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Intelligent transport systems — Vocabulary

Systèmes de transport intelligents — Vocabulaire

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Foreword

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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).

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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 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.

Introduction

The definitions found in this document have been formulated in accordance with major ISO International Standards such as ISO 704 and are based on a consistent concept model. It is recognized that the contents of this document are not exhaustive and that terminology evolves over time.

In most cases, the definitions provided within this document are suitable for general application throughout intelligent transport systems (ITS). In those circumstances where a term is intended for a specific domain of discourse or where the term can be used in multiple domains, the intended context is indicated at the beginning of the definition as bracketed text (e.g. "<ITS-S>").

In addition to a Bibliography, this document provides an index that provides an alphabetical listing of all preferred, admitted, and deprecated terms contained in this document.

Other standardization groups and organizations are encouraged to adopt the terminology in this document to promote better understanding of terms among ITS professionals worldwide. The terms and definitions contained within this document can be searched online at ISO's Online Browsing Platform available at https://www.iso.org/obp.

Intelligent transport systems — Vocabulary

1 Scope

This document defines terms relating to intelligent transport systems (ITS).

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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 Core terms

3.1.1 Entity terms

NOTE Figure A.1 depicts the concept model for the terms defined in this subclause.

3.1.1.1
entity
concrete or abstract thing that exists, did exist, or can possibly exist, including associations among these things

EXAMPLE *Person* (3.1.1.6), object, event, idea, process, etc.

3.1.1.2
immaterial entity
entity (3.1.1.1) that does not occupy three-dimensional space

EXAMPLE Idea, process, organization, etc.

3.1.1.3
material entity
entity (3.1.1.1) that occupies three-dimensional space

Note 1 to entry: All material entities have certain characteristics that can be described and therefore this concept is important for ontology purposes.

3.1.1.4
non-biological entity
material entity (3.1.1.3) that is not and has never been a living organism

3.1.1.5
biological entity
material entity (3.1.1.3) that was or is a living organism

3.1.1.6
person
biological entity (3.1.1.5) that is a human being

3.1.2 General system terms

NOTE Figure A.2 depicts the concept model for the terms defined in this subclause.

3.1.2.1
system
combination of interacting *elements* (3.1.3.10) organized to achieve one or more stated purposes

[SOURCE: ISO/IEC/IEEE 15288:2015, 4.1.46, modified — Notes to entry removed.]

3.1.2.2
transport system
system (3.1.2.1) of infrastructure *elements* (3.1.3.10) and optionally *vehicles* (3.7.1.1) that are jointly designed to move *material entities* (3.1.1.3) from an origin to a destination

Note 1 to entry: Transport systems can also include any supporting system, such as information and control systems.

3.1.2.3
surface transport system
transport system
transport system (3.1.2.2) designed to move *material entities* (3.1.1.3) across the surface or near-surface of the Earth

Note 1 to entry: A surface transport system can include tunnels, bridges and similar *elements* (3.1.3.10).

Note 2 to entry: There is not complete agreement on the precise limitations of a "surface transport system" within the ITS community. Currently, the term is almost exclusively applied to ground-based travel of goods and people over significant distances. The term is viewed as including ferry systems, which often form an integral part of a local surface transport system; it is less clear if it includes long-distance sea-fairing ships. The term "surface transport systems" is also generally limited to transport systems that cover a considerable distance (e.g. factory conveyance technologies are not often referred to as "surface transport systems"). It has been suggested that air travel, which is arguably a transport system designed to move physical entities between points on the surface of the earth, ought to be included in the scope of the term, but this perspective is not universally accepted. It is expected that the exact limitations of the term will be further refined as ITS matures.

Note 3 to entry: Due to the defined scope of ITS, the term "transport system" is intended to be interpreted as being synonymous with the term "surface transport system" unless explicitly specified otherwise.

3.1.2.4
intelligent transport system
ITS
intelligent transportation system
system (3.1.2.1) comprised of information, communication, sensor and control technologies and that is designed to benefit a *surface transport system* (3.1.2.3)

Note 1 to entry: "Intelligent transportation system" is the American English equivalent.

Note 2 to entry: Benefits potentially include, but are not limited to, increased safety, sustainability, efficiency and comfort.

Note 3 to entry: The full term (i.e. "intelligent transport system") is often used when the noun is used as a subject, whereas the abbreviation (i.e. "ITS") is often used to modify another noun (e.g. "Intelligent transport systems provide ITS services.").

3.1.2.5
cooperative ITS
C-ITS
subset of *ITS* (3.1.2.4) where information is shared among *ITS stations* (3.2.7.3) in a manner that enables its use by multiple *ITS services* (3.5.3.1)

3.1.3 General architecture terms

NOTE Figure A.3 depicts the concept model for the terms defined in this subclause.

3.1.3.1
architecture
system architecture
<system> fundamental concepts or properties of a *system* (3.1.2.1) in its *environment* (3.1.3.11) embodied in its *elements* (3.1.3.10), *relationships* (3.1.6.8) and in the principles of its design and evolution

[SOURCE: ISO/IEC/IEEE 42010:2011, 3.2]

3.1.3.2
architecture description
work product used to express an *architecture* (3.1.3.1)

[SOURCE: ISO/IEC/IEEE 42010:2011, 3.3]

3.1.3.3
architecture framework
conventions, principles and practices for the description of *architectures* (3.1.3.1) established within a specific domain of application and/or community of *stakeholders* (3.1.3.4)

EXAMPLE 1 Generalised Enterprise Reference Architecture and Methodologies (GERAM) [ISO 15704] is an architecture framework.

EXAMPLE 2 Reference Model of Open Distributed Processing (RM-ODP) [ISO/IEC 10746] is an architecture framework.

[SOURCE: ISO/IEC/IEEE 42010:2011, 3.4]

3.1.3.4
stakeholder
system stakeholder
<system> individual, team, organization, or *classes* (3.1.12.2) thereof, having an interest in a *system* (3.1.2.1)

[SOURCE: ISO/IEC/IEEE 42010:2011, 3.10]

3.1.3.5
concern
system concern
<system> interest in a *system* (3.1.2.1) relevant to one or more of its *stakeholders* (3.1.3.4)

Note 1 to entry: A concern pertains to any influence on a system in its *environment* (3.1.3.11), including developmental, technological, business, operational, organizational, political, economic, legal, regulatory, ecological and social influences.

[SOURCE: ISO/IEC/IEEE 42010:2011, 3.7]

3.1.3.6
architecture viewpoint
work product establishing the conventions for the construction, interpretation and use of *architecture views* (3.1.3.7) to frame specific system *concerns* (3.1.3.5)

[SOURCE: ISO/IEC/IEEE 42010:2011, 3.6]

3.1.3.7
architecture view
work product expressing the *architecture* (3.1.3.1) of a *system* (3.1.2.1) from the perspective of specific system *concerns* (3.1.3.5)

[SOURCE: ISO/IEC/IEEE 42010:2011, 3.5]

3.1.3.8
model kind
conventions for a type of modelling

Note 1 to entry: Examples of model kinds include *data flow* (3.1.7.1) diagrams, *class* (3.1.11.2) diagrams, Petri nets, balance sheets, organization charts and state transition models.

[SOURCE: ISO/IEC/IEEE 42010:2011, 3.9]

3.1.3.9
architecture model
work product representing one or more *architecture views* (3.1.3.7) and expressed in a format governed by a *model kind* (3.1.3.8)

3.1.3.10
element
architecture element
<architecture> component member of an *architecture model* (3.1.3.9) included in an *architecture view* (3.1.3.7)

3.1.3.11
environment
system environment
<system> context determining the setting and circumstances of all influences upon a *system* (3.1.2.1)

Note 1 to entry: The environment of a system includes developmental, technological, business, operational, organizational, political, economic, legal, regulatory, ecological and social influences.

[SOURCE: ISO/IEC/IEEE 42010:2011, 3.8]

3.1.4 Architecture view terms

NOTE Figure A.4 depicts the concept model for the terms defined in this subclause.

3.1.4.1
communications view
architecture view (3.1.3.7) from the *communications viewpoint* (3.1.4.2)

Note 1 to entry: Within ITS, the preferred model for describing the communications view is based on the *ITS-S reference architecture* (3.1.9.4).

3.1.4.2
communications viewpoint
architecture viewpoint (3.1.3.6) used to frame *concerns* (3.1.3.5) related to all layers of the Open Systems Interconnection (OSI) stack and related management and security issues

3.1.4.3
enterprise view
architecture view (3.1.3.7) from the *enterprise viewpoint* (3.1.4.4)

3.1.4.4
enterprise viewpoint
architecture viewpoint (3.1.3.6) used to frame the policies, funding incentives, working arrangements and jurisdictional structure that support the technical layers of the *architecture* (3.1.3.1)

3.1.4.5
functional view
architecture view (3.1.3.7) from the *functional viewpoint* (3.1.4.6)

3.1.4.6
functional viewpoint
architecture viewpoint (3.1.3.6) used to frame *concerns* (3.1.3.5) related to the definition of *processes* (3.1.7.2) that perform surface transport functions and *data flows* (3.1.7.1) shared between these processes

3.1.4.7
physical view
architecture view (3.1.3.7) from the *physical viewpoint* (3.1.4.8)

Note 1 to entry: The term "deployment view" is sometimes used within the broader ICT community, but the term "physical view" is preferred to prevent confusion between the physical view of a reference architecture and any part of a *deployment architecture* (3.1.9.3).

3.1.4.8
physical viewpoint
architecture viewpoint (3.1.3.6) used to frame *concerns* (3.1.3.5) related to the assignment of functionality to *physical objects* (3.1.8.1) and the interfaces among these physical objects

3.1.5 Architecture — Communication view terms

NOTE Figure A.5 depicts the concept model for the terms defined in this subclause.

3.1.5.1
application entity
ITS-S application entity
DEPRECATED: information layer
<ITS-S> part of the *ITS station reference architecture* (3.1.9.4) that is responsible for providing ITS-related functionality

Note 1 to entry: Within the US, the National Transportation Communications for ITS Protocol (NTCIP) standards identify an "information layer" on top of the traditional OSI stack. However, the purpose of this layer includes both information configuration and functionality. The ITS-S reference architecture separates these two roles between the *management entity* (3.1.5.6) and the application entity.

3.1.5.2
access layer
protocol layer that contains the OSI physical and data link layer protocols

3.1.5.3
ITS-S access layer
link layer
subnet layer
<ITS-S> protocol layer in the *ITS station reference architecture* (3.1.9.4) containing the OSI physical and data link layer protocols for ITS communications

Note 1 to entry: Within the Internet Engineering Task Force (IETF), the term "link layer" is used to describe the same functionality as the ITS-S access layer.

Note 2 to entry: Within the US, the NTCIP standards use the term "subnet layer" to describe the same functionality as the ITS-S access layer.

3.1.5.4
transnet layer
ITS-S networking and transport layer
networking and transport layer
<ITS-S> protocol layer in the *ITS station reference architecture* (3.1.9.4) containing the OSI network and transport layer protocols

Note 1 to entry: The full name of this layer is the networking and transport layer, but the term transnet layer provides a more concise name.

3.1.5.5
facilities layer
ITS-S facilities layer
DEPRECATED: application layer
<ITS-S> protocol layer in the *ITS station reference architecture* (3.1.9.4) containing the OSI session, presentation and application layer protocols

Note 1 to entry: Within the US, the NTCIP standards call the facilities layer the "application layer". However, as this term is easily confused with both the OSI application layer and the *application entity* (3.1.5.1), the term should be avoided and qualified when used (e.g. OSI application layer).

3.1.5.6
management entity
ITS-S management entity
<ITS-S> part of the *ITS station reference architecture* (3.1.9.4) that is responsible for management of communications and configuration information for the local *physical object* (3.1.8.1) and possibly remote physical objects

3.1.5.7
security entity
ITS-S security entity
<ITS-S> part of the *ITS station reference architecture* (3.1.9.4) that is responsible for providing privacy, communication security and *system* (3.1.2.1) security

3.1.6 Architecture — Enterprise view terms

NOTE Figure A.6 depicts the concept model for the terms defined in this subclause.

3.1.6.1
enterprise object
element (3.1.3.10) within an *enterprise view* (3.1.4.3) that represents an organization or individual

3.1.6.2
resource
enterprise view resource
<enterprise view> *element* (3.1.3.10) that represents an *entity* (3.1.1.1) that is managed, operated, referenced and/or used to develop and provide *ITS* (3.1.2.4)

3.1.6.3
document
uniquely identified unit of information for human use

EXAMPLE A report, specification, manual or book, in printed or electronic form.

Note 1 to entry: A document can be a single information item, or part of a larger information item.

[SOURCE: ISO/IEC/IEEE 15289:2019, 3.1.10]

3.1.6.4
interaction
enterprise view interaction
<enterprise view> *element* (3.1.3.10) that represents coordination between two *enterprise objects* (3.1.6.1)

3.1.6.5
formal coordination
enterprise view formal coordination
<enterprise view> *interaction* (3.1.6.4) between two *enterprise objects* (3.1.6.1) governed by a documented agreement

EXAMPLE A road operator can enter into formal agreement(s) with the owner of a *road* (3.3.5.1) and the owner(s) of the associated *roadside* (3.3.1.10) equipment.

3.1.6.6
informal coordination
enterprise view informal coordination
<enterprise view> *interaction* (3.1.6.4) between two *enterprise objects* (3.1.6.1) governed by an understanding that is not documented in a formal agreement between the two parties

3.1.6.7
role
enterprise view role
<enterprise view> *element* (3.1.3.10) that represents the specified responsibilities between an *enterprise object* (3.1.6.1) and another *enterprise view* (3.1.4.3) element

3.1.6.8
relationship
enterprise view relationship
<enterprise view> *element* (3.1.3.10) that represents an association between two *resources* (3.1.6.2)

3.1.6.9
include
enterprise view include
<enterprise view> *relationship* (3.1.6.8) where one *resource* (3.1.6.2) contains another resource

EXAMPLE Every ITS component includes one or more *modules* (3.1.8.7).

3.1.6.10
extend
enterprise view extend
<enterprise view> *relationship* (3.1.6.8) where one *resource* (3.1.6.2) supplements another resource

EXAMPLE A *module* (3.1.8.7) can extend the functionality of another module.

3.1.7 Architecture — Functional view terms

NOTE Figure A.7 depicts the concept model for the terms defined in this subclause.

3.1.7.1
data flow
representation of data flowing between two *processes* (3.1.7.2) or between a process and a *terminator* (3.1.8.3)

3.1.7.2
process
functional view process
<functional view> series of one or more *functions* (3.1.7.3) in support of an *ITS service* (3.5.3.1)

3.1.7.3
function
functional view function
<functional view> series of actions or activities performed by a given object to achieve a goal

Note 1 to entry: A function transforms inputs into outputs that may include the creation, modification, monitoring or destruction of *elements* (3.1.3.10).

3.1.7.4
process specification
document (3.1.6.3) that defines a lowest-level *process* (3.1.7.2)

3.1.8 Architecture — Physical view terms

NOTE Figure A.8 depicts the concept model for the terms defined in this subclause.

3.1.8.1
physical object
ITS physical object
<physical view> abstraction of a *material entity* (3.1.1.3) that interacts with other abstract material entities in the provision of *ITS services* (3.5.3.1)

Note 1 to entry: Physical objects are represented as *elements* (3.1.3.10) within the *physical view* (3.1.4.7) and perform a role. Physical objects can be implemented as cloud-based *systems* (3.1.2.1).

Note 2 to entry: Within many *ITS reference architectures* (3.1.9.5), physical objects are placed into one of five categories: centre, support, field, vehicle or *traveller* (3.6.1.1).

3.1.8.2
ITS component
physical object (3.1.8.1) that has been assigned one or more *functional objects* (3.1.8.6) in the provision of one or more *ITS services* (3.5.3.1)

Note 1 to entry: Physical objects are ITS components if they are an integral part of the *system* (3.1.2.1); otherwise they are *terminators* (3.1.8.3).

3.1.8.3
terminator
ITS terminator
entity (3.1.1.1) that is external to the *ITS service* (3.5.3.1) implementation but with which the implementation communicates either to obtain inputs or to which it can send outputs

Note 1 to entry: A terminator can exist within *functional* (3.1.4.5) and *physical views* (3.1.4.7).

3.1.8.4
information flow
information that is exchanged between *physical objects* (3.1.8.1)

3.1.8.5
information transfer
information flow triple
information flow (3.1.8.4) from a *physical object* (3.1.8.1) acting as an information provider and sent to another physical object acting as an information consumer

Note 1 to entry: The term "information flow triple" is used extensively in the Architecture Reference for Cooperative and Intelligent Transportation (ARC-IT; see Reference [25]).

3.1.8.6
functional object
ITS functional object
set of related *processes* (3.1.7.2) that are performed by a *physical object* (3.1.8.1) to fulfil aspects of an *ITS service* (3.5.3.1)

EXAMPLE A vehicle OBE can include a "vehicle basic safety" functional object.

Note 1 to entry: The term "module" is used by the European FRAME architecture while the Architecture Reference for Cooperative and Intelligent Transportation (ARC-IT) uses the term "functional object".

3.1.8.7
module
ITS module
functional object (3.1.8.6) that can be replaced and has defined interfaces

3.1.9 Architecture type terms

NOTE Figure A.9 depicts the concept model for the terms defined in this subclause.

3.1.9.1
reference architecture
architecture (3.1.3.1) that provides a template solution for *planning* (3.1.9.2) and *deployment architectures* (3.1.9.3)

Note 1 to entry: Interface standards are based on a reference architecture, which should be explicitly described.

3.1.9.2
planning architecture
regional architecture
architecture (3.1.3.1) that provides a long-term vision of *system elements* (3.1.3.10) that may be deployed and managed by different projects and/or *entities* (3.1.1.1) within a geographic area

Note 1 to entry: Some countries use the term "regional architecture", but in International Standards, the term "regional" is avoided due to its multiple meanings.

3.1.9.3
deployment architecture
architecture (3.1.3.1) that provides a vision of a specific deployment of a *system* (3.1.2.1) within a geographic area

3.1.9.4
ITS-S reference architecture
reference architecture (3.1.9.1) for handling communications within a *physical object* (3.1.8.1) as defined in ISO 21217

Note 1 to entry: The ITS-S reference architecture provides a model for describing communication.

3.1.9.5
ITS reference architecture
reference architecture (3.1.9.1) for one or more *ITS services* (3.5.3.1)

Note 1 to entry: An ITS architecture can be a reference, planning or *deployment architecture* (3.1.9.3).

Note 2 to entry: The Harmonised Architecture Reference for Technical Standards (HARTS; see Reference [26]) is an example of an ITS reference architecture.

3.1.9.6
ITS planning architecture
planning architecture (3.1.9.2) for one or more *ITS services* (3.5.3.1)

3.1.9.7
ITS deployment architecture
deployment architecture (3.1.9.3) for one or more *ITS services* (3.5.3.1)

3.1.10 Data concept management terms

NOTE Figure A.10 depicts the concept model for the terms defined in this subclause.

3.1.10.1
data concept
data element (3.1.11.1), *class* (3.1.11.2), *value domain* (3.1.11.3), *data frame* (3.1.11.4), *message* (3.1.11.5) or *interface dialogue* (3.1.11.6) defined, at a minimum, with an unambiguous identifier and a definition

Note 1 to entry: In order to exchange a value corresponding to a data concept, more information than an identifier, a name and a definition can be needed. For a property, a data type is needed. Depending on the kind of property, other data elements such as unit of measure, and language, can be needed as well. The additional information can be given in the *data dictionary* (3.1.10.3), in a data specification that references the data concept or associated with the data themselves.

3.1.10.2
meta-attribute
documenting characteristic of a *data concept* (3.1.10.1) that is stored in a *data dictionary* (3.1.10.3)

3.1.10.3
data dictionary
collection of *data concepts* (3.1.10.1) that allows lookup by *entity* (3.1.1.1) identifier

[SOURCE: ISO 22745-2:2010, B.2.16, modified — "collection of data dictionary entries..." replaced with "collection of data concepts...".]

3.1.10.4
data concept registry
electronic *data dictionary* (3.1.10.3) that follows precise documented rules for the registration and management of stored *data concepts* (3.1.10.1)

Note 1 to entry: The data concept registry contains *meta-attributes* (3.1.10.2) about data concepts in terms of their names and representational forms as well as the semantics associated with the data concepts. A data concept registry may contain metadata that assists information interchange and re-use, both from the perspective of human users and for machine-interpretation of data concepts.

Note 2 to entry: A data concept registry typically includes advanced features for adding retrieving, and working with its contents.

3.1.11 Data concept type terms

NOTE Figure A.11 depicts the concept model for the terms defined in this subclause.

3.1.11.1
data element
unit of data that is considered in a given context to be indivisible and which includes an unambiguous representational form

Note 1 to entry: This definition states that a data element is “indivisible” in a given context. This means it is possible for a data element considered indivisible in one context [e.g. *location* (3.4.1.1)] to be divisible in another context (e.g. latitude, longitude, and elevation).

3.1.11.2
class
object class
set of ideas, abstractions or things in the real world that are identified with explicit boundaries and meaning and whose properties and behaviour follow the same rules

Note 1 to entry: Some ISO/TC 204 documents use the term "object class" for consistency with ISO 11179-1, but within ITS, the term "class" is more generally understood.

Note 2 to entry: This is semantically equivalent to a "class" as used within UML (ISO19505-2:2012).

[SOURCE: ISO/IEC 11179-1:2015, 3.3.18, modified — term changed to from "object class" to "class" and Notes to entry added.]

3.1.11.3
value domain
a set of permissible values

3.1.11.4
data frame
specific grouping of *data elements* (3.1.11.1) that describes information of interest through a useful grouping of more atomic properties about one or more *classes* (3.1.11.2)

Note 1 to entry: The grouping can be a set, sequence or a choice.

Note 2 to entry: A data frame can contain other data frames.

3.1.11.5
message
grouping of *data elements* (3.1.11.1), *data frames* (3.1.11.4), or data elements and data frames that is used to convey information

3.1.11.6
interface dialogue
dialog
dialogue
bi-directional communication sequence between two parties in accordance with predetermined protocols

Note 1 to entry: The term "dialog" represents the American English spelling.

Note 2 to entry: The term "dialogue" can be used when the interface context is known.

3.1.12 System engineering terms

NOTE Figure A.12 depicts the concept model for the terms defined in this subclause.

3.1.12.1
use case
description of the behavioural requirements of a *system* (3.1.2.1) and its *interaction* (3.1.6.4) with a *user* (3.5.1.3)

[SOURCE: ISO/IEC/IEEE 26515:2018, 3.15, modified — Note 1 to entry removed.]

3.1.12.2
scenario
use case scenario
<use case> description of the sequence of events from the *user's* (3.5.1.3) perspective to perform a task in a specified context

[SOURCE: ISO/IEC 25062:2006, A.17]

3.1.12.3
role
specified responsibilities

[SOURCE: ISO/IEC 11179-3:2013, 3.2.121]

3.1.13 Time terms

NOTE Figure A.13 depicts the concept model for the terms defined in this subclause.

3.1.13.1
instant
0-dimensional geometric primitive representing position in time

[SOURCE: ISO 19108:2002, 4.1.17, modified — Note 1 to entry removed.]

3.1.13.2
duration
time between two *instants* (3.1.13.1)

3.2 Technology terms

3.2.1 Top-level physical object terms

NOTE Figure A.14 depicts the concept model for the terms defined in this subclause.

3.2.1.1
central system
ITS central system
ITS component (3.1.8.2) that provides application, management, and/or administrative functions from a centralized *location* (3.4.1.1), i.e. not at the *roadside* (3.3.1.10)

3.2.1.2
field system
ITS field system
roadside system
infrastructure-based *ITS component* (3.1.8.2) located outside of a data centre that is designed to provide local processing or routing services while stationary

EXAMPLE Traffic detector, camera, signal controller, message sign, tolling station.

Note 1 to entry: Typically, field systems are located along the *roadside* (3.3.1.10).

Note 2 to entry: Typically, the operation of a field system is governed by management functions running in a centre system.

Note 3 to entry: Field systems can be permanently installed or transportable.

Note 4 to entry: The term “roadside system” is typically used to describe field systems along a roadside but can also be used to refer to kiosks.

3.2.1.3
personal system
ITS personal system
traveller system
ITS component (3.1.8.2), other than a *vehicle system* (3.2.1.5), that is used by a *person* (3.1.1.6) in relation to a past, current or upcoming journey

3.2.1.4
support system
ITS support system
ITS component (3.1.8.2) that provides services in support of one or more other ITS components

EXAMPLE Data distribution *system* (3.1.2.1), network time source, *cooperative ITS* (3.1.2.5) credentials management system.

3.2.1.5
vehicle system
ITS vehicle system
ITS component (3.1.8.2) that is installed as a component of a *vehicle* (3.7.1.1)

3.2.2 Centre physical object terms

NOTE Figure A.15 depicts the concept model for the terms defined in this subclause.

3.2.2.1
emergency management central system
centre system (3.2.1.1) that allows an *entity* (3.1.1.1) to manage and respond to crashes, events, disasters, evacuation orders and other incidents

3.2.2.2
fleet and freight management central system
centre system (3.2.1.1) that allows a fleet or freight operator to manage and control its personnel, equipment and/or freight

3.2.2.3
maintenance and construction central management system
centre system (3.2.1.1) that allows an *entity* (3.1.1.1) to monitor and manage the construction and maintenance of *road* (3.3.5.1) infrastructure

3.2.2.4
payment administration central system
centre system (3.2.1.1) that allows an *entity* (3.1.1.1) to manage financial transactions related to transportation, especially the electronic transfer of funds

3.2.2.5
public transport central management system
centre system (3.2.1.1) that allows an *entity* (3.1.1.1) to manage the activities of a *public transport* (3.5.6.1) agency

3.2.2.6
traffic management central system
centre system (3.2.1.1) that monitors and controls traffic and the *road network* (3.3.5.2)

3.2.2.7
traffic regulation central system
centre system (3.2.1.1) that officially records traffic regulations in electronic form so that they can be distributed to other systems

3.2.2.8
transport information central system
centre system (3.2.1.1) that provides information of interest to the travelling public

3.2.3 Field physical object terms

NOTE Figure A.16 depicts the concept model for the terms defined in this subclause.

3.2.3.1
field support equipment
ITS field support equipment
portable *field system* (3.2.1.2) used by field personnel to locally troubleshoot, initialize, reprogram and test infrastructure equipment

3.2.3.2
ITS roadside equipment
ITS roadway equipment
field system (3.2.1.2) that performs localized *ITS services* (3.5.3.1)

EXAMPLE traffic signal controller, variable message sign, vehicle detection

Note 1 to entry: ITS services that can be performed by ITS roadside equipment include surveillance, traffic control, information provision, payment transaction services, and/or enforcement

Note 2 to entry: "ITS roadway equipment" is used within the current version of the Architecture Reference for Cooperative and Intelligent Transportation (ARC-IT; see Reference [25]). The term *roadway* (3.3.1.3) has been revised to reflect that the equipment is typically along the roadway rather than a part of the roadway.

3.2.3.3
connected roadside equipment
ITS connected roadside equipment
RSE
connected vehicle roadside equipment
ITS *roadside equipment* (3.2.3.2) that perform *ITS services* (3.5.3.1) by exchanging electronic *message* (3.1.11.5) with nearby *vehicle systems* (3.2.1.5) and/or *personal systems* (3.2.1.3) via short-range wireless technologies

Note 1 to entry: Connected roadside equipment typically provides ITS-related functionality but the term includes roadside equipment that only provide the ITS service of routing for short-range wireless technologies.

Note 2 to entry: The term "connected vehicle roadside equipment" is used within the current version of the Architecture Reference for Cooperative and Intelligent Transportation (ARC-IT; see Reference [25]).

3.2.3.4
roadside unit
ITS roadside unit
RSU
part of *connected roadside equipment* (3.2.3.3) that provides wireless connectivity to *vehicle systems* (3.2.1.5) and/or *personal systems* (3.2.1.3)

3.2.3.5
connected unit
ITS connected unit
electronic device that is *connected* (3.2.3.6) using one or more communication media

3.2.3.6
connected
ITS connected
characteristic of a *material entity* (3.1.1.3) that is equipped with enabled (i.e. on) and operational electronic communication technologies to support *ITS services* (3.5.3.1), including the means to send and receive data to and from other connected entities

Note 1 to entry: The term "connected" does not imply support for any specific communications interface or *ITS-S application process* (3.2.9.2).

3.2.4 Personal physical object terms

NOTE Figure A.17 depicts the concept model for the terms defined in this subclause.

3.2.4.1
nomadic vehicle device
carry-in vehicle device
external in-vehicle device
personal system (3.2.1.3) consisting of global navigation satellite system (GNSS) and/or wireless *modules* (3.1.8.7) that are *connected* (3.2.3.6) to a *vehicle* (3.7.1.1) during a trip

3.2.4.2
personal information device
ITS personal information device
personal system (3.2.1.3) that enables personal access to *traveller* (3.6.1.1) information

EXAMPLE Personal computer.

3.2.4.3
nomadic device
ITS nomadic device
personal information device (3.2.4.2) that is taken with and can be accessed by the *traveller* (3.6.1.1) during a journey

EXAMPLE Smartphone.

3.2.4.4
public information device
ITS public information device
personal system (3.2.1.3) that provides *public* (3.5.8.2) access to *traveller* (3.6.1.1) information

EXAMPLE Kiosk.

3.2.5 Support physical object terms

NOTE Figure A.18 depicts the concept model for the terms defined in this subclause.

3.2.5.1
cooperative ITS credentials management system
CCMS
support system (3.2.1.4) that enables trusted communications among *ITS components* (3.1.8.2) and protects data from unauthorized access

3.2.5.2
map provision system
ITS map provision system
support system (3.2.1.4) that provides map databases used to support *ITS services* (3.5.3.1)

3.2.6 Vehicle physical object terms

NOTE Figure A.19 depicts the concept model for the terms defined in this subclause.

3.2.6.1
ITS on-board equipment
on-board equipment
OBE
onboard equipment
vehicle system (3.2.1.5) that provides all ITS functionality on-board the *vehicle* (3.7.1.1)

Note 1 to entry: ITS on-board equipment relates to any functionality. When there is a need to distinguish between core functionality and that by a special vehicle, the term can be further refined by indicating the type of vehicle to which the on-board equipment relates. For example, emergency vehicle on-board equipment can provide specialized functionality.

Note 2 to entry: The on-board equipment may also perform other functions.

3.2.6.2
ITS on-board unit
on-board unit
OBU
onboard unit
part of *on-board equipment* (3.2.6.1) that provides wireless connectivity to other *ITS components* (3.1.8.2) external to the *vehicle* (3.7.1.1)

Note 1 to entry: An OBU implementation can also include ITS functionality.

3.2.7 ITS station terms

NOTE Figure A.20 depicts the concept model for the terms defined in this subclause.

3.2.7.1
bounded secured managed domain
BSMD
abstract *entity* (3.1.1.1) representing a managed processing and memory *environment* (3.1.3.11) that provides protection from code and data that has not been determined to meet established security requirements

3.2.7.2
ITS trust domain
set of *bounded secured managed domains* (3.2.7.1) that meet a defined set of ITS industry security requirements

3.2.7.3
ITS station
ITS-S
bounded secured managed domain (3.2.7.1) that is able to meet requirements of the *ITS trust domain* (3.2.7.2) within which it wishes to participate

Note 1 to entry: The ITS station reference architecture is defined in ISO 21217.

3.2.7.4
ITS-S unit
ITS station unit
ITS-SU
instantiation of an *ITS station* (3.2.7.3)

3.2.7.5
ITS-S communication unit
ITS station communication unit
ITS-SCU
physical unit in an *ITS-S unit* (3.2.7.4) containing part or all of the functionality of an *ITS-S* (3.2.7.3)

3.2.7.6
ITS station host
ITS-S host
ITS-S (3.2.7.3) functionalities in an *ITS-S node* (3.2.7.8) other than the functionalities of an *ITS-S router* (3.2.7.7), ITS-S border router, ITS-S mobile router or an ITS-S gateway

Note 1 to entry: ITS-S border router and ITS-S mobile router are ITS-S routers with added functionalities, which is why they are separately excluded in the above definition.

Note 2 to entry: ITS-S border router, ITS-S mobile router, and ITS-S gateway are defined in ISO 21217.

3.2.7.7
ITS-S router
ITS-S (3.2.7.3) functionalities in an *ITS-S node* (3.2.7.8) that enable connecting two networks and forwarding packets not explicitly addressed to the ITS-S node

3.2.7.8
ITS-S node
node (3.3.5.4) comprised of a set of functionalities in an *ITS-S unit* (3.2.7.4) that is *connected* (3.2.3.6) to the *ITS station* (3.2.7.3)-internal network or comprises an entire ITS-S unit

3.2.8 ITS application terms

NOTE Figure A.21 depicts the concept model for the terms defined in this subclause.

3.2.8.1
ITS application
realization of an *ITS service* (3.5.3.1) that involves an association of two or more complementary *ITS-S application processes* (3.2.9.2)

3.2.8.2
interoperability design
characteristics necessary to fully define how various *physical objects* (3.1.8.1) interoperate to provide a *service* (3.5.1.1)

Note 1 to entry: Characteristics often include but are not limited to functional, performance and interface requirements.

3.2.8.3
ITS application specification
one or more *documents* (3.1.6.3) that detail the *interoperability design* (3.2.8.2) for an *ITS application* (3.2.8.1)

3.2.8.4
application template
ITS application template
defined annotated outline for an *ITS application specification* (3.2.8.3)

3.2.8.5
ITS implementation
integration of each *physical object* (3.1.8.1) necessary to implement one or more *ITS applications* (3.2.8.1)

Note 1 to entry: An ITS application typically requires multiple components (e.g. an ITS-S acting as a user and another ITS-S acting as a provider). An ITS implementation includes a sample of each component necessary for the service but often does not represent a complete deployment.

Note 2 to entry: An ITS implementation is typically used for a laboratory or other experimental *environment* (3.1.3.11) prior to a full-scale deployment.

3.2.8.6
ITS deployment
installation capable of performing one or more *ITS applications* (3.2.8.1)

Note 1 to entry: An ITS deployment typically refers to the support, central and roadside ITS stations coupled with a tacit acknowledgement of the mobile ITS stations that will communicate with the support, central or roadside ITS stations.

3.2.9 ITS-S application process terms

NOTE Figure A.22 depicts the concept model for the terms defined in this subclause.

3.2.9.1
ITS application role
ITS-S user need (3.5.4.4) expressed as a formal set of interoperability requirements that need to be fulfilled to satisfy a portion of functionality of an *ITS application* (3.2.8.1)

3.2.9.2
ITS-S application process
element (3.1.3.10) in an *ITS station* (3.2.7.3) that performs information processing for an *ITS-S service* (3.5.4.1)

3.2.9.3
ITS-S application
ITS-S application process (3.2.9.2) residing in the *application entity* (3.1.5.1)

3.2.9.4
ITS-S application implementation
implementation of an *ITS-S application process* (3.2.9.2) within the *application entity* (3.1.5.1)

Note 1 to entry: An implementation is typically associated with an implementation name, a version and release number.

3.2.9.5
ITS-S application process installation
installation of an implementation of an *ITS-S application process* (3.2.9.2) on an *ITS station* (3.2.7.3)

Note 1 to entry: An implementation is typically associated with an implementation name, a version and release number.

Note 2 to entry: An installation is typically associated with a specific licence code or serial number.

3.2.9.6
ITS-S application installation
ITS-S application process installation (3.2.9.5) within the *application entity* (3.1.5.1)

3.3 Infrastructure terms

3.3.1 Road reservation component terms

NOTE Figure A.24 provides a graphical depiction and Figure A.25 depicts the concept model for the terms defined in this subclause.

3.3.1.1
cross-section
transverse view of *road* (3.3.5.1) geometry

EXAMPLE Figure A.23.

Note 1 to entry: The transverse view provides a vertical section of the ground and *carriageway* (3.3.1.5) at right angles to the centre line of the carriageway.

3.3.1.2
road reservation
easement
area legally reserved for *road* (3.3.5.1) transport purposes and support

Note 1 to entry: Support includes physical equipment such as safety devices, signage and controller cabinets as well as access by maintenance vehicles and personnel.

Note 2 to entry: The road reservation includes all *carriageways* (3.3.1.5) as well as width to allow for *roadside* (3.3.1.10) devices, *shoulders* (3.3.1.18), *verges* (3.3.1.11), *footways* (3.3.3.3), drainage facilities, sound walls, slopes, embankments, etc.

3.3.1.3
roadway
part of the surface of the *road reservation* (3.3.1.2) primarily designed for the movement of *vehicles* (3.7.1.1) that conform to a specified set of requirements

Note 1 to entry: A roadway is characterized using a *cross-section* (3.3.1.1) of a road facility as the roadway characteristics often change along the length of the road. See "*road*" (3.3.5.1), "*road section*" (3.3.5.7), "*road segment*" (3.3.5.8), and "*road link*" (3.3.5.6) for different types of stretches of roadway.

Note 2 to entry: In practice, the roadway design considers a variety of issues, which can result in suboptimal road segments that violate normal design guidelines. Such *locations* (3.4.1.1) are typically posted with warning signs, but they are still designed for the movement of vehicles.

Note 3 to entry: While the roadway is designed with certain vehicle characteristics in mind, local regulations typically allow a wider set of vehicles to use the roadway.

Note 4 to entry: The roadway includes any contiguous *hard shoulders* (3.3.1.19), *hardstanding* (3.3.1.17) and reserved *lanes* (3.3.1.14).

3.3.1.4
driving space
area above the *roadway* (3.3.1.3) that is primarily designed for the movement of *vehicles* (3.7.1.1)

Note 1 to entry: In practice, the driving space design considers a variety of issues, which can result in suboptimal *road* (3.3.5.1) segments that violate normal design guidelines. Such *locations* (3.4.1.1) are typically posted with warning signs, but they are still designed for the movement of vehicles.

Note 2 to entry: While the driving space is designed with certain vehicle characteristics in mind, local regulations typically allow a wider set of vehicles to use the driving space.

3.3.1.5
carriageway
contiguous area of *roadway* (3.3.1.3) along a *road segment* (3.3.5.8)

Note 1 to entry: A carriageway is comprised of one or more traffic *lanes* (3.3.1.13) [i.e. the *usable width* (3.3.1.15)] and could include *shoulders* (3.3.1.18) and *lay-bys* (3.3.1.16).

Note 2 to entry: Carriageways are separated by *physical traffic separators* (3.3.2.1).

Note 3 to entry: When looking at a *cross-section* (3.3.1.1) of the *road reservation* (3.3.1.2), the roadway consists of all of the carriageways.

3.3.1.6
travelled way
part of the *roadway* (3.3.1.3) that is currently intended for transport purposes

Note 1 to entry: The travelled way does not include *hard shoulders* (3.3.1.19), *hardstanding* (3.3.1.17), or other areas that are not currently intended for normal operational use. In other words, while these other areas are "designed" for transport purposes, they are not "intended" for normal transport purposes (at present); rather these extra areas exist for safety and other exceptional use conditions.

Note 2 to entry: While the limits of the roadway are defined by the design of the physical infrastructure and are generally static; the limits of the travelled way can be dynamic, such as in the case of a *hard shoulder for emergency use* (3.3.4.1) being converted into *hard shoulder running* (3.3.4.2) operation.

3.3.1.7
single carriageway road segment
single carriageway road
single carriageway
undivided highway
roadway (3.3.1.3) comprised of exactly one *carriageway* (3.3.1.5)

Note 1 to entry: The World Road Association (PIARC) term is "single carriageway road" and is recognized as a preferred term. As per the definitions provided in this document, "single carriageway road segment" is more accurate and is the most preferred term. The term "single carriageway" by itself is not preferred but admitted.

Note 2 to entry: A single carriageway road segment could have multiple *lanes* (3.3.1.12) and could allow travel in opposite directions

Note 3 to entry: The term "undivided highway" is the equivalent American English term.

3.3.1.8
dual carriageway road segment
dual carriageway road
divided highway
dual carriageway
roadway (3.3.1.3) comprised of exactly two *carriageways* (3.3.1.5)

Note 1 to entry: The PIARC term is "dual carriageway road" and is recognized as a preferred term. As per the definitions provided in this document, "dual carriageway road segment" is more accurate and is the most preferred term. The term "dual carriageway" by itself is not preferred but admitted.

Note 2 to entry: The term "divided highway" is the equivalent American English term and equates to two or more carriageways.

Note 3 to entry: The two carriageways are typically designed for travel in opposite directions.

3.3.1.9
multiple carriageway road segment
multiple carriageway road
multiple carriageway
roadway (3.3.1.3) comprised of more than two *carriageways* (3.3.1.5)

Note 1 to entry: The PIARC term is "multiple carriageway road" and is recognized as a preferred term. As per the definitions provided in this document, "*dual carriageway road segment*" (3.3.1.8) is more accurate and is the most preferred term. The term "dual carriageway" by itself is not preferred but admitted.

Note 2 to entry: The separate carriageways are typically designed for separate traffic for (often multiple) specific operational reasons, such as direction of travel, category of vehicle (e.g. high occupancy vehicle), local versus through travel, etc.

3.3.1.10
roadside
portion of the *road reservation* (3.3.1.2) excluding all *roadway* (3.3.1.3) and *driving space(s)* (3.3.1.4)

Note 1 to entry: Roadside, *shoulder* (3.3.1.18) and *verge* (3.3.1.11) define similar but slightly different concepts

3.3.1.11
verge
unpaved part of the *roadside* (3.3.1.10) designed for travel safety purposes

Note 1 to entry: A verge can separate two *lanes* (3.3.1.12) of different modes, separate a *traffic lane* (3.3.1.13) from a ditch, or separate a lane from another safety hazard.

Note 2 to entry: Roadside, *shoulder* (3.3.1.18) and verge define similar but slightly different concepts.

3.3.1.12
lane
generic lane
<generic> portion of *road reservation* (3.3.1.2) intended to accommodate a single line of moving *material entities* (3.1.1.3) along its length

EXAMPLE *Traffic lane* (3.3.1.13), *cycle lane* (3.3.3.1), *sidewalk* (3.3.3.4).

Note 1 to entry: *Lanes* (3.3.1.12) are often bounded by lane markings.

Note 2 to entry: Lanes may be significantly wider than the normal vehicle width to allow variance in lane position of the vehicle as well as for various vehicle dimensions.

Note 3 to entry: The "lane" nomenclature typically refers to *motor vehicle* (3.7.6.3) usage, but can also refer to other purposes, such as *sidewalks* (3.3.3.4).

3.3.1.13
traffic lane
lane
portion of *carriageway* (3.3.1.5) designed to accommodate a single line of moving *road vehicles* (3.7.6.1)

Note 1 to entry: The term "lane" is often used to refer to a "traffic lane" when the context is known to be "traffic".

Note 2 to entry: A traffic lane can be bi-directional, such as a single lane *road* (3.3.5.1), a two-way turn/overtaking lane, or a reversible flow lane.

Note 3 to entry: Some jurisdictions allow supplemental uses of a traffic lane, such as multiple motorcycles sharing the width of a traffic lane or allowing a bicycle to use the edge of a lane.

3.3.1.14
reserved lane
traffic lane (3.3.1.13) restricted to a specific subset of *road vehicles* (3.7.6.1) or *user* (3.5.1.3) categories

EXAMPLE 1 Bus lane.

EXAMPLE 2 High-occupancy vehicle lane.

Note 1 to entry: A traffic lane may be reserved permanently or under certain conditions or times.

3.3.1.15
usable width
all *traffic lanes* (3.3.1.13) of a *carriageway* (3.3.1.5)

3.3.1.16
lay-by
short length of paved *carriageway* (3.3.1.5) at its edge designed to allow a *vehicle* (3.7.1.1) to draw out of the *traffic lanes* (3.3.1.13) and stop temporarily

Note 1 to entry: Lay-bys are not part of a *hard shoulder* (3.3.1.19).

Note 2 to entry: Lay-bys can be used for emergency situations, picking up/dropping off *passengers* (3.6.2.1), etc.

3.3.1.17
hardstanding
part of a paved *carriageway* (3.3.1.5) that is not a *traffic lane* (3.3.1.13), *hard shoulder* (3.3.1.19), or *lay-by* (3.3.1.16).

EXAMPLE See Figure A.23.

Note 1 to entry: Hardstanding can include edges of a hard shoulder outside of designated lane markings, slips for future connector *roads* (3.3.5.1), etc.

3.3.1.18
shoulder
either a *hard shoulder* (3.3.1.19) or a *soft shoulder* (3.3.1.20)

Note 1 to entry: In some jurisdictions, a shoulder can be used for emergency stops and/or other purposes in addition to providing a clear zone for safety purposes.

Note 2 to entry: *Roadside* (3.3.1.10), shoulder, and *verge* (3.3.1.11) define similar but slightly different concepts

3.3.1.19
hard shoulder
part of the paved *carriageway* (3.3.1.5) designed to support traffic loads but not normally intended for driving

Note 1 to entry: A hard shoulder can be narrow or wide enough for a *traffic lane* (3.3.1.13).

Note 2 to entry: A hard shoulder can have a surface that discourages usage as a driving surface in some countries.

3.3.1.20
soft shoulder
unpaved part of the *road reservation* (3.3.1.2) not belonging to the *carriageway* (3.3.1.5) but providing lateral support to it

Note 1 to entry: Soft shoulders are not normally intended for driving.

Note 2 to entry: Soft shoulders often have a grass or gravel surface.

3.3.2 Physical traffic separator terms

NOTE Figure A.26 depicts the concept model for the terms defined in this subclause.

3.3.2.1
physical traffic separator
mechanism used to physically separate *carriageways* (3.3.1.5)

Note 1 to entry: Mechanisms include various types of barriers, such as walls, rails, pylons, kerbs and ditches, as well as open, unpaved space. If two streams of traffic are only separated by paved space (including any markings and rumble strips), they share a common carriageway.

3.3.2.2
central reservation
median
median strip
neutral ground
part of the *road reservation* (3.3.1.2) between *carriageways* (3.3.1.5) designed for travel safety purposes

Note 1 to entry: A central reservation can be paved or unpaved and can be equipped with a safety barrier, rails, or other devices.

3.3.2.3
Jersey barrier
city block
concrete barrier
physical traffic separator (3.3.2.1) that consists of a wall with a wide, sloped base designed to divert *vehicles* (3.7.1.1) back into their *traffic lane* (3.3.1.13)

Note 1 to entry: Jersey barriers are typically modular. They are typically made of concrete but can also be made with other materials such as plastic filled with water or sand.

3.3.3 Alternate mode infrastructure component terms

NOTE Figure A.27 provides a graphical depiction and Figure A.28 depicts the concept model for the terms defined in this subclause.

3.3.3.1
cycle lane
lane (3.3.1.12) designed for the through movement of cycles

Note 1 to entry: Cycle lanes are typically much narrower than *traffic lanes* (3.3.1.13).

Note 2 to entry: Cycle lanes are typically part of either a *carriageway* (3.3.1.15) or a *cycleway* (3.3.3.2).

Note 3 to entry: Cycle lanes could also allow and be designed for *motorized vehicles* (3.7.6.2) (e.g. e-scooters, mopeds, etc.) with similar performance characteristics as human-powered cycles, subject to local regulations.

3.3.3.2
cycleway
cycle track
infrastructure primarily designed for the use of cycles and separate from a *carriageway* (3.3.1.5)

Note 1 to entry: Local legislation can allow cycleways to be used by a variety of *low-speed vehicles* (3.7.5.2) (e.g. low-speed scooters, skateboards, etc.) and can share usage of other low-speed modes such as *pedestrians* (3.6.1.4), horseback riders, etc.

3.3.3.3
footway
footpath
pavement
lane (3.3.1.12) primarily designed for the movement of *pedestrians* (3.6.1.4)

Note 1 to entry: A paved footway is called a "pavement" in British English.

Note 2 to entry: Regulations typically allow footways to be used by other ultra-low speed *users* (3.5.1.3), such as the users of wheelchairs and strollers.

3.3.3.4
sidewalk
footway (3.3.3.3) along a *roadside* (3.3.1.10)

3.3.4 Infrastructure operating mode terms

NOTE Figure A.29 depicts the concept model for the terms defined in this subclause.

3.3.4.1
hard shoulder for emergency use
operating mode of a *hard shoulder* (3.3.1.19) that allows operation of emergency, construction, maintenance, or other special use *vehicles* (3.7.1.1) or for emergency stopping and is prohibited for other vehicle usage

3.3.4.2
hard shoulder running
operating mode of a *hard shoulder* (3.3.1.19) that allows operation of general-purpose *motor vehicles* (3.7.6.3) as an extra *lane* (3.3.1.12)

3.3.5 Road network terms

NOTE Figure A.30 depicts the concept model for the terms defined in this subclause.

3.3.5.1
road
curvilinear length of *roadway* (3.3.1.3) that shares the same identification

Note 1 to entry: A length of the *road network* (3.3.5.2) may be referenced by multiple designators (e.g. Main Street and Route 7). In this case, there would be two "roads" that share the same set of "*carriageways*" (3.3.1.5).

Note 2 to entry: A road can change directions at a *junction* (3.3.6.2).

Note 3 to entry: The identification is generally a name or number.

3.3.5.2
road network
interconnected collection of *roads* (3.3.5.1)

3.3.5.3
road model
representation of a *road network* (3.3.5.2)

Note 1 to entry: Road models for different *systems* (3.1.2.1) will often define different models. For example, a public *transport system* (3.1.2.2) can define *road links* (3.3.5.6) based on the *location* (3.4.1.1) of bus stops while a traffic system can define road links based on the location of *junctions* (3.3.6.2).

3.3.5.4
node
road network node
<road network> component of a *road model* (3.3.5.3) representing a *point location* (3.4.1.3) of the *road network* (3.3.5.2) graph

Note 1 to entry: The point location typically represents a point along the *road* (3.3.5.1) which can be used to designate the *location* (3.4.1.1) of a *junction* (3.3.6.2), *public transport* (3.5.6.1) stop, jurisdictional boundary, termination point, etc.

3.3.5.5
link
<road network> component of a *road model* (3.3.5.3) that represents a connection between two *nodes* (3.3.5.4)

Note 1 to entry: A link can be curvilinear and can have various attributes such as width.

3.3.5.6
road link
link (3.3.5.5) representing a contiguous length of a *road* (3.3.5.1) between two *nodes* (3.3.5.4) of operational or managerial significance

Note 1 to entry: The operational characteristics of the nodes would relate to the type of *road model* (3.3.5.3). For example, a traffic *system* (3.1.2.1) can base its road links on nodes that represent *junctions* (3.3.6.2) and road *terminators* (3.1.8.3).

3.3.5.7
road section
aggregation of one or more *road links* (3.3.5.6) that represents a contiguous length of a *road* (3.3.5.1) that shares the same management and operational strategies

EXAMPLE A traffic signal timing plan is applied to one road section.

Note 1 to entry: Different *road models* (3.3.5.3) can divide the same road into different road sections.

3.3.5.8
road segment
link (3.3.5.5) that represents a contiguous length of a *road link* (3.3.5.6) characterized by the same physical characteristics

Note 1 to entry: The definition of road segments is highly dependent on which characteristics are modelled by the implementation. Characteristics that can result in a new road segment include addition or subtraction of a *lane* (3.3.1.12), a change in *roadway* (3.3.1.3) width, the change of *road* (3.3.5.1) type (e.g. start/end of a bridge), etc.

3.3.5.9
lane link
link (3.3.5.5) that represents a *lane* (3.3.1.12) of a *road link* (3.3.5.6)

Note 1 to entry: A *lane segment* (3.3.5.10) can start or end at *locations* (3.4.1.1) other than the start or end of the corresponding *road segment* (3.3.5.8) (e.g. a lane can start mid-block).

Note 2 to entry: A lane segment only includes the *sequential* (3.5.9.2) lane links, it does not include lane links from adjacent lanes.

3.3.5.10
lane segment
link (3.3.5.1) that represents a contiguous length of a *lane link* (3.3.5.9) characterized by the same physical characteristics

3.3.6 Junction terms

NOTE Figure A.31 depicts the concept model for the terms defined in this subclause.

3.3.6.1
intersection
space where two or more *roads* (3.3.5.1) meet or cross

Note 1 to entry: Intersections can be associated with zero *junctions* (3.3.6.2), such as a motorway crossing a road without any connecting ramps, or can be associated with one or more junctions, such as a diamond *interchange* (3.3.6.9).

Note 2 to entry: Complex intersections can be viewed as multiple intersections by providing separate designations for distinct *road links* (3.3.5.6). For example, one model could depict a complex intersection as being associated with multiple junctions; another model could depict the same physical infrastructure as being multiple intersections that are interconnected by different roads, each with its own designator (e.g. "ramp from northbound Road A to eastbound Road B").

3.3.6.2
junction
intersection (3.3.6.1) that allows *travellers* (3.6.1.1) to change *roads* (3.3.5.1)

3.3.6.3
ingress lane
traffic lane (3.3.1.13) designed for entering a *junction* (3.3.6.2)

3.3.6.4
ingress link
all *ingress lanes* (3.3.6.3) on a *road link* (3.3.5.6)

3.3.6.5
egress lane
traffic lane (3.3.1.13) designed for exiting a *junction* (3.3.6.2)

3.3.6.6
egress link
all *egress lanes* (3.3.6.5) on a *road link* (3.3.5.6)

3.3.6.7
intersection manoeuvre
manoeuvre
maneuver
<junction> movement from an *ingress lane* (3.3.6.3) to an *egress lane* (3.3.6.5)

Note 1 to entry: The term "maneuver" is the American English spelling.

3.3.6.8
junction at grade
at-grade intersection
grade junction
junction (3.3.6.2) without any *grade separated manoeuvres* (3.3.6.10)

3.3.6.9
interchange
junction (3.3.6.2) with at least one *grade separated manoeuvre* (3.3.6.10)

Note 1 to entry: The term "interchange" typically refers to the facilities that enable all available manoeuvres at the grade separated *intersection* (3.3.6.1), which typically includes multiple junctions.

Note 2 to entry: The grade separation allows *travellers* (3.6.1.1) on the *link* (3.3.5.5) to pass unimpeded through the interchange when congestion is not present.

3.3.6.10
grade separated manoeuvre
manoeuvre (3.3.6.7) that is vertically separated from one or more manoeuvres that cross its two-dimensional path

3.4 Location terms

3.4.1 Location type terms

NOTE Figure A.32 depicts the concept model for the terms defined in this subclause.

3.4.1.1
location
particular place or position

Note 1 to entry: The term "location" by itself is a broad term that can be used to reference spatial, computer memory, imaginary and other locations.

3.4.1.2
spatial location
ITS spatial location
location (3.4.1.1) within three-dimensional space

Note 1 to entry: The "location" could be a point (consuming no space) or could consume space in one, two, or three dimensions. In any case, the location is identified within a larger space.

Note 2 to entry: Within ITS, locations are typically locations on or near the surface of the earth.

3.4.1.3
point location
spatial location (3.4.1.2) with no length in any of the spatial dimensions

3.4.1.4
geographic point location
geolocation
well defined geographic place described by one coordinate tuple

Note 1 to entry: The "geolocation" term is a short version of the term used within some ITS communities.

[SOURCE: ISO 19145:2013, 4.1.11, modified — Note 1 to entry added.]

3.4.1.5
linear location
ITS linear location
spatial location (3.4.1.2) that extends between two *point locations* (3.4.1.3) along a defined path

Note 1 to entry: The path can exhibit 3-dimensional characteristics.

3.4.1.6
area location
ITS area location
spatial location (3.4.1.2) enclosed within a two-dimensional boundary or boundaries across a defined surface

EXAMPLE The British Isles.

Note 1 to entry: The boundary can consist of a single curvilinear line (e.g. a circle) or multiple curvilinear lines (e.g. the boundaries of city limits) and can consist of multiple enclosed areas.

3.4.2 Location referencing terms

NOTE Figure A.33 depicts the concept model for the terms defined in this subclause.

3.4.2.1
location referencing
ITS location referencing
process used to develop a *spatial reference* (3.4.2.2)

3.4.2.2
spatial reference
ITS spatial reference
location reference
description of a *spatial location* (3.4.1.2) in the real world according to a defined reference system

EXAMPLE Coordinate tuple: 51.476852, -0.000500.

Note 1 to entry: It is not necessary for the rules be formal coordinates but they could be descriptive.

Note 2 to entry: The term "location reference" has been used within ITS, but the term "spatial reference" is preferred to better align with the activities of ISO/TC 211.

3.4.2.3
dynamic spatial reference
dynamic location reference
spatial reference (3.4.2.2) generated on-the-fly based on geographic properties in a digital map database

3.4.2.4
pre-coded spatial reference
pre-coded location reference
spatial reference (3.4.2.2) using a unique identifier that is agreed upon in both the sender and receiver *system* (3.1.2.1) to select a *location* (3.4.1.1) from a set of pre-coded locations

3.4.2.5
link location
pre-coded spatial reference (3.4.2.4) defined within the *road network* (3.3.5.2) database

3.4.2.6
geographic identifier
DEPRECATED: location code
spatial reference (3.4.2.2) in the form of a label or code that identifies a *location* (3.4.1.1)

EXAMPLE "Spain" is an example of a label (country name); "SW1P 3AD" is an example of a code (postcode).

Note 1 to entry: The term "location code" has been used previously in ISO/TC 204 documents, but "geographic identifier" is preferred to better align with the activities of ISO/TC 211.

[SOURCE: ISO 19112:2019, 3.1.2, modified — Note 1 to entry and deprecated term added.]

3.4.2.7
gazetteer
location table
register of *spatial references* (3.4.2.2) of one or more *location* (3.4.1.1) sub-types containing some information regarding position

Note 1 to entry: The positional information need not be coordinates but could be descriptive.

[SOURCE: ISO 19112:2019, 3.1.1, modified — "register of location instances..." changed to "register of spatial references..." in order to fit the relevant concept model.]

3.5 Service terms

3.5.1 Generic service terms

NOTE Figure A.34 depicts the concept model for the terms defined in this subclause.

3.5.1.1
service
provision of one or more capabilities, functionalities or facilities to enable one or more tasks to fulfil a *need* (3.5.1.4)

3.5.1.2
service provider
entity (3.1.1.1) that delivers one or more *services* (3.5.1.1)

3.5.1.3
user
consumer
entity (3.1.1.1) that has a *need* (3.5.1.4) to be fulfilled

Note 1 to entry: The term "consumer" can be used when fulfilling the need results in the consumption of a *resource* (3.1.6.2).

3.5.1.4
user need
need
factor or condition necessary to achieve desired results within a specified context of use

[SOURCE: ISO/IEC TR 25060:2010, 2.25, modified — "for a user" removed from definition.]

3.5.2 Transport service terms

NOTE Figure A.35 depicts the concept model for the terms defined in this subclause.

3.5.2.1
transport service
service
<transport> *service* (3.5.1.1) that delivers one or more *material entities* (3.1.1.3) from one *location* (3.4.1.1) to another to satisfy a *transport need* (3.5.2.4)

Note 1 to entry: The material entities delivered can be people and/or goods.

3.5.2.2
transport provider
service provider
provider
<transport> *entity* (3.1.1.1) that delivers one or more *transport services* (3.5.2.1)

3.5.2.3
transport user
user
consumer
<transport> *entity* (3.1.1.1) that has a *transport need* (3.5.2.4) to be fulfilled

3.5.2.4
transport need
user need
need
<transport> *need* (3.5.1.4) to transport one or more *material entities* (3.1.1.3) to a different *location* (3.4.1.1)

3.5.3 ITS service terms

NOTE Figure A.36 depicts the concept model for the terms defined in this subclause.

3.5.3.1
ITS service
service
functionality that fulfils one or more *ITS user need* (3.5.3.4)

3.5.3.2
ITS service provider
service provider
entity (3.1.1.1) that delivers one or more *ITS service* (3.5.3.1)

Note 1 to entry: *Cooperative ITS* (3.1.2.5) services often require multiple entities cooperatively working together to provide a unified *service* (3.5.1.1) where the individual entities are simultaneously ITS service providers and ITS users.

3.5.3.3
ITS user
user
entity (3.1.1.1) that has an *ITS user need* (3.5.3.4) to be fulfilled

3.5.3.4
ITS user need
user
need
need (3.5.1.4) of an *entity* (3.1.1.1) external to the *intelligent transport system* (3.1.2.4) for a *surface transport system* (3.1.2.3) benefit that can be met with the use of information, communication, sensor, and/or control technologies

EXAMPLE Increasing safety, sustainability, efficiency and/or comfort.

3.5.4 ITS-S service terms

NOTE Figure A.37 depicts the concept model for the terms defined in this subclause.

3.5.4.1
ITS-S service
service
<ITS-S> performance of one or more tasks to fulfil an *ITS-S user need* (3.5.4.4) for an *ITS-S user* (3.5.4.3)

3.5.4.2
ITS-S service provider
service provider
<ITS-S> *ITS-S* (3.2.7.3) that delivers one or more *ITS-S services* (3.5.4.1)

3.5.4.3
ITS-S user
user
<ITS-S> *entity* (3.1.1.1) that has an *ITS-S user need* (3.5.4.4) to be fulfilled

3.5.4.4
ITS-S user need
user need
need
<ITS-S> *need* (3.5.1.4) for processing within a *bounded, secure, managed domain* (3.2.7.1)

3.5.5 ITS-S communication service terms

NOTE Figure A.38 depicts the concept model for the terms defined in this subclause.

3.5.5.1
ITS-S communications process
communication process
<ITS-S> *entity* (3.1.1.1) that delivers one or more *ITS-S communication services* (3.5.5.2)

3.5.5.2
ITS-S communications service
communication service
<ITS-S> performance of one or more tasks to fulfil an *ITS-S communication need* (3.5.5.4) for an *ITS-S communication user* (3.5.5.3)

3.5.5.3
ITS-S communications user
communication user
<ITS-S> *entity* (3.1.1.1) that has an *ITS-S communication need* (3.5.5.4) to be fulfilled

3.5.5.4
ITS-S communications need
communication need
<ITS-S> *need* (3.5.1.4) for communication functionality that connects an *ITS-S* (3.2.7.3) to other *nodes* (3.3.5.4)

3.5.6 Transport-related sharing terms

NOTE Figure A.39 depicts the concept model for the terms defined in this subclause.

3.5.6.1
public transport
public transport service
transport service (3.5.2.1) that is publicly accessible enabling the movement of one or more *persons* (3.1.1.6)

EXAMPLE 1 Bus, tram, cable car, metro, train and ferry are examples of public transport means for collective use.

EXAMPLE 2 Publicly-accessible shared cars, shared bikes and shared el-scooters are examples of public transport means for shared and individual use.

Note 1 to entry: A public transport service can be scheduled or on-demand.

Note 2 to entry: A public transport service is based on the use of publicly accessible transport means for collective, shared or individual use.

3.5.6.2
shared transport service
transport service (3.5.2.1) that relies upon the same *resources* (3.1.6.2) to fulfil the *transport needs* (3.5.2.4) of multiple unrelated *transport users* (3.5.2.3) and where the *transport provider* (3.5.2.2) has the primary responsibility for the operation of the transport mode

Note 1 to entry: A shared transport service might not be dependent upon a vehicle and/or could be multi-modal. For example, a letter courier service could rely on walking and *public transport* (3.5.6.1).

Note 2 to entry: Responsibilities of the transport service can be further delegated to others. For example, a courier service relying on public transport would delegate the operation of the transport mode to the public transport operator.

3.5.6.3
shared vehicle service
transport service (3.5.2.1) that *sequentially* (3.5.9.2) provides the same *vehicles* (3.7.1.1) to multiple unrelated *transport users* (3.5.2.3) and where the transport user has the primary responsibility for the operation of the vehicle

Note 1 to entry: As there should only be one operator of a vehicle at any time, a shared vehicle service should use a sequential operational model.

Note 2 to entry: This term can be specialized by replacing "vehicle" with any defined vehicle type (e.g. "automated vehicle sharing").

3.5.6.4
transport sharing
using a *shared transport service* (3.5.6.2)

3.5.6.5
vehicle sharing
using a *shared vehicle service* (3.5.6.3)

Note 1 to entry: This term can be specialized by replacing "vehicle" with any defined vehicle type. However, in some cases the preferred form is to consolidate terms (e.g. "carsharing" rather than "passenger car sharing").

3.5.7 Contractual model terms

NOTE Figure A.40 depicts the concept model for the terms defined in this subclause.

3.5.7.1
contractual model
shared mobility contract model
legal framework for the agreement between a *service provider* (3.5.1.2) and a *user* (3.5.1.3)

Note 1 to entry: Contracts can be via a third party, implied or verbal, especially in the case of *peer-to-peer* (3.5.7.5).

3.5.7.2
corporate customer model
contractual model (3.5.7.1) where the *user* (3.5.1.3) is a *commercial* (3.5.8.2) *entity* (3.1.1.1)

EXAMPLE 1 A business purchasing monthly *public transport* (3.5.6.1) passes for its employees.

EXAMPLE 2 A commercial entity using a commercial courier service for package delivery.

3.5.7.3
private customer model
contractual model (3.5.7.1) where the *user* (3.5.1.3) is an individual

3.5.7.4
government customer model
contractual model (3.5.7.1) where the *user* (3.5.1.3) is a governmental *entity* (3.1.1.1)

EXAMPLE A governmental entity using a *commercial* (3.5.8.2) courier service for package delivery.

3.5.7.5
peer-to-peer
<transport service> *private customer model* (3.5.7.3) where the *service provider* (3.5.1.2) is an individual

EXAMPLE Ridesourcing.

Note 1 to entry: The customer and provider can connect and/or contract through a third-party *service* (3.5.1.1).

3.5.8 Financial model terms

NOTE Figure A.41 depicts the concept model for the terms defined in this subclause.

3.5.8.1
financial model
economic framework for the agreement between a *service provider* (3.5.1.2) and a *user* (3.5.1.3)

3.5.8.2
commercial
type of *financial model* (3.5.8.1) where *services* (3.5.1.1) are provided with a profit motive

3.5.8.3
public
type of *financial model* (3.5.8.1) where *services* (3.5.1.1) are provided by an administrative authority in an attempt to better serve societal interests

Note 1 to entry: The *transport service* (3.5.2.1) is typically offered to the transport consumer for less than the full capital and operating cost of providing the service, but this is not a requirement.

Note 2 to entry: Typically, the administrative authority is a local government agency; but it could be another administrative authority, such as the national government or a *commercial* (3.5.8.2) *entity* (3.1.1.1) managing *transport needs* (3.5.2.4) on their campus.

3.5.8.4
cooperative
type of *financial model* (3.5.8.1) where *users* (3.5.1.3) partner to defray the costs of *services* (3.5.1.1)

Note 1 to entry: Cooperative models are exclusive *commercial* (3.5.8.2) and *public* (3.5.8.3) models.

3.5.8.5
mutual benefit
cooperative (3.5.8.4) *financial model* (3.5.8.1) where *users* (3.5.1.3) partner on a per-use basis

3.5.8.6
fractional ownership
<transport service> *cooperative* (3.5.8.4) *financial model* (3.5.8.1) where *users* (3.5.1.3) partner to support the purchase, maintenance and overhead costs associated with a *service* (3.5.1.1)

3.5.8.7
private
<transport service> *financial model* (3.5.8.1) where *services* (3.5.1.1) are provided to members of the owning organization without usage fees

EXAMPLE Fleet vehicles of an employer.

3.5.8.8
membership-based
characteristic of a *financial model* (3.5.8.1) that requires *users* (3.5.1.3) to enter into an agreement prior to receiving *services* (3.5.1.1)

Note 1 to entry: The agreement can be associated with fees.

Note 2 to entry: The agreement can be minimal, such as collecting user information for business purposes.

Note 3 to entry: The membership can be granted as a part of a broader agreement. For example, a university bus *system* (3.1.2.1) can restrict access to students and faculty.

3.5.8.9
open-access
characteristic of a *financial model* (3.5.8.1) that does not require membership within an organization to receive *services* (3.5.1.1)

Note 1 to entry: This includes models where membership is optional and can provide extra benefits.

3.5.9 Operational model terms

NOTE Figure A.42 depicts the concept model for the terms defined in this subclause.

3.5.9.1
operational model
logistical framework for the agreement between a *service provider* (3.5.1.2) and a *user* (3.5.1.3)

Note 1 to entry: The logistical framework can set restrictions on how a *passenger* (3.6.2.1) and/or good is received, transported and/or delivered.

3.5.9.2
sequential
operational model (3.5.9.1) where *services* (3.5.1.1) are provided to a single *user* (3.5.1.3) at any one time

EXAMPLE Traditional taxi service.

Note 1 to entry: A single transport consumer can request the transport of multiple *passengers* (3.6.2.1).

3.5.9.3
concurrent
operational model (3.5.9.1) where *services* (3.5.1.1) can be provided to multiple *users* (3.5.1.3) at any one time

3.5.9.4
fixed route
<transport service> *concurrent* (3.5.9.3) operation where transported items can only be received or delivered at stopping points contained in a pre-defined sequence

EXAMPLE Traditional fixed-route bus line.

3.5.9.5
dynamic route
<transport service> *concurrent* (3.5.9.3) operation where transported items can only be received or delivered at stopping points within a pre-defined *service* (3.5.1.1) corridor

EXAMPLE Airport shuttle.

Note 1 to entry: The service corridor is defined by the provider, who may impose further restrictions on where stops are allowed.

Note 2 to entry: The service corridor often includes a communal point of interest (e.g. an airport, transit hub, etc.) as a fixed stopping point.

3.5.9.6
paired on-demand
<transport service> *concurrent* (3.5.9.3) operation where the *transport provider* (3.5.2.2) may choose to divert from its path to service a new request from another *transport users* (3.5.2.3) while servicing an earlier transport user

EXAMPLE Ridesplitting.

3.5.10 Network model terms

NOTE Figure A.43 depicts the concept model for the terms defined in this subclause.

3.5.10.1
network model
infrastructure framework for the agreement between a *service provider* (3.5.1.2) and a *user* (3.5.1.3)

3.5.10.2
station-based roundtrip
<transport service> *operational mode* (3.5.9.1) where the *transport service* (3.5.2.1) is initiated and terminated at the same facility managed by the *transport provider* (3.5.2.2)

3.5.10.3
station-based one-way
<transport service> *operational mode* (3.5.9.1) where the *transport service* (3.5.2.1) is initiated and terminated at two different facilities managed by the *transport provider* (3.5.2.2)

3.5.10.4
free-floating
<transport service> *network model* (3.5.10.1) where the *transport service* (3.5.2.1) may be initiated and terminated at any *location* (3.4.1.1) meeting basic criteria

Note 1 to entry: The basic criteria typically include geographic limits and requirements related to legal and safe locations.

3.5.11 Shared transport service terms

NOTE Figure A.44 depicts the concept model for the terms defined in this subclause.

3.5.11.1
shuttle service
shared transport service (3.5.6.2) that transports *passengers* (3.6.2.1) between two specified *locations* (3.4.1.1)

Note 1 to entry: Each location can be defined as point, linear or *area locations* (3.4.1.6). However, the areas of the two locations should not overlap.

3.5.11.2
taxi service
commercial (3.5.8.2) *shared transport service* (3.5.6.2) that transports *passengers* (3.6.2.1) *sequentially* (3.5.9.2)

3.5.11.3
taxi-share service
commercial (3.5.8.2) *shared transport service* (3.5.6.2) that transports *passengers* (3.6.2.1) *concurrently* (3.5.9.3)

3.5.11.4
rideshare service
cooperative (3.5.8.4) *shared transport service* (3.5.6.2) that transports *passengers* (3.6.2.1) *concurrently* (3.5.9.3)

3.5.11.5
ridesourced service
commercial (3.5.8.2), *peer-to-peer* (3.5.7.5) *shared transport service* (3.5.6.2) that transports *passengers* (3.6.2.1)

3.5.11.6
ridesplit service
ridesourced service (3.5.11.5) that serves *passengers* (3.6.2.1) *concurrently* (3.5.9.3)

3.5.11.7
courier network service
commercial (3.5.8.2), *peer-to-peer* (3.5.7.5) *shared transport service* (3.5.6.2) that transports goods

Note 1 to entry: The goods are typically small packages, letters, food, etc.

3.5.12 Shared vehicle terms

NOTE Figure A.45 depicts the concept model for the terms defined in this subclause.

3.5.12.1
bikesharing service
bicycle sharing service
shared vehicle service (3.5.6.3) that shares bicycles

Note 1 to entry: The term "bicycle sharing service" is admitted, but "bikesharing service" is preferred as it has fewer syllables.

3.5.12.2
carsharing service
passenger car sharing service
shared vehicle service (3.5.6.3) that shares *passenger* (3.6.2.1) cars

Note 1 to entry: The term "passenger car sharing service" is admitted but has the same meaning.

3.5.13 Transport service application terms

NOTE Figure A.46 depicts the concept model for the terms defined in this subclause.

3.5.13.1
mobility app
ITS-S application implementation (3.2.9.4) designed to assist an individual transport consumer in understanding transport-related information, making decisions, and/or acting upon decisions

3.5.13.2
B2C mobility sharing app
mobility app (3.5.13.1) that assists a *transport user* (3.5.2.3) in acquiring a *transport service* (3.5.2.1) from a specific business

3.5.13.4
navigation app
mobility app (3.5.13.1) that assists a *transport user* (3.5.2.3) to determine the best route to a destination

3.5.13.5
P2P mobility sharing app
mobility app (3.5.13.1) that assists a *transport user* (3.5.2.3) in acquiring *transport service* (3.5.2.1) from an individual that participates in the mobility app's network

3.5.13.6
ridesourcing app
P2P mobility sharing app (3.5.13.5) for acquiring a *ridesourced service* (3.5.11.5)

3.5.13.7
public transport app
mobility app (3.5.13.1) that assists a *transport user* (3.5.2.3) in using a *public transport* (3.5.6.1) *system* (3.1.2.1)

Note 1 to entry: A public transport app can include features such as viewing maps, searching routes and schedules, real-time arrival information, ticketing, electronic boarding pass, etc.

3.5.13.8
real-time traveller information app
mobility app (3.5.13.1) that provides information about current travel conditions to a *transport user* (3.5.2.3)

3.5.13.9
taxi hailing app
mobility app (3.5.13.1) that assists a *transport user* (3.5.2.3) in electronically requesting a taxi

3.5.13.10
trip aggregator app
mobility app (3.5.13.1) that assists a *transport user* (3.5.2.3) in planning trips that may span multiple vehicle modes or *transport providers* (3.5.2.2)

Note 1 to entry: The assistance can include reservations, ticketing and similar *services* (3.5.1.1).

3.6 User terms

3.6.1 Traveller terms

NOTE Figure A.47 depicts the concept model for the terms defined in this subclause.

3.6.1.1
traveller
person (3.1.1.6) who is headed to a destination

3.6.1.2
road user
mobile *material entity* (3.1.1.3) within the *road reservation* (3.3.1.2)

EXAMPLE *Pedestrians* (3.6.1.4), road work personnel, *vehicle occupants* (3.6.2.2), occupied and unoccupied vehicles, horses, etc.

3.6.1.4
pedestrian
person (3.1.1.6) who is travelling on foot

3.6.2 Vehicle occupant terms

NOTE Figure A.48 depicts the concept model for the terms defined in this subclause.

3.6.2.1
passenger
person (3.1.1.6) who has a reservation to travel or is travelling in a *vehicle* (3.7.1.1) except for any crew, staff or *drivers* (3.6.2.3)

3.6.2.2
vehicle occupant
person (3.1.1.6) in or on a *vehicle* (3.7.1.1)

Note 1 to entry: A vehicle occupant in a stationary vehicle is not necessarily a *traveller* (3.6.1.1).

3.6.2.3
driver
person (3.1.1.6) that is currently responsible for the *dynamic driving task* (3.7.3.1) for the *vehicle* (3.7.1.1)

Note 1 to entry: The driver is typically on-board the vehicle but could be remote from the vehicle or automated logic.

3.6.2.4
in-vehicle driver
conventional driver
driver (3.6.2.3) that performs the *dynamic driving task* (3.7.3.1) using the *vehicle's* (3.7.1.1) *built-in input devices* (3.7.1.5) to control the longitudinal and lateral movement of the vehicle

3.6.2.5
remote driver
driver (3.6.2.3) that performs the *dynamic driving task* (3.7.3.1) without using the *vehicle's* (3.7.1.1) *built-in input devices* (3.7.1.5) to control the longitudinal and lateral movement of the vehicle

Note 1 to entry: A remote driver can use a variety of physical input devices, but none that are built into the vehicle.

3.7 Vehicle terms

3.7.1 Vehicle component terms

NOTE Figure A.49 depicts the concept model for the terms defined in this subclause.

3.7.1.1
vehicle
material entity (3.1.1.3) designed to transport people or physical goods by changing its physical position

3.7.1.2
motor
engine
material entity (3.1.1.3) that converts energy into mechanical motion

3.7.1.3
wheel
circular *material entity* (3.1.1.3) that rotates about an axle to facilitate movement of the *vehicle* (3.7.1.1)

3.7.1.4
vehicle input device
input device
material entity (3.1.1.3) that can affect the *vehicle's* (3.7.1.1) operation

EXAMPLE steering wheel, lever, pedal, knob, button, touch screen

Note 1 to entry: Input devices include those used to control the motion of the vehicle (e.g. a brake pedal), the state of vehicular equipment (e.g. headlight control), the configuration of the vehicle (e.g. temperature control), etc.

3.7.1.5
built-in vehicle input device
built-in input device
input device (3.7.1.4) designed to be physically *connected* (3.2.3.6) to a *vehicle* (3.7.1.1) and to remain connected even when the vehicle is not in use

Note 1 to entry: Built-in input devices include devices that can be temporarily *disconnected* (3.7.4.3) for security reasons (e.g. some radios are equipped with detachable front panels).

Note 2 to entry: Built-in input devices are typically considered to be a part of the vehicle.

Note 3 to entry: Built-in input devices require a maintenance operation to connect or disconnect.

3.7.1.6
nomadic vehicle input device
nomadic input device
input device (3.7.1.4) that can be carried into, or in near proximity of, a *vehicle* (3.7.1.1) and *connected* (3.2.3.6) as desired

EXAMPLE A smartphone connected to a vehicle (via USB or Bluetooth) to provide *driver* (3.6.2.3) navigation on the vehicle's large screen display

Note 1 to entry: NDs are often more closely associated with a *person* (3.1.1.6) than they are with the vehicle.

Note 2 to entry: Nomadic input devices do not require a maintenance operation to connect or disconnect.

3.7.1.7
remote vehicle input device
remote input device
input device (3.7.1.4) designed to be electronically *connected* (3.2.3.6) to a *vehicle* (3.7.1.1) even when the vehicle is not in close proximity

3.7.2 Vehicle attribute terms

NOTE Figure A.50 depicts the concept model for the terms defined in this subclause.

3.7.2.1
speed
rate of change of a *material entity's* (3.1.1.3) position with respect to a frame of reference

Note 1 to entry: Speed is a function of time.

Note 2 to entry: Speed is the scalar absolute value (magnitude) of velocity.

3.7.2.2
design speed
vehicle design speed
top speed
<vehicle> maximum *speed* (3.7.2.1) at which a *vehicle* (3.7.1.1) is intended to operate for a sustained period of time

Note 1 to entry: The term "top speed" is defined in SAE J3194 in relation to powered micromobility vehicles and is considered to be semantically equivalent to design speed.

3.7.3 Vehicle automation terms

NOTE Figure A.51 depicts the concept model for the terms defined in this subclause.

3.7.3.1
dynamic driving task
DDT
all real-time operational and tactical functions required to operate a *vehicle* (3.7.1.1) in on-road traffic

Note 1 to entry: The DDT includes lateral vehicle motion control, longitudinal vehicle motion control, monitoring the driving *environment* (3.1.3.11), object and event response execution, manoeuvre planning and enhancing conspicuity.

Note 2 to entry: The DDT excludes strategic functions such as trip scheduling and selection of destinations and waypoints.

3.7.3.2
operational design domain
ODD
set of operating conditions under which a given *driving automation system* (3.7.3.6) or feature thereof is specifically designed to function

EXAMPLE 1 *ADS* (3.7.3.10) feature designed to operate a *vehicle* (3.7.1.1) only on fully access-controlled freeways in low-speed traffic, under fair weather conditions and optimal *road* (3.3.5.1) maintenance conditions (e.g. good lane markings and not under construction).

EXAMPLE 2 ADS-dedicated vehicle designed to operate only within a geographically-defined area, and only during daylight at speeds not exceeding 25 mph.

Note 1 to entry: The conditions can include environmental, geographical, time-of-day, and/or other restrictions.

Note 2 to entry: The conditions can require the presence or absence of certain traffic or *roadway* (3.3.1.3) characteristics.

3.7.3.3
fallback
driving automation fallback
<driving automation> response by a *person* (3.1.1.6) to perform the *DDT* (3.7.3.1) or by an *ADS* (3.7.3.10) to achieve a minimal risk condition when the response is triggered upon violation of the defined *operational design domain* (3.7.3.2) constraints or in response to a DDT performance-relevant *driving automation system* (3.7.3.6) failure

Note 1 to entry: This term includes the response of a person to perform the DDT in a manner to quickly achieve a minimal risk condition.

3.7.3.4
fallback-ready user
DDT fallback-ready user
<driving automation> *person* (3.1.1.6) who is able to operate the *vehicle* (3.7.1.1) if the Level 3 *ADS* (3.7.3.11) issues a request to intervene or if that person otherwise identifies a condition that requires intervention to perform the *DDT* (3.7.3.1)

3.7.3.5
DDT performance-relevant system failure
malfunction in a *vehicle system* (3.2.1.5) that prevents the *driving automation system* (3.7.3.6) from reliably performing its portion of the *DDT* (3.7.3.1) on a sustained basis

Note 1 to entry: The malfunction can be internal to the driving automation system or part of another vehicle system.

3.7.3.6
driving automation system
hardware and software *system* (3.1.2.1) that is able to perform part or all of the *DDT* (3.7.3.1) on a sustained basis

Note 1 to entry: In contrast to this generic term for any level 1-5 system, the specific term for a level 3-5 system is "Automated Driving System (ADS)." Given the similarity between the generic term, "driving automation system," and the level 3-5-specific term, "Automated Driving System," the latter term is intentionally capitalized when spelled out and reduced to its acronym, "ADS", as much as possible, while "driving automation system" should not be.

Note 2 to entry: A driving automation system includes any system capable of level 1-5 driving automation.

Note 3 to entry: Driving automation levels are defined in ISO/SAE 22736, which is also known as SAE J3016.

Note 4 to entry: Driving automation levels include "*level 1 driving automation*" (3.7.3.8), "*level 2 driving automation*" (3.7.3.9), "*level 3 ADS*" (3.7.3.11), "*level 4 ADS*" (3.7.3.12) and "*level 5 ADS*" (3.7.3.13).

3.7.3.7
driver support system
driving automation system (3.7.3.6) that is only able to perform part of the *DDT* (3.7.3.1)

Note 1 to entry: Driver support systems include *level 1* (3.7.3.8) and *level 2 driving automation* (3.7.3.9).

3.7.3.8
level 1 driving automation
driver assistance
driver support system (3.7.3.7) that provides either sustained lateral or sustained longitudinal *vehicle* (3.7.1.1) motion control within a specific *operational design domain* (3.7.3.2) with the expectation that a *conventional driver* (3.6.2.4) completes the *DDT* (3.7.3.1)

Note 1 to entry: Other driving automation levels include "*level 2 driving automation*" (3.7.3.9), "*level 3 ADS*" (3.7.3.11), "*level 4 ADS*" (3.7.3.12), and "*level 5 ADS*" (3.7.3.13).

3.7.3.9
level 2 driving automation
partial driving automation
driver support system (3.7.3.7) that provides sustained lateral and longitudinal *vehicle* (3.7.1.1) motion control within a specific *operational design domain* (3.7.3.2) with the expectation that a *conventional driver* (3.6.2.4) completes the object and event detection and response

Note 1 to entry: Other driving automation levels include "*level 1 driving automation*" (3.7.3.8), "*level 3 ADS*" (3.7.3.11), "*level 4 ADS*" (3.7.3.12), and "*level 5 ADS*" (3.7.3.13).

3.7.3.10
ADS
Automated Driving System
driving automation system (3.7.3.6) that is able to perform the entire *DDT* (3.7.3.1) on a sustained basis

Note 1 to entry: The abbreviated form ("ADS") is the most preferred form and the alternative form ("Automated Driving System") uses initial capitals to avoid confusion with the more general "driving automation system".

3.7.3.11
level 3 ADS
conditional driving automation
level 3 Automated Driving System
ADS (3.7.3.10) designed with the expectation that the *fallback-ready user* (3.7.3.4) is available to intervene

Note 1 to entry: Level 3 ADSs are restricted to operating within a specific *ODD* (3.7.3.2).

Note 2 to entry: Other driving automation levels include "*level 1 driving automation*" (3.7.3.8), "*level 2 driving automation*" (3.7.3.9), "*level 4 ADS*" (3.7.3.12), and "*level 5 ADS*" (3.7.3.13).

Note 3 to entry: The user can intervene due to an ADS-issued request, a *DDT* (3.7.3.1) performance-relevant system failure, or other reasons.

3.7.3.12
level 4 ADS
high driving automation
level 4 Automated Driving System
ADS (3.7.3.10) that is capable of operating within a specific *ODD* (3.7.3.2) and providing its own *fallback* (3.7.3.3), without any expectation that a human *driver* (3.6.2.3) will respond to a request to intervene

Note 1 to entry: Other driving automation levels include "*level 1 driving automation*" (3.7.3.8), "*level 2 driving automation*" (3.7.3.9), "*level 3 ADS*" (3.7.3.11), and "*level 5 ADS*" (3.7.3.13).

3.7.3.13
level 5 ADS
full driving automation
level 5 Automated Driving System
ADS (3.7.3.10) that is capable of unconditional (i.e. not *ODD* (3.7.3.2)-specific) operation and providing its own *fallback* (3.7.3.3), without any expectation that a human *driver* (3.6.2.3) will respond to a request to intervene

Note 1 to entry: Other driving automation levels include "*level 1 driving automation*" (3.7.3.8), "*level 2 driving automation*" (3.7.3.9), "*level 3 ADS*" (3.7.3.11) and "*level 4 ADS*" (3.7.3.12).

3.7.3.14
conventional vehicle
automation-equipped conventional vehicle
<driving automation> *vehicle* (3.7.1.1) designed to be operated by a *person* (3.1.1.6) during part or all of every *trip*.

3.7.3.15
ADS-equipped vehicle
automated vehicle
AV
DEPRECATED: autonomous vehicle
vehicle (3.7.1.1) integrated with an *ADS* (3.7.3.10)

Note 1 to entry: The terms "automated vehicle" and "AV" are often used in a colloquial form. However, these terms can be used to mean either an "ADS-equipped vehicle" or a "vehicle with an engaged ADS". The term "ADS-equipped vehicle" is preferred since it is more precise and descriptive in its meaning.

Note 2 to entry: The term "autonomous vehicle" is also often used in a colloquial form and is even less well defined. The term is particularly problematic because the word "autonomous" has been used for a long time in the robotics and artificial intelligence research communities to signify *systems* (3.1.2.1) that have the ability and authority to make decisions independently and self-sufficiently. Due to its imprecise and overly broad meaning, use of the term "autonomous vehicle" is discouraged.

Note 3 to entry: This term can be, and when possible should be, refined by identifying the level of automation. For example, the terms "level 5 ADS-equipped vehicle" and "level 5 automated vehicle" should be interpreted as "ADS-equipped vehicle where the ADS is a *level 5 ADS*." (3.7.3.13).

Note 4 to entry: This term only describes the capabilities of the vehicle, not its operational state. In other words, the term applies as long as the ADS is *connected* (3.2.3.6) to the vehicle, whether the *DDT* (3.7.3.1) is actively engaged or not.

3.7.3.16
dual-mode vehicle
driving automation dual-mode vehicle
<driving automation> *ADS-equipped vehicle* (3.7.3.15) designed for both driverless operation and operation by a *conventional driver* (3.6.2.4) for complete *trips*

3.7.3.17
ADS-dedicated vehicle
ADS-equipped vehicle (3.7.3.15) designed for only driverless operation for complete trips

3.7.4 Vehicle connectivity terms

NOTE Figure A.52 depicts the concept model for the terms defined in this subclause.

3.7.4.1
off-grid
ITS off-grid
characteristic of a *material entity* (3.1.1.3) that is currently unable to send data to or receive data from *connected* (3.2.3.6) entities

3.7.4.2
unconnected
ITS unconnected
characteristic of a *material entity* (3.1.1.3) that is equipped with communications equipment that is not active or is otherwise unable to send data to or receive data from *connected* (3.2.3.6) entities

3.7.4.3
disconnected
ITS disconnected
characteristic of a *material entity* (3.1.1.3) that is or was equipped with communications equipment that is sufficiently physically disconnected such that the material entity is no longer able to send data to or receive data from *connected* (3.2.3.6) entities

Note 1 to entry: The vehicle on-board equipment can still be present in the *vehicle* (3.7.1.1) and can even be partially connected, but not in any operational sense.

3.7.4.4
unequipped
ITS unequipped
characteristic of a *material entity* (3.1.1.3) that is not and has never been equipped with communications equipment for sending data to or receiving data from *connected* (3.2.3.6) entities

3.7.5 Vehicle speed terms

NOTE Figure A.53 depicts the concept model for the terms defined in this subclause.

3.7.5.1
ultra-low-speed vehicle
pedestrian-speed vehicle
vehicle (3.7.1.1) with a *design speed* (3.7.2.2) that does not exceed *ultra-low vehicle speeds* (3.7.5.7)

Note 1 to entry: The term "pedestrian speed vehicle" is allowed but the preferred term follows a logical progression of levels.

3.7.5.2
low-speed vehicle
cycle-speed vehicle
vehicle (3.7.1.1) with a *design speed* (3.7.2.2) in the range of *low vehicle speeds* (3.7.5.8)

EXAMPLE Mountain bicycle.

Note 1 to entry: The term "cycle-speed vehicle" is allowed but the preferred term follows a logical progression of levels.

3.7.5.3
moderately low-speed vehicle
vehicle (3.7.1.1) with a *design speed* (3.7.2.2) in the range of *moderately-low vehicle speeds* (3.7.5.9)

EXAMPLE Typical moped.

3.7.5.4
moderate-speed vehicle
vehicle (3.7.1.1) with a *design speed* (3.7.2.2) in the range of *moderate vehicle speeds* (3.7.5.10)

EXAMPLE Typical side-by-side utility task vehicle (UTV).

3.7.5.5
moderately high-speed vehicle
vehicle (3.7.1.1) with a *design speed* (3.7.2.2) in the range of *moderately-high vehicle speeds* (3.7.5.11)

EXAMPLE Typical *passenger* (3.6.2.1) car.

3.7.5.6
high-speed vehicle
vehicle (3.7.1.1) with a *design speed* (3.7.2.2) in the range of *high vehicle speeds* (3.7.5.12)

EXAMPLE 1 Racing car.

EXAMPLE 2 High-speed train

3.7.5.7
ultra-low vehicle speed
speed (3.7.2.1) of a *vehicle* (3.7.1.1) that does not greatly exceed typical *pedestrian* (3.6.1.4) speeds

EXAMPLE SAE J3194 associates this with a top speed of less than 13 km/h.

Note 1 to entry: Local regulations for the exact speed range vary.

3.7.5.8
low vehicle speed
speed (3.7.2.1) of a *vehicle* (3.7.1.1) that exceeds *pedestrian* (3.6.1.4) speeds and is more typical of pedal cycles

EXAMPLE SAE J3194 associates this with a top speed in the range between 13 km/h and 32 km/h.

Note 1 to entry: Local regulations for the exact speed range vary.

3.7.5.9
moderately-low vehicle speed
speed (3.7.2.1) of a *vehicle* (3.7.1.1) that exceeds speeds typical of pedal cycles but can be reached on performance pedal cycles in short bursts or by performance riders

EXAMPLE SAE J3194 associates this with a top speed in the range of 32 km/h to 48 km/h.

Note 1 to entry: Local regulations for the exact speed range vary.

3.7.5.10
moderate vehicle speed
speed (3.7.2.1) of a *vehicle* (3.7.1.1) that exceeds *moderately-low vehicle speeds* (3.7.5.9) but does not reach free-flow motorway speeds

EXAMPLE A speed in the range of 48 km/h and 87 km/h.

Note 1 to entry: Local regulations for the exact speed range vary.

3.7.5.11
moderately-high vehicle speed
speed (3.7.2.1) of a *vehicle* (3.7.1.1) that is typical of free-flow motorway speeds to twice that speed

EXAMPLE A speed in the range of 87 km/h and 198 km/h.

Note 1 to entry: Local regulations for the exact speed range vary.

3.7.5.12
high vehicle speed
speed (3.7.2.1) of a *vehicle* (3.7.1.1) that exceeds free flow motorway speeds by a factor of two or more

EXAMPLE A speed in excess of 198 km/h.

Note 1 to entry: Local regulations for the exact speed range vary.

3.7.6 Vehicle types — environment terms

NOTE Figure A.54 depicts the concept model for the terms defined in this subclause.

3.7.6.1
road vehicle
vehicle (3.7.1.1) meeting the requirements to operate within the *driving space* (3.3.1.4) of a *road* (3.3.5.1)

Note 1 to entry: Unless indicated otherwise, the term typically refers to vehicles that are allowed to operate in the same driving spaces as motorized *passenger* (3.6.2.1) cars, according to the legal requirements of the local jurisdictional *entity* (3.1.1.1). However, the term can be contextualized for other *environments* (3.1.3.11). For example, a bicycle is a "road vehicle" when the "road" is a *cycleway* (3.3.3.2).

3.7.6.2
motorized vehicle
self-propelled *vehicle* (3.7.1.1)

3.7.6.3
motor vehicle
motorized (3.7.6.2) *road vehicle* (3.7.6.1) allowed to operate in the same *driving spaces* (3.3.1.4) as motorized *passenger* (3.6.2.1) cars

3.7.6.4
non-road vehicle
vehicle (3.7.1.1) not meeting the legal requirements to be driven in *traffic lanes* (3.3.1.13) or *cycle lanes* (3.3.3.1) of a *road network* (3.3.5.2)

3.7.6.5
road cycle
vehicle (3.7.1.1) meeting the legal requirements to operate in *cycle lanes* (3.3.3.1) and *cycleways* (3.3.3.2)

Note 1 to entry: In some countries, other special *lanes* (3.3.1.12) could also be open to road cycles, such as bus lanes.

3.7.6.6
non-road cycle
human-powered *vehicle* (3.7.1.1) not meeting the legal requirements to be driven in *cycle lanes* (3.3.3.1)

Annex A
(informative)

Concept model diagrams

A.1 Core terms

A.1.1 Entity terms

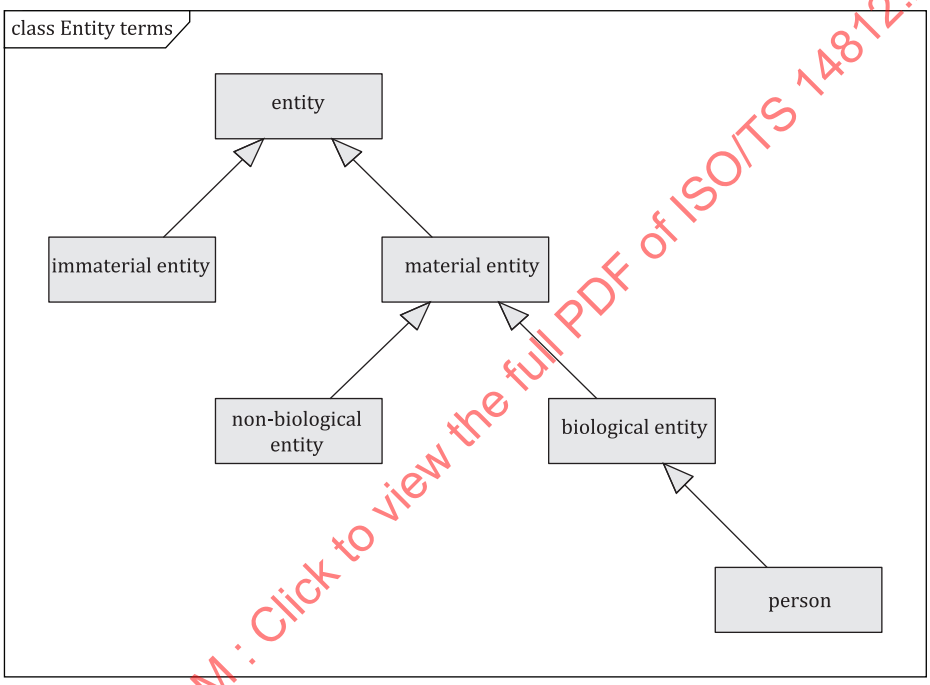


Figure A.1 — Entity terms

A.1.2 General system terms

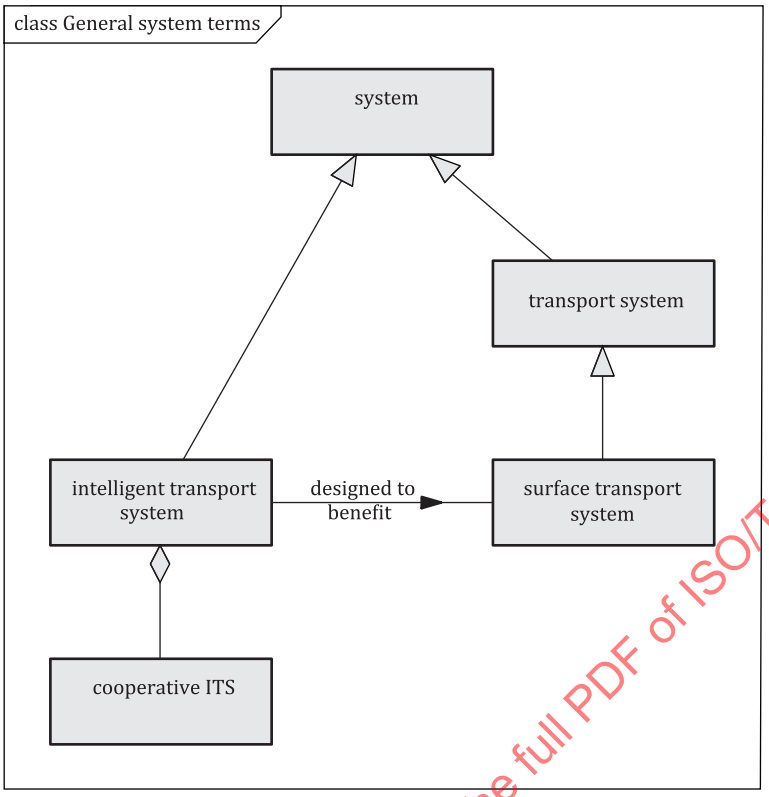


Figure A.2 — General system terms

A.1.3 General architecture terms

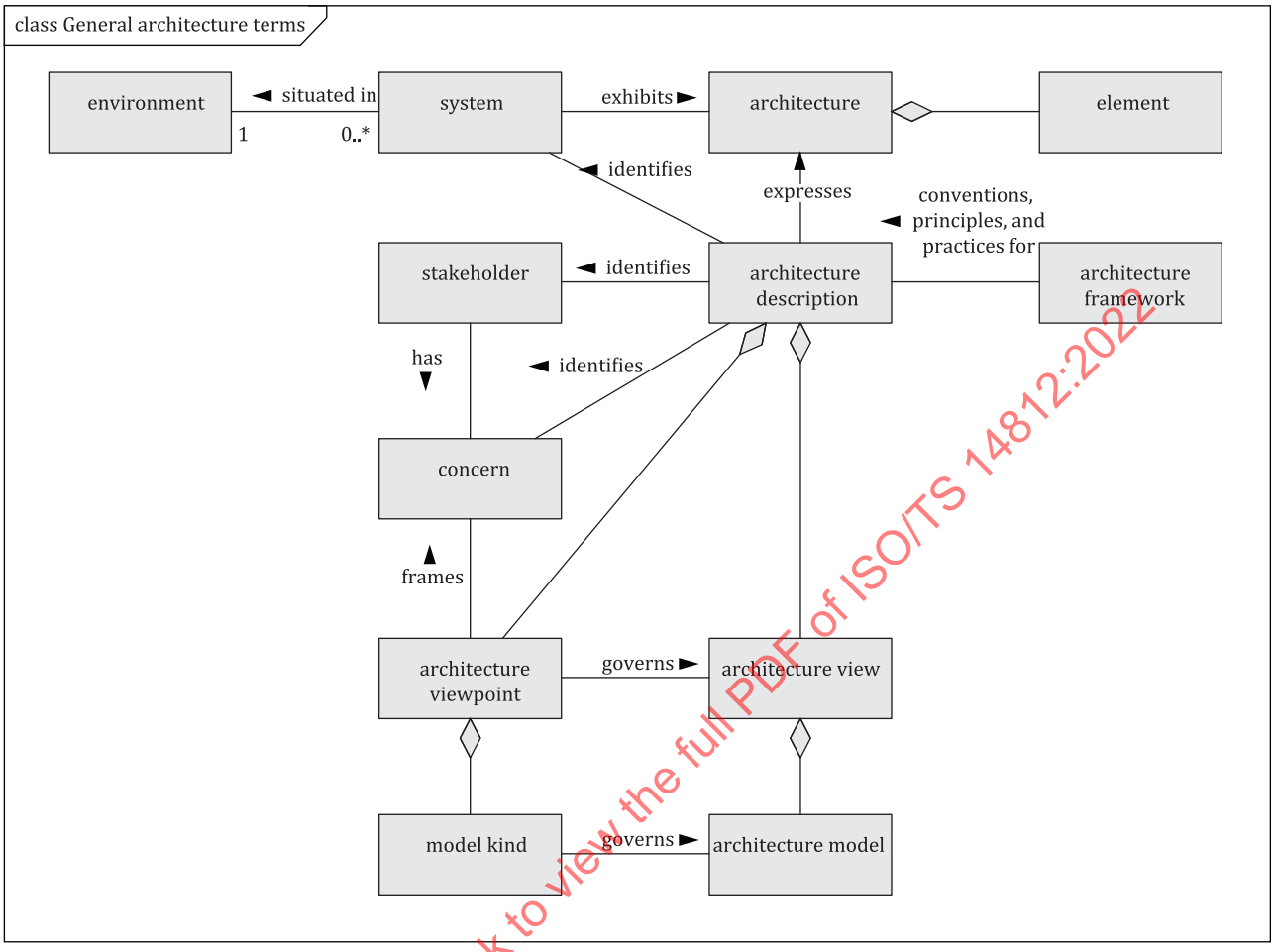


Figure A.3 — General architecture terms

A.1.4 Architecture view terms

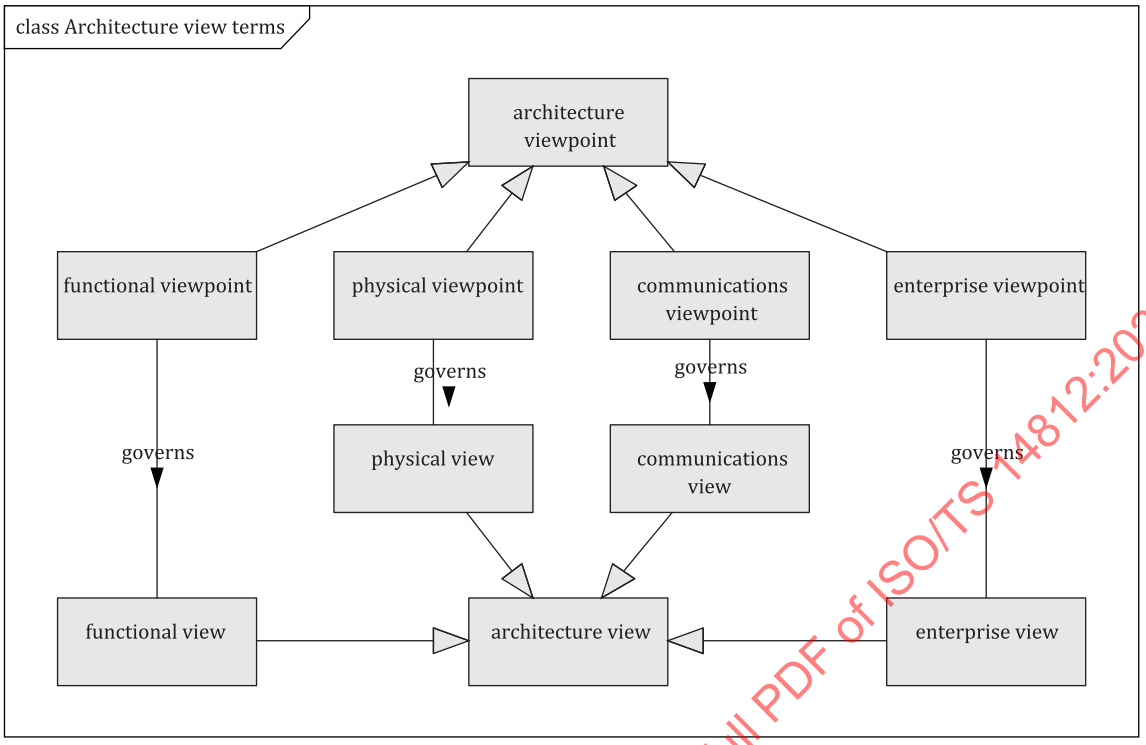


Figure A.4 — Architecture view terms

A.1.5 Architecture — Communication view terms

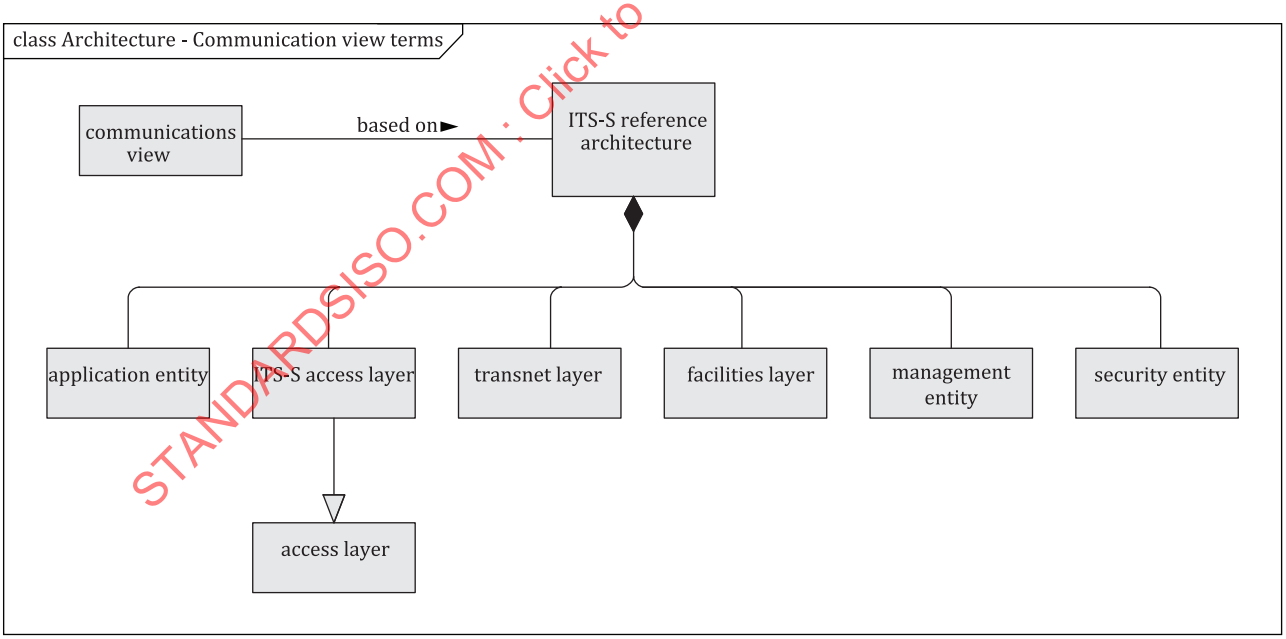


Figure A.5 — Architecture — Communication view terms

A.1.6 Architecture — Enterprise view terms

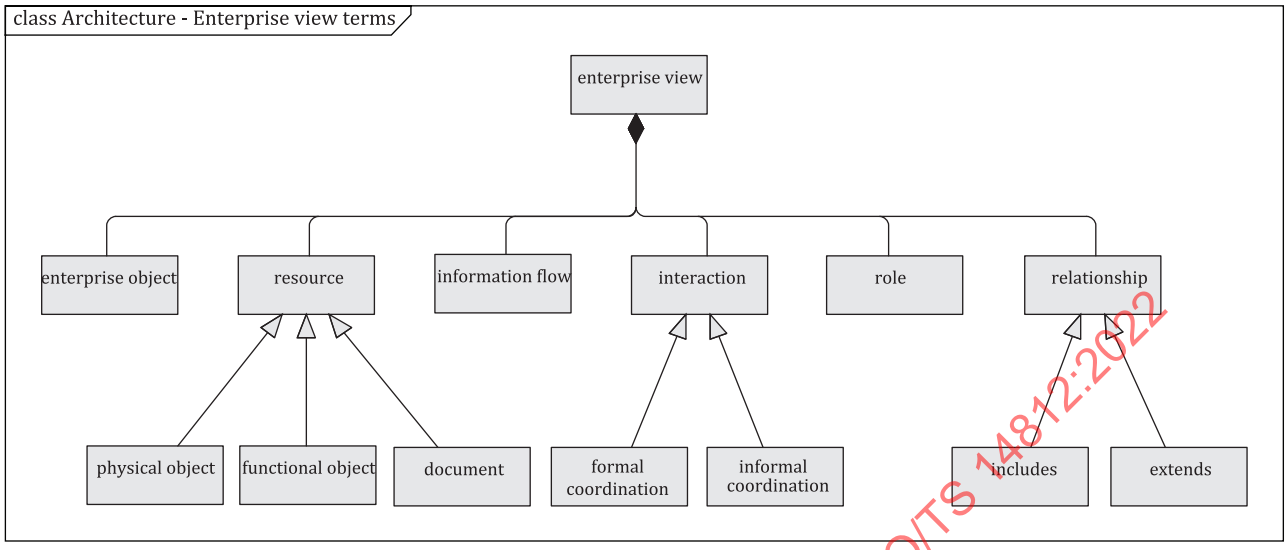


Figure A.6 — Architecture — Enterprise view terms

A.1.7 Architecture — Functional view terms

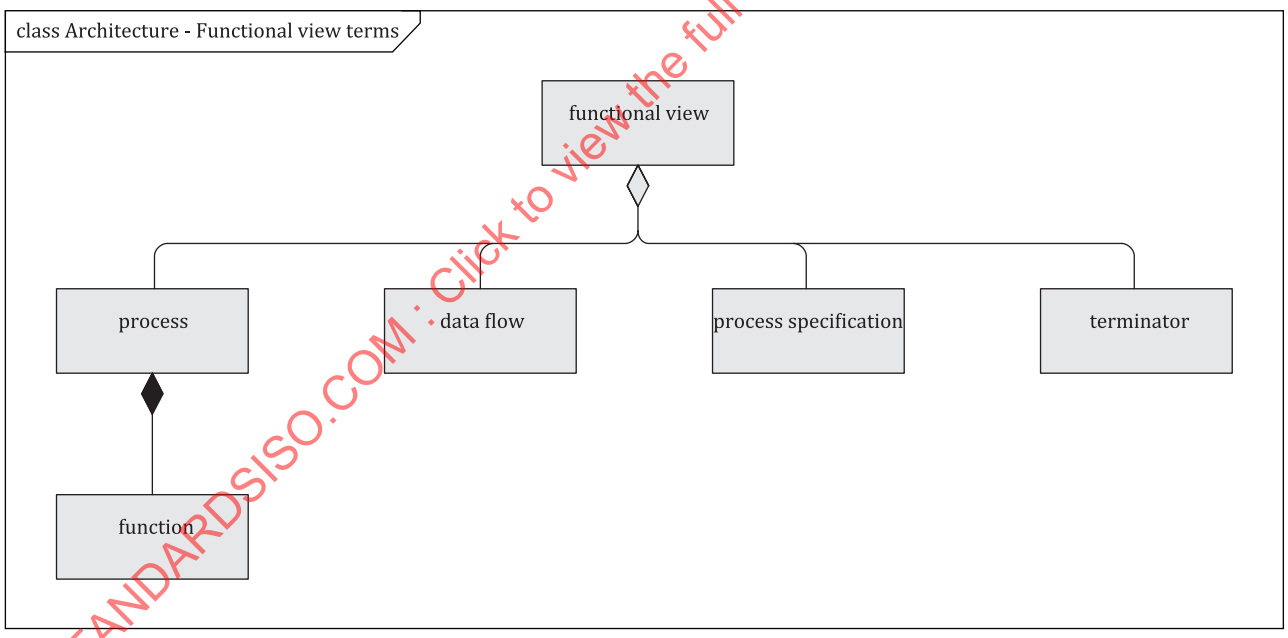


Figure A.7 — Architecture — Functional view terms

A.1.8 Architecture - Physical view terms

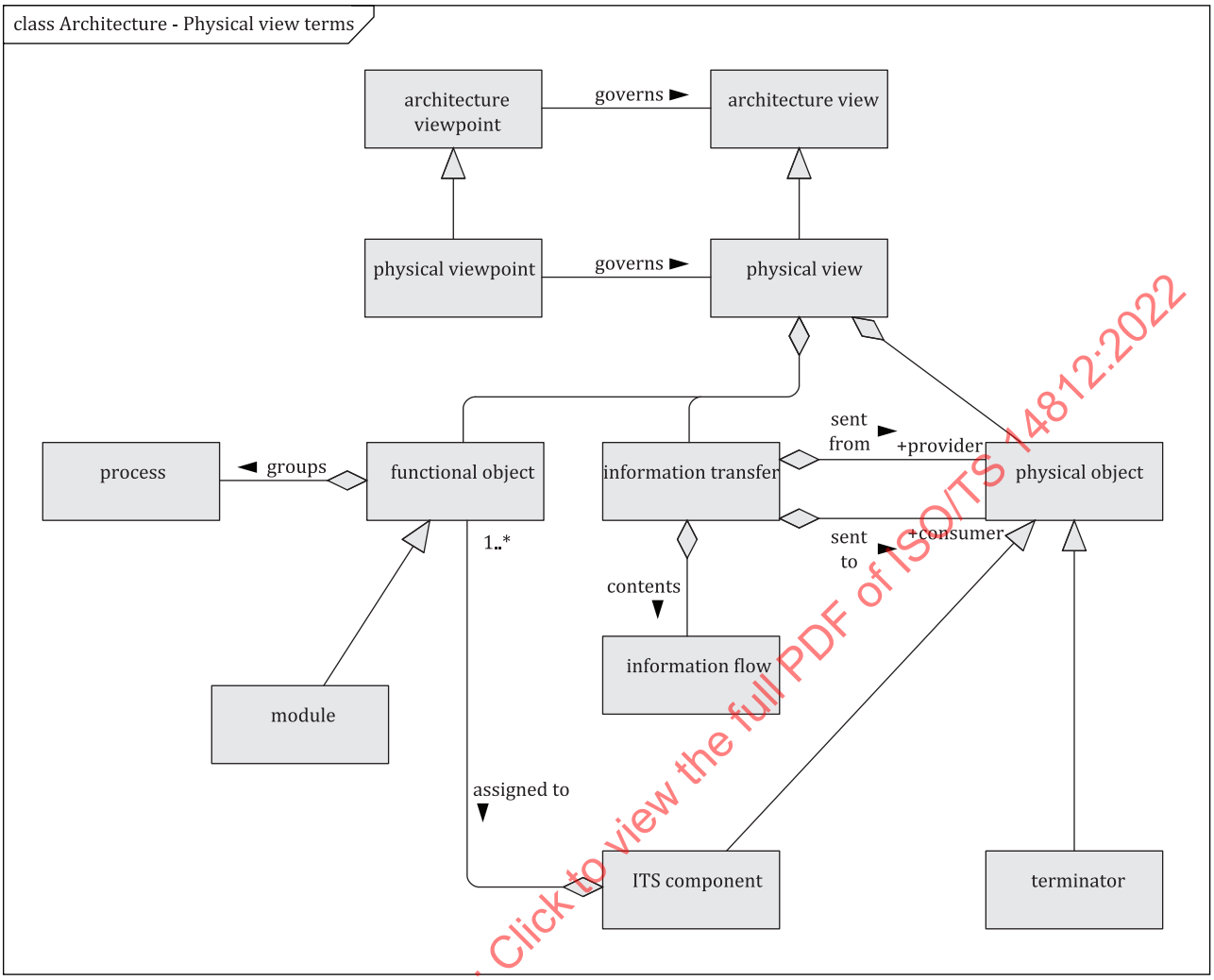


Figure A.8 — Architecture — Physical view terms

A.1.9 Architecture type terms

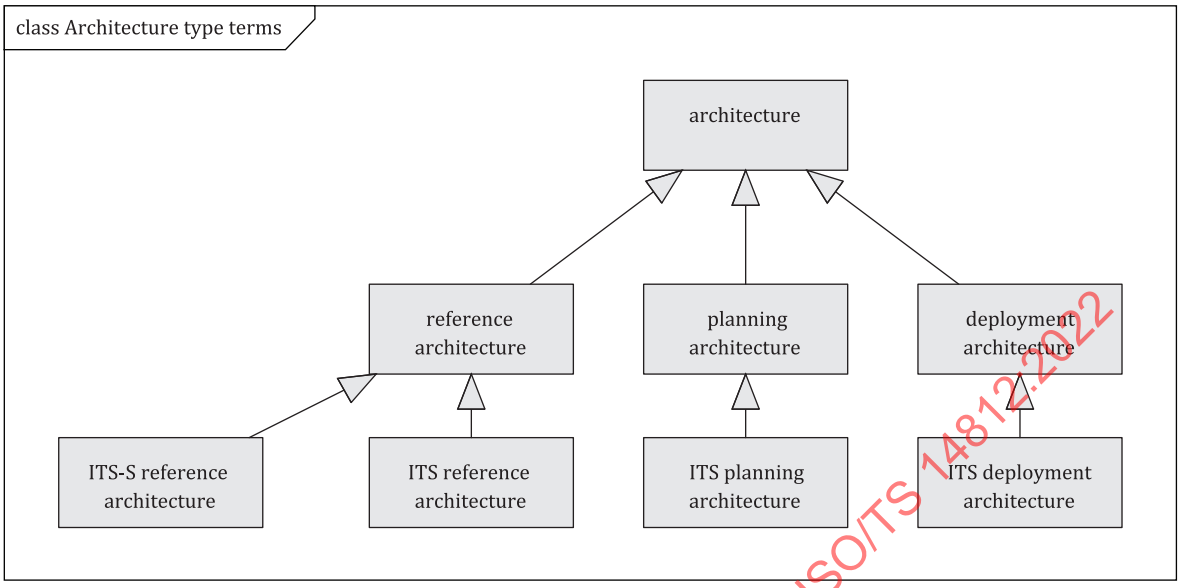


Figure A.9 — Architecture type terms

A.1.10 Data concept management terms

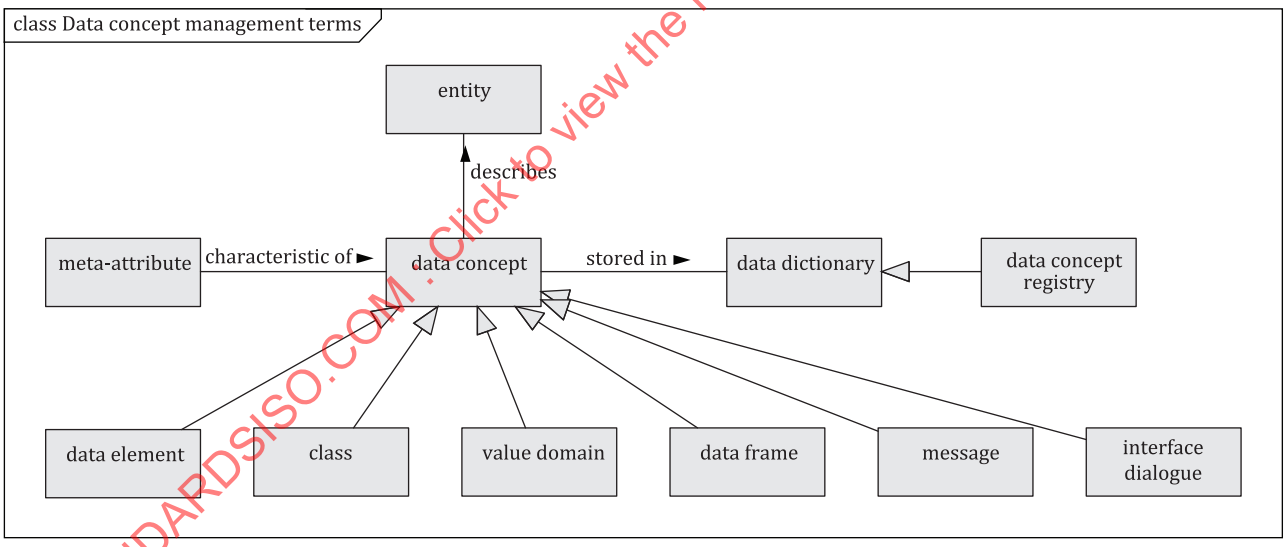


Figure A.10 — Data concept management terms

A.1.11 Data concept type terms

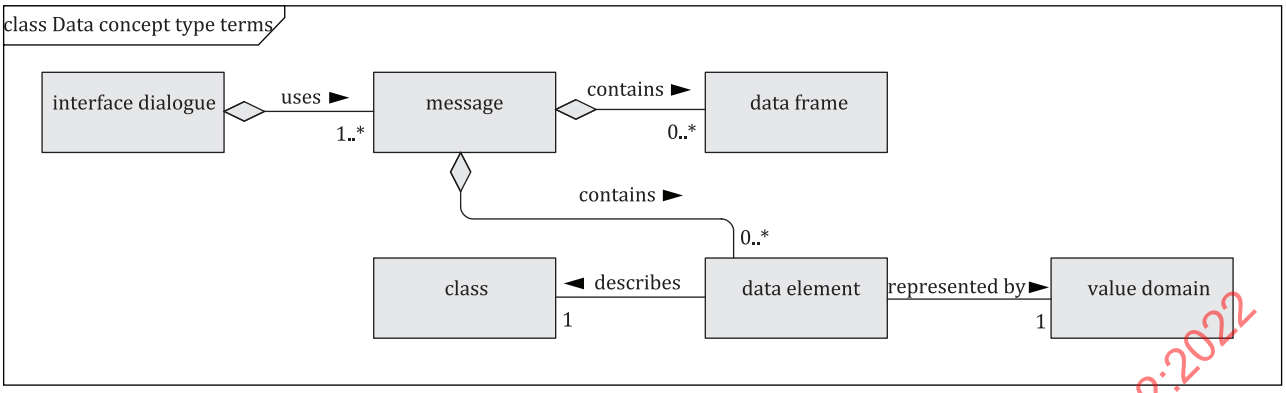


Figure A.11 — Data concept type terms

A.1.12 System engineering terms

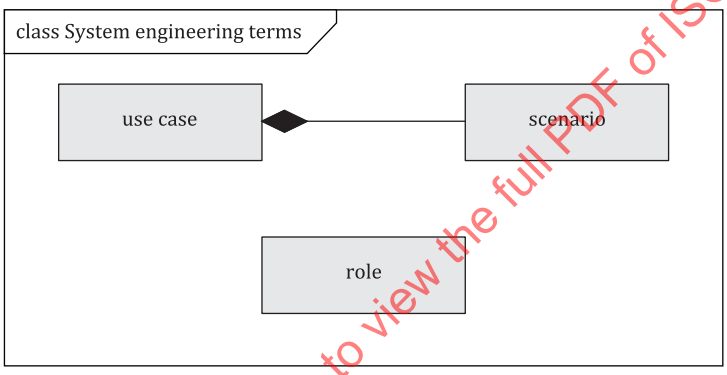


Figure A.12 — System engineering terms

A.1.13 Time terms

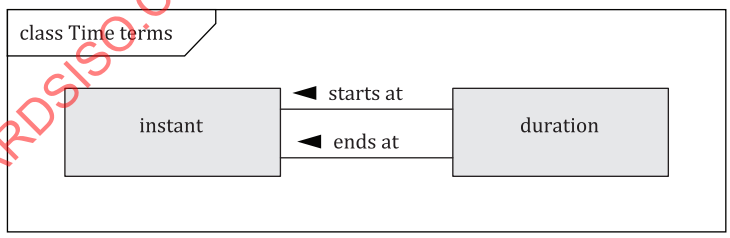


Figure A.13 — Time terms

A.2 Technology terms

A.2.1 Top-level physical object terms

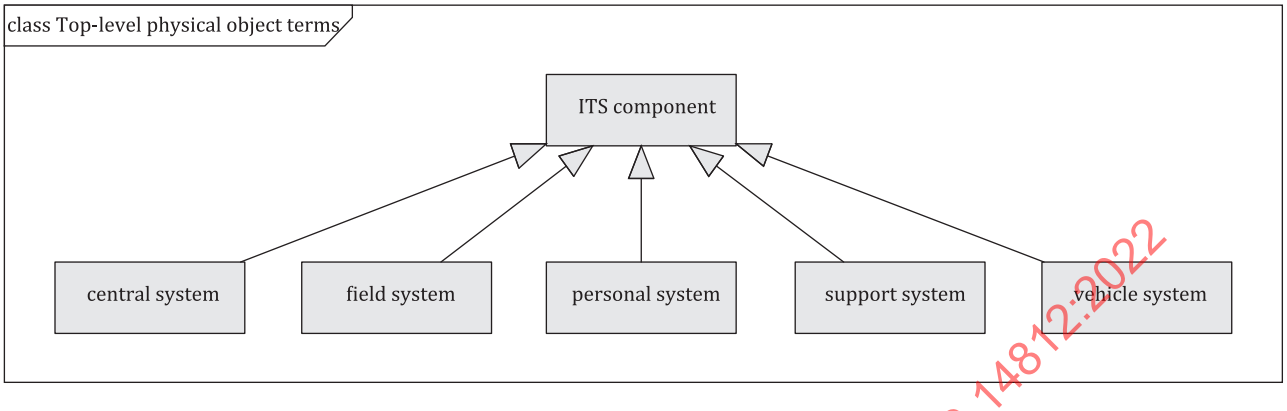


Figure A.14 — Top-level physical object terms

A.2.2 Centre physical object terms

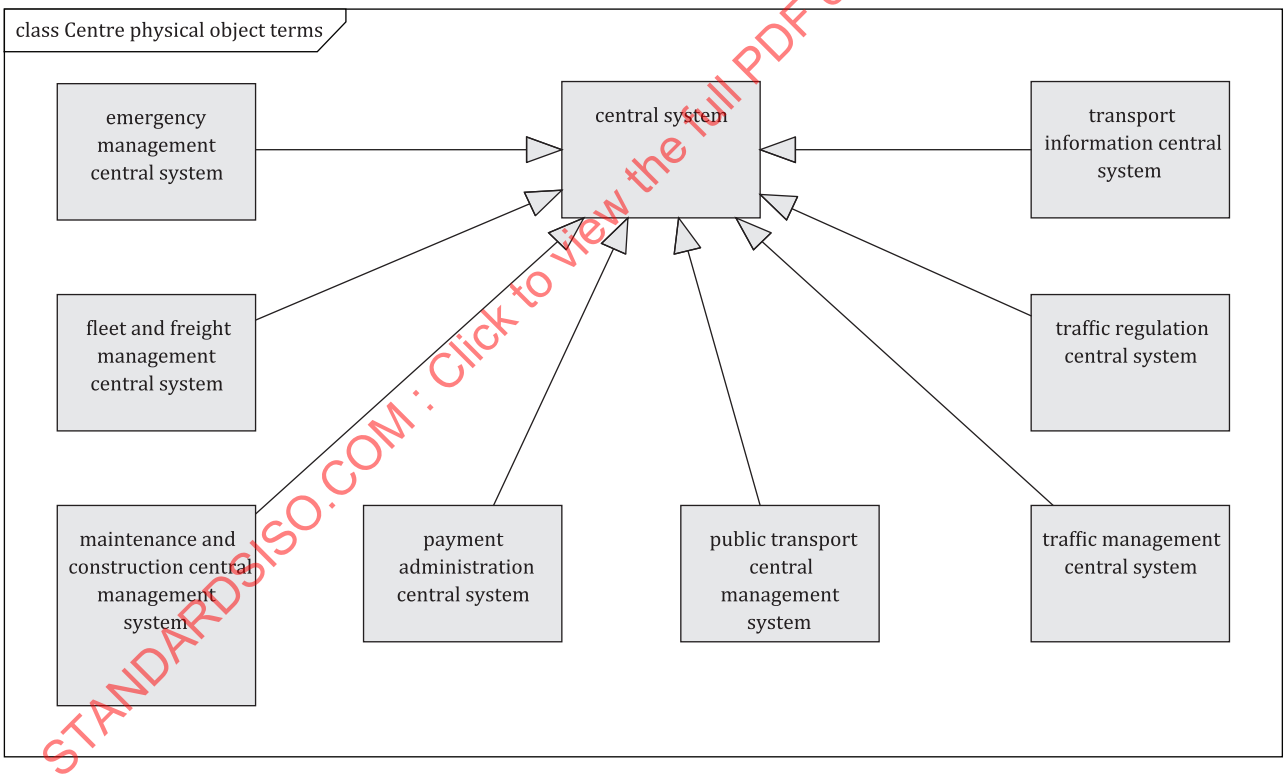


Figure A.15 — Centre physical object terms

A.2.3 Field physical object terms

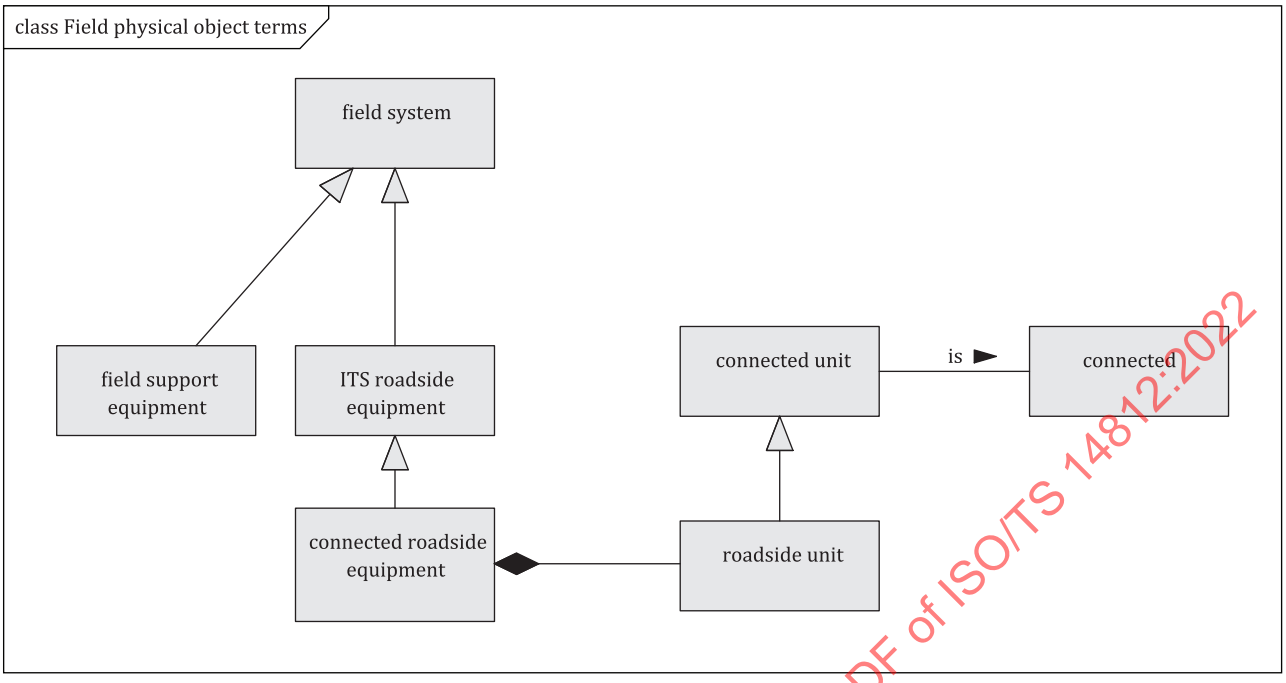


Figure A.16 — Field physical object terms

A.2.4 Personal physical object terms

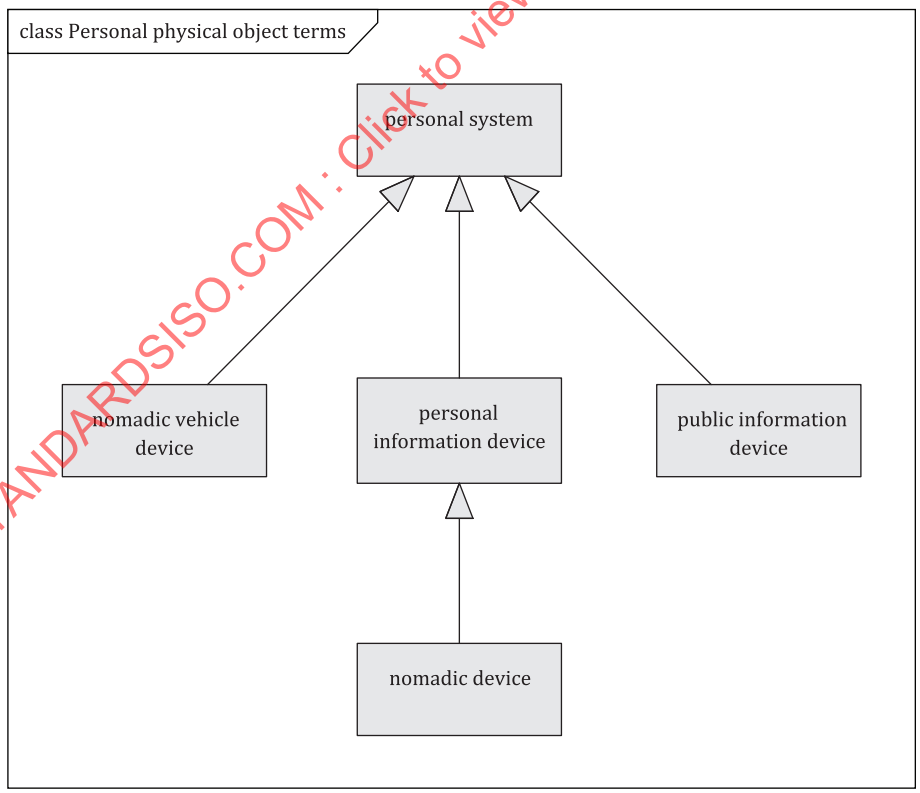


Figure A.17 — Personal physical object terms

A.2.5 Support physical object terms

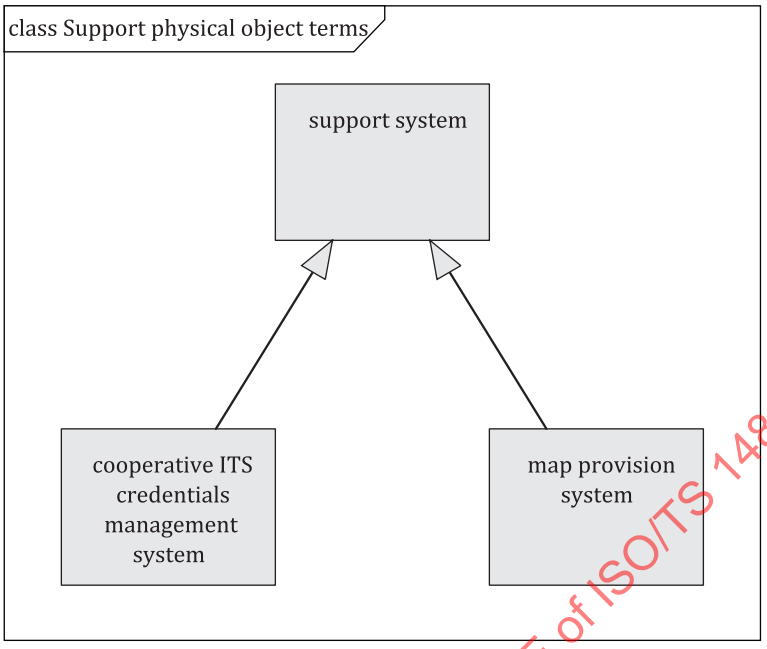


Figure A.18 — Support physical object terms

A.2.6 Vehicle physical object terms

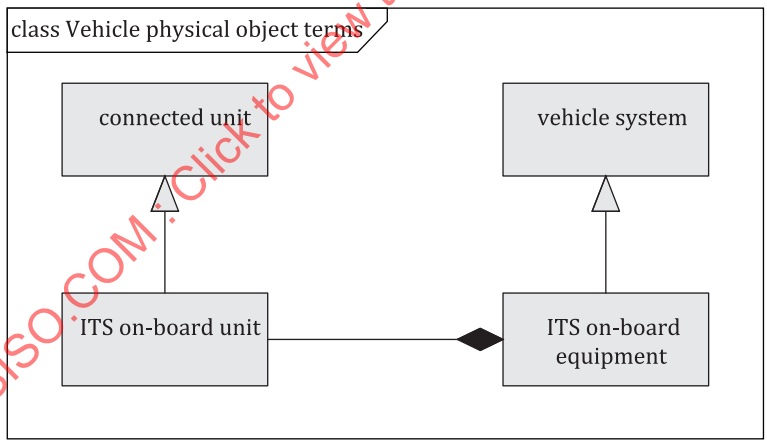


Figure A.19 — Vehicle physical object terms

A.2.7 ITS station terms

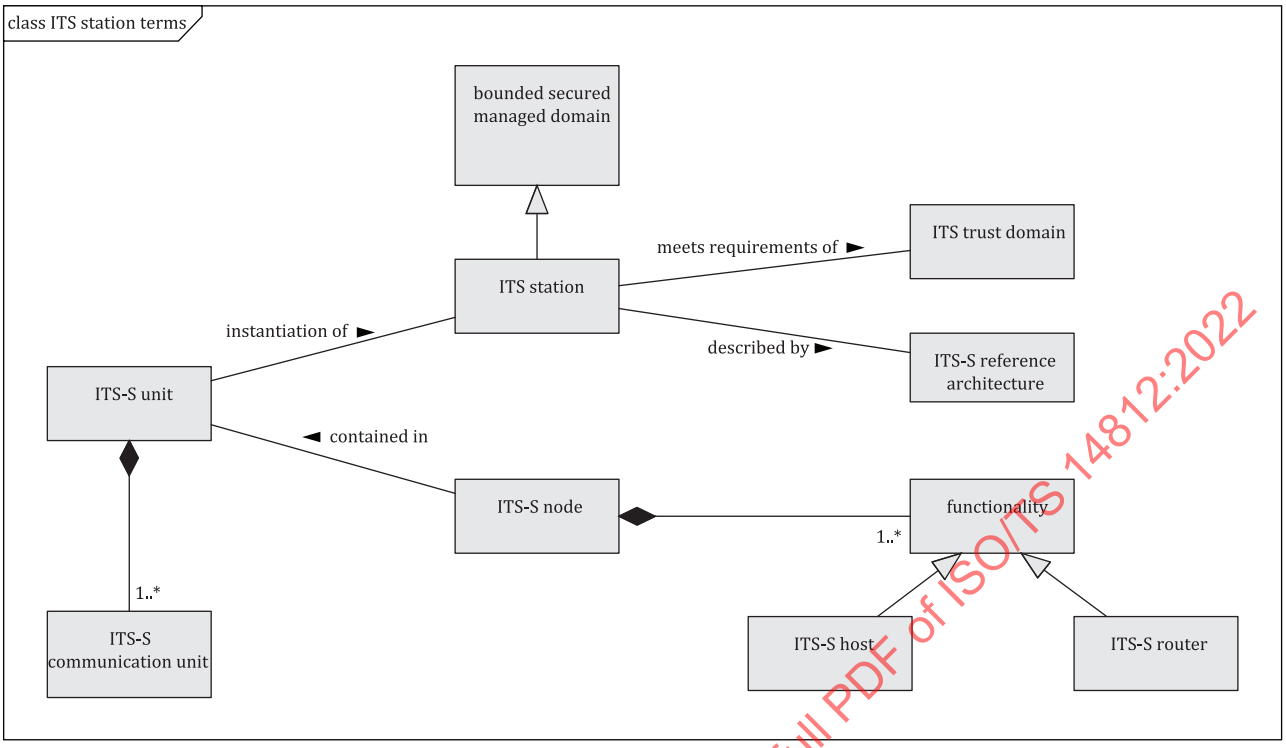


Figure A.20 — ITS station terms

A.2.8 ITS application terms

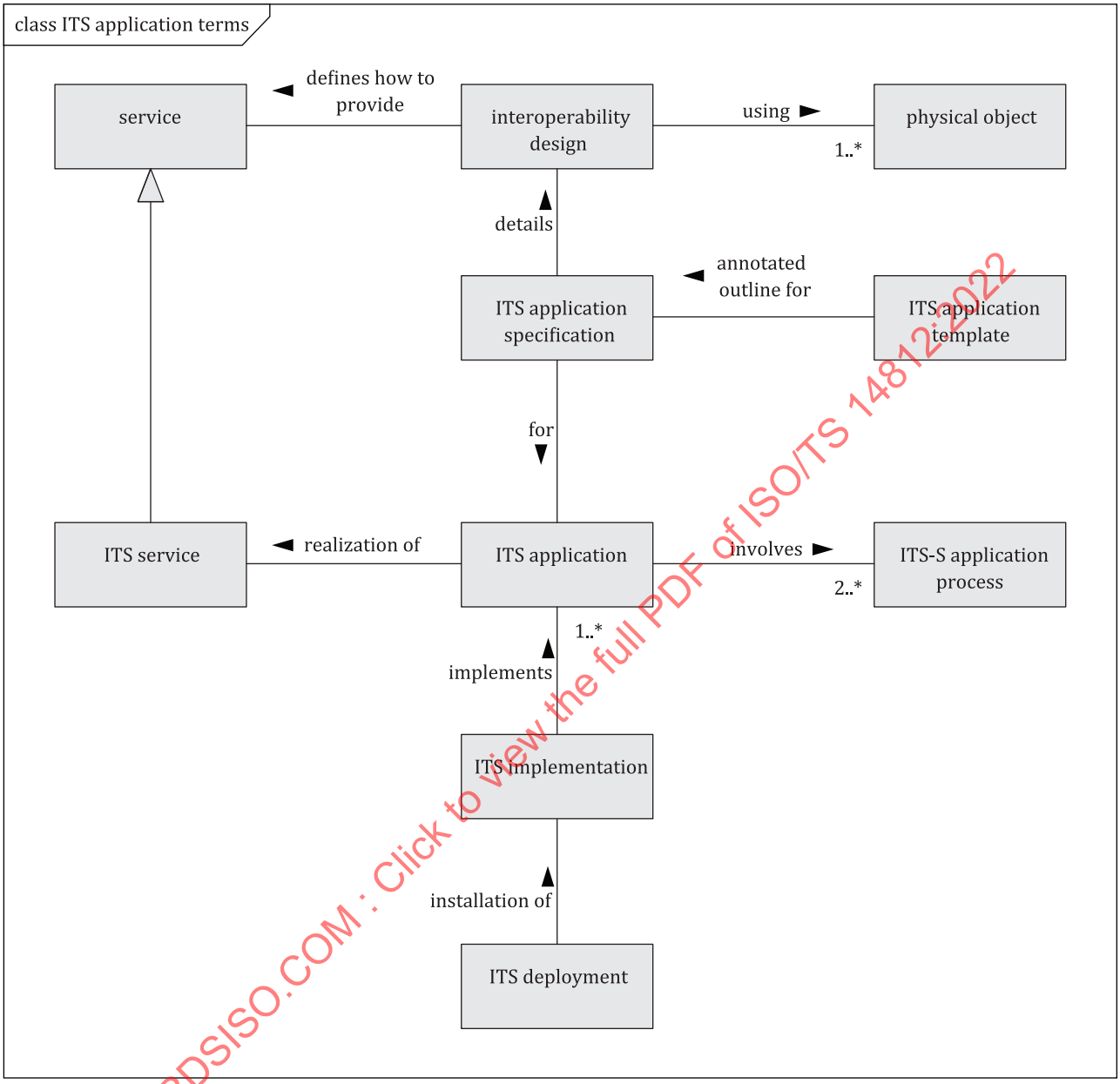


Figure A.21 — ITS application terms

A.2.9 ITS-S application process terms

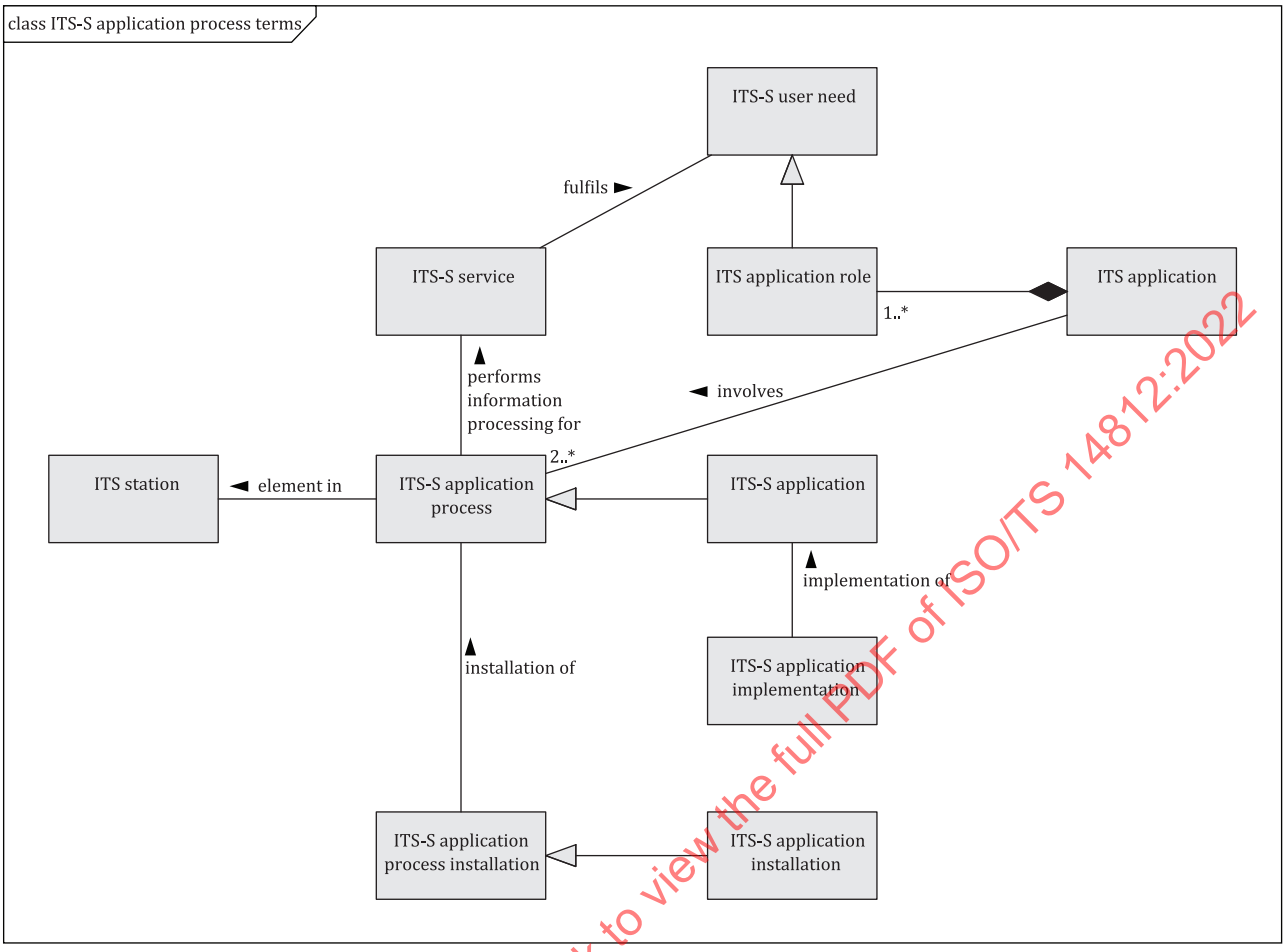


Figure A.22 — ITS-S application process terms

A.3 Infrastructure terms

A.3.1 Road reservation component terms

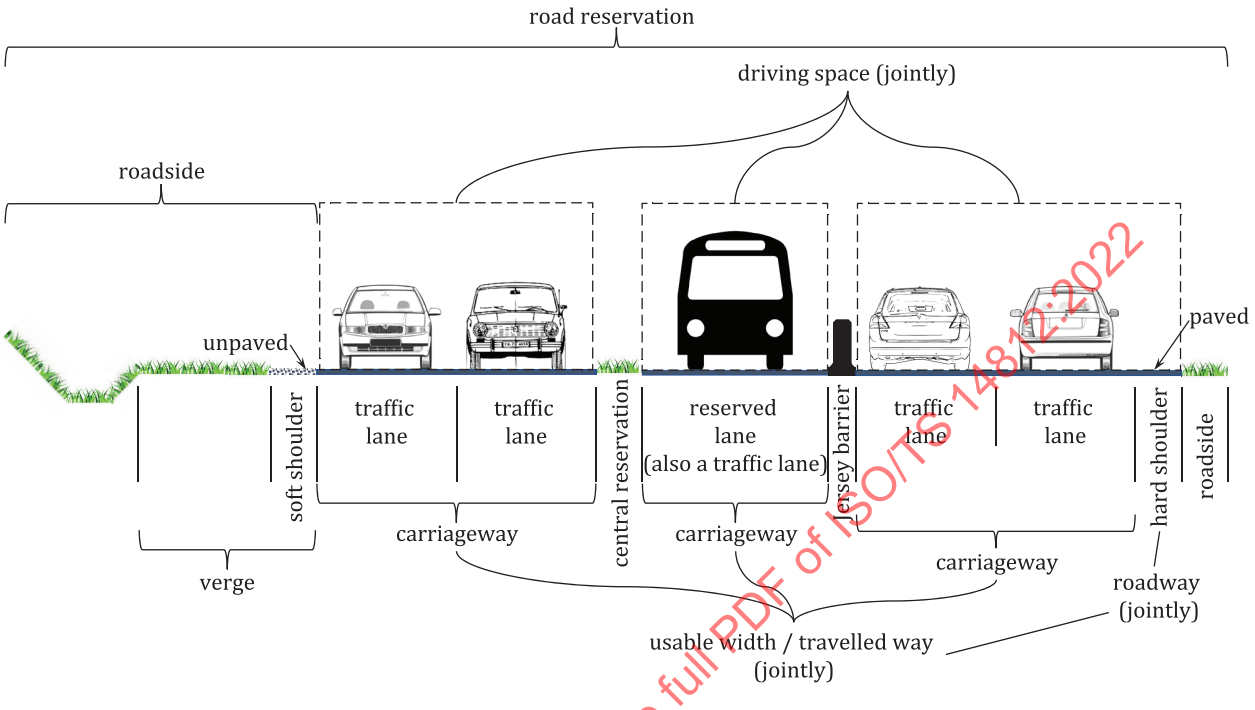
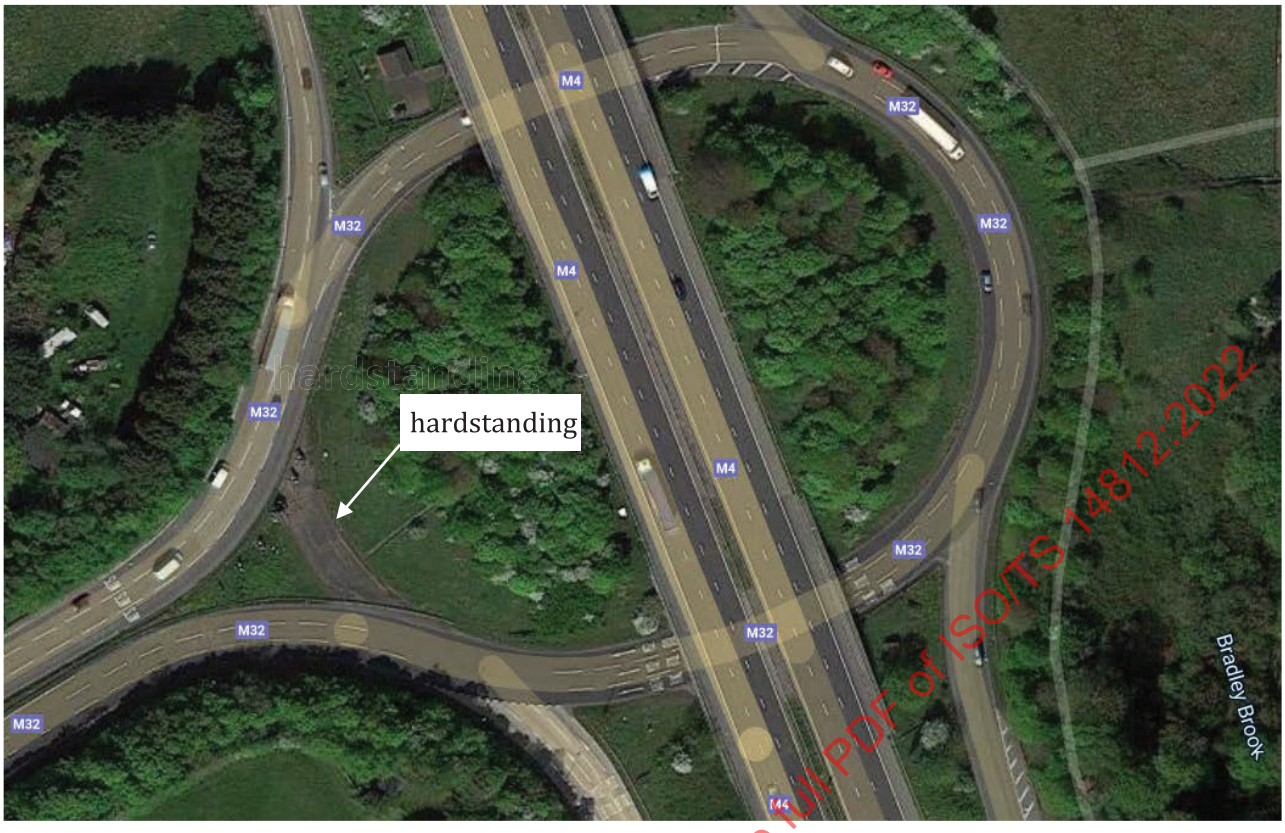


Figure A.23 — Road reservation component graphic



NOTE Image taken from Google Maps, https://maps.google.com, showing the interchange of M4 and M32 motorways northeast of Bristol, UK.

Figure A.24 – Hardstanding

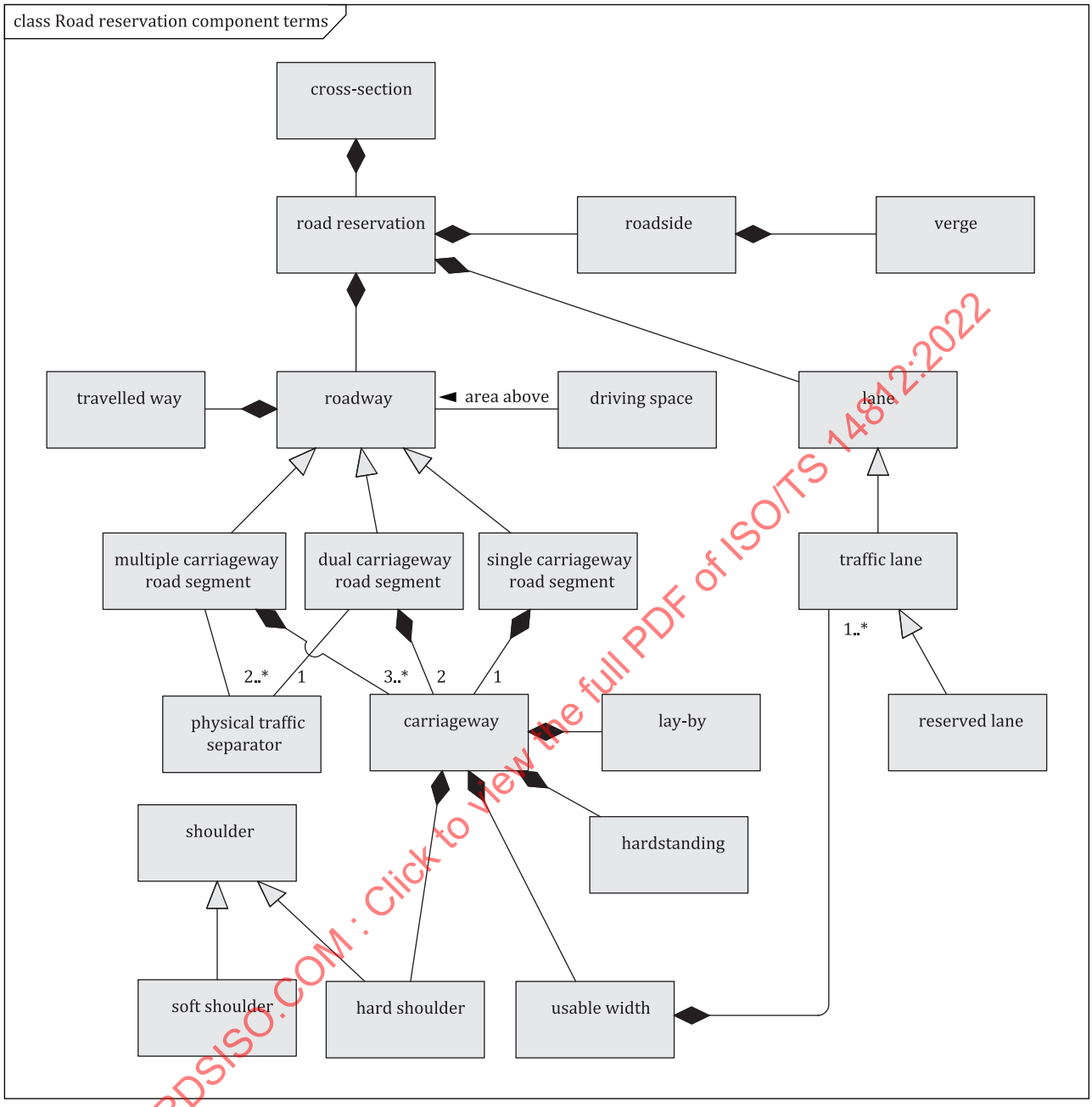


Figure A.25 — Road reservation component terms

A.3.2 Physical traffic separator terms

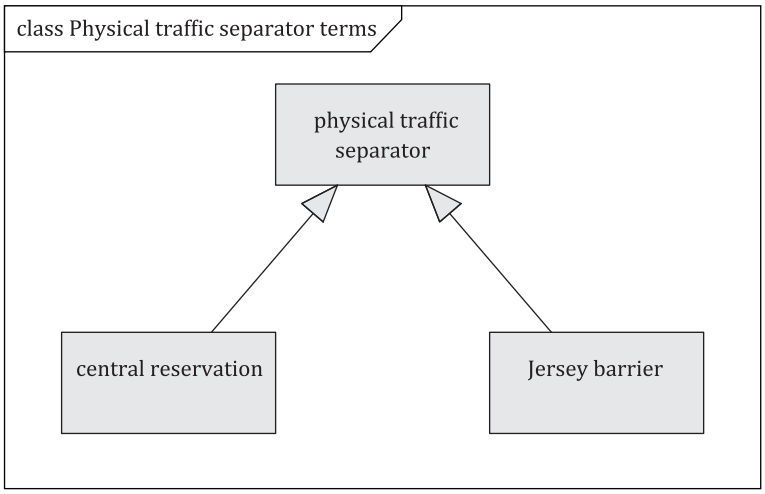


Figure A.26 — Physical traffic separators

A.3.3 Alternate mode infrastructure component terms

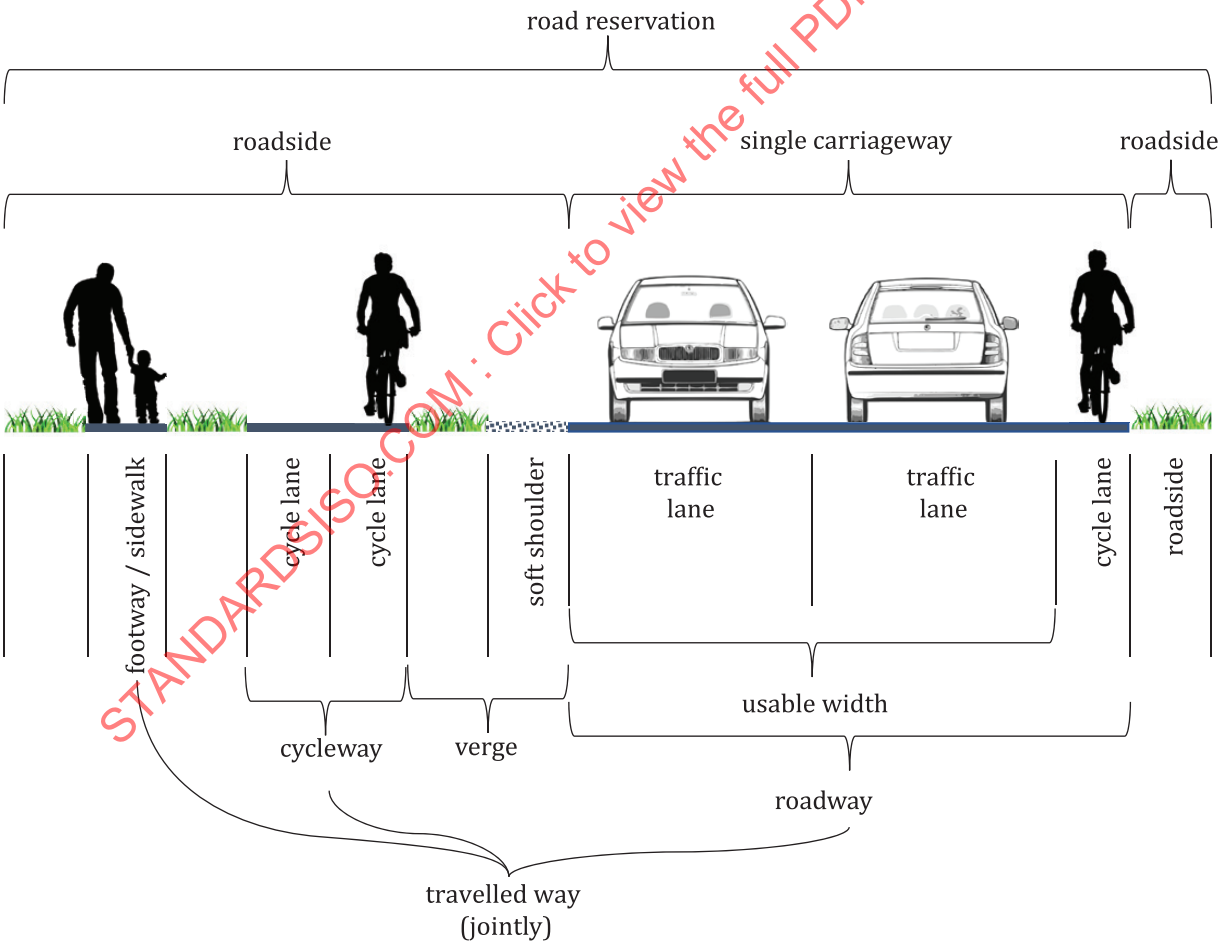


Figure A.27 — Alternate mode graphic

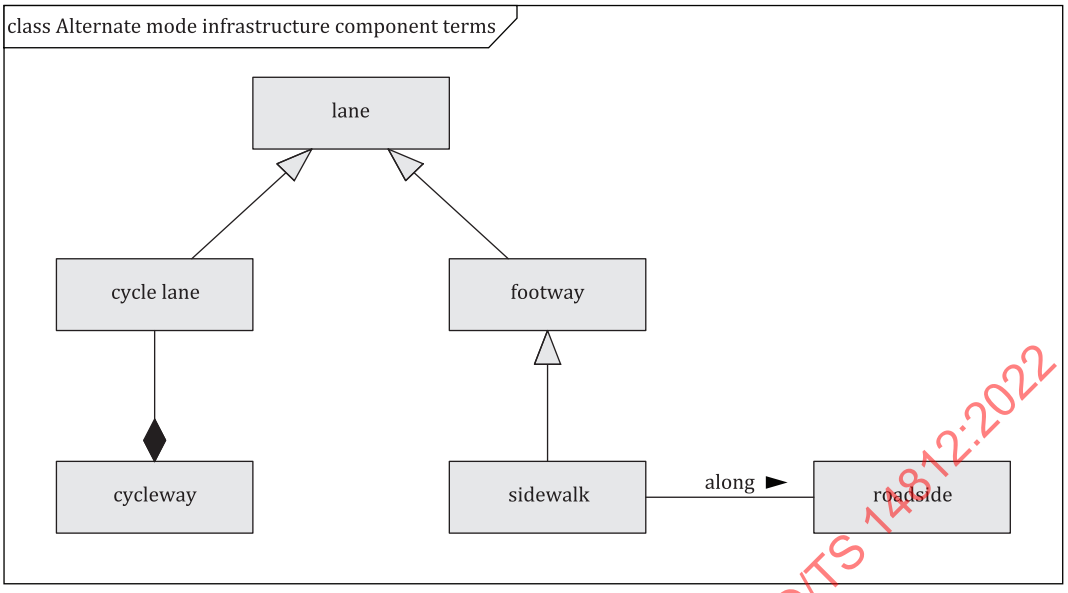


Figure A.28 — Alternate mode infrastructure component terms

A.3.4 Infrastructure operating mode terms

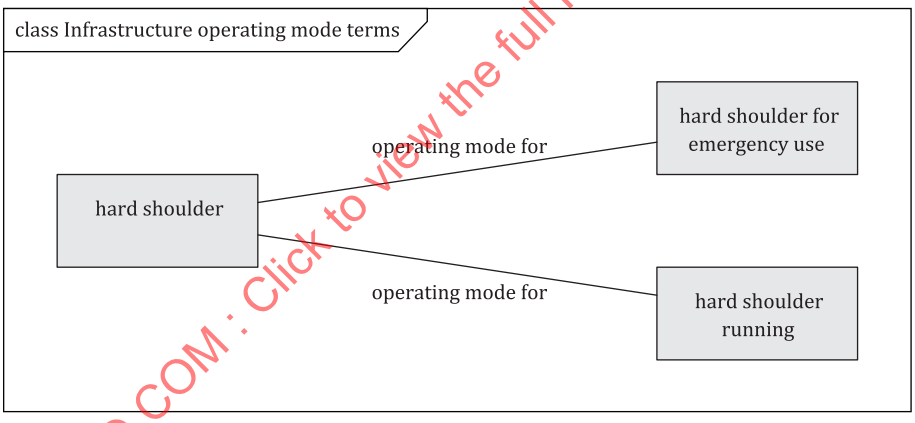


Figure A.29 — Infrastructure operating mode terms

A.3.5 Road network terms

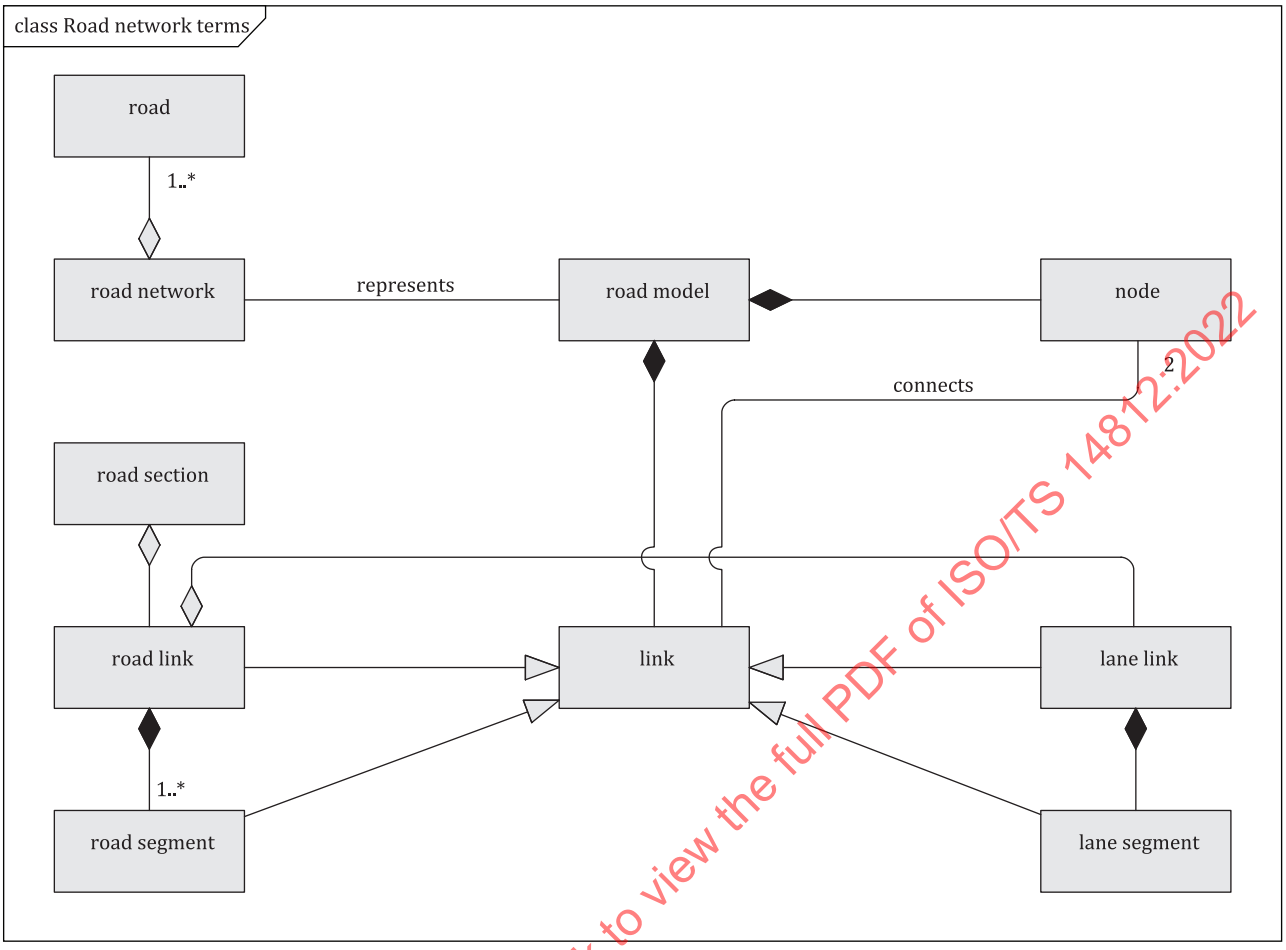


Figure A.30 — Road network terms

A.3.6 Junction terms

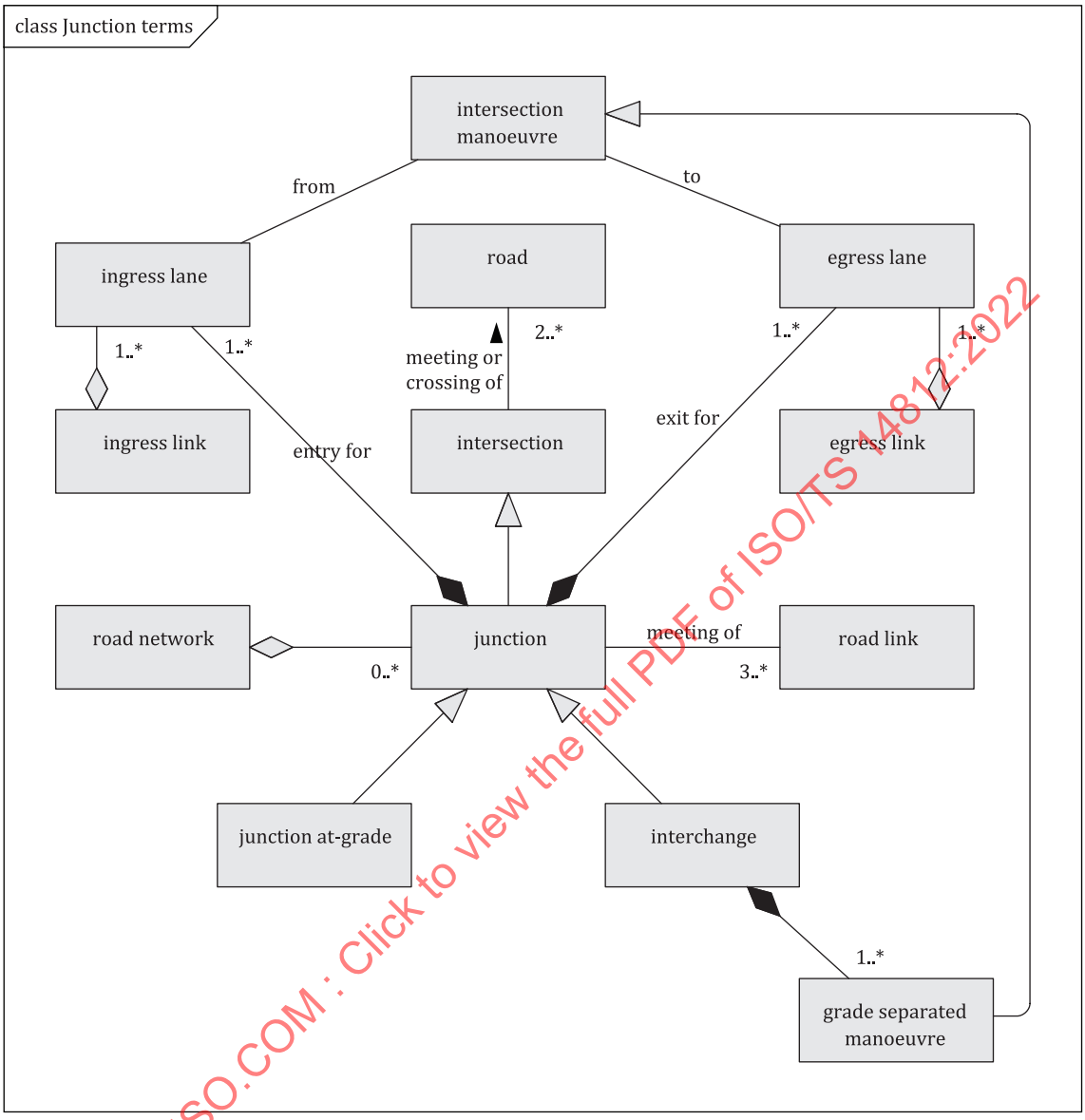


Figure A.31 — Junction terms

A.4 Location terms

A.4.1 Location type terms

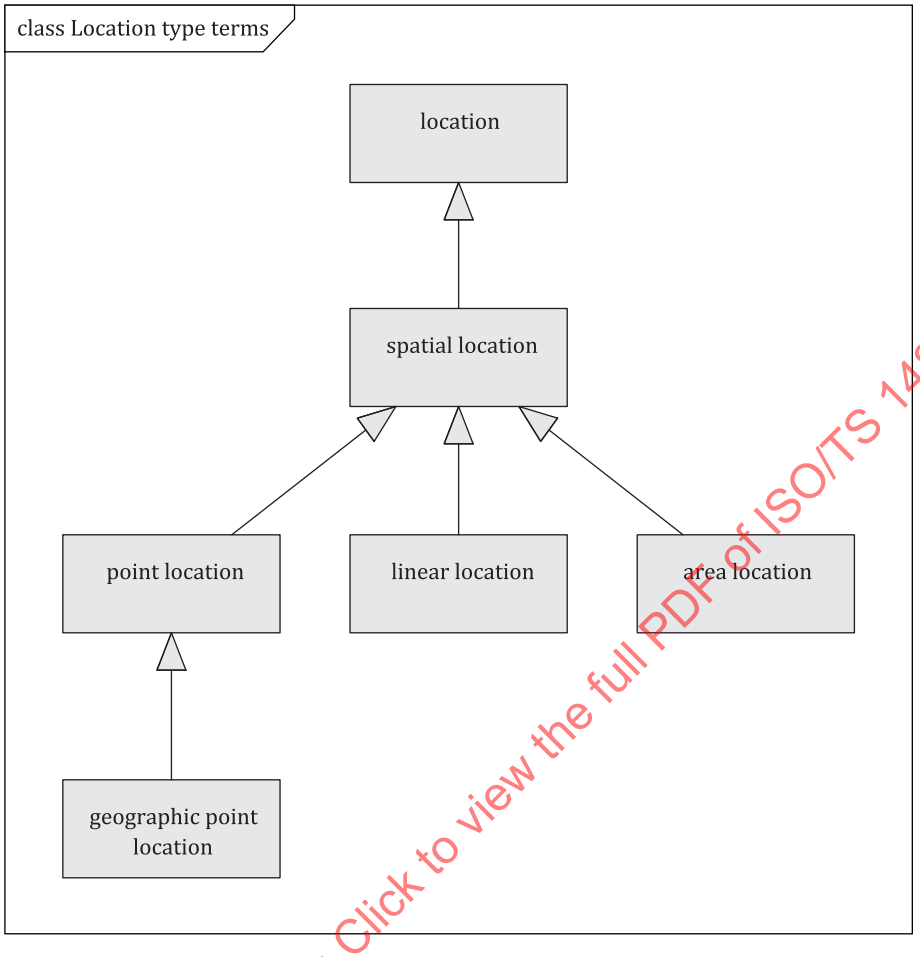


Figure A.32 — Location type terms

A.4.2 Location referencing terms

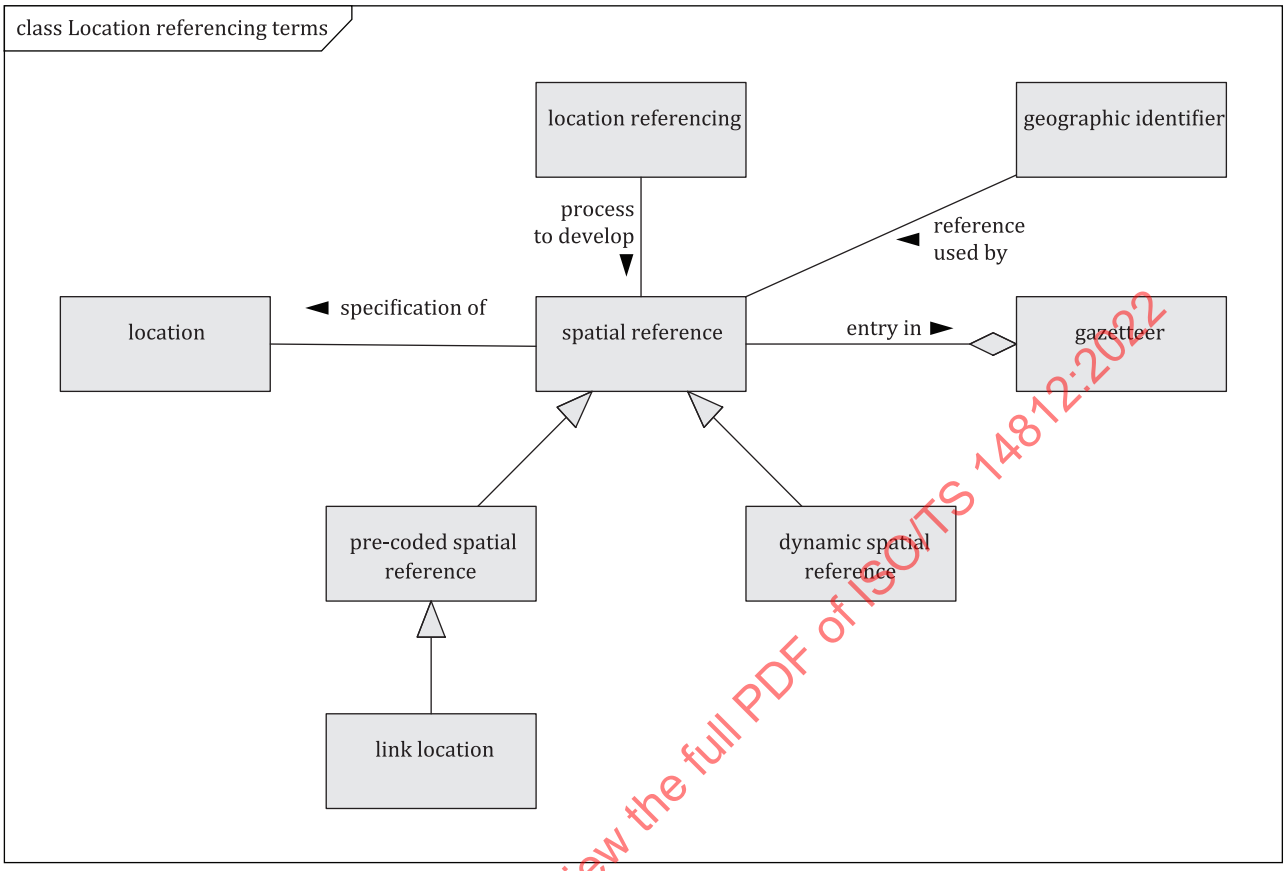


Figure A.33 — Location referencing terms

A.5 Service terms

A.5.1 Generic service terms

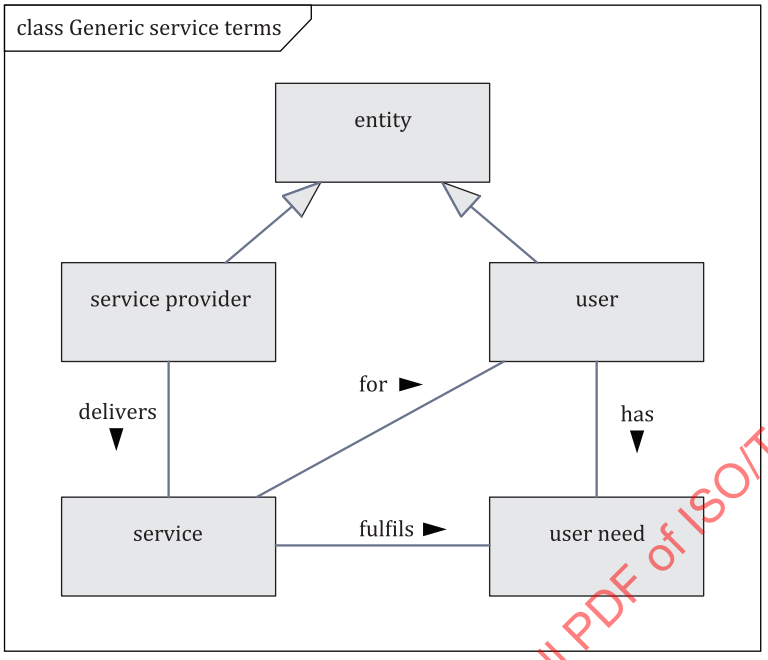


Figure A.34 — Generic service terms

A.5.2 Transport service terms

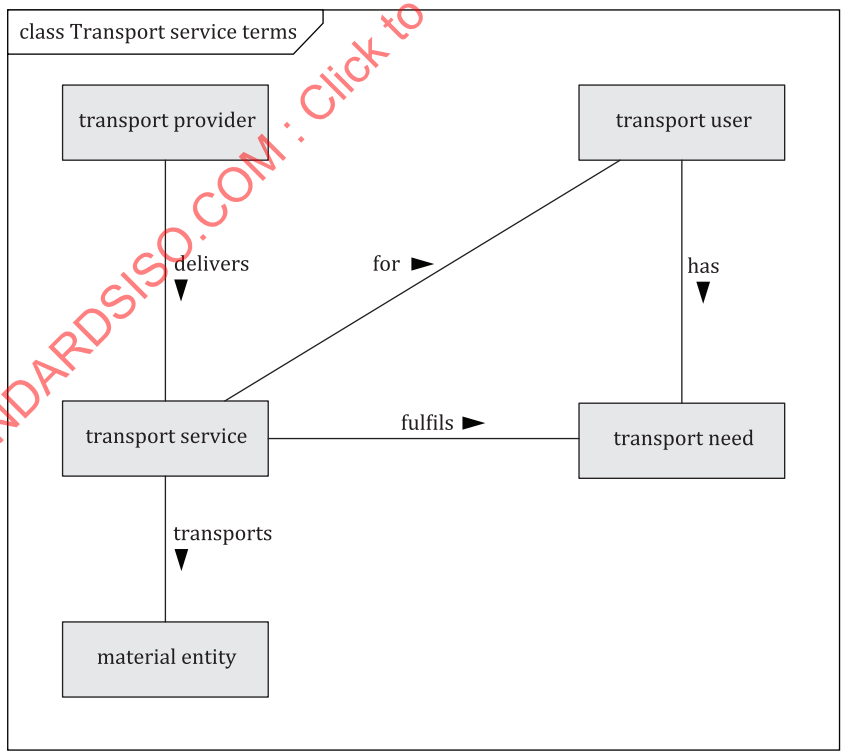


Figure A.35 — Transport service terms

A.5.3 ITS service terms

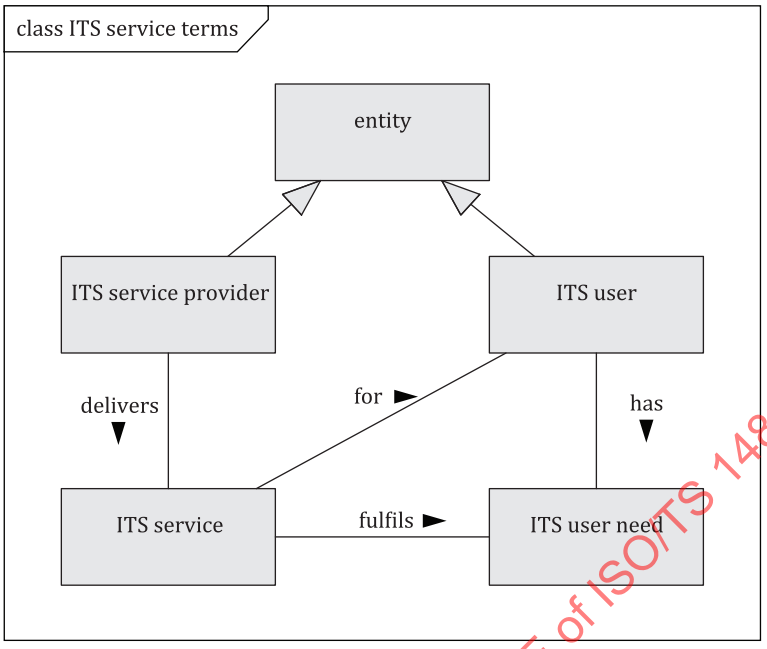


Figure A.36 — ITS service terms

A.5.4 ITS-S service terms

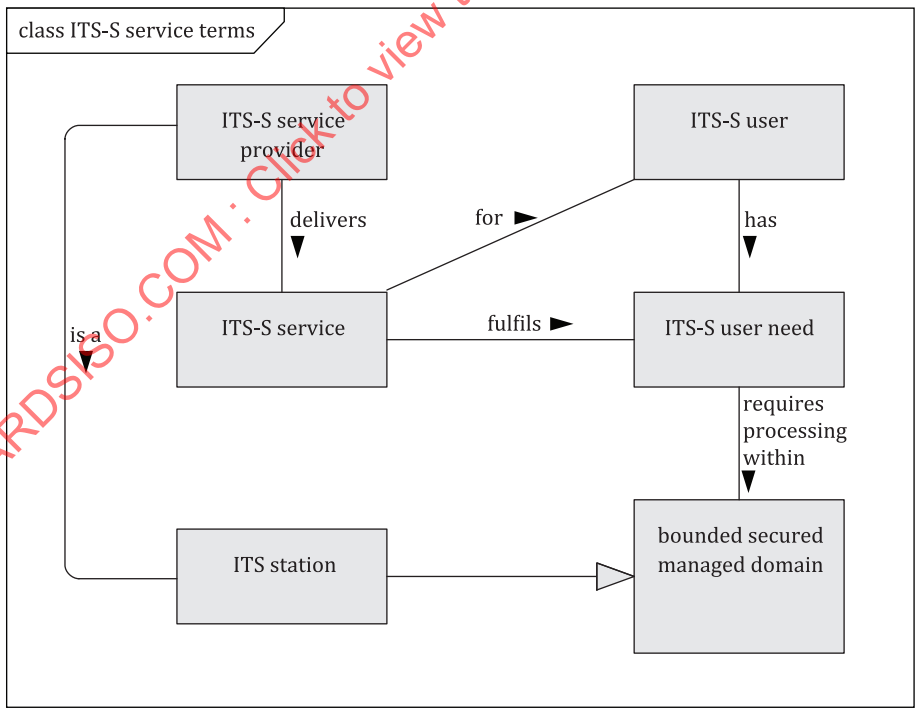


Figure A.37 — ITS-S service terms