Technical Report

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Intelligent transport systems — Mobility integration — Physical and functional view

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Contents

Page

Foreword ..... **iv**
Introduction ..... **v**
1 Scope **1**
2 Normative references **1**
3 Terms, definitions and abbreviated terms **1**
3.1 Terms and definitions 1
3.2 Abbreviated terms 2
4 The core physical and functional objects in the provision of mobility services **2**
4.1 General 2
4.2 MSU requests, books, uses, and pays for the mobility service 4
4.2.1 Use case physical and functional objects 4
4.2.2 Use case interfaces 7
4.3 Manage mobility services 9
4.3.1 Use case Physical objects and functional objects 9
4.3.2 Use case interfaces 11
4.3.3 Interface between TSP Central system and Transport means on-board Equipment interface 11
4.4 Manage transport services 11
4.4.1 Use case Physical and Functional objects 11
4.4.2 Use case interfaces 13
4.5 Manage transport infrastructure 14
4.5.1 Use case Physical and Functional objects 14
4.5.2 Use case interfaces 15
5 External physical objects **16**
5.1 General 16
5.2 Systems for data security 17
5.3 Systems for positioning 17
5.4 Communication systems 17
5.5 Systems for data management services 17
5.6 PSP systems 17
5.7 Electronic fee and fare collection systems 17
Bibliography **18**

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Foreword

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This document was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*.

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

Urbanization, changes in climate and demographic and societal changes are some of the major trends that have had an impact on transport systems and services over the last decades. Combined with the implementation of ITS services and Internet of Things (IoT), new transport concepts have been developed. User requirements on efficiency, availability and interoperability have also been driving forces for new transport concepts for the integration of multimodal, existing and new transport services as described and implemented in mobility concepts like mobility as a service (MaaS) and mobility on demand (MOD). Co-operative, connected and automated mobility (CCAM) can also have a significant effect on how travellers plan and implement their journeys between multiple modes of transport in the integrated mobility environment.

Integrated mobility concepts are evolving around the world, mostly based on the MaaS and MOD concepts. There is a need for a generic, common, and world-wide concept description mapping all existing and foreseen concepts for interoperable, integrated and seamless multimodal transport services.

The role and responsibility models for MaaS and MOD have already been described in ISO/TR 4447. However, there is also a need for a common role and responsibility model for integrated and multimodal mobility services, recognizing and including the work already done by the two mainstream organizations for integrated mobility services, MaaS and MOD.

A common role and responsibility model can be described from an enterprise view[3], where the stakeholders, actors and roles in the MaaS and MOD ecosystems are merged into one enterprise view. The enterprise view addresses the relationships between the entities (e.g. organizations) involved in the provision of the mobility services. An enterprise view has been described in ISO/TR 7878.

The objective of this document is to describe integrated mobility from a physical and functional view[3], to which existing implementations of integrated mobility systems can potentially be mapped. This is intended to enable a common understanding, an exchange of information and knowledge, and a convergence towards one world-wide integrated mobility concept description.

The physical view describes the physical objects (systems and devices) and the information exchanges that support ITS. The physical objects interact and exchange information and services. Physical objects are defined to represent the major physical components of the ITS architecture[3].

The functional view addresses the analysis of abstract functional elements and their logical interactions. The functional objects are allocated to the physical objects based on the analysis of the functional requirements for each of the physical objects[3].

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Intelligent transport systems — Mobility integration — Physical and functional view

1 Scope

This document describes the physical and functional views defined in ISO/TS 14812 on integrated mobility, based on the role and responsibilities models in the mobility-as-a-service (MaaS) and mobility on demand (MOD) ecosystems as described in ISO/TR 4447 and ISO/TR 7878.

This document focuses on mobility service concepts where the included transport services are publicly available.

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/TR 7878, *Intelligent transport systems — Mobility integration — Enterprise view*

ISO/TS 14812, *Intelligent transport systems — Vocabulary*

ISO 24014-1, *Public transport — Interoperable fare management system — Part 1: Architecture*

3 Terms, definitions and abbreviated terms

For the purposes of this document, the terms and definitions given in ISO/TR 7878, ISO/TS 14812, ISO 24014-1 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 Terms and definitions

3.1.1
commercial rule
rule defining the settlement and commission between the enterprise objects involved in the provision of the mobility services

Note 1 to entry: This definition is adapted from the definition of commercial rules in ISO 24014-1.

3.1.2
mobility service
service that provides an integrated interface for multiple transport services

Note 1 to entry: The integrated interface can include an online interface, a payment interface, and/or rules for physically accessing the various transport services.

Note 2 to entry: The typical goal of a mobility service is to fulfil the needs of a transport user in an optimal fashion, even if that requires using multiple transport services.

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3.1.3
mobility service provider
entity that delivers one or more mobility services

3.1.4
mobility service product
specification of one single or two or more integrated transport services provided by the mobility service provider and defined by usage rules, pricing rules and commercial rules

Note 1 to entry: A mobility service product can in many cases be regarded as a combination of transport service products.

3.1.5
pricing rule
rule defining the price and payment/billing relationships to the mobility service user

Note 1 to entry: This definition is based on the definition of pricing rules in ISO 24014-1.

3.1.6
transport service product
specification of a transport service provided by the transport service provider and defined by usage rules, pricing rules and commercial rules

3.2 Abbreviated terms

MSP	mobility service provider
MSU	mobility service user
TSP	transport service provider
PSP	payment service provider
TIO	transport infrastructure operator

4 The core physical and functional objects in the provision of mobility services

4.1 General

The three core enterprise objects were described in ISO/TR 7878:

— Mobility service user (MSU) is the enterprise object that requests the mobility service, selects the mobility service fulfilling the user needs and preferences, uses the service and pays for it. However, the user responsibilities/activities can be divided between different persons, organisations, legal entities, etc. This includes, for example, between the traveller using the mobility service and the entity paying for the mobility service, such as a parent or employer.

— Mobility service provider (MSP) is the enterprise object that provides the MSU with access to the mobility services fulfilling the user needs. The mobility services are based on the collected offers from transport services and the optimisation of the different transport services that fulfils the user needs, e.g. fastest, cheapest or most environmental-friendly combination of transport services.

— Transport service provider (TSP) is the enterprise object that owns and operates the transport means used for the provision of transport services enabling the movement of goods and persons.

Between the enterprise objects there are two types of relationships:

— Agreement that describes the obligations and rights between two enterprise objects or a joint agreement between several enterprise objects

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