



# SLOVENSKI STANDARD

## SIST EN 12896-4:2019

01-november-2019

---

**Javni prevoz - Referenčni podatkovni model - 4. del: Spremljanje delovanja in nadzor**

Public transport - Reference data model - Part 4: Operations monitoring and control

Öffentlicher Verkehr - Referenzdatenmodell Teil 4: Betriebsüberwachung und Steuerung

Transports publics - Modèle de données de référence - Partie 4 : suivi et contrôle de l'exploitation

**STANDARD PREVIEW**  
**(standards.iteh.ai)**

**Ta slovenski standard je istoveten z: EN 12896-4:2019**

SIST EN 12896-4:2019  
<https://standards.iteh.ai/catalog/standards/sist/b61fd8e6-c3e6-4044-bb90-7bc7a60fdaec/sist-en-12896-4-2019>

---

**ICS:**

35.240.60	Uporabniške rešitve IT v prometu	IT applications in transport
-----------	----------------------------------	------------------------------

**SIST EN 12896-4:2019**

**en,fr,de**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN 12896-4:2019

<https://standards.iteh.ai/catalog/standards/sist/b61fd8e6-c3e6-4044-bb90-7bc7a60fdaec/sist-en-12896-4-2019>

EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 12896-4**

September 2019

ICS 35.240.60

English Version

**Public transport - Reference data model - Part 4:  
Operations monitoring and control**

Transports publics - Modèle de données de référence -  
Partie 4 : suivi et contrôle de l'exploitation

Öffentlicher Verkehr - Referenzdatenmodell Teil 4:  
Betriebsüberwachung und Steuerung

This European Standard was approved by CEN on 19 April 2019.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

<https://standards.iteh.ai/catalog/standards/sist/b61fd8e6-c3e6-4044-bb90-7bc7a60fdaec/sist-en-12896-4-2019>



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

## Contents

	Page
European foreword.....	10
Introduction .....	11
1 Scope .....	12
1.1 General Scope of the Standard.....	12
1.2 Functional Domain Description.....	13
1.3 Particular Scope of this Document.....	13
2 Normative references .....	14
3 Terms and definitions .....	14
4 Symbols and Abbreviations.....	16
5 Operations monitoring and control .....	17
5.1 Introduction.....	17
5.2 Dated Operational Plans.....	18
5.2.1 Principles .....	18
5.2.2 Vehicle Work Production Components.....	19
5.2.3 Dated Vehicle Service .....	23
5.2.4 Dated Call .....	24
5.2.5 Implementation of Dated Plans .....	25
5.2.6 Production Plan .....	25
5.3 Resource Detection and Monitoring .....	27
5.3.1 Limits.....	27
5.3.2 Functions Related to the Monitoring Process.....	27
5.3.3 Resources to be monitored.....	28
5.3.4 Vehicle Detecting.....	29
5.3.5 Vehicle Monitoring .....	30
5.4 Vehicle Assignments .....	31
5.4.1 General.....	31
5.4.2 Assignments .....	32
5.4.3 Work Plan Assignment.....	32
5.4.4 Vehicle Assignment .....	33
5.5 Monitored Operations .....	33
5.5.1 Monitored Services.....	33
5.5.2 Monitored Passing Times.....	35
5.5.3 Other Monitored Situations.....	36
5.5.4 Expected and Registered Situation .....	37
5.6 Control Actions.....	37
5.6.1 General.....	37
5.6.2 Vehicle Control Actions.....	39
5.6.3 Elementary Journey Control Actions.....	40
5.6.4 Composite Journey Control Actions.....	43
5.6.5 Interchange Control Actions .....	44
5.7 Operational Events .....	46
5.8 Operational Messages.....	48
5.9 Situation Description.....	49
5.10 Monitored Facilities .....	52

<b>Annex A (normative) Data Dictionary</b> .....	<b>55</b>
<b>A.1 Introduction</b> .....	<b>55</b>
<b>A.2 Data Dictionary — Operations Monitoring and Control</b> .....	<b>55</b>
<b>A.2.1 ALARM</b> .....	<b>55</b>
<b>A.2.2 ARRIVAL</b> .....	<b>55</b>
<b>A.2.3 CALL</b> .....	<b>56</b>
<b>A.2.4 CALL FOR MEANS</b> .....	<b>56</b>
<b>A.2.5 CALL FOR REPAIRS</b> .....	<b>56</b>
<b>A.2.6 CALL PART</b> .....	<b>56</b>
<b>A.2.7 CASUALTIES</b> .....	<b>57</b>
<b>A.2.8 CHANGE OF JOURNEY PATTERN</b> .....	<b>57</b>
<b>A.2.9 CHANGE OF JOURNEY TIMING</b> .....	<b>57</b>
<b>A.2.10 CHANGE OF VEHICLE</b> .....	<b>58</b>
<b>A.2.11 COMPOSITE JOURNEY CONTROL ACTION</b> .....	<b>58</b>
<b>A.2.12 CONTROL ACTION</b> .....	<b>58</b>
<b>A.2.13 DATED ARRIVAL</b> .....	<b>59</b>
<b>A.2.14 DATED CALL</b> .....	<b>59</b>
<b>A.2.15 DATED CALL PART</b> .....	<b>59</b>
<b>A.2.16 DATED DEPARTURE</b> .....	<b>59</b>
<b>A.2.17 DATED JOURNEY PART</b> .....	<b>60</b>
<b>A.2.18 DATED SPECIAL SERVICE</b> .....	<b>60</b>
<b>A.2.19 DATED VEHICLE JOURNEY INTERCHANGE</b> .....	<b>61</b>
<b>A.2.20 DATED VEHICLE SERVICE</b> .....	<b>61</b>
<b>A.2.21 DATED VEHICLE SERVICE PART</b> .....	<b>61</b>
<b>A.2.22 DELAY</b> .....	<b>62</b>
<b>A.2.23 DEPARTURE</b> .....	<b>62</b>
<b>A.2.24 DEPARTURE EXCHANGE</b> .....	<b>62</b>
<b>A.2.25 DEPARTURE LAG</b> .....	<b>63</b>
<b>A.2.26 DETECTED OPERATION</b> .....	<b>63</b>
<b>A.2.27 DRIVER INCIDENT</b> .....	<b>63</b>
<b>A.2.28 EASEMENT</b> .....	<b>64</b>
<b>A.2.29 ELEMENTARY JOURNEY CONTROL ACTION</b> .....	<b>64</b>
<b>A.2.30 ESTIMATED PASSING TIME</b> .....	<b>64</b>
<b>A.2.31 EXTRA DATED VEHICLE JOURNEY</b> .....	<b>65</b>
<b>A.2.32 FACILITY CONDITION</b> .....	<b>65</b>
<b>A.2.33 FACILITY MONITORING METHOD</b> .....	<b>66</b>

iTech STANDARD PREVIEW  
(standards.itech.ai)

[SIST EN 12896-4:2019](https://standards.itech.ai/catalog/standards/sist/b61fd8e6-c3e6-4044-bb90-7bc7a60fdaec/sist-en-12896-4-2019)

<https://standards.itech.ai/catalog/standards/sist/b61fd8e6-c3e6-4044-bb90-7bc7a60fdaec/sist-en-12896-4-2019>

## EN 12896-4:2019 (E)

A.2.34 FACILITY OPERATIONAL EVENT .....	66
A.2.35 FACILITY STATUS .....	66
A.2.36 FLEXIBLE JOURNEY ACTIVATION .....	67
A.2.37 IMPEDED TIME .....	67
A.2.38 INCIDENT .....	67
A.2.39 INTERCHANGE CANCELLATION .....	68
A.2.40 INTERCHANGE CONTROL ACTION .....	68
A.2.41 INTERCHANGE CREATION .....	69
A.2.42 INTERCHANGE MODIFICATION .....	69
A.2.43 JOURNEY CANCELLATION .....	70
A.2.44 JOURNEY CREATION .....	70
A.2.45 LOGICAL DRIVER .....	70
A.2.46 LOGICAL VEHICLE .....	70
A.2.47 LOGICAL VEHICLE CANCELLATION .....	71
A.2.48 LOGICAL VEHICLE CREATION .....	71
A.2.49 METHOD OF CAPTURE .....	71
A.2.50 MONITORED FACILITY .....	71
A.2.51 MONITORED JOURNEY PART FACILITY .....	72
A.2.52 MONITORED LOCAL SERVICE FACILITY .....	72
A.2.53 MONITORED OPERATION .....	72
A.2.54 MONITORED PLACE EQUIPMENT FACILITY .....	73
A.2.55 MONITORED SPECIAL SERVICE .....	73
A.2.56 MONITORED VEHICLE EQUIPMENT FACILITY .....	73
A.2.57 MONITORED VEHICLE JOURNEY .....	74
A.2.58 MONITORED VEHICLE JOURNEY FACILITY .....	74
A.2.59 OBSERVED PASSING TIME .....	74
A.2.60 OPERATIONAL EVENT .....	75
A.2.61 OPERATIONAL MESSAGE .....	75
A.2.62 PARTIAL JOURNEY CANCELLATION .....	75
A.2.63 PLANNED REMEDY .....	76
A.2.64 PRODUCTION PLAN .....	76
A.2.65 PT SITUATION .....	76
A.2.66 PT SITUATION AFFECTED SCOPE .....	76
A.2.67 PT SITUATION CONSEQUENCE .....	77
A.2.68 PT SITUATION CONSEQUENCE SCOPE .....	77
A.2.69 PT SITUATION GENERAL CONSEQUENCE .....	78

ITeH STANDARD PREVIEW  
(standards.iteh.ai)

<https://standards.iteh.ai/catalog/standards/sist/b61fd8e6-c3e6-4044-bb90-7bc7a601dacc/sist-en-12896-4-2019>

<https://standards.iteh.ai/catalog/standards/sist/b61fd8e6-c3e6-4044-bb90-7bc7a601dacc/sist-en-12896-4-2019>

A.2.70 PT SITUATION MESSAGE .....	78
A.2.71 RELATED SITUATION .....	78
A.2.72 REMEDY .....	79
A.2.73 RESORPTION.....	79
A.2.74 RESPACING .....	79
A.2.75 SITE OPERATIONAL EVENT .....	80
A.2.76 SITUATION .....	80
A.2.77 SITUATION CAUSE .....	80
A.2.78 SITUATION REASON .....	81
A.2.79 SITUATION SOURCE .....	81
A.2.80 TYPE OF DELAY.....	81
A.2.81 TYPE OF SITUATION SOURCE .....	82
A.2.82 TYPE OF VEHICLE DETECTING .....	82
A.2.83 TYPE OF VEHICLE MONITORING.....	82
A.2.84 VEHICLE ASSIGNMENT .....	83
A.2.85 VEHICLE CONTROL ACTION.....	83
A.2.86 VEHICLE DETECTING .....	83
A.2.87 VEHICLE DETECTING LOG ENTRY .....	84
A.2.88 VEHICLE INCIDENT.....	84
A.2.89 VEHICLE MONITORING.....	84
A.2.90 VEHICLE MONITORING LOG ENTRY.....	85
A.2.91 VEHICLE WORK ASSIGNMENT .....	85
<b>Annex B (normative) Additional Common Concepts — Extension to EN 12896-1:2016, Public Transport – Reference Data Model – Part 1: Common Concepts .....</b>	<b>86</b>
<b>B.1 Methodology and Conventions .....</b>	<b>86</b>
<b>B.1.1 Methodology for conceptual modelling.....</b>	<b>86</b>
<b>B.1.1.1 General .....</b>	<b>86</b>
<b>B.1.1.2 General .....</b>	<b>86</b>
<b>B.1.1.3 Packages.....</b>	<b>86</b>
<b>B.1.1.4 Package Prefixes and Package order.....</b>	<b>87</b>
<b>B.1.1.5 Part Prefixes and diagram names.....</b>	<b>88</b>
<b>B.1.1.6 Class diagrams .....</b>	<b>88</b>
<b>B.1.1.7 Class Diagram Presentations.....</b>	<b>89</b>
<b>B.1.1.8 Use of Colour.....</b>	<b>89</b>
<b>B.1.2 MODEL Class Diagrams.....</b>	<b>90</b>
<b>B.1.2.1 General .....</b>	<b>90</b>
<b>B.1.2.2 Classes and attributes .....</b>	<b>91</b>

## EN 12896-4:2019 (E)

B.1.2.2.1	General .....	91
B.1.2.2.2	Attribute visibility .....	91
B.1.2.2.3	Attribute names.....	92
B.1.2.2.4	Attribute types.....	92
B.1.2.2.5	Multiplicity of Attributes.....	92
B.1.2.2.6	Common attributes .....	92
B.1.2.2.7	Simple Diagram Example .....	92
B.1.2.3	Relationships .....	94
B.1.2.3.1	General .....	94
B.1.2.3.2	Association relationships .....	94
B.1.2.3.3	Reflexive associations .....	94
B.1.2.3.4	Aggregation relationship .....	95
B.1.2.3.5	Generalization relationship .....	96
B.1.2.3.6	Multiplicity (Cardinality) of Relationships.....	97
B.1.2.3.7	Presence of Relationships on a given diagram.....	97
B.1.2.3.8	Relationships and navigability .....	98
B.1.2.3.9	Positional semantics for laying out classes and relationships.....	100
B.1.2.3.10	Explicit Frames .....	100
B.1.3	Summary of Rules for Transmodel Presentation .....	100
B.1.3.1	Presentation of Class Structure diagrams.....	100
B.1.3.2	Rules for naming and presenting classes .....	101
B.1.3.3	Rules for use of role names.....	101
B.1.3.4	Rules for use of multiplicity .....	102
B.1.3.5	Rules for relationship qualifiers.....	103
B.1.3.6	Rules for presenting relationships .....	104
B.1.3.7	Rules for Placing Role names.....	104
B.2	Extensions to the Common Concept MODEL.....	104
B.2.1	General.....	104
B.2.2	Additional Common Concepts — Additional Generalizations .....	104
B.2.2.1	Generic Type of Value – Conceptual MODEL.....	104
B.2.2.2	Generic Assignment – Conceptual MODEL .....	106
B.2.2.3	Generic Section – Conceptual MODEL .....	106
B.2.3	Extensions to the Generic Framework .....	107
B.2.3.1	General.....	107
B.2.3.2	Alternative Text – Conceptual MODEL.....	107
B.2.3.3	Generic View – Conceptual MODEL.....	108



<b>B.2.3.4 Generic Loggable Object – Conceptual MODEL</b> .....	<b>109</b>
<b>B.2.3.5 Event Model – Conceptual MODEL</b> .....	<b>109</b>
<b>B.2.4 Extensions to the Reusable Components</b> .....	<b>110</b>
<b>B.2.4.1 Employee Model – Conceptual MODEL</b> .....	<b>110</b>
<b>B.2.4.2 Message Model – Conceptual MODEL</b> .....	<b>111</b>
<b>B.2.4.2.1 Messages</b> .....	<b>111</b>
<b>B.2.4.2.2 Publication Scope</b> .....	<b>112</b>
<b>B.2.4.3 Role Model – Conceptual MODEL</b> .....	<b>113</b>
<b>B.2.4.3.1 Generic Roles</b> .....	<b>113</b>
<b>B.2.4.3.2 Service Organization Roles</b> .....	<b>114</b>
<b>B.2.4.3.3 Employee Roles</b> .....	<b>114</b>
<b>B.2.4.3.4 Administrative Organization Roles</b> .....	<b>115</b>
<b>B.2.4.3.5 Technology Organization Roles</b> .....	<b>116</b>
<b>B.2.4.3.6 Messaging Roles</b> .....	<b>117</b>
<b>B.2.4.3.7 Transport Customer Roles</b> .....	<b>118</b>
<b>B.2.4.4 Security List – Conceptual MODEL</b> .....	<b>118</b>
<b>B.2.4.5 Transfer Time – Conceptual MODEL</b> .....	<b>119</b>
<b>B.2.5 Data Dictionary</b> .....	<b>119</b>
<b>B.2.5.1 General</b> .....	<b>119</b>
<b>B.2.5.2 ADMINISTRATIVE ORGANIZATION ROLE</b> .....	<b>120</b>
<b>B.2.5.3 ALTERNATIVE TEXT</b> .....	<b>120</b>
<b>B.2.5.4 ASSIGNMENT</b> .....	<b>120</b>
<b>B.2.5.5 BLACKLIST</b> .....	<b>120</b>
<b>B.2.5.6 CLASS ATTRIBUTE</b> .....	<b>121</b>
<b>B.2.5.7 CONDUCTOR ROLE</b> .....	<b>121</b>
<b>B.2.5.8 CUSTOMER SERVICE PROVIDER ROLE</b> .....	<b>121</b>
<b>B.2.5.9 CUSTOMER SERVICE ROLE</b> .....	<b>121</b>
<b>B.2.5.10 DATA COLLECTOR ROLE</b> .....	<b>122</b>
<b>B.2.5.11 DRIVER ROLE</b> .....	<b>122</b>
<b>B.2.5.12 EMPLOYEE</b> .....	<b>122</b>
<b>B.2.5.13 EMPLOYEE ROLE</b> .....	<b>122</b>
<b>B.2.5.14 EVENT</b> .....	<b>123</b>
<b>B.2.5.15 GENERAL EVENT</b> .....	<b>123</b>
<b>B.2.5.16 GENERAL OBSERVER ROLE</b> .....	<b>123</b>
<b>B.2.5.17 GENERAL SECTION</b> .....	<b>124</b>
<b>B.2.5.18 LOG</b> .....	<b>124</b>

## EN 12896-4:2019 (E)

B.2.5.19	LOG ENTRY .....	124
B.2.5.20	LOGGABLE OBJECT .....	124
B.2.5.21	MESSAGE .....	125
B.2.5.22	MESSAGE PART .....	125
B.2.5.23	MESSAGE PRIORITY .....	125
B.2.5.24	ORGANIZATION ROLE.....	125
B.2.5.25	PT SCOPE.....	126
B.2.5.26	PUBLICATION APPROVER ROLE .....	126
B.2.5.27	PUBLICATION DECISION .....	126
B.2.5.28	PUBLICATION SCOPE .....	126
B.2.5.29	PUBLICATION WINDOW .....	127
B.2.5.30	PUBLISHING ACTION.....	127
B.2.5.31	PUBLISHING CHANNEL.....	127
B.2.5.32	QUALIFICATION.....	127
B.2.5.33	REGISTRAR ROLE .....	128
B.2.5.34	SECTION.....	128
B.2.5.35	SECTION IN LINK SEQUENCE .....	128
B.2.5.36	SECURITY LIST .....	128
B.2.5.37	SECURITY LISTABLE.....	129
B.2.5.38	SECURITY LISTING.....	129
B.2.5.39	SECURITY MANAGER ROLE.....	129
B.2.5.40	SERVICE OPERATOR ROLE.....	129
B.2.5.41	SITUATION AUTHOR ROLE .....	130
B.2.5.42	SPECIFIC OBSERVER ROLE.....	130
B.2.5.43	STATION EMPLOYEE ROLE .....	130
B.2.5.44	TECHNOLOGY ORGANIZATION ROLE.....	130
B.2.5.45	TRAFFIC INFORMATION OFFICER ROLE .....	131
B.2.5.46	TRANSFER TIME .....	131
B.2.5.47	TRANSPORT USER ROLE.....	131
B.2.5.48	TRAVEL DOCUMENT CONTROLLER ROLE .....	131
B.2.5.49	TRAVEL DOCUMENT CONTROLLING ORGANIZATION ROLE.....	132
B.2.5.50	TRAVEL ORGANIZATION ROLE.....	132
B.2.5.51	TYPE OF AUDIENCE .....	132
B.2.5.52	TYPE OF EVENT.....	132
B.2.5.53	TYPE OF MESSAGE .....	133
B.2.5.54	TYPE OF MESSAGE PART CONTENT .....	133

ITeH STANDARD PREVIEW  
(standards.iteh.ai)

SIST EN 12896-4:2019

<https://standards.iteh.ai/catalog/standards/sist/b61fd8e6-c3e6-4044-bb90-7bc7a601dacc/sist-en-12896-4-2019>

B.2.5.55	TYPE OF QUALIFICATION .....	133
B.2.5.56	TYPE OF SECURITY LIST .....	133
B.2.5.57	TYPE OF VALUE .....	134
B.2.5.58	View .....	134
B.2.5.59	WHITELIST .....	134
<b>Annex C (informative) Data Model Evolution .....</b>		<b>135</b>
C.1	Change Requests .....	135
C.2	Source of Text .....	163
C.3	Diagram Status .....	163
<b>Annex D (informative) Mapping to DATEX II and SIRI (SX and FM) .....</b>		<b>165</b>
D.1	Related standards .....	165
D.2	Mapping with DATEX II .....	165
D.2.1	DATEX II .....	165
D.2.2	DATEX II and Transmodel .....	166
D.2.3	Overview of correspondence of Situation elements .....	166
D.2.4	Outline Mapping between DATEX II and Transmodel .....	169
D.3	Mapping with SIRI SX and SIRI FM .....	170
D.3.1	SIRI — Service Interface for Real-time Information .....	170
D.3.2	Outline Mapping between SIRI — SX — and Transmodel .....	171
D.3.3	Outline Mapping between SIRI — FM — and Transmodel .....	172
<b>Bibliography .....</b>		<b>174</b>

**EN 12896-4:2019 (E)****European foreword**

This document (EN 12896-4:2019) has been prepared by Technical Committee CEN/TC 278 “Intelligent transport systems”, the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 2020, and conflicting national standards shall be withdrawn at the latest by March 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

The series is composed of the following documents:

- *Public transport – Reference data model – Part 1: Common concepts;*
- *Public transport – Reference data model – Part 2: Public transport network;*
- *Public transport – Reference data model – Part 3: Timing information and vehicle scheduling;*
- *Public transport – Reference data model – Part 4: Operations monitoring and control;*
- *Public transport – Reference data model – Part 5: Fare management;*
- *Public transport – Reference data model – Part 6: Passenger information;*
- *Public transport – Reference data model – Part 7: Driver management;*
- *Public transport – Reference data model – Part 8: Management information & statistics; and*
- *Public transport – Reference data model – Part 9: Informative documentation [CEN/TR].*

Together these create version 6 of the European Standard EN 12896, known as “Transmodel”, and thus replace EN 12896:2006, known as “Transmodel v5.1”.

In comparison with EN 12896:2006, the technical modifications made are presented in CEN/TR 12896-9, *Public transport – Reference data model – Part 9: Informative documentation*.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## Introduction

Part 1 of this European Standard presents the following items:

- Rationale for the Transmodel Standard;
- Use of the Transmodel Standard;
- Applicability of the Transmodel Standard;
- Conformance Statement;
- Transmodel Origins;
- Reference to the Previous Version and Other Documents.

The data structures represented in Part 1 are generic patterns that are referenced by different other parts.

Part 2 of this European Standard presents space-related data structures.

Part 3 presents time-related data structures and replaces the sections of EN 12896:2006 referring to the time-related Tactical Planning Components and to Vehicle Scheduling.

Part 4 (this part) presents data referring to daily operations (i.e. to operational days), different from those planned for day types (space-related data structures and tactical planning components) and including operational raw data referring to operations follow-up.

Part 5 presents fares structures including sales, validation and control.

Part 6 presents Passenger Information (planned and real-time).

Part 7 presents Driver Management including Driver Scheduling (day-type related driver schedules), Rostering (ordering of driver duties into sequences according to some chosen methods) and Driving Personnel Disposition (assignment of logical drivers to physical drivers and recording of driver performance).

Part 8 presents Management Information and Statistics.

## EN 12896-4:2019 (E)

### 1 Scope

#### 1.1 General Scope of the Standard

The main objective of the present standard is to present the Reference Data Model for Public Transport, based on:

- the Reference Data Model, EN 12896, known as Transmodel V5.1;
- EN 28701:2012, *Intelligent transport systems – Public transport – Identification of Fixed Objects in Public Transport (IFOPT)*, although note that this particular standard has been withdrawn as it is now included within Parts 1 and 2 of this standard (EN 12896-1:2016 and EN 12896-2:2016) following their successful publication;

incorporating the requirements of:

- EN 15531-1 to -3 and CEN/TS 15531-4 and -5: *Public transport – Service interface for real-time information relating to public transport operations (SIRI)*;
- CEN/TS 16614-1 and -2: *Public transport – Network and Timetable Exchange (NeTEx)*, in particular the specific needs for long distance train operation.

Particular attention is drawn to the data model structure and methodology:

- the data model is described in a modular form in order to facilitate the understanding and the use of the model;
- the data model is entirely described in UML.

The following functional domains are considered:

- Network Description: routes, lines, journey patterns, timing patterns, service patterns, scheduled stop points and stop places;
- Timing Information and Vehicle Scheduling (runtimes, vehicle journeys, day type-related vehicle schedules);
- Passenger Information (planned and real-time);
- Fare Management (fare structure, sales, validation, control);
- Operations Monitoring and Control: operating day-related data, vehicle follow-up, control actions;
- Driver Management:
  - Driver Scheduling (day-type related driver schedules),
  - Rostering (ordering of driver duties into sequences according to some chosen methods),
  - Driving Personnel Disposition (assignment of logical drivers to physical drivers and recording of driver performance);
- Management Information and Statistics (including data dedicated to service performance indicators).

The data modules dedicated to cover most functions of the above domains will be specified.

Several concepts are shared by the different functional domains. This data domain is called “Common Concepts”.

## 1.2 Functional Domain Description

The different functional domains (enumerated above) taken into account in the present document, and of which the data have been represented as the reference model, are described in EN 12896-1:2016, *Public transport – Reference data model – Part 1: Common concepts*.

## 1.3 Particular Scope of this Document

The present document entitled *Public transport – Reference data model – Part 4: Operations monitoring and control* incorporates the following data packages:

- Dated Production Components MODEL;
- Call MODEL;
- Production Plan MODEL;
- Detecting and Monitoring MODEL;
- Control Action MODEL;
- Event and Incident MODEL;
- Messaging MODEL;
- Situation MODEL; and
- Facility Monitoring and Availability MODEL.

iTech STANDARD PREVIEW  
(standards.itech.ai)

SIST EN 12896-4:2019

<https://standards.itech.ai/standards/sist/b61fd8e6-c3e6-4044-bb90-7bc7a60fdaac/sist-en-12896-4-2019>

The data structures represented in this part form descriptions of data that are specific to operations for an operational day (as opposed to those planned for day types). They reference to structures as described in EN 12896-1:2016, such as version frames or generic grouping mechanisms, but also to EN 12896-2:2016 and EN 12896-3:2016.

This document itself is composed of the following parts:

- Main document (normative) presenting the data model for the domain Operations Monitoring and Control;
- Annex A (normative), containing the data dictionary, i.e. the list of all the concepts and attribute tables present in the main document together with the definitions;
- Annex B (normative), providing a complement to EN 12896-1:2016, particularly useful for parts 4 to 8 of the Public Transport Reference Data Model;
- Annex C (informative), indicating the data model evolutions; and
- Annex D (informative), providing a mapping between the Situation Publication model of DATEX II (EN 16157 and CEN/TS 16157 (all parts), *Situation Publication Data Model 2.2, 2013*), SIRI Situation Exchange (CEN/TS 15531-5:2016) and SIRI Facility Monitoring (CEN/TS 15531-4:2011).