DRAFT AMENDMENT

ISO 37106:2018/DAM 1

ISO/TC **268**

Secretariat: **AFNOR**

Voting begins on:
2020-09-10

Voting terminates on:
2020-12-03

Sustainable cities and communities — Guidance on establishing smart city operating models for sustainable communities

AMENDMENT 1

Villes et communautés territoriales durables — Lignes directrices pour l'établissement de stratégies pour les villes intelligentes et les collectivités

AMENDEMENT 1

ICS: 13.020.20

This document is circulated as received from the committee secretariat.

Reference number
ISO 37106:2018/DAM 1:2020(E)

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 268, *Sustainable cities and communities*.

In the development of this document, ISO Guide 82 has been taken into account in addressing sustainability issues.

Introduction

This document helps cities deliver their vision for a sustainable future, by providing a toolkit of "smart practices" for managing governance, services, data and systems across the city in an open, collaborative, citizen-centric and digitally-enabled way. It defines a "smart operating model" for cities, which enables them to operationalize their vision, strategy and policies at a faster pace, with greater agility and with lower delivery risk.

This means, in particular, a focus on enabling cities to:

a) make current and future citizen needs the driving force behind investment decision-making, planning and delivery of all city spaces and systems;

b) integrate physical and digital planning;

c) identify, anticipate and respond to emerging challenges in a systematic, agile and sustainable way;

d) create a step-change in the capacity for joined-up delivery and innovation across organizational boundaries within the city.

Although many of the principles and methodologies established by this document are relevant within specific vertical sectors of cities (e.g. water, waste, energy, urban agriculture, transport, IT), the focus is very much on the issues and challenges involved in joining all of these up into a whole-city strategic approach to the use of smart data, smart ways of working and smart technologies. Central to this document is therefore a strong emphasis on leadership and governance, culture, business model innovation, and the active role played by citizens, businesses and civil society in the creation, delivery and use of city spaces and services.

This document is aimed at city leaders. Much in the guidance can also be helpful to leaders of communities other than at city-scale, including both smaller urban areas and larger, regional-scale initiatives. But the prime intended audience, with whom the guidance has been developed and validated, is city leaders, including:

- policy developers in city authorities – both those responsible for the authority's service design, commissioning and delivery role, and also those responsible for its community leadership role, in particular:
  - elected leaders;
  - senior executives of local authorities (including chief executives, chief information officers and directors of key departments);
  - senior executives of other public bodies with a city-wide remit;
- other interested parties interested in leading and shaping the city environment, including:
  - senior executives in the private sector who wish to partner with and assist cities in the transformation of city systems to create shared value;
  - leaders from voluntary sector organizations active within the city;
  - leaders in the higher and further educations sectors;
  - community innovators and representatives.

In addition to this leadership audience, the document will be of interest to all parties engaged in smart cities, including individual citizens.

The working definition of a smart city used for the purposes of this document is that approved by ISO TMB:

A smart city should be described as one that 'dramatically increases the pace at which it improves its sustainability and resilience… by fundamentally improving how it engages society, how it applies collaborative leadership methods, how it works across disciplines and city systems, and how it uses data and integrated technologies… in order to transform services and quality of life to those in and involved with the city (residents, businesses, visitors).'

NOTE This is deliberately presented as a working definition rather than intended as a definitive definition which all cities are to follow. While there is a strong degree of commonality among the smart city strategies that are being developed around the world, there is also significant diversity. All cities embarking on the development of a smart city strategy can define their own reasons for doing so, in their own language; the process of discussion and debate between interested parties to define what, for them, is meant by "Smart Paris", "Smart Tokyo" or "Smart Toronto" is an important one.

Sustainable cities and communities — Guidance on establishing smart city operating models for sustainable communities

AMENDMENT 1

4.1 Transforming the traditional operating model for cities

At the end of the existing paragraphs, before section 4.2, add the following new text and table:

These features of a smart city operating model are described in more detail throughout the rest of the document. Together, they combine to deliver important new ways of working: governance changes within the city that transform the city's capability and capacity to drive city-wide change at speed, enabling city leaders to deliver transformational impacts against priority outcomes.

These six key governance changes are summarised in Table 1 below, and Annex A maps out in detail how they flow through to deliver improved social, economic and environmental outcomes - and, ultimately, improved performance against the six purposes of a sustainable community described in ISO 37101.

Table 1 — Key governance changes within a city that result from adoption of a smart city operating model

New ways of working	Governance change	Summary description
Openness and collaboration: City systems are opened up so that all city stakeholders can collaborate in driving change	Stakeholder alignment	City stakeholders are now aligned behind a clear vision for the future of the city and are committed to shared principles on how they will work together to deliver that vision.
	Improved transparency	Citizens and businesses are better able to hold city authorities to account, empowered by access to city data and effective feedback mechanisms.
	Citizen engagement	Increased civic participation and co-creation of city services.
Integrated smart working: Internal city systems are joined up, enabling real-time integration	Cross-silo collaboration	City organisations have the skills, tools, business processes and incentives to respond effectively to customer needs and city challenges that cut across organisational boundaries.
	Real-time city management	City services are able to respond in real-time to changing demand and circumstances
	Shared use of common resources	City organisations are now sharing and re-using interoperable digital building blocks to meet common needs, managed as a city-wide service

4.3 Summary of recommendations

Replace the paragraph in [A] part b) (to replace the reference to Annex A with Annex B) with:

Use the delivery principles given in Annex B as a key input and starting point for that process.

5.2 The need

Replace the final sentence at the end of the fifth paragraph (to replace the reference to Annex A with Annex B) with:

> These principles are set out in full in Annex B.

5.3 Recommendations

Replace the paragraph for part b) with:

> Smart city leaders should use the delivery principles given in Annex B as a key input and starting point for that process.

6.3.2 The need, third paragraph

Replace the second reference “for ISO 37101” to “(in ISO 37104)”

6.3.4 Linkages

Add the following text at the end of the paragraph:

> – and an illustrative Smart City Benefit Map, showing line-of-sight between common smart city investments and social, economic and environmental outcomes, is at Annex A.

6.7.1 Context

Replace the reference to Annex A with Annex B:

> The [A] delivery principles (see Annex B) focus on the need to enable sharing and reuse of city assets and services, through interoperability enabled by open standards.

6.18.2 The need, fourth paragraph

Replace the reference to Annex A with Annex B:

> As set out in Annex B on smart city delivery principles (see A.6), key principles underpinning such a platform should include:

7.1 Context

Replace the heading with “7.1 General”

Delete the second paragraph and heading:

> The need
>
> All intended benefits need to be delivered in practice, and this will not happen without proactive benefit management.

Delete the fifth paragraph and heading below:

City leaders should use key performance indicators. This document does not seek to specify in detail what benefits and impacts a smart city programme should seek to focus on, because this will vary by city, but commonality of measurement across cities allows for integrity and comparability. A common core of key performance indicators for smart cities that provide for this has been brought together in ISO 37120, listing 100 KPIs mapped against the key issues for sustainable cities described in ISO 37101.

Recommendation

Replace paragraph six text “covering the elements” with “based around the three pillars” as below:

Whatever the selection of targeted benefits and impacts (which will be integrally linked to the specific [B1] city vision for any city), this document recommends that cities should adopt a best-practice, outcomes-based approach to benefits realization, based around the three pillars illustrated in Figure 9:

After Figure 9, add the new text:

Sub-components C1 to C3 below give more detailed advice and recommendations on each of these three elements of benefit realization.

7.2 Subcomponent [C1] — Benefit mapping

7.2.1 Context

Smart cities programmes need a clear and measurable framework showing how their investments and activities lead to delivery of city outcomes, underpinned by a credible theory of change to demonstrate causal relationships across all stages of the benefit chain.

7.2.2 The need

Benefit mapping requires clarity about all the intended outcomes from the smart city programme, with clear line-of-sight showing how the immediate outputs from specific activities and investments in the project flow through to deliver those outcomes. This flow is called the ‘benefit chain’ as illustrated in Figure 10.

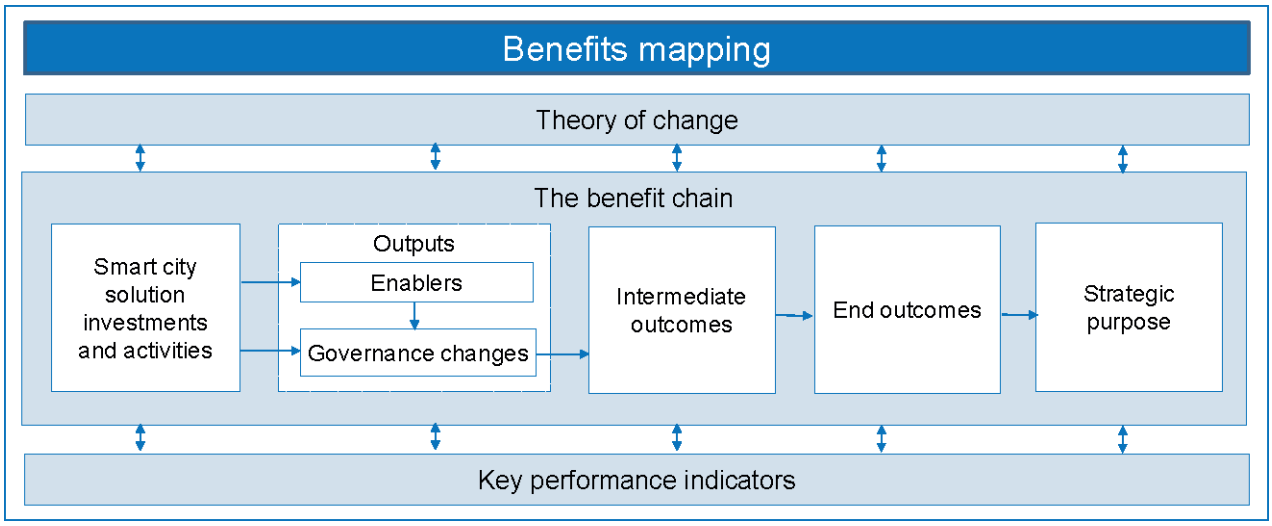

Figure 10 — ISO 37106 benefit realization framework

The benefit map should:

a) **start with the strategic purposes:** real clarity on the problems that the smart city programme aims to address and how doing so will impact on the vision and strategic aims for the city as a whole.

b) **map out clear line of sight between:**

   1) **smart city investments and activities:** all major programme actions and resources that contribute towards one or more of the project's deliverables;

   2) **outputs:** the outputs of smart city investments and activities that contribute to achievement of the targeted outcomes. In general, these fall into two types: **enablers** and **governance changes**. Enablers tend to be artefacts or systems of some kind (e.g. assets such as buildings, IT systems, control systems, equipment, databases etc.). Governance changes include changes to processes, policies, organizational structure, and even behaviours and values. Enablers on their own – if not then followed up by any governance change – cannot deliver benefits, so it is important that these changes are effectively understood and mapped;

   3) **intermediate outcomes:** these are the short-term benefits that the project seeks to deliver as a result of putting one or more outputs in place. City leaders should aim for a project to achieve some 'quick wins' early on so as to build change momentum and stakeholder buy-in to the next phases of work.

   4) **end outcomes:** these are the longer-term social, economic and environmental outcomes that the project seeks to achieve, in fulfilment of its **strategic purpose**.

c) **be underpinned by an evidence-based theory of change:** in developing the benefit chain, it is important to ensure that the logical flow is credible, even if causality cannot be proven at each step. This is because causal links between many smart city investments and the full range of downstream benefits can never be fully proven on a cost-effective basis, due to:

   1) the long-term nature of the governance changes involved, in which interventions now can deliver benefits (often very important ones) decades in the future; and

   2) the difficulty of isolating the impact that the investment has on a particular social or economic outcome from the myriad of other factors that also impact on that outcome.

   The key test of the benefit map is therefore not that it proves a particular set of outcomes, but that it gives confidence that there is a genuine and credible cause and effect flowing from activities to outputs to outcomes, and is grounded in the reality of what can practically be evaluated on a cost-effective basis.

   At the same time, it is important to remember that an effective benefit map needs to provide not just a logical framework, but also an emotionally-satisfying one. The benefit map needs to seem intuitively correct, and be resonant for key project stakeholders. This means it should be developed collaboratively with stakeholders. Getting the right people together to develop the smart city benefit map means that they buy into the resulting output, and are more likely to support its delivery.

7.2.3 Recommendations

Smart city leaders should develop a benefit map for the smart city programme, giving clear line-of-sight on how all aspects of project activity flow through to the strategic outcomes being targeted by the city. This should not seek to prove cause and effect on an unequivocal basis, but demonstrate a credible logical flow underpinned by an evidence-based theory of change which has the support of key stakeholders.

7.2.4 Linkages

Benefit mapping is a key tool to support:

— The development of **[B1] city vision**; and

— **[B3] collaborative engagement**.

Work on benefit mapping should form an integral part of the initial planning phase of the **[B7] smart city roadmap**.

Once the benefit map has been developed, it should:

— be underpinned with detailed metrics and measurement processes via **[C2] benefit tracking**

— inform management of **[D] key risks** – in particular, it is important to ensure that risks to the delivery of key outputs and outcomes are identified and managed.

For illustrative purposes, Annex A presents a typical benefit map for a smart city, showing:

— the outputs that flow from the sorts of investment and activity recommended in this document;

— in particular the six key governance changes that flow from successful implementation of a smart city operating model (as described in Clause 4.1)

— how those governance changes enable transformational impacts against high priority social, economic and environmental outcomes for cities – including, ultimately, improved performance against the six purposes of a sustainable community described in ISO 37101.

7.3 Subcomponent [C11] — Benefit tracking

7.3.1 Context

Once city leaders have fully defined and articulated the project's intended benefits through [C1] benefit mapping, they should establish appropriate measurements and measurement processes to track progress against these benefits over the duration of the project.

7.3.2 The need

Benefit tracking is about establishing a baseline of current performance against the target output and outcomes, defining success criteria for future performance, and tracking progress against planned delivery trajectories aimed at achieving these success criteria.

Key elements to address include:

a) **Key performance indicators (KPIs):** measures should be identified to track progress across all stages of the benefit map, and which can be tracked with integrity across the lifecycle of the smart city programme. This should cover both outcome and leading indicators:

   1) **Outcome indicators:** Outcome indicators relate to measurement of the key benefits being targeted by the project – they focus on the intermediate outcome and end outcomes of the benefit chain shown in Figure 10.

   2) **Leading indicators:** Leading indicators focus on measures that indicate whether the city is on track for successful delivery, by looking at the city's performance in establishing key capabilities. They focus on the project investment, activities and outputs stages of the benefit chain shown in Figure 10.

      This document does not seek to specify in detail what benefits and impacts a smart city programme should seek to focus on, because this will vary by city, but commonality of measurement across cities allows for integrity and comparability. A common core of key performance indicators for cities that provide for this has been brought together in ISO 37120, listing 100 KPIs mapped against the key issues for sustainable cities described