
**Smart community infrastructures —
Urban data integration framework for
smart city planning (SCP)**

*Infrastructures urbaines intelligentes — Cadre d'intégration des
données urbaines pour la planification des villes intelligentes*



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Contents

Page

Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principles	3
4.1 General	3
4.1.1 General	3
4.1.2 Data availability	3
4.1.3 Sovereignty over the data	3
4.1.4 Data security	3
4.1.5 Data privacy	3
4.1.6 Co-construction and sharing	4
4.2 Principles of heterogeneous data integration	4
4.2.1 General	4
4.2.2 Unambiguity	4
4.2.3 Scalability	4
4.2.4 Compatibility	4
4.2.5 Modularity	4
4.3 Data quality recommendations	4
5 Data of SCP on community infrastructure	5
5.1 General	5
5.2 Usage of community infrastructure data	5
5.2.1 Construction project life cycle	5
5.2.2 Urban simulation	6
5.2.3 Smart transportation	6
5.2.4 Smart grid	6
5.2.5 Smart environmental sanitation	6
5.3 Smart city planning (SCP) data	6
5.4 Community infrastructure data	11
5.4.1 General	11
5.4.2 Data definition	11
5.4.3 Source of heterogeneous planning data	13
6 SCP data integration framework	13
6.1 General	13
6.2 Integration subjects	13
6.3 Integration objects	13
6.4 Integration process	14
6.5 Integration results	14
7 SCP data integration	15
7.1 General	15
7.2 Data model and description specification	15
7.3 Data extraction and system exchange	16
7.4 Data quality verification	16
7.5 Data encoding or mapping specification	16
7.6 Smart community infrastructure data entities	16
7.7 Heterogeneous data integration	18
7.8 Date management recommendations	18
7.8.1 General	18
7.8.2 Data exchange and sharing	18
7.8.3 Data exchange and sharing security	18

8	Management of security and privacy	18
8.1	General	18
8.2	Data security level and protection principles	19
8.3	Technical advice for data security	19
8.4	Life cycle safety of data	19
8.5	System security protection	20
	Annex A (informative) Case studies	21
	Bibliography	27

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).

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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.

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.

Introduction

The city is a product of social evolution, technology, economic and social civilization improvements, as well as a fundamental unit for the social and economic life of its region. However, with the influence of global urbanization, increasingly more problems have been observed, such as environmental pollution, traffic congestion, insufficient resources and urban lifeline system weakness.

Urban planning refers to the conduct of engineering construction, economy, society, environment and land use of the city and its surroundings. It involves the regional layout of industry, the regional layout of buildings, the setting of transportation infrastructure and the planning of urban engineering. It is related to urban development and city infrastructure construction.

The planning, construction, operation, management and evaluation of community infrastructure is the process of natural environment transformation. This process involves multiple city managers and various data. Therefore, the integration of heterogeneous data for smart community infrastructure planning is particularly important. Based on ecological and spatial information, the smart city planning (SCP) data and infrastructure data that need to be integrated should be analysed. The establishment of a data integration framework and further realization of heterogeneous data integration is intended to support the operation of community infrastructure construction projects throughout their life cycles and ultimately achieve inclusive, sustainable and high-quality development of the city.

In terms of smart community infrastructure, ISO/TS 37151 describes the principles and requirements of performance metrics. ISO/TR 37152 gives possible issues and solutions in developing and operating smart community infrastructure, outline and benefits of a common framework for development and operation. In addition, BS/PAS 183 provides data interoperability, types of data, data protection reform, data value chain, purposes for data use, assessing data states, access rights for data and data structure.

ISO/TS 37151, ISO/TR 37152 and BS/PAS 183 provide the basis and guidance for ISO 37156, which describes the types and model, opportunities, privacy and security of data exchange and sharing, and provides guidance for data exchange and sharing of smart community infrastructure. ISO 37156 provides guidance for the integration of infrastructure data in this document, and this document is considered to be an application scenery of ISO 37156 in data integration.

Smart community infrastructures — Urban data integration framework for smart city planning (SCP)

1 Scope

This document establishes a data framework that involves possible multi-source common data through standardized data integration and sharing mechanisms. It includes recommendations for:

- precision, dimensions of the data, data collection, updates and storing mechanisms;
- a data model for data integration, data standardization and data fusion approaches for heterogeneous smart city infrastructure data;
- a data security level and sharable attributes for all involved data, principles on data sharing or exchange.

This document focuses on the integration and application of heterogeneous data from urban infrastructure systems, such as water, transport, energy, drainage and waste, so as to support smart city planning (SCP). It contains case studies, in [Annex A](#), of various smart city projects.

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 <https://www.electropedia.org/>

3.1 data

reinterpretable representation of information in a formalized manner suitable for communication, interpretation or processing

Note 1 to entry: Data can be processed by humans or by automatic means.

[SOURCE: ISO/IEC 2382:2015, 2121272]

3.2 data availability

property of being accessible and usable upon demand by an authorized entity

[SOURCE: ISO/IEC 27000:2018, 3.7, modified — term revised.]

3.3 data exchange

accessing, transferring, and archiving of *data* ([3.1](#))

[SOURCE: ISO/TS 13399-5:2014, 3.7, modified — definition revised.]