International Standard

ISO 16481

Sustainable mobility and transportation — Digital governance — Strategic needs regarding ISO 37101 purposes of sustainability

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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 document 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).

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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*, Subcommittee SC 2, *Sustainable mobility and transportation*.

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.

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Introduction

0.1 General

This document aims at structuring the needs and specifying the digital governance capabilities on a mobility system to make it more sustainable.

It supports mobility stakeholders and especially transport authorities in the emergence and the realization of contributive solutions to the objectives of sustainability described in ISO 37101.

This document is the first of an intended set composed of the following documents:

— ISO 16481: to build a vision about the functional and environmental needs on systems composing the mobility system;

— ISO 16483: to identify and standardize the metrics that will help define strategic goals and quantify the evolution of the sustainable mobility system;

— and a forthcoming document dealing with mobility data framework.

A sustainable mobility system is a complex system combining multiple mobility systems. Mobility data governance is the cornerstone of the capabilities of such a system: standardizing data semantics, data services and data exploitation rules are among the key topics of the proposal.

This set of International Standards contributes directly to reducing energy consumption and air pollution from mobility. It introduces a systemic approach on sustainable mobility of a city or a territory.

This is unprecedented and complements the numerous standard initiatives that contribute to specific aspects of mobility solutions. These International Standards can guide transport authorities to translate sustainability ambitions into concrete plans, helping to define the associated mobility policies. It also defines the common rules among the co-existing systems of the mobility system. Once defined, this allows the systemic governance of the mobility system to implement strategic choices. For example, all measures creating directly or indirectly energy savings and air pollution, as well as improving resilience of the solutions, are described and leverages are given for decision makers to make well-based choices.

From the guidance of the purposes of sustainable cities and territories, especially "Preservation and improvement of environment", "Resilience" and "Responsible resource use", the contribution of mobility is analysed and associated needs are identified. Relevant actions levers are used to specify mechanisms and behaviours on the systems composing the mobility system.

Thus, the use of this International Standard set, starting with ISO 16481, aims at helping transport authorities in implementing their sustainability strategies and implement a governance able to handle the complexity of a mobility system.

This document deals with the strategic needs of digital governance for sustainable mobility. It is organized in two parts.

0.2 Use-case of part 1

The first part presents the links between the sustainability purposes and issues of the ISO 37101 and mobility needs:

It introduces the high-level needs of a sustainable mobility system.

This part of the document supports the transport authorities of an urban area to build a vision about the functional, social and environmental needs on the systems composing the mobility system to develop sustainability. Examples of users of this standard are detailed in Annex B.

— First, the users of this standard should apply the recommendations described in 4.1 to prepare the assessment and evolution plans of the mobility system. In later stages, this document also aims at providing support to the organizations adapting their governance to a mobility becoming more digital.

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— Second, the users should apply the process described in 4.2 to assess the sustainability purposes and issues and define/ challenge the ambitions of the territory.

0.3 Use-case of part 2

The second part translates the high-level needs on the mobility system to high-level needs on digital systems that are involved in sustainable mobility, named “High-level digital needs" afterwards.

The high-level digital needs per the sustainability purposes of Clause 5 and the ones per the mobility systems of Clause 6 help in specifying or designing systems contributing to the mobility system. This approach provides a way to check that key digital features have been well covered and are consistent with the overall strategic sustainable mobility plan of the territory.

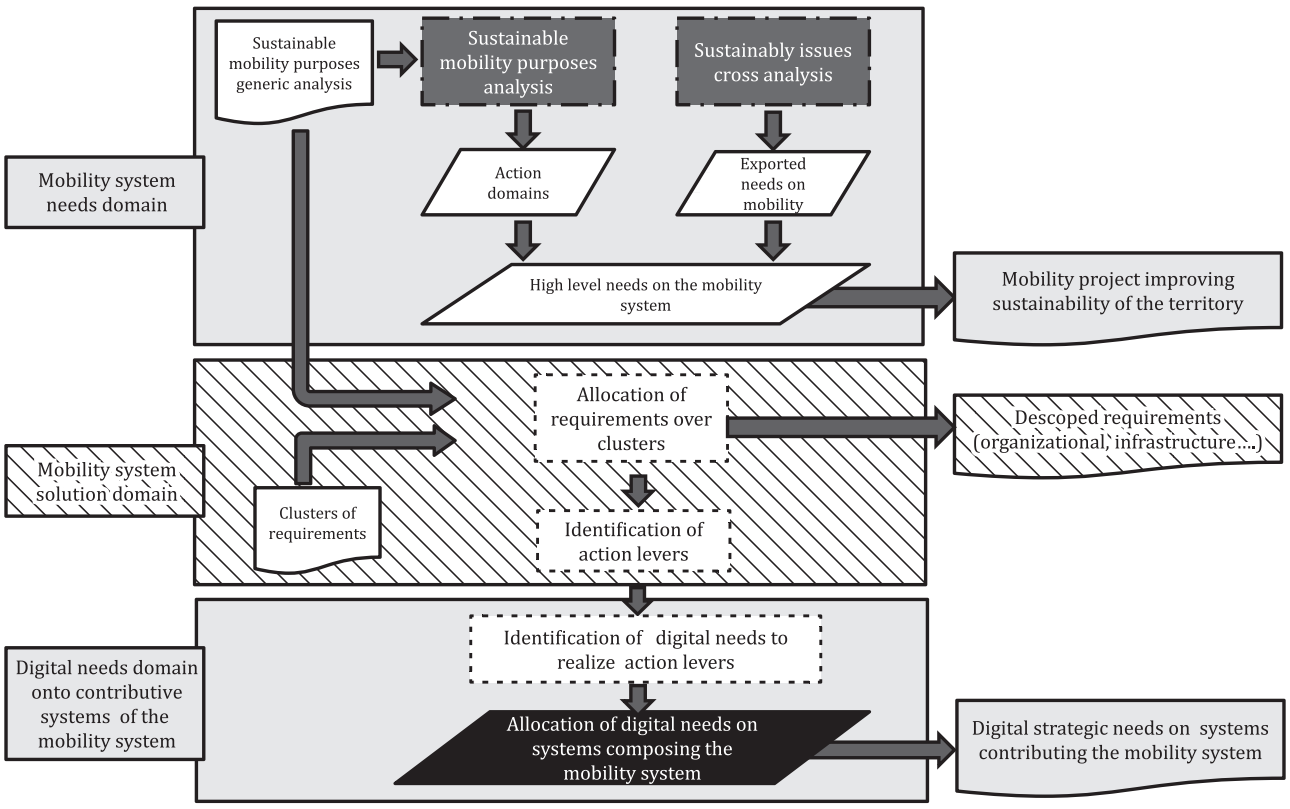
0.4 Introduction to the backbone of this document

Figure 1 below represents the structure of this document.

This document uses two generic analyses:

— The first one is labelled “Sustainable mobility purposes generic analysis”, it identifies sustainability mobility issues associated to sustainability purposes of the ISO 37101 and proposes a combination into high-level needs. This is further developed in Clause 4.

— The second one is labelled “Clusters of requirements”, it identifies a breakdown of requirements able to fulfil the whole set of high-level needs. This is further developed in Clauses 5 and 6.



Key

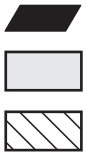
generic analyses results introduced in the document

processes defined in the document

solutions developed in the document

outputs of needs to produce the mobility project

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outputs of needs identified in the document

mobility needs domain

mobility solution domain

Figure 1 — Graphical representation of the document structure

— The back end-coloured rectangles clarify the type of handled objects: The grey ones deal with needs, the light one deals with requirements positioned as potential solutions to expressed needs.

— On top, the “Mobility system needs domain” represents the structure of “part 1” described in 0.1 above. This is a process to produce a mobility project for the users of this document.

— The “Mobility system solution domain” in the middle and the “Digital needs domain onto contributory systems of the mobility system” at the bottom represent the structure of "part 2” described in 0.3 above. This is a solution to identify the digital strategic needs on the systems contributing to the mobility system.

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Sustainable mobility and transportation — Digital governance — Strategic needs regarding ISO 37101 purposes of sustainability

1 Scope

This document aims at achieving sustainability goals of the local community. It applies to the digital governance part of the mobility system of a city engaged in sustainability.

This document applies to the digital governance part of the mobility system of a city committed to sustainability. It aims at achieving sustainability goals of the local community.

It targets urban mobility and its connections with intercity and other long-distance transport solutions. It applies to the mobility of people and goods.

An urban mobility system is a system of transport systems which:

— contributes to the dimensioning and governance of mobility as a whole;

— contributes to transport solutions: orchestrated, on demand, shared or not;

— provides mobility services.

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 37101:2016, *Sustainable development in communities — Management system for sustainable development — Requirements with guidance for use*

ISO 37104:2019, *Sustainable cities and communities — Transforming our cities — Guidance for practical local implementation of ISO 37101*

ISO 16483, *Sustainable Mobility and Transportation — Digital Governance — Indicators*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 16483 and the following apply.

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

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

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

3.1
baseline review
initial diagnosis mapping the local situation, with regard to the six purposes of sustainability

Note 1 to entry: See ISO 37104:2019, 5.2.

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3.2
local community
community of the area of interest

3.3
digital need
part of needs that concern computerized systems

Note 1 to entry: Other parts of needs relate, e.g. to physical infrastructure, or policies.

3.4
high-level need
global expectation on the mobility system of the concerned territory that define the desired characteristics, dimensioning, choices shaping or animating the mobility system

3.5
strategic need
global expectation on the systems composing the mobility system of the concerned territory that define the essential characteristics, dimensioning and choices allowing the achievement of the requirements on the targeted mobility system

3.6
high-level requirement
specification of objectives that describe the scope, the context and the targeted results intended to fulfil expressed needs

Note 1 to entry: High-level requirements are the proposed replies to *high-level needs* (3.4).

3.7
key performance indicator
KPI
quantifiable measure of performance over time for a specific objective

3.8
greenhouse gas emission
GHG emission
release of a GHG into the atmosphere

[SOURCE: ISO 14064-1: 2018, 3.1.5]

3.9
hypervision system
supervision system at mobility system level, such as a monitoring and control system of the mobility flows and multimodal services

3.10
exploitation aided system
EAS
system that assists the mobility operators in their diagnosis and any support to intervene, and that regulates the concerned system

3.11
data policy manual
governance manual that provides roles and responsibilities related to data governance through policies, processes and procedures

Note 1 to entry: A data policy manual may also provide remedies.

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3.12
passenger
person who has a reservation to travel or is travelling in a vehicle except for any crew, staff or drivers

[SOURCE: ISO/TS 14812:2025, 3.6.2.1]

3.13
traveller
person who is headed to a destination

[SOURCE: ISO/TS 14812:2025, 3.6.1.1]

3.14
vulnerable person
weak person with no protection and that can easily be hurt physically

Note 1 to entry: This includes people living with disabilities, children, pregnant women and the elderly.

4 Instantiating ISO 37101 sustainability purposes through the prism of mobility

4.1 Implementing the management system for sustainable mobility development in communities described in ISO 37101 and ISO 37104

The management system specified in ISO 37101 and ISO 37104 describes the methodology to design and implement a scheme that contributes to the sustainable development of cities and local communities.

Figure 2 represents this management system to drive sustainability ambition over the 12 relevant sustainability issues faced by communities versus the 6 sustainability purposes described in ISO 37101.

It shows that, to instantiate ISO 37101 through the prism of mobility, sustainability purposes and sustainability issues have to be analysed in terms of mobility.

The users of this standard shall first get acquainted with ISO 37101 and ISO 37104, especially ISO 37101:2016 “Context of the organization” (Clause 4) and ISO 37104:2019 “Political commitment: leadership, responsibilities, organization and capacity building” and “Implementing a management system for sustainable development” (Clauses 4 and 5).

It can be useful for the user to get acquainted with the ISO 37154 for transportation in order to support the infrastructure development vision.

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