



« Sustainable Cities and Communities
»

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ISO/WD TS 37107
Sustainable cities and communities -- Maturity
framework for sustainable and smart-enabled
communities"

COMMENTS

Dear member,

Following the application on Resolution 110 of ISO/TC 268 taken in Zhuhai (May 2018) and the remote meeting held on June 20th 2018 ; it has been agreed to set-up a CIB in order to collect feedbacks and comments on **ISO/WD TS 37107 "Sustainable cities and communities - Maturity framework for sustainable and smart-enabled communities"**.

You will below the Working Draft on ISO/WD TS 37107 and Please note that the CIB is being launched from 2018-07-20 to 2018-07-25.

Comments received will be then forwarded to WG 4 in order to be resolved during their forthcoming meeting of WG 4 to be held in Russia (Moscow) along with other WGs of ISO/TC 268 and SC 1.

FOLLOW UP

Please cast your vote and comments up to September 25th 2018 through ISO Balloting Portal

SOURCE

ISO/TC 268 Secretariat.

Sustainable cities and communities — Maturity model for smart sustainable communities

ISO/TC 268 Working draft

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Introduction

The United Nations (UN) sustainable development agenda, “Transforming Our World: The 2030 Agenda for Sustainable Development”, was adopted by world leaders in New York in September 2015. Through 17 Sustainable Development Goals (SDGs) and 169 targets, this agenda aims to end poverty and promote prosperity and well-being by 2030, while reducing the adverse impact of human activities on the environment. The UN SDGs address cities directly through Goal 11, which aims to “Make cities inclusive, safe, resilient and sustainable”.

TC/268 leads ISO’s work on how standardization can contribute to achievement of the UN SDGs. It develops requirements, frameworks, guidance and supporting techniques and tools related to the achievement of sustainable development in cities and communities, including how smartness opens up new opportunities for a community’s ability to plan and deliver transformational change.

Increasingly, city and community leaders have asked ISO for a simple-to-use, high-level diagnostic tool that will give them an overview of the extent to which they are already implementing the good practices set out in TC/268 standards. This document responds to that demand. The Maturity Model described in the document has been developed in close collaboration with a number of pilot cities, including:

- Birmingham, UK
- Cambridge, UK
- Dubai, UAE
- Glasgow UK
- London, UK
- Moscow, Russia
- Peterborough, UK
- Sydney, Australia.

[List final set of pilot cities.]

The document is structured in six parts:

- Clause 1 describes the **scope** of the Maturity Model for Smart Sustainable Communities (MMSSC)
- Clause 2 lists **normative references**
- Clause 3 sets out the **terms and definitions** used in the document
- Clause 4 describes the **methodology and principles** used in development of the MMSSC
- Clause 5 presents the **structure of the MMSSC** that has resulted from this development process
- Clause 6 gives guidance on **how to use the MMSSC**, looking at:
 - How to use the MMSSC to **baseline current maturity** of a community
 - How to use the MMSSC to **drive improved performance** in future
 - How to **use the MMSSC in conjunction with other maturity models** that address specific elements of smart-enabled sustainable development in more detail (such as CEN’s Smart Mature Resilience model, and the quality assurance matrix for the key functions of local government described in ISO 18091).

Supporting tools are provided in three Annexes:

- Annex A (normative) provides the detailed **diagnostic tool** to be used when applying the MMSSC
- Annex B (informative) **maps the wider set of ISO standards and guidance** which communities can use in order to build on strengths and address weaknesses that they may identify through use of the MMSSC.
- Annex C (informative) provides more detailed mapping of this model against the **key functions of local government described in ISO 18091**, to facilitate joint use of the two tools.

Sustainable cities and communities — Maturity Model for Smart Sustainable Communities

1 Scope

This document provides a top-level Maturity Model for Smart Sustainable Communities (MMSSC), which can be used on a self-assessment basis by individual cities and communities and as the basis for cross-city benchmarking. The MMSSC is a simple way for community leaders to: assess how mature their community is in its journey towards adoption of the good practices for sustainable and smart-enabled development that are set out in ISO TC/268 standards; identify strengths and weaknesses; and then quickly find their way to the international standards and guidance that are most relevant to their needs.

The MMSSC focuses in particular on assessment of the maturity of a community's progress towards:

- a) **The purposes of sustainable development:** establishment and continuous improvement of a 'Plan, Do, Check, Act' management system to deliver the six purposes of a sustainable community (as described in ISO 37101 and its supporting implementation guide, ISO 37104):
 - Attractiveness
 - Preservation and improvement of the environment
 - Responsible resource use
 - Resilience
 - Social cohesion
 - Well-being
- b) **Smart enablers:** ensuring that this management system is supported by smart community infrastructure (as described in the standards and guides developed by TC/268 SC1), smart measurement (as described in ISO 37120, ISO 37122 and ISO 37123) and by a smart city operating model (as described in ISO 37106), so that the community is enabled to:
 - make current and future citizen needs the driving force behind investment decision-making, planning and delivery of all city spaces and systems;
 - integrate physical and digital planning;
 - identify, anticipate and respond to emerging challenges in a systematic, agile and sustainable way;
 - create a step-change in the capacity for joined-up delivery and innovation across organizational boundaries within the city.

2 Normative references

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

ISO 37100, *Sustainable cities and communities - Vocabulary*

ISO 37153, *Smart community infrastructures — Maturity model for assessment and improvement*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 37100 apply. ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

4 Methodology and structure

4.1 Context

The MMSSC uses the methodology for developing maturity models in ISO 37153, *Smart community infrastructures — Maturity model for assessment and improvement*. This is a highly relevant and peer-reviewed methodology, which draws on other widely-used standards for maturity models (such as the Capability Maturity Model presented in the ISO/IEC 15504 series, which addresses maturity in the field of software development).

This methodology and the resulting structure of the MMSSC is described below:

- Clause 4.3 presents an **overview** of the MMSSC
- Clause 4.4 provides more detail on the **dimensions and key characteristics** of a sustainable and smart-enabled community that are assessed in the model
- Clause 4.5 describes the five **levels of maturity** which are used in the MMSSC to describe each of the key characteristics.

First, though, Clause 4.2 sets out the **principles** that have been followed when applying the ISO 37153 methodology to develop the MMSSC.

4.2 MMSSC design principles

The ISO 37153 methodology was developed initially for use in assessing the maturity of smart community infrastructure. In this document, it has been deployed – in consultation with city and community leaders – in order to assess the maturity of a community as a whole, not just its infrastructure. This very broad scope for the MMSSC inevitably required a number of choices to be made when applying the methodology. In undertaking this work, MMSSC design was informed at all stages by seven principles; these are that the MMSSC should be:

1. User-focused
2. Comprehensive
3. Simple to use
4. Flexible
5. Technology-neutral
6. Action-oriented
7. Extensible and interoperable.

The principles are described in more detail in Table 1. Inevitably, there are tensions between some of these principles: for example, the more **comprehensive** the model becomes, the more detailed it gets and hence less **simple to use**. In balancing these trade-offs, Principle 1 (**user-focus**) has been used as the key determining question – what approach is of most value to users?

Table 1: MMSSC design principles

Summary principle The MMSSC should be:	Description
User-focused	The MMSSC should be developed in close conjunction with city and community leaders to ensure it meets their needs in a user-friendly way
Comprehensive	The MMSSC should cover, at least at a high level, the key city-wide challenges involved in the journey to become a sustainable and smart-enabled community
Simple to use	The MMSSC should not be complex and should be intuitively easy to use. Its use should not require extensive and costly data collection.
Flexible	The MMSSC should be applicable to very different sizes and types of community, regardless of their social, economic and cultural context
Technology-neutral	The MMSSC should avoid linking maturity to adoption of specific technologies or solutions, which risk rapidly become outdated.
Action-oriented	The MMSSC should be designed so that any gaps or weaknesses it identifies can easily be matched against practical advice within International Standards on how a community can address these.
Extensible and interoperable	The MMSSC should use a modular, extensible and interoperable structure, deploying the standardised approach recommended in ISO 37153, in order that it can easily be extended in future - for example: <ul style="list-style-type: none"> • By developing sector-specific versions of the model • Through interoperability with other more detailed maturity models that look at individual MMSSC characteristics in greater levels of detail than is possible in an overview model such as MMSSC.

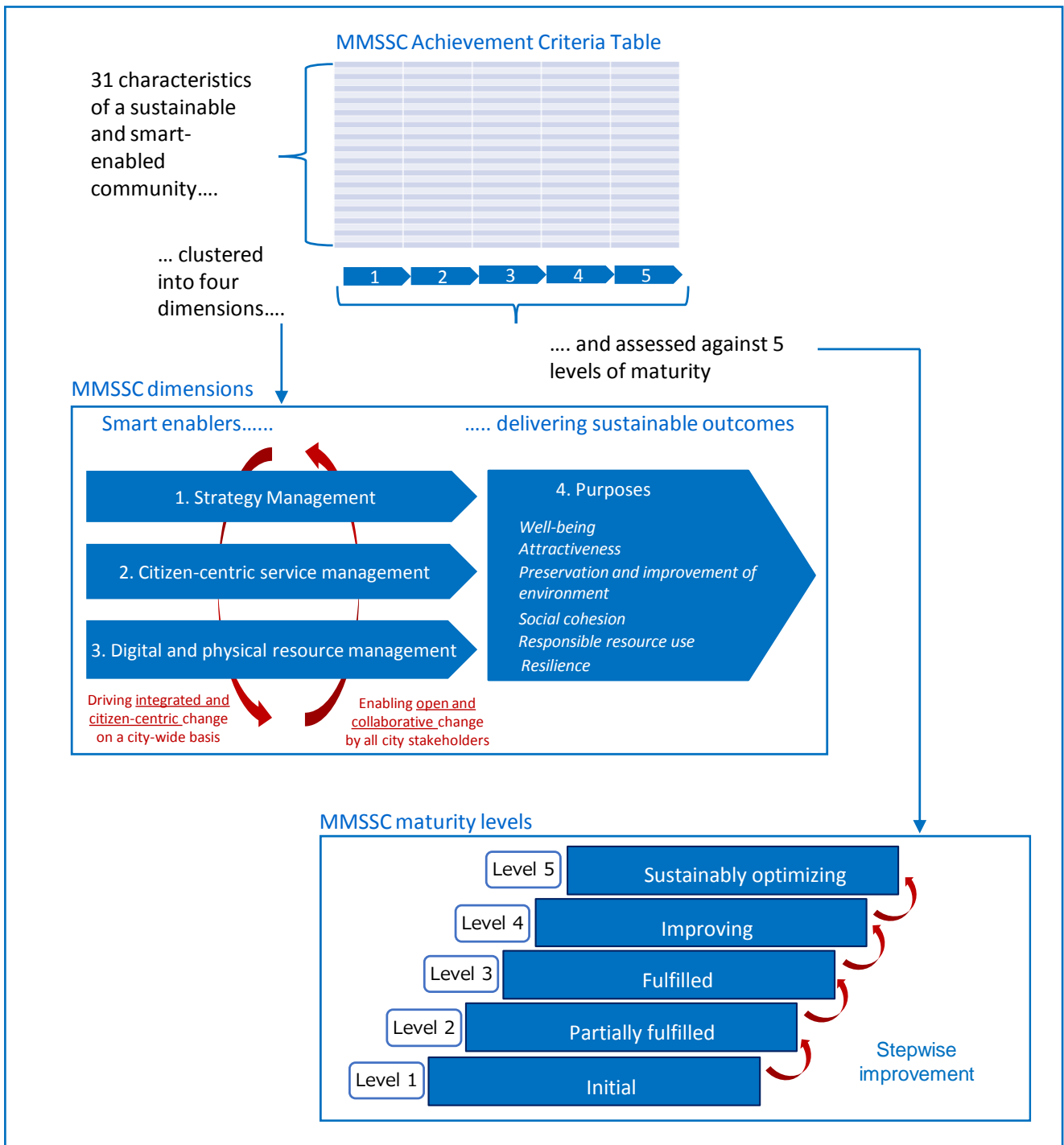
4.3 Overview of MMSSC structure

A high level summary of the MMSSC structure is at Figure 1. As this illustrates, the model is a matrix, in which:

- a set of 31 characteristics (clustered together in four dimensions: purposes; strategy management; citizen-centric service management; and digital and physical resource management).....
- are each defined against five levels of maturity (on a 1-5 scale in which level represents an improvement in performance from the previous level).

Clauses 4.4 below describes the characteristics and dimensions, and Clause 4.5 describes the definitions for the maturity levels. The Achievement Criteria Table that results is set out in full Annex A: this provides detailed descriptions of the criteria that a particular characteristic must meet in order to reach a particular level of maturity.

Figure 1: Overview of MMSSC structure



4.4 Dimensions and characteristics of a sustainable and smart-enabled community

The MMSSC assesses a community across four dimensions.

Dimensions 1-3 of the model assess the city's maturity in establishing **smart enablers**. The dimensions being assessed are derived from best practices described within ISO TC/268 standards for smart cities and smart community infrastructures¹.

¹ Specifically, the maturity model gives an overview of city maturity against the best practices described in ISO 37104, ISO 37106, ISO/TS 37151 and ISO/TR 37152.

They cover 25 'smart enablers', grouped in three domains:

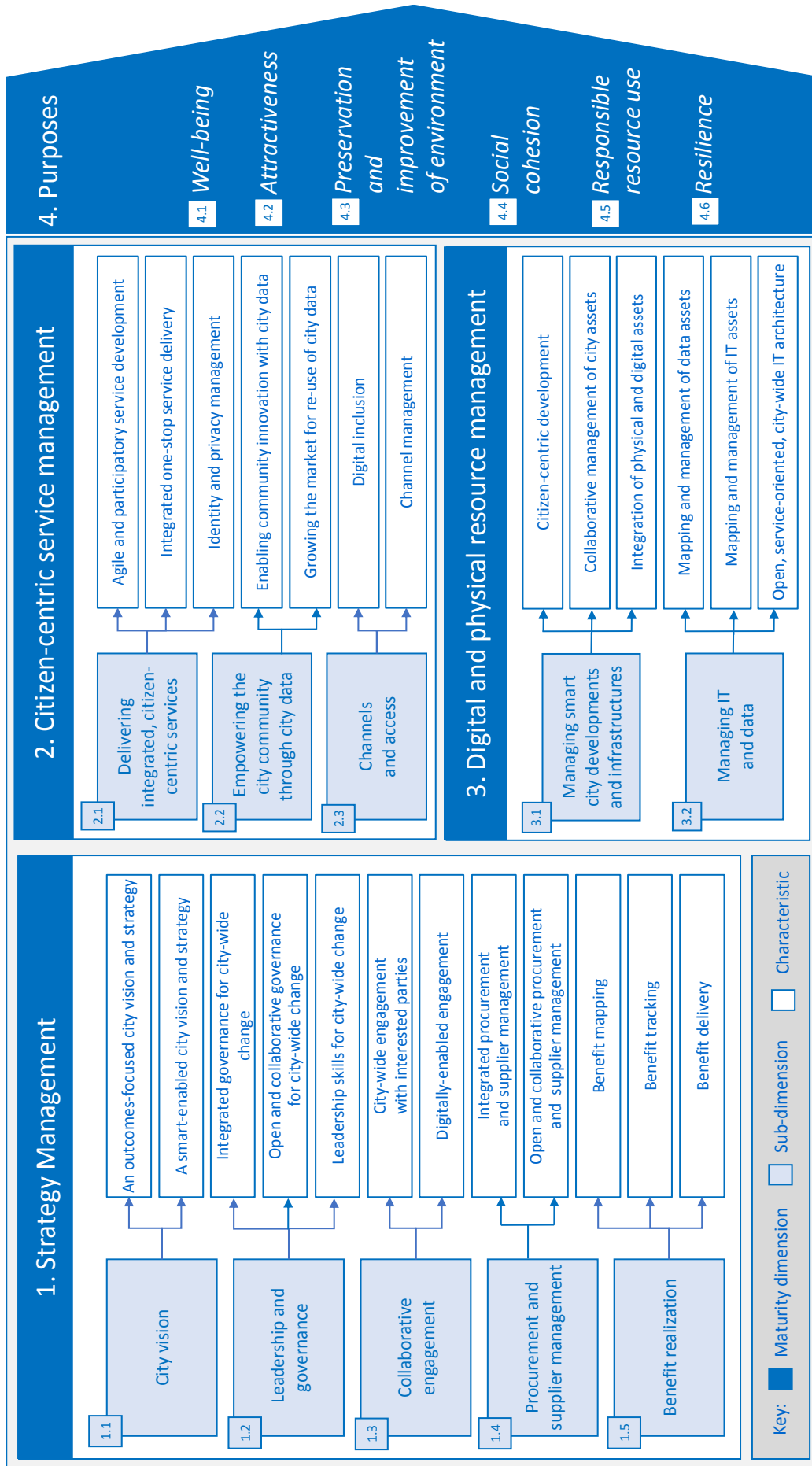
- **Strategy management:** the key aspects of governance, planning and decision making that need to be managed at a whole-of-city level rather than within individual city silos.
- **Citizen-centric service management:** 'smart enablement' of the way in which city services for citizens and businesses are planned and delivered
- **Physical and digital resource management:** changes to the way in which physical, technological and information resources are managed in a city that help to accelerate, de-risk and lower the cost of delivering change within the city.

Dimension 4 of the model assesses the city's maturity in achievement of the **six purposes of a sustainable community** described in ISO 37101:

- **Well-being**
- **Attractiveness**
- **Preservation and improvement of the environment**
- **Social cohesion**
- **Responsible resource use**
- **Resilience.**

A detailed illustration of the structure of these four dimensions and their sub-dimensions is shown at Figure 2. Users should note that the purpose of the dimensions and sub-dimensions is only to enable communities to report the results of their MMSSC assessment at different levels of summary information – and that the actual assessment is made at the level of the 31 detailed characteristics within these dimensions.

Figure 2: MMSSC dimensions, sub-dimensions and characteristics



4.5 Levels of maturity

The levels of maturity used in the MMSSC are those recommended in ISO 37153. The detailed definition of each level varies slightly according to the nature of the characteristic being assessed. Table 2 below shows the level definitions used in the MMSSC.

Table 2: definitions for the five levels of maturity

LEVEL	<i>Parts 1-3: Smart Enablers</i>		<i>Dimension 4: Purposes</i>
	For components focused on how <u>integrated and citizen-centric</u> the community is	For components focused on how <u>open and collaborative</u> the community is	For components focused on progress towards the six <u>purposes</u> of a sustainable community
1: INITIAL	Processes to manage this smart enabler either do not exist or are managed on a fragmented basis by different community organisations	Processes to manage this either do not exist or are managed entirely within the local authority with no engagement with or transparency to the community	The community has no strategy to address this purpose; action is ad hoc and fragmented.
2: PARTIALLY FULFILLED	Some progress is being made towards a community-wide plan, but not within a consistently applied community-wide management framework	Some processes have been established to consult interested parties, but these are ad hoc	Community leaders have identified priorities in pursuit of this sustainability purpose, and have developed a community-wide plan to deliver these.
3: FULFILLED	The community has established community-wide management processes to deliver best practices in this area	The community has established community-wide management communication and engagement processes to ensure effective input from interested parties	Community leaders have baselined current performance against this sustainability purpose, and established success criteria and trajectories for the changes that the community aims to deliver over time. The local authority has established community-wide accountability and governance structures to manage these improvements.
4: IMPROVING	The community can demonstrate that is measuring the performance of these processes and that positive impacts are being achieved	The community can demonstrate interested parties (not just the local authority) are engaged in the governance of these processes.	Community leaders are actively tracking performance against key indicators for this sustainability purpose, and have established clear processes for interested parties to give feedback. There is substantial community and authority buy-in, and there is demonstrable evidence that performance is improving.
5: SUSTAINABLY OPTIMISING	The community can demonstrate clear evidence of systemic continual improvement, where relevant in real time or near real time.	The community can demonstrate that it is using effective, collaborative and digitally-enabled engagement with interested parties to drive systemic continual performance	Digital dashboards give all interested parties near real-time insight into community performance on key priorities for this sustainability purpose. There is clear evidence that the community is evaluating the effectiveness of its policies to deliver this sustainability purpose and using the learning from this to drive continuous improvement – both within the community and across wider regional, national and international networks.

5 How to use the Maturity Model for Smart Sustainable Communities

5.1 How to baseline current maturity

The diagnostic tool for use when assessing the maturity of a city or community against the MMSSC is at Annex A. For each of the 31 key characteristics of a sustainable and smart-enabled community, this provides detailed assessment criteria to determine which maturity level the community has reached.

Users are recommended to assess their community's maturity both:

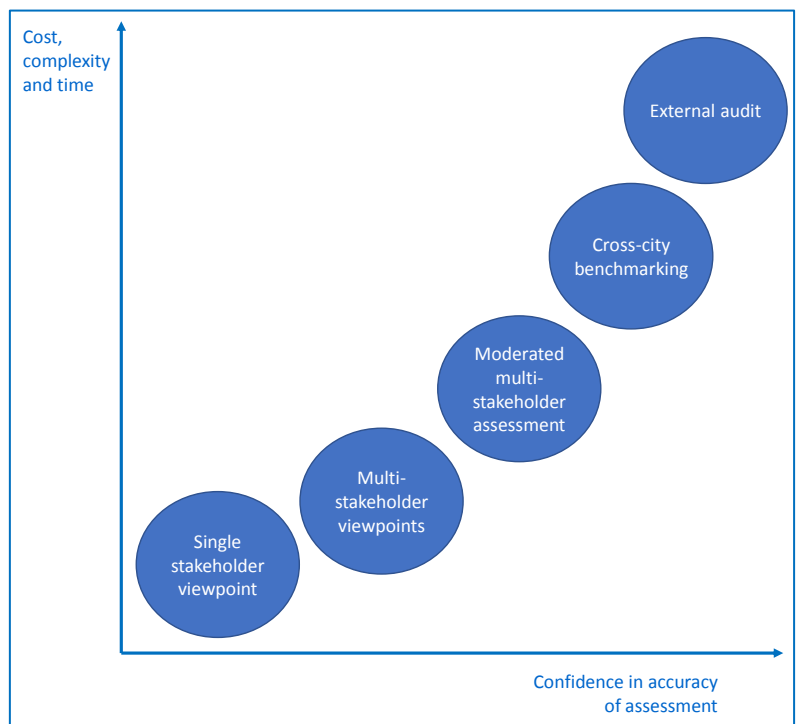
- **Now:** that is, which of the achievement criteria in the table at Annex A best describe the community's current performance for each characteristic?
- **In two years' time:** based on current plans that community leaders have already put in place, would the community expect to meet a high level of achievement criteria in two years' time?

This dual assessment will give both an overview of current strengths and weaknesses, and of where there are key gaps in existing plans for improvement.

Different approaches may be used to gather evidence for the maturity assessment. As summarised in Figure 3, these differ in both the degree of confidence they deliver in the accuracy of the resulting assessment, and in their cost and complexity:

- **Single stakeholder viewpoint:** any individual or organization with an interest in and knowledge of the community could simply use the MMSSC diagnostic tool to develop their own assessment of their community's maturity.
- **Multi-stakeholder viewpoints:** by aggregating the knowledge and perceptions of multiple interested parties (from across key units of the local authority, the wider public sector, civil society and from the private sector), communities can develop a more accurate view of their current maturity – and also identify any key differences of perception between stakeholder groups.
- **Moderated multi-stakeholder assessment:** the accuracy of a multi-stakeholder self-assessment can be increased by bringing interested parties together, for example through a facilitated workshop, to exchange views, share evidence and develop a consensus-based assessment.
- **Cross-city benchmarking:** an additional level of accuracy can be gained by different cities and communities coming together to exchange the results of their own self-assessments, in order both to compare across cities but also to moderate and challenge the evidence base that underpins these.
- **External audit:** finally, trusted third parties may wish to develop services that audit and certify they have independently verified evidence that a community meets the MMSSC assessment criteria.

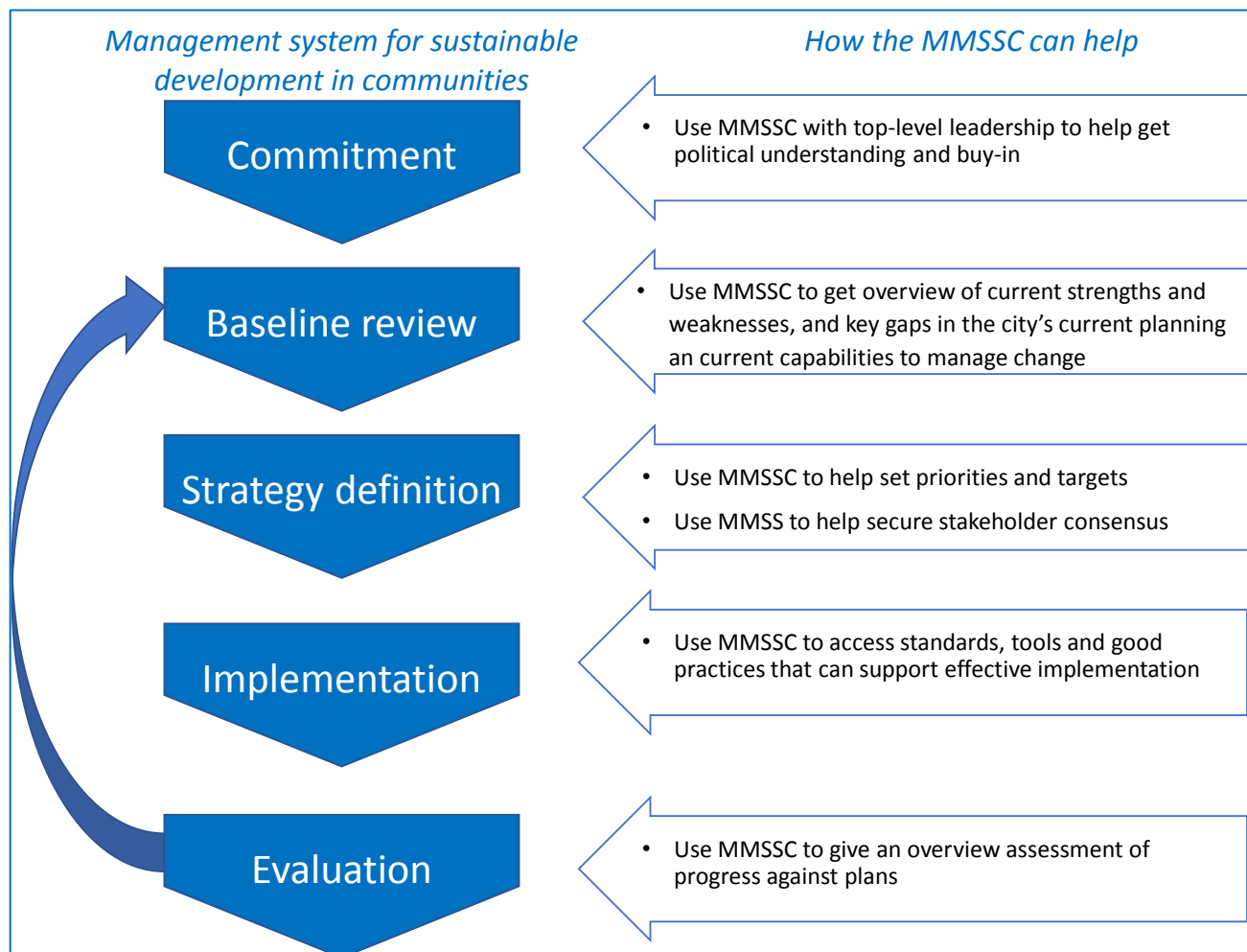
Figure 3: assessment methods



5.2 How to use the model to drive improved performance in future

Communities can use the MMSSC to inform the PDCA cycle for continuous improvement (Plan, Do, Check, Act). ISO 37104 gives detailed guidance on how to implement such a process in the context of implementing the ISO 37101 management system for sustainable communities, recommending a five-stage process for communities to use: commitment; baseline review, strategy definition; establishing and implementing the action plan; and performance evaluation and continuous improvement. Figure 4 below illustrates how the MMSSC can be used at each stage of this process.

Figure 4: use of the MMCCS to support the strategy development and implementation process



The MMSSC is intended to help a community get an overview of its current maturity and of key areas where it needs to improve in order to be better able to implement sustainable change. As such, it is a starting point, not the end of the analysis and planning a community will need to do. Table 3 below summarizes the key standards that are available from ISO to support communities as they take forward action on the different elements of the MMSSC model; Annex B maps out in further detail how these support each of the different dimensions and sub-dimensions of the MMSSC.

Table 3: ISO standards that communities can use to drive improvement

Standard	Description
ISO 37101	<ul style="list-style-type: none"> Sets out a management system for communities that commit to the sustainable development of their territories, targeted on the six purposes
ISO 37104	<ul style="list-style-type: none"> Provides more detailed operational guidance on how cities and other urban communities can apply the general requirements of ISO 37101. Provides practical guidance to all types of cities

	on initiating, planning, implementing, measuring and managing sustainable development activities in a way that is both inclusive and holistic.
<i>ISO 37106</i>	<ul style="list-style-type: none"> Provides guidance on how communities can ensure that their vision and strategy for the future is under-pinned by a smart city operating model – using smart technologies, smart data and smart ways of working to implement change faster and with reduced delivery risk.
<i>ISO 37120</i>	<ul style="list-style-type: none"> Sets out a common core of key performance indicators for cities to use within their impact evaluation and benefit realization work on city services and quality of life
<i>ISO 37122</i>	<ul style="list-style-type: none"> Supplements <i>ISO 37120</i> with additional indicators relevant to smart cities.
<i>ISO 37123</i>	<ul style="list-style-type: none"> Supplement <i>ISO 37120</i> with additional indicators relevant to resilient cities.
<i>ISO/TR 37152</i>	<ul style="list-style-type: none"> Gives guidance on planning, development, operation and maintenance of infrastructures in ways that harmonize them as part of a smart community and ensure that the interactions between multiple infrastructures are well orchestrated.
<i>ISO/TS 37151</i>	<ul style="list-style-type: none"> Sets out principles and requirements for measuring how smart community infrastructure can support such an integrated citizen-centric approach
<i>ISO/30145</i>	<ul style="list-style-type: none"> Describes a Smart City ICT Reference Framework, mapping out how ICT supports smart cities - including the detailed engineering architecture that supports delivery of the ‘Open, service-oriented, city-wide IT architecture’ described at high level in the MMSSC.
<i>ISO/IEC 30182</i>	<ul style="list-style-type: none"> Describes, and gives guidance on, a smart city concept model (SCCM) that can provide the basis of interoperability between component systems of a smart city, by aligning the ontologies in use across different sectors.
<i>ISO 18901</i>	<ul style="list-style-type: none"> Describes how to deliver quality-assured management of 39 core functions of local government. Many of those functions are directly relevant to achievement of the Purposes of a Sustainable Community described in ISO 37101, which form a core part of the Maturity Model for Sustainable and Smart-enabled Communities.

5.3 How to use the model in conjunction with other maturity models

Communities may wish to develop a more detailed assessment of their current maturity in some areas than can be provided in a top-level city-wide strategic framework such as the MMSSC.

That is why – in keeping with the Design Principle 7 (that the MMSSC should be extensible and interoperable – see Clause 4.2) – the MMSSC has been developed to align with other models that explore some of these characteristics in more detail. In this first version of the MMSSC, the assessment criteria have been designed to allow interoperability in particular with

- The quality assurance matrix for the key functions of local government described in ISO 18091
- The European Union’s *Resilience Maturity Model*
- The *Digital Inclusion and Digital Accessibility Maturity Model* developed by G3ict (the Global Initiative for Inclusive ICTs - an initiative launched in 2006 by the United Nations Global Alliance for ICT and Development, in cooperation with the Secretariat for the Convention on the Rights of Persons with Disabilities at UN DESA)

Table 4 gives more details of the points of inter-connection between the MMSSC and these more narrowly-focused models.

Table 4: Inter-connection between MMSSC and other maturity models

Maturity model	Point of inter-connection with the MMSSC	How to use with the MMSSC
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<p>ISO 18091</p>	<ul style="list-style-type: none"> • Purposes - all 	<p>ISO 18091 Annex B provides a three-level maturity model describing quality-assured management of 39 core functions of local government. Many of those functions are directly relevant to achievement of the Purposes of a Sustainable Community described in ISO 37101, which form a core part of the Maturity Model for Sustainable and Smart-enabled Communities.</p> <p>Users of the two maturity models should:</p> <ul style="list-style-type: none"> • Use the MMSSC to get an overview of the community’s readiness to plan, manage and improve its performance against each of the ISO 18091 purposes on a holistic basis. • Use the maturity model at Annex B of ISO 18091 to look in more detail at specific functions of local government that are relevant to each of the six ISO 37101 Purposes. (Annex C maps out which of the local government functions described in ISO 18091 are of most relevance to each Purpose). • Note that ISO 18091 uses a three level maturity model: <ul style="list-style-type: none"> – Red: essential practices are missing or not performed in an adequate manner by a local government – Yellow: local government has made some efforts to implement the essential elements and is able to provide the product service as required – Green: minimum acceptable conditions are achieved to deliver reliable operations. • Note that these three levels are broadly equivalent to Levels 1-3 in the MMSSC.
<p>CEN Smart Mature Resilience Model</p>	<ul style="list-style-type: none"> • Purposes – Resilience 	<p>The EU’s resilience maturity model breaks down the concept of urban resilience into ten characteristics, grouped into four dimensions (Leadership & Governance; Infrastructure and resources; Preparedness; Cooperation).</p> <p>Users of the two maturity models should:</p> <ul style="list-style-type: none"> • Use the MMSSC to get an overview of the community’s resilience • Use the Resilience Maturity Model to get a more detailed analysis of maturity against the different elements of resilience • Note that both models use a similar five level definition of maturity (so a score of “1 = non-existent” for Resilience within the MMSSC is likely to be associated for an average score of “1= starting” across the different dimensions of the Resilience Maturity Model).
<p>Digital Inclusion and Digital Accessibility Maturity Model</p>	<ul style="list-style-type: none"> • Inclusiveness of stakeholder engagement is an integral element of many aspects of the MMSSC. • The key point of inter-connection however is the 	<p>Users of the two maturity models should:</p> <ul style="list-style-type: none"> • Use the MMSSC – and in particular Sub-Dimension 2.3 Channels and Access to get an overview of the community’s maturity in taking an inclusive approach to digital services • Use the Digital Inclusion and Digital Accessibility Maturity Model to explore these issues in more detail

	MMSSC sub-dimension 2.3, Channels and Access	<ul style="list-style-type: none">• Note that the two models use the same 1-5 maturity levels.
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Annex A

(normative)

Maturity Model for Smart Sustainable Communities – Achievement Criteria Table

Maturity level

Dimension

1 = Initial

2 = Partially fulfilled

3 = Fulfilled

4 = Improving

5 = Sustainably optimising

1. Strategy management

1.1 City vision

<p>1.1.1 An outcomes-focused city vision and strategy</p>	<p>There is no published vision and strategy for the future of the city</p>	<p>City leaders have published their vision and strategy for the future of the city. But it is unclear how key social, economic and environmental outcomes will be different in future.</p>	<p>City leaders have published their vision and strategy for the future of the city, and this sets out a clear set of objectives and plans for the economic, social and environmental outcomes that city leaders plan to achieve and which are aligned with United Nations sustainable development goals.</p>	<p>As at level 3. In addition, these objectives are underpinned by clear measures of success, which are being tracked by leaders of the city administration.</p>	<p>As at level 4. In addition, there is regular public reporting of progress against the success measures, with clear processes in place for interested parties to give feedback.</p>
<p>1.1.2 A smart-enabled city vision and strategy</p>	<p>There is no published vision and strategy for the future of the city</p>	<p>City leaders have published their vision and strategy for the future of the city. But it is unclear how city leaders plan to address the opportunities opened up by smart technologies, smart data and smart collaboration in order to deliver the city vision.</p>	<p>City leaders have published their vision and strategy for the future of the city, and this sets out a clear plan for how the city will invest to embrace the opportunities opened up by smart technologies, smart data and smart collaboration</p>	<p>As at level 3. In addition, the vision is underpinned by an action plan and clear milestones for establishing smart enablers, which are being tracked by leaders of the city administration.</p>	<p>As at level 4. In addition, there is regular public reporting of progress against the action plan and milestones for establishing smart enablers, with clear processes in place for interested parties to give feedback.</p>

Level now:

Level in 2 years based on current plans:

Level now:

Level in 2 years based on current plans:

1 = Initial

2 = Partially fulfilled

3 = Fulfilled

4 = Improving

5 = Sustainably optimising

1.2 Leadership and governance for city-wide change

1.2.1 Integrated governance for city-wide change	There is no clear focus of accountability within the city administration for development and delivery of smart-enabled change at a city-wide level.	A clear focus of leadership and accountability for development and delivery of smart-enabled change at a city-wide level has been established within the city administration, BUT the people involved are not empowered with the authority, governance processes and resources needed to influence organisational priorities in a significant way.	A clear focus of leadership and accountability for development and delivery of smart-enabled change at a city-wide level has been established within the city administration, AND the people involved are empowered with the authority, governance processes and resources needed to influence organisational priorities in a significant way.	As at Level 3. In addition, the leadership of smart-enabled cross-city change is not seen as the responsibility of a central team, but is embedded in the roles of senior managers across the city administration. Clear programme management processes have been established to support the delivery of this shared agenda.	As at Level 4. In addition, real-time information systems give city leaders full transparency of progress on implementation by the wide range of delivery partners who are involved, with early warning of potential delivery problems.	Level now: <input type="checkbox"/> Level in 2 years based on current plans: <input type="checkbox"/>
1.2.2 Open and collaborative governance for city wide-change	Leadership and governance processes for cross-city change are managed internally within the city administration.	The city administration has established processes to consult and engage interested parties as it delivers its vision and strategy.	Leadership and governance processes for cross-city change are transparent to citizens through a rich mix of mechanisms (including for example: publication of key programme documentation; regular public reporting on progress; clear feedback mechanisms; and use of social media to widen civil participation).	As Level 3. In addition, these processes are not seen solely as the responsibility of the city administration, but engage leaders from the private sector and civil society in open and collaborative governance processes.	As at Level 4. In addition, there is clear evidence that these governance process have a significant impact in shaping strategy and priorities for the city. City stakeholders play a leading role in wider regional, national and international networks of smart and sustainable communities.	Level now: <input type="checkbox"/> Level in 2 years based on current plans: <input type="checkbox"/>
1.2.3 Leadership skills for city-wide change	Leadership skills are defined and managed only at the level of individual city business units.	The city has defined the set of leadership skills it needs within the teams responsible for delivering and leading city-wide change, including: strategy development skills, stakeholder engagement skills, marketing skills, commercial skills and technology management skills. Significant skill gaps exist.	The city has defined the set of leadership skills it needs within the teams responsible for delivering and leading city-wide change, including: strategy development skills, stakeholder engagement skills, marketing skills, commercial skills and technology management skills. Effective mechanisms are in place to develop, recruit and retain necessary skills. Some skill gaps remain.	As Level 3. In addition, the city uses formal mechanisms (such as competency frameworks) to monitor and manage the skills needed within its city-wide change programme. No significant skill gaps remain.	As Level 4. In addition, city leaders have access to real-time management information on the skill levels in all relevant roles across the different city organisations collaborating to deliver the city-wide change programme.	Level now: <input type="checkbox"/> Level in 2 years based on current plans: <input type="checkbox"/>

1 = Initial

2 = Partially fulfilled

3 = Fulfilled

4 = Improving

5 = Sustainably optimising

1.3 Collaborative engagement**1.3.1 City-wide engagement with interested parties**

There is no city-wide programme of communication and engagement with parties who have an interest in the development and implementation of the city's strategy for the future. Engagement with interested parties is managed only by individual city business units.

The city administration has established a formal, city-wide programme of communication and engagement with interested parties.

As at Level 2. In addition, there is clear evidence that an inclusive approach is being taken, with appropriately tailored communication approaches for different stakeholder groups and with pro-active measures to engage with any groups at risk of being excluded from the process.

As at Level 3. In addition, there is clear evidence that all key stakeholder groups have a clear understanding of the city's vision and strategy for the future, and of how they can engage with and influence its delivery.

As at Level 4. In addition, there is clear, publicly-available evidence of how the views of interested parties are shaping the development and implementation of the city's vision and strategy, and feedback systems have been put in place to facilitate ongoing dialogue between interested parties about future plans.

Level now:

Level in 2 years based on current plans:

1.3.2 Digitally-enabled engagement

City leaders do not use digital channels to engage and communicate with interested parties about future plans and priorities the city.

City leaders use web-sites, email and other digital channels to engage and communicate with interested parties about future plans and priorities for the city.

As at Level 2. In addition, city leaders are:

- using digital modelling, data visualisation and/or other technologies to 'bring to life' what it will be like to live and work in the city's vision for the future
- using social media and other digitally-enabled means of communication to facilitate widespread active participation by interested parties.

As Level 3. In addition, there is clear evidence that city leaders are using feedback from interested parties to improve the effectiveness of the digital tools and digital channels they use to develop and communicate the city's vision for the future.

As Level 4. In addition, the city has developed a full virtual model of the city and its systems, for use by interested parties in modelling different scenarios for future development of the city.

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1.4 Smart procurement and supplier management						
1.4.1 Integrated procurement and supplier management	There is no city-wide procurement and supplier management strategy. Requirements are specified and purchased independently by each city business unit, and the city has limited ability to fund solutions where costs and benefits fall across multiple organisations.	The city administration has established a strategy to move towards more coordinated procurement, but control mechanisms are weak. There are some examples of inter-business unit shared procurements, but these are ad hoc and driven by individual local managers.	The city administration has established city-wide policies to optimise procurement and supplier management across different city business units, including: <ul style="list-style-type: none"> - Setting holistic and flexible budgets able to fund cross-organisational projects - A focus on achieving best value for money for the city as whole rather than for an individual business unit - Embedding Smart Contracting Principles in all contracts² 	As at Level 3. In addition, these policies are now underpinned by clear business processes, measurements and controls to ensure compliance across all city procurements.	As at Level 4. In addition, there is clear evidence that the city has effective mechanisms to secure feedback from city business units and from city suppliers on the practical implementation of these policies, which it is using to drive continuous improvement.	Level now: <input type="checkbox"/> Level in 2 years based on current plans: <input type="checkbox"/>
1.4.2 Open and collaborative procurement and supplier management	Potential suppliers to the city have little advance visibility of its procurement requirements. Procurement processes are complex, unclear and difficult for small businesses to engage with. Suppliers of innovative solutions have no clear champion within the city administration. Procurement and contracting is based around traditional purchaser-provider relationships.	The city administration publishes and updates an online pipeline of its own upcoming procurement requirements. Steps are being taken to encourage procurement of innovative solutions, but these are ad hoc and not fully embedded across all city procurements.	The city administration publishes and updates an online pipeline of major city procurement opportunities from all city partners, focused on the challenges the city faces and the outcomes it wishes to achieve. Clear processes are in place to facilitate procurement of innovative solutions, and these are embedded in management processes that ensure they are followed for all city procurements. A range of more innovative delivery models are deployed, including joint ventures and public private partnerships.	There is clear evidence that the city manages an active process of market engagement to nurture an innovation ecosystem across the city and its suppliers, including by investing to: <ul style="list-style-type: none"> - search for and champion innovative procurement solutions to city challenges - early and iterative engagement with potential suppliers - stimulating SME-led innovation - building strategic partnerships with private and not-for-profit organisations to drive innovation, particularly 	As at Level 4. In addition, there is clear evidence that the city has effective mechanisms to secure feedback from city business units and from city suppliers on the performance of the city's innovation ecosystem, which it is using to drive continuous improvement.	Level now: <input type="checkbox"/> Level in 2 years based on current plans: <input type="checkbox"/>

² ISO 37106 defines Smart Contracting Principles. In summary these are: 1) focus on procuring business outcomes; 2) build open data into all procurements; 3) incentivize innovation and collaboration between suppliers; avoid supplier lock-in, by integrating interoperability requirements into all ICT procurement.

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				where markets are under-developed.		
1.5 Benefit realization						
1.5.1 Benefit mapping	There is no city-wide business case for to support investment in smart-enabled change within the city. Most individual projects for smart-enabled change do not have a clear and quantified business case.	There is no city-wide business case for smart-enabled change. Most individual projects for smart-enabled change have a clear and quantified business case, meeting best practice standards agreed at city-wide level.	There is a city-wide business case setting out the costs and benefits expected across the whole city from its investments in smart-enabled change.	As at Level 3. This business case is underpinned by a clear logic model showing how the outputs from key investments deliver impact against the key social, economic and environmental outcomes targeted in the city's vision and strategy.	As at Level 4. In addition, there is clear evidence that the business case and logic model is kept under review and updated in the light of experience.	Level now: <input type="checkbox"/> Level in 2 years based on current plans: <input type="checkbox"/>
1.5.2 Benefit tracking	City leaders have not defined key performance indicators to measure progress in delivering the city's vision and strategy at a city-wide level; any performance management is conducted only at the level of individual business units.	City leaders have defined key performance indicators to measure progress in delivering the city's vision and strategy.	As at Level 2. In addition, for every key performance indicator the city has: <ul style="list-style-type: none"> - baselined its current performance - established success criteria and trajectories to show the changes that the city aims to deliver on that indicator over time 	As at Level 3. In addition, actual performance against these indicators is being actively tracked by city leaders, using management information systems that give city-wide visibility of progress in delivering the expected benefits.	As at Level 4. In addition, these systems are open and accessible to citizens through easy to use data visualisation, giving real-time or near real-time insight into city performance.	Level now: <input type="checkbox"/> Level in 2 years based on current plans: <input type="checkbox"/>
1.5.3 Benefit delivery	City leaders have not defined the social, economic and environmental outcomes they wish to achieve	City leaders have defined the social, economic and environmental outcomes they wish to achieve, but accountability structures for delivering these outcomes sit only within individual business units.	The city administration has established cross-business unit accountability and governance structures to manage delivery of the outcomes targeted by the city vision and strategy.	As at Level 3. In addition, there is clear evidence that these structures are effective in managing risks and issues that cut across organisational boundaries.	As at Level 4. In addition, there is clear evidence that city leaders are undertaking impact evaluations, and that learning from measurement and evaluation is systematically fed back into improved delivery plans.	Level now: <input type="checkbox"/> Level in 2 years based on current plans: <input type="checkbox"/>

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2. Citizen-centric service management

2.1 Delivering integrated, citizen-centric services

2.1.1 Agile and participatory service development	City services tend to treat citizens and businesses as passive recipients of those services. Service design is managed with little consultation or engagement with users.	There are some examples of services being co-designed with users and informed by detailed citizen insight, but on an ad hoc basis.	The city administration has established clear policies for service design, to ensure that iterative and user-centric approaches are used to design city services that are deeply informed by detailed citizen insight and co-created with their users.	As at Level 3. In addition, these policies are underpinned by effective governance processes and cross-service benchmarking aimed at ensuring compliance and driving continuous improvement.	As at Level 4. In addition, investment in real-time information systems means that city services are now able to adapt with agility to changing and personalised needs of their users.	Level now: <input type="checkbox"/> Level in 2 years based on current plans: <input type="checkbox"/>
2.1.2 Integrated one-stop service delivery	City services are designed and delivered in silos. Little or no effort is made to build services for or gather data on citizen and business needs that cut across the boundaries of individual city business units. There is no integrated view of the customers for city services	There are some examples of citizen-centric services being developed in an integrated way across multiple service departments, but on an ad hoc basis.	The front-end delivery of services from the city administration is coordinated through digital and/or physical one-stop-shops. But these have little impact on design and development of services, which remains the responsibility of individual business units in the city.	Citizens and businesses are able to access user-centric services through an integrated, multi-channel one-stop service. This delivers information and services that are built around citizen and business needs and not around the structure of the city's individual business units.	As at Level 4. In addition, the one-stop service is supported by an integrated business and information architecture, which enables a whole-of-city view of and engagement with specific customer groups for city services.	Level now: <input type="checkbox"/> Level in 2 years based on current plans: <input type="checkbox"/>
2.1.3 Identity and privacy management	There are many separate identifiers for users of city services, which are not linked to any common citizen identifier across different city service departments. Personal data is managed in silos, with authentication for digital services done separately for each service.	There is some standardization of key user identity data sets across different city business units, although there is still a lack of trust across business units to facilitate full data sharing.	Citizens can access a single place to register and enrol for digital services from multiple city organisations, and authenticate themselves to those services using a single secure method.	Citizens can choose to manage all of their digital engagements with the city through a single account, choosing from a range of assured public and private identity providers in order to authenticate themselves to the city. They have access to trusted arbitration if they are concerned about any breach to their privacy by the city.	As at Level 4. In addition, citizens can see and update their own data held by the city, and are able to use secure digital channels to see who in the city administration is using their data.	Level now: <input type="checkbox"/> Level in 2 years based on current plans: <input type="checkbox"/>

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2.2 Empowering the city community through city data

2.2.1 Enabling community innovation with city data	<p>Data about the city and city services is locked within individual systems, with no ability for others to access or use it to innovate and create new value.</p>	<p>Some initial steps have been taken towards opening up city data, but on an ad hoc basis by individual systems and services. There is no city-wide framework in place to establish ownership and control responsibilities for city data.</p>	<p>A clear city-wide policy has been established to open the city administration's data up in order to enable citizens, small business, community organisations and others to innovate and create new value with that data.</p> <p>A city data platform has been created to facilitate access to and re-use of open city data, underpinned by open standards that ensure data is easily discoverable, interoperable and reliable.</p>	<p>As at Level 3. In addition, the city data platform is now:</p> <ul style="list-style-type: none"> - enhanced with tools to facilitate exploration and experimentation with city data by application developers - systematically using feedback from data users to drive improvements in the quality and range of data provided through the platform. <p>A significant amount of city data is available through the platform.</p>	<p>As at Level 4. In addition, the city data platform not only makes available open data, but also provides a trusted space for users to share and innovate with non-open data sets in ways that comply with relevant regulation and are protective of personal privacy.</p> <p>Most city data is now available through the platform, which supports a flourishing 'city information market-place'.</p>
2.2.2 Growing the market for re-use of city data	<p>City data is only used by the business units that create and store the data.</p>	<p>Some initial steps have been taken to encourage re-use of city data by other organisations, but on an ad hoc basis.</p>	<p>The city administration has established a clear and effectively resourced programme of work aimed at encouraging and incentivising citizens, small businesses, universities, community organisations and others to innovate and create new value with city data.</p>	<p>As at Level 3. In addition, this program of work has developed to the point where it now includes:</p> <ul style="list-style-type: none"> - a clear 'fair trading policy, ensuring a level playing field between public, private and voluntary sector organisations that develop services based on city data - investment to pump-prime the market with seed-corn funding and/or incubation facilities to stimulate innovative application development using city data to solve city challenges 	<p>As at Level 4. In addition, the city administration has established a strong partnership with other major service providers and asset owners in the city (from the public, private and voluntary sectors), aimed at opening up their data sets also through city data platforms.</p>



2.3 Channels and access					
2.3.1 Digital inclusion	A significant set of citizens do not have the access, skills or trust needed to access services through digital channels, and no significant support is available to them from the city.	A significant set of citizens do not have the access, skills or trust needed to access services through digital channels. Some support is available to help them, but awareness and use of this support is limited.	Strategies are in place to ensure access to and use of digital channels by all customer segments. Targeted strategies for "hard to reach" groups of digital non-users are in place.	As at Level 3. In addition, these strategies are backed by significant city investment, which aims to use the benefits from future universal digital access to fund the costs of ensuring digital inclusion now	As at Level 4. In addition, this digital inclusion strategy for the city is developed and delivered through a multi-stakeholder partnership involving the city administration, the community and voluntary sectors, and the private sector.
2.3.2 Channel management	There is no overarching channel strategy in place for the city. The city has no overall view of the channels it uses to deliver its services, and the costs and service levels achieved through each. The city administration's services are delivered primarily through channels which are managed and branded by the city administration. Take-up of digital services is low.	A channel management strategy has been set by the city administration to ensure a joined-up approach to delivering services via the most appropriate and cost effective channels, with a focus on shifting customers into lower-cost digital channels wherever appropriate. However, relatively little progress has been made. Take-up of digital services is low.	A channel management strategy has been set by the city administration to ensure a joined-up approach to delivering services via the most appropriate and cost effective channels, with a focus on shifting customers into lower-cost digital channels wherever appropriate. Strategies are in place to ensure access to and use of digital channels by all customer segments, with adequate assisted digital provision for the digitally excluded.	As at Level 3. In addition, these strategies are underpinned by clear management information systems giving city leaders real-time information on the cost, performance and take-up of different channels for city services.	As at Level 4. In addition, integrated channel strategies with other city partners from the public, private and voluntary sectors are commonplace, with channel sharing and integrated, citizen-centric service delivery.

Level now:

Level in 2 years based on current plans:

Level now:

Level in 2 years based on current plans:

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3. Digital and physical resource management

3.1 Managing smart city developments and infrastructures

3.1.1 Citizen-centric development	<p>The planning of city developments and infrastructures is undertaken with minimal consultation and engagement with interested parties.</p>	<p>The planning of city developments and infrastructures is often undertaken with significant consultation and engagement with interested parties, but on an ad hoc basis.</p>	<p>Clear policy and planning frameworks have been established to ensure that all major physical developments and infrastructures in the city are</p> <ul style="list-style-type: none"> – rooted in an overall vision the future of the city that is clear, compelling and jointly owned by all interested parties – designed in partnership with citizens, businesses, service providers and community organisations so that they work well for the people who live in and use them. 	<p>As at Level 3. In addition, these policies are underpinned by effective governance processes and benchmarking aimed at ensuring compliance and driving continuous improvement.</p>	<p>As at Level 4. In addition, there is clear, publicly-available evidence of how the views of interested parties are shaping the development and implementation of the city's physical infrastructure, and feedback systems have been put in place to facilitate ongoing dialogue between interested parties about future plans</p>	<p>Level now: <input type="checkbox"/></p> <p>Level in 2 years based on current plans: <input type="checkbox"/></p>
3.1.2 Collaborative management of city assets	<p>Physical assets and infrastructures are managed in silos across the city.</p> <p>There is no clear map of what assets exist.</p> <p>No policies or processes have been established to ensure that synergies between city assets can be fully exploited.</p>	<p>The city administration has started to map out its physical assets and infrastructures.</p> <p>There are examples of initiatives to promote synergies between different assets, but on an ad hoc basis.</p>	<p>The city administration has developed a clear map of the physical assets and infrastructures it controls.</p> <p>It has established common, administration-wide asset management policies aimed at exploiting synergies between all assets controlled by the city administration³.</p> <p>Compliance with these policies is patchy however, and the city lacks the governance structures</p>	<p>As at Stage 3, the city administration has developed a clear map of the physical assets and infrastructures it controls and common asset management policies to exploit synergies between them.</p> <p>In addition, these policies are underpinned by effective governance processes and benchmarking aimed at ensuring compliance and</p>	<p>The city administration, in partnership with other major service providers and asset owners in the city (from the public, private and voluntary sectors), has a developed a clear map of the physical assets and infrastructures it controls.</p> <p>City partners are implementing common, city-wide asset management policies aimed at exploiting synergies between major city assets², underpinned by collaborative, cross-sectoral</p>	<p>Level now: <input type="checkbox"/></p> <p>Level in 2 years based on current plans: <input type="checkbox"/></p>

³ Such as: use of city assets developed for one purpose to deliver benefits against wider city objectives (eg use of street lights for Wi-Fi); collaborative installation and maintenance protocols; use of joint sensor networks to monitor the integrity and performance of the different infrastructures.

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			and incentives to drive compliance.	driving continuous improvement.	governance and benchmarking processes.	Level now: <input type="checkbox"/>
					The city actively explores and promotes the development of innovative business models and public private partnerships that enable the sharing and joint development of assets across organizational and sectoral boundaries.	Level in 2 years based on current plans: <input type="checkbox"/>
3.1.2 Integration of physical and digital assets	The city's physical assets are typically not digitally-enabled. There has been little investment in sensors and connectivity to deliver real-time digital data on the status and performance of city assets.	The city's physical assets are typically not digitally-enabled. There have been some initial investments in sensors and connectivity to deliver real-time digital data on the status and performance of city assets, but this has been managed on an ad hoc basis by individual asset owners.	Clear policy and planning frameworks have been established to ensure that all major physical developments and infrastructures in the city have digital assets and communications networks built into them from the start	As at Level 3. In addition, these policies are underpinned by effective governance processes and benchmarking aimed at ensuring compliance and driving continuous improvement.	As Level 4. In addition, there is clear evidence that on a widespread basis city leaders are now: <ul style="list-style-type: none"> - using digital modelling of the city to test and compare different options, evaluating their likely impact on the city - using digital visualisations to engage interested parties in more meaningful consultation and co-creation of city spaces - using analysis of real-time data on the status and performance of city assets to improve neighbourhood management and service delivery. 	Level now: <input type="checkbox"/> Level in 2 years based on current plans: <input type="checkbox"/>

3.2 Managing IT and data					
3.2.1 Mapping and management of city data assets	Data assets are managed in silos across the city. There is no clear map of what assets exist. No policies or processes have been established to ensure that they can interoperate with each other.	The city has started to map out its data assets. There are examples of initiatives to promote interoperability between specific systems, but on an ad hoc basis.	The city has started to map out its data assets, and to develop policies, processes and standards to encourage interoperability and reuse on a systematic basis. Compliance with these policies is patchy however, and the city lacks the governance structures and incentives to drive compliance.	The city administration and its suppliers have full transparency of the data assets that exist in the city. Clear leadership and collaborative governance processes have been established across the city administration to encourage interoperability and reuse on a systematic basis.	As at Level 4. In addition, these collaborative governance arrangements for data asset management have been opened up to include all major data users and suppliers across the city's data ecosystem. A broad cross-sectoral partnership of city organisations is committed to publishing and sharing data against common standards.
3.2.2 Mapping and management of city technology assets	Technology assets are managed in silos across the city. There is no clear map of what assets exist. No policies or processes have been established to ensure that they can interoperate with each other.	The city has started to map out its technology assets. There are examples of initiatives to promote interoperability between specific systems, but on an ad hoc basis.	The city has started to map out its technology assets, and to develop policies, processes and standards to encourage interoperability and reuse on a systematic basis. Compliance with these policies is patchy however, and the city lacks the governance structures and incentives to drive compliance.	The city administration and its suppliers have full transparency of the technology assets that exist in the city. Clear leadership and collaborative governance processes have been established across the city administration to encourage interoperability and reuse on a systematic basis.	As at Level 4. In addition, these collaborative governance arrangements for technology asset management have been opened up to include all major IT users and suppliers across the city's IT ecosystem.

Level now:

Level in 2 years based on current plans:

Level now:

Level in 2 years based on current plans:

<p>3.2.3 Open, service-oriented, city-wide IT architecture</p>	<p>The city's IT architecture is a mish-mash of unconnected systems, which use different technologies and standards and which do not easily interoperate. Each major system is designed in a bespoke way with significant costs involved with making changes not envisaged in the original design. This leads to significant duplication, with very limited re-use and sharing of IT and data assets.</p>	<p>There are some examples of IT and data asset sharing and re-use, but these are ad hoc and costly.</p>	<p>A comprehensive IT strategy and enterprise architecture has been established for the local authority, based on open standards, modular design and service-oriented architecture.</p> <p>A roadmap for transition towards this architecture has been established, and strong leadership and collaborative governance arrangements have been established to manage the transition</p>	<p>As at Level 3. In addition, the local authority manages all of its IT on a platform basis, with either:</p> <ul style="list-style-type: none"> • All of its business units sharing an integrated city platform; or • Widespread sharing and re-use of strategic IT and data assets between different parts of the local authority and its suppliers, based on interoperable systems and open standards. 	<p>As at Level 4. In addition, the local authority platform is now part of an open, service-oriented, city-wide IT architecture which:</p> <ul style="list-style-type: none"> • Brings together all major public and private sector suppliers of city services • Enables a significant degree of city-wide asset re-use and sharing, and facilitates service innovation across the ecosystem.
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Level now:

Level in 2 years based on current plans:

Maturity level

Dimension



4. Purposes of a sustainable community (as described in ISO 37106)					
Attractiveness	There is no clear strategy for enhancing the attractiveness the city. That is, city leaders have not explicitly identified the factors about the city that appeal to its citizens and to external parties such as visitors and investors. Actions to enhance these factors are ad hoc and fragmented, rather than planned and managed on an integrated city-wide basis.	City leaders have explicitly identified the factors about the city that appeal to its citizens and to external parties such as visitors and investors, and have developed a city-wide plan to enhance these factors.	As at Level 2. In addition, city leaders have baselined current performance against the key factors determining attractiveness, and established success criteria and trajectories for the changes that the city aims to deliver over time. The local authority has established city-wide accountability and governance structures to manage these improvements.	As at level 3. In addition, city leaders are actively tracking performance against key indicators of attractiveness, and have established clear processes for interested parties to give feedback. There is substantial community and authority buy-in, and there is demonstrable evidence that attractiveness is improving.	As at level 4. In addition, digital dashboards give all interested parties near real-time insight into city performance on key drivers of attractiveness. There is clear evidence that the city is evaluating the effectiveness of its policies to improve attractiveness and using the learning from this to drive continuous improvement– both within the community and across wider regional, national and international networks.
Preservation and improvement of environment	There is no clear strategy for preserving and improving the environment. That is, city leaders have not explicitly identified key priorities for improving environmental performance (including greenhouse gas emission; protection, restoration and enhancement of biological diversity and ecosystem services; reduced health hazard). Actions to address these issues are ad hoc and fragmented, rather than planned and managed on an integrated city-wide basis.	City leaders have explicitly identified key priorities for improving environmental performance of the city, and have developed a city-wide plan to deliver these improvements.	As at Level 2. In addition, city leaders have baselined current performance against their key priorities for improving environmental performance, and established success criteria and trajectories for the changes that the city aims to deliver over time. The local authority has established city-wide accountability and governance structures to manage these improvements.	As at Level 3. In addition, city leaders are actively tracking performance against key indicators of improved environmental performance, and have established clear processes for interested parties to give feedback. There is substantial community and authority buy-in, and there is demonstrable evidence that environmental performance is improving.	As at Level 4. In addition, digital dashboards give all interested parties near real-time insight into city performance on key priorities for environmental performance. There is clear evidence that the city is evaluating the effectiveness of its policies to preserve and improve the environment and using the learning from this to drive continuous improvement – both within the community and across wider regional, national and international networks.

Level now:

Level in 2 years based on current plans:

Level now:

Level in 2 years based on current plans:

Resilience	<p>There is no clear strategy for ensuring the resilience of the city to crises and external shocks. Actions to improve resilience are ad hoc and fragmented, rather than planned and managed on an integrated city-wide basis. Crisis management is based on risk assessment for the city that is fragmented and incomplete. Critical infrastructure providers operate independently of each other, and a disruption to one critical infrastructure can have cascading effects across others.</p>	<p>City leaders have developed a resilience action plan based on a holistic risk assessment, including identification of inter-dependencies between critical infrastructures.</p>	<p>As at Level 2. In addition, this resilience action plan is now underpinned by a formalized resilience management process. Leading and lagging indicators of resilience are identified and monitored.</p>	<p>As at Level 3. All relevant interested parties are fully engaged in delivery, monitoring and continuous improvement of the resilience action plan through collaborative and participative governance processes, and understand the benefits to them. There is demonstrable evidence that resilience is improving.</p>	<p>As at Level 4. In addition, digital dashboards give all interested parties near real-time insight into city performance on key priorities for resilience. There is clear evidence that the city is evaluating the effectiveness of its policies to enhance resilience and using the learning from this to drive continuous improvement – both within the community and across wider regional, national and international networks.</p>	<p>Level now: <input type="checkbox"/></p> <p>Level in 2 years based on current plans: <input type="checkbox"/></p>
Responsible resource use	<p>There is no clear strategy for using resources more responsibly. That is, city leaders have not explicitly identified key priorities for improving resource use (including land management; reduction, re-use and recycling of materials; sustainable production, storage and distribution). Actions to address these issues are ad hoc and fragmented, rather than planned and managed on an integrated city-wide basis.</p>	<p>City leaders have explicitly identified key priorities for improving resource use in the city, and have developed a city-wide plan to deliver these improvements.</p>	<p>As at Level 2. In addition, city leaders have baselined current performance against their key priorities for improving resource use, and established success criteria and trajectories for the changes that the city aims to deliver over time. The local authority has established city-wide accountability and governance structures to manage these improvements.</p>	<p>As at Level 3. In addition, city leaders are actively tracking performance against key indicators of responsible resource use, and have established clear processes for interested parties to give feedback. There is substantial community and authority buy-in, and there is demonstrable evidence that environmental performance is improving.</p>	<p>As at Level 4. In addition, digital dashboards give all interested parties near real-time insight into city performance on key priorities for resource use. There is clear evidence that the city is evaluating the effectiveness of its policies to preserve and improve the environment and using the learning from this to drive continuous improvement – both within the community and across wider regional, national and international networks.</p>	<p>Level now: <input type="checkbox"/></p> <p>Level in 2 years based on current plans: <input type="checkbox"/></p>
Social cohesion	<p>There is no clear strategy for social cohesion. That is, city leaders have not explicitly identified:</p> <ul style="list-style-type: none"> • The key groups who are at risk of exclusion from full participation in city life, because of for example social or ethnic background, gender, age or and disability. 	<p>City leaders have explicitly identified key priorities for improving social cohesion, and have developed a city-wide plan to deliver these improvements.</p>	<p>As at Level 2. In addition, city leaders have baselined current performance against their key priorities for improving social cohesion, and established success criteria and trajectories for the changes that the city aims to deliver over time. The local authority has established city-wide accountability and</p>	<p>As at Level 3. In addition, city leaders are actively tracking performance against key indicators of social cohesion, and have established clear processes for interested parties to give feedback. There is substantial community and authority buy-in, and there is demonstrable evidence that</p>	<p>As at Level 4. In addition, digital dashboards give all interested parties near real-time insight into city performance on key priorities for social cohesion. There is clear evidence that the city is evaluating the effectiveness of its policies to preserve and improve the environment and using the learning from this to drive continuous improvement – both within the</p>	<p>Level now: <input type="checkbox"/></p> <p>Level in 2 years based on current plans: <input type="checkbox"/></p>

	<ul style="list-style-type: none"> The barriers to and drivers of greater social cohesion across all groups in the community. <p>Actions to promote social cohesion are ad hoc rather than planned and managed on an integrated city-wide basis.</p>		governance structures to manage these improvements.	environmental performance is improving.	community and across wider regional, national and international networks.
Wellbeing	<p>There is no clear strategy for promoting wellbeing. City leaders have not explicitly identified the key factors that drive the overall wellbeing of the city's residents (such as access to opportunities; creativity, education; happiness; healthy environment; human capital improvement; liveable city; prosperity; quality of life; security; self-confidence; welfare). Actions to address these issues are ad hoc and fragmented, rather than planned and managed on an integrated city-wide basis.</p>	<p>City leaders have explicitly identified key priorities for improving wellbeing in the city, and have developed a city-wide plan to deliver these improvements.</p>	<p>As at Level 2. In addition, city leaders have baselined current performance against their key priorities for improving wellbeing, and established success criteria and trajectories for the changes that the city aims to deliver over time. The local authority has established city-wide accountability and governance structures to manage these improvements.</p>	<p>As at Level 3. In addition, city leaders are actively tracking performance against key indicators of wellbeing, and have established clear processes for interested parties to give feedback. There is substantial community and authority buy-in, and there is demonstrable evidence that environmental performance is improving.</p>	<p>As at Level 4. In addition, digital dashboards give all interested parties near real-time insight into city performance on key priorities for resource use. There is clear evidence that the city is evaluating the effectiveness of its policies to preserve and improve the environment and using the learning from this to drive continuous improvement – both within the community and across wider regional, national and international networks.</p>

Level now:

Level in 2 years based on current plans:

Annex B

(informative)

How ISO standards help communities address each dimension of the MMSSC

MMSSC dimension	Sub-dimension	Relevant supporting standards
Purposes	Overall	<ul style="list-style-type: none"> • <i>ISO 37101</i> sets out a management system for communities that commit to the sustainable development of their territories, targeted on the six purposes. • <i>ISO 37104</i> provides more detailed operational guidance on how cities and other urban communities can apply the general requirements of <i>ISO 37101</i>. It provides practical guidance to all types of cities on initiating, planning, implementing, measuring and managing sustainable development activities in a way that is both inclusive and holistic.
	Attractiveness	<ul style="list-style-type: none"> • <i>ISO 37104</i> provides detailed guidance on how to: identify the issues that impact on a city's attractiveness; undertake a baseline review of these issues; define strategy for the future; establish and implement the action plan; and then deploy performance evaluation and continuous improvement.
	Preservation and improvement of the environment	<ul style="list-style-type: none"> • <i>ISO 37104</i> provides detailed guidance on how to: identify the issues that impact on preservation and improvement of a city's environment; undertake a baseline review of these issues; define strategy for the future; establish and implement the action plan; and then deploy performance evaluation and continuous improvement
	Responsible resource use	<ul style="list-style-type: none"> • <i>ISO 37104</i> provides detailed guidance on how to: identify the issues that impact on responsible resource use in a city; undertake a baseline review of these issues; define strategy for the future; establish and implement the action plan; and then deploy performance evaluation and continuous improvement.
	Resilience	<ul style="list-style-type: none"> • <i>ISO 37104</i> provides detailed guidance on how to: identify the issues that impact resilience use in a city; undertake a baseline review of these issues; define strategy for the future; establish and implement the action plan; and then deploy performance evaluation and continuous improvement.
	Social cohesion	<ul style="list-style-type: none"> • <i>ISO 37104</i> provides detailed guidance on how to: identify the issues that impact on social cohesion use in a city; undertake a baseline review of these issues; define strategy for the future; establish and implement the action plan; and then deploy performance evaluation and continuous improvement.
	Well-being	<ul style="list-style-type: none"> • <i>ISO 37104</i> provides detailed guidance on how to: identify the issues that impact on wellbeing in a city; undertake a baseline review of these issues; define strategy for the future; establish and implement the action plan; and then deploy performance evaluation and continuous improvement.
Strategy management	City vision	<ul style="list-style-type: none"> • <i>ISO 37104</i> provides guidance on how to develop a vision, strategy and action plan for a city that is aligned with local needs and the UN Sustainable Development Goals.

		<ul style="list-style-type: none"> • <i>ISO 37106</i> provides guidance (in <i>Sub-component [B1] City vision</i>) on ensuring that the city vision is fully informed by the opportunities opened up by smart technologies, smart data and smart collaboration.
	Leadership and governance	<ul style="list-style-type: none"> • <i>ISO 37104, Clause 5</i>, provides guidance on achieving political commitment for sustainable development, and establishing the leadership, responsibilities, organization and capacity building that is required. • <i>ISO 37106</i> provides guidance (in <i>Sub-component [B2] Leadership and Governance</i>) on ensuring open and collaborative governance across the multi-stakeholder partnerships needed for an effective smart city operating model.
	Collaborative engagement	<ul style="list-style-type: none"> • <i>ISO 37106 (Sub-component [B3] Collaborative engagement)</i> provides guidance on how to manage inclusive, collaborative and digitally-enabled engagement with all interested parties.
	Procurement and supplier management	<ul style="list-style-type: none"> • <i>ISO 37106 (Sub-component [B4] Procurement and supplier management)</i> provides guidance on how cities can use their purchasing power and supporting processes to enable faster innovation and service transformation across the city.
	Benefit realization	<ul style="list-style-type: none"> • <i>ISO 37106 (Sub-component C)</i> provides guidance on how cities can use <i>benefit mapping, benefit tracking</i> and <i>benefit delivery</i> best practices to ensure that all of their activities and investments deliver maximum impact against the key policy outcomes targeted by city leaders. • <i>ISO 37104 (Clause 4.5)</i> provides guidance on how such approaches can best be applied in the context of performance evaluation and continuous improvement of a management system for sustainable development. • <i>ISO 37120</i> sets out a common core of key performance indicators for cities to use within their impact evaluation and benefit realization work on city services and quality of life • <i>ISO 37122</i> and <i>ISO 37123</i> supplement <i>ISO 37120</i> with additional indicators relevant to, respectively, smart cities and resilient cities.
Citizen-centric service management	Delivering integrated, citizen-centric services	<ul style="list-style-type: none"> • <i>ISO 37106 (Sub-component B9 Delivering integrated citizen-centric services)</i> provides guidance on how multiple silo organizations across the city can collaborate to provide integrated, citizen-centric services. Key themes are agile and participatory service development and integrated one-stop service delivery. • <i>ISO 37106 (Sub-component B10 Identity and privacy management)</i> provides guidance on the integrated and citizen-centric approaches to privacy protection and identity management that are needed to support such a transformation.
	Empowering the city community through city data	<ul style="list-style-type: none"> • <i>ISO 37106 (Sub-component B8 Empowering the city community through city data)</i> provides guidance on city platforms for open and shared data, and on how to grow the market for re-use of city data to nurture open innovation across the city.
	Channels and access	<ul style="list-style-type: none"> • <i>ISO 37106 (Sub-component B11 Digital inclusion and channel management)</i> provides guidance on how to make maximum use of digital channels for city services while fully engaging with and meeting the needs of those groups at risk of digital exclusion.

Digital and physical resource management	Managing smart city developments and infrastructures	<ul style="list-style-type: none"> • ISO 37106 (<i>Sub-component B12 Managing smart city developments and infrastructures</i>) provides guidance on citizen-centric development of the built environment, collaborative management of city assets across organizational and sectoral boundaries; and on integration of digital and physical assets in the city. • ISO/TR 37152 gives more detailed guidance on planning, development, operation and maintenance of infrastructures in ways that harmonize them as part of a smart community and ensure that the interactions between multiple infrastructures are well orchestrated. • ISO/TS 37151 sets out principles and requirements for measuring how smart community infrastructure can support such an integrated citizen-centric approach
	Managing IT and data	<ul style="list-style-type: none"> • ISO 37106 (<i>Sub-component B13 IT and data resource mapping and management</i>) provides guidance on how the city can take an integrated approaching to managing technology and data assets. • ISO 37106 (<i>Sub-component B14 Open, service-oriented, city-wide IT architecture</i>) provides guidance on how such integrated approaches can over time establish the city as an open and interoperable platform for innovation. • ISO/30145 describes a Smart City ICT Reference Framework, mapping out how ICT supports smart cities - including the detailed engineering architecture that supports delivery of the 'Open, service-oriented, city-wide IT architecture' described at high level in the MMSSC. • Further detailed guidance on service-oriented architecture is given in ISO/IEC 18384-2 • Detailed advice on smart city terminology and reference models is available in ISO/IEC 30182 and ISO 37100.

Annex C
(informative)
Links between MMSSC and ISO 18901

Clause 5.3 of this document describes how the MMSSC can be used in conjunction with the quality assurance matrix for the key functions of local government described in Annex B of ISO 18091. The table below gives more detail of which of these local government functions make the most direct contribution to achievement of the six purposes of a sustainable community assessed in the MMSSC.

ISO 37101 Purpose	ISO 18901 local government function
Attractiveness	<ul style="list-style-type: none"> • B.1.9: Rule of law prevails in local government territory • B.2.1: Promotion of innovative economic alternatives • B.2.2: Promotion of decent work opportunities • B.2.4: Promotion of local job training • B.2.5: Promotion of tourism • B.2.6: Responsible for sustainable mobility, communications routes and interconnection • B.3.10: Promotion of cultural and historic heritage preservation
Preservation and improvement of environment	<ul style="list-style-type: none"> • B.4.1: Air quality care • B.4.3: Care of the surrounding image • B.4.6: Care and responsible of water • B.4.7: Care and responsible of soil • B.4.8: Promotion of environmental education
Resilience	<ul style="list-style-type: none"> • B.1.6: Promotion of civil protection and emergency services • B.1.7: Systematic use of Information and Communication Technologies • B.1.12: Safety and security conscious • B.2.3: Responsible for food security
Responsible resource use	<ul style="list-style-type: none"> • B.4.2: Clean and responsible of waste • B.4.4: Care and responsible of natural resources • B.4.5: Effective land management system
Social cohesion	<ul style="list-style-type: none"> • B.1.4: Community engagement in public policies and programmes • B.1.10: Transparency and information access, integrity and social responsibility • B3.3: Promotion of social and ethnic inclusion • B3.4: Promotion of gender equality • B3.5: Responsible for the at-risk and vulnerable population • B.3.9: Promotion of civic education and a social responsible culture • B.3.11: Responsible for combating poverty
Wellbeing	<ul style="list-style-type: none"> • B.3.1: Provision of public services • B.3.2: Promotion of sports, recreation and social sector development • B3.6: Promotion of public health • B3.7: Promotion of quality basic education • B.3.8: Promotion of decent housing

Bibliography

[To be completed]