

BS EN 1545-2:2015



BSI Standards Publication

Identification card systems — Surface transport applications

Part 2: Transport and travel payment related
data elements and code lists

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National foreword

This British Standard is the UK implementation of EN 1545-2:2015. It supersedes BS EN 1545-2:2005 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee IST/17, Cards and personal identification.

A list of organizations represented on this committee can be obtained on request to its secretary.

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English Version

Identification card systems - Surface transport applications - Part 2: Transport and travel payment related data elements and code lists

Systèmes de cartes d'identification - Applications pour le transport terrestre - Partie 2: Éléments de données et listes de codes relatifs au transport et au paiement des voyages

Identifikationskartensysteme - Landgebundene Transportanwendungen - Teil 2: Datenelemente und Codelisten für Zahlungsvorgänge in Transport- und Reiseanwendungen

This European Standard was approved by CEN on 27 September 2014.

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.

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COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 1545-2:2015) has been prepared by Technical Committee CEN/TC 224 "Personal identification, electronic signature and cards and their related systems and operations", the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by October 2015 and conflicting national standards shall be withdrawn at the latest by October 2015.

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

This document supersedes EN 1545-2:2005.

This European Standard comprises the following parts, under the general title "*Identification card systems - Surface transport applications*":

General part:

Part 1: Elementary data types, general code lists and general data elements.

Sector specific part:

Part 2: Transport and travel payment related data elements and codes.

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

Introduction

ICs offer far greater opportunities for use in surface transport applications (STA) when compared to magnetic stripe and barcoded cards. The standardisation of data elements, which is the purpose of this European Standard, facilitates the use of ICs across multiple transport applications and operators, and in a variety of transport related terminals. This European Standard also permits application builders to minimise data duplication.

This European Standard contains definitions of data formats, data elements and specifies data elements with associated codelists related to transport and travel payment. It is for use in the creation of surface transport related data structures that may reside on a transport application. Abstract Syntax Notation One (ASN.1) has been used in the definition of data types in this European Standard.

This European Standard provides a comprehensive toolbox of data elements and types as the basis for the creation of data structures to be used in STAs. This European Standard alone does not ensure interoperability; this is left to the application builders. The definition of data structures to be used in STAs is left to applications.

This European Standard has a hierarchical approach:

1. basis for all definitions used in this European Standard is ASN.1 (ISO/IEC 8824);
2. EN 1545-1 standardises its general elements, data types and data elements with associated code lists in accordance with ASN.1;
3. The sectoral parts of this European Standard (EN 1545-2) define the sector specific elements and codes. Apart from the sector specific codes that are directly based on ASN.1 all definitions of sector specific data elements have to be based on EN 1545-1 definitions;
4. It is left to the applications to define the relevant data structures (data objects) strictly based on the definitions of EN 1545:

4. Any transport application

data structures (sets)

sector specific data elements from EN 1545-sectoral

sector specific codes from EN 1545-sectoral

general data elements from EN 1545-1

elementary data types from EN 1545-1

general data elements with code lists from EN 1545-1

3. EN 1545-sectoral

sector specific data elements

general data elements from EN 1545-1

elementary data types from EN 1545-1

sector specific code lists

codes expressed in ASN.1

2. EN 1545-1

general data elements

elementary data types from EN 1545-1

universal ASN.1 types from ISO/IEC 8824
general data elements with associated code lists
codes expressed in ASN.1
elementary data types
universal ASN.1 types from ISO 8824

1. ISO/IEC 8824

universal ASN.1 data types

This European Standard refers to existing ASN.1 encoding rules (transfer syntaxes), such as the basic and packed encoding rules, for use within surface transport applications. However this European Standard does not exclude the use of other encoding rules. The abstract syntax notation (ASN.1) has been used in the definition of data types (i.e. ASN.1 types) in this European Standard.

The ASN.1 basic encoding rules (BER) includes significant redundancy in order to make transferred data fully self-defining, which may result in data structures too large to be used in applications on ICs with restricted data storage capacity. Therefore this European Standard allows the use of alternative encoding rules such as the ones based upon the ASN.1 packed encoding rules (PER) (see Clause 9).

This European Standard does not pretend to identify and specify every possible ASN.1 type that may be used in future applications by application builders. In addition, local systems may be defined in their own way.

This European Standard will be updated and added to over time as new surface transport applications are created in the normal CEN practice.

1 Scope

This European Standard specifies data formats, data elements and data elements with associated code lists for use within Surface Transport Applications on ICs. This European Standard defines those data elements and code lists related to transport and travel payment and the specific data elements needed for low memory capacity ICs.

The mechanism for how to establish the application context, including the decision of which encoding rules to use, is outside the scope of this European Standard.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1545-1:2005, *Identification card systems - Surface transport applications - Part 1: Elementary data types, general code lists and general data elements*

ISO 4217, *Codes for the representation of currencies*

3 Terms and definitions

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

3.1

account

a precise list or enumeration of financial transactions held in a central location, used for payment for services. When payment is made through the use of a card, the card identifies the centrally held account

[SOURCE: EN 1545-1:2005]

3.2

contract

specific relationship between a transport service provider and a customer. The contract defines the conditions under which the customer may use the services which are predefined by the service provider. The contract may also indicate how the customer is charged. In public transport, a ticket represents a contract

3.3

coupon

ticket in a group of tickets sold as a group, where each ticket has the same nominal value valid for one journey e.g. a carnet or multi-journey ticket

3.4

currency

unit in which a value is expressed. This may be conventional legal currency or proprietary tokens

3.5

customer

individual or organisation which receives a service in a commercial relationship with a service provider

3.6

event

circumstance which causes data to be written to a machine readable card. This may be an external event or a card event. The card may already be available at the Interface device, or it may be presented, which action may itself create an event

3.7

first event

first of a set of related events which are deemed to constitute a single journey

3.8

holder

person or organisation that is recognised as being the authorised user of the application

3.9

interchange

transfer of a passenger from one vehicle to another between two journey segments

3.10

interface device

device used to interface with the Integrated Circuit Card

3.11

journey

complete sequence of one or more journey legs required to achieve a specific purpose at a specific destination. This sequence may include the use of more than one vehicle and using more than one transport mode

3.12

journey segment

part of a journey in which the customer uses one vehicle only. Some journeys consist of just one segment

3.13

machine readable card

ID-1 standard card containing information that may be read or written to by a machine or a card reading device

3.14

network

all coordinated lines of road based, rail based, water based transport within a defined geographical area and/or under a specified authority where a card is uniquely used

3.15

operator

organisation responsible for the operation of a surface transport service

3.16

point

when used as a location reference, the smallest addressable location in space (where smallest will depend on the context in which the reference is used)

3.17

purse

electronic purse

generic name for all types of card based payment means where value is expressed electronically on the

card. Applications may range from an inter-sector electronic purse to a prepaid value card for one application within one company. In this latter case, the term On-board Account is sometimes used

3.18

route

ordered sequence of points passed through by a transport service

3.19

service

facilities provided and/or actions performed by an operator/service provider

3.20

transport mode

means of transport characterised by the technology of the vehicle and infrastructure employed

3.21

zone

area in which all points are considered identical from the point of view of fare collection

4 Abbreviations

For the purposes of this document, the following abbreviations apply:

AID	Application Identifier [ISO/IEC 7816-5:2004]
ASN.1	Abstract Syntax Notation One, [ISO/IEC 8824-1:2002]
BCD	Binary Coded Decimal
BER	Basic Encoding Rules, [ISO/IEC 8825-1:2002]
BIBO	Be-in, Be-out
CAD	Card accepting device
CICO	Check-in, Check-out
CIBO	Check-in, Be-out
EAN	European Article Numbering
IC	Integrated Circuit
IEP	Inter Sector Electronic Purse according to the EC e-Money Directive 2000/46
MII	Major Industry Identifier, [EN ISO/IEC 7812-1:2000]
PER	Packed Encoding Rules
RFU	Reserved for Future Use
STA	Surface Transport Application
STR	Stored Travel Rights
VAT	Value Added Tax
WIWO	Walk-in, Walk-out

5 Approach for definitions of data types

See EN 1545-1:2005, Clause 5.

6 Transport and Travel Payment related Data Elements with Associated Code lists

6.1 AccommodationClassCode

Code representing an accommodation class.

AccommodationClassCode ::= ENUMERATED {

unknown	(0),
first	(1),
second-standard-traveller	(2),
small	(3),
large	(4),
business	(5),
economy	(6),
club	(7),
enhanced-standard	(8),
premium	(9),
rfuCEN1	(10),
rfuCEN2	(11),
rfuCEN3	(12),
networkIdSpecific1	(13),
networkIdSpecific2	(14),
networkIdSpecific3	(15)

}

6.2 AssistanceTypeCode

Code defining the service provided by service provider staff.

AssistanceTypeCode ::= ENUMERATED {

unspecified	(0),
assist-wheelchair-user	(1),
assist-visually-impaired-person	(2),
assist-hearing-impaired-person	(3),
assist-mobility-impaired-person	(4), -- without wheelchair
assist-persons-accompanied-by-infants	(5),
assist-unaccompanied-minor	(6),
assist-mentally-handicapped-person	(7),
rfuCEN1	(8),
rfuCEN2	(9),

rfuCEN3	(10),
rfuCEN4	(11),
networkIdSpecific1	(12),
networkIdSpecific2	(13),
networkIdSpecific3	(14),
networkIdSpecific4	(15)

}

6.3 DiscountCode

A code specifying the validity criteria and percentage discount to which the holder is entitled. On the basis of the defined element the fare reduction is calculated in the CAD or background system.

DiscountCode ::= INTM

--no-reduction	(0),
--Percentage-discount-level-1	(1),
--Percentage-discount-level-2	(2),
--Percentage-discount-level-3	(3),
--Percentage-discount-level-4	(4),
--Percentage-discount-level-5	(5),
--reduction-on-basis-of-a-kilometre-calculation	(6),
--reduction-dependant-on-the-used-mode-of-transport	(7),
--reduction-dependant-on-the-vehicle-class	(8),
--for-short-distance-bus-and-train-travel-up-to-50 km	(9),
--for-long-distance-train-travel	(10),
--for-long-distance-bus-travel	(11),
--rfuCEN	(12...45
--networkIdSpecific	(46...63

6.4 ExtraServiceCode

Code identifying the extra service offered in a contract.

ExtraServiceCode ::= INTM

--none	(0),
--breakfast	(1),
--lunch	(2),
--dinner	(3),
--cold-buffet	(4),
--snack	(5),
--hot-drink	(6),
--child-extras	(7),
--infant-facilities	(8),

--hot-buffet	(9),
--meal	(10),
--rfuCEN	(11..31),
--networkIdSpecific	(32..63)

6.5 FareBasisCode

Code indicating the basis on which the price of a fare is calculated.

FareBasisCode ::= INTP

--undefined	(0),
--fare-code	(1),
--distance	(2),
--zones	(3),
--stops	(4),
--rides	(5),
--station-count	(6),
--rfuCEN	(7...15),
--networkIdSpecific	(16...31)

6.6 JourneyTypeCode

A code indicating the type of journey defined in a travel contract.

```
JourneyTypeCode ::= ENUMERATED {  
  
    unspecified           (0),  
    single                (1),  
    return                (2),  
    circular              (3),  
    rfuCEN1               (4),  
    rfuCEN2               (5),  
    networkIdSpecific1   (6),  
    networkIdSpecific2   (7)  
  
}
```

6.7 LoyaltyTypeCode

Indicates whether loyalty is held locally (on card) or on central account.

```
LoyaltyTypeCode ::= ENUMERATED {  
  
    undefined           (0),  
    oncard              (1),  
    centralAccount      (2)  
  
}
```

6.8 MultiProductTypeCode

Indicates the type of a multiple contract.

```
MultiProductTypeCode ::= ENUMERATED{  
  
    stored-single-journey-legs           (0),  
    stored-multi-leg-journeys,           (1),  
    rfuCEN1                              (2),  
    rfuCEN2                              (3),  
    rfuCEN3                              (4),  
    rfuCEN4                              (5),  
    networkSpecific1                     (6),  
    networkSpecific2                     (7)  
  
}
```

6.9 PaymentMeansCode

The means by which the payment is affected.

```
PaymentMeansCode ::= BIT STRING (SIZE(5))
```

mmmm Payment means (5 bits) :

'00000'	Unspecified
'00001'	Cash
'00010'	Cheque
'00011'	Credit-Debit-card
'00100'	IEP
'00101'	CTA
'00110'	Direct-Debit-offline
'00111'	Invoicing
'01000'	Stored-Travel-Rights
'01001'	Loyalty-redemption
'01010'	Token
'01011'	Membership-benefit
'01100'	Auto-Renew
'01101'	Warrant
'01110'	Voucher
'01111'	Traveller-cheque
'10000'	Cheque-Vacances
'10001'	Direct-Debit-Online
'10011' - '10111'	rfuCEN
'11000' - '11111'	networkIDSpecific

6.10 PaymentModeCode

The payment mode identifies the timing of actual money transfer (e.g. ahead of or after the event).

PaymentModeCode ::= BIT STRING (SIZE(2))

pp Payment mode (2 bits) :

'00'B : unspecified,

'01'B : prepayment, (payment is affected in advance of travel)

'10'B : postpayment, (payment is affected after travel, possibly in back office)

'11'B : trippayment (payment is affected at the end of a trip, i.e. at check out)

6.11 PaymentScopeCode

The payment scope refers to the application extent of the payment method.

PaymentScopeCode ::= BIT STRING (SIZE(4))

ssss Payment Scope (4 bits) :

'0000'B : Not further specified,

'0001'B : Inter-Sector (Multi-purpose) International,

'0010'B : Inter-Sector (Multi-purpose) National,
'0011'B : Financial (banking) International specific,
'0100'B : Financial (banking) National specific,
'0101'B : Company (provider) specific,
'0110'B : Inter-Company specific,
'0111'B : Transport National specific,
'1000'B : Transport International specific,
'1100'B : Locally (regionally) specific,
'1111'B : Proprietary, unspecified.

6.12 PaymentUnit

The unique designation of a currency shall be as defined in ISO 4217 using the ISO numeric representation. The code can also express a company specific token or a 'charging unit code' as used in freight.

PaymentUnit ::= OCTET STRING (SIZE(2))

Value Assignment :

'0xxx'H Currency in main units,
'1xxx'H Currency in minor units of 10
'2xxx'H Currency in minor units of 100 ('cents'),
'3xxx'H Currency in minor units of 1000,
'4xxx'H Currency in 'major' units / 10,
'5xxx'H Currency in 'major' units / 100,
'6xxx'H Currency in 'major' units / 1000,
'7xxx'H Currency in 'major' units / 10000,
'8xxx'H Currency in 'major' units / 100000

xxx BCD representation of Currency as defined in ISO 4217.

(928 for EURO)

'9xxx'H Tokens :

xxx Purse Provider specific coding.

'Axxx'H Charging Unit Codes denoting quantification of the service provided

(e.g. man-hours)

'Bxxx'H Fare code

6.13 SeatPositionCode

To identify the position of the passenger seat with respect to the direction of travel.

```
SeatPositionCode ::= ENUMERATED {
    unspecified                (0),
    facing-direction-of-travel (1),
    back-to-direction-of-travel (2),
    airline                    (3), --(fixed position)
    facing-right               (4), --relative to direction of travel
    facing-left                (5), --relative to direction of travel
    rfuCEN                     (6),
    networkIdSpecific          (7)
}
```

6.14 STRLoadCode

Indicates how the STR is loaded.

```
STRLoadCode ::= ENUMERATED {
    unspecified                (0),
    threshold-autoload        (1),
    internal-autoload         (2), --load from another value source
    loaded-by-user            (3),
    pre-selected-autoload     (4),
    periodic-autoload         (5),
    rfuCEN2                   (6),
    rfuCEN3                   (7)
}
```

6.15 UrbanAddOnCode

Indicates if a contract can be used for an urban journey in addition to the principle journey.

```
UrbanAddOnCode ::= ENUMERATED {
    unspecified                (0),
    urban-at-origin           (1),
    urban-at-destination      (2),
    urban-at-both             (3),
    interchange                (4),
    rfuCEN1                   (5),
    rfuCEN2                   (6),
    rfuCEN3                   (7)
}
```

}

6.16 ValidationModelCode

Defines the validation model i.e. CICO, CI-Destination, BIBO.

ValidationModelCode ::= ENUMERATED {

unspecified	(0),
manual-preselection-immediately-validated	(1)
manual-preselection-validation-required	(2)
cico	(3)
bibo	(4)
cibo	(5)
wiwo	(6)
rfuCEN1	(7)

}

7 Transport and Travel Payment related data elements

7.1 AccompaniedBy

Defines the accompanying persons, objects or animals under the contract.

AccompaniedBy ::= SEQUENCE {

accompaniedByType	ProfileCodeNetwork,
accompaniedByNumber	NumberOfCompanions

}

7.2 AccountNumber

The reference for a central account.

AccountNumber ::= IA1

7.3 AmountPaid

The amount of a transaction.

AmountPaid ::= Amount

7.4 AppDepositRefundableFlag

It indicates whether a deposit taken when the application was loaded is refundable without reference to the product owner.

AppDepositRefundableFlag ::= Flag

0 = non refundable without referral, 1 = refundable

7.5 AutoloadEndDate

The last date upon which an autoload facility may be used.

AutoloadEndDate ::= DateStamp

7.6 AutoloadStartDate

The first date upon which an autoload facility may be used.

AutoloadStartDate ::= DateStamp

7.7 AutoRenewFlag

A flag indicating whether auto-renew is enabled.

AutoRenewFlag ::= Flag

0 = not enabled, 1 = enabled

7.8 Balance

Amount remaining e.g. in a purse or a stored travel rights accumulator.

Balance ::= SignedAmount

7.9 CompanionAllowedFlag

A flag indicating that, under the contract, a companion is allowed to travel at the same fare as the person entitled to travel. No other evidence is required for the companion.

CompanionAllowedFlag ::= Flag

0 = not allowed,

1 = allowed

7.10 CountOfCharges

The cumulative count of CTA charge transactions.

CountOfCharges ::= Counter

7.11 CountOfCoupons

The running total of coupons remaining after the event (which is either additive or subtractive).

CountOfCoupons ::= Counter

7.12 CountOfJourneyLegs

The accumulative number of individual rides making up the overall journey for the specific journey purpose.

CountOfJourneyLegs ::= Counter

7.13 CountOfJourneys

The accumulative number of journeys until reset.

CountOfJourneys ::= Counter

7.14 CountOfJourneysPerPeriod

The accumulative number of journeys until reset. Period is defined according to NetworkID.

CountOfJourneysPerPeriod ::= Counter

7.15 CouponsAutoload

The number of coupons to be loaded during an autoload event.

CouponsAutoload ::= Quantity

7.16 CouponsDeducted

Number of coupons deducted at this event.

CouponsDeducted ::= Quantity

7.17 CouponsLoaded

Number of coupons loaded into the application.

CouponsLoaded ::= Quantity

7.18 CumulativeFare

Sum of the fare values for a number of transactions.

CumulativeFare ::= Amount

7.19 DebitingAmount

Amount for a debit.

DebitingAmount ::= Amount

7.20 DecrementCountOfJourneys

A journey counter, which is loaded with the number of journeys purchased upon ticket creation, and is decremented each time a journey is made.

DecrementCountOfJourneys ::= Counter

7.21 Deposit

Amount of a deposit.

Deposit ::= Amount

7.22 DepositRefundableFlag

A flag indicating whether a deposit may be refunded.

DepositRefundableFlag ::= Flag

0 = not refundable, 1 = refundable

7.23 Destination

Destination is the designated end point of the journey under the contract. The point in this context may be a zone, a bus-stop, a station, etc.

Destination ::= LocationIdentifier

Value Assignment: NetworkId specific value.

7.24 DiscountLevel

Level for the actual calculation of the discount in the fare algorithm. The data refers to a table held in the CAD.

DiscountLevel ::= INTEGER(0..7)

Value Assignment: NetworkId specific value.

7.25 DossierId

Reference to a 'Travel Dossier' held by the travel product retailer. The Dossier is the electronic record of one or more travel related contracts (e.g. flight, train journey, hotel) and is used for post-sale transactions.

DossierId ::= ReferenceIdentifier

Value Assignment: NetworkId specific value.

7.26 DownPayment

The value deducted from a stored value or purse at check in (in a CICO environment) to ensure any payment in case of forgotten check out.

DownPayment ::= Amount

7.27 DynamicDiscount

Dynamically calculated parameter that determines the final calculation of the discount with reference to a specific product, e.g. number of kilometres, number of rides, number of zones, number of stops etc. and/or combined with other data e.g. period, date etc. The parameter is updated on each transaction.

DynamicDiscount ::= OCTET STRING(SIZE(4))

7.28 ExpiryDateOffset

The date upon which a ticket or entitlement expires, expressed as an offset from a contract expiry date defined elsewhere.

ExpiryDateOffset ::= INT1

7.29 FareDeducted

The amount of fare deducted.

FareDeducted ::= Amount

7.30 FareNotChargedFlag

A flag indicating that an operator has issued a ticket without collecting all or part of the fare, at his own risk.

FareNotChargedFlag ::= Flag

0 = charged normally, 1 = not charged

7.31 InterchangesAllowed

The number of interchanges permitted between the first boarding point and the last alighting point of a single journey.

InterchangesAllowed ::= Quantity

7.32 JourneyDistance

The length of a journey.

JourneyDistance ::= Length

Value Assignment: NetworkId specific value and unit.

7.33 JourneyRunId

JourneyRun identifies the specific service which the customer is permitted to use by the product, e.g., a train number or trip number.

JourneyRunId ::= ReferenceIdentifier

Value Assignment: NetworkId specific value.

7.34 LineId

Identifier for a public transport line.

LineId ::= ReferenceIdentifier

7.35 LoadAmount

Amount for loading to stored value or to a credit account. May be used for AutoloadAmount and AutotopupAmount.

LoadAmount ::= Amount

7.36 LoyaltyMembershipId

Identifies the holder within a loyalty scheme.

LoyaltyMembershipId ::= ReferencelIdentifier

Value Assignment: NetworkId specific value.

7.37 LoyaltyPoints

Accumulator for loyalty points.

LoyaltyPoints ::= Counter

7.38 LoyaltySchemeld

An identifier for a loyalty scheme.

LoyaltySchemeld ::= ReferencelIdentifier

7.39 ManualPricingFlag

Indicates that the sale price has been determined manually, rather than being calculated by the ticketing system.

ManualPricingFlag ::= Flag

7.40 MaxAmountLimit

The maximum value of an account.

MaxAmountLimit ::= Amount

7.41 MaxNumberOfCharges

The maximum number of charges to an account which may be made in a charge period.
MaxNumberOfCharges ::= Quantity

7.42 MaxTripsPerDayOfWeek

Give the maximum number of journeys allowed each day of the week.

MaxTripsPerDayOfWeek ::= TripsPerDayOfWeek

7.43 MaxValidJourneys

Maximum number of journeys permitted under the contract. When the maximum number of journeys has been completed, the contract may no longer be used.

MaxValidJourneys ::= Quantity

7.44 MinAmountLimit

The absolute minimum value of an account. Below this no action will be possible.

MinAmountLimit ::= SignedAmount

7.45 NotVia

NotVia is a point through which the journey shall not pass. In public transport this could be an interchange point.

NotVia ::= LocationIdentifier

Value Assignment: NetworkId specific value.

7.46 NumberOfAdults

The number of adults.

NumberOfAdults ::= Quantity

7.47 NumberOfChildren

The number of children.

NumberOfChildren ::= Quantity

7.48 NumberOfCompanions

The number of accompanying persons, animals, objects.

NumberOfCompanions ::= Quantity

7.49 NumberOfConcessionaryAdults

The number of concessionary adults in a party.

NumberOfConcessionaryAdults ::= Quantity

7.50 NumberOfConcessionaryChildren

The number of concessionary children in a party.

NumberOfConcessionaryChildren ::= Quantity

7.51 NumberOfConcessionaryPassengers

The number of concessionary passengers in a party. NumberOfConcessionaryPassengers ::= Quantity

7.52 NumberOfPassbacks

The number of passbacks allowed until the anti-passback rule applies.

NumberOfPassbacks ::= Quantity

7.53 Origin

Origin is the designated starting point of the journey under the contract. The point in this context may be a zone, a bus-stop, a station, a toll plaza, etc.

Origin ::= LocationIdentifier

Value Assignment: NetworkId specific value.

7.54 OverbookingIndicator

A flag indicating whether the accommodation has been overbooked.

OverbookingIndicator ::= Flag

7.55 PartFareAmount

The discount or discounted amount as indicated by DiscountLevel.

PartFareAmount ::= Amount

7.56 PassbackTime

Number of minutes for which anti-passback applies following a card transaction.

PassbackTime ::= Quantity

7.57 PassengerTotal

The number of passengers.

PassengerTotal ::= Quantity

7.58 PaymentMeansId

Identification of the means of payment used, e.g. credit card number, warrant number, entitlement-Id, purse-Id, cash etc. Used for controlling refunds.

PaymentMeansId ::= ReferenceIdentifier

7.59 PaymentMeansPriorityFlag

When set to one (1) the contract containing this flag shall be used in preference to any other payment means contained within the card. This flag may not be set to one if any other contract has a similar flag set to one.

PaymentMeansPriorityFlag ::= Flag

7.60 PaymentProvider

PaymentProvider is the identity of provider of the payment instrument which is being offered for payment.

PaymentProvider ::= NetworkSpecificCompanyId

7.61 PayMethod

General construct describing a method of payment, i.e. the combination of transaction mode code, payment means code, payment mode code and payment scope code.

Paymethod ::= BIT STRING (SIZE(13))

Value Assignment : Binary 'tppmmmmssss'B

Where

tt is TransactionModeCode

pp is PaymentModeCode

mmmm is PaymentMeansCode

ssss is PaymentScopeCode

7.62 PeriodJourneys

PeriodJourneys is the number of journeys allowed per period. The period will be specific to each particular product. It will usually be a day, however the flexibility exists for other time periods, such as week or month, to be used.

PeriodJourneys ::= Quantity

7.63 Price

Data element which indicates a nominal monetary value.

```
Price ::= SEQUENCE {  
    priceAmount          Amount,  
    priceVATAmount       Amount,  
    pricePaymentUnit    PaymentUnit  
}
```

priceAmount is the value of the price, the unit of which is specified in pricePaymentUnit. The priceAmount is assumed to always include VAT.

PriceVATAmount is the value of the tax

pricePaymentUnit is the unit in which the price and the tax is expressed.

7.64 PriceModificationLevel

This element indicates a max. or min. level of the price for a journey. The number corresponds to the level in a specific amount of money in the front-office system.

PriceModificationLevel ::= ReferenceNumber

7.65 PricingLevel

Static fixed parameter that refers to a table held within the CAD to determine the corresponding pricing rule. PricingLevel ::= INT1

7.66 ProductId

Identifier of a product.

ProductId ::= ReferenceIdentifier

Value Assignment: NetworkId specific value.

7.67 ProductLoadDateStamp

Date of loading or renewing the contract.

ProductLoadDateStamp ::= DateStamp

7.68 ReceiptPrintedFlag

Flag indicating that a paper receipt has been issued for the contract sale. This element shall prevent the holder from printing one receipt more than once and reclaim VAT more than once.

ReceiptPrintedFlag ::= Flag

0 = not been issued, 1 = issued

7.69 ReceiptToPrintFlag

A flag indicating whether a receipt shall be printed, when appropriate, if the POST is capable of this.
ReceiptToPrintFlag ::= Flag

0 = no print, 1 = print

7.70 ReservationReferenceld

The identification of a reference for a reservation.

ReservationReferenceld ::= Referenceldentifier

Value Assignment: NetworkId specific value.

7.71 Routeld

Route is the reference to the allowed route, (including route variants,) to be used under the contract. As an example, this may be a public transport route or a motorway link.

Routeld ::= Referenceldentifier

Value Assignment: NetworkId specific value.

7.72 RouteVariantId

RouteVariant is a qualifier defining the specific route variant allowed under the contract. The route of which this is a variant referenced by the route.

RouteVariantId ::= Referenceldentifier

Value Assignment: NetworkId specific value.

7.73 SeatAlphald

The alphanumeric reference of a seat.

SeatAlphald ::= Referenceldentifier

Value Assignment: NetworkId specific value.

7.74 SeatNumber

The numeric reference of a seat.

SeatNumber ::= ReferenceNumber

7.75 ServiceOperatorUsageIndicator

Indicates that a ticket has been used on a specific service operator service, as part of a journey made on the services of several service operators. Bit 0 is set when used on the first service operator service, bit 1 on the second service operators service, and so on.

ServiceOperatorUsageIndicator ::= BIT STRING (SIZE(4))

7.76 SmokingFlag

A flag indicating that smoking is permitted in the allocated accommodation where 1 indicates smoking.

SmokingFlag ::= Flag

0 = smoking prohibited, 1= smoking permitted

7.77 STRIdentifier

Identifies a specific instance of an STR contract. The value is STR network specific and shall be unique within that context.

STRIdentifier ::= ReferenceIdentifier

Value Assignment: NetworkId specific value.

7.78 STRProvider

Company that is responsible for the management of travel rights stored in the application.

STRProvider ::= NetworkSpecificCompanyId

7.79 STRTransactionAmount

The value of a STR transaction. If the transaction increases the value of STR, then a positive value shall be stored. If the transaction decreases the value of STR, then a negative value shall be stored.

STRTransactionAmount ::= SignedAmount

7.80 TariffNumber

Identifier for a tariff, coding fare, which applies for a public transport trip. Indicates the reference to a certain fare. Where a pre-purchased ticket continues to be valid for a certain distance after a fares increase this identifier points to an information in the CAD before the increase happened. The value is network specific and shall be unique within that context.

TariffNumber ::= ReferenceNumber

Value Assignment: NetworkId specific value.

7.81 ThresholdAmount

The value of a threshold amount related to an account serving as a trigger for an action, e.g. at which autoreload of the account takes place.

ThresholdAmount ::= SignedAmount

7.82 TicketToPrintFlag

A flag indicating whether a ticket shall be printed, when appropriate, if the POST is capable of this.

TicketToPrintFlag ::= Flag

0 = no print, 1 = print

7.83 TicketTransferFlag

A flag indicating whether a ticket may be transferred to a person other than the person to whom it was sold. TicketTransferFlag ::= Flag

0 = not transferable, 1 = transferable

7.84 TimeAllowed

For a ticket valid for more than one Journey Leg provided a leg starts within a given time of the first leg starting. This element defines the maximum time allowed between commencement of a journey leg, and the commencement of the subsequent journey leg, as a count of 30 s intervals (unit = 30 sec). The duration of the preceding Journey Leg(s) is included. The countdown is triggered by the time of validation. Journey legs commenced after this time has been exceeded shall be classed as a new journey.

TimeAllowed ::= Quantity

Example: 2min30 = 5

7.85 TrainNumber

The numeric reference of a train.

TrainNumber ::= ReferenceNumber

Value Assignment: NetworkId specific value.

7.86 TransferTimeLimitFS

For a ticket valid for more than one Journey Leg, this element defines the maximum allowable duration of an interruption to a journey, or the maximum allowable duration of a transfer measured between the finish of a first journey leg and the commencement of the next journey leg, counted in minutes (unit = 1 minute).

TransferTimeLimitFS ::= Quantity

7.87 TransferTimeLimitSS

For a ticket valid for more than one Journey Leg provided a leg starts within a given time of the first leg starting. This element defines the transfer time allowed between the commencement of a journey leg, and the commencement of a subsequent journey leg, counted in minutes (unit = 1 minute). The countdown is triggered by the time of validation. The duration of the preceding Journey Leg(s) is included. Journey legs commenced after this time has been exceeded shall be classed as a new journey.

TransferTimeLimitSS ::= Quantity

7.88 TravelServiceId

The identification of a travel service.

TravelServiceId ::= ReferenceIdentifier

Value Assignment: NetworkId specific value.

7.89 TripsPerDayOfWeek

Records a number of journeys against each day of the week. This may be used in two ways: to record actual journeys made each specific day, or to specify the maximum journeys permitted each specific day.

TripsPerDayOfWeek ::= SET SIZE(8) OF INTS first INTS for Monday

second INTS for Tuesday

...

seventh INTS for Sunday

eighth INTS for special days, network specific (such as public holidays).

Assumes max. 15 trips per day. The total size of the element is four bytes.

7.90 VATAmount

The amount of VAT.

VATAmount ::= Amount

7.91 VATPercentage

The percentage of the VAT is expressed in value of 0,01.

VATPercentage ::= Percentage-2

7.92 Via

Via is a point through which the journey shall pass. In public transport this could be an interchange point.

Via ::= LocationIdentifier

Value Assignment: NetworkId specific value.

7.93 Zone

An identifier of a geographical area.

Zone ::= LocationId

Value Assignment: NetworkId specific value.

7.94 ZoneCount

The number of zones from a specified home zone for which product is valid, in a 'star' based zonal systems. If ZoneCount contains zero then the product is only valid in the home zone. Home zone may be specified using ZoneID, ZoneMap or implicitly.

ZoneCount ::= Quantity

7.95 ZoneMap

A bit mapped element. Each bit relates to a zone, where each zone may be further defined in a table held within the CAD. Bit 1 relates to the first zone, bit 2 to the second zone, and so on, where bit 1 is defined as the least significant bit of the least significant byte, and bit 24 is defined as the most significant bit of the most significant byte. When a bit is set to one (1), it indicates that travel within the related zone is permitted, when a bit is set to zero (0), travel is not permitted.

ZoneMap ::= INT3

8 Data elements for low memory capacity ICs

8.1 General

Data elements intended for use in ICs where memory capacity is limited and where the size of data elements is critical.

8.2 ChildFlag

A flag indicating whether the contract applies to an adult or a child.

ChildFlag ::= Flag

0 = adult, 1 = child

8.3 ClassFlag

A flag indicating the class of accommodation.

ClassFlag ::= Flag

0 = standard class, 1 = first class

8.4 CurrencyFlag

A flag indicating EURO or the home currency.

CurrencyFlag ::= Flag

0 = home currency, 1 = EURO

8.5 ExpiryTimeIndicatorCode

It indicates whether expiry time is 23:59 or some other time.

```
ExpiryTimeIndicatorCode ::= ENUMERATED {  
    expires-at-23-59    (0),  
    expires-at-contract-provider-defined-time    (1)  
}
```

8.6 LocationTypeFlag

A flag indicating whether data in a following location identifier element defines an origin or a destination. Only used when there is no explicitly defined data element representing origin or destination.

LocationTypeFlag ::= Flag

0 = location identifier defines an origin, 1 = location identifier defines a destination

8.7 OffPeakOnlyFlag

Indicates whether a ticket is invalid at peak times.

OffPeakOnlyFlag ::= Flag

0 = valid at all times, 1 = valid off-peak only

8.8 ValidityItem

A bitmap used for product specific purposes and comprises one time programmable memory. Each bit represents one validity item, where the validity item type is determined by the product owner and may be, e.g. a journey. A bit is changed from its initial state to its programmed state to indicate that the validity item has been used.

ValidityItem ::= BitMap

8.9 WeekdayValidityFlag

A flag indicating whether a contract is valid on all days or on weekdays only.

WeekdayValidityFlag ::= Flag

0 = valid on all days, 1 = valid on weekdays only

9 Encoding rules

Shall be according to EN 1545-1:2005, Clause 9.

10 Backwards compatibility

Backwards compatibility has been maintained with version 1.0 defined in ENV 1545-1:1998 and ENV 1545- 2:1998, wherever possible. Implementers of ENV 1545-1:1998 and ENV 1545-2:1998 are advised to review their implementation for compatibility with this European Standard.

11 Transport general module definition

The value ranges and value sizes defined shall be used in the TransportPayment module when this module is subject for implementation.

The following object identifier and object descriptor values are assigned to identify and describe the ASN.1 module TransportPayment :

EN 1545-2 OBJECT IDENTIFIER ::= {

iso(1) identifiedorg(3) cen.std(0162) 0001 1 EN 1545 02(01545)}

TransportPayment2 OBJECT IDENTIFIER ::= { EN 1545-2 abstractsyntax(1) transportPayment2
(2) }

and

“EN 1545 ASN.1 Module for Transport Payment V2”

-- Pretty-printed by Ansp, the pretty-printer of France Telecom R&D

```
TransportPayment2 DEFINITIONS AUTOMATIC TAGS ::=
BEGIN
EXPORTS ALL;
IMPORTS
SignedAmount, Amount, ReferenceIdentifier, Length, INT1, INT2, INT3,
INT4, INTS, INTM, INTP, ProfileCodeNetwork, IAI, ReferenceNumber, Flag,
DateStamp, Counter, LocationIdentifier, Quantity,
NetworkSpecificCompanyId, UserActionCode, Percentage-2, LocationId,
BitMap
FROM TransportGeneral2;
AccommodationClassCode ::= ENUMERATED {
unknown(0), first(1), second-standard-traveller(2), small(3), large(4),
business(5), economy(6), club(7), enhanced-standard(8), premium(9),
rfuCEN1(10), rfuCEN2(11), rfuCEN3(12), networkIdSpecific1(13),
networkIdSpecific2(14), networkIdSpecific3(15)}
AssistanceTypeCode ::= ENUMERATED {
unspecified(0), assist-wheelchair-user(1), assist-visually-impaired-
person(2), assist-hearing-impaired-person(3), assist-mobility-impaired-
person(4), -- without wheelchair assist-persons-accompanied-by-
infants(5), assist-unaccompanied-minor(6), assist-mentally-handicapped-
person(7), rfuCEN1(8), rfuCEN2(9), rfuCEN3(10), rfuCEN4(11),
networkIdSpecific1(12), networkIdSpecific2(13), networkIdSpecific3(14),
networkIdSpecific4(15)}
DiscountCode ::= INTM
--no-reduction      (0),
--Percentage-discount-level-1 (1),
--Percentage-discount-level-2 (2),
--Percentage-discount-level-3 (3),
--Percentage-discount-level-4 (4),
--Percentage-discount-level-5 (5),
--reduction-on-basis-of-a-kilometre-calculation (6),
--reduction-dependant-on-the-used-mode-of-transport (7),
--reduction-dependant-on-the-vehicle-class (8),
--for-short-distance-bus-and-train-travel-up-to-50 km (9),
--for-long-distance-train-travel (10),
--for-long-distance-bus-travel (11),
--rfuCEN (12...45),
--networkIdSpecific (46...63)
ExtraServiceCode ::= INTM
--none (0),
--breakfast (1,
```

```
--lunch      (2),
--dinner     (3),
--cold-buffet (4),
--snack      (5),
--hot-drink  (6),
--child-extras (7),
--infant-facilities (8),
--hot-buffet (9),
--meal       (10),
--rfuCEN     (11..31),
--networkIdSpecific (32..63)
FareBasisCode ::= INTP
--undefined (0),
--fare-code (1),
--distance (2),
--zones     (3),
--stops     (4),
--rides     (5),
--station-count (6),
--rfuCEN     (7...15),
--networkIdSpecific (16...31)
JourneyTypeCode ::= ENUMERATED {
unspecified(0), single(1), return(2), circular(3), rfuCEN1(4), rfuCEN2(5),
networkIdSpecific1(6), networkIdSpecific2(7)}
LoyaltyTypeCode ::= ENUMERATED {undefined(0), oncard(1), centralAccount(2)}
MultiProductTypeCode ::= ENUMERATED {
stored-single-journey-legs(0), stored-multi-leg-journeys(1), rfuCEN1(2),
rfuCEN2(3), rfuCEN3(4), rfuCEN4(5), networkSpecific1(6), networkSpecific2(7)
}
PaymentMeansCode ::= BIT STRING(SIZE (5)) PaymentModeCode ::= BIT
STRING(SIZE (2)) PaymentScopeCode ::= BIT STRING(SIZE (4)) PaymentUnit ::=
OCTET STRING(SIZE (2))
SeatPositionCode ::= ENUMERATED { unspecified(0), facing-direction-of-
travel(1), back-to-direction-of-travel(2),
airline(3), --(fixed position)
facing-right(4), --relative to direction of travel
facing-left(5), --relative to direction of travel
rfuCEN(6), networkIdSpecific(7)}
STRLoadCode ::= ENUMERATED {
unspecified(0), threshold-autoload(1),
internal-autoload(2), --load from another value source
loaded-by-user(3), pre-selected-autoload(4), periodic-autoload(5),
rfuCEN2(6), rfuCEN3(7)}
UrbanAddOnCode ::= ENUMERATED {
unspecified(0), urban-at-origin(1), urban-at-destination(2), urban-at-
both(3), interchange(4), rfuCEN1(5), rfuCEN2(6), rfuCEN3(7)}
ValidationModelCode ::= ENUMERATED {
unspecified(0), manual-preselection-immediately-validated(1), manual-
preselection-validation-required(2), cico(3), bibo(4), cibo(5), wiwo(6),
rfuCEN1(7)}
AccompaniedBy ::= SEQUENCE {
accompaniedByType ProfileCodeNetwork,
accompaniedByNumber NumberOfCompanions}
AccountNumber ::= IAI
AmountPaid ::= Amount
```

```
AppDepositRefundableFlag ::= Flag
AutoloadEndDate ::= DateStamp AutoloadStartDate ::= DateStamp AutoRenewFlag
::= Flag
Balance ::= SignedAmount CompanionAllowedFlag ::= Flag CountOfCharges ::=
Counter CountOfCoupons ::= Counter CountOfJourneyLegs ::= Counter
CountOfJourneys ::= Counter CountOfJourneysPerPeriod ::= Counter
CouponsAutoload ::= Quantity CouponsDeducted ::= Quantity CouponsLoaded ::=
Quantity CumulativeFare ::= Amount DebitingAmount ::= Amount
DecrementCountOfJourneys ::= Counter
Deposit ::= Amount
DepositRefundableFlag ::= Flag Destination ::= LocationIdentifier
DiscountLevel ::= INTEGER(0..7) DossierId ::= ReferenceIdentifier
DownPayment ::= Amount
DynamicDiscount ::= OCTET STRING(SIZE (4))
ExpiryDateOffset ::= INT1 FareDeducted ::= Amount
FareNotChargedFlag ::= Flag InterchangesAllowed ::= Quantity JourneyDistance
::= Length JourneyRunId ::= ReferenceIdentifier LineId ::=
ReferenceIdentifier LoadAmount ::= Amount
LoyaltyMembershipId ::= ReferenceIdentifier LoyaltyPoints ::= Counter
LoyaltySchemeId ::= ReferenceIdentifier ManualPricingFlag ::= Flag
MaxAmountLimit ::= Amount MaxNumberOfCharges ::= Quantity
MaxTripsPerDayOfWeek ::= TripsPerDayOfWeek MaxValidJourneys ::= Quantity
MinAmountLimit ::= SignedAmount
NotVia ::= LocationIdentifier NumberOfAdults ::= Quantity NumberOfChildren
::= Quantity NumberOfCompanions ::= Quantity NumberOfConcessionaryAdults ::=
Quantity NumberOfConcessionaryChildren ::= Quantity
NumberOfConcessionaryPassengers ::= Quantity NumberOfPassbacks ::= Quantity
Origin ::= LocationIdentifier OverbookingIndicator ::= Flag PartFareAmount
::= Amount PassbackTime ::= Quantity PassengerTotal ::= Quantity
PaymentMeansId ::= ReferenceIdentifier PaymentMeansPriorityFlag ::= Flag
PaymentProvider ::= NetworkSpecificCompanyId Paymethod ::= BIT STRING(SIZE
(13))
PeriodJourneys ::= Quantity
Price ::= SEQUENCE {
priceAmount Amount,
priceVATAmount Amount,
pricePaymentUnit PaymentUnit}
PriceModificationLevel ::= ReferenceNumber PricingLevel ::= INT1
ProductId ::= ReferenceIdentifier ProductLoadDateStamp ::= DateStamp
ReceiptPrintedFlag ::= Flag ReceiptToPrintFlag ::= Flag
ReservationReferenceId ::= ReferenceIdentifier RouteId ::=
ReferenceIdentifier
RouteVariantId ::= ReferenceIdentifier
SeatAlphaId ::= ReferenceIdentifier
SeatNumber ::= ReferenceNumber ServiceOperatorUsageIndicator ::= BIT
STRING(SIZE (4)) SmokingFlag ::= Flag
STRIdentifier ::= ReferenceIdentifier
STRProvider ::= NetworkSpecificCompanyId STRTransactionAmount ::=
SignedAmount
TariffNumber ::= ReferenceNumber ThresholdAmount ::= SignedAmount
TicketToPrintFlag ::= Flag TicketTransferFlag ::= Flag TimeAllowed ::=
Quantity TrainNumber ::= ReferenceNumber
TransferTimeLimitFS ::= Quantity TransferTimeLimitSS ::= Quantity
TravelServiceId ::= ReferenceIdentifier TripsPerDayOfWeek ::= SET SIZE (8)
OF INTS
VATAmount ::= Amount
VATPercentage ::= Percentage-2 Via ::= LocationIdentifier
```

```
Zone ::= LocationId
ZoneCount ::= Quantity
ZoneMap ::= INT3
ChildFlag ::= Flag
ClassFlag ::= Flag
CurrencyFlag ::= Flag
ExpiryTimeIndicatorCode ::= ENUMERATED {
  expires-at-23-59(0), expires-at-contract-provider-defined-time(1)}
LocationTypeFlag ::= Flag OffPeakOnlyFlag ::= Flag ValidityItem ::= BitMap
WeekdayValidityFlag ::= Flag END
```

Annex A (normative)

Assignment of object identifiers

EN 1545-2 OBJECT IDENTIFIER ::= {

iso(1) identifiedorg(3) cen.std(0162) 0001 1 EN 1545 02(01545)}

TransportPayment2 OBJECT IDENTIFIER ::= {

EN 1545-2 abstractsyntax(1) transportPaymentl2 (2) }

and

“EN 1545 ASN.1 Module for Transport Payment V2”

Annex B (normative)

Tags

The following assignments of tags are provided.

Reference	Element or type	Tag #	Tag spec.	Tag encoding
6-1	AccommodationClassCode	220	[APPLICATION 220]	5F 81 5C
6-2	AssistanceTypeCode	221	[APPLICATION 221]	5F 81 5D
6-3	DiscountCode	222	[APPLICATION 222]	5F 81 5E
6-4	ExtraServiceCode	223	[APPLICATION 223]	5F 81 5F
6-5	FareBasisCode	224	[APPLICATION 224]	5F 81 60
6-6	JourneyTypeCode	225	[APPLICATION 225]	5F 81 61
6-7	LoyaltyTypeCode	226	[APPLICATION 226]	5F 81 62
6-8	MultiProductTypeCode	227	[APPLICATION 227]	5F 81 63
6-9	PaymentMeansCode	228	[APPLICATION 228]	5F 81 64
6-10	PaymentModeCode	229	[APPLICATION 229]	5F 81 65
6-11	PaymentScopeCode	230	[APPLICATION 230]	5F 81 66
6-12	PaymentUnit	231	[APPLICATION 231]	5F 81 67
6-13	SeatPositionCode	232	[APPLICATION 232]	5F 81 68
6-14	STRLoadCode	233	[APPLICATION 233]	5F 81 69
6-15	UrbanAddOnCode	234	[APPLICATION 234]	5F 81 6A
6-16	ValidationModelCode	235	[APPLICATION 235]	5F 81 6B
7-1	AccompaniedBy	236	[APPLICATION 236]	5F 81 6C
7-2	AccountNumber	237	[APPLICATION 237]	5F 81 6D
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