

ICS 35.240.01
CCS L70



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

GB/T 45224-2025

**Smart city - Technical requirement for intelligent monitoring of
urban transport infrastructure**

智慧城市 城市交通基础设施智能监测技术要求

Issued on: January 24, 2025

Implemented on: August 1, 2025

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

Table of Contents

1 Scope	1
2 Normative references	1
3 Terms and Definitions	1
4 Abbreviations	2
5 Basic Provisions	2
6 Monitoring content and methods	5
6.1 Monitoring content	5
6.2 Monitoring methods	6
7 Data Acquisition	9
7.1 Equipment selection and installation	9
7.2 Data Collection	11
7.3 Data Transmission	13
7.4 Data Access	14
8 Data Processing	14
8.1 Data Preparation	14
8.2 Data Storage	14
8.3 Data Calculation	15
8.4 Data Analysis	15
8.5 Data Sharing and Exchange	15
9.1 General requirements	16
9.2 Monitoring control values	16
9.3 Early Warning Strategy	16
9.4 Warning Release and Disposal	17
9.5 Deformation prediction	17
10.1 Data Quality Assessment	18
19 Reference	25

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. Please note that

some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents. This document was proposed and coordinated by the National Technical Committee for Information Technology Standardization (SAC/TC28). This document was drafted by: Chongqing Institute of Surveying and Mapping Science and Technology, Chongqing Surveying Institute Co., Ltd., China Electronics Technology Standardization Research Institute Institute of Surveying and Mapping, Shenzhen University, Wuhan University, Jinan Institute of Surveying and Mapping, Guangzhou Urban Planning, Surveying and Design Institute Co., Ltd., Shenyang Institute of Surveying and Mapping Surveying and Mapping Research Institute Co., Ltd., Beijing Surveying and Mapping Design Institute, Construction Comprehensive Survey Research and Design Institute Co., Ltd., Nanjing Surveying and Mapping Research Institute Research Institute Co., Ltd., Fuzhou Surveying and Design Institute Co., Ltd., China Railway Sixth Survey and Design Institute Group Co., Ltd., Shanghai Municipal Engineering Design China Railway Design Group Co., Ltd., China Railway Engineering... China Railway Bridge Engineering Group Co., Ltd., Shanghai Urban Construction Design and Research Institute (Group) Co., Ltd., Smart Interconnect Technology Co., Ltd., CASCO Signal Co., Ltd., Qingdao Xizheng Digital Technology Co., Ltd., Shanghai Huace Navigation Technology Co., Ltd., CCCC Second Highway Survey and Design Co., Ltd. China Railway No.

9 Bridge Engineering Co., Ltd., Beijing Zhongtian Lutong Intelligent Control Technology Co., Ltd., China Science and Technology Industrialization Promotion Co., Ltd. Jinhui, Shijiazhuang Railway University, Changchun Guanghua Science and Technology Development Co., Ltd., Chongqing Design Institute Co., Ltd., and Chongqing Jiaotong University. The main drafters of this document are. Xiang Zejun, Chen Hanxin, Li Qingquan, Liu Wen, Teng Degui, Wang Datao, Peng Gefei, Wang Changhan, Tu Wei, Zhang Heng, Yuan Changzheng, Wang Peng, Deng Xingdong, Wang Ye, Sui Jianwu, Liu Yang, Zhang Fenglu, Tai He, Li Chao, Mao Weiqi, Chen Ruilin, Xiong Kaiming, Duan Wei, Xu Qinguo, Wang Lingxi, Ma Hong, Li Cong, Li Chengpeng, Cui Hao, You Kesi, Xue Qi, Yan Jun, Wang Lei, Wu Bo, Yu Zufeng, Yu Fei, Chen Hongsheng, Zhang Hao, Hu Bo, Hu Enhua, Teng Mingxing, Andy Lau, Long Chuan, Zou Jingui, Chen Wenyin, Lu Chengxu, Ren Zihao, Xu Fei, Zhu Dongming, Sun Wuxu, Li Jing, Ren Zhengzhao, Wang Yifu and Chen Lili.

Urban transportation infrastructure is an important carrier to support urban economic and social activities. Ensuring its safety throughout its life cycle is of great importance. Structural safety is the cornerstone of the safety of urban transportation infrastructure throughout its life cycle. Once a problem occurs, it is very likely to cause secondary disasters and serious Affecting the safety of people's lives and property. With the completion of the large-scale construction phase of infrastructure, the structural safety monitoring and operation of existing infrastructure The importance of maintenance work is becoming increasingly prominent. In order to improve work efficiency and timely discover structural safety risks, it is necessary to use advanced scientific and technological tools. period, and carry out efficient and reasonable intelligent monitoring work. Intelligent monitoring of urban

transportation infrastructure is a comprehensive task involving the integration of multidisciplinary and multi-industry knowledge. The Internet of Things, artificial intelligence, cloud computing, big data and other cutting-edge technologies are used to build digital collection systems, networked transmission systems and intelligent applications. Use the system to achieve intelligent early warning of structural safety and operation status assessment. This document is positioned in the field of integrated infrastructure of smart cities, aiming to standardize and support the intelligent transformation and upgrading of traditional infrastructure. level, promoting the integration and development of smart cities and emerging technologies. Based on the reference of relevant domestic and international standards and the practical experience of intelligent monitoring in various cities, this document provides a comprehensive guide for urban transportation infrastructure. The monitoring content and methods in the structural intelligent monitoring work stipulate the monitoring data acquisition, data processing, monitoring early warning and data management. The technical requirements of the city will help improve the fine governance capabilities of smart cities. Smart City Urban Transportation Infrastructure Intelligent monitoring technology requirements

1 Scope

GB/T 45224-2025 sets the technical requirements for intelligent monitoring of urban transport infrastructure, the instrumentation of bridges, tunnels, elevated roads and their approaches so that their condition is known continuously rather than at inspection intervals. The case for it is straightforward: Chinese cities built an enormous stock of this infrastructure in a short period, it is now ageing together, and manual inspection cannot cover it at the frequency the risk warrants. The standard sets the basic provisions, then the monitoring content and methods, what is to be monitored on each type of structure, deflection, strain, vibration, inclination, crack width, bearing and joint movement, corrosion and scour among them, and by what techniques; then the data acquisition, the selection and installation of the equipment, the sampling and the transmission; then the data processing, storage and analysis, the assessment of the structure from the monitored data, the alarm thresholds and the response, and the system operation and maintenance. It takes effect on 1 August 2025.

This document provides the monitoring content and methods in the intelligent monitoring of urban transportation infrastructure structure, and stipulates the acquisition and Technical requirements for data processing, monitoring and early warning, and data management. This document is applicable to guiding the safety monitoring of urban transportation infrastructure structures. This document does not apply to marine and inland waterway ports, waterways and other water transport infrastructure, as well as urban aviation infrastructure.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document.

GB/T 7408.1 Date and time information exchange representation Part

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 Engineering infrastructure that provides transportation services for the transportation of urban social products and residents' travel, including urban roads, bridges, tunnels, rails, Road transportation, passenger terminals, stations, transportation hubs, etc.

3.2 Intelligent monitoring Using measuring instruments or sensors, through specific monitoring methods, automatically or manually assist in acquiring, processing and managing monitoring data.

4 Open sharing requirements

GB 50026 Engineering Measurement Standard

GB 50982 Technical Specification for Building and Bridge Structure Monitoring

GB 55018 General Specification for Engineering Measurement JGJ

8 Specification for Building Deformation Measurement JT/T 1037 Technical Specification for Highway Bridge Structure Monitoring