

PAS 186:2020

Smart cities – Supplying data products and services for smart communities – Code of practice



中國建築



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Foreword

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This PAS is not to be regarded as a British Standard. It will be withdrawn upon publication of its content in, or as, a British Standard.

The PAS process enables a code of practice to be rapidly developed in order to fulfil an immediate need in industry. A PAS can be considered for further development as a British Standard, or constitute part of the UK input into the development of a European or International Standard.

Use of this document

As a code of practice, this PAS takes the form of guidance and recommendations. Particular care should be taken to ensure that claims of compliance are not misleading.

Any user claiming compliance with this PAS is expected to be able to justify any course of action that deviates from its recommendations.

Relationship with other publications

This PAS is issued as part of a suite of BSI publications related to smart cities:

- PAS 180, *Smart cities – Vocabulary*, defines terms for smart cities, including smart cities concepts, across different infrastructure and systems elements and used across all service delivery channels (this PAS is in the process of being superseded by a new ISO standard based on its content);
- PAS 183, *Smart cities – Guide to establishing a decision-making framework for sharing data and information services*, gives guidance for decision-makers from the public, private and third sectors on establishing a framework which can support the sharing of city data and the creation of interoperable information services (this PAS is in the process of being superseded by a new ISO standard based on its content);

- PAS 184, *Smart cities – Developing project proposals for delivering smart city solutions – Guide*, gives guidance on how good practice described in other BSI smart city publications can be applied when developing an individual project proposal within the broader smart city programme;
- PAS 185, *Smart cities – Specification for establishing and implementing a security-minded approach*, specifies requirements for establishing a framework for the security-minded management of smart cities and their associated infrastructure, as well as of data, information and services used to deliver city services;
- PD 8100, *Smart cities overview – Guide*, gives guidance on how to adopt and implement smart city products and services in order to facilitate the rapid development of an effective smart city;
- BS ISO 37106, *Sustainable cities and communities – Guidance on establishing smart city operating models for sustainable communities*, gives guidance on a good practice framework for decision-makers in smart cities and communities (from the public, private and voluntary sectors) to develop, agree and deliver smart city strategies that can transition their city's ability to meet future challenges and deliver future aspirations; and
- BS ISO/IEC 30182, *Smart city concept model – Guidance for establishing a model for data interoperability*, provides a framework that can normalize and classify information from many sources so that data sets can be discovered and combined to gain a better picture of the needs and behaviours of a city's citizens (residents and businesses).

The above documents are aimed primarily at leaders of local authorities. This PAS complements these publications by showing how suppliers of smart services and smart products can help support the delivery of smart cities, through the creation of data products and data services that are aligned with the good practice management approaches described in the existing BSI smart city publications.

Presentational conventions

The provisions of this code of practice are presented in roman (i.e. upright) type. Its recommendations are expressed in sentences in which the principal auxiliary verb is "should".

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Where words have alternative spellings, the preferred spelling of the Shorter Oxford English Dictionary is used (e.g. "organization" rather than "organisation").

The word "should" is used to express recommendations of this PAS. The word "may" is used in the text to express permissibility, e.g. as an alternative to the primary recommendation of the clause. The word "can" is used to express possibility, e.g. a consequence of an action or an event.

Where URLs for websites and webpages have been cited, they aim to provide ease of reference for the PAS user and are correct at the time of publication. The location of a webpage or website, or its contents cannot be guaranteed.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a PAS cannot confer immunity from legal obligations.

Introduction

0.1 General

Smart communities require much more than just technology. Truly smart communities require citizen-centric and data-driven innovation – a new community operating model that cuts across organizational silos and sectoral barriers. The guiding principles for such a smart community operating model are set out in BS ISO 37106 (which supersedes PAS 181), with other documents in the BSI smart city publications giving more detail on specific elements – such as cross-silo data sharing (BS ISO/IEC 30182 and PAS 183), developing smart city projects and solutions (PAS 184), the implications for urban planning (PD 8100) and city security (PAS 185).

The above existing publications are aimed primarily at community authority leaders, making recommendations and requirements for actions to take to implement smarter ways of working across the community.

Implicitly, however, the BSI smart city publications also have significant consequences for the suppliers of smart services and smart products. This PAS makes these explicit, establishing recommendations for smart community suppliers at two levels:

- **Product:** recommendations for common specifications for data products and data services aimed at ensuring they have optimum impact on future development of the community; and
- **People and process:** good practice recommendations on how a smart community supplier engages with the community authority, covering the key roles, skills and business processes it deploys when developing, delivering and maintaining data products and data services.

This PAS is therefore a supplier-focused counterpart to the existing smart city publications. It aims to guide smart community suppliers of smart products and smart services during the implementation of smart city strategy by:

- helping to remove barriers for suppliers of data products and data services by defining a set of clear recommendations that help the design of products and services that meet city requirements;
- addressing market failures experienced by cities by ensuring data products and data services are not developed in isolation from solving real city problems and are based on a clear set of outcomes;
- addressing market concerns around ethics and security of smart city products and services, through embedding best practice in their design; and
- ensuring data products and services are developed in a citizen-centric and inclusive way.

0.2 Context

BS ISO 37106 brings together global good practice on how communities (and in particular cities) are moving towards a new “smart community operating model”, the key features of which are summarized in Table 1 below.

Table 1 – Key features of BS ISO 37106 smart community operating model

- **Investing in smart data**, i.e. ensuring that data on the performance and use of the community's physical, spatial and digital assets is available in real time and on an open and interoperable basis, in order to enable real-time integration and optimization of community resources
- **Managing community data as an asset in its own right**, both within the local authority and in collaboration with other significant data owners across the community
- **Empowering the community through community data:**
 - both at a technical level, through development of open data platforms; and
 - at a business level, through steps to enable a thriving market in reuse of public data together with release of data from commercial entities in a commercially-appropriate and privacy-protective way
- **Delivering integrated and citizen-centric services**, by:
 - providing citizens and businesses with public services that: are accessible in one stop, over multiple channels; engage citizens, businesses and communities directly in the creation of services; and are built around user needs, not the community's organizational structures; and
 - establishing an integrated business and information architecture which enables a whole-of-community view of specific customer groups for community services (e.g. commuters, elderly people, troubled families, disabled people, ethnic minorities)
- **Setting holistic and flexible budgets**, with a focus on value for money beyond standard departmental boundaries
- **Establishing community-wide governance and stakeholder management processes** to support and evaluate these changes

NOTE Table 1 is adopted from BS ISO 37106.

Moving towards such a smart community operating model is a lengthy process, requiring leadership over a sustained period of time and extensive collaboration between a wide range of stakeholders. To help manage this process, BS ISO 37106 outlines a set of guiding principles for community leaders to use as they drive change within the community over time. A high-level summary of the BS ISO 37106 guiding principles, as shown in Figure 1, is that a smart community is visionary, citizen-centric, digital, open and collaborative.

Suppliers can support communities in this drive to become smarter by embedding smart community recommendations in their own products and services. The box below illustrates the wide range of organizations that can valuably make use of this PAS.

ILLUSTRATIVE USE CASES

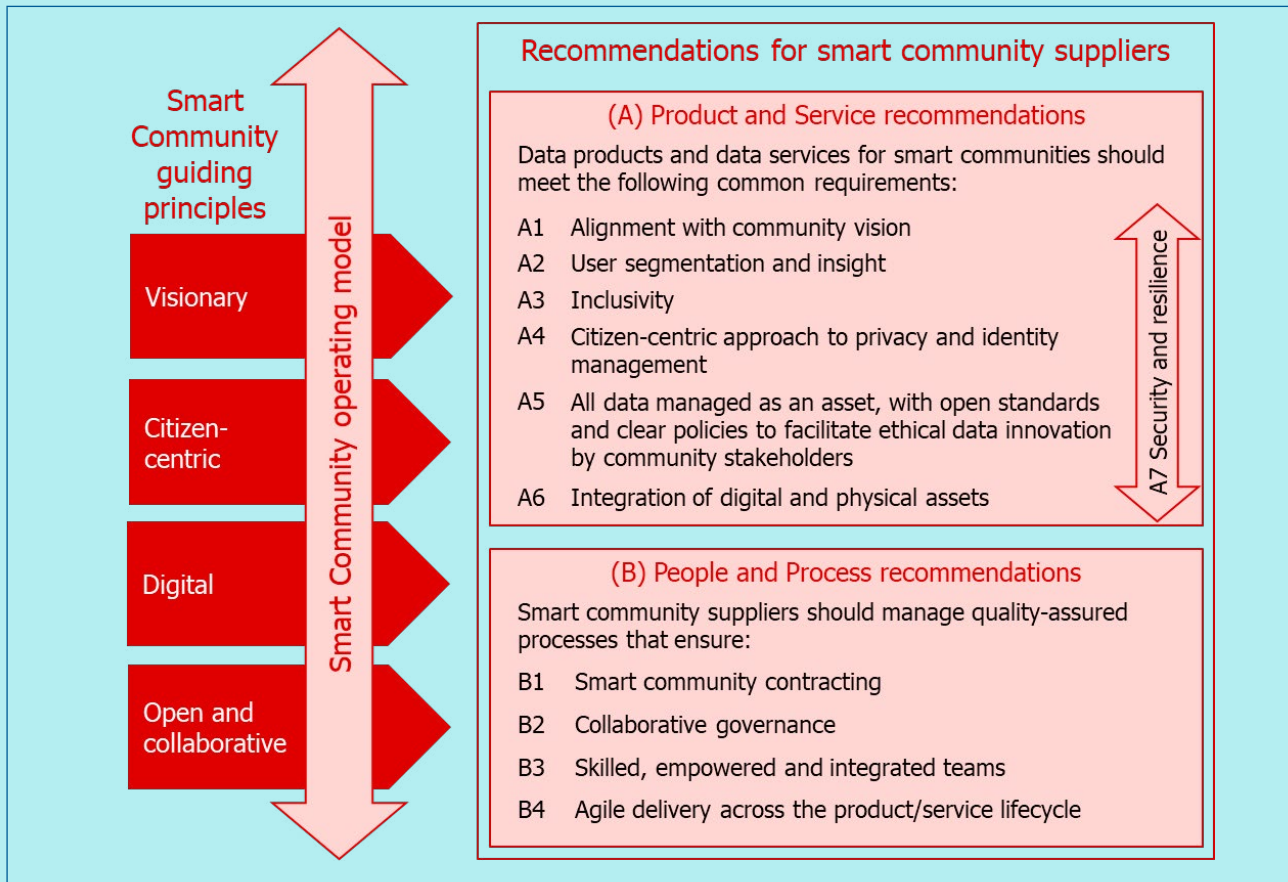
- **An application developer** (for example of citizen engagement tools) can use PAS 186 to demonstrate to city clients that its services are developed in highly user-centric and privacy-protective ways, support the city in delivering UN Sustainability Goals, and are easily interoperable with other digital services and infrastructure deployed in the city.
- **A smart city solutions provider** (for example, a supplier of "smart traffic lights") can use PAS 186 to demonstrate to city clients that their solution is secure and interoperable with other city systems – and is not just technically viable, but also delivered through a scalable business model and agile operating model.
- **A developer offering a complete service to design, build and operate a new city neighbourhood** can use PAS 186 to demonstrate to city clients that the new development will be citizen-centric, digitally-enabled and supportive of the management and improvement of city services.
- **A community authority** can embed PAS 186 in its procurement requirements from suppliers, to help ensure that products and services are aligned with city priorities and that the city is better able to implement innovation at scale.

0.3 Overview of recommendations for smart community suppliers

Figure 1 gives an overview of the recommendations for smart community suppliers that are described in this PAS. These recommendations are common for all data products and data services being supplied to smart communities, and are at two levels:

- a) product and service recommendations; and
- b) people and process recommendations.

Figure 1 – Overview of recommendations for smart community suppliers



The recommendations summarized in Figure 1 are described in more detail in Clause 4 and Clause 5.

For each individual recommendation, this PAS describes five levels of supplier maturity, in a structured way, allowing quantitative comparison, each mapped against the generic maturity levels defined in Figure 2. This five-level maturity model follows the methodology recommended in BS ISO 37153. Performance at Level 3 or more on this scale represents compliance by a supplier with that recommendation. Clause 6 gives further details on how different levels of performance across the different recommendations can be combined to give an assessment of whether or not the supplier conforms to the standard as a whole. Annex A presents an illustrative scorecard of how an individual supplier might be scored against this framework.

Figure 2 – Maturity model for smart community suppliers

1. Initial	Processes to manage this recommendation do not exist.
2. Partially fulfilled	Processes to manage this recommendation are managed on an ad hoc basis by the supplier.
3. Fulfilled	The supplier has established quality-assured processes to manage the delivery of this recommendation.
4. Improving	The supplier can demonstrate that it is measuring the impact of these processes, that positive impacts are being achieved, and that (where appropriate) the processes follow relevant international standards.
5. Sustainably optimizing	As at Level 4. In addition, the supplier can demonstrate clear evidence of systemic continual improvement, where relevant in real time or near real time.

1 Scope

This PAS gives recommendations for suppliers of data products and data services to smart cities and smart communities. This PAS is technology neutral and supplier impartial. Its recommendations are independent of the underlying IT infrastructures which hold and deliver data products and data services.

This PAS is for use by organizations that supply data products or data services for smart cities and smart communities, regardless of sector.

Stakeholders who are responsible for procuring, contracting or commissioning services might also benefit from this PAS by referencing it when detailing requirements for data products and data services within smart cities and/or smart communities.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes provisions of this document.¹⁾ For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Standards publications

BS EN ISO 19650-1:2018, *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*

BS EN 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*

BS EN 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*

BS ISO 37120, *Sustainable cities and communities – Indicators for city services and quality of life*

PAS 185, *Smart Cities – Specification for establishing and implementing a security-minded approach*

PAS 7040:2019, *Digital manufacturing – Trustworthiness and precision of networked sensors – Guide*

Other publications

[N1] Caldwell, B., Guarino Reid, L., Vanderheiden, G., Chisholm, W., Slatin, J. and White, J., *WCAG 2.1 Web Content Accessibility Guidelines WCAG 2.1*.²⁾

¹⁾ Documents that are referred to solely in an informative manner are listed in the Bibliography

²⁾ Available at <<https://www.w3.org/TR/2018/REC-WCAG21-20180605/>>