

ISO/FDIS 23795-2:2023(E)

© ISO 2023

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

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: + 41 22 749 01 11
[Email](mailto:copyright@iso.org): copyright@iso.org
Website: www.iso.org

Published in Switzerland

Formatted: Font: 11 pt, Bold

Formatted: Font: Bold

Formatted: Left: 1.9 cm, Right: 1.9 cm, Gutter: 0 cm, Header distance from edge: 1.27 cm

Commented [eXtyles1]: The reference is to a withdrawn standard which has been replaced

ISO 20344, Personal protective equipment — Test methods for footwear

Formatted: Default Paragraph Font

Formatted: Default Paragraph Font

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted: French (Switzerland)

Formatted: French (Switzerland)

Formatted: French (Switzerland)

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[ISO/FDIS 23795-2](#)

<https://standards.iteh.ai/catalog/standards/sist/ddfbbdb5-eb01-4d96-bca1-0742890466d8/iso-fdis-23795-2>

Contents Page

Foreword — iv

Introduction — iv

1 — Scope — 1

2 — Normative references — 1

3 — Terms, definitions and abbreviated terms — 1

3.1 — Terms and definitions — 1

3.1.1 Nomadic Device (ND) — 1

3.1.2 Nomadic Device Identification (ND-ID) — 2

3.2 — Abbreviations and terms — 2

4 — General Information — 3

4.1 — Purpose of this service Introduction — 3

4.2 Overview of use cases — 3

4.3 Functional requirement — 4

5 — Use cases definitions — 5

5.1 — UC 1 Speeding — 5

5.2 — UC 2 Long term speeding — 5

5.3 — UC 3 Sudden acceleration — 6

5.4 — UC 4 Sudden start — 6

5.5 — UC 5 Sudden deceleration — 7

5.6 — UC 6 Sudden stop — 7

5.7 — UC 7 Idling — 8

5.8 — UC 8 Fuel cut — 8

5.9 — UC 9 Economical driving — 8

6 — Dataset definition — 9

6.1 — Data type — 9

6.2 — Dataset definition in use cases — 9

6.2.1 UC 1 Speeding — 9

6.2.2 UC 2 Long term speeding — 10

6.2.3 UC 3 Sudden acceleration — 10

6.2.4 UC 4 Sudden start — 11

6.2.5 UC 5 Sudden deceleration — 12

6.2.6 UC 6 Sudden stop — 12

6.2.7 UC 7 Idling — 13

6.2.8 UC 8 Fuel cut — 13

6.2.9 UC 9 Economical driving — 14

Formatted: Font: 11 pt, Bold

Formatted: Font: Bold

Formatted: Left

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.71 cm

iTeh Standards
(<https://standards.itih.ai>)
Document Preview

ISO/FDIS 23795-2

<https://standards.itih.ai/catalog/standards/sist/ddfbbdb5-eb01-4d96-bca1-0742890466d8/iso-fdis-23795-2>

Formatted: Font: 11 pt, Bold

Formatted: Font: Bold

Bibliography 16

Foreword v

Introduction vi

1 Scope 1

2 Normative references 1

3 Terms, definitions and abbreviated terms 1

3.1 Terms and definitions 1

3.2 Abbreviated terms 2

4 General information 2

4.1 Purpose of information provision for eco-friendly driving behaviour 2

4.2 Overview of use cases 3

4.3 Functional requirement 4

5 Use cases definitions 4

5.1 Overview 4

5.2 UC 1: Speeding 4

5.3 UC 2: Long speeding 5

5.4 UC 3: Sudden acceleration 5

5.5 UC 4: Sudden start 6

5.6 UC 5: Sudden deceleration 7

5.7 UC 6: Sudden stop 7

5.8 UC 7: Idling 8

5.9 UC 8: Fuel-cut 9

5.10 UC 9: Economical driving 9

6 Datasets definitions 11

6.1 Overview 11

6.2 Data type 11

6.3 Datasets definitions in use cases 11

6.3.1 UC 1: Speeding 11

6.3.2 UC 2: Long speeding 11

6.3.3 UC 3: Sudden acceleration 12

6.3.4 UC 4: Sudden start 13

6.3.5 UC 5: Sudden deceleration 13

6.3.6 UC 6: Sudden stop 14

6.3.7 UC 7: Idling 15

6.3.8 UC 8: Fuel-cut 15

6.3.9 UC 9: Economical driving 16

Bibliography 17

iTeh Standards
(https://standards.itoh.ai)
Document Preview

ISO/FDIS 23795-2
https://standards.itoh.ai/catalog/standards/sist/dd1bbdb5-eb01-4d96-bca10742890466d8/iso-fdis-23795-2

Formatted: Normal, Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted: Font: 11 pt, Bold

Formatted: Font: Bold

Formatted: Left

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

~~Attention is drawn~~ISO draws attention to the possibility that ~~some of the elements~~implementation of this document may ~~be involve~~ the ~~subject~~use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights ~~in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).~~

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

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

A list of all parts in the [ISO 23795 series](#) can be found on the ISO website.

Commented [eXtyle2]: Invalid reference: "ISO 23795 series"

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.

Formatted: Default Paragraph Font

Formatted: Default Paragraph Font

Formatted: Default Paragraph Font

Introduction

Vehicle emission has become a main air pollution contributor, producing carbon dioxide and greenhouse gases. This document has been established to define criteria for measuring carbon dioxide emissions in relation to driving behaviours.

The international community has been actively pursuing greenhouse gas reduction policies, ^{[1],[2],[3],[4],[5],[6]} etc. since the Paris Agreement adopted by the CMA (Conference of the parties serving as the Meeting of the parties to Paris Agreement) as a comprehensive policy direction to cope with climate change.

In addition, the U.S., Europe and Asia are implementing a greenhouse gas ETS (emission trading system) to boost it.

In particular, greenhouse gases emitted from the transportation sector for greenhouse gas emission trading need to be quantified according to national policies. This standard is a basic document that can support the quantification of greenhouse gases emitted from vehicles.

The document aims to extract driving information based on driving patterns of drivers needed to provide eco-friendly driving behaviour services as part of achieving goals related to global carbon reduction policies.

It is intended to be used as a basis for interaction between vehicles, nomadic devices and cloud servers. Carbon dioxide emission measurement in relation to driving behaviours is determined by different events: speeding, long speeding, sudden acceleration/deceleration, sudden start/stop, idling, fuel-cut, economical driving, etc.

This document provides all documents and references required to support the implementation of the requirements related to standardized access to nomadic device service for estimating carbon dioxide emissions. The document contains functional requirements and datasets required by use cases.

[ISO/FDIS 23795-2](https://standards.iteh.ai/catalog/standards/sist/ddfbbdb5-eb01-4d96-bca1-0742890466d8/iso-fdis-23795-2)

<https://standards.iteh.ai/catalog/standards/sist/ddfbbdb5-eb01-4d96-bca1-0742890466d8/iso-fdis-23795-2>

Intelligent transport systems (ITS) — Extracting trip data ~~via using~~ ~~nomadic device and mobile devices~~ for estimating CO₂ emissions

Part 2: Information provision for eco-friendly driving behaviour

Part 2: Information provision for eco-friendly driving behaviour

1 Scope

This document defines the extraction of vehicle trip data via nomadic devices to measure CO₂ emissions in relation to driving behaviours. The extracted data can then be ~~analyzed~~ ~~analysed~~ and provided to drivers to serve as eco-friendly driving guidance. In this document the following items are defined:

- ~~Use~~ ~~use~~ cases for different events (speeding, long speeding, sudden start and stop, sudden acceleration and deceleration, idling, fuel-cut, economical driving);
- ~~Functional~~ ~~functional~~ requirements for collecting data for driving behaviour pattern analysis;
- ~~Data~~ ~~data~~ sets for each use case for measuring vehicle emissions (CO₂) and for being provided to drivers via nomadic devices.

Vehicle types such as passenger cars, vans, utility vehicles, etc. are concerned in this document.

2 Normative references

There are no normative references in this document.

3 Terms, definitions and abbreviated terms

3.1 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/>

3.1.1 nomadic device ND

~~Implementation~~ ~~implementation~~ of a personal ITS station which provides communication connectivity via portable equipment such as cellular telephones, wireless communication network (3G, 4G and 5G), mobile wireless broadband (WIMAX, HC-SDMA, etc.), etc. and includes short range links, such as IEEE 802.11x, etc. to connect portable devices to the motor vehicle communications system network.

[SOURCE: ISO/TR 10992:2010]

Formatted: Left: 1.9 cm, Right: 1.9 cm, Gutter: 0 cm, Header distance from edge: 1.27 cm

Formatted: Sub Bold, Font: (Asian) Japanese, Not Superscript/ Subscript

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.7 cm + 1.4 cm + 2.1 cm + 2.8 cm + 3.5 cm + 4.2 cm + 4.9 cm + 5.6 cm + 6.3 cm + 7 cm

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.71 cm

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.7 cm + 1.4 cm + 2.1 cm + 2.8 cm + 3.5 cm + 4.2 cm + 4.9 cm + 5.6 cm + 6.3 cm + 7 cm

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted: Default Paragraph Font

Formatted: Default Paragraph Font

Formatted: Default Paragraph Font

Commented [xTyles3]: Not found, but similar references exist

ISO/TR 10992:2011, Intelligent transport systems — Use of nomadic and portable devices to support ITS service and multimedia provision in vehicles

3.1.2 nomadic device identification ND ID

Unique identifier assigned to nomadic device by the nomadic device's manufacturer

3.2 Abbreviated terms

3.2.1	-
ID	identification
3.2.2	-
UVIP	unified vehicle interface protocol
3.2.3	-
RPM	revolutions per minute
3.2.4	-
GNSS	global navigation satellite system
3.2.5	-
cc	em ³ ;cubic centimetres (cm ³)
3.2.6	-
uint8_t	unsigned character
3.2.7	-
uint16_t	unsigned short integer
3.2.8	-
uint32_t	unsigned integer
3.2.9	-
uint64_t	unsigned long integer

4 General information

4.1 Purpose of information provision for eco-friendly driving behaviour

The main purpose of providing information on eco-friendly driving behaviour is to give eco-friendly driving behaviour guidance to drivers so that they can reduce their carbon dioxide emissions from vehicles. In order to meet this aim, it is necessary to conduct driving behaviour analysis by monitoring data gathered from the ND in a vehicle. Figure 1 provides an overview of this process.

Formatted: Font: 11 pt, Bold

Formatted: Font: Bold

Formatted: English (United Kingdom)

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.71 cm

Commented [eXtyle4]: No section matches the in-text citation "3.2.1". Please supply the missing section or delete the citation.

Formatted: Table body (+), Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted Table

Commented [eXtyle5]: No section matches the in-text citation "3.2.2". Please supply the missing section or delete the citation.

Formatted: Table body (+), Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted Table

Commented [eXtyle6]: No section matches the in-text citation "3.2.3". Please supply the missing section or delete the citation.

Formatted: Table body (+), Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted Table

Commented [eXtyle7]: No section matches the in-text citation "3.2.4". Please supply the missing section or delete the citation.

Formatted: Table body (+), Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted Table

Commented [eXtyle8]: No section matches the in-text citation "3.2.5". Please supply the missing section or delete the citation.

Formatted: Table body (+), Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted Table

Commented [eXtyle9]: No section matches the in-text citation "3.2.6". Please supply the missing section or delete the citation.

Formatted: Table body (+), Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted Table

Commented [eXtyle10]: No section matches the in-text citation "3.2.7". Please supply the missing section or delete the citation.

Formatted

Formatted Table

Commented [eXtyle11]: No section matches the in-text

Formatted

Formatted Table

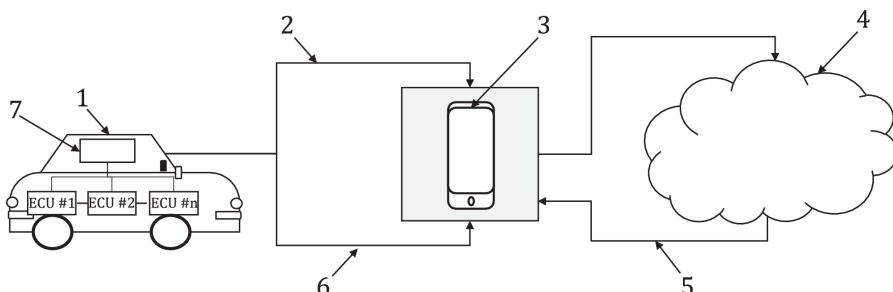
Commented [eXtyle12]: No section matches the in-text

Formatted

Formatted Table

Formatted

Formatted



Key

- 1 vehicle data (speed, RPM, etc)
- 2 wireless communication(3G, LTE, 5G, etc.)
- 3 nomadic device
- 4 cloud server
- 5 driving behaviour information
- 6 short-range wireless communication (IEEE 802.11x series)
- 7 UVIP

Figure 1 — Service system overview

The carbon emissions produced by a vehicle are proportional to the speed, sudden acceleration, sudden deceleration, idling, etc. of that vehicle. Driving behaviours are therefore categorized by driving events such as speeding, long speeding, sudden start/stop, sudden acceleration/deceleration, idling, fuel-cut, and economical driving.

23795_2_ed1fig1.EPS

Key

- 1 vehicle data(speed,RPM, etc)
- 2 wireless communication(3G, LTE, 5G, etc)
- 3 nomadic device
- 4 cloud server
- 5 driving behaviour information
- 6 short range wireless communication(IEEE 802.11x series)
- 7 UVIP

Figure 1 — Service system overview

4.2 Overview of use cases

For the purpose stated in 4.1, various use cases are defined as follows:

- UC1: Speeding – Act of driving faster than is legally allowed;
- UC2: Long speeding – Act of driving faster than is legally allowed for a long duration;
- UC3: Sudden acceleration – Acceleration in a brief time;

Formatted: Font: 11 pt, Bold

Formatted: Font: Bold

Formatted: Left

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.7 cm + 1.4 cm + 2.1 cm + 2.8 cm + 3.5 cm + 4.2 cm + 4.9 cm + 5.6 cm + 6.3 cm + 7 cm

Formatted Table

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.7 cm + 1.4 cm + 2.1 cm + 2.8 cm + 3.5 cm + 4.2 cm + 4.9 cm + 5.6 cm + 6.3 cm + 7 cm

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.7 cm + 1.4 cm + 2.1 cm + 2.8 cm + 3.5 cm + 4.2 cm + 4.9 cm + 5.6 cm + 6.3 cm + 7 cm

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.7 cm + 1.4 cm + 2.1 cm + 2.8 cm + 3.5 cm + 4.2 cm + 4.9 cm + 5.6 cm + 6.3 cm + 7 cm

Formatted Table

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.7 cm + 1.4 cm + 2.1 cm + 2.8 cm + 3.5 cm + 4.2 cm + 4.9 cm + 5.6 cm + 6.3 cm + 7 cm

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.7 cm + 1.4 cm + 2.1 cm + 2.8 cm + 3.5 cm + 4.2 cm + 4.9 cm + 5.6 cm + 6.3 cm + 7 cm

Formatted Table

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.7 cm + 1.4 cm + 2.1 cm + 2.8 cm + 3.5 cm + 4.2 cm + 4.9 cm + 5.6 cm + 6.3 cm + 7 cm

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.7 cm + 1.4 cm + 2.1 cm + 2.8 cm + 3.5 cm + 4.2 cm + 4.9 cm + 5.6 cm + 6.3 cm + 7 cm

Formatted Table

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.71 cm

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted: Font: 11 pt, Bold

Formatted: Font: Bold

- UC4: Sudden start – Acceleration from a stop position in a brief time;
- UC5: Sudden deceleration – Deceleration in a brief time;
- UC6: Sudden stop – Deceleration to stop in a brief time;
- UC7: Idling – Running a vehicle’s engine in a stop position;
- UC8: Fuel-cut – Maintain RPM without stepping on a pedal;
- UC9: Economical driving – Maintaining speed in the specified range of speed allowed.

4.3 Functional requirement

This document defines functional requirement for providing driving behaviour information using an ND.

The functional requirements of an ND are as follows:

- the ND shall be reliably and consistently connected with a vehicle in order to gather trip information;
- the ND shall receive vehicle status data such as vehicle speed, fuel injection amount, ~~rpm,~~ RPM, etc., which is collected through vehicle ITS station, and shall transfer it to a cloud server;
- the ND shall be reliably and consistently connected with a vehicle;
- the ND shall provide power supply interfaces for stable nomadic device operation.

5 Use cases definitions

5.1 Overview

This clause defines all use cases for providing a driver's driving habit information through an ND. There are nine use cases in total, shown in ~~Tables 1 to 9,~~ Tables 1 to 10.

5.1.2 UC 1: Speeding

Speeding is a case where the vehicle has been driven at more than 20 km/h above the legal road speed limit, for a duration of 2 ~~minutes~~min or less.

Table 1. — Use case 1: Speeding

Use case name	Vehicle information provision service for speeding
Actor(s)	Vehicle, driver, ND
Goal	Providing vehicle speeding information to driver.
Use case input	Automatic request by ND
Use case output	Vehicle speeding data displayed on ND
Brief description	This use case defines basic data for providing the driver with information on speeding of the vehicle driver via the ND. This information can be used for calculating CO ₂ emissions and eco-friendly driving habits.
Data required	a) Trip ID

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.71 cm

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.7 cm + 1.4 cm + 2.1 cm + 2.8 cm + 3.5 cm + 4.2 cm + 4.9 cm + 5.6 cm + 6.3 cm + 7 cm

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.71 cm

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted: None, Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted: Font: Not Bold, Font color: Auto

Formatted: Table header, Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted Table

Formatted: Font: Not Bold, Font color: Auto

Formatted: Font color: Auto

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted: Font: Not Bold, Font color: Auto

Formatted: Font color: Auto

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted: Font: Not Bold, Font color: Auto

Formatted: Font color: Auto

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted: Font: Not Bold, Font color: Auto

Formatted: Font color: Auto

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted: Font: Not Bold, Font color: Auto

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers

Formatted: Adjust space between Latin and Asian text, Adjust space between Asian text and numbers, Tab stops: Not at 0.04 cm

Formatted: Font color: Auto

Formatted