



**International
Standard**

ISO/IEC 17917

**Smart cities — Guidance to
establishing a decision-making
framework for sharing data and
information services**

*Villes intelligentes — Recommandations pour l'établissement
d'un cadre décisionnel pour le partage des données et des services
d'information*

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This document was prepared by Joint Technical Committee ISO/IEC JTC 1, as a fast track draft standard.

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0 Introduction

0.1 General

The term “smart city” denotes the effective integration of physical, digital and human systems in the built environment to deliver a sustainable, prosperous and inclusive future for its citizens. A basic assumption in the design of a smart city is the ability of the physical and digital systems to be interoperable. This standard gives governance guidance for decision-makers on establishing a decision-making framework for sharing city data and creating interoperable information services.

Data has the ability to transform the city and its services, providing visibility on the services available, and supporting citizen interactions with those services. Improving the design and integration of city services can serve the public better and drive innovation and efficiencies.

This standard aims to support data sharing in cities and between cities, and the establishment of data sharing agreements, particularly where data is being shared by multiple organizations to transform the delivery of city services.

Missing data or misinterpretation of data can lead to the wrong actions being taken by city decision-makers. A decision-making framework for sharing data can help ensure that they have the best overall data ecosystem on which to base decisions.

Sharing data across a city requires more than the interoperability covered by the smart city concept model (SCCM) defined in ISO/IEC 30182, which focuses by necessity on the semantics of data in a city. Full data interoperability requires a

data framework to be created across the entire spectrum of data for a city: open, closed and shared data.

This standard builds on the integrated operating model defined in ISO/IEC 37106:2021 and assumes that the governance of a smart city programme and the overall management of the city’s data assets has been understood and agreed upon by city leaders and decision-makers from the organizations delivering city services.

The value of data sharing has yet to be explored by cities, as data is predominantly currently used for a specific purpose related to the public task, additionally data is not viewed as an essential city asset which can be used to transform a city. Data can also provide the basis for new commercial models in smart cities.

This standard defines the data framework for sharing city data to enable discussions between the specialists who build and design the physical and digital services and the decision-makers using data to transform their city.

This standard is for use by decision-makers in smart cities from the public, private and third sectors. It is also of interest to any city organization wishing to share data.

It is expected that each city will create a decision-making framework based on this standard to address its own challenges and opportunities, taking into account the priorities and needs of their city. The creation of a data ecosystem based on the interoperability and data sharing principles in this standard could create data assets that are used to improve the quality of life for citizens and create sustainable commercial models to fund innovation.

0.2 Relationship to other smart city standardization documents

0.2.1 ISO 37106

This standard has been built on the guidance in ISO 37106, *Sustainable cities and communities* - Guidance on establishing smart city operating models for sustainable communities . The particular components of a smart city framework which apply are:

- a) [B2] Transforming the city's operating model with particular reference to the governance model developed and any vulnerabilities of both data and city services;
- b) [B6] Establishing a common terminology and reference model; and
- c) [B10] Identity and privacy management.

This standard is guidance to help with the implementation of these components of the smart city framework.

0.2.2 ISO/IEC 30182

The smart city concept model (SCCM) described in ISO/IEC 30182, *Smart city concept model - Guide to establishing a model for data interoperability* addresses the data interoperability issues that arise as a result of each sector and/or service in a city having its own model and terminology that it uses for data. This standard defines the data framework that addresses the other areas that affect interoperability, such as access rights, privacy, availability and formats. These other areas are also barriers to interoperability and portability which impact the design of the physical and digital services.

This standard addresses the barriers other than the semantics addressed in ISO/IEC 30182 , to enable data interoperability and portability, and the sharing of data and information services in a smart city.

The data framework identifies all elements which will be needed to deliver the four key types of insight when data and services are appropriately shared:

operational, critical, analytical and strategic insight. (See ISO/IEC 30182:2017, Clause 0).

0.3 Relationship to building information modelling (BIM) standards

The following documents are considered to be the foundational standardization documents to be used as part of a whole lifecycle approach to the built environment for BIM Level 2 in smart cities.

This standard assumes that the ISO 19650 series is used for all BIM Level 2 building and infrastructure assets in a smart city and that asset procuring organizations use them as part of their overall digital and smart strategies.

- ISO 19650-1, Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) - Information management using building information modelling - Part 1: Concepts and Principles;
- ISO 19650-2, Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) - Information management using building information modelling - Part 2: Delivery phase of the assets;
- ISO 19650-3, Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) - Information management using building information modelling - Part 3: Operational phase of the assets;

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- ISO 19650-4, Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) - Information management using building information modelling - Part 4: Information exchange;
- ISO 19650-5, Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) - Information management using building information modelling - Part 5: Security-minded approach to information management.

1 Scope

This standard gives guidance on establishing a decision-making framework for sharing data and information services in smart cities.

It covers:

- a) types of data in smart cities;
- b) establishing a data sharing culture;
- c) data value chain - roles and responsibilities;
- d) purposes for data use;
- e) assessing data states;
- f) defining access rights for data; and
- g) data formats/format of transportation.

This standard aims to support the sharing of data and information services within cities. For some cities there will also be a need to establish specific data sharing agreements, particularly where data is being shared by multiple organizations at once.

This standard supports a transparent approach to making decisions and creating specific data sharing agreements in order to fully realise the benefits and value of data and information services in a city.

Missing data or misinterpretation of data can lead to the wrong actions being taken by city decision-makers. A decision-making framework for sharing data can help ensure that they have the best overall data on which to base decisions.

This standard does not cover:

- a) national security issues;
- b) good practice for use of data by the citizen;
- c) existing interoperability agreements between cities;
- d) defining application programming interfaces (API) networks; or
- e) any data sharing rules and regulations specific to a particular jurisdiction. It is assumed that a security-minded approach to data sharing is used by cities.

NOTE 1 Further details on the areas not covered in this standard, including information on relevant standards publications, are given in Annex A.

This standard is for use by decision-makers in smart cities from the public, private and third sectors. It is also of interest to any city organization wishing to share data.