

A Guide to Smart Cities: How to start implementing standards in your city

How standards can build a bright future for your city



The rise of the smart sustainable city

We are undergoing the largest wave of urban growth in history.

At the turn of the 20th century, just 15% of the world population lived in cities. Now it's over 50%. And by 2050, three-quarters of the world's 9 billion people will be city-dwellers.

This is putting a severe strain on the services and resources of towns and cities – risking the sustainable growth that's vital to their prosperity, as well as to their citizens' health and wellbeing.

Until now, tackling the problems associated with urbanization has been a complex issue.

One important challenge for local authorities is key decisions have to be made in isolation on a department-by-department basis, rather than with a big-picture view of the city as a whole.

But now, city leaders and town planners can meet the challenges head-on and transform their communities – using best practice guidance developed by peers and experts.

“There is huge potential for the UK to be the world leader in smart cities and to achieve a strategic advantage for UK cities and industry.”

David Willetts, former UK Minister for Universities and Science

A smart city harnesses digital technology and data – often in energy, water and transport – to perform better, boost wellbeing and respond to local and global challenges.

In a smart city, individual city systems are highly integrated, not just within themselves but also with each other. This means they can seamlessly deliver the best for the local area.

What's more, the smart city agenda isn't only for major cities; it's just as important for smaller cities and towns.

For urban citizens, this means:

- services built around their needs
- better access to information on all aspects of their city
- increased input into public sector decision-making

The outcome: a nicer place to live and work, and better services at a lower cost.

And for urban leaders, it means:

- effective measures that help you make confident decisions and manage the city more effectively
- better collaboration, enabling more efficient working between city stakeholders
- more transparent processes that increase citizen and business engagement

The outcome: greater competitiveness, increased efficiency and better results at lower costs.

“There is no better way to improve the lives of billions of people around the world than to improve the way cities work.”

Michael Bloomberg, former mayor of New York City



The rewards for towns and cities that step up

If it's managed well, urbanization could lead to a new era of wellbeing, resource efficiency and economic growth. It has the potential to yield benefits ranging from increased employment and improved health, to better education and environmental protection.

With the right strategies, towns and cities can:

- save money and strengthen their tax base
- attract more talent, businesses and investment
- manage services more efficiently, such as traffic congestion
- reduce pollution
- offer their citizens an excellent quality of life
- set the standard for sustainability

The risks for towns and cities that don't adapt

Unless they adapt to this change, towns and cities will struggle to deal with problems like:

- the need to compete for talent and capital with other cities worldwide
- the inward migration that's increasing congestion, pollution and pressure on services
- the shrinking industries that lead cities to fall into decline
- the rise in online shopping and entertainment that's changing the face of local retail
- the ageing population that's increasing its impact on the costs of public services



Peterborough has saved £5 million pounds by creating a state-of-the-art fibre network, connecting 107 council, education and health sites across the city.



50% of all journeys in **Cardiff** will be made sustainable transport modes by 2026, thanks to a forward-thinking transport initiative.



In **Barcelona**, the city's parks use technology to remotely sense and control park irrigation and the water in public fountains. This program alone increased the city's water conservation by 25%, saving around \$555,000 a year.

The role of local authority leaders

The smartness of a city or town isn't about technology for its own sake. It's about how tech is used as part of a wider approach, to help the city function effectively – both in its individual systems, and as an integrated whole.

It builds on the city's existing foundations so that leaders can set a compelling vision and follow a new and more effective path into the future.

Smart cities are therefore the result of smart leadership. And local authority leaders have a key leadership role to play.

For you as a local authority decision-maker, smart leadership is about supporting the collaborative effort of all your city's organizations and citizens to tackle the key priorities in the most effective ways.

So how do you go about building a smart city?

Standards: the guidance you need to succeed.

Building a smart city is a complex task – and every city is different. Luckily, one common denominator makes things much simpler for you: standards.

Standards contain best practice guidance and expert knowledge that ensure quality and performance, so that things work smoothly and safely in your city.

- They let you compare solutions and choose the best one for your needs
- They enable you to integrate solutions from different suppliers.
- They provide valuable guidance for city life, including energy-efficient buildings, intelligent transport, better waste management and much more.

As a result, standards can help eliminate risks, cut costs and make it easier for you to grow manage your town or city effectively.

“Industry standards are key to achieving world leadership status for the UK. I welcome the publications of the first two BSI smart city standards...(they) will help to address barriers to implementing smart city concepts and promote uptake of smart city solutions at scale.”

David Willetts, former UK Minister for Universities and Science



After the 2008 recession, Barcelona was searching for ways to avoid economic and developmental stagnation.

To help save money and optimize the infrastructure, the local government used the latest technologies and introduced smart city initiatives – saving \$37 million from smart lighting, \$58 million from smart water measures, and increasing cash flow from parking by \$50 million.



Smart City Standards

You'll find BSI standards to steer you forward whatever your role – whether you're the Mayor working on strategy or the CIO putting data practices in place.

Vision

PD 8100 helps cities define their own vision.

- It contains a smart city capability assessment/gap analysis diagnostic tool.
- It enables city leaders to make an overall assessment of the readiness of their city to benefit from transformational opportunities offered by smart city approaches.

As a result, standards can help eliminate risks, cut costs and make it easier for you to grow manage your town or city effectively.

Strategy

Once a city has defined its vision, the next step is to set its strategy.

PAS 181 (soon to be published as an international standard, ISO 37106), gives guidance on establishing a city's unique strategy. It puts the citizen at the centre, helping the city manage its digital assets in order to create effective services and deliver change.

ISO 37101 Sustainable development in communities - Management system for sustainable development allows for the creation of specific sustainability strategies.

- It sets out 6 purposes of sustainability, and prompts stakeholders to ask themselves questions in order to set reasoned goals for the city.
- The goals are mapped against 12 broader considerations (such as governance, innovation, culture, health and education).

ISO 37101 provides a management system for a city to consider and prioritise its goals and actions.

Planning

With a vision and a strategy in place, cities can move onto the planning stage.

PD 8101 provides guidance for holistic planning, taking into account future city potential.

- It recognises that multi-party projects need a shared vision and benefits realization plan, covered within.
- It also recognises that user needs and behaviours have to be incorporated into the design phase.

Infrastructure

The following standards for implementation infrastructures have been published:

PD ISO/TR 37150:2014 *Smart community infrastructures -- Review of existing activities relevant to metrics*

PD ISO/TR 37152:2016 *Smart community infrastructures -- Common framework for development and operation*

PD ISO/TS 37151:2015 *Smart community infrastructures -- Principles and requirements for performance metrics*

Data

Smart city thinking can improve resource consumption and transform the capabilities of a city.

BS ISO/IEC 30182 provides a framework for data sharing to allow a common language for collaboration and insight, across the whole range of city services, promoting systems interoperability.

PAS 183 Decision-making framework for sharing data and information addresses the organisational barriers to sharing data in a city by helping establish a data sharing culture. It covers:

- Type of data required to be shared
- Establishing the roles and responsibilities for the data value chain
- Purposes for data use
- Defining access rights for data
- Assessing data states
- Data formats and transportation

Additional tools

BS ISO 37120:2014 provides sets of indicators for city services and quality of life. There is on-going work to develop indicators for resilience and smartness.

PD ISO/TR 37121:2017 provides an inventory of existing guidelines and approaches on sustainable development and resilience in cities.

PAS 184 Developing project proposals for smart city solutions gives guidance on how to justify a smart city solution by showing how it would be beneficial.

"I have first hand experience that such standards can support cities as they embark upon their own, specific Smart City journey. And don't let the term "city" put you off! The standards are equally relevant to all major urban areas and even small urban and rural communities.

Trevor Gibson, Smart City Leadership & Development Manager, Future Peterborough

For more information, visit:
www.bsigroup.com/SmartCityStandards

About BSI

BSI is the national body responsible for preparing British Standards and other standards-related publications, information and services. BSI is incorporated by Royal Charter. British Standards and other standardization products are published by BSI Standards Limited.

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