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

GB/T 46142-2025

**Smart community infrastructures - Application guidance for QR
code in smart transportation**

智慧城市基础设施 智慧交通快速响应矩阵码应用指南

(English Translation)

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document is modified to adopt ISO 37180:2021 "Smart city infrastructure QR code identification in smart transportation and related services" and Certification and

Authorization Guide".

This document has the following structural adjustments compared to ISO 37180:2021.

- a) Delete 4.3 of ISO 37180:2021 and merge the content into the introduction;
- b) Adjust Chapter 5 of ISO 37180:2021 to 4.3, and merge the clauses under this chapter;
- c) Adjust 6.1 of ISO 37180:2021 to 4.2;
- d) Adjust Chapter 6 of ISO 37180:2021 to Chapter 5 and add 5.1;
- e) 6.5 and 6.6 of ISO 37180:2021 are deleted, and the relevant contents are merged into 4.1 and 6.1;
- f) Adjust Chapter 7 of ISO 37180:2021 to Chapter 6 and adjust the article numbers accordingly;
- g) 7.1 of ISO 37180:2021 is deleted and the relevant content is incorporated into 6.2;
- h) 7.3.1, 7.3.2, and 7.3.3 under 7.3 of ISO 37180:2021 are merged into 6.3;
- i) Adjust Chapter 8 of ISO 37180:2021 to Chapter 7, and adjust the clause numbers under this chapter simultaneously, adding 7.2;
- j) Adjust Chapter 9 of ISO 37165:2020 to 7.3, and merge the clauses under this chapter.

The technical differences between this document and ISO 37180:2021 and their reasons are as follows.

- a) Change the description of QR codes of different forms and usages in 4.2 of ISO 37180:2021 and 6.5 of ISO 37180:2021 to the above contents are integrated into 4.1 and appropriately refined to avoid duplication of contents in different chapters and articles, which is in line with Chinese people's reading comprehension habits.

It is convenient for the implementation of standards and improves the applicability of standards;

- b) In "Applicable transport and related services", the referenced clauses of ISO 37154:2017 were merged and the text description was optimized to make the text more clear.

To be concise and clear (see 4.3), conform to Chinese reading comprehension habits, facilitate implementation of the standard, and improve the applicability of the standard;

- c) Changed the "QR Code Practicality" section to "Application System Security" and added a description of application system security (See 6.1) to align the QR code security principles with the specific security requirements of Chapter 6 and improve the applicability of the standard;

- d) Added a detailed description and principle of QR code generation (see 5.1). According to standard practice, QR code generation is the process of generating a QR code in the it is

an essential part of the application of smart transportation and related services. It adds relevant content to facilitate the implementation of standards and improve the applicability of standards.

Usability;

e) Deleted 6.5 and 6.6 of ISO 37180:2021 and merged the content on the use of QR codes with the corresponding content of 4.1.

In addition, the content on application system security is merged with the corresponding content in 6.1 to avoid duplication and dispersion of chapter contents and facilitate labeling.

Quasi-implementation;

f) Changed the specific description of the use of public key cryptographic algorithms and added the normative reference GB/T 36625.3-2021.

Modify to the specific requirements for public key algorithms (see 6.2), clarify the uniqueness of QR codes, one code and one key, etc. according to standard practices Security requirements to comply with national digital security strategies and facilitate standard implementation;

g) Added a detailed description of the authorization object in QR code authorization security (see 6.3). According to the implementation of the standard, it is necessary to clarify the different situations.

The authorized objects in this case are easy for users to understand and are connected with the previous text, which facilitates the implementation of the standard;

h) Added content on privacy information security (see 6.4). According to the implementation of the standard, the application of QR code involves a large number of individuals.

In order to comply with my country's requirements for personal information protection, the classification and authorization of privacy information protection have been increased.

Management requirements, facilitate the implementation of standards, and improve the applicability of standards;

i) Added the specific principles of data exchange and sharing as a new clause (see 7.2), and added the normative reference GB/T 43245-2023 and GB/T 42420-2023. According to the standard practice, it is necessary to refine the data exchange and sharing in QR code applications.

Management, to facilitate the implementation of standards;

j) Added normative references to GB/T 36749-2018 and ISO 37122:2019 (see 7.3) to facilitate user understanding and standardization.

Quasi-implementation.

The following editorial changes have been made to this document.

- a) To coordinate with the existing standard, the name of the standard is changed to "Smart City Infrastructure Smart Transportation Rapid Response Matrix Code Application" guide";
- b) Deleted the references to ISO and IEC terminology bases in terms and definitions (see Chapter 3 of ISO 37180:2021);
- c) The informative reference GB/T 18284 replaces ISO 18004 (see 3.1);
- d) Changed the translation of the term "service agent" to "service agency" (see 3.5);
- e) Adjust the original title of "Smart Transportation Concept Using QR Code Identification and Authentication" to "Overview" (see Chapter 4);
- f) Change the original title "Background" to "Smart Transportation QR Code" (see 4.1);
- g) Adjust the original title from "Practicality of QR Codes" to "Overall Security" (see 6.1);
- h) Changed "QR Code Identification and Authentication" to "QR Code Application" in various titles (see Chapter 5, Chapter 6, and Chapter 7);
- i) Change the original title "Quality Maintenance" to "QR Code Application Operation and Maintenance Management" and merge the clauses of this chapter to make the content more concise and easy to understand.

Read more to improve the applicability of the standard (see 7.3).

Introduction

Quick Response Matrix Code, or QR Code, has been widely used around the world due to its large-capacity data storage and fast transmission characteristics.

application.

Early QR codes had problems such as low security, easy copying and counterfeiting, and the use of QR codes as tickets for travel and personal information storage.

At the same time, the generation, recognition and authentication of early QR codes took a long time (often more than 1 second), which not only led to this can lead to crowded waiting rooms, passengers missing their trains, and even accidents, and increase the security risks of QR codes being counterfeited, tampered with, or denied. These problems are extremely serious.

This limits the application of QR codes in the transportation field.

The QR code generation, identification and authentication procedures based on the underlying public key technology have higher security and are unique, controllable and anonymous.