



BSI Standards Publication

Smart cities overview – Guide

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Summary of pages

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Foreword

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The PD process enables a guide to be rapidly developed in order to fulfil an immediate need in industry. A PD 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.

Relationship with other documents

Acknowledgement is given to Urban DNA for their role in the development of the capability assessment/gap analysis at Annex A.

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

- PAS 180, *Smart cities – Vocabulary*, which defines terms for smart cities, including smart cities concepts across different infrastructure and systems elements and used across all service delivery channels;
- PAS 181, *Smart city framework – Guide to establishing strategies for smart cities and 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 transform their city's ability to meet future challenges and deliver future aspirations;

- PAS 182, *Smart city concept model – Guide to establishing a model for data interoperability*, which provides a framework that can normalize and classify information from many sources so that datasets can be discovered and combined to gain a better picture of the needs and behaviours of a city's citizens (residents and businesses);
- PD 8101 *Smart cities – Guide to the role of the planning and development process*, which gives guidance on how the planning and implementation of development and infrastructure projects can equip cities to benefit from the potential of smart technologies and approaches.

These publications are available to download at:
<http://www.bsigroup.com/en-GB/smart-cities/>

Information about this document

Copyright is claimed on Figure 2. Copyright holders are the City Protocol Society, 2400 Camino Ramon, Suite 375 San Ramon, CA 94584, USA.

Use of this document

As a guide, this PD takes the form of guidance and recommendations. It should not be quoted as if it were a specification or a code of practice and claims of compliance cannot be made to it.

Presentational conventions

The guidance in this PD is presented in roman (i.e. upright) type. Any recommendations are expressed in sentences in which the principal auxiliary verb is "should".

Spelling conforms to *The Shorter Oxford English Dictionary*. If a word has more than one spelling, the first spelling in the dictionary is used.

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

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0 Introduction

0.1 General

Cities today are facing enormous challenges. It is no longer enough to simply make incremental improvements to the way cities are managed. Instead, city leaders are faced with the task of identifying and implementing radical and transformational solutions.

Fortunately, fresh approaches to city management and developments in technology are providing new and useful tools for city leadership, and creating greater opportunities for citizens, businesses and other organizations in the city to actively participate in implementing the changes that need to take place.

In short, technology can help cities become smarter.

0.2 Challenges facing modern cities

The challenges cities face today include the following.

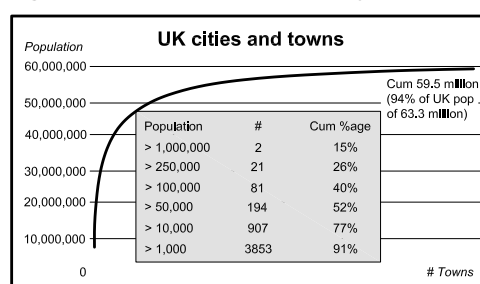
- **Challenges of resilience.** The increasing incidence of extreme weather conditions, growing food shortages and energy vulnerabilities around the globe, all have a profound impact on cities.
- **Emerging markets.** The growth of emerging markets, in particular the expected doubling of the middle class globally from three billion to six billion by 2050, is creating increased competition for resources and economic activity.
- **Global competition.** UK cities are no longer just facing competition from other UK cities for talent and capital but have to match the attractions of cities globally.
- **Migration.** The continuing inward migration experienced by many cities is leading to increased congestion, pollution and demand on service provision. The differing social norms of the many communities in a modern cosmopolitan city, while providing a richer cultural environment, can also affect social cohesion.

Cities are important

Cities make up just 9% of the UK's landmass but account for 54% of population, 59% of jobs, 61% of GVA (Gross Value Added) and 72% of high-skilled jobs.

Of course, the smart city agenda is not just for the major and medium-sized cities; it is just as important for smaller cities and towns. When these are included, the places where 80% of people in the UK live are covered (Figure 1).

Figure 1 UK cities and towns by population



[SOURCE: Office for National Statistics data, 2013]

Benefits of integration

75% of the 60–90 million street lights in Europe are over 25 years old. Replacing them with LED lamps could potentially halve the energy bill and maintenance costs giving a return on investment (ROI) in around 6–8 years. Replacement would also enable them to be used as strategic assets for a Wi-Fi mesh network; a hub for smart parking and other sensors; a post for air quality monitoring; a stand for CCTV and the like.

The King's Cross development is one of the largest urban redevelopment projects in Europe, and will ultimately provide facilities for 45,000 people to live, work and study. A key feature is the integrated planning and operation of water, electricity, gas, heat and data services under a single asset owner. This integration will enable both substantial cost savings and the deployment of new technologies in energy supply, use of renewables, and other features that together will achieve high levels of sustainability and a targeted reduction in CO₂ emissions by over 50% relative to 2005 levels.

- **Industrial decline.** Some cities, in contrast, are having to deal with industrial decline and decreasing population.
- **Ageing population.** The ageing population is having an ever increasing impact on both the tax base and the costs of public services.
- **Persistent inequality.** There is a variation of life expectancy of up to 20 years between the richest and poorest parts of many UK cities.¹⁾
- **Citizens.** The increasing use of digital technology in every aspect of life means that citizens expect public services to be delivered in a more customer-centric way.
- **Pace of service innovation.** The accelerating pace of change in the way people live their lives provides real challenges for long-term planning. For instance, the rapidly increasing use of online shopping is undermining the viability of retail districts and out-of-town shopping centres.
- **Ageing infrastructure.** A significant amount of infrastructure in UK cities is likely to require replacing or retrofitting over the next few years to make it fit for purpose.
- **Lack of overall control.** Many of the key decisions relating to city life are made by individual agencies with a narrow, compartmentalized focus, rather than in terms of their impact on the city as a whole. Many aspects of city life are also dependent on the decisions of regional or national governments or agencies.
- **Money.** In a time of stretched budgets, it is often difficult to get the investment funding needed to take a long-term approach to city challenges – particularly where new business models, service innovation, or new technology is involved.

0.3 Challenge of managing the city

Cities can be viewed as complex organisms, with many organizations and infrastructures providing the services needed for them to function effectively. The local authority only directly manages a minority of the key city services and has to exercise its overall strategic management role through partnerships with the other stakeholders in the city.

Figure 2 maps out some of the systems and activities that make up a city.

¹⁾ See for example London: <http://life.mappinglondon.co.uk/>