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 PAS gives 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 PAS 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 PAS 182, 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 PAS builds on the integrated operating model defined in PAS 181 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 PAS 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 PAS 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 PAS 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 PAS 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 PAS 181

This PAS has been built on the new integrated operating model defined in PAS 181, *Smart city framework – Guide to establishing strategies for smart cities*

and 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] Mapping the city's interoperability needs; and

c) [B11] Identity and privacy management.

PAS 183 is a tool to help with the implementation of these components of the smart city framework.

0.2.2 PAS 182

The smart city concept model (SCCM) described in PAS 182, *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 PAS 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 which impact the design of the physical and digital services. This PAS addresses the barriers other than the semantic addressed in PAS 182, to enable data interoperability 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 PAS 182:2014, Clause **0**).

0.3 Relationship to building information modelling (BIM) documents

The Government Construction Strategy (GCS) required the Government to implement fully collaborative 3D BIM (with all project and asset information, documentation and data being electronic) as a minimum by 2016.

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 PAS assumes that the PAS 1192 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.

- BS 1192, *Collaborative production of architectural, engineering and construction information – Code of practice*;
- PAS 1192-2, *Specification for information management for the capital/delivery phase of construction projects using building information modelling*;
- PAS 1192-3, *Specification for information management for the operational phase of assets using building information modelling*;
- BS 1192-4, *Collaborative production of information – Fulfilling employer's information exchange requirements using COBie – Code of practice*;
- PAS 1192-5, *Specification for security-minded building information modelling, digital built environments and smart asset management*.

1 Scope

This PAS 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 PAS 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 PAS 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 PAS 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 Requirements on establishing and implementing a security-minded approach to data sharing are specified in PAS 185 (in preparation).

NOTE 2 Further details on the areas not covered in this PAS, including information on relevant standards publications, are given in Annex A.

This PAS 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.

2 Terms and definitions

For the purposes of this PAS, the terms and definitions given in PAS 180 and the following apply.

2.1 closed data
data which has been restricted for use

2.2 data
recorded information

[SOURCE: BS EN ISO 22005:2007, **3.11**]