INTERNATIONAL ISO

First edition
2017-12

Smart community infrastructures — Maturity model for assessment and improvement

Infrastructures communautaires intelligentes — Modèle de maturité pour l'évaluation et l'amélioration

Reference number
ISO 37153:2017(E)

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Foreword

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

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

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

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

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

This document was prepared by Technical Committee ISO/TC 268, *Sustainable cities and communities*, Subcommittee SC 1, *Smart community infrastructures*.

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".

According to the SDGs, cities and communities are well positioned as "hubs for idea, commerce, culture, science, productivity, [and] social development." At the same time, cities, which are growing rapidly in many parts of the world, are facing a number of challenges in meeting the needs of their citizens in an equitable and sustainable way.

As urban populations grow, the demand for community infrastructures such as energy, water, transportation, waste, and information and communications technology (ICT) will also continue to grow in the coming decades, driven by major trends such as population growth and increased urbanization. According to the report "Infrastructure 2030" by the Organization for Economic Cooperation and Development (OECD), total cumulative infrastructure investment requirements — for new and improvements to existing community infrastructure — will be approximately $53 trillion (USD) over the next two decades (2010 to 2030).

The appropriate development of community infrastructure is fundamental to supporting the operations and activities of communities, while helping communities overcome urban challenges and make progress in supporting all 17 of the SDGs. It can also play an important role in helping communities overcome urban challenges. In addition to providing a high quality of service to support a decent standard of living for all city residents, community infrastructure should also be economically efficient and endeavour to reduce the environmental impact of urban activity.

In order for communities to develop community infrastructure efficiently, and in a manner that will enable continual improvements in all aspects of performance, it is helpful to have a tool to gauge the current level of maturity of community infrastructure relative to desired future improvements. For such a process, a maturity model is widely recognized as an efficient and effective tool. A maturity model describes the practices and processes needed at each level to reliably and sustainably achieve a corresponding level of desired performance. For example, the capability maturity model (CMM) as presented in the ISO/IEC 15504 series performs this function in the field of software development. Documents such as ISO 18091 and ISO 37101 also promote a CMM-like framework for local governments or communities.

This document describes a community infrastructure maturity model (CIMM) and a standardized approach for the assessment and improvement using the CIMM. The CIMM aids all stakeholders to understand the level of performance, process and interoperability of community infrastructure and their contribution to the community, helps them in setting targets for improvement that will guide investments and helps them to identify gaps in current levels of community infrastructure.

The CIMM can be expressed conceptually as a series of levels, each of which builds off the levels shown in Figure 1. The details are described in Clauses 4 and 5.

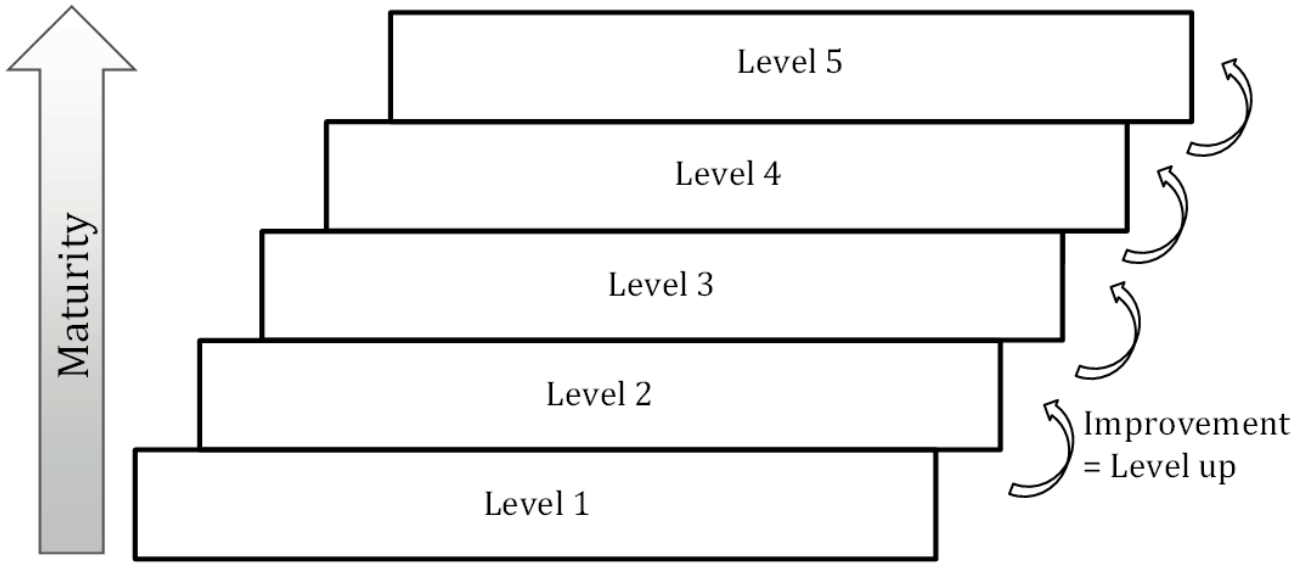

Figure 1 — Conceptual expression of community infrastructure maturity model (CIMM)

To promote continual improvements, it is important to make decisions based on a systematic overall picture of the characteristics of community infrastructure. Therefore, this document provides a systematic framework for assessment, the CIMM, which includes the five reference levels of maturity in each of the characteristics of the community infrastructure.

An assessment using the CIMM could be used to compare different communities but can also be used to make a comparison between the current and future states of infrastructure in a single community by defining the object and scope of the assessment. For example, in the "Plan-Do-Check-Action (PDCA)" cycle of development of community infrastructure, this document could be particularly helpful in the "Plan" and "Check" phases, helping users to assess the current performance, process and interoperability, and to check progress toward achieving desired improvements.

More specifically, this document supports the following stakeholders:

— citizens
  — to improve their quality of life;
— owners of community infrastructure
  — to identify which performance characteristics of the infrastructure should be prioritized;
  — to identify what technical performance aspects should be given priority for improvement;
— suppliers of community infrastructure
  — to determine which community infrastructure products will meet the specified requirements;
  — to identify directions for the development of future community infrastructure products and services;
— operators of community infrastructure
  — to determine the current performance of the community infrastructure they operate;

  - to determine the appropriate performance improvement processes;

- investors
  - to determine which types of infrastructure investments will best meet the desired level of performance;
- city planners or government decision makers
  - to assess city planning and identify which infrastructure to prioritize;
- all stakeholders
  - to ensure investment in community infrastructure that maximizes performance and minimizes life-cycle costs;
  - to promote the harmonization of the needs of residents, community managers and the environment;
  - to promote the sustainable development and resilience of communities.