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**Report of pilot testing on the  
application of ISO smart community  
infrastructures standards**

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 268, *Sustainable cities and communities*, Subcommittee SC 1, *Smart community infrastructures*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

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## Introduction

ISO/TC 268/SC 1 identifies the best pilot cities on a global scale by continuously selecting cities to standardize SC 1 in subsequent smart city infrastructure. It provides guiding suggestions for the development of smart cities, provides reference and helps for the construction of international smart cities, reversely puts the results formed by standards into practice in cities and ensures that the development of smart cities reaches the level of performance they deserve.

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# Report of pilot testing on the application of ISO smart community infrastructures standards

## 1 Scope

This document provides information on the results of pilot city testing of several ISO smart community infrastructures standards.

## 2 Normative references

There are no normative references in this document.

## 3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

### 3.1

#### **data exchange**

accessing, transferring and archiving of data

[SOURCE: ISO 37156:2020, 3.3.5]

### 3.2

#### **data sharing**

providing shared, exchangeable and extensible data to enable community infrastructure

[SOURCE: ISO 37156:2020, 3.3.6]

### 3.3

#### **smart community infrastructure**

community infrastructure with enhanced technological performance that is designed, operated and maintained to contribute to sustainable development and resilience of the community

[SOURCE: ISO 37100:2016, 3.6.2, modified — Notes to entry removed.]

## 4 General

### 4.1 Overview

#### 4.1.1 How to succeed in testing smart community international standards in cities

Smart community international standards, which are combined with the current situation and development goals of local smart community construction, can promote the establishment of local characteristics of a smart community performance evaluation system (EVA), and guide and supervise the local smart community construction results. The correctness, completeness and implementation of the contents of international standards can be verified through specific projects in the construction content and construction practice. At the same time, the standards can get pilot testing feedback

according to the actual usage in the project construction. Also, the content of the international standards can be modified and improved to evaluate the achievements of smart community construction.

#### 4.1.2 Recommendations for international standard pilot testing work

ISO/TC 268/SC 1 can promote the formulation of test targets and work programs, select proper pilot cities, implement pilot implementation programs and accept pilot test results, which greatly promotes the construction of smart cities and international standards.

### 4.2 Implementation

#### 4.2.1 Global implementation

According to smart city standards and status analysis, different standards are selected to carry out pilot test work. The targets of the whole world are:

- Promote the practicality of international standards. Pilot testing work can verify the feasibility of smart community international standards, accelerate the implementation of standard results, further optimize and improve international standards, make international standards more mature and applicable.
- Improve the level of international standardization. Different countries and cities have different needs for the development of smart cities. The global pilot cities are testing under the same framework, which is conducive to improving the standardization of cities and the overall standardization of the international community.
- Promote the sustainable development of cities. Pilot testing work is helpful to establish a smart community performance evaluation system suitable for local characteristics, scientifically guide and supervise the effectiveness of smart community construction, improve the level of smart city and achieve sustainable development of cities and communities.

In addition, through the standards pilot and testing work, it can provide mature working ideas and methods for other international standard testing work.

Different cities can learn from each other. They can construct and improve the smart community design, city planning and maturity models in accordance with international standards. The pilot test results are promoted to the international standardization system to enhance the visibility of the community and attract the attention of the industry. Cities can also find shortcomings and further clarify the key points of smart community construction.

Until now, Chengdu and Nanhai in China have taken the lead in the pilot test work. Hefei, Kawasaki and Cambridge are going to start standard pilot testing work.

Hefei has a total area of 11 400 km<sup>2</sup> and a total resident population of 7 790 000. The urban built-up area of Hefei is 416 km<sup>2</sup> and the built-up area resident population is about 4,09 million. This city has selected ISO/TS 37151, ISO 37154 and ISO 37156 for pilot testing.

Kawasaki City was selected as a pilot city in Japan. Kawasaki is a sustainable growing city, it has multiple functions such as a heavy industrial area, a business area and a commuter town for Tokyo. Kawasaki selected ISO 37153 for pilot testing.

Cambridge was selected as a pilot city in the UK. Cambridge is the capital of Cambridgeshire in England. Cambridge's pilot and testing of smart community international standards has provided an important foundation for the future construction of a friendly city between Cambridge and Hefei.



## 4.2.2 Implementation in China

### 4.2.2.1 Chengdu

Chengdu is the provincial capital of Sichuan Province, China, and a sub-provincial city. It covers an area of 14 300 km<sup>2</sup> and has a resident population of nearly 16 million. Chengdu selected ISO/TS 37151, ISO 37153, ISO 37155-1 and ISO 37156 for pilot testing. Through the pilot test, several documents were formed. Since September 2017, the municipal government of Chengdu has investigated 20 departments. The research department has little information about energy and waste and has not collected corresponding data. In the three aspects of transportation, water and ICT, Chengdu seldom has the corresponding mature index system standards and norms, but the construction of a performance evaluation system has a certain basis. Chengdu already has the corresponding recognition and attention to the construction of the index system, but the construction of the index system only stays at the stage of a single and individual business, and there is no overall or global platform for the construction of the index system.

Based on the theory of the life cycle, there are four problems in the management of smart community infrastructure projects in Chengdu. First, there is no standard reference process or process documents for smart community infrastructure projects; second, the logic of the project process is not clear; third, the risk-prevention awareness of the project process is weak; fourth, the particularity of smart community projects is not fully considered.

The municipal government of Chengdu has a large number of urban basic data resources, but the management is decentralized and the system is not perfect; the data is incomplete, irregular, incorrect and inconsistent and has other quality problems. Furthermore, there is no unified data exchange management platform. Therefore, all departments in the city need to speed up the decentralized management of data resources and insufficient data sharing.

### 4.2.2.2 Nanhai

Nanhai district, Foshan, is located in the central part of Guangdong province, the hinterland of the Pearl river delta, adjacent to Guangzhou, adjacent to Hong Kong and Macao. The whole area covers an area of 107 382 km<sup>2</sup>. Nanhai district, combined with the actual situation, selects ISO/TS 37151 and ISO 37156.

Through field investigations of smart cities in Nanhai district and face-to-face communication with the municipal government of Nanhai, we found that the research department in Nanhai has little information about energy and waste. It is very difficult to collect the corresponding data and there are very few mature indicators system standards or specifications. The construction of a performance evaluation index system in transportation, waste and ICT has a certain foundation, but there is no overall platform.

Moreover, we found that most of the databases of the municipal government of Nanhai cannot be shared or can only be shared in a very limited range. They are expensive and inefficient to use and poorly shared. In addition, at present, information sharing among the municipal government of Nanhai is mostly point-to-point mode and there is no unified data exchange management platform.

### 4.2.2.3 Hefei (high-tech zone)

Hefei has total area of 11 400 km<sup>2</sup> and a total resident population of 7 790 000. The urban built-up area of Hefei is 416 km<sup>2</sup> and the built-up area resident population is about 4,09 million. Hefei selects ISO/TS 37151, ISO 37154 and ISO 37156.

The municipal government of Hefei established the working group of pilot testing for international standards. From the city administrators, environment sector and citizens surveyed, it is learned that city administrators stress the size, operating efficiency and investment benefits of smart community infrastructures, especially the operating efficiency. The environment sector of Hefei values the effective utilization of smart community infrastructures and the improvement of energy use efficiency. By contrast, the citizens highlight the regional coverage and the accessibility of smart community infrastructures.

The municipal government of Hefei builds a data exchange and sharing platform for carrying out data acquisition, data storage, data cleaning, data mining, data visualization and analysis. It also promotes the big data technology exchange and transformation, the formation of several in the country with independent intellectual property rights of large data products representative.

NOTE [Annex A](#) includes details of Chengdu pilot testing work; [Annex B](#) includes details of Nanhai pilot testing work; [Annex C](#) includes details of Hefei pilot testing work; [Annex D](#) includes details of Kawasaki pilot testing work.

### 4.3 Methods

The pilot project of smart city international standards includes field visiting, research and analysis, global pilot selection, pilot implementation, pilot summary.

- Research and analysis. From the perspective of smart city technology development, the needs of smart city standard construction, the current situation of smart city infrastructure standards construction and the city's current needs, ISO standards are selected as testing standards.
- Global pilot selection. The selection includes the following aspects:
  - a) Application stage: the city will document an application form in accordance with the requirements.
  - b) Preliminary examination stage: the application materials are verified and experts organized to select qualified declaration cities in batches.
  - c) Verification stage: the city will start to enter the implementation plan development stage through the primary city. An ISO international expert group is formed using expert remote guidance and pilot site inspection to communicate with the city one-on-one and give expert opinion documents.
  - d) Selection and announcement stage: a comprehensive evaluation of pilot city's conditions, determination of pilot cities.
- Pilot implementation:
  - a) Interpretation of international test standards: organize relevant knowledge training.
  - b) Analysis of smart city infrastructure needs: comprehensively evaluate the development needs and goals of various infrastructures, consider the support of urban resources and relevant stakeholders and determine the development direction of smart community infrastructure.
  - c) Standards implementation: pilot work will be carried out in accordance with the implementation plan, with a period of 2 years.

## 5 Achievement and results

Through pilot testing work around the world, ISO/TC 268/SC 1 has accelerated the promotion of standard results, guided the construction of smart cities and achieved sustainable urban development. Up to now, a pilot awarding ceremony has been successfully held in Chengdu, Nanhai district and Hefei, and pilot testing work conducted. The progress of test work in pilot cities has been reported in meetings and on-site expert opinions absorbed to promote work progress. [Table 1](#) presents a phased summary.