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**Smart community infrastructures - Principles and requirements
for performance metrics**

智慧城市基础设施 绩效评价的原则和要求

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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 /T S37151.2015 "Principles and Requirements for Performance Evaluation of Smart City Infrastructure". Compared with ISO /T S37151.2015, this document has made the following structural adjustments.

--- Adjust Figure 1 in the introduction to 4.2.1. The technical differences between this document and ISO /T S37151.2015 and their reasons.

--- GB/T 40758-2021 with normative references has been added to adapt to the technical conditions of our country and increase operability (see Chapter 3). This document is proposed and managed by the National Standardization Technical Committee for Urban Sustainable Development (SAC/TC567). Please note that some contents of this document may refer to patents. The issuing agency of this document assumes no responsibility for identifying patents. This document is drafted by: Midtown Wisdom (Beijing) Urban Planning and Design Research Institute Co., Ltd., China National Institute of Standardization, China

Urban Science Science Research Association, Beijing Huizhi Technology Co., Ltd., Jiangsu Quality and Standardization Research Institute, China Communications Road and Bridge Construction Co., Ltd., Smart City (Cooperative Fei) Standardization Research Institute Co., Ltd., China Railway Construction Network Information Technology Co., Ltd., Foshan Nanhai District Zhongcheng Digital City Promotion Center, Zhongshe Engineering Consulting (Chongqing) Co., Ltd., Tianjin Anjie IoT Technology Co., Ltd., CCCC Infrastructure Maintenance Group Co., Ltd., China City Wisdom Technology Co., Ltd., China Southwest Architecture Design and Research Institute Co., Ltd., CCID Engineering Technology Co., Ltd., CCCC Second Highway Survey and Design Institute Co., Ltd., Guangdong Telecom Planning and Design Institute Co., Ltd., China Power Construction Road and Bridge Group Co., Ltd., Zhejiang Wuxin Ltd. The main drafters of this document. Wan Biyu, Jiang Dong, Yang Feng, Chen Huiwen, Wang Jing, Lu Guannan, Zhang Jianbing, Ma Rong, Li Lingling, Du Qingfeng, Yan Maomao, Chen Shuangquan, Chen Yuyi, Yu Chengshui, Luo Xionghui, Luo Feng, Dai Tong, Li Baorui, Zeng Yu, Kang Yongjun, Chen Zhengwei, Zhang Yongtao, Ouyang Wei, Zeng Yican, Xu Qian, Ding Chunlei, Deng Xingdong, Cheng Xianyong, Zhang Guoyi, Gu Xun, Lei Yong, Wang Wei, Hong Yong, Li Ming, Zhang Jiaxin, Wan Bitao, Liu Ping, Zhao Yanyan, Li Yunpeng, Xiong Zhengyuan, Wang Jianhua, Xie Xiao, Zhang Fuguo, Zhang Shaoqiu, Liu Fuhai, Ni Jiaojiao, He Siyan, Wang Xudong, Luo Chao, Yang Zhao, Tang Chunyan, Li Jianping, Zhao Chunhua, Shao Zhenfeng, Li Bing, Chen Long, Fan Yixiong, Hu Hui, Wu Kexin, Du Tao, Chen Jun, Wu Baolin, Wang Changhai, Fang Changjian, Zhao Shijia, Yu Gang, Guo Zhongmeng, Li Wenqiu, Hua Linlin, Wang Yanhui, Sai Han, Zheng Tao, Liu Lu, Zhang Xu, Yang Yang, Qi Zhifei, Han Richao, Li Guojian, Guo Jianmin, An Haiyu, Yan Yu, Tan Wenjie, Gao Zengxiao, Wang Hengdong, Xiang Bengan, Fan Wei, Cao Yuxin, Cha Siyi, Luo Zhongyu, Liu Biao, Shen Zhoubiao, Jiang Guichuan, Chen Ken, Deng Xiaofeng, Wang Guoguang, Tang Chao, Zhang Xiaojuan, Liu Yashan, Zhang Jin, Tang Dakun, Xu Qinguo, Chen Hua, Xu Lingshun, Meng Jun, Zhou Dongbo, Li Hu, Zhang Xiaochun, Ye Zhongnan, Liu Yang, Tan Xinghua, Chen Yanbo, Guo Eryu, Liang Cai, Luo Jin, Liu Baitao, Wang Chao, Liao Hongyu, Hou Haiqian, Wang Qingbin.

Urban infrastructure is the basis for supporting urban activities. The investment and construction of urban infrastructure projects is an important factor for cities to achieve their development goals. push factor. In the future, with the substantial expansion and growth of the urban population and economy, the demand for urban infrastructure will be driven by major factors such as urbanization driven by continued growth. At present, as my country's "smart city" construction projects are being carried out across the country, urban infrastructure products and solutions Services and international trade have also increased. The urgent need for my country's smart city infrastructure construction and the existence of a sustainable green and low-carbon development path in a certain conflict. Therefore, the construction of smart city infrastructure needs to efficiently promote my country's Sustainable green low-carbon development of cities. The era of rapid development of information and communication technology has arrived, and the digital and innovative

development of infrastructure supports and promotes urban transportation. The refinement and grid of business governance will further enhance the city's smart construction and sustainable development. Currently vigorously promoting "new infrastructure" in the country. In the context of the new infrastructure, the new infrastructure includes "digital infrastructure" represented by information infrastructure construction such as artificial intelligence and 5G big data cloud computing. "Infrastructure digitalization" and the digital transformation and upgrading of traditional infrastructure such as transportation, energy, and water conservancy. Regardless of whether the city adopts Incremental expansion of infrastructure, or optimization of stock, analysis and clarification of the current status and development needs of existing urban infrastructure are all An important step in the performance evaluation of smart city construction and development. The purpose of smart city infrastructure in the field of standardization is to promote international trade in urban infrastructure products and services, and to spread cutting-edge technologies. improve the sustainability of cities by establishing uniform product standards. This document is modified to adopt ISO /T S37151.2015 "Wisdom Principles and Requirements for Performance Evaluation of Urban Infrastructure, by analyzing the three perspectives of urban managers, residents and the environment It converts the demand into performance indicators, and provides a set of general methods for index extraction, which is suitable for evaluating smart city infrastructure. construction performance. The process of index extraction and analysis fully respects the characteristics and social and cultural diversity of cities around the world. To better understand and use this standard, the appendix gives some performance evaluation indicators of national important infrastructure. Therefore, this document addresses the It has good reference and guiding significance for the construction and maintenance of my country's smart city infrastructure, and it is also applicable to the development evaluation of new infrastructure. This document applies to.

---Local government;

--- land and space planners;

--- Operators of urban infrastructure (such as energy, water, transportation, waste, information and communication technology, etc.);

---Urban infrastructure suppliers (such as builders, engineering companies, system integrators or component manufacturers). The urban infrastructure layer is the foundation to support the other two layers, see Table 1. Table

1 Scope

GB/Z 42192-2022 addresses how the performance of smart city infrastructure should be measured. Cities publish indicators in quantity, and the indicators are mostly chosen because the data existed rather than because they describe how well the city works. Infrastructure metrics fail in a specific way: each system is measured on its own terms - the transport network on journey times, the grid on availability, the water network on losses -

while the value of making them 'smart' lies in what happens between them, and no single-system indicator can see that. Optimising each in isolation can make the whole worse. This document gives the principles and requirements for defining, identifying, optimising and coordinating urban infrastructure performance indicators, and provides analysis and guidance for evaluating urban performance in terms of interoperability, synergy, resilience and security - the cross-cutting qualities that only appear when infrastructures are considered together. As a GB/Z it is a guiding technical document rather than a requirement standard, which suits a subject where the right indicators depend on the city. Under ICS 13.020.20 and CCS A00, it is written for municipal authorities, infrastructure operators and the consultancies designing smart city programmes.

This document gives the principles and requirements for the definition, identification, optimization and coordination of urban infrastructure performance indicators, Provide analysis and suggestions for urban performance evaluation in terms of gender, synergy, resilience, and security. Urban infrastructure includes, but is not limited to, energy, water, transport, waste, and ICT. The principles and requirements of this document are applicable to all types of cities, including the evaluation of infrastructure elements at all stages of planning, design, management and evaluation. estimate. However, the choice and importance of metrics or (key) performance indicators for urban infrastructure are the result of the application of this document, and the The choice depends on the characteristics of each city. In this document, the performance of technical solutions that can measure the intelligence of urban infrastructure is based on the International Standards Group Urban sustainability and urban sustainability as defined in the ISO /TC268 series of international standards. toughness. Note

1.This document considers that cities with different economic levels (such as developed countries and developing countries) should focus on the measurement indicators or performance indicators of urban infrastructure. different. This document does not make best practice recommendations. This document does not recommend simply duplicating a specific smart infrastructure, or using it as a benchmark standard. In applying this document, it is up to the user to decide whether to set relevant goals. Note 2 to entry. This document does not propose principles or requirements for specific types of urban infrastructure, but considers specific urban infrastructure (such as ISO 24510. 2007, ISO 24511.2007 and ISO 24512.2007) for compatibility with existing international standards. Note

3.This document does not involve testing, reporting or verification. For content related to this document, refer to ISO /T R 37150.2014, Chapter

6.This document does not enter Instead of making comparisons between different cities, it aims to allow cities to more effectively evaluate urban infrastructure.

2 Normative references