not exceeding the weight of the vehicle at half load
Phase II	5	Must be equipped	Must be equipped	Not exceeding the weight of the vehicle at full load

Article 49: In addition to the application materials of general technical test, the test subject shall also submit the following application materials:

(I) The test plan should include test purpose, test route, test time, test items, test procedures, type and weight of counterweight items and the like;

(II) Qualification documents of the test vehicle, such as temporary vehicle license plate and others;

(III) Reports of corresponding half-load and full-load tests in the closed test site;

(IV) Proof materials of training and operation ability of the test driver;

(V) Safeguard measures, risk analysis, emergency measures and others of loading tests;

(VI) Other materials.

## Chapter Seven: Test Management

Article 50: In the process of **performing** the test, the test subject shall follow the traffic management measures and relevant provisions, provide perfect test safeguard measures and management norms, and strictly abide by laws and regulations.

Article 51: The test subject shall carry out the test on the designated road or area and in the designated time period.

Article 52: The road test of the test vehicle shall be carried out within the validity periods of review opinions and temporary vehicle license plate used for the test. The test

vehicle shall comply with the relevant regulations on the management of temporary vehicle license plate.

Article 53: The test subject shall submit the Test Plan (see Annex 8) to the third authorized party within five working days before the test. The third authorized party has the right to request the test subject to change the test plan or terminate the test based on actual situation.

Article 54: In the process of automated driving test, the following provisions shall be strictly observed. Any violation shall be treated as a major violation:

(I) The test subject, the test driver and the test engineer shall abide by laws and regulations of the People's Republic of China and relevant provisions of the road traffic safety laws and regulations. The test subject and the test driver shall comply with the vehicle prohibition regulations in the specific road area.

(II) The test subject shall submit the Test Plan (see Annex 8) to the third authorized party according to the detailed implementation rules. Tests should be conducted strictly in accordance with the test plan to ensure that there is no major upgrading to the automated driving system. The test shall not be carried out beyond the area, time period or test range. Braking tests shall not be conducted on the road.

(III) The test subject shall guarantee normal operation of the monitoring device. In the driving period of the test vehicle, if the monitoring device is found to be abnormal or notice from the third authorized party about abnormal monitoring device is received, the relevant test vehicle shall not continue the test until the monitoring device is restored to normal operation.

(IV) The automated driving test mark shall be posted on the test vehicle. A test driver who has passed the examination shall be assigned on the driver's seat, and the Test Plan (see Annex 8) and corresponding test review opinions shall be carried along with the vehicle.

(V) No person unrelated to the test shall be allowed to ride in the test vehicle unless he or she is qualified for corresponding manned test. The test vehicle shall not carry any cargo not related to the test unless it has obtained corresponding loading test qualification.

(VI) The test driver should always monitor the operating state of the vehicle and its surroundings and be ready to take over the vehicle at any time. When the test driver finds that the vehicle is in a state that is not suitable for automated driving or the system prompts manual operation, he or she shall take over the vehicle immediately. During the non-unmanned test, the test driver shall remain in the driver's seat of the test vehicle at all time.

During the unmanned test, the test driver can sit in the driver's seat, other seats in the vehicle or the remote test seat outside the vehicle.

(VII) The test driver shall rest for no less than half an hour every two hours when conducting the road test.

(VIII) The test subject shall submit the Road Test Report of Automated Driving (see Annex 5) to the third authorized party every three months after the road test of automated vehicle has been completed (it may be postponed in case of national legal holidays). The automated driving data recorded by the data recording device 90 seconds before and 30 seconds after the occurrence of disengaging from automated driving function shall be submitted. It shall also submit the summary report within one month after completion of the road test.

(IX) The test subject shall submit relevant materials requested by the joint working group or the third authorized party for retrieval and looking up within the specified time. The relevant materials include but are not limited to application documents and certificates, data, documents related to road test and the like.

(X) The test subject shall terminate the test within the specified time upon receiving the notice of termination from the third authorized party.

Article 55: If the test vehicle has a traffic accident during the road test, the test driver should terminate the test immediately and report it to the traffic management department of public security organ in time. If the test vehicle has a traffic accident or traffic violation during the test, the test driver shall be identified as the vehicle driver. During the unmanned test, the test driver signed the corresponding test plan will be identified as the vehicle driver. The traffic management department of the municipal public security organ shall deal with the accident as per the provisions of current road traffic safety laws and regulations, and the test driver shall also bear corresponding legal liability. At the same time, the test subject shall report relevant accident situation to the third authorized party in time.

Article 56: The test subject shall submit the automated driving data before the accident recorded by data recording device to the third authorized party within 24 hours after the automated vehicle has been involved in a traffic accident. The test subject shall submit the Traffic Accident Report of the Test Vehicle for Automated Driving (see Annex 6) to the third authorized party within ten natural days after the test vehicle for automated driving has been involved in a traffic accident. Within five working days after the accident liability confirmation, the test subject shall submit the accident liability confirmation result, cause analysis report and other relevant materials to the third authorized party. The recording data requirements are as follows:

(I) Data records 24 hours prior to the accident: It shall include but be not limited to the vehicle location, external 360-degree video monitoring, video and voice inside the vehicle and the like.

(II) Data of 300 seconds before the accident: It shall include but be not limited to vehicle control mode, vehicle speed, acceleration and other motion status, environmental perception and response status, vehicle lighting, real-time signal state, remote control orders received by the vehicle, failure conditions of the vehicle and others.

Article 57: In case of an accident of the test vehicle for automated driving, the third authorized party may suspend the test qualification of the accident vehicle of the test subject. The test subject shall submit the temporary vehicle license plate of the test vehicle to the third authorized party within 24 hours after the accident. The test subject shall not perform any road test until its test qualification has been resumed by the joint working group.

Article 58: The test subject may submit an application for resuming the test to the third authorized party after submitting relevant proof of the completion of handling the traffic accident.

Article 59: The test subject should provide appropriate tools and measures to ensure that the joint working group and the third authorized party can consult, replay and analyze the data recorded by the automated driving data recording device at any time. The operational data recorded by the recording device of automated driving data shall be kept for not less than 3 years for retrieval by the joint working group and the third authorized party.

Article 60: The joint working group shall revoke the review opinions if any of the following circumstances occurs to the test vehicle during the test:

(I) The joint working group identified the test activities as having major safety risks.

(II) The test vehicle has not obtained a valid temporary vehicle license plate for the road test.

(III) Violations of laws and regulations of the test vehicle have been exposed by the media or reported by the public, and have been verified by the traffic management department of the public security organ.

(IV) The test vehicle has the acts of serious disturbing the traffic order, such as passing against traffic lights, converse running and the like, or according to the road traffic safety laws and regulations, it may be punished with the serious traffic violations such as temporary suspension, revocation of the motor vehicle driving license or detention.

(V) There is a significant upgrading of the test vehicle, which is inconsistent with the application. Or the test subject is unable to submit valid certification materials issued by the third authorized party for no major upgrading of the automated driving system during random inspection conducted by the joint working group from time to time.

(VI) In the case of serious injury, death or vehicle damage caused by a traffic accident,

and the primary responsibility lies with the test vehicle.

Article 61: When the joint working group revokes the review opinions, it shall publish to the public and take back the temporary vehicle license plate for the test and deliver it to the traffic management department of public security organ in the place where the temporary vehicle license plate was verified and issued. If the license plate is not taken back, the working group should inform the traffic management department of public security organ in written form that the license plate has been invalid.

## Chapter Eight: Liability for Illegal Operation

Article 62: If the test subject that has obtained the temporary vehicle license plate for the road test of automated vehicles in Beijing has violated the operation rules or the detailed implementation rules, the joint working group has the right to revoke the review opinions of all test vehicles declared by the test subject, take back the temporary vehicle license plate for the test, and the list of relevant test subjects will be announced regularly. At the same time, the test application submitted by the relevant test subjects will not be accepted within one year.

Article 63: If a unit that has not obtained the temporary vehicle license plate for the road test of automated vehicles in Beijing violates the rules and carries out relevant tests on the road, and is also punished by the traffic management department of public security organ, exposed by the media or reported by the public, the joint working group will not accept the test application submitted by the unit within one year.

Article 64: The test subject shall be legally responsible for the authenticity and legality of all submitted materials and data. If the test subject submits false materials or data, the joint working group has the right to revoke the review opinions of all test vehicles declared by the test subject, withdraw the temporary vehicle license plate for the test, and no longer accept relevant test applications of the test subject.

## Chapter Nine: Supplementary Articles

Article 65: Related definitions of the road tests for automated driving:

(I) The road test of automated driving refers to the scientific test conducted by the test subject for the purpose of testing the automated driving system after obtaining the road test qualification for automated driving in Beijing and complying with relevant provisions of detailed implementation rules.

(II) The automated driving function means that the automated driving system can guide and make decisions on vehicle driving tasks without physical driving operations on the automated test vehicle of the test driver, and the control acts of the test driver can be replaced,

so that the function of safe driving of the vehicle can be realized.

(III) The automated driving system refers to the software and hardware system that can perform automated driving function to complete all driving operations within a certain period of time. The automation system containing only the following vehicle assistance systems is not considered to be automated driving system: active safety assistance system, electronic blind spot assistance system, collision avoidance system, emergency braking system, parking assistance system, adaptive cruise control, lane keeping assistance system, lane departure warning system, traffic jam queuing aid system and the like.

(IV) The major upgrading of automated driving system refers to the system upgrading caused by changes of the composition or key functions of automated driving system, and it includes: Changes in the main components, layout and others of the hardware architecture of automated driving system; changes of the software architecture of automated driving system, dynamic driving tasks and takeover of dynamic driving tasks, range of design and operation, control strategy, minimum risk manoeuvre, safe operation and other aspects.

(V) The dynamic driving task (DDT, Dynamic Driving Task ) refer to the realization of perception, decision-making and execution required by vehicle driving in addition to strategic functions, including but not limited to lateral motion control of the vehicle, longitudinal motion control of the vehicle, target and event detection and response, driving decision-making, vehicle lighting and signal device control. Strategic functions include navigational function, such as trip planning, destination and route selection and other tasks. Dynamic driving tasks include all real-time operational and decision-making functions, which are performed by the driver or the driving automation system, or both.

(VI) The dynamic driving task fallback (DDT Fallback) refers to the behavior that the user performs dynamic driving task or the user/driving automation system makes the vehicle reach the minimum risk status when the driving automation system fails, other vehicle systems fail or the designed operating conditions will not be met.

(VII) The operational design domain (ODD, Operational Design Domain) refers to the vehicle state and external environment of the driving automation function confirmed during design. The operational design domain includes speed, road, traffic, weather, lighting and the like.

(VIII) The minimum risk manoeuvre (MRM, Minimum Risk Manoeuvre) refers to the solution path to minimize risks taken by automated driving system in case of systemic failure (failure that leads to system to be inoperative) or beyond the original operational design domain of the system, so as to ensure the safety of automated vehicle in the operation. This manoeuvre can be implemented automated ally if the automated driving system requires a human take-over and there is no response. It can also be implemented automated ally if there is a risk of serious collision or vehicle failure.

(IX) The test driver refers to the person authorized by the test subject to sit on the test seat for automated driving, who is responsible for the test and will adopt emergency measures for the test vehicle in case of emergency.

(X) The test engineer refers to the tester who is authorized by the test subject to sit on a seat other than the driver's seat and carries out tests and other tasks as per the road test plan of the automated vehicle when the test vehicle for automated driving is running. The test engineer shall sign a formal labor or service contract with the test subject.

(XI) Disengagement from automated driving function refers to the withdrawal of the test vehicle from automated driving mode.

(XII) The accumulated mileage of road test for automated driving refers to the accumulated test mileage of automated vehicle in the actual road test under the state of automated driving. And the automated vehicle shall meet the following conditions:

1. Temporary vehicle license plate of the road test for automated driving has been obtained.

2. Vehicles can be in different batches, but conform to the "Principle of Three Consistencies".

(XIII) The half-load test of real vehicle for manned test refers to the test conducted when the number of people carried by the vehicle is half of the authorized number. The full-load test of real vehicle refers to the test conducted when the number of persons carried by the vehicle is the authorized number. The manned test can adopt counterweight dummies to simulate carrying people.

(XIV) The half-load test of the real vehicle is the test carried out when the vehicle load is half of the authorized weight. The full-load test of the real vehicle is the test carried out when the vehicle load is the authorized weight.

(XV) The traffic accident with subject liability refers to the traffic accident caused by one of the following two conditions for the test vehicle applied by the test subject:

1. Traffic accidents caused by illegal road tests of automated vehicles;
2. The traffic accident in which the test vehicle and the test driver are determined to be primarily or wholly responsible.

Article 66: The detailed implementation rules shall come into effect as of the date of promulgation. Beijing joint working group for automated driving test management is responsible for final interpretation of the measures.

- Annex:
1. Checklist of Application Materials for Automated Driving Test
  2. Application Form for Automated Driving Test
  3. Response Explanation to Test Scenario of Automated Driving System
  4. Self-proof of Test Subject's Compensation Ability
  5. Road Test Report of Automated Driving

6. Traffic Accident Report of the Test Vehicle for Automated Driving
7. Test Change Information Form of the Test Subject
8. Test Plan