

© ISO 2023

All rights reserved

ISO/DTR 16497-1:2023(E)

ISO/TC 268/SC 2, ~~AWG 2~~

~~July 11th, 2023~~

Secretariat: JISC

Date: 2023-09-06

Sustainable mobility and transportation — Sustainable mobility services

**Part 1:
Use cases**

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO/DTR 16497-1

<https://standards.iteh.ai/catalog/standards/sist/a217b89a-bc5-4b10-af06-12b2455a665d/iso-dtr-16497-1>

DTRDIS stage

Warning for WDs and CDs

This document is not an ISO International Standard. It is distributed for review and comment. It is subject to change without notice and may not be referred to as an International Standard.

© ISO 2023 – All rights reserved

ISO #####-#####(X)

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

A model manuscript of a draft International Standard (known as "The Rice Model") is available at <https://www.iso.org/iso/model-document-rice-model.pdf>

iTeh STANDARD PREVIEW (standards.iteh.ai)

ISO/DTR 16497-1

<https://standards.iteh.ai/catalog/standards/sist/a217b89a-1bc5-4b10-af06-12b2455a665d/iso-dtr-16497-1>

© ISO 2023

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: + 41 22 749 01 11
~~Email~~E-mail: copyright@iso.org
Website: ~~www.iso.org~~www.iso.org

Published in Switzerland

iTeh STANDARD PREVIEW (standards.iteh.ai)

[ISO/DTR 16497-1](#)

<https://standards.iteh.ai/catalog/standards/sist/a217b89a-1bc5-4b10-af06-12b2455a665d/iso-dtr-16497-1>

ISO/DTR 16497-1:2023(E)

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO/DTR 16497-1

<https://standards.iteh.ai/catalog/standards/sist/a217b89a-1bc5-4b10-af06-12b2455a665d/iso-dtr-16497-1>

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~~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).

~~Attention is drawn~~ISO draws attention to the possibility that ~~some of the elements~~implementation of this document may ~~be involve~~ the ~~subject~~use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. 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*, SC2 Subcommittee SC2, *Sustainable cities and communities - Sustainable mobility and transportation*.

A list of all parts in the ISO 16497 series can be found on the ISO website.

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.

Field Code Changed

Introduction

~~This document, titled as “Sustainable mobility and transportation – Sustainable mobility services” This document is prepared in order intended to clarify items for standardization based on gap analysis of collected use cases of MaaS (Mobility as a Service (MaaS) or sometimes called as MoD (Mobility on Demand) (just (MoD) (only in the United States of America US), and related projects.~~

~~The project is planned to have three parts. The first part is the technical report, “Sustainable mobility and transportation – Sustainable mobility services – Part 1: Use Cases, mainly for case collection and preparation for the further analyses. The second part is the technical report, “Sustainable mobility and transportation – Sustainable mobility services – Part 2: Gap and overlap analysis. Based on the analysis done in the second step, the final part will be issued as the international standard. Sustainable mobility and transportation – Sustainable mobility services – Part 3 :Service requirements, which will provide fruitful and useful ideas and concepts for all the urban transport policies setting and project implementation in smart cities and communities.~~

iTeh STANDARD PREVIEW (standards.iteh.ai)

ISO/DTR 16497-1

<https://standards.iteh.ai/catalog/standards/sist/a217b89a-1bc5-4b10-af06-12b2455a665d/iso-dtr-16497-1>

~~Sustainable mobility and transportation~~ ~~Sustainable Mobility Services~~

~~Part 1: Use Cases~~

~~1 Scope~~

~~1.1 Objective of this document~~

The objective of this document is to gather use cases for the implementation of sustainable mobility services and facilitate international sharing of experiences and knowledge. The collected data will be analyzed to identify issues for international standardization.

~~Collection range~~ The ISO 16497 series consists of two parts (other parts are planned):

~~— ISO TR 16497-1 (this document): for case collection and preparation for the further analyses.~~

~~— ISO TR 16497-2¹.~~

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO/DTR 16497-1

<https://standards.iteh.ai/catalog/standards/sist/a217b89a-1bc5-4b10-af06-12b2455a665d/iso-dtr-16497-1>

¹ Under development. Stage at time of publication: ISO/PWI TR 16497-2.

Sustainable mobility and transportation — Sustainable mobility services —

Part 1: **Use cases**

~~2.0.0~~ — Definition of use cases to be targeted

1 Scope

~~This document compiles use cases for the implementation of sustainable mobility services. The collected data will be analysed to identify issues for international standardization.~~

This document focuses on use cases that aim to implement sustainable transport services.

~~2.1.1~~ — Aspects for case collection

~~2.1.1.1~~ — Physical scale

The use cases considered are at the city scale or metropolitan scale, aligned with the scope of smart cities and communities.

~~2.1.1.2~~ — Target transport modes

The use cases encompass land transport, water transport, and air transport for both passengers and freight.

~~2.1.1.3~~ — Connection and integration requirement

Ideas related to connection and integration, including demand-side, supply-side, and policy framework aspects, are included.

3 Normative references

~~This document does not include any~~ There are no normative references in this document.

4 Terms and definitions

~~For the purpose of this document, the~~ No terms and definitions given are listed in ISO 16497 apply this document.

ISO and IEC maintain terminology databases for use in standardization, which can be accessed at the following addresses:

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

5 Use cases collection

Multiple use cases have been collected from Japan, China, and India. All cases can be found in ~~the annex~~ parts of this document. Annex A.

6.5 Use cases analysis

The use cases are analyzed based on policy making and planning, travel mode characteristics, multimodal connectivity and coordination, and operational organization structure.

7.6 Subjects for standardization

6.1 General

By analyzing the gathered use cases, discussion points for conducting gap analysis towards standardization have been organized. These points take into account policy goal setting, targeted travel modes, intermodal connections and coordination, as well as operational organizational structures.

7.2.6.2 Issues of Policy making and planning

6.2.1 General

Discussion points for policy goal setting are structured based on the types of policy objectives and their evaluations. Five perspectives are considered, integrating well-being and resilience into the three foundational aspects of sustainability: environmental, social, and economic.

7.2.6.2.2 Policy goals, and objectives

The policy objectives and goals for mobility services vary in each use case. To achieve sustainable cities and communities, the relationships between policy goals and various mobility services are organized from five perspectives: environment, social issues, economy, well-being, and resilience.

7.2.6.2.3 Environment

Assessment is made on the contribution of mobility services towards mitigating climate change, conserving resources, reducing waste and pollution, and enhancing residential environments.

7.2.6.2.4 Society

Assessment is made on the contribution of mobility services towards ensuring equitable access to needs, maintaining and promoting social participation, and strengthening social cohesion.

7.2.6.2.5 Economy

Assessment is made on the contribution of mobility services towards economic growth, enhancing the attractiveness of cities and communities, fostering creativity and innovation, and improving the financial stability of service provision.

7.2.6.2.6 Well-being

Assessment is made on the contribution of mobility services towards promoting health, enhancing quality of life, and fostering a sense of self-efficacy.

7.2.6.2.7 Resilience

Assessment is made on the contribution of mobility services towards ensuring redundancy, managing uncertainty and risks, and fostering the development of social capital and capability.

7.3.6.3 Evaluation of each policy goal

6.3.1 General

The assessment of each policy objective focuses on how quantitative and qualitative evaluations are integrated. The contribution of mobility services towards achieving the policy objectives listed in 6.1.1.1

to 6.1.1.56.2.3 to 6.2.7 is evaluated through quantitative and qualitative approaches. Additionally, the alignment of these contributions with the 169 targets of the SDGs Sustainable Development Goals (SDGs) is confirmed.

7.3.16.3.2 Quantitative evaluation

KPIs (Key Performance Indicators)

Key Performance Indicators (KPIs) are employed for quantitative evaluations. Output indicators that objectively illustrate the results of each policy measure and outcome indicators that quantitatively reflect the achievement of policy objectives are established, with prominent indicators being determined as KPIs.

7.3.26.3.3 Qualitative evaluation

In cases where assessing the contribution of mobility services to policy objectives using numerical or statistical data is challenging, qualitative outcome indicators based on users' subjective perceptions and experiences are utilized. These indicators are then comprehensively evaluated in conjunction with the KPIs in Section 6.1.2.1-6.3.2.

7.3.36.3.4 Responding to the SDGs (contribution to solving social issues)

By employing the quantitative and qualitative evaluations in Sections 6.1.2.1 and 6.1.2.2, 6.3.2 and 6.3.3, the alignment between policy objectives with confirmed contributions from mobility services and the 169 targets of the SDGs is delineated. This clarifies the contributions of relevant mobility services to the SDGs. Examples of SDG targets closely related to mobility services include:

- Target 3.6: By 2020, halve the number of global deaths and injuries from road traffic accidents.
- Target 7.2: By 2030, increase substantially the share of renewable energy in the global energy mix.
- Target 7.3: By 2030, double the global rate of improvement in energy efficiency.
- Target 8.9: By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products.
- Target 9.1: Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all.
- Target 11.2: By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.
- Target 11.7: By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities.

7.56.4 Issues of Travel modes

6.4.1 General

From the perspective of travel modes, the situations requiring mobility services and the forms of mobility services provided are delineated based on the categories of targeted travel needs, combinations of travel modes, and combinations of mobility services.

7.5.16.4.2 Target travel needs corresponding to policy goals

6.4.2.1 General

The travel demands of cities and communities are classified based on ~~travelers'~~travellers' attributes and purposes, identifying the travel needs that correspond to policy objectives.

7.5.1.16.4.2.2 Classification of travel needs

The mobility scenarios in cities and communities are classified based on the attributes of ~~travelers~~travellers (e.g. age, car ownership, etc.) and their trip purposes (e.g. commuting, shopping, leisure, etc.).

7.5.1.26.4.2.3 Identification of travel needs requiring mobility services

Travel needs closely related to the policy objectives to be achieved are determined. In situations where alternative travel mode choices are limited, some form of mobility service is considered necessary.

7.5.26.4.3 Combination of travel modes (inter-modal transport)

6.4.3.1 General

In terms of travel mode combinations, evaluation is given to the integration of diverse mobility tools and the merging of distinct mobility services.

7.5.2.16.4.3.2 Mobility tool combinations

Combinations of mobility tools are organized based on combining existing tools (e.g. private cars and car-sharing), combining existing tools with new ones (e.g. conventional buses and autonomous electric wheelchairs), and combining new tools with each other (e.g. electric kick scooters and autonomous buses).

7.5.36.4.4 Mobility service combinations

Combinations of mobility services are delineated based on temporal aspects, such as variations in travel demand by time of day, day of the week, and season, as well as spatial aspects like, such as the distribution of urban functions and residential populations.

7.7.6.5 Issues of multi-modalMultimodal connectivity and coordination

6.5.1 General

In a multimodal situation, users have the option to choose from multiple travel modes. In such cases, it is necessary to organize how connections and coordination between travel modes are established. This organization is based on what is being connected and coordinated, the purpose, and how these connections and coordination are achieved in terms of systems and technology. Identifying the advantages and disadvantages for users or potential users is particularly important.

Examples of connectivity and coordination discussion are based on three aspects:

- Demand-side aspects include bundling daily travel and tourism travel, and induced demand created by new services.
- Supply-side aspects involve coordination between existing vehicles and new mobility tools, coordination between existing services and new services, coordination between rails and micro-mobility modes, such as small electric vehicle sharing services, and coordination between buses and autonomous electric wheelchair sharing.

- Policy framework aspects encompass the connection between policy evaluation and strategy confirmation based on mobility data space activities, the connection for available and attractive tourism options, and the connection of existing services based on new services.

7.7.46.5.2 Situations of connection and coordination

Possible scenarios for connections and coordination between travel modes include situations where travellers gather information about their trips (such as e.g. routes, travel time, fares, and fees), situations where they reserve mobility services, and situations where they pay for fares and fees associated with these services.

7.7.26.5.3 Objective

The policy objectives intended by for connecting and coordinating different mobility services, include promoting a modal shift away from private cars, encouraging out-of-home activities that contribute to personal health improvement and local economic revitalization, among other aspects.

7.7.46.5.4 MethodMethods and technology

Methods and technologies for connecting and integrating mobility services can be organized according to their purposes. Potential objectives include streamlining the collection of travel-related information, simplifying service reservations and payments, consolidating fares and fees between different services, and offering new services through collaboration with other entities (e.g. MaaS apps) and the motivation that comes from these initiatives.

7.96.6 Issues of operationOperational organization structure

6.6.1 General

It is crucial to highlight the significant disparities across various use cases, particularly in terms of the stakeholders involved in projects aiming to connect and integrate mobility services, the nature of relationships among these participants, and the methods employed to secure funding for successful implementation.

7.9.16.6.2 Participants' roles and relationships

For each use case, it is necessary to define the roles and relationships of the entities involved in the project. This includes clarifying the leading entities responsible for policy and decision making, as well as the operators of the MaaS platform.

7.9.26.6.3 Finance

Each use case will be structured to encompass the financial scale required for project execution, the relationships between all cost bearers and the direct and indirect beneficiaries resulting from connected and coordinated mobility services, as well as the mechanisms for revenue reallocation and internal subsidization.

**Annex A
(informative)**

Use case examples

This annex contains examples of use cases (shown in Figures A.1 to A.9). Five use cases have been reported from Japan, three from China, and one from India- (as of April 2023).

A.1 ~~A.1~~ Japan-01 Case in Toyoake city

~~SA :Single Answer – MA :Multiple answers – FA :Free Answer~~

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO/DTR 16497-1

<https://standards.iteh.ai/catalog/standards/sist/a217b89a-1bc5-4b10-af06-12b2455a665d/iso-dtr-16497-1>

Service name	"choisoko" by AISIN			
Overview of the area (SA) (FA)	Geographic conditions	large city, regional city, rural area, tourist destination		
	Population size/ population density	(70,000) persons/area · (2,962) persons/km ²		
	Older population share	(21,6) %		
	Modal share (car)	(60,7) %		
Policy targets (MA)	Mitigation of environmental impacts			
	Ensuring diversity, equity, and inclusiveness		<input type="radio"/>	
	Economic growth, regional revitalization, sustaining and improving competitiveness			
	Promoting health		<input type="radio"/>	
	Other	()		
Primary target of the policy (SA)	Attribute	Resident, Visitor (Senior) Disabled		
	Trip Purpose	Commuting, School, Business, shopping, Sightseeing, etc.		
	Trip range	Feeder mode (access / egress), overall trip		
Needs of main target (SA)	Speed, Frequency, Timeliness, Accessibility to services			
Travel modes considered Transportation modes for the service (MA)	Existing transport mode	Railroad		
		Tram		
		Bus		
		Taxi		
	New Mobility	On-demand transportation	<input type="radio"/>	⇒
		Shared Taxi		
		Car sharing		
		Ride-hailing		
Overview of On-demand Transportation (SA/FA)	Operator's primary business auto parts company			
	Position in local transport system		Transportation in inconvenient areas	
	Shared cycle			
	Other		()	
Service provided (MA)	MaaS Function	Search for multiple modes		
		Reservation		
		Payment		
		Ticketing		
	Supplementary Services	Collaborate with business, tourism, etc.		
		Create opportunities to go out (events)	<input type="radio"/>	
Other	()			
Organization involved (style of collaboration)	Leading organization (SA)		Participant(s) (MA)	
	Local government		<input type="radio"/>	
	Transport operator		<input type="radio"/>	
	Non-profit organization			
	Public sector			
	Private sector	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>