

ISO-TR-/DTR 37112

ISO/TC 268/ANG4

Secretariat: AFNOR

Date: 16 August 2023-10-26

**Sustainable cities and communities — ~~Good practice case~~
— Case studies in how smart city operating models support an
effective public-health emergency response**

DTR *Villes et communautés territoriales durables — Études de cas sur la façon dont les modèles
d'exploitation des villes intelligentes soutiennent une réponse d'urgence efficace en matière de santé
publique*

ISO/DTR 37112

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FDIS stage

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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

Dealing with public health emergencies and eliminating their impact on sustainable development has become a common challenge for all countries in the world globally. In recent years, the pandemic/epidemic of Ebola virus disease (EVD) in West Africa, the Middle East respiratory syndrome (MERS), Zika virus disease and new crown pneumonia and COVID-19, have caused severe consequences to countries around the world. This has critically challenged the public health emergency management (PHEM) systems of many countries, especially developing countries. Eliminating the impact of sudden public health events is an important goal for achieving sustainable development globally.

The rapid development of the Internet, Internet of Things, Artificial Intelligence, Cloud Computing, 5G broadband cellular networks and other information and communication technologies is accelerating change across the economy and society at large. In smart cities and communities, new network facilities, new data environments, and new technology applications offer the potential to transform the effectiveness of PHEM enabling. This enables monitoring and analysis, virus tracing, prevention and control treatment, resource allocation and other aspects of public health emergencies to be managed with a faster response speed, with more efficient and transparent reporting systems, and more effective medical, social and economic outcomes.

Equally, however, it is clear that However, technology can only make a difference when accompanied by innovative ways of working: (e.g. smart governance processes), supported by interoperable standards, that enable organizations to collaborate in new ways to:

- deliver integrated action, rapidly and at scale;
- engage the public in new and more interactive forms of communication and participation; and
- do this through partnership across the public sector and private sector, and collaboration across local, regional, national and international levels of government.

This Technical Report document is intended to inform the development of future international standards in this area on how community authorities can effectively plan and deliver this sort kind of smart PHEM, by drawing together and analysing best practice case studies on how cities around the world have responded to the COVID-19 pandemic.

The Technical Report This document has been developed by an ad hoc group bringing together members of the ISO/TC 268 and the IEC Smart Cities Systems Committee (IEC SyC SC). Case studies were gathered by national standards organizations, using an information-gathering framework aligned with the Smart City Use Case framework previously developed by IEC SyC SC; and interviews were held with senior representatives from each city to explore lessons learned and refine the case study studies in more detail.

Sustainable cities and communities — Case studies in how smart city operating models support an effective public-health emergency response

1 Scope

This ~~draft Technical Report~~document identifies good ~~practices~~practice case studies of smart city responses to COVID-19 through the use of smart technologies, smart data, smart decision-making and smart ways of working. In particular, it aims to demonstrate how the principles for smart city operating models recommended in ISO 37106 can deliver improved outcomes in public-health emergency management (PHEM), at every stage of the command-and-control process for emergency management and incident response set out in ISO 22320.

~~The Technical Report~~This document is intended to inform ~~development of a future International Standard (ISO 37113) recommending~~,¹ which recommends a framework of good practices that can be used in responding to future public-health emergencies.

2 Normative references

There are no normative references in this document.

2.3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

- IEC Electropedia: available at <http://www.electropedia.org/>
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3.1 General

3.1.1

open data

data available without restrictions from copyright, patents or other mechanisms of control or costs, regardless of access, or use

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[SOURCE: ISO 37110:2022, 3.1]

¹ Under development. Stage at the time of publication: ISO/DIS 37113.

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2.13.2 Terms relating to Public-health emergencies

3.2.1

public-health emergencies (PHEs) emergency

PHE

sudden occurrence of major infectious diseases, diseases of unknown causes, major food and occupational poisoning and other events that seriously affect public health that cause or ~~may~~ cause serious damage to public health-

3.2.2

public-health risks-risk

A likelihood of an event that ~~may~~ adversely affect the health of human populations, with an emphasis on one which ~~may~~ spread internationally or ~~may~~ present a serious and direct danger-

3.2.3

public-health emergency management

~~(PHEM)~~

overall approach to preventing ~~PHEs~~ a public-health emergency (PHE) and managing those that occur

NOTE—Note 1 to entry: In general, PHEM utilizes a risk-management approach to prevention, preparedness, response and recovery before, during and after ~~either~~ potentially destabilizing ~~and~~ or disruptive events, ~~or both~~.

3.4 Case study framework: — Smart city approaches to management of COVID-19

This ~~technical report~~ document supports the United Nations Sustainable Development Goals (UN SDGs) of making cities and human settlements inclusive, safe, resilient, and sustainable, and is an enabler for all six strategic purposes of a sustainable community described in ISO 37101. ~~ISO has been working with cities around the world to identify~~ It identifies good practices in how communities have smart technologies, smart data, smart decision-making and smart ways of working to improve the effectiveness of their response to COVID-19. The conceptual framework ~~that we have~~ used to explore these practices is illustrated in ~~Figure 1~~ Figure 1 below.

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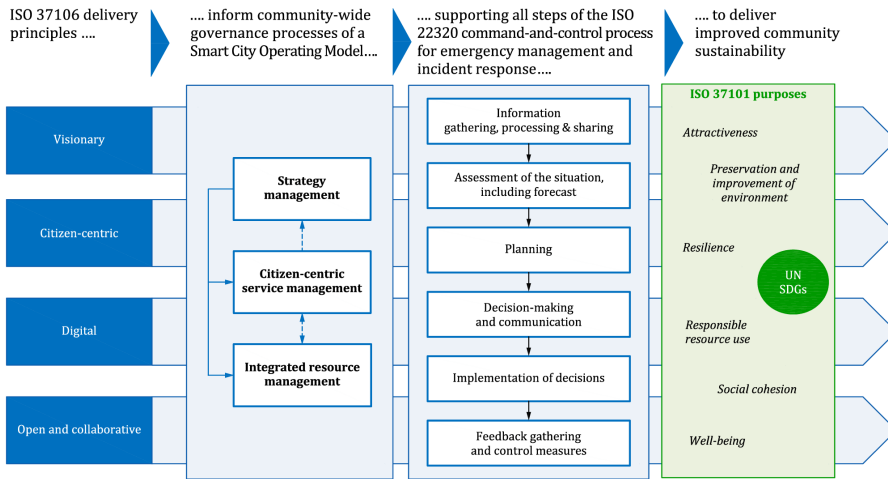
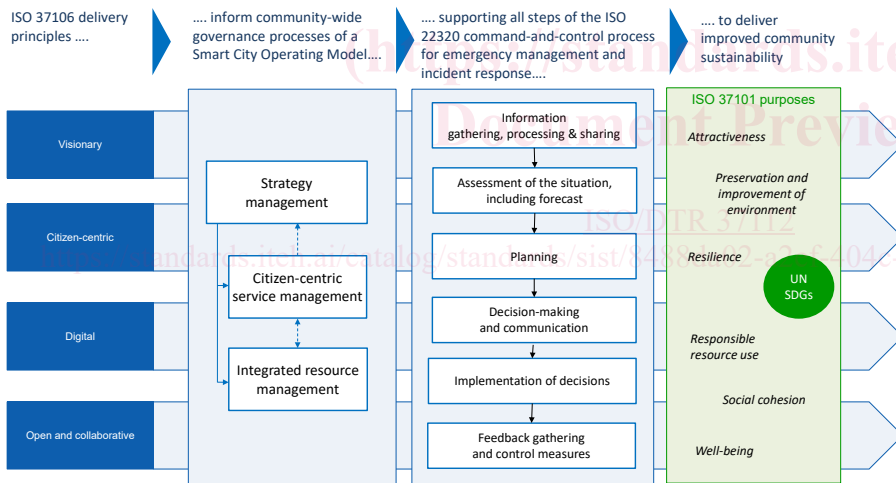


Figure 1 — Framework for Smart Public-Health Emergency Management (PHEM)



In particular, this ~~technical report~~ document:

a) Is informed by

- 1) the four delivery principles for a 'smart city operating model' described in ISO 37106:
 - i) establishing a clear, compelling and inclusive vision for the sustainable future of the community;
 - ii) taking a citizen-centric approach to all aspects of service design and delivery;
 - iii) enabling a ubiquitous, integrated and inclusive digitization of community spaces and systems;
 - iv) embedding openness and collaboration in the way the community works;
- 2) the smart city operating model described in ISO 37106, which enable cities to implement the above principles by addressing city-wide challenges of joining up across city silos, in three areas:
 - i) Strategy management: the key aspects of governance, planning roadmap development and decision-making that need to be managed at a whole-of-city level in order to provide effective responses to community-wide challenges
 - ii) Citizen-centric service management: the provision of public services for citizens and businesses that are built around user ~~need, accessible, inclusive~~ needs, accessibility, inclusivity and co-created with users.
 - iii) Integrated digital and physical resource management: ensuring that data on the performance and use of the community's physical, spatial and digital assets is available in real-time and on an interoperable basis, in order to enable real-time integration and optimization of city resources; and opening up community data (in secure and privacy-protective ways) in order to enable innovation by citizens, businesses and civil society.

b) Provides good practice case studies for community authorities on how these ISO 37106 delivery principles and smart city operating ~~Model~~ models can support more effective PHEM at each stage of the command-and-control process for emergency management and incident response set out in ISO 22320.

It is important to note that Although Figure 1 illustrates the ISO 22320 command-and-control process as a simplified, linear one, in practice it is a non-linear process with multiple feedback loops across multiple stakeholders, as illustrated at Figure 2 in Figure 2.

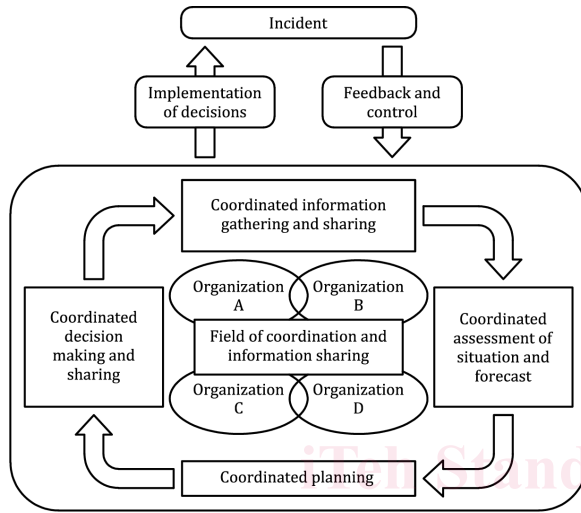
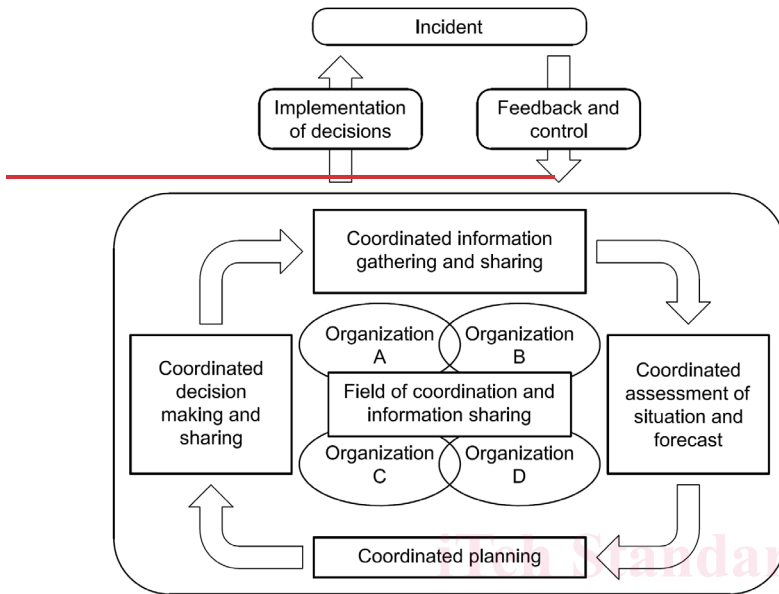


Figure 2 — Multiple stakeholder coordinated command-and-control process for emergency management and incident response

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Smart PHEM uses new technologies and new ways of working to help improve each step of this process, and to facilitate speedier and more effective collaboration across the wide range of stakeholders that need to be involved at each step. Case studies on how cities have done this during the COVID-19 pandemic are described below. The case studies were selected by ISO in collaboration with national standards organizations and through outreach to cities in collaboration with the IEC Smart Cities Systems Committee (IEC-SyC SC) and were documented in consultation with senior officials from the different cities.

4.5 Good practice cases across all phases of the ISO 22320 command-and-control process for emergency management

5.1 General

This section of the Technical Report clause highlights six good practice case studies. Each one focuses on a separate aspect of the ISO 22320 command-and-control processes for emergency management and incident response (as shown above in Figure 1) and demonstrates how the case study implements the ISO 37106 principles of visionary, citizen-centric, digital, and open and collaborative.