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Sustainable cities and communities — Indicators for resilient cities

Villes et communautés territoriales durables — Indicateurs de performance pour les villes résilientes

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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 of 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 www.iso.org/iso/foreword.html.

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

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Cities need indicators to establish their baseline, and measure and evaluate their performance. However, existing indicators are often not standardized, consistent or comparable over time or across cities. To address these challenges, a new series of International Standards is being developed to provide standardized indicators that enable a uniform approach to what is measured, and how that measurement is to be undertaken.

The first standard in this series, ISO 37120, has quickly become the international reference point for sustainable city indicators. While ISO 37120 contains a number of indicators of relevance to a city's resilience planning and assessment, the need for additional indicators for resilient cities has been identified, reflected in this document, as has the need for additional indicators for smart cities, developed in ISO 37122.

A resilient city is able to prepare for, recover from and adapt to shocks and stresses. Cities are increasingly confronted by shocks, including extreme natural or human-made events which result in loss of life and injury, material, economic, and/or environmental losses and impacts. These shocks can include but are not limited to floods, earthquakes, hurricanes, wildfires, volcanic eruptions, pandemics, chemical spills and explosions, terrorism, power outages, financial crises, cyber-attacks and conflicts. A resilient city is also able to manage and mitigate ongoing human and natural stresses in a city relating to environmental degradation (e.g. poor air and water quality), social inequality (e.g. chronic poverty and housing shortages) and economic instability (e.g. rapid inflation and persistent unemployment) that cause persistent negative impacts in a city.

A city's preparedness can be characterized by developing a detailed understanding of the risks to the city, by taking action to reduce vulnerability and exposure, and by enhancing the awareness and participation of individuals, households and businesses.

A resilient city is able to recover from shocks and stresses in a timely and efficient manner, with a focus on ensuring the continuity or rapid restoration of city services such as electricity, water, telecommunications, waste management, sanitation, food distribution, financial services and access to emergency services.

A resilient city is also a city that understands the necessity to adapt its systems and processes to ensure that they are as robust as possible in the face of shocks and stresses, building back better following extreme events, while focusing on the goal of restoring and ensuring long-term prosperity.

Resilience is both a core component and an essential enabler of sustainable development. This document is focused on resilience measurement as a major contribution to the sustainability of a city. The structure of the family of city indicators standards for sustainable cities and communities reflects this relationship between sustainable development, resilient development and smart development (see Figure 1).

Progress and transformation towards sustainable development through maintaining and improving city services and quality of life in the face of shocks and stresses is a core component of a resilient city. This document is therefore intended to be implemented in conjunction with ISO 37120.

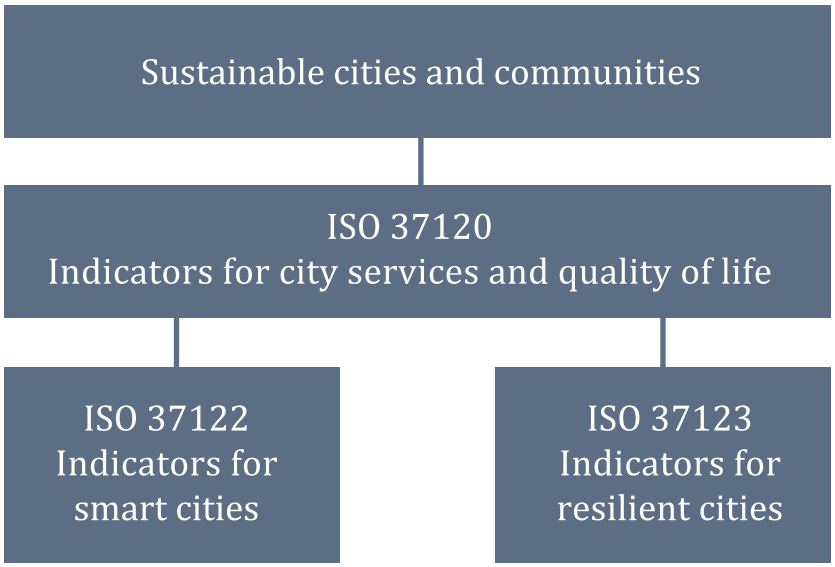

Figure 1 — Sustainable cities and communities — Relationships within the family of city indicators standards

The indicators in this document have been selected to make reporting as simple and inexpensive as possible, and therefore reflect an initial platform for reporting. The indicators have been developed to help cities:

a) prepare for, recover from and adapt to shocks and stresses;

b) learn from one another by allowing comparison across a wide range of performance measures, and by sharing good practices.

The indicators in this document can be used to track and monitor progress towards a resilient city, through the development of a city resilience strategy or when applying a city management system such as ISO 37101. While the indicators are structured around ISO themes that correspond to different sectors and services provided by cities, it is noted that the indicators can also be organized according to the risk management process (Annex B), the disaster management process (Annex C), the Sustainable Development Goals and the Sendai Framework for Disaster Risk Reduction (Annex D) and the ISO 37101 issues and purposes (Annex E). Furthermore, the typologies of hazards (Annex A) can assist cities in identifying the potential hazards that they face, which is relevant to many of the indicators contained in this document. It is also provided as a guide for helping identify peer cities facing similar hazards.

This document will support any and all global agreements that support sustainability and resilience. Agreements currently in place include, but are not limited to: the Sendai Framework for Disaster Risk Reduction[22], the New Urban Agenda, the 2030 Agenda (i.e. the United Nations Sustainable Development Goals[27]) and the Paris Agreement.

A city which conforms to this document does so in regard to measurement of indicators for city resilience in conformity with the definitions and methodologies as set out in this document, and may only claim conformity to that effect. This document does not provide a value judgement, threshold or target numerical value for the indicators, therefore conformity with this document does not confer a status in this regard.

It is acknowledged that cities may not have direct influence or control over factors governing some of these indicators, but the reporting is important for meaningful comparison and provides a general indication of resilience.

In this document, the following verbal forms are used:

— “shall” indicates a requirement;

— “should” indicates a recommendation;

— “may” indicates a permission;

— “can” indicates a possibility or a capability.

The terminology used within this document is outlined in the United Nations General Assembly (UNGA) Terminology Document, available at https://www.preventionweb.net/files/50683_oiewgreportenglish.pdf

Sustainable cities and communities — Indicators for resilient cities

1 Scope

This document defines and establishes definitions and methodologies for a set of indicators on resilience in cities.

This document is applicable to any city, municipality or local government that undertakes to measure its performance in a comparable and verifiable manner, irrespective of size or location. Maintaining, enhancing and accelerating progress towards improved city services and quality of life is fundamental to the definition of a resilient city, so this document is intended to be implemented in conjunction with ISO 37120.

This document follows the principles set out in ISO 37101, and can be used in conjunction with this and other strategic frameworks.

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 37101, *Sustainable development in communities — Management system for sustainable development — Requirements with guidance for use*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 37101 and ISO 37120 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
critical infrastructure
physical structures, facilities, networks and other assets which provide services that are essential to the social and economic functioning of a community or society

Note 1 to entry: Examples of critical infrastructure can include, but are not limited to, power generation, transmission and distribution, water treatment, distribution and drainage, wastewater and storm water infrastructure, transportation, gas supply and distribution, telecommunications infrastructure, educational facilities, hospitals and other health facilities.