

ICS 93.080.30

CCS R 80



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

GB/T 31454-2015

Image capture and processing of vehicle on highway toll lane

公路收费车道图像抓拍与处理

(English Translation)

Issued on: May 15, 2015

Implemented on: August 1, 2015

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of the PRC**

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1 Scope

This Standard specifies the terms and definitions, image capture system constitution, technical requirements, and test methods for image capture and processing of vehicle on toll lane in the highway toll system.

This Standard applies to toll systems of highway and bridge-tunnel.

2 Normative references

The following documents are indispensable for the application of this document.

For the dated references, only the editions with the dates indicated are applicable to this document. For the undated references, the latest edition (including all the amendments) are applicable to this document.

GB/T 17235.1 Information technology - Digital compression and coding of continuous-tone still images - Part 1: Requirements and guidelines

GB/T 18367-2001 Highway toll collection manner

JT/T 489 Vehicle classification of the toll for highway

IEEE 802.3 IEEE Standard for Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements - Part 3: Carrier Sense Multiple Access with

Collision Detection (CSMA/CD) access method and Physical Layer specifications

IEEE 1394 IEEE Standard for a High Performance Serial Bus

3 Terms and definitions

The terms and definitions defined in GB/T 18367 and the following apply to this document.

3.1 Toll lane

- a) Input signal: It shall be in accordance with PAL standard;
- b) Video input signal: Typical peak - peak 1.0 V, up to 1.5 V;
- c) Video input impedance: 75 ohm, unbalanced;
- d) Signal-to-noise ratio: no less than 46 dB;
- e) Resolution: no less than 450 TV lines.

5.6.3 The input digital video signal shall comply with the following regulations:

The image quality of the input video signal shall not be lower than the MPEG-2

Main level requirement and shall not be less than 720x576 pixels (25 frames/s).

5.7 Image processing

5.7.1

The toll lane software shall, on the captured still image, superimpose the vehicle processing data. The superimposition shall be performed after the corresponding vehicle toll transaction processing is completed, to record the final data.

5.7.2

The still image of vehicle captured by the closed toll system shall be superimposed with the following information:

- a) The basic information which shall be superimposed for the entrance toll lane includes toll station number, processing date/time, vehicle model (entrance determination), vehicle type. Superimposable extended information includes toll lane number, toll employee number, and other characters to be superimposed as required (such as license plate number, pass ticket serial number, etc.);
- b) The basic information which shall be superimposed for the exit toll lane includes toll station number, processing date/time, vehicle model (entrance/exit determination), vehicle type (entrance/exit determination), special processing type, fee amount. Superimposable extended information includes toll lane number, toll employee number, and other characters to be superimposed as required (such as license plate number, truck weighing data, pass ticket serial number, etc.);
- c) Superimposed characters shall not obscure important parts of the image, such as vehicle license plate, driver and front passengers. If there is no special demand, the

characters should be superimposed on the pavement at the lower part of the screen; and should not be superimposed in the contour of the vehicle;

d) The superimposed characters are Chinese characters, uppercase or c) Choose large, medium, and small vehicles five each. Choose truck for large vehicles. For medium and small vehicles, passenger car or truck is optional. It is required that the vehicle license plate is clean and can be directly identified by the naked eye;

d) The vehicle classification refers to the provisions of JT/T 489. Large vehicles take the vehicles of the third-category or above (including the third-category). Medium vehicles take the second-category vehicles.

Small vehicles take the first-category vehicles;

e) The test judges are not less than 3; and meet the driver's vision requirements;

f) During the daytime and nighttime respectively, for each of the three types of vehicles, large, medium, and small, five images shall be collected. The image file is copied out and printed as an A4 color picture, which is saved along with the tester record table;

g) Daytime test requirements: The speed of the small vehicle passing through the lane shall be no less than 40 km/h. To ensure the safety of the test, the lanes which have not been opened for tolling shall be selected for testing; and the electric railings of the lanes shall be opened. The speed of the vehicle shall be measured using a calibrated radar speedometer; or the measured speed of the vehicle-mounted speedometer shall be observed in the vehicle. It is required that the speedometer of the test vehicle is pre-calibrated. The test speed and test lanes for large and medium vehicles are not limited;

h) Nighttime test requirements: The test speed for each type of vehicle is not limited. The lanes which have been opened for tolling may be used for testing.

6.2.2 Judgment method

The judgment method is subjective judgment. The judges shall independently make the judgment. Through the computer display of the toll station, observe the captured picture quality of the vehicle; identify the superimposed information and the license plate characters; and FILL in the record table in the appendix. After the test is completed, the summary table is filled out. The total score takes the arithmetic mean of the scores of the three vehicle types of all the testers.

6.2.3 Judgment standard of image

6.2.3.1

The captured image and superimposed information shall not show obvious vignette, blur, distortion, and other phenomena. If there is the above

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