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de l'accréditation, de la sécurité et qualité
des produits et services

ILNAS-EN 12896-5:2019

**Public transport - Reference data
model - Part 5: Fare management**

Transports publics - Modèle de données
de référence - Partie 5 : gestion tarifaire

Öffentlicher Verkehr -
Referenzdatenmodell - Teil 5:
Fahrgeldmanagement

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National Foreword

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**Public transport - Reference data model - Part 5: Fare
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Transports publics - Modèle de données de référence -
Partie 5 : gestion tarifaire

Öffentlicher Verkehr - Referenzdatenmodell - Teil 5:
Fahrgeldmanagement

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

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Contents

Page

European foreword.....	11
Introduction	12
1 Scope	13
1.1 General Scope of the Standard.....	13
1.2 Functional Domain Description	14
1.3 Particular Scope of this Document.....	14
2 Normative references	15
3 Terms and definitions	15
4 Symbols and Abbreviations.....	22
5 Public Transport Fares Domain.....	24
5.1 Scope & Overview.....	24
5.1.1 Functional Domains of a Fare Model.....	24
5.1.2 Variety and Complexity of Fare Systems	26
5.1.3 Impact of Control and Validation Technologies.....	27
5.1.4 Ticketing Paradigms: Account Based Ticketing & Media Centric Ticketing.....	27
5.1.5 Interoperability	28
5.1.6 Abstract Modelling.....	28
5.1.7 Modelling Approach - Access Rights.....	29
5.1.8 Possible Simplifications for Implementations	30
5.1.9 Further Evolution of Fare Systems.....	30
5.1.10 Use of Fare Data in Passenger Information services.....	31
5.2 Fundamental Concepts.....	31
5.2.1 Access Rights.....	31
5.2.2 Access Rights Specification	31
5.2.3 Fare Products.....	32
5.2.4 Sales Offer Packages.....	32
5.2.5 Overview on Access Rights Levels, Parameter Types and Associated Concepts	33
5.2.6 Customers and Contracts	34
5.2.7 Travel Documents, Customers, Contracts and Sales Offer Packages.....	34
5.2.8 Distribution and Fulfilment.....	35
5.2.9 Sales Transactions	36
5.2.10 Prices	37
5.2.11 Consumption Control.....	38
5.2.12 Sales and Validation Entries.....	39
5.2.13 Revenue protection measures.....	39
5.2.14 Roles.....	39
5.3 Use Cases for the Fare Model	40
5.3.1 General.....	40
5.3.2 Business context.....	40
5.3.3 Actors and use case types.....	44
5.3.4 Use Cases	46
5.4 Organisation of the Conceptual Model	48
5.5 Extensions to the Network Model for fares	49
5.5.1 General.....	49
5.5.2 Fare Zone – Conceptual Model.....	49

5.6	Fare Structure	55
5.6.1	General	55
5.6.2	Fare Structure Model & Sub-models	55
5.6.3	Common Fare Structure	57
5.6.4	Geographical Fare Structure.....	58
5.6.5	Time Fare Structure.....	62
5.6.6	Quality Fare Structure.....	63
5.6.7	Fare Structure Element	65
5.6.8	Validable & Controllable Elements Validable Element.....	72
5.7	Access Right Assignment.....	76
5.7.1	Principles.....	76
5.7.2	Fare Product	95
5.8	Fare Pricing.....	106
5.8.1	Principles.....	106
5.8.2	Fare Calculation Parameters	106
5.8.3	Fare Price.....	107
5.8.4	Price Derivation	110
5.8.5	Price Groups	111
5.8.6	Fare Table.....	112
5.9	Sales Description	114
5.9.1	Sales Offer Package	114
5.9.2	Fare Sales Distribution	116
5.9.3	Type of Travel Document.....	117
5.9.4	Medium Access Device and Medium Application Instance.....	119
5.9.5	Example - Sales Descriptions.....	120
5.10	Customers and Sales Transactions.....	123
5.10.1	General	123
5.10.2	Sales Transaction – Model & Sub-models	123
5.10.3	Fare Contracts.....	123
5.10.4	Retail Consortiums.....	128
5.10.5	Sale Transactions.....	130
5.10.6	Fare Contract Events.....	136
5.11	Fare Roles	147
5.11.1	Fare Management Roles	147
5.11.2	Fare Technology Roles.....	148
5.11.3	Fare Transport Customer Roles	149
5.11.4	Fare Product Roles specific to Fare Management.....	150
5.11.5	Service Organisation Roles that are relevant for Fare Management.....	151
5.11.6	Administrative organisation roles that are specific for Fare Management	152
5.11.7	Technology provide roles that are involved in Fare Management.....	153
5.11.8	Summary of Fare Roles.....	155
5.12	Control and Validation.....	157
5.12.1	Control Means	157
5.12.2	Elementary Controls.....	158
5.12.3	Validation	159
5.12.4	Validation and Control Events	164
5.12.5	Access Right Control Roles	170
5.12.6	Summary of Events & Entries.....	171
5.12.7	Other Output.....	175
5.13	Additional Topics.....	175
5.13.1	Fare Version.....	175
5.13.2	Information on Fares.....	175
5.13.3	Modularisation & Package dependencies.....	176

5.13.4	Explicit Frames.....	178
5.13.5	Version Frames	178
5.13.6	Fare Frame.....	178
5.13.7	Sales Transaction Frame	179
Annex A	(normative) Data Dictionary	181
A.1	Introduction	181
A.2	Data Dictionary — Fare Management.....	181
A.2.1	ACCESS RIGHT IN PRODUCT	181
A.2.2	ACCESS RIGHT PARAMETER ASSIGNMENT	181
A.2.3	ACCESSED FARE STRUCTURE ELEMENT.....	182
A.2.4	ACCOUNT AUTO RENEWAL EVENT.....	182
A.2.5	ACCOUNT AUTO TOP UP EVENT	183
A.2.6	ACCOUNT AWARD REFUND EVENT	183
A.2.7	ACCOUNT PROVIDER ROLE.....	184
A.2.8	ACCOUNT SALES EVENT	184
A.2.9	ACCOUNT DETECT ELIGIBILITY CHANGE EVENT	184
A.2.10	ACCOUNT DETECT NO CHECK IN EVENT	185
A.2.11	ACCOUNT DETECT NO CHECK OUT EVENT	185
A.2.12	ACCOUNT DETECT REENTRY EVENT	186
A.2.13	ACCOUNT DETECT SUSPICIOUS BEHAVIOUR EVENT	186
A.2.14	ACCOUNT DETECT TRIP EVENT	187
A.2.15	ACCOUNT PROCESSING EVENT	187
A.2.16	ACCOUNT REVIVE ENTRY	187
A.2.17	ACCOUNT REVIVE EVENT.....	188
A.2.18	ACCOUNT SUSPEND ENTRY.....	188
A.2.19	ACCOUNT SUSPEND EVENT	189
A.2.20	ADJUST BALANCE ON CHECK IN ENTRY.....	189
A.2.21	ALLOW ACCOUNT ON SECURITY LIST EVENT	189
A.2.22	AMOUNT OF PRICE UNIT.....	190
A.2.23	BECOMES ELIGIBLE ENTRY	190
A.2.24	BOOKING DEBIT.....	191
A.2.25	BOOKING POLICY.....	191
A.2.26	BORDER POINT	192
A.2.27	CANCELLING	192
A.2.28	CAPPED DISCOUNT RIGHT	192
A.2.29	CAPPING RULE.....	193
A.2.30	CAPPING RULE PRICE.....	193
A.2.31	CEASES TO BE ELIGIBLE ENTRY	194
A.2.32	CELL.....	194
A.2.33	CHARGING MOMENT	194
A.2.34	CHARGING POLICY	195
A.2.35	COMMERCIAL PROFILE.....	195
A.2.36	COMMERCIAL PROFILE ELIGIBILITY	196
A.2.37	COMPANION PROFILE.....	196
A.2.38	COMPANION ROLE.....	196
A.2.39	CONTROL ENTRY	197
A.2.40	CONTROL MEANS.....	197
A.2.41	CONTROL PARAMETER ASSIGNMENT	197
A.2.42	CONTROL PASSENGER TRIP ENTRY.....	198
A.2.43	CONTROL PASSENGER TRIP EVENT	198
A.2.44	CONTROL RECORD	199
A.2.45	CONTROL TYPE	199

A.2.46	CONTROLLABLE ELEMENT	199
A.2.47	CONTROLLABLE ELEMENT IN SEQUENCE	200
A.2.48	CONTROLLABLE ELEMENT PRICE	200
A.2.49	CONTROLLED ACCESS	201
A.2.50	CORPORATE PURCHASER ROLE	201
A.2.51	CUSTOMER ACCOUNT	201
A.2.52	CUSTOMER ACCOUNT ENTRY	202
A.2.53	CUSTOMER ACCOUNT EVENT	202
A.2.54	CUSTOMER ACCOUNT SECURITY LISTING	203
A.2.55	CUSTOMER BOOKING CANCELLATION ENTRY	203
A.2.56	CUSTOMER BOOKING ENTRY	203
A.2.57	CUSTOMER BOOKING EVENT	204
A.2.58	CUSTOMER COLLECT EVENT	204
A.2.59	CUSTOMER DEREGISTER EVENT	205
A.2.60	CUSTOMER DEREGISTRATION ENTRY	205
A.2.61	CUSTOMER ELIGIBILITY	205
A.2.62	CUSTOMER EXCHANGE EVENT	206
A.2.63	CUSTOMER FULFILMENT EVENT	206
A.2.64	CUSTOMER MEDIA APPLICATION RESTORE EVENT	206
A.2.65	CUSTOMER MEDIA INSTALL EVENT	207
A.2.66	CUSTOMER MEDIA RESTORE EVENT	207
A.2.67	CUSTOMER MEDIA REGISTRATION ENTRY	208
A.2.68	CUSTOMER MODIFY PROFILE EVENT	208
A.2.69	CUSTOMER PAYMENT MEANS	208
A.2.70	CUSTOMER PRODUCT ACTIVATION EVENT	209
A.2.71	CUSTOMER PRODUCT PURCHASE ENTRY	209
A.2.72	CUSTOMER PRODUCT PURCHASE EVENT	210
A.2.73	CUSTOMER PROFILE MODIFICATION ENTRY	210
A.2.74	CUSTOMER PURCHASE PACKAGE	210
A.2.75	CUSTOMER PURCHASE PACKAGE ELEMENT	211
A.2.76	CUSTOMER PURCHASE PACKAGE PRICE	211
A.2.77	CUSTOMER PURCHASE PARAMETER ASSIGNMENT	212
A.2.78	CUSTOMER PURCHASE STATUS	212
A.2.79	CUSTOMER REFUND EVENT	212
A.2.80	CUSTOMER REGISTER EVENT	213
A.2.81	CUSTOMER REGISTER MEDIA EVENT	213
A.2.82	CUSTOMER REGISTRATION ENTRY	214
A.2.83	CUSTOMER SALES EVENT	214
A.2.84	CUSTOMER SECURITY LISTING	214
A.2.85	DENY ACCOUNT ON SECURITY LIST EVENT	215
A.2.86	DEVICE PARAMETER ASSIGNMENT	215
A.2.87	DEVICE RELATED CONTROL MEANS	216
A.2.88	DISCOUNTING RULE	216
A.2.89	DISTANCE MATRIX ELEMENT	216
A.2.90	DISTANCE MATRIX ELEMENT PRICE	217
A.2.91	DISTRIBUTION ASSIGNMENT	217
A.2.92	DISTRIBUTION CHANNEL	218
A.2.93	EMV CARD	219
A.2.94	ENTITLEMENT GIVEN	219
A.2.95	ENTITLEMENT PRODUCT	220
A.2.96	ENTITLEMENT REQUIRED	220
A.2.97	EXCHANGING	221
A.2.98	FARE CONTRACT	221

A.2.99	FARE CONTRACT ENTRY	221
A.2.100	FARE CONTRACT EVENT	222
A.2.101	FARE CONTRACT SECURITY LISTING	222
A.2.102	FARE CONTRACT STATUS	222
A.2.103	FARE DATA COLLECTOR ROLE	223
A.2.104	FARE DAY TYPE	223
A.2.105	FARE DEBIT	224
A.2.106	FARE DEMAND FACTOR	224
A.2.107	FARE EASEMENT	224
A.2.108	FARE EASEMENT PARAMETER CHANGE	225
A.2.109	FARE ELEMENT IN SEQUENCE	225
A.2.110	FARE FRAME	226
A.2.111	FARE FRAME DEFAULTS	226
A.2.112	FARE INTERVAL	226
A.2.113	FARE ORGANISATION ROLE	227
A.2.114	FARE PRICE	227
A.2.115	FARE POINT IN JOURNEY PATTERN	228
A.2.116	FARE PRODUCT	229
A.2.117	FARE PRODUCT ATTRIBUTOR ROLE	229
A.2.118	FARE PRODUCT DISTRIBUTOR ROLE	230
A.2.119	FARE PRODUCT EXCHANGE ENTRY	230
A.2.120	FARE PRODUCT ISSUER ROLE	231
A.2.121	FARE PRODUCT OWNER ROLE	231
A.2.122	FARE PRODUCT PRICE	231
A.2.123	FARE PRODUCT PURCHASE ENTRY	232
A.2.124	FARE PRODUCT REFUND ENTRY	232
A.2.125	FARE PRODUCT RENEWAL ENTRY	233
A.2.126	FARE PRODUCT RETAILER ROLE	233
A.2.127	FARE PRODUCT SALE DEBIT	233
A.2.128	FARE PRODUCT VALIDITY PARAMETER	234
A.2.129	FARE QUOTA FACTOR	234
A.2.130	FARE REGISTRAR ROLE	235
A.2.131	FARE SECURITY MANAGER ROLE	235
A.2.132	FARE SCHEDULED STOP POINT	235
A.2.133	FARE SECTION	236
A.2.134	FARE STRUCTURE ELEMENT	236
A.2.135	FARE STRUCTURE ELEMENT IN SEQUENCE	237
A.2.136	FARE STRUCTURE ELEMENT PRICE	237
A.2.137	FARE STRUCTURE FACTOR	237
A.2.138	FARE TABLE	238
A.2.139	FARE TRIP ACTIVATION ENTRY	238
A.2.140	FARE UNIT	239
A.2.141	FARE ZONE	239
A.2.142	FREQUENCY OF USE	239
A.2.143	FULFILMENT ENTRY	240
A.2.144	FULFILMENT METHOD	240
A.2.145	FULFILMENT METHOD PRICE	241
A.2.146	GENERIC PARAMETER ASSIGNMENT	241
A.2.147	GEOGRAPHICAL INTERVAL	242
A.2.148	GEOGRAPHICAL INTERVAL PRICE	242
A.2.149	GEOGRAPHICAL STRUCTURE FACTOR	243
A.2.150	GEOGRAPHICAL UNIT	243
A.2.151	GEOGRAPHICAL UNIT PRICE	244

A.2.152	GROUP OF DISTRIBUTION CHANNELS	244
A.2.153	GROUP OF DISTANCE MATRIX ELEMENTS	244
A.2.154	GROUP MEMBER ROLE	245
A.2.155	GROUP OF SALES OFFER PACKAGES	245
A.2.156	GROUP TICKET	245
A.2.157	IDENTITY PROVIDER ROLE.....	246
A.2.158	INDIVIDUAL PASSENGER ROLE.....	247
A.2.159	INDIVIDUAL PURCHASER ROLE.....	247
A.2.160	INSUFFICIENT ACCESS RIGHTS ENTRY	248
A.2.161	INTERCHANGING	248
A.2.162	LIMITING RULE.....	249
A.2.163	LUGGAGE ALLOWANCE.....	249
A.2.164	MEDIA APPLICATION RESTORE ENTRY.....	250
A.2.165	MEDIA PRODUCT INSTALLATION ENTRY	250
A.2.166	MEDIA PROVIDER ROLE.....	251
A.2.167	MEDIA RECHARGE PURCHASE ENTRY	251
A.2.168	MEDIA RESTORE ENTRY	252
A.2.169	MEDIA PRODUCT ACTIVATION ENTRY.....	252
A.2.170	MEDIA PRODUCT DEACTIVATION ENTRY	252
A.2.171	MEDIUM ACCESS DEVICE.....	253
A.2.172	MEDIUM ACCESS DEVICE SECURITY LISTING	253
A.2.173	MEDIUM APPLICATION INSTANCE	254
A.2.174	MEDIUM APPLICATION OWNER ROLE	254
A.2.175	MEDIUM APPLICATION PROVIDER ROLE	254
A.2.176	METHOD OF BOOKING.....	255
A.2.177	MINIMUM STAY	255
A.2.178	MOBILE DEVICE.....	256
A.2.179	MONTH VALIDITY OFFSET	256
A.2.180	NETWORK VALIDITY PARAMETER	256
A.2.181	NO ACCESS RIGHTS ENTRY.....	257
A.2.182	NO CHECK OUT DETECTED ENTRY.....	257
A.2.183	NO CHECK IN DETECTED ENTRY	258
A.2.184	NO PROOF ON PERSON ENTRY.....	258
A.2.185	OFFENCE	259
A.2.186	OFFENCE DEBIT.....	259
A.2.187	OFFENDER ROLE.....	260
A.2.188	OFFERED TRAVEL SPECIFICATION.....	260
A.2.189	ORGANISATIONAL VALIDITY PARAMETER.....	260
A.2.190	OTHER CONTROL MEANS.....	261
A.2.191	OTHER DEBIT.....	261
A.2.192	PARKING CHARGE BAND.....	261
A.2.193	PARKING PRICE.....	262
A.2.194	PARKING TARIFF	262
A.2.195	PASSENGER ACTIVATE TRIP EVENT	263
A.2.196	PASSENGER CHECK IN ENTRY	263
A.2.197	PASSENGER CHECK IN EVENT	263
A.2.198	PASSENGER CHECK OUT ENTRY.....	264
A.2.199	PASSENGER CHECK OUT EVENT	264
A.2.200	PASSENGER TRAVEL CONTROL EVENT.....	265
A.2.201	PASSENGER TRAVEL ENTRY	265
A.2.202	PASSENGER USED SAME STOP ENTRY	265
A.2.203	PASSENGER WAY POINT ENTRY.....	266
A.2.204	PASSENGER WAY POINT EVENT	266

A.2.205	PAYMENT PROVIDER ROLE.....	267
A.2.206	PENALTY POLICY.....	267
A.2.207	PRE-ASSIGNED FARE PRODUCT	267
A.2.208	PRICE GROUP.....	268
A.2.209	PRICE UNIT.....	268
A.2.210	PRICEABLE OBJECT	269
A.2.211	PRICING PARAMETER SET	269
A.2.212	PRICING RULE.....	269
A.2.213	PRICING SERVICE	270
A.2.214	PURCHASE FULFILMENT ENTRY.....	270
A.2.215	PURCHASE WINDOW	271
A.2.216	PURCHASER ROLE.....	271
A.2.217	QUALITY STRUCTURE FACTOR.....	272
A.2.218	QUALITY STRUCTURE FACTOR PRICE.....	272
A.2.219	REBATING.....	273
A.2.220	REFUNDING	273
A.2.221	REPLACING.....	273
A.2.222	REQUESTED TRAVEL SPECIFICATION	274
A.2.223	RESELLING	274
A.2.224	RESELLING MOMENT	275
A.2.225	RESERVATION MOMENT.....	275
A.2.226	RESERVING.....	275
A.2.227	RESIDENTIAL ELIGIBILITY	276
A.2.228	RESIDENTIAL QUALIFICATION.....	277
A.2.229	RESTORE CUSTOMER ACCOUNT ENTRY	277
A.2.230	RESTORE CUSTOMER ACCOUNT EVENT.....	278
A.2.231	RETAIL CONSORTIUM.....	278
A.2.232	RETAIL DEVICE	278
A.2.233	RETAIL DEVICE SECURITY LISTING	279
A.2.234	REVENUE PROTECTION ENTRY.....	279
A.2.235	ROUND TRIP	280
A.2.236	ROUNDING.....	280
A.2.237	ROUNDING METHOD.....	280
A.2.238	ROUNDING STEP.....	281
A.2.239	ROUTING	281
A.2.240	ROUTING VALIDITY PARAMETER.....	282
A.2.241	SALE DISCOUNT RIGHT	282
A.2.242	SALES EVENT	283
A.2.243	SALES NOTICE ASSIGNMENT	283
A.2.244	SALES OFFER PACKAGE.....	283
A.2.245	SALES OFFER PACKAGE ELEMENT	284
A.2.246	SALES OFFER PACKAGE PRICE.....	284
A.2.247	SALES OFFER PACKAGE SUBSTITUTION	285
A.2.248	SALES TRANSACTION.....	285
A.2.249	SALES TRANSACTION FRAME	286
A.2.250	SCOPING VALIDITY PARAMETER	286
A.2.251	SECURITY LIST ALLOW ENTRY.....	287
A.2.252	SECURITY LIST DENY ENTRY	287
A.2.253	SERIES CONSTRAINT.....	287
A.2.254	SERIES CONSTRAINT PRICE.....	288
A.2.255	SERVICE ACCESS RIGHT	288
A.2.256	SERVICE VALIDITY PARAMETER.....	289
A.2.257	SMARTCARD	289

A.2.258	SPECIFIC PARAMETER ASSIGNMENT	289
A.2.259	SUPPLEMENT PRODUCT	290
A.2.260	SUSPICIOUS BEHAVIOUR ENTRY	290
A.2.261	START TIME AT STOP POINT	291
A.2.262	STEP LIMIT	291
A.2.263	TARIFF	292
A.2.264	TEMPORAL VALIDITY PARAMETER	292
A.2.265	THIRD PARTY PRODUCT	293
A.2.266	TIME INTERVAL	293
A.2.267	TIME INTERVAL PRICE	293
A.2.268	TIME STRUCTURE FACTOR	294
A.2.269	TIME UNIT	294
A.2.270	TIME UNIT PRICE	294
A.2.271	TRANSFERABILITY	295
A.2.272	TRANSPORT CUSTOMER	295
A.2.273	TRAVEL COMPENSATION ENTRY	296
A.2.274	TRAVEL DOCUMENT	296
A.2.275	TRAVEL DOCUMENT ANNULMENT ENTRY	297
A.2.276	TRAVEL DOCUMENT COLLECTION ENTRY	297
A.2.277	TRAVEL DOCUMENT CONFISCATION ENTRY	298
A.2.278	TRAVEL DOCUMENT SECURITY LISTING	298
A.2.279	TRAVEL SPECIFICATION	299
A.2.280	TRAVEL SPECIFICATION EVENT	299
A.2.281	TRIP DEBIT	299
A.2.282	TRIP PURCHASE ENTRY	300
A.2.283	TYPE OF ACCESS RIGHT ASSIGNMENT	300
A.2.284	TYPE OF ACCESS RIGHT RESTRICTION	300
A.2.285	TYPE OF BAGGAGE	301
A.2.286	TYPE OF BAGGAGE USE	301
A.2.287	TYPE OF DISTRIBUTION ASSIGNMENT	301
A.2.288	TYPE OF CONCESSION	302
A.2.289	TYPE OF CREDIT POLICY	302
A.2.290	TYPE OF CUSTOMER ACCOUNT	302
A.2.291	TYPE OF DISTRIBUTION CHANNEL	303
A.2.292	TYPE OF DISTRIBUTION RIGHT	303
A.2.293	TYPE OF ENTITLEMENT	304
A.2.294	TYPE OF FARE CONTRACT	304
A.2.295	TYPE OF FARE CONTRACT ENTRY	304
A.2.296	TYPE OF FARE PRODUCT	305
A.2.297	TYPE OF FREQUENCY OF USE	305
A.2.298	TYPE OF FULFILMENT METHOD	305
A.2.299	TYPE OF MACHINE READABILITY	306
A.2.300	TYPE OF MEDIA ACCESS DEVICE	306
A.2.301	TYPE OF MINIMUM STAY	307
A.2.302	TYPE OF OFFENCE	307
A.2.303	TYPE OF PENALTY POLICY	307
A.2.304	TYPE OF PRICING RULE	308
A.2.305	TYPE OF PROOF REQUIRED	308
A.2.306	TYPE OF RE-ENTRY POLICY	308
A.2.307	TYPE OF RESALE	309
A.2.308	TYPE OF RESERVATION FEE	309
A.2.309	TYPE OF RESERVATION NEEDED	309
A.2.310	TYPE OF RESERVATION RULE	310

A.2.311	TYPE OF RETAIL DEVICE	310
A.2.312	TYPE OF ROUTING	311
A.2.313	TYPE OF SALES OFFER PACKAGE.....	311
A.2.314	TYPE OF SERIES CONSTRAINT.....	311
A.2.315	TYPE OF STAY.....	312
A.2.316	TYPE OF TARIFF	312
A.2.317	TYPE OF TRAVEL DOCUMENT	312
A.2.318	TYPE OF USAGE PARAMETER	313
A.2.319	TYPE OF USAGE TRIGGER.....	313
A.2.320	TYPE OF USAGE VALIDITY PERIOD.....	314
A.2.321	UNMATCHED TRAVEL ENTRY.....	314
A.2.322	USAGE DISCOUNT RIGHT.....	315
A.2.323	USAGE PARAMETER.....	315
A.2.324	USAGE PARAMETER PRICE	315
A.2.325	USER PROFILE	316
A.2.326	USER PROFILE ELIGIBILITY.....	316
A.2.327	USAGE VALIDITY PERIOD.....	317
A.2.328	VALIDABLE ELEMENT.....	317
A.2.329	VALIDABLE ELEMENT PRICE.....	318
A.2.330	VALIDATED ACCESS.....	318
A.2.331	VALIDATION ENTRY.....	318
A.2.332	VALIDATION PARAMETER ASSIGNMENT	319
A.2.333	VALIDITY PARAMETER ASSIGNMENT	319
Annex B (normative) Additional Common Concepts — Extension to EN 12896-1:2016, <i>Public transport – Reference data model – Part 1: Common concepts</i>		321
B.1	Methodology and Conventions.....	321
B.1.1	Methodology for conceptual modelling	321
B.1.2	MODEL Class Diagrams	325
B.1.3	Summary of Rules for Transmodel Presentation	337
B.2	Extensions to the Common Concept MODEL.....	342
B.2.1	General.....	342
B.2.2	Additional Common Concepts	342
B.2.3	Extensions to the Generic Framework	345
B.2.4	Extensions to the Reusable Components.....	348
B.2.5	Data Dictionary	357
Annex C (informative) Data Model Evolution.....		378
C.1	Change Requests.....	378
C.2	Source of Text	399
C.3	Diagram Status	405
Bibliography.....		406

European foreword

This document (EN 12896-5:2019) 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 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 (this part) 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.

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 standard, 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 5: Fare Management* addresses Fare Information for Public Transport and incorporates the following data packages:

- Fare Structure;
- Access Right Assignment;
- Fare Pricing;
- Sales Description;
- Sales Transaction;
- Fare Roles;
- Validation and Control;
- Explicit Frames for Fares.

This document itself is composed of the following parts:

- Main document (normative) representing the data model for the concepts shared by the different fare domains covered by Transmodel,
- 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 the "Common Concepts" domain, particularly useful for parts 4 to 8 of the Public Transport Reference Data Model,
- Annex C (informative), indicating the data model evolutions from previous versions of Transmodel (EN 12896:2006).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 12896-1:2016, *Public transport – Reference data model – Part 1: Common concepts*

EN 12896-2:2016, *Public transport – Reference data model – Part 2: Public transport network*

EN 12896-3:2016, *Public transport – Reference data model – Part 3: Timing information and vehicle scheduling*

EN 12896-6, *Public transport – Reference data model – Part 6: Passenger information*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

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

3.1 General terms and definitions:

NOTE The following generic terms are used.

3.1.1

attribute

property of an entity

3.1.2

conceptual data model

description of a real-world domain in terms of entities, relationships and attributes in an implementation independent manner in order to provide a structure on which the rest of the development of an application system can be based

3.1.3

conceptual level

conceptual data model, in the context of data modelling,

3.1.4

database

collection of data

Note 1 to entry: Often used in the sense of the physical implementation of a data model.

3.1.5

data domain

data structure (in this European Standard, a part of the Reference Data Model for Public Transport) made up of data related to each other, through the fact that there is a functional area or group of functions using this data set as a whole