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**Specifications for on-street
e-parking system and equipment**

道路内电子泊车系统及设备技术要求

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Specifications for on-street e-parking system and equipment

1 Scope

This Standard specifies the composition, functions, performances and main equipment technical requirements of on-street e-parking systems.

This Standard applies to the planning, design, construction, operation and management of on-street parking spaces. Other intelligent transportation systems may refer to this Standard.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 4208 Degrees of protection provided by enclosure (IP code)

GB 5768.2-2009 Road traffic signs and markings - Part 2: Road traffic signs

GB/T 22239 Information security technology - Baseline for classified protection of information system security

GA/T 484 LED variable message signs of road traffic inducement

GA/T 832-2014 Technical specifications for image forensics of road traffic offences

GA/T 1127 General technical requirements for cameras used in security video surveillance

GA/T 1211 Technical requirements for high definition video surveillance system in security use

3 Terms and definitions

For the purpose of this document, the following terms and definitions apply.

3.8

parking offences image forensics

Image collection for behaviors of not parking according to regulations and not paying actual parking fees.

NOTE: Applicable to behaviors of not parking according to regulations and not paying actual parking fees in on-street parking spaces.

3.9

parking management system

A system for managing and analyzing geographic information, parking space detection information, payment information, and guiding information of parking spaces.

4 System composition and functions

4.1 General requirements

4.1.1 It shall be implemented in conjunction with urban roads or intelligent parking management systems.

4.1.2 It shall be consistent with the principle of resource integration and low carbon simplicity.

4.1.3 Parking e-payment shall be easy to operate and meet the driver's payment habits.

4.1.4 It shall be shared with other urban or regional traffic information to achieve balanced use of parking spaces.

4.2 System composition

It is mainly composed of parking space information detection equipment, e-payment equipment, data transmission and parking management system. When there is extended function, it can add video surveillance equipment, parking guiding equipment, parking offences image forensics equipment, etc. The system composition is shown in Figure 1.

4.4 Performance requirements

4.4.1 The mean time between failures of the system shall not be less than 10000 h.

4.4.2 The parking space collection information and payment information shall be permanently stored.

4.4.3 The system management software event information shall be kept for at least 1 year.

4.4.4 The system shall adopt a safety protection level not lower than level 2 and meet the requirements of GB/T 22239.

5 Equipment technical requirements

5.1 General technical requirements

5.1.1 It shall have the power-on recovery function.

5.1.2 The data transmission delay of the out-field equipment and parking management system shall be less than 3 s.

5.1.3 The out-field equipment shall have the clock calibration function. The equipment system time shall be synchronized with the Beijing time, and the 24 h error is less than 1 s.

5.2 Parking space information detection equipment

5.2.1 The parking space information detection equipment includes loop coil detector, ultrasonic detector, geomagnetic induction detector, video detector, infrared detector, radio frequency identification device, etc.

5.2.2 The accuracy of data collection at the time of entry/exit parking space of the same vehicle should be greater than 95 %.

5.2.3 The parking duration relative error shall be within $\pm 20\%$, and the error shall be able to be corrected by the parking space billing method to maximize the benefit of both the parking space owner and the user.

5.2.4 The stable working temperature, relative humidity and air pressure conditions of the parking space information detection equipment shall meet the following conditions:

a) Cold area: $-40\text{ }^{\circ}\text{C} \sim +65\text{ }^{\circ}\text{C}$, non-cold area: $-20\text{ }^{\circ}\text{C} \sim +70\text{ }^{\circ}\text{C}$;

b) Relative humidity $\leq 85\%$, no condensation;

5.4.3 Front-end surveillance cameras shall meet the requirements of GA/T 1127.

5.4.4 When the e-payment equipment alarms, the video surveillance can automatically switch to the alarmed parking space area.

5.4.5 It should be installed with upright pole.

5.4.6 The video surveillance system shall comply with the technical requirements of GA/T 1211 and be capable of sharing parking space video images with the parking management system.

5.5 Parking guiding equipment

5.5.1 Parking guiding consists of information release, data transmission and release terminals.

5.5.2 Information release is generally completed by the parking management system. The release terminal includes parking space guiding screen, mobile terminal, Web, etc.

5.5.3 The parking guiding screen is used to display the number of free parking spaces in the designated area and the driving direction.

5.5.4 The parking guiding screen should adopt the method of hierarchical guiding, providing parking space information step by step.

5.5.5 The parking guiding screen shall be in the form of a full LED guiding screen or a combination of LED and fixed texts.

5.5.6 The parking guiding screen should adopt monochrome or double primary color LED display; for brightness requirements, screen and structure settings, see Annex A.

5.5.7 The digital character format (font, font size, etc.) of the parking guiding screen shall comply with the provisions of GB 5768.2-2009, and the performance shall comply with the provisions of GA/T 484.

5.5.8 The parking guiding screen shall have a self-checking function to correctly detect the working state of the illuminating pixels; if a valid frame is not received within the given minimum communication interval, it shall automatically black out.

5.5.9 The parking guiding screen can be powered by the mains, and solar power should be used if the conditions permit and the load can meet the requirements.

5.5.10 If the parking guiding information is released by means of mobile

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