



Rail Settlement Plan

ITSO in National Rail Specification

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Glossary

Term	Meaning
ATOC	Association of Train Operating Companies
CM	Customer Media
DfT	Department for Transport
DTS	Date Time Stamp
HOPS	Host Operator or Processing System
IoP	ITSO on Prestige
IPE	ITSO Product Entity – one of a set of templates that define how a product is stored on ITSO media
ISAM	ITSO Security Application Module
ITSO	Integrated Transport Smartcard Organisation, the company responsible for the ITSO Specification, and for providing service needed for the operation of ITSO equipment
Lennon	Latest earnings networked nationally over night – RSP's apportionment and settlement information service
OID	Operator Identification
POST	Point of Service Terminal – this can include rail TIS and TVM, but also includes gates, validators and hand held checkers
SDCI+	Standard Data Capture Interface Plus – as SDCI but incorporating additional functionality
RSP	Rail Settlement Plan
TfL	Transport for London
TIS	Ticket Issuing System
TOC	Train Operating Company
TT	Transient Ticket
TVM	Ticket Vending Machine
UD	User Defined

1. Introduction

1.1 Purpose of document

1.1.1 This document specifies the National Rail standards for issuing, checking and validating rail products on ITSO Smart Media. It specifies in detail how rail products should be mapped to the ITSO Product Entities (IPEs) and also defines the rail specific rules that are required around the ITSO specification to ensure interoperability across the rail network.

1.1.2 Suppliers developing rail equipment for issuing, checking or validating rail products on ITSO Smart Media will need to comply with the data and business rules defined within this document. Compliance with this standard will be checked through the RSP accreditation process as defined in RSPS3016 and through ITSO as defined in the ITSO Certification of Rail POST Equipment.

1.2 Background

1.2.1 ITSO ticketing schemes are now being implemented across the British railways. To support interoperable ITSO based ticketing and validation on National Rail requires the industry to specify standards over and above the ITSO specification to unequivocally define:

- Minimum set of IPEs that need to be processed for interoperable ticketing;
- Which IPEs should be used for which product types;
- How rail data should be mapped to the IPEs;
- Additional messaging requirements;
- Architecture for remote fulfilment;
- The logic to be applied and amendments to the data stored on the media when a product is validated on entry to and exit from the rail network;
- Hotlist and Actionlist processing requirements.

1.3 Scope

1.3.1 This document applies to version 2.1.4 onwards of the ITSO specification.

1.4 Future Updates

1.4.1 As products and services are migrated across to ITSO customer media, the additional functionality that has been defined for ITSO 2.1.4 will be specified for use in this document.

1.5 Related Documents

RSP Ref	Title	Usage
n/a	ITSO Specifications	Details of ITSO Specifications can be found at www.itso.org.uk
n/a	ITSO Certification of Rail POST Equipment – ITSO	
n/a	Knowledgebase	Details UK National Rail retail processes and procedures

RSP Ref	Title	Usage
n/a	IoP Business Rules	Rules agreed by TOCs, TfL and DfT for the operation of ITSO on Prestige (IoP) and IoP Plus
RSPA2004	TIS Process Guide - Direct Fulfilment	Process guide for direct printing of tickets.
RSPA2005	TIS Process Guide - Indirect Fulfilment	Process guide for actionlisting of tickets.
RSPA2007	TIS Process Guide - Usage-based Products	Process guide in preparation for usage based products
RSPA2008	TIS Process Guide - ITSO in National Rail	Process guide for the use of Smart media on National Rail
RSPS1003	ITSO Code of Practice	Specification in preparation on ITSO rules for rail
RSPS2001	Retail Control Service - Interface Control Document	Defines interface for additional information required for Smart customer media ticketing, e.g. IPE for use for a given TOC
RSPS3005	TIS Accreditation Requirements - Direct Smart media	Accreditation Requirements for direct Smart ticketing fulfilment
RSPS3006	Accreditation Requirements - ITSO Actionlist Fulfilment	Accreditation Requirements for actionlist fulfilment requests
RSPS3016	TIS Accreditation Requirements – ITSO Ticket Control Equipment	Accreditation Requirements for validation equipment
RSPS3018	CCST X Layout Design	Provides information on Print Formats to be used by TIS when operating with the 'Common' CCST stock
RSPS4000	SDCI+ Interface Specification - Lennon Settlement	Defines the interface specification to the Lennon service.
RSPS5045	Fares and Associated Data Feed Interface Specification	Defines the data available in various forms from RSP, some of which will need to be used

2. General Rules

2.1 Use of Shell Log Forms

- 2.1.1 The basic log should not be used. Normal log using the transient ticket should be used instead.

2.2 Directory Entry

- 2.2.1 The directory entry "Expiry Date" should be set by TIS to the calculated end date from the matching SDCI+ record and fares data.

2.3 Product Ownership

- 2.3.1 It is an underlying principle of ITSO Smart Ticketing on UK Rail that the flow owning TOC decides the ITSO Product owner (either the flow owning TOC or RSP) who will be responsible for registering the appropriate ITSO product for use as a Smart ticket. Where Flows are currently ATOC owned, they will be allocated to an appropriate TOC who will decide on the ITSO Product Owner prior to entry of the Smart flow into the Retail Control System. In order to ensure that all such registered products are identical, the precepts set out in this document are required to be followed by any TOC wishing to retail tickets in ITSO Smart form. This will ensure that all TOCs retail identical ITSO Smart products, which in turn will ensure that the resultant ITSO products are accepted by all ITSO Smart enabled rail devices and where applicable other modes of transport.

2.4 Maximum and Minimum Journey Time

- 2.4.1 Maximum Journey Time
 - 2.4.1.1 Maximum Journey Time is defined as the period up to the end of the traffic day on which a journey starts. Hence any individual journey that starts at any time on a given calendar day may continue up to a predefined time the following morning (typically 04:29 for National Rail) or unless the final destination is reached previously. If a Journey is not completed within the Maximum Journey Time then the end of the journey must be subsequently resolved at the next presentation of the Customer Media (CM) by performing a Forced Exit before the next Journey can be started.
 - 2.4.1.2 For example, if journey is started at 14:00, Maximum Journey Time is 14hr29min. If a journey is started at 00:30 and the ticket has more than one day until expiry the Maximum Journey Time is 27hr59min, however, if the journey is started after the expiry date but still within the validity period the Maximum Journey Time will be 3hr59 min
- 2.4.2 Minimum Journey Time
 - 2.4.2.1 Minimum Journey Time defines a period after which a passenger is deemed to have travelled after checking in. A passenger may undo a previous check-in by exiting at the same location within the Minimum Journey Time.

2.5 Action list processing

- 2.5.1 Cardholder not present

- 2.5.1.1 HOPS and POSTs within National Rail are required to support Cardholder not present “Detached” IPE actionlisting (Actionlist Action to Take, Code 15 – Update Shell Contents: IPE Fulfillment Action. This code should only be used for initial creation or deletion of the product or in exceptional circumstances where changes to other elements of the IPE are required) This shall be implemented in accordance with ITSO DG0026.
- 2.5.2 Amend IPE
- 2.5.2.1 Where standard amendments e.g number of journeys to an IPE is required via Actionlisting, this should use the code type Action To Take 10 or 11.
- 2.5.3 Action Removal
- 2.5.3.1 To minimise the risk of new actions being ignored by POSTs because previous actions have not been fulfilled, the front line HOPS should remove obsolete actions (whichever is earlier). An expired action is where the EXP date for any of the enclosed products is in the past, an obsolete action is where the fulfilment window for the product has passed.
- 2.5.3.2 The retailer must ensure that the fulfilment window does not continue beyond the latest end of validity period of the IPEs within a single fulfilment request. Additionally, the HOPS must not distribute actionlists for expired products even if they are within the fulfilment window. This applies to both daily refreshes and incremental lists.
- 2.5.4 POST Sets
- 2.5.4.1 The ITSO Specification provides the following addressing methods for action list and hot list records:
- ISAM addressed, where a record is targeted at a specific ISAM ID
 - OID broadcast addressed, where a record is targeted to all ISAMs for an OID
 - SET addressed, where a record is targeted to a specified POST Set.
- 2.5.4.2 The POST Set addressed method of action and hot list distribution has been agreed by the railway industry as the most efficient way of sending Class 2 messages to POSTs. Thus, POST Sets shall be supported by HOPS and POSTs within National Rail.
- 2.5.4.3 Each POST Set is defined as being either Public or Private:
- Public (or Published) – these Sets are known to, and can be used by, other organisations
 - Private – these Sets are not known to, nor usable by, other organisations
- 2.5.4.4 Where private POST Sets are used, a public Set may actually be implemented (from an ITSO messaging perspective) as one or more private Sets. This would allow an operator a more detailed level of distribution when constructing ITSO hot lists and action lists.
- 2.5.4.5 For the purposes of clarity, this document does not seek to define how Private Sets should be used by an individual operator.
- 2.5.4.6 However, for interoperability to work successfully between the various train operators, Published Sets are required to be defined.
- 2.5.5 Published POST Sets – agreed industry format

- 2.5.5.1 For action listing purposes the initial implementation of POST Sets for National Rail will follow this principle:
- Each existing NLC code will be mapped to a single published POST Set ID. The Retail Control Service will supply details of the NLC / POST Set mappings to the appropriate online / web TIS systems.
- 2.5.5.2 For hot listing purposes the initial implementation of POST Sets for National Rail will follow the principle that TOCs can either:
- Specify which sets of POSTs they will send hot lists to (this may vary depending on whether a Shell or Product is being hot listed), or
 - Use a “special” published POST Set ID will be used to distribute hotlist items to all POSTs within an OID. The highest available Public POST Set number (3FFE) will be used for this purpose.
- 2.5.5.3 In the future, targeting of POST Set action lists and hot lists can be made more granular by defining published Set IDs for groups of TVM ISAMs, Gate ISAMs, PVAL ISAMs, Portables ISAMs and so on.
- 2.5.5.4 The railway industry requires the facility for Hot Lists and Action Lists to be sent to different POST Sets for both Revenue Protection and customer convenience purposes. This is especially true in the case of large London terminus stations where multiple TOCs may operate.
- 2.5.5.5 Although the use of NLCs to map to POST Set IDs does give some scope for granularity, as in the case of stations where multiple gatelines have been installed (e.g. London Victoria, which has a different NLC for the Southern, Southeastern and Gatwick Express gatelines), the TOC community intends to specify in the future additional Published POST Set IDs which would diverge away from a straight NLC to Post Set ID mapping. Details of this will be published to industry suppliers in due course.

2.6 Delimiters

- 2.6.1 All ITSO equipment must support comma delimiters and use in both incoming and outgoing messages in accordance with ITSO TN 416.

3. Mapping rail products to the IPEs

3.1 Introduction

3.1.1 To ensure interoperability of ticketing and validation across the rail network, it is necessary to be prescriptive in respect of which IPE TYPs must be used to represent rail products (where interoperability is required). As defined in the Ticketing and Settlement Agreement (TSA)), all Permanent Products are interoperable in terms of either their retail or travel entitlement and as such must map to the IPEs as defined within this document.

3.1.2 The required product to IPE mapping for the minimum permitted set of IPEs is defined in the table below and it is mandatory that any equipment intended for rail use applies/supports products represented in accordance with this mapping. This will be checked and enforced through RSP accreditation.

IPE	Description	Rail Product Types
14 / 16	Entitlement	English National Concessionary Travel Card (ENCTS), Identity Product, Discount Entitlement, Railcards
22	Pre-defined Ticket (Area Based)	Season tickets, Travelcards, Zonal Ticketing, Plus Bus, Staff passes, Gate Passes and usage based products (including Period Carnets of duration from 1 to 255 days)
23	Pre-defined specific journey ticket	Singles, Returns and Carnets –Note that TYP 24 is the preferred IPE for these Rail Product Types unless purely for local area ticketing
24	Pre-defined specific journey ticket with reservations and special restrictions	Singles, Returns and, Trip Carnets for national use but TYP 22 and TYP23 may be preferred for local area ticketing
<i>TT</i>	<i>Transient Ticket</i>	Not strictly an IPE, but the <i>TT</i> is critical for the industry agreed approach to rail validation.

3.1.3 TOCs/Schemes may also optionally choose to support other IPE/product mappings identified, but cannot expect that these products will be supported by equipment elsewhere on the rail network. IPE 2 is detailed within this document as an optional IPE.

3.1.4 The following sections look at each of the IPEs identified as mandatory for interoperable ticketing and define in detail how rail data should be mapped to the IPE fields when an IPE is created.

3.2 Rail products on TYP14 and TYP16

3.2.1 TYP14 and TYP16 may be used in Rail for any or all of the following:

3.2.1.1 Railcards and Other Discount Entitlements (TYP14 only),

3.2.1.2 Personalisation (TYP16 or TYP14 if a third party TYP16 already exists),

3.2.1.3 English National Concessionary Travel Scheme, or Scottish / Welsh Entitlement products (where accepted on certain rail services) – TYP16 only. This is for information for devices that have to accept these products issued by non rail entities on their own cards as TYP16 IPE.

Rail Product	PTYP Allocation
Personalisation or Railcards or other discount entitlements	1

3.3 Railcards or other discount entitlements on TYP14

3.3.1 The TYP14 IPE Data Group should be populated as defined below

IPE Field Name	Description in ITSO Spec	Rail Uses
IPELength	Defined in ITSO TS 1000-2	No rail specific rules.
IPEBitMap	Defined in ITSO TS 1000 parts 2 and 5	See TYP14 Bit Map section below.
IPEFormatRevision	This element shall be set to the value of the version used for this IPE	IFR 1
RemoveDate	Count of days. IPE can be removed after ExpiryDate + RemoveDate. A Value of 255 indicates that the IPE may not be removed.	Set to 1 day.

IPE Field Name	Description in ITSO Spec	Rail Uses
ConcessionaryPassIssuerCostCentre	<p>Defines the Concessionary Travel Authority that issued the Concession Pass.</p> <p>ConcessionaryPassIssuerCostCentre is a number that is unique to a given Travel Concession Authority.</p> <p>Where the concession is granted in respect of the concessionaire's age or disability, under a UK scheme, then the value of ConcessionaryPassIssuer-CostCentre allocated by the appropriate National Concessionary Travel Body for the country in which the pass holder is resident shall be used. This requirement does not prevent this element being used to hold other ConcessionaryPassIssuer-CostCentre values when the IPE is used with other types of concession.</p> <p>A registered OID value may be used in this data element.</p>	Set to 0.
IDFlags	Refer to table 24 in ITSO TS 1000-5	Refer to table.
RoundingFlagsEnable	<p>This flag indicates when set to zero (0) that the RoundingFlag and RoundingValueFlag are not operational and that the POST shall use its own rules when calculating proportional and half fares.</p> <p>This flag indicates when set to one (1) that the RoundingFlag and RoundingValueFlag are operational and shall be used when calculating proportional and half fares.</p>	Set to 0.
PassbackTime	<p>Passback time in minutes. A setting of zero shall indicate that passback time is not defined within the IPE, in which case anti passback rules defined within the POST shall be implemented.</p>	Set to 0.

IPE Field Name	Description in ITSO Spec	Rail Uses
HolderID	Identifies the IPE Holder who is entitled to the product's benefits subject to the product's terms and conditions. Issuer defined holder identity number, OR electronically stored photo image serial number, OR the serial number of the customer media holder's photo identity card.	Set to associated rail photocard ID if applicable. Encoding of the 3 alphabetic and 4 numeric characters in one four byte field. Three alphabetic characters each in a 5 bit field. Letter "A" represented by a value of 0 and letter "Z" would be represented by a value of 25. The numeric fields would require a maximum value of 9999 so can be stored as a binary value in 14 bits. The photocard check digit is omitted only the first 7 characters are needed. The Photocard ID can be encoded as 29 bits with 3 leading 0 bits. Inspection devices must clearly display this photocard ID
RoundingFlag	This flag is only operative when the RoundingFlagsEnable flag is set to one (1). When set to one (1), any calculated fare shall be rounded up, otherwise, when set to zero (0), any calculated fare shall be rounded down.	Set to 0.
RoundingValueFlag	This flag is only operative when the RoundingFlagsEnable flag is set to one (1). When set to zero (0), any calculated fare shall be rounded to the nearest single currency unit (e.g. 1p). When set to one (1), any calculated fare shall be rounded to the nearest multiple of 5 currency units (e.g. 5p).	Set to 0.

IPE Field Name	Description in ITSO Spec	Rail Uses
EntitlementExpiryDate	Date a specific entitlement expires.	Set on creation
DepositCurrencyCode	Where the associated value data element is not used, the value of this element shall be set to zero (0).	Set to 0 unless there is a deposit in which case set to GBP (or correct code).
DepositMethodofPayment	Where more than one method of payment is used, it is suggested that the method used to pay the most monetary value shall be recorded here, but any appropriate method may be recorded at the discretion of the IPE Owner. Where the associated value data element is not used, the value of this element shall be set to zero (0).	Entered by TIS.
DepositVATSalesTax	Where the associated value data element is not used, the value of this element shall be set to zero (0).	Entered by TIS.
Deposit Amount	Amount of deposit or charge paid for the IPE.	Entered by TIS.

IPE Field Name	Description in ITSO Spec	Rail Uses
EntitlementCode	Entitlement code according to EN1545 EntitlementTypeCode.	<p>The following Entitlement Codes will be used in Rail:</p> <p>Railcards: 24 = Disabled, Senior, Network, 16-25, Family and Friends, Job Centre Plus, HM Forces. 25 = Two Together</p> <p>Annual Season Ticket (London and South East only): 24 = Goldcard</p> <p>Student etc: 19 = Scholar</p> <p>TOC scheme specific: 26 = TOC defined 27 = TOC defined 28 = TOC defined 29 = TOC defined</p> <p>Priv discount: 30 = Staff</p>

IPE Field Name	Description in ITSO Spec	Rail Uses
ConcessionaryClass	Concessionary class code according to EN1545 ProfileCodeIOP.	<p>The following Concessionary Class codes will be used in Rail:</p> <p>Railcards: 5 = Disabled 4 = Senior 15 = Network 3 = 16-25 1 = Family and Friends 8 = Job Centre Plus 10 = HM Forces 1 = Two Together</p> <p>Annual Season Ticket (London and South East only): 16 = Goldcard</p> <p>Student etc: 3 = Scholar</p> <p>TOC scheme specific: 1 = Adult 3 = Scholar</p> <p>Priv discount: 9 = Staff</p>
SecondaryHolderID	Identifies a secondary person who is entitled to the product's benefits subject to the product's terms and conditions. Issuer defined holder identity number, OR electronically stored photo image serial number, OR the serial number of the customer media holder's identity customer media, for a secondary holder.	Not present.
HalfDayofWeek	Defines AM/PM and Day of Week validity.	Not present.
ValidAtOrFrom	Area or location code at which the Ticket is valid, where the Ticket is valid in an area, or Origin location code (or destination for return trips) where the IPE is valid for a defined journey.	Not present.

IPE Field Name	Description in ITSO Spec	Rail Uses
ValidTo	Destination location code (or origin for return trip).	Not present.
Padding	Pad with 0x00's to a whole number of blocks, less 3 bytes for IIN if that element is present.	No rail specific rules
IIN	Issuer Identification Number. IIN used to represent the product owner OID where the product owner is not the media owner.	N/A N/A No rail specific rules

3.3.2 The TYP14 IPE Bit Map should be populated as defined below.

Bit	Related Data Element	Rail Uses
0	IIN data element present.	Set to 0.
1	SecondaryHolderID element present.	Set to 0.
2	HalfDayofWeek and ValidAtOrFrom elements present.	Entered by TIS.
3	ValidTo element present.	Entered by TIS.
4,5	RFU	Set to 0.

3.3.3 The TYP14 Flags should be populated as defined below.

Flag	Flag Name and Purpose	Rail Uses
0	Personalised: Set to one (1) to indicate that the surface of the customer media carries a photographic image of the customer media holder, otherwise cleared to zero (0).	Set to 1 if photograph present, set to 0 if no photograph
1,2	Gender1 and Gender2: Set both Gender1 & Gender2 to zero (00) when gender is not known. Set Gender2 to zero (0) & Gender1 to one (1) for male. Set Gender2 to one (1) & Gender1 to zero (0) for female. Where both Gender1 & Gender2 set to one (1) indicates that gender is not specified.	Set to 00.
3	URI: When set to one (1), the POST shall read the URI information within the customer media, and shall use the information contained therein. This flag shall only be set to one (1) if the IPE creator or modifier is satisfied that a working URI application exists within the Customer Media and that that application includes the data which would otherwise be provided within this IPE. If, at the point of use,	Set to 0.

Flag	Flag Name and Purpose	Rail Uses
	the URI application is found to be non-existent or non-functional then the POST shall check this IPE for relevant data.	
4	CompanionAllowed: When this flag is set to one (1) a Companion is Allowed to travel at the same rate as the entitled concessionary person, no other evidence of entitlement is required for the companion.	Set to 0, except where the IPE is a disabled Railcard or similar and the holder is entitled to Companion benefits as decided by the TIS, in which case set to 1.
5	PrintTicket: When set to one (1) a Ticket shall be printed, when appropriate, if the POST is capable of this.	Set to 0.
6	DepositRefundable?: When set to one (1), the deposit is refundable, when set to zero (0), the deposit may not be refunded without reference to the product owner.	Set to 0.
7	ShellDepositRefundable?: When set to one (1), the shell deposit is refundable, when set to zero (0), the shell deposit may not be refunded without reference to the shell owner.	Set to 0.

3.4 Personalisation using TYP16 or TYP14 (TOC issued)

3.4.1 The TYP16 IPE Data Group should be populated as defined below

IPE Field Name	Description in ITSO Spec	Rail Uses
IPELength	Defined in ITSO TS 1000-2	No rail specific rules.
IPEBitMap	Defined in ITSO TS 1000 parts 2 and 5	See TYP16 Bit Map section below.
IPEFormatRevision	This element shall be set to the value of the version used for this IPE	IFR1
RemoveDate	Count of days. IPE can be removed after ExpiryDate + RemoveDate. A Value of 255 indicates that the IPE may not be removed.	Set to 255 days = IPE may not be removed.

IPE Field Name	Description in ITSO Spec	Rail Uses
ConcessionaryPassIssuerCostCentre	Defines the Concessionary Travel Authority that issued the Concession Pass. ConcessionaryPassIssuerCostCentre is a number that is unique to a given Travel Concession Authority. Where the concession is granted in respect of the concessionaire's age or disability, under a UK scheme, then the value of ConcessionaryPassIssuer-CostCentre allocated by the appropriate National Concessionary Travel Body for the country in which the pass holder is resident shall be used. This requirement does not prevent this element being used to hold other ConcessionaryPassIssuer-CostCentre values when the IPE is used with other types of concession. A registered OID value may be used in this data element.	Set to 0.
IDFlags	Refer to table 24 in ITSO TS 1000-5	Refer to table.
RoundingFlagsEnable	This flag indicates when set to zero (0) that the RoundingFlag and RoundingValueFlag are not operational and that the POST shall use its own rules when calculating proportional and half fares. This flag indicates when set to one (1) that the RoundingFlag and RoundingValueFlag are operational and shall be used when calculating proportional and half fares.	Set to 0.
PassbackTime	Passback time in minutes. A setting of zero shall indicate that passback time is not defined within the IPE, in which case anti passback rules defined within the POST shall be implemented.	Set to 0.
DateOfBirth	Users of this field shall take note of the requirements of the Data Protection Act.	Set to 0.

IPE Field Name	Description in ITSO Spec	Rail Uses
Language	Language code – A pointer to a table stored in the POST, which shall contain the matching codes based on ISO 639 and defined in Table 24a. This data element shall be ignored if Idflag 3 is set to one (1).	Set to 44.
HolderID	Identifies the IPE Holder who is entitled to the product's benefits subject to the product's terms and conditions. Issuer defined holder identity number, OR electronically stored photo image serial number, OR the serial number of the customer media holder's photo identity card.	<p>Set to associated rail photocard ID if applicable.</p> <p>Encoding of the 3 alphabetic and 4 numeric characters in one four byte field.</p> <p>Three alphabetic characters each in a 5 bit field. Letter "A" represented by a value of 0 and letter "Z" would be represented by a value of 25.</p> <p>The numeric fields would require a maximum value of 9999 so can be stored as a binary value in 14 bits.</p> <p>The photocard check digit is omitted only the first 7 characters are needed.</p> <p>The Photocard ID can be encoded as 29 bits with 3 leading 0 bits.</p> <p>Inspection devices must clearly display this photocard ID</p>
RoundingFlag	This flag is only operative when the RoundingFlagsEnable flag is set to one (1). When set to one (1), any calculated fare shall be rounded up, otherwise, when set to zero (0), any calculated fare shall be rounded down.	Set to 0.

IPE Field Name	Description in ITSO Spec	Rail Uses
RoundingValueFlag	This flag is only operative when the RoundingFlagsEnable flag is set to one (1). When set to zero (0), any calculated fare shall be rounded to the nearest single currency unit (e.g. 1p). When set to one (1), any calculated fare shall be rounded to the nearest multiple of 5 currency units (e.g. 5p).	Set to 0.
EntitlementExpiryDate	Date a specific entitlement expires.	Set on creation
DepositMethodofPayment	Where more than one method of payment is used, it is suggested that the method used to pay the most monetary value shall be recorded here, but any appropriate method may be recorded at the discretion of the IPE Owner. Where the associated value data element is not used, the value of this element shall be set to zero (0).	Set to 0.
DepositVATSalesTax	Where the associated value data element is not used, the value of this element shall be set to zero (0).	Set to 0.
ShellDepositMethodofPayment	Where more than one method of payment is used, it is suggested that the method used to pay the most monetary value shall be recorded here, but any appropriate method may be recorded at the discretion of the IPE Owner. Where the associated value data element is not used, the value of this element shall be set to zero (0).	Set to 0.
ShellDepositVATSalesTax	Where the associated value data element is not used, the value of this element shall be set to zero (0).	Set to 0.
DepositCurrencyCode	Where the associated value data element is not used, the value of this element shall be set to zero (0).	Set to 0.
ShellDepositCurrencyCode	Where the associated value data element is not used, the value of this element shall be set to zero (0).	Set to 0.

IPE Field Name	Description in ITSO Spec	Rail Uses
Deposit Amount	Amount of deposit or charge paid for the TYP 16 IPE. It may relate to a deposit for the ID, or for the Concessionary Entitlement, or may relate to a charge for an enhanced Concessionary Entitlement.	Set to 0.
ShellDeposit	Amount of deposit paid for the entire ITSO shell. Note that values recorded in this data element and its associated data elements shall be reported using the data messages appropriate to the ITSO shell deposit, not the TYP 16 IPE data messages.	Set to 0.
EntitlementCode	Entitlement code according to EN1545 EntitlementTypeCode.	Set to 0.
ConcessionaryClass	Concessionary class code according to EN1545 ProfileCodeIOP.	Can be encoded with a 0 (which is likely to be the norm); however, can be set as appropriate by TOCs for local scheme purposes
SecondaryHolderID	Identifies a secondary person who is entitled to the product's benefits subject to the product's terms and conditions. Issuer defined holder identity number, OR electronically stored photo image serial number, OR the serial number of the customer media holder's identity customer media, for a secondary holder.	This will be set according to the cardholders granted concession: This could be one of the following: - Adult : set to 1 (adult) - Child : set to 2 (child) - Scholar : set to 19 (scholar) - Staff : set to 9 (staff)
ForenameLength	Length of Forename, in bytes. The Forename element shall be compressed to the actual size required for the text stored, and the actual size of the element stored here.	Set to 0.
Forename	Holder's Forename according to EN1545. Users of this field shall take note of the requirements of the Data Protection Act.	Not present.

IPE Field Name	Description in ITSO Spec	Rail Uses
SurnameLength	Length of Surname, in bytes. The Surname element shall be compressed to the actual size required for the text stored, and the actual size of the element stored here.	Set to 0.
Surname	Holder's Surname according to EN1545. Users of this field shall take note of the requirements of the Data Protection Act.	Not present.
HalfDayofWeek	Defines AM/PM and Day of Week validity.	Not present.
ValidAtOrFrom	Area or location code at which the Ticket is valid, where the Ticket is valid in an area, or Origin location code (or destination for return trips) where the IPE is valid for a defined journey.	Not present.
ValidTo	Destination location code (or origin for return trip).	Not present.
Padding	Pad with 0x00's to a whole number of blocks, less 3 bytes for IIN if that element is present.	Use IIN rail rule to determine if that element is present and pad accordingly.
IIN	Issuer Identification Number. IIN used to represent the product owner OID where the product owner is not the media owner.	N/A No rail specific rules

3.4.2 The TYP16 IPE BitMap should be populated as defined below.

Bit	Related Data Element	Rail Uses
0	IIN data element present.	Set to 0.
1	SecondaryHolderID element present.	Set to 0.
2	ForenameLength, Forename, SurnameLength and Surname elements present.	Set to 0.
3	HalfDayofWeek and ValidAtOrFrom elements present.	Set to 0.
4	ValidTo element present.	Set to 0.

5	RFU	Set to 0.
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3.4.3 The TYP16 Flags should be populated as defined below.

Flag	Flag Name and Purpose	Rail Uses
0	Personalised: Set to one (1) to indicate that the surface of the customer media carries a photographic image of the customer media holder, otherwise cleared to zero (0).	Set to 1 if a photo is present, set to 0 if no photo present.
1,2	Gender1 and Gender2: Set both Gender1 & Gender2 to zero (00) when gender is not known. Set Gender2 to zero (0) & Gender1 to one (1) for male. Set Gender2 to one (1) & Gender1 to zero (0) for female. Where both Gender1 & Gender2 set to one (1) indicates that gender is not specified.	Set to 00.
3	URI: When set to one (1), the POST shall read the URI information within the customer media, and shall use the information contained therein. This flag shall only be set to one (1) if the IPE creator or modifier is satisfied that a working URI application exists within the Customer Media and that that application includes the data which would otherwise be provided within this IPE. If, at the point of use, the URI application is found to be non-existent or non-functional then the POST shall check this IPE for relevant data.	Set to 0.
4	CompanionAllowed: When this flag is set to one (1) a Companion is Allowed to travel at the same rate as the entitled concessionary person, no other evidence of entitlement is required for the companion.	Set to 0.
5	PrintTicket: When set to one (1) a Ticket shall be printed, when appropriate, if the POST is capable of this.	Set to 0.
6	DepositRefundable?: When set to one (1), the deposit is refundable, when set to zero (0), the deposit may not be refunded without reference to the product owner.	Set to 0.
7	ShellDepositRefundable?: When set to one (1), the shell deposit is refundable, when set to zero (0), the shell deposit may not be refunded without reference to the shell owner.	Set to 0.

3.4.4 The TYP14 IPE Data Group should be populated as defined below

IPE Field Name	Description in ITSO Spec	Rail Uses
IPELength	Defined in ITSO TS 1000-2	No rail specific rules.
IPEBitMap	Defined in ITSO TS 1000 parts 2 and 5	See TYP14 Bit Map section below.

IPE Field Name	Description in ITSO Spec	Rail Uses
IPEFormatRevision	This element shall be set to the value of the version used for this IPE	IFR 1
RemoveDate	Count of days. IPE can be removed after ExpiryDate + RemoveDate. A Value of 255 indicates that the IPE may not be removed.	Set to 1 day.
ConcessionaryPassIssuerCostCentre	Defines the Concessionary Travel Authority that issued the Concession Pass. ConcessionaryPassIssuerCostCentre is a number that is unique to a given Travel Concession Authority. Where the concession is granted in respect of the concessionaire's age or disability, under a UK scheme, then the value of ConcessionaryPassIssuer-CostCentre allocated by the appropriate National Concessionary Travel Body for the country in which the pass holder is resident shall be used. This requirement does not prevent this element being used to hold other ConcessionaryPassIssuer-CostCentre values when the IPE is used with other types of concession. A registered OID value may be used in this data element.	Set to 0.
IDFlags	Refer to table 24 in ITSO TS 1000-5	Refer to table.
RoundingFlagsEnable	This flag indicates when set to zero (0) that the RoundingFlag and RoundingValueFlag are not operational and that the POST shall use its own rules when calculating proportional and half fares. This flag indicates when set to one (1) that the RoundingFlag and RoundingValueFlag are operational and shall be used when calculating proportional and half fares.	Set to 0.
PassbackTime	Passback time in minutes. A setting of zero shall indicate that passback time is not defined within the IPE, in which case anti passback rules defined within the POST shall be implemented.	Set to 0.

IPE Field Name	Description in ITSO Spec	Rail Uses
HolderID	<p>Identifies the IPE Holder who is entitled to the product's benefits subject to the product's terms and conditions.</p> <p>Issuer defined holder identity number, OR electronically stored photo image serial number, OR the serial number of the customer media holder's photo identity card.</p>	<p>Set to associated rail photocard ID if applicable.</p> <p>Encoding of the 3 alphabetic and 4 numeric characters in one four byte field.</p> <p>Three alphabetic characters each in a 5 bit field. Letter "A" represented by a value of 0 and letter "Z" would be represented by a value of 25.</p> <p>The numeric fields would require a maximum value of 9999 so can be stored as a binary value in 14 bits.</p> <p>The photocard check digit is omitted only the first 7 characters are needed.</p> <p>The Photocard ID can be encoded as 29 bits with 3 leading 0 bits.</p> <p>Inspection devices must clearly display this photocard ID</p>
RoundingFlag	<p>This flag is only operative when the RoundingFlagsEnable flag is set to one (1).</p> <p>When set to one (1), any calculated fare shall be rounded up, otherwise, when set to zero (0), any calculated fare shall be rounded down.</p>	Set to 0.

IPE Field Name	Description in ITSO Spec	Rail Uses
RoundingValueFlag	This flag is only operative when the RoundingFlagsEnable flag is set to one (1). When set to zero (0), any calculated fare shall be rounded to the nearest single currency unit (e.g. 1p). When set to one (1), any calculated fare shall be rounded to the nearest multiple of 5 currency units (e.g. 5p).	Set to 0.
EntitlementExpiryDate	Date a specific entitlement expires.	Set on creation
DepositCurrencyCode	Where the associated value data element is not used, the value of this element shall be set to zero (0).	Set to 0.
DepositMethodofPayment	Where more than one method of payment is used, it is suggested that the method used to pay the most monetary value shall be recorded here, but any appropriate method may be recorded at the discretion of the IPE Owner. Where the associated value data element is not used, the value of this element shall be set to zero (0).	Set to 0.
DepositVATSalesTax	Where the associated value data element is not used, the value of this element shall be set to zero (0).	Set to 0.
Deposit Amount	Amount of deposit or charge paid for the IPE.	Set to 0.
EntitlementCode	Entitlement code according to EN1545 EntitlementTypeCode.	This will be set according to the cardholders granted concession. This could be one of the following: - Adult : set to 0 (no-entitlement) - Child : set to 3 (proportional fare) - Scholar : set to 3 (proportional fare) - Staff : set to 14 (free-travel)

IPE Field Name	Description in ITSO Spec	Rail Uses
ConcessionaryClass	Concessionary class code according to EN1545 ProfileCodeIOP.	This will be set according to the cardholders granted concession: This could be one of the following: - Adult : set to 1 (adult) - Child : set to 2 (child) - Scholar : set to 19 (scholar) - Staff : set to 9 (staff)
SecondaryHolderID	Identifies a secondary person who is entitled to the product's benefits subject to the product's terms and conditions. Issuer defined holder identity number, OR electronically stored photo image serial number, OR the serial number of the customer media holder's identity customer media, for a secondary holder.	Not present.
HalfDayofWeek	Defines AM/PM and Day of Week validity.	Not present.
ValidAtOrFrom	Area or location code at which the Ticket is valid, where the Ticket is valid in an area, or Origin location code (or destination for return trips) where the IPE is valid for a defined journey.	Not present.
ValidTo	Destination location code (or origin for return trip).	Not present.
Padding	Pad with 0x00's to a whole number of blocks, less 3 bytes for IIN if that element is present.	No rail specific rules
IIN	Issuer Identification Number. IIN used to represent the product owner OID where the product owner is not the media owner.	N/A N/A No rail specific rules

3.4.5 The TYP14 IPE Bit Map should be populated as defined below.

Bit	Related Data Element	Rail Uses
0	IIN data element present.	Set to 0.
1	SecondaryHolderID element present.	Set to 0.
2	HalfDayofWeek and ValidAtOrFrom elements present.	Set to 0.
3	ValidTo element present.	Set to 0.
4,5	RFU	Set to 0.

3.4.6 The TYP14 Flags should be populated as defined below.

Flag	Flag Name and Purpose	Rail Uses
0	Personalised: Set to one (1) to indicate that the surface of the customer media carries a photographic image of the customer media holder, otherwise cleared to zero (0).	Set to 1 if photograph present, set to 0 if no photograph
1,2	Gender1 and Gender2: Set both Gender1 & Gender2 to zero (00) when gender is not known. Set Gender2 to zero (0) & Gender1 to one (1) for male. Set Gender2 to one (1) & Gender1 to zero (0) for female. Where both Gender1 & Gender2 set to one (1) indicates that gender is not specified.	Set to 00.
3	URI: When set to one (1), the POST shall read the URI information within the customer media, and shall use the information contained therein. This flag shall only be set to one (1) if the IPE creator or modifier is satisfied that a working URI application exists within the Customer Media and that that application includes the data which would otherwise be provided within this IPE. If, at the point of use, the URI application is found to be non-existent or non-functional then the POST shall check this IPE for relevant data.	Set to 0.
4	CompanionAllowed: When this flag is set to one (1) a Companion is Allowed to travel at the same rate as the entitled concessionary person, no other evidence of entitlement is required for the companion.	Set to 0
5	PrintTicket: When set to one (1) a Ticket shall be printed, when appropriate, if the POST is capable of this.	Set to 0.
6	DepositRefundable?: When set to one (1), the deposit is refundable, when set to zero (0), the deposit may not be refunded without reference to the product owner.	Set to 0.
7	ShellDepositRefundable?: When set to one (1), the shell deposit is refundable, when set to zero (0), the shell deposit may not be refunded without reference to the shell owner.	Set to 0.

3.5 English National Concessionary Travel Scheme, or Scottish / Welsh Entitlement products on TYP16

- 3.5.1 Concessionary travel products loaded onto ITSO media by local authorities (free bus passes) are accepted on certain rail services in National Rail, mainly in PTE areas. Although these products will not be encoded by TOCs, POST suppliers will need to ensure that their equipment is capable of reading and validating these products as appropriate.

Rail Product	PTYP Allocation
Concessionary Travel or Entitlement Products	1

- 3.5.2 The minimum TYP16 IPE Data Group that needs to be supported will be populated as defined below

IPE Field Name	Description in ITSO Spec	Expected data content
IPELength	Defined in ITSO TS 1000-2	No rail specific rules.
IPEBitMap	Defined in ITSO TS 1000 parts 2 and 5	See TYP16 Bit Map section below.
IPEFormatRevision	This element shall be set to the value of the version used for this IPE	IPEFormatRevision permitted by the currently published version of the specification.
RemoveDate	Count of days. IPE can be removed after ExpiryDate + RemoveDate. A Value of 255 indicates that the IPE may not be removed.	No rail specific rules.
ConcessionaryPassIssuerCostCentre	Defines the Concessionary Travel Authority that issued the Concession Pass. ConcessionaryPassIssuerCostCentre is a number that is unique to a given Travel Concession Authority. Where the concession is granted in respect of the concessionaire's age or disability, under a UK scheme, then the value of ConcessionaryPassIssuer-CostCentre allocated by the appropriate National Concessionary Travel Body for the country in which the pass holder is resident shall be used. This requirement does not prevent this element being used to hold other ConcessionaryPassIssuer-CostCentre values when the IPE is used with other types of concession. A registered OID value may be used in this data element.	This may be used to identify validity at the location.

IPE Field Name	Description in ITSO Spec	Expected data content
IDFlags	Refer to table 24 in ITSO TS 1000-5	Refer to table.
RoundingFlagsEnable	This flag indicates when set to zero (0) that the RoundingFlag and RoundingValueFlag are not operational and that the POST shall use its own rules when calculating proportional and half fares. This flag indicates when set to one (1) that the RoundingFlag and RoundingValueFlag are operational and shall be used when calculating proportional and half fares.	No rail specific rules.
PassbackTime	Passback time in minutes. A setting of zero shall indicate that passback time is not defined within the IPE, in which case anti passback rules defined within the POST shall be implemented.	No rail specific rules
DateOfBirth	Users of this field shall take note of the requirements of the Data Protection Act.	No rail specific rules.
Language	Language code – A pointer to a table stored in the POST, which shall contain the matching codes based on ISO 639 and defined in Table 24a. This data element shall be ignored if Idflag 3 is set to one (1).	No rail specific rules.
HolderID	Identifies the IPE Holder who is entitled to the product's benefits subject to the product's terms and conditions. Issuer defined holder identity number, OR electronically stored photo image serial number, OR the serial number of the customer media holder's photo identity card.	No rail specific rules.
RoundingFlag	This flag is only operative when the RoundingFlagsEnable flag is set to one (1). When set to one (1), any calculated fare shall be rounded up, otherwise, when set to zero (0), any calculated fare shall be rounded down.	No rail specific rules.

IPE Field Name	Description in ITSO Spec	Expected data content
RoundingValueFlag	This flag is only operative when the RoundingFlagsEnable flag is set to one (1). When set to zero (0), any calculated fare shall be rounded to the nearest single currency unit (e.g. 1p). When set to one (1), any calculated fare shall be rounded to the nearest multiple of 5 currency units (e.g. 5p).	No rail specific rules.
EntitlementExpiryDate	Date a specific entitlement expires.	Use this as the expiry date if populated otherwise use the IPE expiry date
DepositMethodofPayment	Where more than one method of payment is used, it is suggested that the method used to pay the most monetary value shall be recorded here, but any appropriate method may be recorded at the discretion of the IPE Owner. Where the associated value data element is not used, the value of this element shall be set to zero (0).	No rail specific rules.
DepositVATSalesTax	Where the associated value data element is not used, the value of this element shall be set to zero (0).	No rail specific rules.
ShellDepositMethodofPayment	Where more than one method of payment is used, it is suggested that the method used to pay the most monetary value shall be recorded here, but any appropriate method may be recorded at the discretion of the IPE Owner. Where the associated value data element is not used, the value of this element shall be set to zero (0).	No rail specific rules.
ShellDepositVATSalesTax	Where the associated value data element is not used, the value of this element shall be set to zero (0).	No rail specific rules.
DepositCurrencyCode	Where the associated value data element is not used, the value of this element shall be set to zero (0).	No rail specific rules.
ShellDepositCurrencyCode	Where the associated value data element is not used, the value of this element shall be set to zero (0).	No rail specific rules.

IPE Field Name	Description in ITSO Spec	Expected data content
Deposit Amount	Amount of deposit or charge paid for the TYP 16 IPE. It may relate to a deposit for the ID, or for the Concessionary Entitlement, or may relate to a charge for an enhanced Concessionary Entitlement.	No rail specific rules.
ShellDeposit	Amount of deposit paid for the entire ITSO shell. Note that values recorded in this data element and its associated data elements shall be reported using the data messages appropriate to the ITSO shell deposit, not the TYP 16 IPE data messages.	No rail specific rules.
EntitlementCode	Entitlement code according to EN1545 EntitlementTypeCode.	As a minimum must support: 14 = Unlimited Free Ride 2 = Limited Free Ride 3 = Proportional Fare 0 = No Entitlement
ConcessionaryClass	Concessionary class code according to EN1545 ProfileCodeIOP.	As a minimum must support: 2 = Child 4 = Pensioner 5 = Disabled 19 = Scholar 0 = Unspecified
SecondaryHolderID	Identifies a secondary person who is entitled to the product's benefits subject to the product's terms and conditions. Issuer defined holder identity number, OR electronically stored photo image serial number, OR the serial number of the customer media holder's identity customer media, for a secondary holder.	No rail specific rules.
ForenameLength	Length of Forename, in bytes. The Forename element shall be compressed to the actual size required for the text stored, and the actual size of the element stored here.	No rail specific rules.

IPE Field Name	Description in ITSO Spec	Expected data content
Forename	Holder's Forename according to EN1545. Users of this field shall take note of the requirements of the Data Protection Act.	No rail specific rules.
SurnameLength	Length of Surname, in bytes. The Surname element shall be compressed to the actual size required for the text stored, and the actual size of the element stored here.	No rail specific rules.
Surname	Holder's Surname according to EN1545. Users of this field shall take note of the requirements of the Data Protection Act.	No rail specific rules.
HalfDayofWeek	Defines AM/PM and Day of Week validity.	No rail specific rules.
ValidAtOrFrom	Area or location code at which the Ticket is valid, where the Ticket is valid in an area, or Origin location code (or destination for return trips) where the IPE is valid for a defined journey.	This value will be set to NULL It is expected that POST config data will define whether the product is valid at the location
ValidTo	Destination location code (or origin for return trip).	This value will be set to NULL It is expected that POST config data will define whether the product is valid at the location
Padding	Pad with 0x00's to a whole number of blocks, less 3 bytes for IIN if that element is present.	No rail specific rules.
IIN	Issuer Identification Number. IIN used to represent the product owner OID where the product owner is not the media owner.	No rail specific rules

3.5.3 The TYP16 IPE BitMap should be populated as defined below.

Bit	Related Data Element	Expected data content
0	IIN data element present.	No rail specific rules.

1	SecondaryHolderID element present.	No rail specific rules.
2	ForenameLength, Forename, SurnameLength and Surname elements present.	No rail specific rules.
3	HalfDayofWeek and ValidAtOrFrom elements present.	Not present
4	ValidTo element present.	Not present
5	RFU	No rail specific rules.

3.5.4 The TYP16 Flags should be populated as defined below.

Flag	Flag Name and Purpose	Expected data content
0	Personalised: Set to one (1) to indicate that the surface of the customer media carries a photographic image of the customer media holder, otherwise cleared to zero (0).	No rail specific rules.
1,2	Gender1 and Gender2: Set both Gender1 & Gender2 to zero (00) when gender is not known. Set Gender2 to zero (0) & Gender1 to one (1) for male. Set Gender2 to one (1) & Gender1 to zero (0) for female. Where both Gender1 & Gender2 set to one (1) indicates that gender is not specified.	No rail specific rules.
3	URI: When set to one (1), the POST shall read the URI information within the customer media, and shall use the information contained therein. This flag shall only be set to one (1) if the IPE creator or modifier is satisfied that a working URI application exists within the Customer Media and that that application includes the data which would otherwise be provided within this IPE. If, at the point of use, the URI application is found to be non-existent or non-functional then the POST shall check this IPE for relevant data.	No rail specific rules.
4	CompanionAllowed: When this flag is set to one (1) a Companion is Allowed to travel at the same rate as the entitled concessionary person, no other evidence of entitlement is required for the companion.	No rail specific rules.
5	PrintTicket: When set to one (1) a Ticket shall be printed, when appropriate, if the POST is capable of this.	No rail specific rules.
6	DepositRefundable?: When set to one (1), the deposit is refundable, when set to zero (0), the deposit may not be refunded without reference to the product owner.	No rail specific rules.
7	ShellDepositRefundable?: When set to one (1), the shell deposit is refundable, when set to zero (0), the shell deposit may not be refunded without reference to the shell owner.	No rail specific rules.

3.6 Rail products on TYP22

3.6.1 TYP22 may be used for season tickets, travelcards, staff passes, stored passes and usage based products.

3.6.2 The following PTYPs have been allocated for use on National Rail to ensure interoperability. These shall be used by all participating TOCs and retailers.

Rail Product	PTYP Allocation
Season Ticket	0
Season Ticket	1
Season Ticket	2
Season Ticket	3
Charge To Account season ticket (Flexismart)	4
Season ticket with stored passes (Flexi Season)	5
Travelcards	19
Rover Tickets	28
PlusBus	29
Gate Passes	30
Staff Passes	31

3.6.3 The TYP22 IPE Data Group should be populated as defined below.

IPE Field Name	Description in ITSO Spec	Rail Uses	Data Format where not specified in ITSO Spec
IPELength	Defined in ITSO TS 1000-2	No rail specific rules.	
IPEBitMap	Defined in ITSO TS 1000 parts 2 and 5	See TYP22 Bit Map section below.	

IPE Field Name	Description in ITSO Spec	Rail Uses	Data Format where not specified in ITSO Spec
IPEFormatRevision	This element shall be set to the value of the version used for this IPE	Set to an IPEFormatRevision permitted by the currently published version of the specification. All new products shall be at format revision IPEformatrevision =>2 but existing products to be handled by validation devices may be at format revision 1.	
RemoveDate	Count of days. IPE can be removed after ExpiryDate + RemoveDate. A Value of 255 indicates that the IPE may not be removed.	Set to 1 day.	

IPE Field Name	Description in ITSO Spec	Rail Uses	Data Format where not specified in ITSO Spec
ProductRetailer	ITSO Identity of the retailer, included for information purposes, not for the purpose of determining IPE acceptability at the point of use.	Set to SDCI+ "NLC (Shift)" from the DB record for the sale. Product is gate or staff pass then set to Null as these products are not retailed.	<p>The ProductRetailer element is made up of 2 bytes (bits 0 to 15) and would normally hold an OID16 type value. To differentiate an NLC from an OID16 the most significant bit (bit 15) must be set to 1.</p> <p>The next 5 most significant bits (bits 10 to 14) are encoded to represent the first character of the NLC - values 0 to 31 representing characters '0' to '9' and 'A' to 'V'.</p> <p>The least significant 10 bits must be encoded as a binary representation of the last 3 digits of the supplied NLC in the range 0 to 999.</p> <p>Note: Use of first bit to indicate a Retailer NLC prevents the use of OIDs above a value of 32767 (0x7FFF).</p>

IPE Field Name	Description in ITSO Spec	Rail Uses	Data Format where not specified in ITSO Spec
TYP22Flags	Refer to table 30 in ITSO TS 1000-5	The principal use of these flags in rail is to specify the peak/off-peak validity. The time periods defining 'peak' shall be defined by the appropriate parameter table transmitted to the POST. For full details see the TYP22Flags section below.	
PassbackTime	Passback time in minutes. A setting of zero shall indicate that passback time is not defined within the IPE, in which case anti-passback rules defined within the post shall be implemented.	Set to: Zero = use POST settings. or 63 = no passback check and will override POST settings	
IssueDate	Date of IPE issue. The IPE shall not be used prior to the IssueDate.	Set to Date (Sale) taken from SDCI+ DB Date (Shift Start) field	
ExpiryTime	ExpiryTime, on the day defined by ExpiryDate.	Set to 28:30 (i.e. value of 1710 minutes) Certain "special" products may require the use of alternative times. In these cases the alternative times should be encoded.	

IPE Field Name	Description in ITSO Spec	Rail Uses	Data Format where not specified in ITSO Spec
AutoRenewQuantity1	The contents of this element shall be interpreted differently depending upon the state of Bit 1 of the TYP22ValueFlags element.	No rail specific rules.	
Class	Coded according to EN1545 AccommodationClassCodeList	Set to according to SDCI+ BE/BM record "Class Indicator" field 0=unknown (note that "Class Indicator" field in BE/BM record will be set to 9 for the equivalent of this item) 1 =1st 2 =Std	
ValidityCode	A user defined element which may be used to further define Product validity. A value of zero shall designate a null condition.	Field defined as a series of flags with two purposes: To indicate whether the product is a test product or a live product. To be used in conjunction with the TYP22Flags to point to the correct validity time data (allowing greater granularity of restriction data than simply peak and off-peak). Flag definition in section 3.7.6 Note: this field is not of sufficient size to hold the rail validity codes	
ValidityStartDTS	Date and time of commencement of validity. The IPE shall be valid from the time specified.	Set to 00:01 on valid from date from SDCI+ BE "Date (Travel)" /BM "Date (Start of Valididty)" record.	

IPE Field Name	Description in ITSO Spec	Rail Uses	Data Format where not specified in ITSO Spec
PromotionCode	An IPE owner defined data element.	No rail specific rules. Ignore whatever value is present in this data element	
ValidOnDayCode	Defines days of the week upon which the IPE is valid.	No rail specific rules. However it must match the TYP22Flags settings.	
PartySizeAdult	-	Set to either 0 or 1. Exactly one of PartySizeAdult, PartySizeChild and PartySizeConcession must equal 1. The other two must equal 0.	
PartySizeChild	-	Set to either 0 or 1. Exactly one of PartySizeAdult, PartySizeChild and PartySizeConcession must equal 1. The other two must equal 0.	

IPE Field Name	Description in ITSO Spec	Rail Uses	Data Format where not specified in ITSO Spec
PartySizeConcession	Number of concessionary travellers recorded here shall not also be recorded in either PartySizeAdult or PartySizeChild.	Set to either 0 or 1. Exactly one of PartySizeAdult, PartySizeChild and PartySizeConcession must equal 1. The other two must equal 0. Where a customer has an entitlement such as a railcard or a concessionary pass status that has had an effect on the product then this field must be populated instead of either PartySizeAdult or PartySizeChild.	
AmountPaidCurrencyCode	Where the associated value data element is not used, the value of this element shall be set to zero. May be used to define scaling factor for Amount Paid.	For National Rail the scaling factor bits shall be set to zero to avoid reduction in granularity of the AmountPaid.	
AmountPaid	Actual amount paid.	Set to SDCl+ "Fare Amount" from the BE/BM record in pence.	

IPE Field Name	Description in ITSO Spec	Rail Uses	Data Format where not specified in ITSO Spec
AmountPaidMethodOfPayment	Where more than one MOP is used it is suggested that the method used to pay the most monetary value shall be recorded here, but any appropriate method may be recorded at the discretion of the IPE Owner. Where the associated value data element is not used, the value of this element shall be set to zero.	Set according to SDCI+ BE/BM record "MoP Code" field. If more than 1 byte is recorded in SDCI+ use CCST X rules in RSPS3018.	
AmountPaidVATSalesTax	Where the associated value data element is not used, the value of this element shall be set to zero.	Set to zero.	
PassDuration	Optional element whose presence is identified by bit 3 of the Bit Map. Duration of the pass in days. This value shall be used to determine a new ExpiryDateCurrent when a Stored Ticket (pass) is used, taking into account any remaining validity of the current pass. This element shall always be present and used when this IPE is used in Stored Ticket (pass) mode.	To be used if product type is stored passes (bit 3 of BitMap set to 1 if used). Note: limitation on field size only enables pass durations of up to 255 days.	

IPE Field Name	Description in ITSO Spec	Rail Uses	Data Format where not specified in ITSO Spec
RouteCode	Optional element whose presence is identified by bit 1 of the Bit Map. User defined routing information.	Set to the 5 digit route code as used to define the flow on which the rail product is priced (as defined within the RSP fares data). Bit 1 of the Bit Map must be set to 1 to indicate presence of this element. If the product does not have any geographical validity (e.g. a staff pass) then this element need not be present.	STRING
ValidAtOrFrom	Optional element whose presence is identified by bit 1 of the Bit Map. Area or location code at which the Ticket is valid, where the Ticket is valid in an area or Origin location code (or destination for return trips) where the IPE is valid for a defined journey.	Populated with the NLC that defines the journey origin. Bit 1 of the Bit Map must be set to 1 to indicate presence of this element. If the product does not have any geographical validity (e.g. a staff pass) then this element need not be present.	LOC DEF 203 Or LOC DEF 255 if not used.

IPE Field Name	Description in ITSO Spec	Rail Uses	Data Format where not specified in ITSO Spec
ValidTo	Optional element whose presence is identified by bit 1 of the Bit Map. Destination location code (or origin for return trips)	Populated with the NLC that defines the journey destination. Bit 1 of the Bit Map must be set to 1 to indicate presence of this element. If the product does not have any geographical validity (e.g. a staff pass) then this element need not be present. If the permitted travel area is entirely defined by the ValidAtOrFrom field then this field should be set to the Null LocDefType.	LOC DEF 203 Or LOC DEF 255 if not used.
Padding	As required to pad sector.	As required.	
IIN	Optional element whose presence is identified by bit 0 of the Bit Map. IIN used to represent the product owner where the product owner is not the media owner. Issuer Identification Number	N/A N/A No rail specific rules	

3.6.4 The TYP22 IPE BitMap should be populated as defined below.

Bit	Related Data Element	Rail Uses
0	IIN data element present	Set to 00
1	RouteCode, ValidAtOrFrom and ValidTo data elements present	Set to 1 if product has geographical validity constraints.
2	RFU	Set to 0
3	PassDuration data element present	No specific rail rule.
4	ConcessionaryPassIssuerCostCentre data element present	Set to 0
5	RFU	Set to 0

3.6.5 The TYP22Flags should be populated as defined below.

Flag	Flag Name and Purpose	Rail Uses
0	Transferable: set to 1 if the product is transferrable	May be used if required by the product conditions but cannot be applied where any discounts relating to the media owner apply to the product
1-4	RFU	Set to 0
5	PrintTicket - when set to 1 a ticket shall be printed, when appropriate, if POST is capable of this	Set to 0
6	PrintReceipt - when set to 1 a receipt shall be printed, when appropriate, if POST is capable of this	Set to 0
7	RFU	Set to 0

Flag	Flag Name and Purpose	Rail Uses
8	OffPeakOnly	Flags 8 through 15 are used to determine day and time validity. By using appropriate combinations most scenarios can be catered for e.g. Anytime, any day of week Anytime, specific days of week Anytime, specific half days Off peak, any day of week Off peak specific days of week The data defining the peak period of a TOC's registered product will need to be distributed to the POSTS as configuration data.
9	ValidAMWeekdays	
10	ValidPMWeekdays	
11	ValidAMSaturdays	
12	ValidPMSaturdays	
13	ValidAMSundays	
14	ValidPMSundaysd	
15	ValidPublicHolidays	

3.6.6 Validity code usage in rail (X means that either 1 or 0 may be used) – details of which fares ticket type codes shall apply to these validity codes will be defined in the RCS data feed:

	BITS				
Definition	4	3	2	1	0
NULL – NOT FOR USE IN RAIL	0	0	0	0	0
Test Product	1	X	X	X	0
Live Product	1	X	X	X	1
No Gradation	X	0	0	0	X
High Peak	X	0	0	1	X
Mid Peak	X	0	1	0	X
Shoulder Peak	X	0	1	1	X
Shoulder Off Peak	X	1	0	0	X
Mid Off Peak	X	1	0	1	X
Low Off Peak	X	1	1	0	X
Reserved for Future Use General note: any bits set for future use should be ignored by rail posts conforming to this version of the specification.	X	1	1	1	X

3.6.7 If present the TYP22 IPE Value Group should be populated as defined below.

IPE VG Field Name	Description in ITSO Spec	Rail Use
VGLength	Defined in ITSO TS 1000-2	No rail specific rules.
VGBitMap	Defined in ITSO TS 1000-2	No rail specific rules.
VGFormatRevision	Defined in ITSO TS 1000-2	No rail specific rules.
TransactionType	Defined in ITSO TS 1000-5	No rail specific rules.
TransactionSequenceNumber	Defined in ITSO TS 1000-2	No rail specific rules.
DateTimeStamp	Defined in ITSO TS 1000-2	No rail specific rules.
ISAMIDModifier	Defined in ITSO TS 1000-5	No rail specific rules.
ActionSequenceNumber	Defined in ITSO TS 1000-2	No rail specific rules.
NumberRemainingPasses	Count of coupons	To be used if product type is stored passes.
TYP22ValueFlags	Bit 0 = set to one (1) when Auto-Renew enabled Bit 1 = set to one (1) when Stored Tickets (Passes), defined by NumberRemainingPasses, are enabled Bits 2-5 RFU	Auto-renew (facilitated by bit 0) may only be used where the product owners back office systems have been accredited by RSP (confirming that appropriate settlement data is generated). Bit 1 to be used if product type is stored passes. Other bits to be specified as required.
ExpiryDateSP	Expiry date of Stored Tickets (Passes) (i.e. inactivated passes enumerated by NumberRemainingPasses)	To be used if product type is stored passes.

IPE VG Field Name	Description in ITSO Spec	Rail Use
ExpiryDateCurrent	Expiry date of the current active pass	No rail specific rules.
Padding	As required.	As required

3.7 Rail products on TYP23

3.7.1 TYP23 may be used for single, return and carnet type products. It is recommended that TYP24 should be used instead of this, due to the additional functionality provided by TYP24.

3.7.2 The following PTYPs have been allocated for use on National Rail to ensure interoperability. These shall be used by all participating TOCs and retailers.

Rail Product	PTYP Allocation
Peak Single	1
Off Peak Single	2
Peak Return	3
Off Peak Return	4
Peak Carnet	5
Off Peak Carnet	6

3.7.3 The TYP23 IPE Data Group should be populated as defined below.

IPE Field Name	Description in ITSO Spec	Rail Uses	Data Format where not specified in ITSO Spec
IPELength	Defined in ITSO TS 1000-2	No rail specific rules.	
IPEBitMap	Defined in ITSO TS 1000 parts 2 and 5	See TYP23 Bit Map section below.	
IPEFormatRevision	This element shall be set to the value of the version used for this IPE	Set to an IPEFormatRevision permitted by the currently published version of the specification. All new products shall be at format revision IPEformatrevision =>2 but existing products to be handled by validation devices may be at format revision 1.	

IPE Field Name	Description in ITSO Spec	Rail Uses	Data Format where not specified in ITSO Spec
RemoveDate	Count of days. IPE can be removed after ExpiryDate + RemoveDate. A Value of 255 indicates that the IPE may not be removed.	Set to 1 day.	
ProductRetailer	ITSO Identity of the retailer, included for information purposes, not for the purpose of determining IPE acceptability at the point of use.	Set to SDCI+ "NLC (Shift)" from the DB record for the sale.	<p>The ProductRetailer element is made up of 2 bytes (bits 0 to 15) and would normally hold an OID16 type value. To differentiate an NLC from an OID16 the most significant bit (bit 15) must be set to 1.</p> <p>The next 5 most significant bits (bits 10 to 14) are encoded to represent the first character of the NLC - values 0 to 31 representing characters '0' to '9' and 'A' to 'V'.</p> <p>The least significant 10 bits must be encoded as a binary representation of the last 3 digits of the</p>

IPE Field Name	Description in ITSO Spec	Rail Uses	Data Format where not specified in ITSO Spec
			<p>supplied NLC in the range 0 to 999.</p> <p>Note: Use of first bit to indicate a Retailer NLC prevents the use of OIDs above a value of 32767 (0x7FFF).</p>
TYP23Flags	Refer to table 34 in ITSO TS 1000-5	All flags set to zero.	
PassbackTime	Passback time in minutes. A setting of zero shall indicate that passback time is not defined within the IPE, in which case anti-passback rules defined within the post shall be implemented.	<p>Set to:</p> <p>Zero = use POST settings.</p> <p>or</p> <p>63 = no passback check and will override POST settings</p>	
IssueDate	Date of IPE issue. The IPE shall not be used prior to the IssueDate.	<p>Use this field to specify the Start of Validity rather than the actual issue date.</p> <p>Set to 00:01 (time) and "Date (Travel)" from the SDCl+ BE record.</p> <p>This will also be date from StartOfValidityDateTime.from an indirect fulfilment request.</p>	
ValidityCode	A user defined element which may be used to further define Product validity.	Field defined as a series of flags with two purposes:	

IPE Field Name	Description in ITSO Spec	Rail Uses	Data Format where not specified in ITSO Spec
	A value of zero shall designate a null condition.	To indicate whether the product is a test product or a live product. To be used in conjunction with the TYP23Flags to point to the correct validity time data (allowing greater granularity of restriction data than simply peak and off-peak). Flag definition in section 3.8.6 Note: this field is not of sufficient size to hold the rail validity codes	
ExpiryTime	ExpiryTime, on the day defined by ExpiryDate.	Set to 28:30 (i.e. value 1710 minutesminutes) Certain "special" products may require the use of alternative times. In these cases the alternative times should be encoded.	
Class	Coded according to EN1545 AccommodationClassCodeList	Set to according to SDCI+ BE record "Class Indicator" field 0=unknown (note that "Class Indicator" field in BE record will be set to 9 for the equivalent of this item) 1 =1st 2 =Std	
PartySizeAdult	-	Set to either 0 or 1.	

IPE Field Name	Description in ITSO Spec	Rail Uses	Data Format where not specified in ITSO Spec
		Exactly one of PartySizeAdult, PartySizeChild and PartySizeConcession must equal 1. The other two must equal 0.	
PartySizeChild	-	Set to either 0 or 1. Exactly one of PartySizeAdult, PartySizeChild and PartySizeConcession must equal 1. The other two must equal 0.	
PartySizeConcession	Number of concessionary travellers recorded here shall not also be recorded in either PartySizeAdult or PartySizeChild.	Set to either 0 or 1. Exactly one of PartySizeAdult, PartySizeChild and PartySizeConcession must equal 1. The other two must equal 0. Where a customer has an entitlement such as a railcard or a concessionary pass status that has had an effect on the product then this field must be populated instead of either PartySizeAdult or PartySizeChild.	
AmountPaidCurrencyCode	Where the associated value data element is not used, the value of this element shall be set to zero.	For National Rail the scaling factor bits shall be set to zero to avoid reduction in granularity of the AmountPaid.	

IPE Field Name	Description in ITSO Spec	Rail Uses	Data Format where not specified in ITSO Spec
	May be used to define scaling factor for Amount Paid.		
AmountPaid	Actual amount paid.	Set to SDCI+ "Fare Amount" from the BE record in pence.	
AmountPaidMethodOfPayment	Where more than one MOP is used it is suggested that the method used to pay the most monetary value shall be recorded here, but any appropriate method may be recorded at the discretion of the IPE Owner. Where the associated value data element is not used, the value of this element shall be set to zero.	Set according to SDCI+ BE record "MoP Code" field. If more than 1 byte is recorded in SDCI+ use CCST X rules in RSPS3018.	
AmountPaidVATSalesTax	Where the associated value data element is not used, the value of this element shall be set to zero.	Set to zero.	
PhotocardNumber	Number corresponding Transport photocard	Set to last 4 characters of associated photocard	
PromotionCode	An IPE owner defined data element.	No rail specific rules.	
ConcessionaryPassIssuerCostCentre	Element whose presence is identified by bit 4 of the Bit Map. Defines a concessionary pass or permit issuing authority cost centre. This value shall be determined by the IPE Owner.	Set to zero.	

IPE Field Name	Description in ITSO Spec	Rail Uses	Data Format where not specified in ITSO Spec
	A registered OID value may be used in this data element.		
TYP23Mode	IPE operating mode (defined in ITSO TS 1000 part 5, table 35)	Set to 0:	
MaxTransfers	Defines the maximum number of transfers allowable in a single journey.	Set to zero.	
TimeLimit	Defines the maximum elapsed time allowed between the start of a leg and the start of the next leg for the second of the two legs to qualify as part of a multi-leg journey. Specified as a count of 30 second intervals.	Set to zero.	
ValueOfRideJourney	Nominal value of one ride or journey	Set to zero.	
ValueOfRideJourneyCurrencyCode	-	Set to zero.	
RouteCode	Optional element whose presence is identified by bit 1 of the Bit Map. User defined routing information.	Set to the 5 digit route code as used to define the flow on which the rail product is priced (as defined within the RSP fares data). Bit 1 of the Bit Map must be set to 1 to indicate presence of this element. If the product does not have any geographical validity (e.g. a staff pass) then this element need not be present.	STRING

IPE Field Name	Description in ITSO Spec	Rail Uses	Data Format where not specified in ITSO Spec
Origin1	Optional element whose presence is identified by bit 1 of the Bit Map. Area or location code at which the Ticket is valid, where the Ticket is valid in an area or Origin location code (or destination for return trips) where the IPE is valid for a defined journey.	Populated with the NLC that defines the journey origin. Bit 1 of the Bit Map must be set to 1 to indicate presence of this element. If the product does not have any geographical validity then this element need not be present.	LOC DEF 203 Or LOC DEF 255 if not used.
Destination1	Optional element whose presence is identified by bit 1 of the Bit Map. Destination location code (or origin for return trips)	Populated with the NLC that defines the journey destination. Bit 1 of the Bit Map must be set to 1 to indicate presence of this element. If the product does not have any geographical validity then this element need not be present.	LOC DEF 203 Or LOC DEF 255 if not used.
Padding	As required to pad sector.	As required.	
IIN	Optional element whose presence is identified by bit 0 of the Bit Map. IIN used to represent the product owner where the product owner is not the media owner.	N/A No rail specific rules	

3.7.4 The TYP23 IPE BitMap should be populated as defined below.

Bit	Related Data Element	Rail Uses
0	IIN data element present	Set to 0

Bit	Related Data Element	Rail Uses
1	RouteCode, Origin1 and Destination 1 data elements present	Set to 1 if product has geographical validity constraints.
2	RFU	Set to 0
3	TYP23Mode, MaxTransfers, TimeLimit, ValueOfRideJourney, optional RFU, ValueOfRideJourneyCurrencyCode data elements present	Set to 1
4	RFU	Set to 0
5	RFU	Set to 0

3.7.5 The TYP23Flags should be populated as defined below.

Flag	Flag Name and Purpose	Rail Uses
0	RFU	Set to 0
1	UsedChecked	Set to 0
2-4	RFU	Set to 0
5	PrintTicket - when set to 1 a ticket shall be printed, when appropriate, if POST is capable of this	Set to 0
6	PrintReceipt - when set to 1 a receipt shall be printed, when appropriate, if POST is capable of this	Set to 0
7	RFU	Set to 0

3.7.6 Validity code usage in rail (X means that either 1 or 0 may be used) – details of which fares ticket type codes shall apply to these validity codes will be defined in the RCS data feed:

	BITS				
Definition	4	3	2	1	0
NULL – NOT FOR USE IN RAIL	0	0	0	0	0
Test Product	1	X	X	X	0
Live Product	1	X	X	X	1
No Gradation	X	0	0	0	X
High Peak	X	0	0	1	X
Mid Peak	X	0	1	0	X
Shoulder Peak	X	0	1	1	X
Shoulder Off Peak	X	1	0	0	X
Mid Off Peak	X	1	0	1	X
Low Off Peak	X	1	1	0	X
Reserved for Future Use General note: any bits set for future use should be ignored by rail posts conforming to this	X	1	1	1	X

	BITS				
Definition	4	3	2	1	0
version of the specification					

3.7.7 If present the TYP23 IPE Value Group should be populated as defined below.

IPE VG Field Name	Description in ITSO Spec	Rail Uses
VGLength	Defined in ITSO TS 1000-2	No rail specific rules.
VGBitMap	Defined in ITSO TS 1000-2	No rail specific rules.
VGFormatRevision	Defined in ITSO TS 1000-2	No rail specific rules.
TransactionType	Defined in ITSO TS 1000-5	No rail specific rules.
TransactionSequenceNumber	Defined in ITSO TS 1000-2	No rail specific rules.
DateTimeStamp	Defined in ITSO TS 1000-2	No rail specific rules.
ISAMIDModifier	Defined in ITSO TS 1000-5	No rail specific rules.
ActionSequenceNumber	Defined in ITSO TS 1000-2	No rail specific rules.

IPE VG Field Name	Description in ITSO Spec	Rail Uses
CountRemainingJourneyRides	Count of remaining rides, journeys or Tickets. This count shall be decremented each time the ticket is used. A count of zero shall indicate that no rides or journeys are available.	Set to 1 for a single, 2 for a return. If a carnet product is being issued, then alternate journeys will represent out then return journeys between the specified origin and destination. For example if this is set to 10 then this represents 5 out and 5 return journeys. If an out/return leg is used out of sequence then the previous unused journey is also removed from the count. If the product is a carnet of journeys within a zone then the origin and destination should both be specified as the zone NLC and this value will represent the number of journeys without concept of single or return.
CountTransfers	Count of transfers made in the current journey. This element shall be set to zero upon IPE creation and when an initial journey leg is made.	Set to zero.
TYP23ValueFlags	Bit 0 = Auto-Renew flag Bit 1 = UsedChecked Bits 2-7 RFU	Auto-renew (facilitated by bit 0) may only be used where the product owners back office systems have been accredited by RSP (confirming that appropriate settlement data is generated). Bit 1 = Set to 0. Bits 2-7 = Set to 0.
Padding	As required.	As required

3.8 Rail products on TYP24

3.8.1 TYP24 may be used for all rail products other than Railcards or Season Tickets.

3.8.2 The following PTYPs have been allocated for use on National Rail to ensure interoperability. These shall be used by all participating TOCs and retailers.

Rail Product	PTYP Allocation
All Products	1

3.8.3 The TYP24 IPE Data Group should be populated as defined below.

IPE Field Name	Description in ITSO Spec	Rail Use	Data Format where not specified in ITSO Spec
IPELength	Defined in ITSO TS 1000-2	No rail specific rules.	
IPEBitMap	Defined in ITSO TS 1000 parts 2 and 5	See TYP24 Bit Map section below.	
IPEFormatRevision	This element shall be set to the value of the version used for this IPE	Set to an IPEFormatRevision permitted by the currently published version of the specification. IPEformatrevision =>2	
RemoveDate	Count of days. IPE can be removed after ExpiryDate + RemoveDate A value of 255 indicates that the IPE may not be removed.	Set to 1 day.	
ProductRetailer	Identity of retailer, included for information purposes, not for the purpose of determining IPE acceptability at the point of use.	Set to SDCl+ "NLC (Shift)" from the DB record for the sale.	The ProductRetailer element is made up of 2 bytes (bits 0 to 15) and would normally hold an OID16 type value. To differentiate an NLC from an OID16 the most significant bit (bit 15) must be set to 1.

IPE Field Name	Description in ITSO Spec	Rail Use	Data Format where not specified in ITSO Spec
			<p>The next 5 most significant bits (bits 10 to 14) are encoded to represent the first character of the NLC - values 0 to 31 representing characters '0' to '9' and 'A' to 'V'.</p> <p>The least significant 10 bits must be encoded as a binary representation of the last 3 digits of the supplied NLC in the range 0 to 999.</p> <p>Note: Use of first bit to indicate a Retailer NLC prevents the use of OIDs above a value of 32767 (0x7FFF).</p>
TYP24Flags	Refer to table 138 in ITSO TS 1000-5	For details see the TYP24Flags section below.	
ProductTypeEncoding	<p>Binary encoding to determine product type (single, return)</p> <p>0 = n journeys in one direction.</p> <p>1 = n journeys where pairs are treated as returns.</p> <p>2 = n journeys in either direction.</p> <p>3 – 15 = RFU.</p> <p>See 'NumberOfJourneysSold'.</p>	<p>Set to</p> <ul style="list-style-type: none"> 0 = Single 1 = Return 2 = Carnet either direction 	

IPE Field Name	Description in ITSO Spec	Rail Use	Data Format where not specified in ITSO Spec
TicketNumber	Unique reference number for the ticket.	Set to SDCl+ "Transaction Number" from the BE/BM record	HEX
NumberOfAssociatedIPes	Indicates the presence and number of the optional 'Associated IPE reference' data elements.	Set to number of IPE(s) present on the customer media used in conjunction with the product sold	
NumberOfDiscounts	Indicates the presence and number of the optional 'Discounts' data elements.	Set to 0 = none 1 = One discount	
NumberOfSupplements	Indicates the presence and number of the optional 'Supplements' data elements.	Set to number of supplements product has up to 3	
NumberOfTransferTypes	Indicates the presence and number of the optional 'Transfer' data elements.	Set to the number of transfer entitlements the product has – up to 1	
NumberOfInterchanges	Indicates the presence and number of the optional 'Interchange' data elements.	Set to the number of interchanges (OSI's) the product has – up to 7	
NumberOfRestrictionTimeBands	Indicates the presence and number of the optional 'Restriction time band' data elements.	Set to 0	
NumberOfVehicleSpecificRestrictions	Indicates the presence and number of the optional vehicle specific restrictions/easements' data elements.	Set to 0	
NumberOfRoutingPoints	Indicates the presence and number of the optional 'Routing points' data elements.	Set to 0	
Class	Accommodation class (1st or std or unknown)	Set to according to SDCl+ BE/BM record "Class Indicator" field	

IPE Field Name	Description in ITSO Spec	Rail Use	Data Format where not specified in ITSO Spec
		0=unknown (note that "Class Indicator" field in BE/BM record will be set to 9 for the equivalent of this item) 1 =1st 2 =Std	
AutoRenewTimeAfterExpiry	Number of days after expiry of original product that auto-renew still applies	Set to 0	
NumberOfJourneysSold	Value of 'n' in 'ProductTypeEncoding', Where: n=1 for a single n=2 for a return n=10 for a carnet of 10 singles n=60 for a carnet of 30 returns.	Rail rules: Set to – 1 for single 2 for return 3-60 for 3 to 60 single carnet tickets Returns treated as two singles Return carnets are multiples of return ticketsRefer to ProductTypeEncoding	
OutPortionPeriodOfValidity	Out portion period of validity in days relative to 'OutPortionValidFrom' - used to define outward portion end of validity.	Obtain as part of "Select a product" process	
RtnPortionPeriodOfValidity	Rtn portion period of validity in days relative to 'RtnPortionValidFrom' - used to define return portion end of validity.	Obtain as part of "Select a product" process	
OperatorSpecificity	Used to indicate that product is only valid on the services of a specific operator.	Only set if product is TOC specific Derive from carrier in timetable information for product/flow sold.	STRING

IPE Field Name	Description in ITSO Spec	Rail Use	Data Format where not specified in ITSO Spec
FaresTypeOfTicket	Fares Type of Ticket (FTOT) code.	Note that this differs from the related SDCl+ where the Type of Ticket is LTOT. The FTOT is produced during the Select a Product process.	STRING
PartySizeAdult	Number of adult passengers	Set to either 0 or 1. Exactly one of PartySizeAdult and PartySizeChild must equal 1. The other must equal 0.	
PartySizeChild	Number of child passengers	Set to either 0 or 1. Exactly one of PartySizeAdult and PartySizeChild must equal 1. The other must equal 0.	
PartySizeConcession	Number of concessionary travellers recorded here shall not also be recorded in either PartySizeAdult or PartySizeChild.	Set to either 0 or 1. Exactly one of PartySizeAdult, PartySizeChild and PartySizeConcession must equal 1. The other two must equal 0. Where a customer has an entitlement such as a railcard or a concessionary pass status that has had an effect on the product then this field must be populated instead of either PartySizeAdult or PartySizeChild.	

IPE Field Name	Description in ITSO Spec	Rail Use	Data Format where not specified in ITSO Spec
IdDocumentReference	To cross reference to an ID document (e.g. non-Smart railcard or photocard)	5 digit number, first digit indicates ID Type last four digits are set to last four numeric digits from ID to be used by passenger, details of ID Types can be found in RSPS3008.	HEX
Origin	Location of ticket origin (as sold). For validation purposes: on a return ticket, for the out portion, this is the journey origin, on the return portion this field is to be used as the destination.	Populated with the SDCI+ BE/BM record NLC that defines the journey origin. If the product does not have any geographical validity then this element is set to default.	LOC DEF 203 Or LOC DEF 255 if not used.
Destination	Location of ticket destination (as sold).	Populated with the SDCI+ BE/BM record NLC that defines the journey destination. If the product does not have any geographical validity then this element is set to default.	LOC DEF 203 Or LOC DEF 255 if not used.
AlternativeOrigin	An alternative Location of ticket origin.	Set to Null	LOC DEF 255
AlternativeDestination	An alternative Location of ticket destination.	Set to Null	LOC DEF 255
Route	UD Route code.	Set to the 5 digit route code as used to define the flow on which the rail product is priced (as defined within the RSP fares data). If the product does not have any geographical validity (e.g. a staff pass) then this element is set to default,, default is 00000, "any permitted". Route Code in the SDCI+ BE record	STRING

IPE Field Name	Description in ITSO Spec	Rail Use	Data Format where not specified in ITSO Spec
OutPortionValidFrom	Out portion valid from date.	Set to 00:01 (time) and "Date (Travel)"/ "Date (Start of Validity)" from the SDCl+ BE/BM record Validation will in most cases override this to whatever time is set by the POST for the product.	
RtnPortionValidFrom	Rtn portion valid from date	Set to 00:01 (time) and "Date (Travel)" in accordance with the RSP Fares Data rule for the Return portion of the product	
RestrictionCode	Restriction code.	Set to the 2 string character journey restriction code for the rail product priced (as defined within the RSP fares data).	STRING
DaysTravelPermitted	Restriction definition - days of week on which product is valid (binary flags for MTWTFSS & Bank Holidays)	Set to 11111111 if travel is permitted on any day of the week. As some products are valid only for travel on specific days (e.g. Weekender tickets) this value will reflect specific day validity if appropriate	
DaysRestrictionApplies	Restriction definition - days of week where restriction applies (binary flags for MTWTFSS & Bank Holidays)	Set to 00000000	
AmountPaidCurrencyCode	As per item name.	For National Rail the scaling factor bits shall be set to zero to avoid reduction in granularity of the AmountPaid.	
AmountPaidMOP	Method of payment (majority if multiple)	Set according to SDCl+ BE/BM record "MoP Code" field.	

IPE Field Name	Description in ITSO Spec	Rail Use	Data Format where not specified in ITSO Spec
		If more than 1 byte is recorded in SDCI+ use CCST X rules in RSPS3018.	
AmountPaid	Price paid by customer	Set to SDCI+ "Fare Amount" from the BE/BM record in pence.	
VendorLoc	Location of the ticket vendor	Set to SDCI+ "NLC (Shift)" from the DB record.	
Repeating Data Group of associated IPEs			
IPEInstanceID	Instance ID of other IPEs that form part of the total product	Set to IPEInstanceID of the IPE used in conjunction with sale of product	
Repeating Data Group of discounts			
DiscountCode	5 character UD code to identify discount.	Set to the 3/5 character code to identify discount (railcard code or other) from the SDCI+ from the BE record. If if discount is based on IPE 14/16, otherwise set to HEX equivalent of "XXXXX"."".	HEX
DiscountAmount	Value in base units e.g. pence. Set to zero if 'DiscountPercentage' is populated.	Set to 0	
DiscountPercentage	Specified to rounded integer (e.g. 33.3% = 33). Set to zero if 'DiscountAmount' is populated	Set to BE/BM Record "Discount Percentage"	
DiscountCodeType	Type of discount code.	Set to 00001 = Status Code, 00010 = Lennon discount code, 00011 = IPE 14/16 discount.	HEX

IPE Field Name	Description in ITSO Spec	Rail Use	Data Format where not specified in ITSO Spec
Repeating Data Group of supplement codes			
AssociatedSupplementCode	UD Supplement Code.	Set to the 3 character supplement code for the rail supplements priced (as defined within the RSP fares data).	
Repeating Data Group of interchanges			
OutOfLocationInterchangeExit	Location where an interchange exit may be required for the journey (may be used for nominated break of journey)	Populated with the NLC that defines the location interchange exit point.	
OutOfLocationInterchangeEntry	Location where an interchange entry may be required for the journey (may be same as Interchange exit location)	Populated with the NLC that defines the location interchange entry point.	
PermittedInterchangeTime	Permitted interchange time - number of minutes.	No rail specific rules - Interchange time permitted will not be stored in the IPE and will be configured in the Rail Validator	Set default value to Zero to specify using configuration in the Rail Validator
Repeating Data Group of transfer entitlements			
TransferEntitlementType	Encoded transfer entitlement.	Set to 2 = Break of journey permitted (Note use of "1 – Cross London Marker" has now been removed and is handled by Interchanges).	
NumberOfTransfers	Number of permitted transfers of type defined in 'TransferEntitlementType'.	Break of journey – Set to maximum value permitted by ITSO specification (511).	

IPE Field Name	Description in ITSO Spec	Rail Use	Data Format where not specified in ITSO Spec
ExtendedValidityPeriod	POV that transfer is valid for after end of main product validity - number of hours.	Set to zero –Break of journey entitlements do not require extended time validity.	
Repeating Data Group restriction time band – DO NOT USE			
OperatorApplicability	UD Operator code to which the restriction time band applies		
SpecificLocationApplicability	Specific Origin or Destination location to which the restriction time band applies.		
TimeBandOnOutOrReturn	Used to indicate if associated time band applies to the outward or return journey or both		
TimeBandStart	Restriction definition - start time of time band		
TimeBandEnd	Restriction definition – end time of time band		
TimeBandOnArriveOrDepart	Restriction definition - defines whether time band restriction applies to departure or arrival		
TimeBandIncludeExcludeFlag	Restriction definition - defines whether the product is valid or not within the time band		
Repeating Data Group of train specific restrictions – DO NOT USE			
SpecificVehicleDepartureLocation	Location of departure (service origin)		

IPE Field Name	Description in ITSO Spec	Rail Use	Data Format where not specified in ITSO Spec
SpecificVehicleDepartureTime	Timestamp of the departure time (from service origin) of the vehicle that is either restricted or 'eased'.		
RestrictionOrEasementFlag	Flag to indicate whether travel is permitted on the specific service defined in the rest of this data block		
Repeating Data Group for routing data – DO NOT USE			
RoutingLocation	Location of routing point		
ViaNotVia	Indicates whether the routing point is a via or no-via constraint		
Customer details group dataset			
Name	Passenger's name	Set to First 20 characters of a passenger's name (concatenation of Last Name, Space and First Name), if longer than 20 characters, truncate from the right.	
Gender	Passenger's gender	Set to Bit Map 00=Not specified, 01=Male, 10=Female, 11 = Not Used Only used for Sleeper services. 00 for non gender specific e.g. seating on sleeper. 11 for gender not used	

IPE Field Name	Description in ITSO Spec	Rail Use	Data Format where not specified in ITSO Spec
Padding	Pad with 0x00's to a whole number of blocks, less 3 bytes for IIN if that element is present.	No rail specific rules	
IIN	Issuer Identification Number	N/A Set to 0 No rail specific rules	

3.8.4 The TYP24 bitmap shall be populated as defined below where a bit shall be set to one (1) when the corresponding data element (or elements) is present.

Bit	Related Data Element	Rail Uses
0 (least significant)	IIN present	Set to 00 No rail specific rules
1	PaxDetail data elements present	Set to Bit Map 0=no, 1=yes
2	IPE contains optional data elements as specified in: NumberOfAssociatedIPEs, NumberOfDiscounts, NumberOfSupplements, NumbersOfTransferTypes, NumberOfInterchanges, NumberOfRestrictionTimeBands, NumberOfVehicleSpecificRestrictions and NumberOfRoutingPoints	Set to Bit Map 0=no, 1=yes
3	VG contains optional data elements as specified in NumberOfReservations.	Set to Bit Map 0=no, 1=yes
4	RFU	Set to Bit Map 0
5 (most significant)	RFU	Set to Bit Map 0

3.8.5 The TYP24 Flags

Bit	Related Data Element	Rail Uses
0	When set to one (1) indicates that the product contains a Follow-on renewal Ticket	Set to Bit Map 0
1	When set to one (1) indicates that the product contains a Duplicate Ticket	Set to Bit Map 0
2	When set to one (1) indicates that the product contains a Replacement Ticket	Set to Bit Map 0=no, 1=yes (for technical failure of card)
3	When set to one (1) indicates that the product contains an Unfulfilled Warrant	Set to Bit Map 0
4	When set to one (1) indicates that the product contains a Carnet	Set to Bit Map 0=no, 1=yes if NumberOfJourneysSold >2 or RCS CCSTformat element specifies as carnet.
5	TestOrLiveFlag: When set to one (1) indicates that the product is a test ticket.	Set to Bit Map 0=live, 1=test
6	PassengerDetailsFlag: When set to one (1) indicates that the IPE contains passenger name and gender details.	Set to same setting as Type 24 Bitmap, bit 1
7	ReservationsMandatoryFlag: When set to one (1) indicated that a reserved seat is mandatory.	Set to Bit Map 0=no, 1=yes
8	CompanionPermittedFlag: When set to one (1) indicates that a companion is allowed.	Always set to Bit Map 0=no
9	AutoRenewFlag: When set to one (1) indicates that AutoRenew is enabled.	Set to Bit Map 0=disabled

Bit	Related Data Element	Rail Uses
10	RFU	Set to Bit Map 0 Shall be ignored if it is set to one (1)
11	RFU	Set to Bit Map 0 Shall be ignored if it is set to one (1)

3.8.6 The TYP24 Value Group

IPE Field Name	Description in ITSO Spec	Rail Uses	Data Format where not specified in ITSO Spec
JourneysRemaining	Count of the number of journeys that the ticket is still valid for and is reduced on exit at destination. Initially set to 2 for a return ticket and 1 for a single.	Should initially be set to NumberofJourneysSold	
TransfersRemaining	Count of the total number of remaining transfers - reduced by the equipment of the service provider honouring the transfer entitlement. Up to 3 transfer types are permitted each with up to 511 transfers	If transfer entitlements defined (e.g. Break of Journey) then set to number of transfers applicable. Otherwise if no transfer entitlements set to 0.	
JourneyPartUsedFlag	Indicates that the current part of the product has been part used (e.g. an outward leg up to an out-of-station interchange) Set to 1 on exit at interchange and re-set to 0 when a journey is completed e.g. when the out portion is used	Initially set to Bit Map 0 This flag will be set by the rail validator when a break of journey or out of station interchange is begun.	
NumberOfReservations	Product structuring data: indicates the presence and number of the optional reservations data elements.	Set to Binary 0 - 2 based on number of reservations (0 means no reservations, 3 - 15 not used)	

IPE Field Name	Description in ITSO Spec	Rail Uses	Data Format where not specified in ITSO Spec
DTSOfLastValidation	DTS of last validation event. Maybe an on vehicle or the start of an interchange period.	No rail specific rules This DTS will be set by the rail validator when any validation occurs (inc break of journey & out of station interchanges).	
LocationOfLastValidation	Location of last validation event.	Initially set to null. This location will be set by the rail validator when this product has been selected as being used (inc break of journey & out of station interchanges). For use on train optional validation setting using either train number (Head code), route code or NLC as appropriate.	
BookingReference	Booking Reference	Set to 8 character NRS booking reference number if numreservations>0 Use the first booking number where number of reservations >1	
Repeating Data Group of Reservations			
LegDepartureDateTime	Date and time of reserved leg departure.	No rail specific rules	

IPE Field Name	Description in ITSO Spec	Rail Uses	Data Format where not specified in ITSO Spec
LegServiceId	Retail Service ID of the reserved leg.	Populated with the 8 character RSID that defines the train service for the leg.	
LegOrigin	Location of Leg origin.	Populated with the NLC that defines the origin for the leg.	
LegDestination	Location of leg destination.	Populated with the NLC that defines the destination for the leg.	
Coach	Coach ID.	Set to 2 characters (left padded with spaces) of coach ID eg 'space A' If ReservationType=3 set to null	
SeatNumber	Seat Number ID.	Set to 3 ASCII characters (left padded with spaces) seat number e.g. ' 33' hex value 203333 If ReservationType=3 set to null	
AccommodationAttribute	Accommodation Attribute	Set to 4 characters from NRS data feed (via RDS) If ReservationType=3 set to null	

IPE Field Name	Description in ITSO Spec	Rail Uses	Data Format where not specified in ITSO Spec
SeatDirection	Facing, Back or Airline - or null if not used	From NRS: <i>01 = Facing</i> <i>10 = Back</i> <i>11 = Airline</i> <i>If ReservationType=3 set to null</i>	
BerthUpperLower	Indicates sleeper berth position: (binary) 00 = Not specified 01 = Lower 10 = Upper 11 = RFU	From NRS	
ReservationType	Seat/Berth/Bike/No-place/Wheelchair type code.	Set to 0=Seat, 1=Berth, 2=Bike, 3=No-place, 4=Wheelchair, 5-15=RFU	BMP
TogetherFlag	Indication as to whether sleeper cabin is shared.	Set to Bit Map 0=not together, 1=together	

IPE Field Name	Description in ITSO Spec	Rail Uses	Data Format where not specified in ITSO Spec
Padding	Pad to a whole number of blocks with 0x00's Padding shall be provided once only for the Data Group comprising value records. Padding shall be positioned at the end of the Data Group.	No rail specific rules	

4. Validation

4.1 Introduction

4.1.1 The full validation process includes:

- Interaction with the ITSO media (including checking hotlists for media and products);
- Identification of valid travel products;
- An interaction with the media such that data stored on the media is updated to reflect the commencement or termination of a journey and
- The oldest expired product should be deleted where there are no free directory entries available by the relevant processing POSTS in the Rail environment. Product Deletions should only take place if the TT is closed, if it is not closed and can be closed during the current operation (e.g. as part of an Exit), then it should be closed before the deletion takes place.

4.1.2 The rules detailed here are the minimum that must be applied by rail validation equipment to support interoperability. Schemes and suppliers are not limited to the logic described here provided that any additional checks are not contrary to the minimum requirements.

4.1.3 The validation requirements have been defined to minimise the processing on entry/exit validation while coping with the scenario of multiple products valid from the journey origin at the time of entry.

4.1.4 At a high-level the rail specific elements of the validation approach are as follows:

- Identify whether there are any valid products on the media for the time and location of the validation event (note: it is suggested that the seal of each product is not checked at this stage);
- Following the identification that there are one or more valid products held on the media, the validation device creates a Transient Ticket to record the entry to the rail network independently of any potentially valid IPEs identified. The Transient Ticket will record a list of candidate IPEs pointing to those products on the media valid from the point of entry;
- If there is only one valid product held on the media, it should be selected ;
- If there is no equipment to support check-in at the journey origin, the check-in may be executed by an on-train device (similarly check-out may be done on-train for journeys to non-equipped locations);
- The Transient Ticket is then assessed on exit validation to precisely determine whether any of the candidate products are valid for the journey made;
- Following the identification of a valid product, its seal should be verified;
- Once the validity of the product is decided, and if appropriate for the product, its value group should be updated to reflect the fact that a journey was made; and
- An ITSO 0209 message recording the actual use of the product needs to be sent to the Service Operator of the entry point equipment to enable them to 'close' the journey that was started. This enables the Service Operator of the entry point to identify occurrences of 'incomplete journeys' that may be as a result of improper use of fraudulent activity if it is a task they wish to perform.

4.1.5 A validation device must have an ISAM to enable the update of data on the media and shall also have been ITSO certified.

- 4.1.6 A process flow chart providing guidance on the validation scenarios possible can be found in a separate RSP specification.

4.2 Scope

- 4.2.1 If Transient Ticket format revision used by the CM is 1–3 it should not be processed further, as it is not a rail industry Transient Ticket.
- 4.2.2 This section lists the Operations and Media Updates an ITSO POST may perform and the Messages it sends during the validation process (check-in/ check-through/ check-out). The Operations and Media Updates used for making a sale and for post-sale events are described in other RSP standards documents referenced in section 1.5.
- 4.2.3 The Operations listed are limited to those that write data to the Customer Media (CM), with a single, specific task in mind (e.g. check-out where no decrement required [for a season ticket]), when the decision on what to do has been made.
- 4.2.4 An Operation may be initiated directly by the operator (if there is one), automatically, or a combination of both.
- 4.2.5 The list of Operations is definitive for the Data Contents of the currently scoped IPEs (2, 22, 23 and 24 – also TYP16 in some PTE areas) and a POST shall not perform any other Operations on them, but a POST is not obliged to be able to perform all of the listed Operations (i.e. it may perform a sub-set); these are defined later as Profiles.
- 4.2.6 A single contact with a CM may result in multiple Operations being performed; e.g. on a train where it is known that there are no gates at the passenger's origin and destination: (i) OP1: Check-in, then (ii) OP2: Check-out where no decrement required.
- 4.2.7 An Operation consists of one or more Media Updates and Messages.
- 4.2.8 A Media Update is a low-level interaction with the CM. The operator of a POST will not have knowledge of this, but will interact at a higher level.
- 4.2.9 A Message is the ITSO-defined POST-to-HOPS communication.
- 4.2.10 Read-only devices are, by definition, outside the scope of this document.

4.3 General Notes

- 4.3.1 It is not possible to update a Transient Ticket, so 'alterations' are made by the POST copying it into the POST's own memory, making the required alterations and writing a new Transient Ticket to the CM.
- 4.3.2 Media Updates that write a new Transient Ticket to the CM without copying across existing values start with the term 'construct' (although some of the new values might coincidentally be the same).
- 4.3.3 Once a new Transient Ticket is created the old one is not referred to during validation, other than for OP8: undo inspection product selection.
- 4.3.4 When Data Element contents are listed in this document:
- Data Elements in different Data Groups are separated with dotted lines
 - The literal contents are in normal font; instructions are in italics.

- 4.3.5 The IPEID1–4 Data Elements (marked with † symbol) should only be populated in sequence, i.e. IPEID1 must always be populated, then IPEID2 should be populated next (if required), IPEID3 may only be populated if IPEID2 is, and IPEID4 may only be populated if IPEID3 is. If the list of Candidate IPEs reduces in size, it may be necessary to not just remove unwanted items from the list, but to move remaining IPEs so the aforementioned logic is complied with.
- 4.3.6 As per the ITSO specifications, within an IPE's Data Content only Data Elements from an IPE's Value Record Data Group may be updated; those in its Data Group may not.
- 4.3.7 When a POST updates an IPE's Value Group Dataset, copies a Transient Ticket or updates the Log Directory, it must maintain the values of the Data Elements, other than for the Data Elements which it is writing as per the Media Update, even if they are considered to be unused Data Elements and/or erroneous values.
- 4.3.8 The purpose of this is to provide consistent results and enable forwards-compatibility — as much as it is practical to consider — with new functionality that a POST might not have yet implemented.
- 4.3.9 This may lead to potentially unexpected output from the POST, however new POST implementations would be written to account for this, which is easier than updating existing POSTs.
- 4.3.10 The following terminology is used when referring to return tickets.

Term	Notes
Unused	Neither the out nor the return portion has been used, and no check-in has occurred for either.
Quarter-used	The out portion has been checked-in only, but no check-out has occurred
Half-used	The out portion has been fully used (checked-in and checked-out), but the return portion has not been used (not even checked-in)
Three-quarters-used	The out portion has been fully used (checked-in and checked-out), and the return portion has been checked-in only.
Used	Both the out and return parts have been both checked-in and checked-out

- 4.3.11 On a TYP23 it is not possible to distinguish a half-used return from an unused single¹, which means it is not possible to stop someone travelling in the wrong direction on a single.

4.4 Break of Journey and Out of Station Interchange

4.4.1 Break of Journeys (BOJ)

BOJ is permissible for Season Products (TYP 22). The second journey is started on re-entry, which will be treated separately from the first journey up to the BOJ. Each is a complete journey in its own right. The resumed journey starting with the re-entry will be treated as a

¹ TYP24 corrects this.

second journey completely divorced from the first. Rail Validation devices should have line of route validity configured to support this, which will need to be set up by the Service Operator.

- BOJ for non season products and BOJ validation will not be treated as two journeys and will be limited to TYP 24 product. Thus if a TOC wants to issue a non season product that has BOJ permitted it must be achieved via the TYP 24 product.
- The TYP 24 - "TransferEntitlementType" in Transfers data group will be used to identify BOJ permitted.
- For non Season TYP 24 products where BOJ is permitted the BOJ start and end will be recorded in the Transient Ticket (in the same way that Check In and Check Out events are currently recorded)
- A "BOJ OUT" and a "BOJ IN" transient ticket event will be defined with identifiable ITSO TransactionTypes
- BOJ OUT : TransactionType "exchange (8)"
- BOJ IN : TransactionType "record-of-multiple-leg-journey (14)"
- A "BOJ OUT" will mimic the operation of the current "Inspection with Product Selection" transient ticket event. Thus on BOJ an IPE must be selected automatically or if this is not possible then Seek assistance displayed.
- A "BOJ IN" event will be bounded by the following rules (whichever is greater)
- Within day of validity of ticket.
- Or within Maximum Journey Time.

The new Transient Ticket events will not contain details about the BOJ itself as this data is recorded in the selected IPE's value group and value group extension.

4.4.2 Out of Station Interchanges (OSI)

4.4.2.1 Applicable Rail Validation devices will be configured such that they are aware that they are an OSI location

- and have the NLC of the partner location configured.
- and have a time limit for the OSI configured (usually 10s of minutes).
- and have a time limit for the Interchange configured.

4.4.2.2 Planned OSIs (interchanges) will be stored in the TYP 24 Interchange Data Group.

- Allowable out / In interchange locations stored in IPE.
- These will only be for the interchanges where the passenger may not complete the interchange within the usual OSI times.
- Interchange time permitted to be configurable in the Rail Validation device.

4.4.2.3 Unplanned OSIs within the IoP estate will follow standard OSI rules as for Oyster (normal CIN / COUT validation rules allow OSI in these cases).

- OSI time will be configurable in the Rail Validation device.
- Unplanned OSI's may apply to all rail IPEs

4.5 Pass Activation

4.5.1 Pass activation is applicable only to Period Carnet / Period Pass Products (TYP 22), where a value group exists for the product, Stored Passes are enabled and the product is either the sole valid or the selected product on the media at that validation. Unlike other products

where usage is determined at the exit validation, pass activation may occur at either entry or an intermediate (inspection) point.

- 4.5.2 Activation at exit is undertaken in line with the requirements as for other products.

4.6 Operations

- 4.6.1 The Media Updates listed in the 'Notes' column are listed in the order
- Transient Ticket (sub-ordered according to the ordering of the Data Groups within the ITSO specification),
 - IPE Value Group and then
 - Log Directory.
- 4.6.2 They are not listed in chronological order of when they should be performed, apart from MU14: Commit updates and modify Log Directory, which, by its nature, should be performed last.
- 4.6.3 From an implementation perspective, if a POST needs to perform multiple Media Updates on the same part of a Shell — i.e. Transient Ticket or IPE Value Group — it is expected that it will do them in one, single write, as this will reduce the interaction time. However, for convenience of reference, these have been listed separately.
- 4.6.4 Transactional messages within each operation will follow the requirements set out in the following documentation;
- Developer Guidance 0019 Check In – Check Out Principles for Validation with Product Selection on Exit, at this is mandatory for the UK rail industry
 - The messaging requirements defined in section 4.3 of Part 6 of the ITSO specification.
- 4.6.5 Where the need has been identified for additional transaction messaging requirements which are not covered by DG0019 or Part 6, these message requirements are listed within the operation, usually by reference to an ITSO Shell and or Product Owner.
- 4.6.6 Where a transaction message is defined, the 'Destination' column is not necessarily the HOPS that initially receive the Message, as all Messages are sent via the POST to the service operator's HOPS, but defines the owner of the HOPS the message shall be sent to.
- 4.6.7 For rail products, seals must be checked for certain Operations.

Operation	Seal Checking
OP1: check in	Optional
OP2: check-out where no decrement required	Mandatory for IPE being used
OP3: check-out where decrement required	Mandatory for IPE being used
OP4: undo check-in	Optional
OP5: reverse decrement	Optional
OP6: inspection product selection	Mandatory for IPE being used
OP7: inspection only	Optional
OP8: undo inspection product selection	Optional

Operation	Seal Checking
OP9: check-out with forced check in where no decrement required	Mandatory for IPE being used
OP10: check-out with forced check in where decrement required	Mandatory for IPE being used
OP11: break of journey out	Mandatory for IPE being used
OP12: break of journey in	Optional
OP13: break of journey out with forced check in where decrement required	Mandatory for IPE being used
OP14: Check-out where part-used update required (e.g. OSI)	Mandatory for IPE being used
OP15: Check-out with forced check-in where part-used update required (e.g. OSI)	Mandatory for IPE being used
OP16: pass activation at check-in	Mandatory for IPE being used
OP17: pass activation at inspection	Mandatory for IPE being used
OP18: pass activation at check-out	Mandatory for IPE being used
OP19: Pass activation at check-out with forced check-in	Mandatory for IPE being used
OP20 – OP25	RFU
OP26: inspection product selection following forced check-in	Mandatory for IPE being used
OP27: inspection only following forced check-in	Optional
OP28: Single product valid at entry at check-in (not Pass product)	Mandatory for IPE being used

4.6.8 It may be desirable that a POST checks the seals of all IPEs; for example, if a POST is awaiting a user decision for inspection product selection, in the time it takes the user to select, the POST could have checked all of the seals, thus saving time after selection. However this is an implementation detail beyond the scope of this document.

4.6.9 A POST may implement different Operations. The details of these operations and the associated ITSO certification to satisfy RSP interoperability requirements are set out in the ITSO Certification of Rail POST Equipment

Ref.	Operation	Notes		
OP1	Check-in where multiple products valid on entry	The type of ticket checked-in does not affect the Media Updates used.		
		MU Ref.	Media Update	
		MU1	Construct Transient Ticket	
		MU14	Commit updates and modify Log Directory	
		Message Ref.	Message	Destination
		0210	Journey Record	As per DG0019 plus Shell Owner
OP2	Check-out where no decrement required	MU Ref.	Media Update	
		MU3	Set status to checked-out on Transient Ticket	
		MU6	Set Destination on Transient Ticket	
		MU7	Set IPE on Transient Ticket (conditional*)	
		MU8	Remove Candidate IPE from Transient Ticket (conditional*)	
		MU10	Remove Entry from Transient Ticket (conditional**)	
		MU11	Remove Entry OID from Transient Ticket ***	
		MU14	Commit updates and modify Log Directory	
		* Only required if an inspection product selection Operation has NOT been performed previously.		
		** Only required if an inspection only or inspection product selection Operation HAS been performed previously.		
		*** Entry and Entry OID information preserved in HOPS through inclusion in 209/210 message		
		Message Ref.	Message	Destination
		0210	Journey Record	As per DG0019 plus Shell Owner
		0209	Journey Record	As per DG0019 plus Shell Owner

Ref.	Operation	Notes		
OP3	Check-out where decrement required	MU Ref.	Media Update	
		MU3	Set status to checked-out on Transient Ticket	
		MU6	Set Destination on Transient Ticket	
		MU7	Set IPE on Transient Ticket (<i>conditional*</i>)	
		MU8	Remove Candidate IPE from Transient Ticket (<i>conditional*</i>)	
		MU10	Remove Entry from Transient Ticket (<i>conditional**</i>)	
		MU11	Remove Entry OID from Transient Ticket ***	
		MU12	Decrement Value Group remaining journeys	
		MU14	Commit updates and modify Log Directory	
		 * Only required if an inspection product selection Operation has NOT been performed previously.		
		** Only required if an inspection only or inspection product selection Operation HAS been performed previously.		
		*** Entry and Entry OID information preserved in HOPS through inclusion in 209/210 message		
		Message Ref.	Message	Destination
		0210	Journey Record	As per DG0019 plus Shell Owner
		0209	Journey Record	As per DG0019 plus Shell Owner
0208; 0006	Amend IPE	As per Part 6 plus Shell Owner		
OP4	Undo check-in	It is intended this Operation will be performed by a POST intending to undo a check-in.		
		MU Ref.	Media Update	
		MU5	Set status to undo-previous-event-without-refund on Transient Ticket	
		MU14	Commit updates and modify Log Directory	
		The following transaction messages are to be written for this operation (no other messages are required);		
		Message Ref.	Message	Destination
		0210	Journey Record	Exit POST service operator
				Entry POST service operator
				Shell Owner
		The entry POST service operator will receive this as a second 0210 message, and will need to use this to interpret that a 0209 will not be forthcoming.		

Ref.	Operation	Notes		
OP5	Reverse decrement	It is intended this Operation will be performed by a POST intending to undo a check-out. This operation shall only be carried out by an attended device.		
		This operation does not re-check-in the passenger, as this might not be desired; if it is, the 'OP1: check-in' Operation should also be performed.		
		MU Ref.	Media Update	
		MU5 MU13	Set status to undo-previous-event-without-refund on Transient Ticket Increment Value Group remaining journeys	
		MU14	Commit updates and modify Log Directory	
		Message Ref.	Message	Destination
		0208; 0006	Amend Ticket IPE	As per Part 6 plus Shell Owner
OP6	Inspection product selection			
		MU Ref.	Media Update	
		MU4	Set status to inspected on Transient Ticket	
		MU7	Set IPE on Transient Ticket	
		MU8	Remove Candidate IPE from Transient Ticket	
		MU9	Set ENTRY on Transient Ticket (<i>conditional*</i>)	
		MU14	Commit updates and modify Log Directory	
* To be populated if state at beginning of this operation is checked in.				
		Message Ref.	Message	Destination
		0209	Journey Record	As per DG0019 plus Shell Owner
		0210	Journey Record	As per DG0019 plus Shell Owner
OP7	Inspection only			
		MU Ref.	Media Update	
		MU4	Set status to inspected on Transient Ticket	
		MU9	Set ENTRY on Transient Ticket (<i>conditional*</i>)	
		MU14	Commit updates and modify Log Directory	
		* To be populated if state at beginning of this operation is checked in.		
		Message Ref.	Message	Destination
		0210	Journey record	As per DG0019 plus Shell Owner

Ref.	Operation	Notes		
OP8	Undo inspection product selection	MU Ref.	Media Update	
		MU2	Copy Transient Ticket occupying Previous slot	
		MU14	Commit updates and modify Log Directory	
		Message Ref.	Message	Destination
		0210	Journey record	POST service operator Shell Owner
OP9	Check-out with forced check-in where no decrement required	0300	Transaction Reversal	As per Part 6 plus Shell Owner
		MU Ref.	Media Update	
		MU3a	Construct Transient Ticket (Null Origin)	
		MU6	Set Destination on Transient Ticket	
		MU7	Set IPE on Transient Ticket	
OP10	Check-out with forced check-in where decrement required	MU14	Commit updates and modify Log Directory	
		Message Ref.	Message	Destination
		0210	Journey Record	As per DG0019 plus Shell Owner
		0209	Journey Record	As per Part 6 plus Shell Owner
		MU Ref.	Media Update	
		MU3a	Construct Transient Ticket (Null Origin)	
		MU6	Set Destination on Transient Ticket	
		MU7	Set IPE on Transient Ticket	
		MU12	Decrement Value Group remaining journeys	
		MU14	Commit updates and modify Log Directory	
		Message Ref.	Message	Destination
		0210	Journey Record	As per DG0019 plus Shell Owner
		0209	Journey Record	As per Part 6 plus Shell Owner
		0208; 0006	Amend IPE	As per Part 6 plus Shell Owner

Ref.	Operation	Notes			
OP11	Break of journey out	MU Ref.	Media Update		
		MU15	Set status to break-of-journey-out on Transient Ticket		
		MU7	Set IPE on Transient Ticket (<i>conditional*</i>)		
		MU8	Remove Candidate IPE from Transient Ticket (<i>conditional*</i>)		
		MU9	Set ENTRY on Transient Ticket (<i>conditional**</i>)		
		MU16	Update Value Group to reflect BoJ Exit.		
		MU14	Commit updates and modify Log Directory		
		* Only required if an inspection product selection Operation has NOT been performed previously.			
		** To be populated if state at beginning of this operation is checked in.			
		Message Ref.	Message	Destination	
0210	Journey Record	As per DG0019 plus Shell Owner			
0209	Journey Record	As per DG0019 plus Shell Owner			
0208; 0006	Amend IPE	As per Part 6 plus Shell Owner			
OP12	Break of journey in	MU Ref.	Media Update		
		MU17	Set status to break-of-journey-in on Transient Ticket		
		MU9	Set ENTRY on Transient Ticket (<i>conditional*</i>)		
		MU14	Commit updates and modify Log Directory		
		* To be populated if state at beginning of this operation is checked in.			
		Message Ref.	Message	Destination	
0210	Journey record	As per DG0019 plus Shell Owner			
OP13	Break of journey out with forced check in where decrement required	MU Ref.	Media Update		
		MU15a	Construct Transient Ticket (Null Origin)		
		MU7	Set IPE on Transient Ticket		
		MU16	Update Value Group to reflect BoJ Exit.		
		MU14	Commit updates and modify Log Directory		
		Message Ref.	Message	Destination	
		0210	Journey Record	As per DG0019 plus Shell Owner	
		0209	Journey Record	As per Part 6 plus Shell Owner	
		0208; 0006	Amend IPE	As per Part 6 plus Shell Owner	

Ref.	Operation	Notes			
OP14	Check-out where part-used update required (e.g. OSI)	MU Ref.	Media Update		
		MU3	Set status to checked-out on Transient Ticket		
		MU6	Set Destination on Transient Ticket		
		MU7	Set IPE on Transient Ticket (<i>conditional*</i>)		
		MU8	Remove Candidate IPE from Transient Ticket (<i>conditional*</i>)		
		MU10	Remove Entry from Transient Ticket (<i>conditional**</i>)		
		MU11	Remove Entry OID from Transient Ticket ***		
		MU18	Update Value Group to reflect BoJ Re-Entry		
		MU14	Commit updates and modify Log Directory		
		* Only required if an inspection product selection Operation has NOT been performed previously.			
		** Only required if an inspection only or inspection product selection Operation HAS been performed previously.			
		*** Entry and Entry OID information preserved in HOPS through inclusion in 209/210 message			
		Message Ref.	Message	Destination	
0210	Journey Record	As per DG0019 plus Shell Owner			
0209	Journey Record	As per DG0019 plus Shell Owner			
0208; 0006	Amend IPE	As per Part 6 plus Shell Owner			
OP15	Check-out with forced check-in where part-used update required (e.g. OSI)	MU Ref.	Media Update		
		MU3a	Construct Transient Ticket (Null Origin)		
		MU6	Set Destination on Transient Ticket		
		MU7	Set IPE on Transient Ticket		
		MU18	Update Value Group to reflect BoJ Re-Entry		
		MU14	Commit updates and modify Log Directory		
		Message Ref.	Message	Destination	
		0210	Journey Record	As per DG0019 plus Shell Owner	
		0209	Journey Record	As per DG0019 plus Shell Owner	
		0208; 0006	Amend IPE	As per Part 6 plus Shell Owner	

Ref.	Operation	Notes		
OP16	Pass activation at check-in	MU Ref.	Media Update	
		MU19	Construct Transient Ticket (product selected)	
		MU20	Decrement Value Group remaining stored passes	
		MU14	Commit updates and modify Log Directory	
		Message Ref.	Message	Destination
		0210	Journey Record	As per DG0019 plus Shell Owner
		0209	Journey Record	As per Part 6 plus Shell Owner
		0208; 0006	Amend IPE	As per Part 6 plus Shell Owner
OP17	Pass activation at inspection	MU Ref.	Media Update	
		MU4	Set status to inspected on Transient Ticket	
		MU7	Set IPE on Transient Ticket	
		MU8	Remove Candidate IPE from Transient Ticket (<i>conditional*</i>)	
		MU9	Set ENTRY on Transient Ticket (<i>conditional*</i>)	
		MU20	Decrement Value Group remaining stored passes	
		MU14	Commit updates and modify Log Directory	
		* To be applied if state at beginning of this operation is checked in.		
		Message Ref.	Message	Destination
		0210	Journey Record	As per DG0019 plus Shell Owner
		0209	Journey Record	As per Part 6 plus Shell Owner Entry POST service operator
		0208; 0006	Amend IPE	As per Part 6 plus Shell Owner

Ref.	Operation	Notes		
OP18	Pass activation at Check-out	MU Ref.	Media Update	
		MU3	Set status to checked-out on Transient Ticket	
		MU6	Set Destination on Transient Ticket	
		MU7	Set IPE on Transient Ticket	
		MU8	Remove Candidate IPE from Transient Ticket	
		MU10	Remove Entry from Transient Ticket	
		MU11	Remove Entry OID from Transient Ticket *	
		MU20	Decrement Value Group remaining stored passes	
		MU14	Commit updates and modify Log Directory	
		* Entry and Entry OID information preserved in HOPS through inclusion in 209/210 message		
Message Ref.	Message	Destination		
0210	Journey Record	As per DG0019 plus Shell Owner		
0209	Journey Record	As per DG0019 plus Shell Owner		
0208; 0006	Amend IPE	As per Part 6 plus Shell Owner		
OP19	Pass activation at check-out with forced check-in	MU Ref.	Media Update	
		MU3a	Construct Transient Ticket (Null Origin)	
		MU6	Set Destination on Transient Ticket	
		MU7	Set IPE on Transient Ticket	
		MU20	Decrement Value Group remaining stored passes	
		MU14	Commit updates and modify Log Directory	
		Message Ref.	Message	Destination
		0210	Journey Record	As per DG0019 plus Shell Owner
		0209	Journey Record	As per Part 6 plus Shell Owner
		0208; 0006	Amend IPE	As per Part 6 plus Shell Owner
OP20 – OP25	RFU			

Ref.	Operation	Notes		
OP26	Inspection product selection following forced check-in	MU Ref.	Media Update	
		MU1a	Construct Transient Ticket (Null Origin)	
		MU4	Set status to inspected on Transient Ticket	
		MU7	Set IPE on Transient Ticket	
		MU8	Remove Candidate IPE from Transient Ticket	
		MU14	Commit updates and modify Log Directory	
		Message Ref.	Message	Destination
		0210	Journey Record	POST service operator Shell Owner
		0209	Journey Record	As per Part 6 plus Shell Owner
OP27	Inspection only following forced check-in	MU Ref.	Media Update	
		MU1a	Construct Transient Ticket (Null Origin)	
		MU4	Set status to inspected on Transient Ticket	
		MU14	Commit updates and modify Log Directory	
		Message Ref.	Message	Destination
		0210	Journey record	POST service operator Shell Owner
OP28	Single product valid at entry at check-in (not Pass product)	MU Ref.	Media Update	
		MU19	Construct Transient Ticket (product selected)	
		MU14	Commit updates and modify Log Directory	
		Message Ref.	Message	Destination
		0210	Journey Record	As per DG0019 plus Shell Owner
		0209	Journey Record	As per Part 6 plus Shell Owner

4.7 Media Updates

Ref.	Media Update	Notes	
MU1	Construct Transient Ticket	Data Element	Value for Rail Use
		TTLlength	<i>Value as per ITSO specification</i>
		TTBitMap1	0 (Not used)
		TTFormatRevision	4
		TTBitMap2 (Presence of Data Groups)	<i>See individual bits</i>
		Bit 0: Amount Paid (LSB)	0
		Bit 1: Destination	0
		Bit 2: IPE ID	0
		Bit 3: Origin	1
		Bit 4: RFU	0
		Bit 5: Routing Code	0
		Bit 6: RFU	0
		Bit 7: IIN	0
		Bit 8: Candidate IPEs	1
		Bit 9: Entry	0
		Bit 10: Entry OID	1
		Bit 11: User defined (MSB)	0
		TTTransactionType	11 (check-in)
		DateTimeStamp	<i>The POST's current time when the MU is performed</i>
		AmountPaidMethodOfPayment	<i>Data Group not present</i>
		AmountPaidCurrencyCode	<i>Data Group not present</i>
		AmountPaid	<i>Data Group not present</i>
		CompanionTravelled	<i>Data Group not present</i>
		ReturnTicket	<i>Data Group not present</i>
		RFU	<i>Data Group not present</i>
		NoFareCharged	<i>Data Group not present</i>
		AmountPaidVATSalesTax	<i>Data Group not present</i>
		DestinationTT	<i>Data Group not present</i>
		RFU	<i>Data Group not present</i>
		IPEPointer	<i>Data Group not present</i>
		[continued]	

Ref.	Media Update	Notes																																
MU1	Construct Transient Ticket	[continued from previous]																																
		<table><tr><th>Data Element</th><th>Value for Rail Use</th></tr><tr><td>OriginLocation</td><td>Value as per ITSO specification with<table><tr><td>Location Definition type</td><td>203 (Short Rail National Location Code (NLC))</td></tr></table></td></tr><tr><td>RoutingCode</td><td>Data Group not present</td></tr><tr><td>IIN</td><td>Data Group not present</td></tr><tr><td>IPEID1 †</td><td>First candidate IPE (mandatory)</td></tr><tr><td>IPEID2 †</td><td>Second candidate IPE (conditional)</td></tr><tr><td>IPEID3 †</td><td>Third candidate IPE (conditional)</td></tr><tr><td>IPEID4 †</td><td>Fourth candidate IPE (conditional)</td></tr><tr><td>CIPEFlags</td><td>Value as per ITSO specification</td></tr><tr><td>ENTRY_TT_IPE_ISAMID</td><td>Data Group not present</td></tr><tr><td>ENTRY_TT_IPE_SAMSequenceNumber</td><td>Data Group not present</td></tr><tr><td>ENTRY_DateTimeStamp</td><td>Data Group not present</td></tr><tr><td>ENTRY_OID</td><td>Value as per ITSO specification</td></tr><tr><td>ENTRY_IIN_Index</td><td>Value as per ITSO specification</td></tr><tr><td>UserDefined</td><td>Data Group not present</td></tr></table>	Data Element	Value for Rail Use	OriginLocation	Value as per ITSO specification with <table><tr><td>Location Definition type</td><td>203 (Short Rail National Location Code (NLC))</td></tr></table>	Location Definition type	203 (Short Rail National Location Code (NLC))	RoutingCode	Data Group not present	IIN	Data Group not present	IPEID1 †	First candidate IPE (mandatory)	IPEID2 †	Second candidate IPE (conditional)	IPEID3 †	Third candidate IPE (conditional)	IPEID4 †	Fourth candidate IPE (conditional)	CIPEFlags	Value as per ITSO specification	ENTRY_TT_IPE_ISAMID	Data Group not present	ENTRY_TT_IPE_SAMSequenceNumber	Data Group not present	ENTRY_DateTimeStamp	Data Group not present	ENTRY_OID	Value as per ITSO specification	ENTRY_IIN_Index	Value as per ITSO specification	UserDefined	Data Group not present
		Data Element	Value for Rail Use																															
		OriginLocation	Value as per ITSO specification with <table><tr><td>Location Definition type</td><td>203 (Short Rail National Location Code (NLC))</td></tr></table>	Location Definition type	203 (Short Rail National Location Code (NLC))																													
		Location Definition type	203 (Short Rail National Location Code (NLC))																															
		RoutingCode	Data Group not present																															
		IIN	Data Group not present																															
		IPEID1 †	First candidate IPE (mandatory)																															
		IPEID2 †	Second candidate IPE (conditional)																															
		IPEID3 †	Third candidate IPE (conditional)																															
		IPEID4 †	Fourth candidate IPE (conditional)																															
		CIPEFlags	Value as per ITSO specification																															
		ENTRY_TT_IPE_ISAMID	Data Group not present																															
		ENTRY_TT_IPE_SAMSequenceNumber	Data Group not present																															
ENTRY_DateTimeStamp	Data Group not present																																	
ENTRY_OID	Value as per ITSO specification																																	
ENTRY_IIN_Index	Value as per ITSO specification																																	
UserDefined	Data Group not present																																	

MU1a	Construct Transient Ticket (Null Origin)	Data Element	Value for Rail Use
		TTLength	<i>Value as per ITSO specification</i>
		TTBitMap1	<i>0 (Not used)</i>
		TTFormatRevision	<i>4</i>
		TTBitMap2 (Presence of Data Groups)	<i>See individual bits</i>
		Bit 0: Amount Paid (LSB)	<i>0</i>
		Bit 1: Destination	<i>0</i>
		Bit 2: IPE ID	<i>0</i>
		Bit 3: Origin	<i>1</i>
		Bit 4: RFU	<i>0</i>
		Bit 5: Routing Code	<i>0</i>
		Bit 6: RFU	<i>0</i>
		Bit 7: IIN	<i>0</i>
		Bit 8: Candidate IPEs	<i>1</i>
		Bit 9: Entry	<i>0</i>
		Bit 10: Entry OID	<i>1</i>
		Bit 11: User defined (MSB)	<i>0</i>
		TTTransactionType	<i>11 (check-in)</i>
		DateTimeStamp	<i>The POST's current time when the MU is performed</i>
		AmountPaidMethodOfPayment	<i>Data Group not present</i>
		AmountPaidCurrencyCode	<i>Data Group not present</i>
		AmountPaid	<i>Data Group not present</i>
		CompanionTravelled	<i>Data Group not present</i>
		ReturnTicket	<i>Data Group not present</i>
		RFU	<i>Data Group not present</i>
		NoFareCharged	<i>Data Group not present</i>
		AmountPaidVATSalesTax	<i>Data Group not present</i>
		DestinationTT	<i>Data Group not present</i>
		RFU	<i>Data Group not present</i>
		IPEPointer	<i>Data Group not present</i>
		IPEID1 †	<i>First candidate IPE (mandatory)</i>
		IPEID2 †	<i>Second candidate IPE (conditional)</i>
		IPEID3 †	<i>Third candidate IPE (conditional)</i>
		IPEID4 †	<i>Fourth candidate IPE (conditional)</i>
		CIPEFlags	<i>Value as per ITSO specification</i>
		ENTRY_TT_IPE_ISAMID	<i>Data Group not present</i>
		ENTRY_TT_IPE_SAMSequenceNumber	<i>Data Group not present</i>
		ENTRY_DateTimeStamp	<i>Data Group not present</i>
		ENTRY_OID	<i>Value as per ITSO specification</i>
		ENTRY_IIN_Index	<i>Value as per ITSO specification</i>
		UserDefined	<i>Data Group not present</i>
		[continued]	

Ref.	Media Update	Notes												
MU1a	Construct Transient Ticket (Null Origin)	[continued from previous]												
		<table><tr><th>Data Element</th><th>Value for Rail Use</th></tr><tr><td>OriginLocation</td><td>Value as per ITSO specification with</td></tr><tr><td></td><td><table><tr><td>Location Definition type</td><td>255 (Null Origin)</td></tr></table></td></tr><tr><td>RoutingCode</td><td>Data Group not present</td></tr><tr><td>IIN</td><td>Data Group not present</td></tr></table>	Data Element	Value for Rail Use	OriginLocation	Value as per ITSO specification with		<table><tr><td>Location Definition type</td><td>255 (Null Origin)</td></tr></table>	Location Definition type	255 (Null Origin)	RoutingCode	Data Group not present	IIN	Data Group not present
		Data Element	Value for Rail Use											
		OriginLocation	Value as per ITSO specification with											
			<table><tr><td>Location Definition type</td><td>255 (Null Origin)</td></tr></table>	Location Definition type	255 (Null Origin)									
Location Definition type	255 (Null Origin)													
RoutingCode	Data Group not present													
IIN	Data Group not present													
MU2	Copy Transient Ticket occupying Previous slot	This shall be carried out in accordance with the ITSO specification.												
MU3	Set status to checked-out on Transient Ticket	Unless stated otherwise, Data Elements must be the same as before.												
		<table><tr><th>Data Element</th><th>Value for Rail Use</th></tr><tr><td>TTTransactionType</td><td>12 (check-out)</td></tr><tr><td>DateTimeStamp</td><td>The POST's current time when the MU is performed</td></tr></table>	Data Element	Value for Rail Use	TTTransactionType	12 (check-out)	DateTimeStamp	The POST's current time when the MU is performed						
Data Element	Value for Rail Use													
TTTransactionType	12 (check-out)													
DateTimeStamp	The POST's current time when the MU is performed													

MU3a	Construct Transient Ticket (Null Origin) and Checked out	Data Element	Value for Rail Use
		TTLength	<i>Value as per ITSO specification</i>
		TTBitMap1	0 (<i>Not used</i>)
		TTFormatRevision	4
		TTBitMap2 (Presence of Data Groups)	<i>See individual bits</i>
		Bit 0: Amount Paid (LSB)	0
		Bit 1: Destination	0
		Bit 2: IPE ID	0
		Bit 3: Origin	1
		Bit 4: RFU	0
		Bit 5: Routing Code	0
		Bit 6: RFU	0
		Bit 7: IIN	0
		Bit 8: Candidate IPEs	0
		Bit 9: Entry	0
		Bit 10: Entry OID	0
		Bit 11: User defined (MSB)	0
		TTTransactionType	12 (<i>check-out</i>)
		DateTimeStamp	<i>The POST's current time when the MU is performed</i>
		AmountPaidMethodOfPayment	<i>Data Group not present</i>
		AmountPaidCurrencyCode	<i>Data Group not present</i>
		AmountPaid	<i>Data Group not present</i>
		CompanionTravelled	<i>Data Group not present</i>
		ReturnTicket	<i>Data Group not present</i>
		RFU	<i>Data Group not present</i>
		NoFareCharged	<i>Data Group not present</i>
		AmountPaidVATSalesTax	<i>Data Group not present</i>
		DestinationTT	<i>Data Group not present</i>
		RFU	<i>Data Group not present</i>
		IPEPointer	<i>Data Group not present</i>
		OriginLocation	<i>Value as per ITSO specification with</i>
			Location 255
			Definition type
		RoutingCode	<i>Data Group not present</i>
		IIN	<i>Data Group not present</i>
		IPEID1	<i>Data Group not present</i>
		EID2	<i>Data Group not present</i>

Ref.	Media Update	Notes	
		IPEID3	Data Group not present
		IPEID4	Data Group not present
		CIPEFlags	Value as per ITSO specification
		ENTRY_TT_IPE_ISAMID	Data Group not present
		ENTRY_TT_IPE_SAMSequenceNumber	Data Group not present
		ENTRY_DateTimeStamp	Data Group not present
		ENTRY_OID	Data Group not present
		ENTRY_IIN_Index	Data Group not present
		UserDefined	Data Group not present
		IPEID2	Data Group not present
		IPEID3	Data Group not present
		IPEID4	Data Group not present
		CIPEFlags	Value as per ITSO specification
		ENTRY_TT_IPE_ISAMID	Data Group not present
		ENTRY_TT_IPE_SAMSequenceNumber	Data Group not present
		ENTRY_DateTimeStamp	Data Group not present
		ENTRY_OID	Data Group not present
		ENTRY_IIN_Index	Data Group not present
		UserDefined	Data Group not present
MU4	Set status to inspected on Transient Ticket	Unless stated otherwise, Data Elements shall be the same as before.	
		Data Element	Value for Rail Use
		TTTransactionType	0 (not-specified)
		CIPE Flag	Bit 1 = Set
		DateTimeStamp	The POST's current time when the MU is performed
		The ITSO specification defines 0 as 'not-specified', however it will be interpreted to mean 'inspected' in this context; this value permits the recipient HOPS to distinguish the reason for receipt of the message	
		CIPEFlag – CM has been inspected during the current journey.	

Ref.	Media Update	Notes																
MU5	Set status to undo-previous-event-without-refund on Transient Ticket	<div>Unless stated otherwise, Data Elements shall be the same as before.</div> <table><thead><tr><th>Data Element</th><th>Value for Rail Use</th></tr></thead><tbody><tr><td>TTTransactionType</td><td>3 (undo-previous-event-without-refund)</td></tr><tr><td>DateTimeStamp</td><td>The POST's current time when the MU is performed</td></tr></tbody></table> <div>The implication of this Media Update is that a POST must be able to interpret a Transient Ticket in this state as if it were in state 12 (checkedchecked-out).</div>	Data Element	Value for Rail Use	TTTransactionType	3 (undo-previous-event-without-refund)	DateTimeStamp	The POST's current time when the MU is performed										
Data Element	Value for Rail Use																	
TTTransactionType	3 (undo-previous-event-without-refund)																	
DateTimeStamp	The POST's current time when the MU is performed																	
MU6	Set Destination on Transient Ticket	<div>Unless stated otherwise, Data Elements shall be the same as before.</div> <table><thead><tr><th>Data Element</th><th>Value for Rail Use</th></tr></thead><tbody><tr><td>TLength</td><td>Value as per ITSO specification</td></tr><tr><td>TTBitMap2 (Presence of Data Groups)</td><td>See individual bits</td></tr><tr><td>Bit 1: Destination</td><td>1</td></tr><tr><td>DateTimeStamp</td><td>The POST's current time when the MU is performed</td></tr></tbody></table> <table><thead><tr><th>DestinationTT</th><th>Value as per ITSO specification with</th></tr></thead><tbody><tr><td></td><td>Location Definition type</td></tr><tr><td></td><td>203 (Short Rail National Location Code (NLC))</td></tr></tbody></table> <div>This could be a NULL destination (Location Definition type 255) for a forced check-out.</div>	Data Element	Value for Rail Use	TLength	Value as per ITSO specification	TTBitMap2 (Presence of Data Groups)	See individual bits	Bit 1: Destination	1	DateTimeStamp	The POST's current time when the MU is performed	DestinationTT	Value as per ITSO specification with		Location Definition type		203 (Short Rail National Location Code (NLC))
Data Element	Value for Rail Use																	
TLength	Value as per ITSO specification																	
TTBitMap2 (Presence of Data Groups)	See individual bits																	
Bit 1: Destination	1																	
DateTimeStamp	The POST's current time when the MU is performed																	
DestinationTT	Value as per ITSO specification with																	
	Location Definition type																	
	203 (Short Rail National Location Code (NLC))																	
MU7	Set IPE on Transient Ticket	<div>Unless stated otherwise, Data Elements shall be the same as before.</div> <table><thead><tr><th>Data Element</th><th>Value for Rail Use</th></tr></thead><tbody><tr><td>TLength</td><td>Value as per ITSO specification</td></tr><tr><td>TTBitMap2 (Presence of Data Groups)</td><td>See individual bits</td></tr><tr><td>Bit 2: IPE ID</td><td>1</td></tr><tr><td>DateTimeStamp</td><td>The POST's current time when the MU is performed</td></tr></tbody></table> <table><thead><tr><th>RFU</th><th>Value</th></tr></thead><tbody><tr><td>IPEPointer</td><td>0</td></tr></tbody></table> <div>IPE used for journey. This might not have even been a candidate (for instance the passenger may have purchased a new ticket on-train, which supersedes those Candidate IPEs identified at check-in).</div>	Data Element	Value for Rail Use	TLength	Value as per ITSO specification	TTBitMap2 (Presence of Data Groups)	See individual bits	Bit 2: IPE ID	1	DateTimeStamp	The POST's current time when the MU is performed	RFU	Value	IPEPointer	0		
Data Element	Value for Rail Use																	
TLength	Value as per ITSO specification																	
TTBitMap2 (Presence of Data Groups)	See individual bits																	
Bit 2: IPE ID	1																	
DateTimeStamp	The POST's current time when the MU is performed																	
RFU	Value																	
IPEPointer	0																	

Ref.	Media Update	Notes										
MU8	Remove Candidate IPE from Transient Ticket	Unless stated otherwise, Data Elements must be the same as before.										
		<table><tr><th>Data Element</th><th>Value for Rail Use</th></tr><tr><td>TTLlength</td><td>Value as per ITSO specification</td></tr><tr><td>TTBitMap2 (Presence of Data Groups)</td><td>See individual bits</td></tr><tr><td>Bit 8: Candidate IPEs</td><td>0</td></tr><tr><td>DateTimeStamp</td><td>The POST's current time when the MU is performed</td></tr></table>	Data Element	Value for Rail Use	TTLlength	Value as per ITSO specification	TTBitMap2 (Presence of Data Groups)	See individual bits	Bit 8: Candidate IPEs	0	DateTimeStamp	The POST's current time when the MU is performed
		Data Element	Value for Rail Use									
		TTLlength	Value as per ITSO specification									
		TTBitMap2 (Presence of Data Groups)	See individual bits									
		Bit 8: Candidate IPEs	0									
		DateTimeStamp	The POST's current time when the MU is performed									
		<table><tr><td>IPEID1</td><td>Data Group not present</td></tr><tr><td>IPEID2</td><td>Data Group not present</td></tr><tr><td>IPEID3</td><td>Data Group not present</td></tr><tr><td>IPEID4</td><td>Data Group not present</td></tr><tr><td>CIPEFlags</td><td>Value as per ITSO specification</td></tr></table>	IPEID1	Data Group not present	IPEID2	Data Group not present	IPEID3	Data Group not present	IPEID4	Data Group not present	CIPEFlags	Value as per ITSO specification
		IPEID1	Data Group not present									
		IPEID2	Data Group not present									
IPEID3	Data Group not present											
IPEID4	Data Group not present											
CIPEFlags	Value as per ITSO specification											
MU9	Set ENTRY on Transient Ticket	Unless stated otherwise, Data Elements must be the same as before.										
		<table><tr><th>Data Element</th><th>Value for Rail Use</th></tr><tr><td>TTLlength</td><td>Value as per ITSO specification</td></tr><tr><td>TTBitMap2 (Presence of Data Groups)</td><td>See individual bits</td></tr><tr><td>Bit 9: Entry</td><td>1</td></tr><tr><td>DateTimeStamp</td><td>The POST's current time when the MU is performed</td></tr></table>	Data Element	Value for Rail Use	TTLlength	Value as per ITSO specification	TTBitMap2 (Presence of Data Groups)	See individual bits	Bit 9: Entry	1	DateTimeStamp	The POST's current time when the MU is performed
		Data Element	Value for Rail Use									
		TTLlength	Value as per ITSO specification									
		TTBitMap2 (Presence of Data Groups)	See individual bits									
		Bit 9: Entry	1									
		DateTimeStamp	The POST's current time when the MU is performed									
		<table><tr><td>ENTRY_TT_IPE_ISAMID</td><td>Value as per ITSO specification</td></tr><tr><td>ENTRY_TT_IPE_SAMSequenceNumber</td><td>Value as per ITSO specification</td></tr><tr><td>ENTRY_DateTimeStamp</td><td>Value as per ITSO specification</td></tr></table>	ENTRY_TT_IPE_ISAMID	Value as per ITSO specification	ENTRY_TT_IPE_SAMSequenceNumber	Value as per ITSO specification	ENTRY_DateTimeStamp	Value as per ITSO specification				
		ENTRY_TT_IPE_ISAMID	Value as per ITSO specification									
		ENTRY_TT_IPE_SAMSequenceNumber	Value as per ITSO specification									
ENTRY_DateTimeStamp	Value as per ITSO specification											
MU10	Remove ENTRY from Transient Ticket	<table><tr><th>Data Element</th><th>Value for Rail Use</th></tr><tr><td>TTLlength</td><td>Value as per ITSO specification</td></tr><tr><td>TTBitMap2 (Presence of Data Groups)</td><td>See individual bits</td></tr><tr><td>Bit 9: Entry</td><td>0</td></tr><tr><td>DateTimeStamp</td><td>The POST's current time when the MU is performed</td></tr></table>	Data Element	Value for Rail Use	TTLlength	Value as per ITSO specification	TTBitMap2 (Presence of Data Groups)	See individual bits	Bit 9: Entry	0	DateTimeStamp	The POST's current time when the MU is performed
		Data Element	Value for Rail Use									
		TTLlength	Value as per ITSO specification									
		TTBitMap2 (Presence of Data Groups)	See individual bits									
		Bit 9: Entry	0									
		DateTimeStamp	The POST's current time when the MU is performed									
		<table><tr><td>ENTRY_TT_IPE_ISAMID</td><td>Data Group not present</td></tr><tr><td>ENTRY_TT_IPE_SAMSequenceNumber</td><td>Data Group not present</td></tr><tr><td>ENTRY_DateTimeStamp</td><td>Data Group not present</td></tr></table>	ENTRY_TT_IPE_ISAMID	Data Group not present	ENTRY_TT_IPE_SAMSequenceNumber	Data Group not present	ENTRY_DateTimeStamp	Data Group not present				
		ENTRY_TT_IPE_ISAMID	Data Group not present									
		ENTRY_TT_IPE_SAMSequenceNumber	Data Group not present									
		ENTRY_DateTimeStamp	Data Group not present									

Ref.	Media Update	Notes														
MU11	Remove ENTRY OID from Transient Ticket	<div>Unless stated otherwise, Data Elements must be the same as before.</div> <table><tr><th>Data Element</th><th>Value for Rail Use</th></tr><tr><td>TLength</td><td>Value as per ITSO specification</td></tr><tr><td>TTBitMap2 (Presence of Data Groups)</td><td>See individual bits</td></tr><tr><td>Bit 10: Entry OID</td><td>0</td></tr><tr><td>DateTimeStamp</td><td>The POST's current time when the MU is performed</td></tr><tr><td>ENTRY_OID</td><td>Data Group not present</td></tr><tr><td>ENTRY_IIN_Index</td><td>Data Group not present</td></tr></table>	Data Element	Value for Rail Use	TLength	Value as per ITSO specification	TTBitMap2 (Presence of Data Groups)	See individual bits	Bit 10: Entry OID	0	DateTimeStamp	The POST's current time when the MU is performed	ENTRY_OID	Data Group not present	ENTRY_IIN_Index	Data Group not present
Data Element	Value for Rail Use															
TLength	Value as per ITSO specification															
TTBitMap2 (Presence of Data Groups)	See individual bits															
Bit 10: Entry OID	0															
DateTimeStamp	The POST's current time when the MU is performed															
ENTRY_OID	Data Group not present															
ENTRY_IIN_Index	Data Group not present															
MU12a	Decrement Value Group remaining journeys — IPE22	<div>Unless stated otherwise, Data Elements must be the same as before.</div> <table><tr><th>Data Element</th><th>Value for Rail Use</th></tr><tr><td>DateTimeStamp</td><td>The POST's current time when the MU is performed</td></tr><tr><td>ISAMIDModifier</td><td>Value as per ITSO specification</td></tr><tr><td>NumberRemainingPasses</td><td>For singles: 0 For returns: 0 or 1 For carnets: 0 – 1 less than previous; Data Element capacity limits this to 6060. There are currently no rail-specific maxima, but this may be revised.</td></tr></table> <div>It might be desirable to decrement NumberRemainingPasses by more than 1 if circumstances dictate e.g. if using the return portion of a return ticket invalidates the out portion (although such business logic is beyond the scope of this document); however it is not possible to decrement by more than one as the ISAM will reject it, so this MU would have to be performed repeatedly / this MU would have to perform multiple ISAM calls (the difference between which is purely semantic).</div>	Data Element	Value for Rail Use	DateTimeStamp	The POST's current time when the MU is performed	ISAMIDModifier	Value as per ITSO specification	NumberRemainingPasses	For singles: 0 For returns: 0 or 1 For carnets: 0 – 1 less than previous; Data Element capacity limits this to 6060. There are currently no rail-specific maxima, but this may be revised.						
Data Element	Value for Rail Use															
DateTimeStamp	The POST's current time when the MU is performed															
ISAMIDModifier	Value as per ITSO specification															
NumberRemainingPasses	For singles: 0 For returns: 0 or 1 For carnets: 0 – 1 less than previous; Data Element capacity limits this to 6060. There are currently no rail-specific maxima, but this may be revised.															

Ref.	Media Update	Notes								
MU12b	Decrement Value Group remaining journeys — IPE23	<p>Unless stated otherwise, Data Elements must be the same as before.</p> <p>It is not valid to attempt to perform this Media Update if CountRemainingRidesJourneys is zero.</p> <table><tr><th>Data Element</th><th>Value for Rail Use</th></tr><tr><td>DateTimeStamp</td><td><i>The POST's current time when the MU is performed</i></td></tr><tr><td>ISAMIDModifier</td><td><i>Value as per ITSO specification</i></td></tr><tr><td>CountRemainingRidesJourneys</td><td><i>For singles: 0</i> <i>For returns: 0 or 1</i> <i>For carnets: 0 – 1 less than previous; Data Element capacity limits this to 255. There are currently no rail-specific maxima, but this may be revised.</i></td></tr></table> <p>It might be desirable to decrement CountRemainingRidesJourneys by more than 1 if circumstances dictate e.g. if using the return portion of a return ticket invalidates the out portion (although such business logic is beyond the scope of this document); however it is not possible to decrement by more than one as the ISAM will reject it, so this MU would have to be performed repeatedly / this MU would have to perform multiple ISAM calls (the difference between which is purely semantic).</p> <p>Decrementing by more than 1 will generate multiple message as there are multiple decrements.</p>	Data Element	Value for Rail Use	DateTimeStamp	<i>The POST's current time when the MU is performed</i>	ISAMIDModifier	<i>Value as per ITSO specification</i>	CountRemainingRidesJourneys	<i>For singles: 0</i> <i>For returns: 0 or 1</i> <i>For carnets: 0 – 1 less than previous; Data Element capacity limits this to 255. There are currently no rail-specific maxima, but this may be revised.</i>
Data Element	Value for Rail Use									
DateTimeStamp	<i>The POST's current time when the MU is performed</i>									
ISAMIDModifier	<i>Value as per ITSO specification</i>									
CountRemainingRidesJourneys	<i>For singles: 0</i> <i>For returns: 0 or 1</i> <i>For carnets: 0 – 1 less than previous; Data Element capacity limits this to 255. There are currently no rail-specific maxima, but this may be revised.</i>									
MU12c	Decrement Value Group remaining journeys — IPE24	<p>Unless stated otherwise, Data Elements must be the same as before.</p> <table><tr><th>Data Element</th><th>Value for Rail Use</th></tr><tr><td>DateTimeStamp</td><td><i>The POST's current time when the MU is performed</i></td></tr><tr><td>ISAMIDModifier</td><td><i>Value as per ITSO specification</i></td></tr><tr><td>JourneysRemaining</td><td><i>For singles: 0</i> <i>For returns: 0 or 1</i> <i>For carnets: 0 – 1 less than previous; Data Element capacity limits this to 255. There are currently no rail-specific maxima, but this may be revised.</i></td></tr></table> <p>It might be desirable to decrement JourneysRemaining by more than 1 if circumstances dictate e.g. if using the return portion of a return ticket invalidates the out portion; however it is not possible to decrement by more than one as the ISAM will reject it, so this MU would have to be performed repeatedly / this MU would have to perform multiple ISAM calls (the difference between which is purely semantic).</p>	Data Element	Value for Rail Use	DateTimeStamp	<i>The POST's current time when the MU is performed</i>	ISAMIDModifier	<i>Value as per ITSO specification</i>	JourneysRemaining	<i>For singles: 0</i> <i>For returns: 0 or 1</i> <i>For carnets: 0 – 1 less than previous; Data Element capacity limits this to 255. There are currently no rail-specific maxima, but this may be revised.</i>
Data Element	Value for Rail Use									
DateTimeStamp	<i>The POST's current time when the MU is performed</i>									
ISAMIDModifier	<i>Value as per ITSO specification</i>									
JourneysRemaining	<i>For singles: 0</i> <i>For returns: 0 or 1</i> <i>For carnets: 0 – 1 less than previous; Data Element capacity limits this to 255. There are currently no rail-specific maxima, but this may be revised.</i>									

Ref.	Media Update	Notes								
MU13a	Increment Value Group remaining journeys — IPE22	<div>Unless stated otherwise, Data Elements must be the same as before.</div> <table><tr><th>Data Element</th><th>Value for Rail Use</th></tr><tr><td>DateTimeStamp</td><td><i>The POST's current time when the MU is performed</i></td></tr><tr><td>ISAMIDModifier</td><td><i>Value as per ITSO specification</i></td></tr><tr><td>NumberRemainingPasses</td><td><i>For singles: 1</i> <i>For returns: 1 or 2</i> <i>For carnets: 1 greater than previous – max; Data Element capacity limits this to 63. There are currently no rail-specific maxima, but this may be revised.</i></td></tr></table> <div>Note: It might be desirable to increment NumberRemainingPasses by more than 1 if circumstances dictate—e.g. undoing a decrement that was greater than 1—unlike decrementing by more than 1 this can be done in a single ISAM call.</div>	Data Element	Value for Rail Use	DateTimeStamp	<i>The POST's current time when the MU is performed</i>	ISAMIDModifier	<i>Value as per ITSO specification</i>	NumberRemainingPasses	<i>For singles: 1</i> <i>For returns: 1 or 2</i> <i>For carnets: 1 greater than previous – max; Data Element capacity limits this to 63. There are currently no rail-specific maxima, but this may be revised.</i>
Data Element	Value for Rail Use									
DateTimeStamp	<i>The POST's current time when the MU is performed</i>									
ISAMIDModifier	<i>Value as per ITSO specification</i>									
NumberRemainingPasses	<i>For singles: 1</i> <i>For returns: 1 or 2</i> <i>For carnets: 1 greater than previous – max; Data Element capacity limits this to 63. There are currently no rail-specific maxima, but this may be revised.</i>									
MU13b	Increment Value Group remaining journeys — IPE23	<div>Unless stated otherwise, Data Elements must be the same as before.</div> <table><tr><th>Data Element</th><th>Value for Rail Use</th></tr><tr><td>DateTimeStamp</td><td><i>The POST's current time when the MU is performed</i></td></tr><tr><td>ISAMIDModifier</td><td><i>Value as per ITSO specification</i></td></tr><tr><td>CountRemainingRidesJourneys</td><td><i>For singles: 1</i> <i>For returns: 1 or 2</i> <i>For carnets: 1 greater than previous – max; Data Element capacity limits this to 255. There are currently no rail-specific maxima, but this may be revised.</i></td></tr></table> <div>Note: It might be desirable to increment CountRemainingRidesJourneys by more than 1 if circumstances dictate—e.g. undoing a decrement that was greater than 1—unlike decrementing by more than 1 this can be done in a single ISAM call.</div>	Data Element	Value for Rail Use	DateTimeStamp	<i>The POST's current time when the MU is performed</i>	ISAMIDModifier	<i>Value as per ITSO specification</i>	CountRemainingRidesJourneys	<i>For singles: 1</i> <i>For returns: 1 or 2</i> <i>For carnets: 1 greater than previous – max; Data Element capacity limits this to 255. There are currently no rail-specific maxima, but this may be revised.</i>
Data Element	Value for Rail Use									
DateTimeStamp	<i>The POST's current time when the MU is performed</i>									
ISAMIDModifier	<i>Value as per ITSO specification</i>									
CountRemainingRidesJourneys	<i>For singles: 1</i> <i>For returns: 1 or 2</i> <i>For carnets: 1 greater than previous – max; Data Element capacity limits this to 255. There are currently no rail-specific maxima, but this may be revised.</i>									

Ref.	Media Update	Notes										
MU13c	Increment Value Group remaining journeys — IPE24	<div>Unless stated otherwise, Data Elements must be the same as before.</div> <table><thead><tr><th>Data Element</th><th>Value for Rail Use</th></tr></thead><tbody><tr><td>DateTimeStamp</td><td><i>The POST's current time when the MU is performed</i></td></tr><tr><td>ISAMIDModifier</td><td><i>Value as per ITSO specification</i></td></tr><tr><td>JourneysRemaining</td><td><i>For singles: 1</i> <i>For returns: 1 or 2</i> <i>For carnets: 1 greater than previous – max; Data Element capacity limits this to 31. There are currently no rail-specific maxima, but this may be revised.</i></td></tr></tbody></table> <div>Note: It might be desirable to increment JourneysRemaining by more than 1 if circumstances dictate—e.g. undoing a decrement that was greater than 1—unlike decrementing by more than 1 this can be done in a single ISAM call.</div>	Data Element	Value for Rail Use	DateTimeStamp	<i>The POST's current time when the MU is performed</i>	ISAMIDModifier	<i>Value as per ITSO specification</i>	JourneysRemaining	<i>For singles: 1</i> <i>For returns: 1 or 2</i> <i>For carnets: 1 greater than previous – max; Data Element capacity limits this to 31. There are currently no rail-specific maxima, but this may be revised.</i>		
Data Element	Value for Rail Use											
DateTimeStamp	<i>The POST's current time when the MU is performed</i>											
ISAMIDModifier	<i>Value as per ITSO specification</i>											
JourneysRemaining	<i>For singles: 1</i> <i>For returns: 1 or 2</i> <i>For carnets: 1 greater than previous – max; Data Element capacity limits this to 31. There are currently no rail-specific maxima, but this may be revised.</i>											
MU14	Commit updates and modify Log Directory	<div>Prior to performing this Media Update the Transient Ticket and/or IPE value Groups should be written to the Customer Media.</div> <div>Unless stated otherwise, Data Elements must be the same as before.</div> <table><thead><tr><th>Data Element</th><th>Value for Rail Use</th></tr></thead><tbody><tr><td>PTR (Pointer to IPE)</td><td><i>Pointer to Transient Ticket</i></td></tr><tr><td>EEI (Entry / Exit Indicator)</td><td><i>0 (Outside of a Closed System)</i></td></tr><tr><td>DTS (Date time stamp)</td><td><i>The POST's date/time value corresponding to the time when a Transient Ticket Record was created</i></td></tr><tr><td>PTLBM</td><td><i>0</i></td></tr></tbody></table> <div>Even though the rail industry will not validate / use the EEI, this Media Update overwrites it when updating the Log Directory; the alternative option, to write the value that was read (i.e. copy it), is not permitted.</div>	Data Element	Value for Rail Use	PTR (Pointer to IPE)	<i>Pointer to Transient Ticket</i>	EEI (Entry / Exit Indicator)	<i>0 (Outside of a Closed System)</i>	DTS (Date time stamp)	<i>The POST's date/time value corresponding to the time when a Transient Ticket Record was created</i>	PTLBM	<i>0</i>
Data Element	Value for Rail Use											
PTR (Pointer to IPE)	<i>Pointer to Transient Ticket</i>											
EEI (Entry / Exit Indicator)	<i>0 (Outside of a Closed System)</i>											
DTS (Date time stamp)	<i>The POST's date/time value corresponding to the time when a Transient Ticket Record was created</i>											
PTLBM	<i>0</i>											
MU15	Set status to break-of-journey-out on Transient Ticket	<div>Unless stated otherwise, Data Elements must be the same as before (or as dictated by ITSO).</div> <table><thead><tr><th>Data Element</th><th>Value for Rail Use</th></tr></thead><tbody><tr><td>TTTransactionType</td><td><i>8 (break of journey out)</i></td></tr><tr><td>DateTimeStamp</td><td><i>The POST's current time when the MU is performed</i></td></tr></tbody></table>	Data Element	Value for Rail Use	TTTransactionType	<i>8 (break of journey out)</i>	DateTimeStamp	<i>The POST's current time when the MU is performed</i>				
Data Element	Value for Rail Use											
TTTransactionType	<i>8 (break of journey out)</i>											
DateTimeStamp	<i>The POST's current time when the MU is performed</i>											

Ref.	Media Update	Notes	
MU15a	Construct Transient Ticket (Null Origin) and break of journey out	Data Element	Value for Rail Use
		TTLenght	<i>Value as per ITSO specification</i>
		TTBitMap1	0 (Not used)
		TTFormatRevision	4
		TTBitMap2 (Presence of Data Groups)	<i>See individual bits</i>
		Bit 0: Amount Paid (LSB)	0
		Bit 1: Destination	0
		Bit 2: IPE ID	0
		Bit 3: Origin	1
		Bit 4: RFU	0
		Bit 5: Routing Code	0
		Bit 6: RFU	0
		Bit 7: IIN	0
		Bit 8: Candidate IPEs	0
		Bit 9: Entry	0
		Bit 10: Entry OID	0
		Bit 11: User defined (MSB)	0
		TTTransactionType	8 (break-of-journey-out)
		DateTimeStamp	<i>The POST's current time when the MU is performed</i>
		AmountPaidMethodOfPayment	<i>Data Group not present</i>
		AmountPaidCurrencyCode	<i>Data Group not present</i>
		AmountPaid	<i>Data Group not present</i>
		CompanionTravelled	<i>Data Group not present</i>
		ReturnTicket	<i>Data Group not present</i>
		RFU	<i>Data Group not present</i>
		NoFareCharged	<i>Data Group not present</i>
		AmountPaidVATSalesTax	<i>Data Group not present</i>
		DestinationTT	<i>Data Group not present</i>
		RFU	<i>Data Group not present</i>
		IPEPointer	<i>Data Group not present</i>
		[continued]	

Ref.	Media Update	Notes	
		[continued from previous]Data Element	Value for Rail Use
		OriginLocation	Value as per ITSO specification with Location 255 Definition type
		RoutingCode	Data Group not present
		IIN	Data Group not present
		IPEID1	Data Group not present
		IPEID2	Data Group not present
		IPEID3	Data Group not present
		IPEID4	Data Group not present
		CIPEFlags	Value as per ITSO specification
		ENTRY_TT_IPE_ISAMID	Data Group not present
		ENTRY_TT_IPE_SAMSequenceNumber	Data Group not present
		ENTRY_DateTimeStamp	Data Group not present
		ENTRY_OID	Data Group not present
		ENTRY_IIN_Index	Data Group not present
		UserDefined	Data Group not present

Ref.	Media Update	Notes																										
MU16	Update Value Group to reflect BoJ Exit	<p>Unless stated otherwise, Data Elements must be the same as before (or as dictated by ITSO).</p> <p>For TYP23 product, it is not valid to attempt to perform this Media Update if CountTransfers is equal to MaxTransfers</p> <p>For TYP24 products, it is not valid to attempt to perform this Media Update if TransfersRemaining is zero.</p> <table><thead><tr><th>Data Element</th><th>Value for Rail Use</th></tr></thead><tbody><tr><td>TransactionType</td><td>8 (break of journey out)</td></tr><tr><td>DateTimeStamp</td><td>The POST's current time when the MU is performed</td></tr><tr><td>ISAMIDModifier</td><td>Value as per ITSO specification</td></tr><tr><td>TYP24 JourneyPartUsedFlag</td><td>1 less than previous; Data Element capacity limits this to 511. There are currently no rail-specific maxima, but this may be revised.</td></tr><tr><td>JourneysRemaining</td><td>Decrement by 1</td></tr><tr><td>TransfersRemaining</td><td>Decrement by 1</td></tr><tr><td>DTSOfLastValidation</td><td>The POST's current time when the MU is performed</td></tr><tr><td>LocationOfLastValidation</td><td>NLC Code of the rail validator performing the MU</td></tr><tr><td>TYP23 TYP23ValueFlags (UsedChecked)</td><td>Set to 1</td></tr><tr><td>CountRemainingJourneyRides</td><td>Decrement by 1</td></tr><tr><td>CountTransfers</td><td>Increment by 1</td></tr><tr><td></td><td></td></tr></tbody></table>	Data Element	Value for Rail Use	TransactionType	8 (break of journey out)	DateTimeStamp	The POST's current time when the MU is performed	ISAMIDModifier	Value as per ITSO specification	TYP24 JourneyPartUsedFlag	1 less than previous; Data Element capacity limits this to 511. There are currently no rail-specific maxima, but this may be revised.	JourneysRemaining	Decrement by 1	TransfersRemaining	Decrement by 1	DTSOfLastValidation	The POST's current time when the MU is performed	LocationOfLastValidation	NLC Code of the rail validator performing the MU	TYP23 TYP23ValueFlags (UsedChecked)	Set to 1	CountRemainingJourneyRides	Decrement by 1	CountTransfers	Increment by 1		
Data Element	Value for Rail Use																											
TransactionType	8 (break of journey out)																											
DateTimeStamp	The POST's current time when the MU is performed																											
ISAMIDModifier	Value as per ITSO specification																											
TYP24 JourneyPartUsedFlag	1 less than previous; Data Element capacity limits this to 511. There are currently no rail-specific maxima, but this may be revised.																											
JourneysRemaining	Decrement by 1																											
TransfersRemaining	Decrement by 1																											
DTSOfLastValidation	The POST's current time when the MU is performed																											
LocationOfLastValidation	NLC Code of the rail validator performing the MU																											
TYP23 TYP23ValueFlags (UsedChecked)	Set to 1																											
CountRemainingJourneyRides	Decrement by 1																											
CountTransfers	Increment by 1																											
MU17	Set status to break-of-journey-in on Transient Ticket	<p>Unless stated otherwise, Data Elements must be the same as before (or as dictated by ITSO).</p> <table><thead><tr><th>Data Element</th><th>Value for Rail Use</th></tr></thead><tbody><tr><td>TTTransactionType</td><td>14 (break of journey in)</td></tr><tr><td>DateTimeStamp</td><td>The POST's current time when the MU is performed</td></tr></tbody></table>	Data Element	Value for Rail Use	TTTransactionType	14 (break of journey in)	DateTimeStamp	The POST's current time when the MU is performed																				
Data Element	Value for Rail Use																											
TTTransactionType	14 (break of journey in)																											
DateTimeStamp	The POST's current time when the MU is performed																											

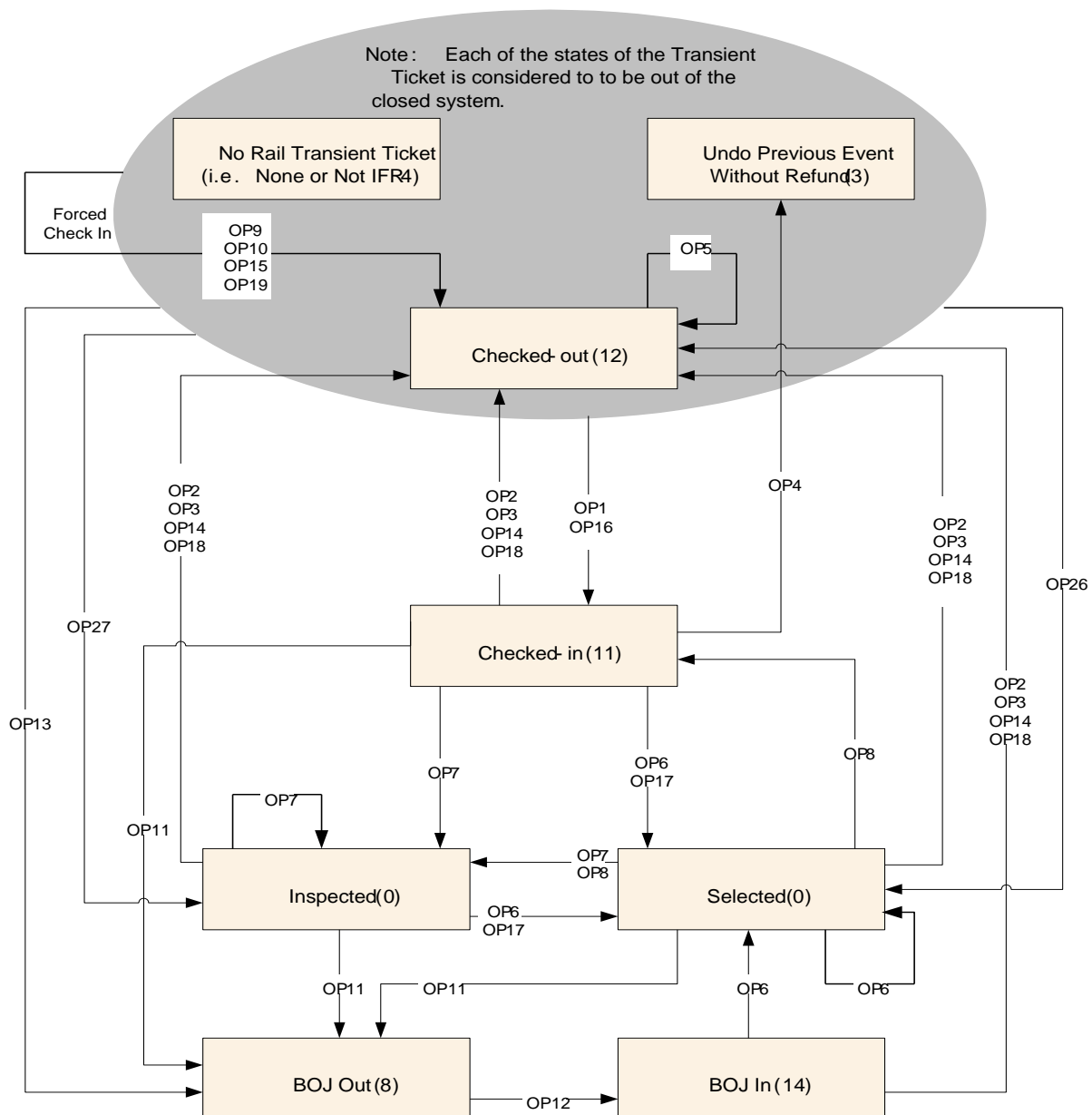
Ref.	Media Update	Notes										
MU18	Update Value Group to reflect BoJ Re-Entry	<div>Unless stated otherwise, Data Elements must be the same as before (or as dictated by ITSO).</div> <table><thead><tr><th>Data Element</th><th>Value for Rail Use</th></tr></thead><tbody><tr><td>DateTimeStamp</td><td><i>The POST's current time when the MU is performed</i></td></tr><tr><td>ISAMIDModifier</td><td><i>Value as per ITSO specification</i></td></tr><tr><td>TYP24 JourneyPartUsedFlag JourneysRemaining</td><td><i>Set to 0 Increment by 1</i></td></tr><tr><td>TYP23 TYP23ValueFlags (UsedChecked) CountRemainingJourneyRides</td><td><i>Set to 0 Increment by 1</i></td></tr></tbody></table>	Data Element	Value for Rail Use	DateTimeStamp	<i>The POST's current time when the MU is performed</i>	ISAMIDModifier	<i>Value as per ITSO specification</i>	TYP24 JourneyPartUsedFlag JourneysRemaining	<i>Set to 0 Increment by 1</i>	TYP23 TYP23ValueFlags (UsedChecked) CountRemainingJourneyRides	<i>Set to 0 Increment by 1</i>
Data Element	Value for Rail Use											
DateTimeStamp	<i>The POST's current time when the MU is performed</i>											
ISAMIDModifier	<i>Value as per ITSO specification</i>											
TYP24 JourneyPartUsedFlag JourneysRemaining	<i>Set to 0 Increment by 1</i>											
TYP23 TYP23ValueFlags (UsedChecked) CountRemainingJourneyRides	<i>Set to 0 Increment by 1</i>											

Ref.	Media Update	Notes	
MU19	Construct Transient Ticket (Product Selected)	Data Element	Value for Rail Use
		TTLength	<i>Value as per ITSO specification</i>
		TTBitMap1	<i>0 (Not used)</i>
		TTFormatRevision	<i>4</i>
		TTBitMap2 (Presence of Data Groups)	<i>See individual bits</i>
		Bit 0: Amount Paid (LSB)	<i>0</i>
		Bit 1: Destination	<i>0</i>
		Bit 2: IPE ID	<i>1</i>
		Bit 3: Origin	<i>1</i>
		Bit 4: RFU	<i>0</i>
		Bit 5: Routing Code	<i>0</i>
		Bit 6: RFU	<i>0</i>
		Bit 7: IIN	<i>0</i>
		Bit 8: Candidate IPEs	<i>0</i>
		Bit 9: Entry	<i>0</i>
		Bit 10: Entry OID	<i>1</i>
		Bit 11: User defined (MSB)	<i>0</i>
		TTTransactionType	<i>11 (check-in)</i>
		DateTimeStamp	<i>The POST's current time when the MU is performed</i>
		AmountPaidMethodOfPayment	<i>Data Group not present</i>
		AmountPaidCurrencyCode	<i>Data Group not present</i>
		AmountPaid	<i>Data Group not present</i>
		CompanionTravelled	<i>Data Group not present</i>
		ReturnTicket	<i>Data Group not present</i>
		RFU	<i>Data Group not present</i>
		NoFareCharged	<i>Data Group not present</i>
		AmountPaidVATSalesTax	<i>Data Group not present</i>
		DestinationTT	<i>Data Group not present</i>
		[continued]	

Ref.	Media Update	Notes																																				
		<div>[continued from previous]</div> <table><tr><th>Data Element</th><th>Value for Rail Use</th></tr><tr><td>RFU</td><td>Data Group not present</td></tr><tr><td>IPEPointer</td><td>IPE used for journey</td></tr><tr><td>OriginLocation</td><td>Value as per ITSO specification with<table><tr><td>Location Definition type</td><td>203 (Short Rail National Location Code (NLC))</td></tr></table></td></tr><tr><td>RoutingCode</td><td>Data Group not present</td></tr><tr><td>IIN</td><td>Data Group not present</td></tr><tr><td>IPEID1 †</td><td>Data Group not present</td></tr><tr><td>IPEID2 †</td><td>Data Group not present</td></tr><tr><td>IPEID3 †</td><td>Data Group not present</td></tr><tr><td>IPEID4 †</td><td>Data Group not present</td></tr><tr><td>CIPEFlags</td><td>Data Group not present</td></tr><tr><td>ENTRY_TT_IPE_ISAMID</td><td>Data Group not present</td></tr><tr><td>ENTRY_TT_IPE_SAMSequenceNumber</td><td>Data Group not present</td></tr><tr><td>ENTRY_DateTimeStamp</td><td>Data Group not present</td></tr><tr><td>ENTRY_OID</td><td>Value as per ITSO specification</td></tr><tr><td>ENTRY_IIN_Index</td><td>Value as per ITSO specification</td></tr><tr><td>UserDefined</td><td>Data Group not present</td></tr></table>	Data Element	Value for Rail Use	RFU	Data Group not present	IPEPointer	IPE used for journey	OriginLocation	Value as per ITSO specification with <table><tr><td>Location Definition type</td><td>203 (Short Rail National Location Code (NLC))</td></tr></table>	Location Definition type	203 (Short Rail National Location Code (NLC))	RoutingCode	Data Group not present	IIN	Data Group not present	IPEID1 †	Data Group not present	IPEID2 †	Data Group not present	IPEID3 †	Data Group not present	IPEID4 †	Data Group not present	CIPEFlags	Data Group not present	ENTRY_TT_IPE_ISAMID	Data Group not present	ENTRY_TT_IPE_SAMSequenceNumber	Data Group not present	ENTRY_DateTimeStamp	Data Group not present	ENTRY_OID	Value as per ITSO specification	ENTRY_IIN_Index	Value as per ITSO specification	UserDefined	Data Group not present
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ENTRY_TT_IPE_SAMSequenceNumber	Data Group not present																																					
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ENTRY_OID	Value as per ITSO specification																																					
ENTRY_IIN_Index	Value as per ITSO specification																																					
UserDefined	Data Group not present																																					
MU20	Decrement Value Group remaining stored passes — IPE22	<div>Unless stated otherwise, Data Elements must be the same as before.</div> <table><tr><th>Data Element</th><th>Value for Rail Use</th></tr><tr><td>DateTimeStamp</td><td>The POST's current time when the MU is performed</td></tr><tr><td>ISAMIDModifier</td><td>Value as per ITSO specification</td></tr><tr><td>ExpiryDateCurrent</td><td>Calculated as the later of (ExpiryDateCurrent or Today's date) plus the number of days defined by PassDuration</td></tr><tr><td>NumberRemainingPasses</td><td>1 less than previous; Data Element capacity limits this to 63. There are currently no rail-specific maxima, but this may be revised.</td></tr></table>	Data Element	Value for Rail Use	DateTimeStamp	The POST's current time when the MU is performed	ISAMIDModifier	Value as per ITSO specification	ExpiryDateCurrent	Calculated as the later of (ExpiryDateCurrent or Today's date) plus the number of days defined by PassDuration	NumberRemainingPasses	1 less than previous; Data Element capacity limits this to 63. There are currently no rail-specific maxima, but this may be revised.																										
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4.8 State Transitions

- 4.8.1 The following state transition diagram shows the states of a Transient Ticket for the defined Operations, using the defined Media Updates.
- 4.8.2 As specified in paragraph 4.3.1, a new Transient Ticket is created each time.
- 4.8.3 The Media is deemed to be outside of the closed system if its Transient Ticket is in one of the following states:
- No Transient ticket exists (ie This Media has been set to use the ITSO Basic Log);
 - Its ITSO Format Revision is not Version 4 Checked Out (Transaction Code 12);
 - Undo Previous Event Without Refund(Transaction Code 3); or
 - Not Having a Transaction Value of 0, 11, 8, 14.



- | | |
|--|--|
| OP1: check in | OP16: pass activation at check |
| OP2: check out where no decrement required | OP17: pass activation at inspection |
| OP3: check out where decrement required | OP18: pass activation at checkout |
| OP4: undo checkin | OP19: Pass activation at checkout with forced checkin |
| OP5: reverse decrement | OP20: check in with STR decrement |
| OP6: inspection product selection | OP20 -OP25 : Reserve for future |
| OP7: inspection only | OP26: inspection product selection following forced check in |
| OP8: undo inspection product selection | OP27: inspection only following forced checkin |
| OP9: check out with forced check in where no decrement required | |
| OP10: check out with forced check in where decrement required | |
| OP11: break of journey out | |
| OP12: break of journey in | |
| OP13: break of journey out with forced check in where decrement required | |
| OP14: Check out where part used update required(e.g. OS) | |
| OP15: Check out with forced checkin where part used update required(e.g. OS) | |

5. Messaging

5.1 Introduction & Scope

5.1.1 The ITSO Specification (Part 6) defines numerous message formats for communications between ITSO POSTs and HOPS and between one HOPS and another. Several of these messages come in different versions and, on closer inspection; there are numerous options and choices to be made. It is most desirable for ITSO messages relating to rail to be consistent and this section proposes rules to restrict the variability and improve consistency.

5.1.2 This section concentrates on:

- Transaction messages generated by POSTs for delivery to HOPS. Note that a POST can address each transaction message to a number of destination HOPS (i.e. IPE owner, Shell owner) in addition to its “owning” HOPS. It is this cross-scheme operation that makes consistency so desirable;
- Data list messages for both Hot and Action list items. These relate to both HOPS to POST and HOPS to HOPS messages; and
- Miscellaneous Messages using the 08XX message codes. These relate to both HOPS to POST and HOPS to HOPS messages.

5.2 Rail TIS POSTS

5.2.1 For rail TIS POSTS including Ticket Vending Machines, Ticket Office Machines and Portable Sales Devices, it is required that all IPE creation and IPE Amend messages are sent to the Shell Owner in addition to any other specified destinations. This includes all 0005, 0207, 0006 and 0208 messages generated by the TIS.

5.3 Transaction Message Coverage

5.3.1 The following table shows the transaction message coverage as required to meet interoperability between rail schemes – this is in line with 2.1.4 DG019

- “Y” indicates that there are specific rules applicable to that message in rail and that those rules are defined within Section 3
- “N” indicates that there are no additional rules proposed for rail
- “X” indicates that the message is considered not to have any function within a rail context, though their generation maybe required by ITSO specification and to support schemes processes.

5.3.2 As a general rule, additional rules are not proposed for blocks of message fields that are simply copies of corresponding blocks from the Customer Media (for example several messages contain a copy of the Value Group of the IPE concerned.). The table also shows the message version to be used. No additional rules are proposed for ACKs and NAKs.

5.3.3 Rail POST and HOPS should, regardless of the coverage indicator generate, the version of the message indicated.

5.3.4 Many of the transaction messages, including several for which this document proposes no additional rules, contain a data attribute of ProductRetailer. For transactions generated at a POST operating within the rail network, the ProductRetailer should be set to the NLC code of the Vendor of the IPE to which the transaction message relates.

Transaction Group	Transaction Type	Hex Code	Version	Sent To Owners Of:	Covered here
ITSO shell	Create ITSO shell	0001	2	Shell POST	Y
	Delete ITSO shell	0004	2	Shell POST	N
IPE administration	Create IPE (sent to ITSO Shell owner)	0005	2	Shell	Y
	Amend IPE (sent to ITSO Shell owner)	0006	2	Shell	Y
	Delete IPE (sent to ITSO Shell owner and IPE owner)	0007	2	Shell POST IPE	Y
ITSO Shell owner records	Stored Travel Rights first use	0008	2	Shell	N
	Enable/disable CTA	0009	2	Shell	X
ITSO ID	Create ITSO ID TYPs 14 & 16 (includes any deposit payment)	0200	2	SHELL POST IPE	N
	Amend ITSO ID TYPs 14 & 16	0201	2	SHELL POST IPE	N
Stored Travel Rights	Create Stored Travel Rights TYP 2	0120	2	SHELL POST IPE	N
	Amend Stored Travel Rights TYP 2	0121	2	SHELL POST IPE	N
	Stored Travel Rights usage (deduction from store) (funds transfer request)	0100	2	SHELL POST IPE	N
	Stored Travel Rights load (manual or Actionlist)	0101	2	SHELL POST IPE	N
	Stored Travel Rights load (Auto-Top-Up)	0102	2	SHELL POST IPE	N
	Stored Travel Rights load check record	0103	2	SHELL POST IPE	N
	Enable or amend Auto-Top-Up	0104	2	SHELL POST IPE	N
	Disable Auto-Top-Up	0105	2	SHELL POST IPE	N
	First use of Stored Travel Rights (to IPE owner)	0106	2	SHELL POST IPE	N

Transaction Group	Transaction Type	Hex Code	Version	Sent To Owners Of:	Covered here
	Stored Travel Rights TransactionReversal (restoration of Stored Travel Rights deducted during a Transaction which has been cancelled)	0107	2	SHELL POST IPE	N
	Stored Travel Rights – refund of part/all Stored Travel Rights (which may, or may not, follow a loading transaction)	0108	2	SHELL POST IPE	N
	Refund all Stored Travel Rights, together with any deposit amount and disable the Stored Travel Rights IPE	0109	2	SHELL POST IPE	N
Charge to account (CTA)	Create CTA IPE TYP 4	0122	2	POST IPE	X
	Amend CTA IPE TYP 4	0123	2	POST IPE	X
	Create CTA IPE TYP 5	0124	2	POST IPE	X
	Amend CTA IPE TYP 5	0125	2	POST IPE	X
	Enable CTA	010B	2	POST IPE	X
	Disable CTA	010C	2	POST IPE	X
	CTA Full / Partial Refund for a purchased ticket	010D	2	POST IPE	X
	CTA TYP 4 Usage	010E	2	POST IPE	X
	CTA TYP 4 Value Adjustment	010F	2	POST IPE	X
	CTA TYP 5 Full / Partial Refund for a purchased ticket	0110	2	POST IPE	X
	CTA TYP 5 Usage	0111	2	POST IPE	X
	CTA TYP 5 Value Adjustment	0112	2	POST IPE	X
Loyalty	Create Loyalty IPE	020B	2	POST IPE	X
	RFU	0202			X
	Loyalty add points	0203	2	POST IPE	X
	Loyalty redemption	0204	2	POST IPE	X

Transaction Group	Transaction Type	Hex Code	Version	Sent To Owners Of:	Covered here
	Loyalty amendment (transaction reversal)	0205	2	POST IPE	X
	First use of scheme	0206	2	POST IPE	X
Transaction Reversal	(other than Stored Travel Rights, with rides refund to Customer Media if appropriate)	0300	3	SHELL POST IPE	Y
Predefined ticket and predefined specific journey ticket transactions	Create IPE (sent to IPE owner)	0207	4	SHELL POST IPE	Y
	Amend IPE (sent to IPE owner). A record code 0208 is generated for every change to the IPE, including a stored rides use.	0208	4	SHELL POST IPE	Y
Refund	Full / Partial refund for a purchased ticket (IPE)	0301	3	SHELL POST IPE	Y
Journey record	Journey / entry / exit record (IPE usage)	0209	4	SHELL POST IPE	Y
	Journey / entry / exit record (Transient Ticket)	0210	5	SHELL POST IPE*	Y
Miscellaneous	Deposit received	0302	2	SHELL POST IPE	Y
	Deposit refund	0303	2	SHELL POST IPE	Y
	Enable / Amend Auto-Renew	0304	2	POST IPE	X
	Disable Auto-Renew	0305	2	POST IPE	X
	Supplementary Data message	0310	3	SHELL POST IPE	Y
	Hotlist match event record	0311	2	SHELL POST plus IPE (IPE Hotlisted)	N
	Actionlist match event record	0312	2	SHELL POST IPE	N
	Cyclic Log status change	0313	2	Shell	X
	Unblock Shell or Product	0314	2	Shell and, if appropriate, the IPE	N

Transaction Group	Transaction Type	Hex Code	Version	Sent To Owners Of:	Covered here
Exceptions	Transaction Failed	0400	2	Shell POST IPE (depending on the error)	Y
	Transaction with Customer Media apparently successful, but the POST was unable to confirm this.	0410	2	Shell POST IPE	Y

* Send when a single product selected.

5.3.5 Code 0200 & 0201: Create ITSO ID TYP16 (includes any deposit amounts) & Amend ITSO ID TYP16

5.3.6 The data content of ITSO transaction messages relating to the creation or amendment of IPE 16 will depend on the exact definition of these IPEs within a rail scheme. The following is for guidance only, but matches the rules applied for other IPEs or resolves issues related to personal data.

Name	Source	Format	Size	Comment	Rail Rule
Amount	POST	VALI	2	Amount of any remittance by the Customer Media holder, excluding a deposit.	For Typ16 set to 0
AmountCurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0	For Typ16 set to 0
HolderTitle	POST	ASCII	4	Where necessary, this element shall be padded with trailing spaces	Set to space
HolderSurname	POST	ASCII	20	Where necessary, this element shall be padded with trailing spaces	Set to space
HolderOtherNames	POST	ASCII	30	Where necessary, this element shall be padded with trailing spaces	Set to space
HolderAddress1	POST	ASCII	30	Where necessary, this element shall be padded with trailing spaces	Set to space

Name	Source	Format	Size	Comment	Rail Rule
HolderAddress2	POST	ASCII	30	1.1.1.1 Where necessary, this element shall be padded with trailing spaces	Set to space
HolderAddress3	POST	ASCII	30	Where necessary, this element shall be padded with trailing spaces	Set to space
HolderAddress4	POST	ASCII	30	Where necessary, this element shall be padded with trailing spaces	Set to space
HolderPostcode	POST	ASCII	10	Where necessary, this element shall be padded with trailing spaces	Set to space
HolderPhoneDay	POST	ASCII	20	Where necessary, this element shall be padded with trailing spaces	Set to space
HolderPhoneHome	POST	ASCII	20	Where necessary, this element shall be padded with trailing spaces	Set to space
HolderPhoneMobile	POST	ASCII	20	Where necessary, this element shall be padded with trailing spaces	Set to space
HolderEmail	POST	ASCII	40	Where necessary, this element shall be padded with trailing spaces	Set to space
IPE-TYP	POST	TYP	1	This element shall indicate the TYP of IPE to which a message instance refers, and also indicates the type of optional data which may be found within a message instance.	Set to 16

Name	Source	Format	Size	Comment	Rail Rule
				In this instance it shall be used to identify whether the IPE is of TYP 14 or TYP 16.	
ValidAtOrFrom	IPE	LOC1	Variable, maximum 17	Variable length element	Always NULL for TYP16
ValidTo	IPE	LOC1	Variable, maximum 17	Variable length element	Always NULL for TYP16

5.3.7 Standard Elements – Regardless of format revision

5.3.7.1 The following elements shall always be returned as the leading data elements in every transaction message for all types of transaction.

5.3.7.2 The definition applies to all transaction messages generated for rail regardless of whether they are identified within section 5.3, as “X”, “N” or “Y”.

Name	Source	Format	Size	ITSO Specification Comment	Rail Rule														
RecordFormatRevision	POST	HEX code	1	Defines format revision of this message.	Set by POST as appropriate														
TransactionDateTime	POST	DTS	3	Date & time at which the transaction took place which shall be identical to any DTS recorded in the shell IPEs or Transient Ticket store	Machine time rounded down to previous minute boundary														
TransactionInformation	POST	UD	1	User defined element	Set to zero														
StaffID	POST	HEX	4	Identifies the operators member of staff (if any) conducting the transaction. If none then zero shall be recorded in this element	A value must be provided by the POST, but there are no specific rail rules														
SupplementalInformation	POST	HEX	1	Additional information code	For POST in a defined “test mode” all transactions generated shall have code 01 For POST operating in “live mode” but which generates transactions which relate to test products (IPEs with Validity Code bit 4 set to 1) shall have the code 01														
				<table><tr><th>Code</th><th>Meaning</th></tr><tr><td>00</td><td>No supplemental information stored</td></tr><tr><td>01</td><td>Test/Maintenance/training transaction</td></tr><tr><td>02</td><td>Incomplete transaction</td></tr><tr><td>03</td><td>Commercial In (required for 0209 Journey Records only)</td></tr><tr><td>04</td><td>Commercial Out (required for 0209 Journey Records only)</td></tr><tr><td>05</td><td>Minimum Subsidy In (required for 0209 Journey Records only)</td></tr></table>		Code	Meaning	00	No supplemental information stored	01	Test/Maintenance/training transaction	02	Incomplete transaction	03	Commercial In (required for 0209 Journey Records only)	04	Commercial Out (required for 0209 Journey Records only)	05	Minimum Subsidy In (required for 0209 Journey Records only)
				Code		Meaning													
				00		No supplemental information stored													
				01		Test/Maintenance/training transaction													
				02		Incomplete transaction													
				03		Commercial In (required for 0209 Journey Records only)													
04	Commercial Out (required for 0209 Journey Records only)																		
05	Minimum Subsidy In (required for 0209 Journey Records only)																		

Name	Source	Format	Size	ITSO Specification Comment		Rail Rule
				06	Minimum Subsidy Out (required for 0209 Journey Records only)	In all other cases POST will generate transactions with code set to 00 The above applies to all transactions generated including all 0209 journey records written in a rail context
				07	Minimum Cost In (required for 0209 Journey Records only)	
				08	Minimum Cost Out (required for 0209 Journey Records only)	
FormatVersionCode	Shell	FVC	1	Format version information from the directory header. A 4 bit number occupying bits 0-3; bits 4-7 shall be set to zero		Taken from the CMD
KeyStrategyVersion	Shell	KSC	1	Format version information from the directory header		Taken from the CMD
KeyVersion	Shell	KVC	1	Format version information from the directory header		Taken from the CMD
IPEID	Shell & Dir	IPEIDM	7	<p>Identifies the IPE involved in the transaction, taken from the ITSO Shell’s directory entry. It is a concatenation of IIN, OID, TYP and PTYP in that order.</p> <p>When a message is used to record an event relating to an ITSO Shell, then this IPEID element shall either:</p> <p>made up of the Shell’s IIN, the Shell owner’s OID, IPE Type - which shall be set to a value of 32 (decimal), and a Shell owner defined PTYP value which shall be used to indicate the Shell version,</p> <p>or</p> <p>set to zero to indicate that the message relates to a Shell. (This option shall not be used in new or amended implementations. Note that this option will be removed in a future version of the ITSO Specification.)</p>		Taken from the CMD

Name	Source	Format	Size	ITSO Specification Comment	Rail Rule
				If the IPE cannot be read and IINL = 1, set the IIN portion of this element to zero (0).	
Shell_IterationNumber	Shell	INS#	1	A 0.5 byte value occupying bits 0 to 3 bits 4 to 7 shall be set to zero	Taken from the CMD

5.3.8 Message Specific Rules

5.3.8.1 Introduction

5.3.8.1.1 The following sections list the rail rules applicable to each transaction message. Only those data attributes which require specific rail interpretation are listed. Other attributes within the transaction messages that are not listed should be taken from the IPE, Directory Entry or Shell as recorded in part 6 of the ITSO specification.

5.3.8.2 Code 0001: Create ITSO shell

5.3.8.2.1 Issuers of ITSO Customer Media for rail must **not** to use a Card Reference Number (MCRN) separate from the ISRN. If media is issued with a separate MCRN the ISRN must be printed on the card as well.

5.3.8.3 Code 0300: Transaction Reversal/Cancellation (other than Stored Travel Rights)

5.3.8.3.1 This transaction reversal record does not positively identify the transaction being reversed. The following rules are intended to mitigate this and to clarify the processing these transaction messages:

- The 0300 transaction message should only be written to reverse either a change applied to the Journeys/Passes of an IPE Value Group of a Travel Product IPE, i.e. TYP 22, 23 & 24, or to reverse where a product selection has taken place where an 0209 transaction message was generated
- Each 0300 transaction message reverses a single prior transaction message. (If a single customer transaction generated several Travel Product IPE transaction messages, then voiding that customer transaction requires the same number of 0300 transaction messages)

Name	Source	Format	Size	Comment	Rail Rule
AmountPaid	POST	VALI	4	Actual fare/price refund amount for ticket (if any), currency is defined by CurrencyCode	Set to 0
NormalPrice	POST	VALI	4	Full fare/price for ticket (if any), currency is defined by CurrencyCode	Set to 0

Name	Source	Format	Size	Comment	Rail Rule	
CurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0	Set to value in matching SDCI+ record or to the Amount in the IPE	
StoredUsesRefunded	POST	HEX	1	Number of stored uses of the ticket refunded (if any)	Set by POST	
				IPE TYP		IPE Data element to which StoredUsesRefunded maps
				22		NumberRemainingPasses
				23		CountRemainingRidesJourneys
				24		JourneysRemaining
TicketNumber	IPE or POST	UD	6	Operators Ticket number, when available, otherwise set to zero. Shall be obtained from the IPE if IPE is of TYP 24, otherwise obtained from the POST. An IPE element shorter than 6 bytes shall occupy the least significant bytes of this element.	TicketNumber if this is a TYP 24 Set to Transaction Number (Original Ticket) in the SDCI+ BS record. for TYP 22 & 23	

5.3.8.4 Code 0301: Full/Partial refund for a purchased ticket (IPE)

5.3.8.4.1 This transaction message should only be used for refunds undertaken at a manually operated POST. It should only be written where the IPE Data Group is to be removed from the customer media. The refund transaction requires a return of payment to the cardholder.

5.3.8.4.2 Reversing a change to the journeys/passes within an IPE Value Group, but leaving the IPE otherwise unchanged, should result in an 0300 Transaction Reversal

Name	Source	Format	Size	Comment	Rail Rule
Amount	POST	VALI	4	Amount refunded	Set to value in matching SDCI+ record or to the Amount in the IPE
AmountCurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0	Bits 0 to 3 set to 0000 for GBP and 0001 for Euro
TicketNumber	IPE or POST	UD	6	Operators Ticket number, when available, otherwise set to zero. Shall be obtained from the IPE if IPE is of TYP 24, otherwise obtained from the POST. An IPE element shorter than 6 bytes shall occupy the least significant bytes of this element.	TicketNumber if this is a TYP 24 Set to Transaction Number (Original Ticket) in the SDCI+ BS record for TYP 22 & 23 except when not the original retailer and this is not available. In which case, set to 0.
ReasonCode	POST	UD	1	Reason codes "01" to "99" encoded as 1 byte numeric value.	Set to numeric value for the reason code in the SDCI+ BS record.
VATSalesTax	POST	VATM	2		Set to 0

5.3.8.5 Code 0207: Create IPE (sent to IPE owner and to Shell owner)

5.3.8.5.1 This records the creation of a ticket IPE using the approved IPE TYP for rail (22, 23 & 24). If a simultaneous journey is made a journey record shall also be created.

5.3.8.5.2 Common Data

Name	Source	Format	Size	Comment	Rail Rule
IPE-TYP	POST	TYP	1	This element shall indicate the TYP of IPE to which a message instance refers, and also indicates the type of optional data which may be found within a message instance.	Set by POST

Name	Source	Format	Size	Comment			Rail Rule
NormalPrice	POST	VALI	4	Full price for ticket (if any), currency is defined by CurrencyCode			Set by POST
CurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0			Bits 0 to 3 set to 0000 for GBP and 0001 for Euro
MachineNumber	POST	HEX	4	Serial number of the terminal conducting the transaction			Defined by Service Operator Recommendation is that where a POST is also a TIS that the TIS details are used
TransactionFlags	POST	HEX	1				Set bit 0 = 0, bit 1 = 1, bit 2 = 0 for application of an action list item for Typ 22, 23 or 24 Set bit 0 , bit 1 and bit 2 to zero otherwise Set bit 3 = 1, bit 4 = 0, bit 5 = 0 for all transactions at an operated TIS Set bit 3 = 0, bit 4 = 1, bit 5 = 0 for all transactions at a customer operated TVM, Gate or Validator
				Flag ID	Flag name	Flag purpose	
				0	AutoTransacti on	Set to one (1) when the relevant transaction took place automatically due to auto-renew, otherwise set to zero (0). Note that the use of flags 0, 1 and 2 is mutually exclusive.	
				1	ActionListTran saction	Set to one (1) when the relevant transaction took place due to an Actionlist item, otherwise set to zero (0).	
				2	StoredTicketA ctivation	Set to one (1) when the relevant transaction took place due to Stored Ticket activation, otherwise set to zero (0).	

Name	Source	Format	Size	Comment			Rail Rule
				3	ManualPostTransaction	Set to one (1) when the relevant transaction took place at an attended POST, e.g. a ticket office machine or bus ticket machine, otherwise set to zero (0). Note that the use of flags 3, 4 and 5 is mutually exclusive.	
				4	UnattendedPostTransaction	Set to one (1) when the relevant transaction took place at an unattended POST, e.g. a ticket vending machine, otherwise set to zero (0).	
				5	RemotePostTransaction	Set to one (1) when the relevant transaction took place with a remote POST, e.g. CM holder not present, otherwise set to zero (0).	
				6	RFU		
				7	RFU		
MessageBitMap	DIR & POST	BMP	1	<p>Bit 0 shall be a copy of the Value Group Present flag from the directory. This indicates whether a value group is present in an IPE instance, and therefore also present in a message instance.</p> <p>Bit 1 shall be set to one (1) when the ID_IPEID, ID_ISAMID and ID_ISASeq# data elements are included in the record.</p> <p>Bits 2 – 7 are RFU.</p>			<p>Bit 0 set as required dependent upon the IPE created</p> <p>Bit 1 always set to 1</p>

5.3.8.5.3 IPE Typ 22 data

Name	Source	Format	Size	Comment	Rail Rule
ValidAtOrFrom	IPE	LOC1	Variable, max 17		Taken from the IPE Dependent on value of Bit 1 within IPEBitMap, if this is set then use LocDefType 203, UK National Rail Location code otherwise LocDefType 255, NULL location
ValidTo	IPE	LOC1	Variable, max 17		Taken from the IPE Dependent on value of Bit 1 within IPEBitMap, if this is set then use LocDefType 203, UK National Rail Location code otherwise LocDefType 255, NULL location

5.3.8.5.4 IPE Typ 23 data

Name	Source	Format	Size	Comment	Rail Rule
Origin1	IPE	LOC1	Variable, max 17		Taken from the IPE Dependent on value of Bit 1 within PEBitMap, if this is set then use LocDefType 203, UK National Rail Location code otherwise LocDefType 255, NULL location

Name	Source	Format	Size	Comment	Rail Rule
Destination1	IPE	LOC1	Variable, max 17		Taken from the IPE Dependent on value of Bit 1 within PEBitMap, if this is set then use LocDefType 203, UK National Rail Location code otherwise LocDefType 255, NULL location

5.3.8.6 Code 0208: Amend IPE (sent to IPE owner and to Shell owner)

5.3.8.6.1 This message records the amendment of a ticket IPE using the approved IPE TYP for rail (22, 23 & 24). Such an amendment includes changes to the Value Group of the IPE. If a simultaneous journey is made a journey record shall also be created.

5.3.8.6.2 Common Data

Name	Source	Format	Size	Comment	Rail Rule
IPE-TYP	POST	TYP	1	This element shall indicate the TYP of IPE to which a message instance refers, and also indicates the type of optional data which may be found within a message instance.	Set by POST
NormalPrice	POST	VALI	4	Full price for ticket (if any), currency is defined by CurrencyCode	Set by POST if the Amount in the IPE Data Group is amended. Otherwise set to 0
CurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0	Bits 0 to 3 set to 0000 for GBP and 0001 for Euro
MachineNumber	POST	HEX	4	Serial number of the terminal conducting the transaction	Defined by Service Operator

Name	Source	Format	Size	Comment	Rail Rule															
					Recommendation is that where a POST is also a TIS that the TIS details are used															
TransactionFlags	POST	HEX	1	<table><tr><th>Flag ID</th><th>Flag name</th><th>Flag purpose</th></tr><tr><td>0</td><td>AutoTransaction</td><td>Set to one (1) when the relevant transaction took place automatically due to auto-renew, otherwise set to zero (0). Note that the use of flags 0, 1 and 2 is mutually exclusive.</td></tr><tr><td>1</td><td>ActionListTransaction</td><td>Set to one (1) when the relevant transaction took place due to an Actionlist item, otherwise set to zero (0).</td></tr><tr><td>2</td><td>StoredTicketActivation</td><td>Set to one (1) when the relevant transaction took place due to Stored Ticket activation, otherwise set to zero (0).</td></tr><tr><td>3</td><td>ManualPostTransaction</td><td>Set to one (1) when the relevant transaction took place at an attended POST, e.g. a ticket office machine or bus ticket machine, otherwise set to zero (0). Note that the use of flags 3, 4 and 5 is mutually exclusive.</td></tr></table>	Flag ID	Flag name	Flag purpose	0	AutoTransaction	Set to one (1) when the relevant transaction took place automatically due to auto-renew, otherwise set to zero (0). Note that the use of flags 0, 1 and 2 is mutually exclusive.	1	ActionListTransaction	Set to one (1) when the relevant transaction took place due to an Actionlist item, otherwise set to zero (0).	2	StoredTicketActivation	Set to one (1) when the relevant transaction took place due to Stored Ticket activation, otherwise set to zero (0).	3	ManualPostTransaction	Set to one (1) when the relevant transaction took place at an attended POST, e.g. a ticket office machine or bus ticket machine, otherwise set to zero (0). Note that the use of flags 3, 4 and 5 is mutually exclusive.	<p>Set bit 0 = 0, bit 1 = 1, bit 2 = 0 for application of an action list item for Typ 22, 23 or 24</p> <p>Set bit 0 , bit 1 and bit 2 to zero otherwise</p> <p>Set bit 3 = 1, bit 4 = 0, bit 5 = 0 for all transactions at an operated TIS</p> <p>Set bit 3 = 0, bit 4 = 1, bit 5 = 0 for all transactions at a customer operated TVM, Gate or Validator</p>
Flag ID	Flag name	Flag purpose																		
0	AutoTransaction	Set to one (1) when the relevant transaction took place automatically due to auto-renew, otherwise set to zero (0). Note that the use of flags 0, 1 and 2 is mutually exclusive.																		
1	ActionListTransaction	Set to one (1) when the relevant transaction took place due to an Actionlist item, otherwise set to zero (0).																		
2	StoredTicketActivation	Set to one (1) when the relevant transaction took place due to Stored Ticket activation, otherwise set to zero (0).																		
3	ManualPostTransaction	Set to one (1) when the relevant transaction took place at an attended POST, e.g. a ticket office machine or bus ticket machine, otherwise set to zero (0). Note that the use of flags 3, 4 and 5 is mutually exclusive.																		

Name	Source	Format	Size	Comment			Rail Rule
				4	UnattendedPostTransaction	Set to one (1) when the relevant transaction took place at an unattended POST, e.g. a ticket vending machine, otherwise set to zero (0).	
				5	RemotePostTransaction	Set to one (1) when the relevant transaction took place with a remote POST, e.g. CM holder not present, otherwise set to zero (0).	
				6	RFU		
				7	RFU		
MessageBitMap	DIR & POST	BMP	1	<p>Bit 0 shall be a copy of the Value Group Present flag from the directory. This indicates whether a value group is present in an IPE instance, and therefore also present in a message instance.</p> <p>Bit 1 shall be set to one (1) when the ID_IPEID, ID_ISAMID and ID_ISASeq# data elements are included in the record.</p> <p>Bits 2 – 7 are RFU.</p>			<p>Bit 0 set as required dependent upon the IPE created</p> <p>Bit 1 always set to 1</p>

5.3.8.6.3 IPE Typ 22 data

Name	Source	Format	Size	Comment	Rail Rule
ValidAtOrFrom	IPE	LOC1	Variable, max 17		<p>Taken from the IPE</p> <p>Dependent on value of Bit 1 within IPEBitMap, if this is set then use LocDefType 203, UK National Rail Location code</p>

Name	Source	Format	Size	Comment	Rail Rule
					otherwise LocDefType 255, NULL location
ValidTo	IPE	LOC1	Variable, max 17		Taken from the IPE Dependent on value of Bit 1 within IPEBitMap, if this is set then use LocDefType 203, UK National Rail Location code otherwise LocDefType 255, NULL location

5.3.8.6.4 IPE Typ 23 data

Name	Source	Format	Size	Comment	Rail Rule
Origin1	IPE	LOC1	Variable, max 17		Taken from the IPE Dependent on value of Bit 1 within PEBitMap, if this is set then use LocDefType 203, UK National Rail Location code otherwise LocDefType 255, NULL location
Destination1	IPE	LOC1	Variable, max 17		Taken from the IPE Dependent on value of Bit 1 within PEBitMap, if this is set then use LocDefType 203, UK National Rail Location code

Name	Source	Format	Size	Comment	Rail Rule
					otherwise LocDefType 255, NULL location

5.3.8.7 Code 0209: Journey / entry /exit record (IPE usage)

5.3.8.7.1 This transaction message shall be generated in accord with the rail validation process defined elsewhere within this document.

Name	Source	Format	Size	Comment	Rail Rule
AmountPaid	POST	VALI	4	Actual fare/price paid for journey (if any). Do not insert any value here if an amount value is entered in a simultaneous ticket creation or amendment record. Currency is defined by CurrencyCode.	Always set to 0
NormalPrice	POST	VALI	4	Full fare/price for journey. Do not insert any value here if an amount value is entered in a simultaneous ticket creation or amendment record. Currency is defined by CurrencyCode.	Always set to 0
CurrencyCode	POST	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0	Set to 0
Location	POST	LOC1	Variable	Location at which the journey commenced or location at which the event recorded herein occurred	Use LocDefType 203, UK National Rail Location code. This will be the Origin as set in the transient ticket record or if no transient ticket record present the NLC of the POST. If the check is made on train the latter will be the NLC of the POST's Depot

Name	Source	Format	Size	Comment	Rail Rule
Destination	POST	LOC1	Variable	Destination or proposed destination where known	<p>Use LocDefType 203, UK National Rail Location code.</p> <p>This will be the Destination as set in the transient ticket record or if this is not recorded the NLC of the POST. If the check is made on train the latter will be the NLC of the POST's Depot</p>
ConcessionaryAuthority	POST	HEX	2	Identity of the concessionary authority within whose area the journey commenced, obtained from the POST configuration data where this information may be stored for this purpose. Where no concessionary authority ID data is stored in this data element then it shall be set to zero. This is a number that is unique to a given Travel Concession Authority. These numbers are allocated by the appropriate National Concessionary Travel Authority for the country in which the boarding point is located. This value might be an OID	Set to 0
RemainingUses	IPE	HEX	1	<p>If a multi-use IPE (i.e. multi-ride, journey ticket or multi-use voucher) then record the remaining number of uses after the transaction. This data will be extracted from the TYP 22 NumberRemainingPasses, TYP 23 CountRemainingRidesJourneys, TYP 24 JourneysRemaining, IPE element, depending on the IPE used for the transaction.</p> <p>If the IPE element is smaller than 1 byte, then it shall occupy the least significant bits of this element. If the IPE does not include this data, then set this element to a value of zero.</p>	Taken from the IPE Value Group if present otherwise set to zero

Name	Source	Format	Size	Comment	Rail Rule
				If the value of the data element in the IPE is greater than or equal to 255, then set this element to 255, or if the IPE value is less than 255 then set this element to that value.	
TransactionType	IPE POST	HEX	1	<p>If a TransactionType code has been recorded in either the transient ticket log or in the IPE value record, then that value shall be recorded here.</p> <p>Otherwise, where no TransactionType code has been stored in an IPE or a transient Ticket relevant to the Journey Record, use an appropriate code according to EN1545 EventTypeCode.</p> <p>As 8 bit codes can be stored here [whereas only 4 bit codes are permissible in IPEs] then if a more appropriate code, greater than 15, is available in the EN1545 EventTypeCode list; that EventTypeCode value may be used here.</p> <p>Further guidance may be found in ITSO DG0007.</p>	Set to a value which corresponds to the current Transient Ticket Record
ServiceOperatorID	POST	UD	2	This could be an OID, or could be a user defined value, defined either by the Service Operator or by the owner of the Product used in the Transaction	Set to 0
ServiceNumber	POST	UD	10	An identifier for the route or service relevant to the Transaction. If there is no relevant identifier available set to a null value (0 or ASCII spaces).	Set to 0
TripNumberOrTrainNumber	POST	UD	10	An identifier for the bus trip number or train number relevant to the Transaction. If there is no relevant identifier available set to a null value (0 or ASCII spaces).	Set to Retail Train ID if known otherwise set to 0

Name	Source	Format	Size	Comment	Rail Rule	
ReimbursementDataFlags	POST	BMP	1		Set to 0	
				Bit		Meaning
				0		Concessionary Minimum Cost Contract if set to 1
				1		Concessionary Minimum Subsidy Contract if set to 1
				2		Direction (OUT or Clockwise, set to 0, IN or Anticlockwise, set to 1)
				3		RFU
				4		RFU
				5		RFU
				6		RFU
				7		RFU
SupplementaryData	POST	Variable	Variable	One or more elements encoded according to asn.1 using basic encoding rules. Allowable data elements and associated tag values are defined in ITSO Developer Guide DG0009.	Set to Null	

5.3.8.8 Code 0210: Journey / entry /exit record (Transient Ticket)

5.3.8.8.1 This transaction message shall be generated in accord with the rail validation process defined elsewhere within this document.

Name	Source	Format	Size	Comment	Rail Rule
TTTransactionType	TTR	HEX	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0	Taken from the most recently written transient ticket record
AmountPaidMethodOfPayment	TTR	MOP	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0	Set to 0

Name	Source	Format	Size	Comment	Rail Rule
AmountPaidCurrencyCode	TTR	VALC	1	A 0.5 byte value, occupying bits 0 to 3, bits 4 to 7 shall be set to 0	Set to 0
AmountPaid	TTR	VALI	2		Set to 0
DestinationTT	TTR	LOC2	7		Taken from the most recently written transient ticket record If present use LocDefType 203, UK National Rail Location code If not present on transient ticket record use LocDefType 255, for NULL location
OriginLocation	TTR	LOC2	7		Taken from the most recently written transient ticket record Use LocDefType 203, UK National Rail Location code
RoutingCode	TTR	LOC2	7		Set to 0
UserDefinedSize	POST	HEX	1	The size of the User defined element in bytes	Set to 0

5.3.8.9 Code 0302: Deposit Received

5.3.8.9.1 For rail the 0302 transaction message should only be written where the IPE Data Group (IPE 14 or 16) added to the card has a DepositAmount > 0. Zero value records should not be generated

5.3.8.9.2 DepositType shall always be set to 2

5.3.8.10 Code 0303: Deposit Refunded

- 5.3.8.10.1 For rail the 0303 transaction message should only be written for a refund, where the IPE Data Group (IPE 14 or 16) is to be removed from the customer media or where the customer media containing at least one of these IPEs is to be surrendered.
- 5.3.8.10.2 The IPE Data Group must include a DepositAmount > 0 or there is a value associated with the customer media. Zero valued refunds should not be generated.
- 5.3.8.10.3 DepositType shall always be set to 2.
- 5.3.8.10.4 The refund transaction requires a return of payment to the cardholder.
- 5.3.8.11 Code 0310: Supplementary Data Message
- 5.3.8.11.1 This message type is not to be used by rail scheme.
- 5.3.8.12 Code 0400: Transaction Failed
- 5.3.8.12.1 This message shall be used to report error conditions occurring during an attempted interaction with a Customer Media (CM). Only one message shall be generated for each attempt and the POST shall implement time limits to ensure that a single card holder action cannot be registered as multiple attempts.

Name	Source	Format	Size	Comment	Rail Rule
ExceptionType	POST	HEX	1	The most appropriate exception code shall be used to reflect the condition triggering the sending of an 0400 message.	Any valid value contained in Table 73 of part 6 of the ITSO specification
POSTType	POST	UD	2	Code defining terminal type, allows different result codes for different terminal types, depending upon the terminals capabilities	Defined by Service Operator Recommendation is that where a POST is also a TIS that the TIS details are used

- 5.3.8.13 Code 0410: Transaction with CM apparently successful, POST unable to confirm
- 5.3.8.13.1 This message shall be used to report the error condition in its title if that occurs during an attempted interaction with a CM. If the write was in fact successful then a prompt second presentation should have no additional effect. If in fact failed completely then a second presentation

should result in a successful transaction. If the transaction was partially successful – some data was updated and some not, then the outcome is indeterminate.

Name	Source	Format	Size	Comment	Rail Rule
POSTType	POST	UD	2	Code defining terminal type, allows different result codes for different terminal types, depending upon the terminals capabilities	Defined by Service Operator Recommendation is that where a POST is also a TIS that the TIS details are used
ShellImage	POST	HEX	as req'd	An image of such data as has been read by the POST, from the media, for purposes of the transaction process to which this message relates. The data will be loaded in the following order: Shell environment Data Group Directory (2 copies where present) IPE and value records (as many as were read) Logs (as many as were read)	Set by POST based on what it has taken from the CMD POST will need to log this information as required

5.4 Data List Messages

5.4.1 The following table defines the data list message codes available within ITSO.

- “Y” indicates that there are specifically applicable to that message in rail and there usage is covered in sections below.
- “X” indicates that the message is considered not to have any function within a rail context, though their generation maybe required by ITSO specification and to support schemes processes.

Transaction Group	Transaction Type	HEX CODE Single record per Data Block	HEX CODE multiple records per Data Block	Further Covered
POST Configuration	Multiple records of multiple types	n/a	0600	X
	Hotlist	0C02	0602	Y
	Actionlist	0C03	0603	Y
	Data Correction record	0C04	0604	X

5.4.2 Code 0C02 & 0602: Hot List

5.4.2.1 An ITSO POST device which supports hot lists shall be capable of receiving messages in both 0C02 and 0602 format.

5.4.2.2 An ITSO HOPS shall be capable of distributing and receiving messages in both 0C02 and 0602 format.

5.4.3 Code 0C03 & 0603: Action List

5.4.3.1 An ITSO POST devices which support action lists shall be capable of receiving messages in both 0C03 and 0603 format.

5.4.3.2 An ITSO HOPS shall be capable of distributing and receiving messages in both 0C03 and 0603 format.

5.4.3.3 An ITSO POST device which supports action lists shall support an “Action To Take” type of “Update Shell content: IPE Fulfillment Action” as specified in the ITSO specification version 2.1.4 in addition to all other mandatory “Action To Take” types.

5.4.3.4 An ITSO HOPS shall be capable creating action lists with an “Action To Take” type of “Update Shell:IPE Fulfillment Action”. The HOPS shall have the capability to group multiple “Detached” IPEs into a single action item to allow multiple products to be fulfilled on a shell.

5.4.4 ITSO SET addressed message support.

5.4.4.1 An ITSO POST which supports Action and or Hot listing shall support ITSO Set addressed messages for these actions. Typically each station will be allocated one or more Set IDs to map the POST to an NLC and POST type.

- 5.4.4.2 An ITSO HOPS shall be capable of distributing and receiving SET addressed messages. The HOPS shall allow fulfilment locations to be targeted by 3rd party HOPS by the use of externally published SET IDs.
- 5.4.4.3 A HOPS shall support the concept of published and private sets in accordance with ITSO Design Guide 22.
- 5.4.4.4 For Rail usage Published SET IDs shall be in the range of 0x0001 to 0x3FFF.
- 5.4.4.5 For Rail usage Private SET IDs shall be in the range of 0x4000 to 0x7FFF.
- 5.4.4.6 In the Rail environment the published SETs will be provided through the Retail Control System Feed to TIS systems.

5.5 Miscellaneous Messages (08xx series)

5.5.1 The following table defines the 08XX message codes available within ITSO.

- “Y” indicates that there are specifically applicable to that message in rail and there usage is covered in sections below.
- “X” indicates that the message is considered not to have any function within a rail context, though their generation maybe required by ITSO specification and to support schemes processes.

Transaction Group	Transaction Type	HEX CODE	Further Covered
Miscellaneous Messages	Embodiment Parameter Request Message	0800	X
	Supplementary Data Message (Hash/Mac)	0801	X
	CM or Shell status advisory message	0802	X
	Physical ISAM Installation Notification	0803	Y
	Customer Media Holder Details request	0804	Y
	Customer Media Holder Details response	0805	Y
	IPE Fulfilment Action notification	0806	Y
	Additional Shell Data	0807	X
	Embodiment Parameter Request Message	0808	X

5.5.2 Code 0803: Physical ISAM Installation Notification

5.5.2.1 This message shall be generated by a POST in accordance with the rules defined in the ITSO specification.

Name	Format	Size	Comment	Rail Rule						
RecordFormatRevision	Hex	1	Defines the format revision of this message. For messages formatted according to this version of the specification this value shall be set to 2.	Format Revision 2 shall be used.						
POSTIdentifier	ASCII	MS 6	The POST Manufacturer ID shall be a unique reference Issued by the ITSO Registrar	No rail specific rules						
-	ASCII	LS 6	POST Manufacturer hardware identifier / serial number (guaranteed unique by the POST manufacturer)	No rail specific rules						
ServiceOperatorOID	OID16	2	Service operator OID	No rail specific rules						
ServiceOperator	UD	4	User defined service operator identifier	TOC code right padded with spaces. Derived from RSP Fares Data feed (e.g. "SN" for Southern or "SW" for South West).						
TypeofPOST	UD	30	User defined description of the type of POST	This shall be populated with a description of the device. Examples are <ul style="list-style-type: none">• “TVM”• “FIXED VALIDATOR”• “GATE”• “MOBILE INSPECTION UNIT”• “MOBILE VALIDATOR”• “PERSO STATION”						
0803_FixtureIdentifier	UD	16	User defined The identification code of the fixture to which the POST is currently attached, shall be set to all 0's where no FixtureIdentifier is available	For Rail the following shall be used <table><tr><th>Format</th><th>Size (bytes)</th><th>Comment</th></tr><tr><td>ASCII</td><td>4</td><td>“NLC” at which the POST is installed.</td></tr></table>	Format	Size (bytes)	Comment	ASCII	4	“NLC” at which the POST is installed.
Format	Size (bytes)	Comment								
ASCII	4	“NLC” at which the POST is installed.								

Name	Format	Size	Comment	Rail Rule		
				BCD	3	“Specific location” which is a unique reference for the device type at an NLC. e.g.. plinth Number within station at which ISAM is installed.
				HEX	4	“IPv4 Address” - set to IP address of the device or to all zeros if POST connects through an intermediate node.
				BCD	2	“Site ID” Set to indicate the Site ID of the site computer this POST is attached to. When no site computer exists this will be set to all zeros.
				HEX	3	Not Used (set to all zeros)
PreviousISAMIRN	BCD	9	IRN of the ISAM that was previously installed in the POST device, shall be set to all 0's if no ISAM previously installed	No rail specific rules.		
NewISAMIRN	BCD	9	IRN of the ISAM that has just been or currently is installed in the POST device	No rail specific rules		
TimeZone	ASCII	5	The current time zone of the POST device in the format: <sign><offset from UTC> i.e. "-1000"; "+0000", "+1230" Where the offset	No rail specific rules		

Name	Format	Size	Comment	Rail Rule
			consists of two digits for the number of hours and two digits for the number of minutes (HHMM). NB: This is not necessarily the time zone the POST is currently being used in and does not necessarily enable transaction versus time zone reconciliation	
ListStorageSpace	HEX	3	The combined amount of storage space available for Hotlist, Actionlist and PCD items.	No rail specific rules
HotlistStorage	HEX	3	The amount of space (in Kbytes) available on the POST device to store Hotlist items. Set to all zeros if no separate area is defined.	No rail specific rules
ActionlistStorage	HEX	3	The amount of space (in Kbytes) available on the POST device to store Actionlist items. Set to all zeros if no separate area is defined.	No rail specific rules
PCDListStorage	HEX	3	The amount of space (in Kbytes) available on the POST device to store post configuration data items. Set to all zeros if no separate area is defined	No rail specific rules
HotlistSetID	SETID	7	POST-SET Identifier the POST is currently allocated to for Hotlist purposes. Set to zeros if the POST is not part of a POST-SET.	No rail specific rules
ActionlistSetID	SETID	7	POST-SET Identifier the POST is currently allocated to for Actionlist purposes. Set to zeros if the POST is not part of a POST-SET.	No rail specific rules
PCDSetID	SETID	7	POST-SET Identifier the POST is currently allocated to for Post Configuration Data purposes. Set to zeros	No rail specific rules

Name	Format	Size	Comment	Rail Rule
			if the POST is not part of a POST-SET.	
Manifest_Description	ASCII	20	A text string assigned by the HOPS to identify the PCD currently installed in this POST. This Data Element shall be formatted as up to 20 ASCII characters left justified and padded with spaces if necessary. If the Manifest_description is not known then the POST shall return all nulls for this Data Element.	No rail specific rules
Manifest_DTS	DTS	3	A DTS assigned by the HOPS used to identify the date of creation of the PCD described in the Manifest_Description. If the Manifest_DTS is not known then the POST shall return all Zeros for this Data Element.	No rail specific rules
MaximumITSOMessageSize	HEX	3	Maximum size of ITSO messages (in native format) that this POST can accommodate (in Kbytes).	No rail specific rules
InfoFlags	BMP	1	Shall be a bitmapped field, encoded as follows: Bit 0 shall be set to one if the POST acts as a server for POST/HOPS messaging if not then set to 0. Bit 1 shall be set to one if the POST uses the full XML tagset if it uses the reduced tagset then set to 0. Bit 2 shall be set to one if the POST uses the ISAM for storage Bit 3 shall be set to 1 if the POST does not support the sending of standalone messaging. Bit 4 shall be set to 1 to indicate that the POST shall ignore any DOCTYPE element in a received message and use	No rail specific rules

Name	Format	Size	Comment	Rail Rule
			its own stored version of the relevant DTD. Bits 5-7 shall be RFU by ITSO and shall be set to 0.	

- 5.5.3 Code 0804: Customer Media Holder Details request
 - 5.5.3.1 This message type shall be supported by Rail HOPS in accordance with the ITSO specifications. This is to support functions where the media is not owned by the product owner.
- 5.5.4 Code 0805: Customer Media Holder Details response
 - 5.5.4.1 This message type shall be supported by Rail HOPS in accordance with the ITSO specifications. This is to support functions where the media is not owned by the product owner.
- 5.5.5 Code 0806: IPE Fulfilment Action notification
 - 5.5.5.1 This message type shall be supported by Rail HOPS in accordance with the ITSO specifications. This is to support functions where the media is not owned by the product owner.

6. ITSO Fulfilment Service

6.1 Introduction

6.1.1 This section details the RSP accredited interface between the Flow Owning TOC and the TIS Fulfilment service nodes. An overview of the agreed Rail ITSO Fulfilment model along with the process flow for how this works in practice are shown below.

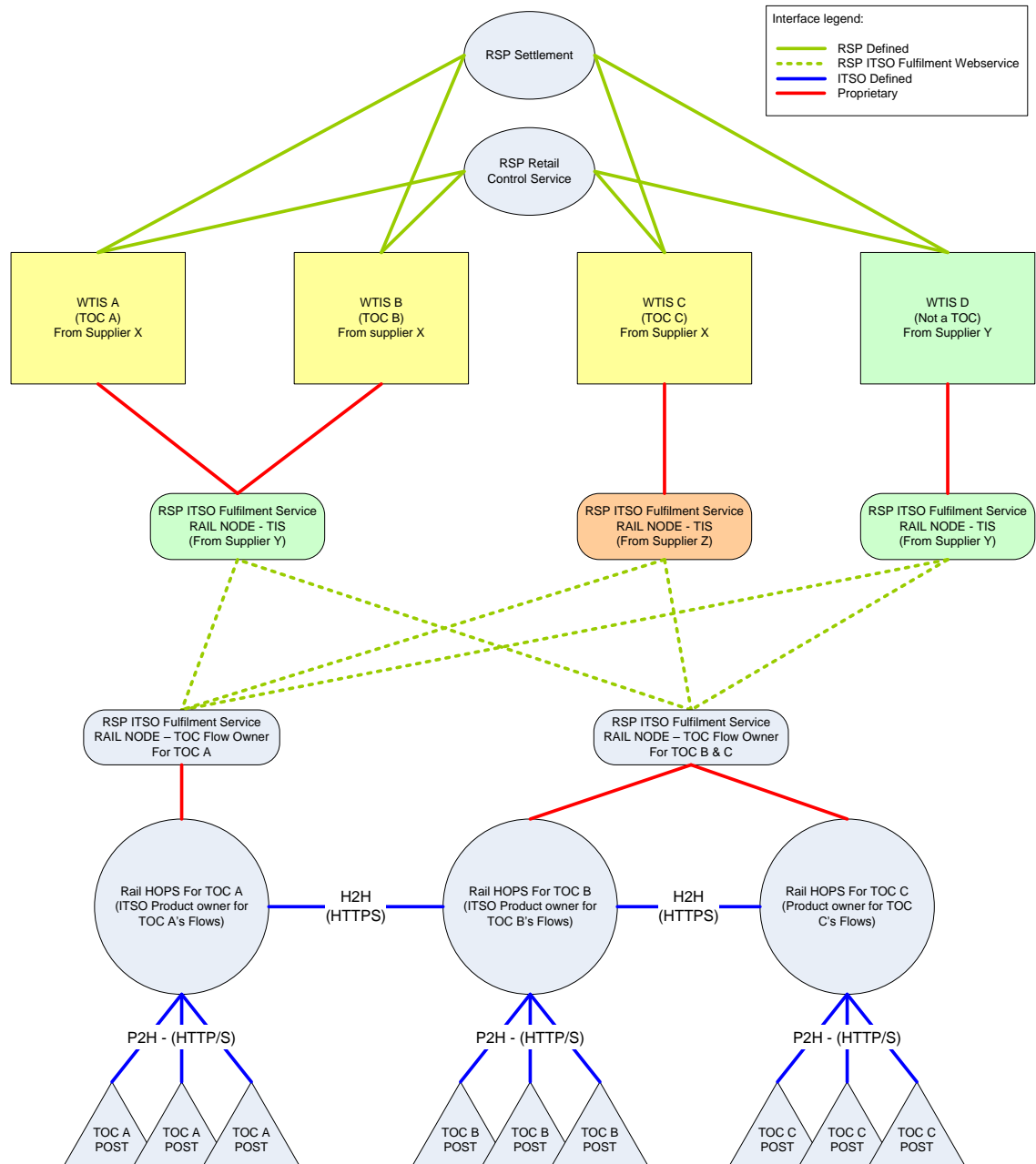


Figure 1 - RSP ITSO Fulfilment Model

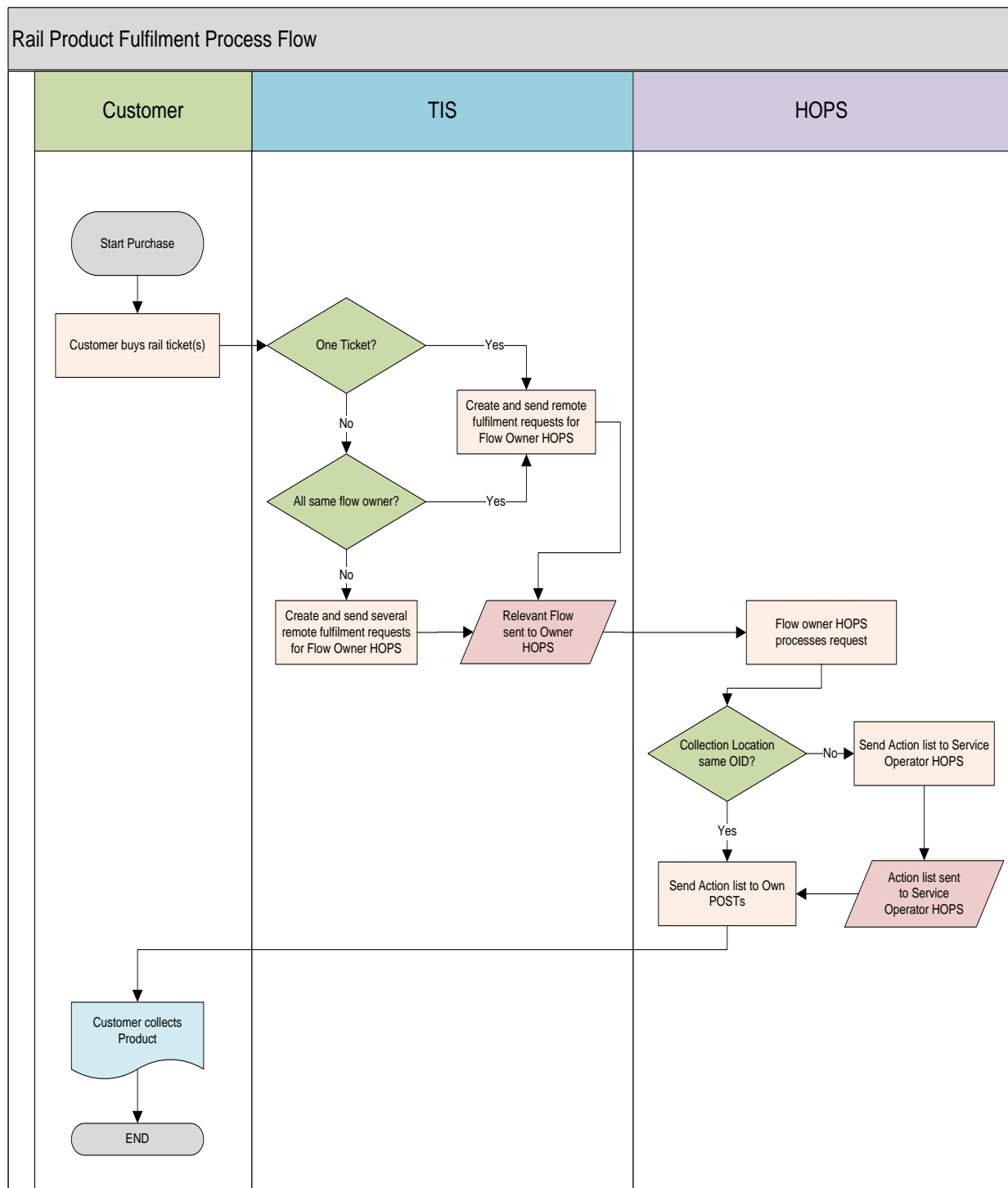


Figure 2 - Rail Product Fulfilment Process Flow

6.2 Interface

6.2.1 Overview

- 6.2.1.1 The Rail ITSO Fulfilment web service shall be deployed as a pair of secured (HTTPS over port 443) SOAP web service interfaces between two Rail nodes the “Flow” and “TIS”.
- 6.2.1.2 The “Flow” rail node shall provide a web service “Flow Owner ITSO Fulfilment Web Service” which will be called by the TIS rail node to initiate a fulfilment request with the appropriate node. This will also be used for any subsequent modifications or queries regarding the original fulfilment.
- 6.2.1.3 The “TIS” rail node shall provide a web service “TIS ITSO Fulfilment Web Service” which will be called by the “Flow” rail node to send fulfilment status updates to the appropriate “TIS” rail node.
- 6.2.1.4 The interfaces will be secured using HTTPS and each rail node will be issued with an SSL client certificate generated from a certificate authority specifically created for the Rail ITSO Fulfilment Service. Thus rail nodes can verify each others client and server certificates to establish mutual trust and to enable access to the web service.

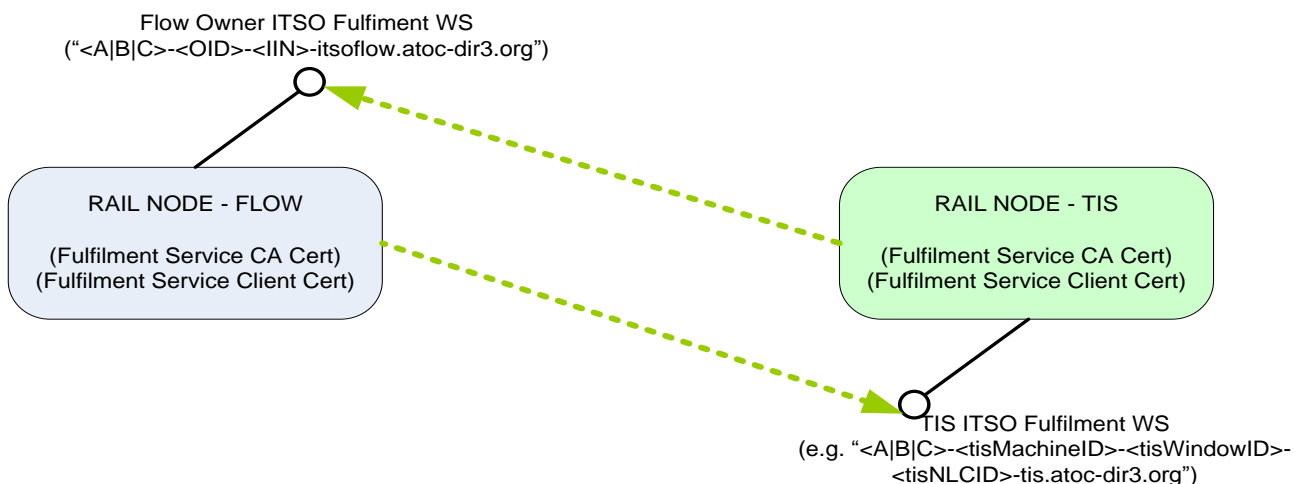


Figure 3 - Web Service Overview

6.2.2 Naming Conventions

- 6.2.2.1 For message transfer from one node to another, the sender acts as a client to the receiver's server. The “TIS” rail node needs to locate the flow owning “Flow” node to start communicating with it. In reverse, the flow owning “Flow” rail node needs to locate the “TIS” node. This location process is called naming services and the most widely used form of this is the Domain Name System (DNS).
- 6.2.2.2 DNS is the basis for the RSP Rail Node naming service and the domain name “atoc-dir3.org” has been registered for this purpose.

6.2.3 “Flow” Rail Node Naming

6.2.3.1 A “TIS” rail node wishing to communicate with a flow owning “Flow” rail node shall construct an Internet hostname to in the form:

<A|B|C>-<OID>-<IIN>-itsoflow.atoc-dir3.org

For example

A-131-633597-itsoflow.atoc-dir3.org

6.2.3.2 A, B, C indicate alternatives that shall be used by the ITSO flow owning “Flow” rail node to provide support for load balancing, redundancy or disaster recovery. Further letters may be used in future if required. OID and IIN shall be decimal versions of the ITSO IIN and ITSO Operator ID with the IIN typically being 633597.

6.2.3.3 This string shall be collectively known as the Flow Owner Fully Qualified Domain Name (FQDN)².

6.2.3.4 A “TIS” rail node preparing to initiate communication with a “Flow” rail node shall look up the DNS record for the Flow Owner FQDN. This will normally yield a CNAME record whose value is the domain name to be used for accessing that Flow Owner node. That domain name is referred to below as the Flow Server Domain Name (FSDN).

6.2.3.5 For example:

IIN & OID constructed ITSO Flow FQDN	FSDN
A-123-633597-itsoflow.atoc-dir3.org	fulfilment.firstscotrail.co.uk
A-321-633597-itsoflow.atoc-dir3.org	flowowner.londonmidland.co.uk

6.2.4 TIS Rail Node Naming

6.2.4.1 A “Flow” rail node wishing to communicate with a “TIS” rail node shall construct an Internet hostname to in the form:

<A|B|C>-<MachineType>-<tisMachineID>-<tisWindowID>-<tisNLCID>-tis.atoc-dir3.org

For example

A-A1-1234-1234-1212-tis.atoc-dir3.org

6.2.4.2 A, B, C indicate alternatives that shall be used by the “TIS” rail node to provide support for load balancing, redundancy or disaster recovery. Further letters may be used in future if required. Vendor ID is an RSP allocated and maintained number representing the rail ticket retailer as specified in the SDCL+ “Business Code”.

6.2.4.3 This string shall be collectively known as the TIS Fully Qualified Domain Name (FQDN).

6.2.4.4 A “Flow” node preparing to initiate communication with a “TIS” rail node shall look up the DNS record for the TIS FQDN. This will normally yield a CNAME record whose value is the domain name to be used for accessing that TIS rail node. That domain name is referred to below as the TIS Server Domain Name (TISSDN).

² “FQDN” is a standard Internet term meaning essentially a complete domain name. The HOPS FQDN defined here is a domain name of the standard form shown above that incorporates the IIN and OID of the HOPS concerned.

6.2.4.5 For example:

Vendor ID constructed TIS FQDN	TISSDN
A-12345-1234-1212-tis.atoc-dir3.org	tickets.firstscotrail.co.uk
A-54321-4321-2121-tis.atoc-dir3.org	webtis.londonmidland.co.uk

6.2.5 Naming Administration

- 6.2.5.1 The ATOC registrar shall be responsible for the administration of the DNS records to resolve a TIS FQDN or a Flow FQDN name to a given TISSDN or FSDN (notified to the Registrar by the operator of that node).
- 6.2.5.2 Using the above mechanism, a “Flow” or “TIS” rail node wishing to communicate shall construct the appropriate FQDN for the rail node then perform a DNS record lookup and if it obtains an associated “CNAME” record then it shall attempt to establish communication using the domain name (“CNAME”) value from that record in the normal way.
- 6.2.5.3 If this fails, the whole process may be repeated. Node suppliers are recommended to include variable wait periods between attempts.
- 6.2.5.4 The Internet hierarchy of caching DNS servers ensures that speed of host name lookup should always be adequate.
- 6.2.5.5 Note that the TISSDN or FSDN may itself be an “alias” defined by another CNAME record in the DNS. Chaining alias domain names in this way is generally deprecated, but the technical objections do not apply here because the node FQDN is not being used directly as an Internet domain name alias.
- 6.2.5.6 Changes to DNS records should be coordinated with all suppliers to take account of possible firewall reconfiguration that may be necessary within hosting facilities. This coordination may be in the form of a published changes list prior to the actual DNS record change being activated. This will allow time for infrastructure changes to take place.

6.3 Web Service Implementation

6.3.1 Flow Owner ITSO Fulfilment Web Service

6.3.1.1 The Flow Owner ITSO Fulfilment Web Service shall be called using the following path:

6.3.1.2 /itsofulfilment-v3-flow/

E.g. an example URL:

flowowner.londonmidland.co.uk/itsofulfilment-v3-flow/

fulfilment.firstscotrail.co.uk/itsofulfilment-v3-flow/

6.3.1.3 The remaining chapters in this section 6.3.1 detail the methods available to the Flow Owner ITSO Fulfilment Web Service. Support for these methods is mandatory unless specified otherwise in the method descriptions.

6.3.2 Method - Indirect Fulfilment Request

6.3.2.1 This method will provide the functionality by which a TIS can request the fulfilment of a ITSO product it has retailed or the amendment of an existing product.

Parameters	[Fulfilment Request]
Return Value	[Fulfilment Service Positive Acknowledgement]
Exceptions	[Fulfilment Service Negative Acknowledgement]
Default Behaviour	Generates a fulfilment request at the Flow owning "Flow" rail node.

6.3.3 Method – Fulfilment Cancellation Request

6.3.3.1 This method will provide the functionality by which a "TIS" rail node can request the cancellation of an ITSO product it has requested for fulfilment. A cancellation request cannot be sent after the fulfilment has been successful and the "TIS" rail node has received the "Fulfilment Successful" update from the "Flow" rail node. After this point any cancellation request for the fulfilment will be rejected by the "Flow" rail node. Following successful fulfilment an ITSO product should be voided, if necessary, using the "Void Request" method.

Parameters	[Fulfilment Cancellation Request]
Return Value	[Fulfilment Service Positive Acknowledgement]
Exceptions	[Fulfilment Service Negative Acknowledgement]
Default Behaviour	Generates a fulfilment cancellation request at the flow owning "Flow" rail node.

6.3.4 Method - Void Request

- 6.3.4.1 This method will provide the functionality by which a “TIS” rail node can request a refund of a ITSO product it has retained.

Parameters	[Void Request]
Return Value	[Fulfilment Service Positive Acknowledgement]
Exceptions	[Fulfilment Service Negative Acknowledgement]
Default Behaviour	Generates a void request at the “Flow” rail node.

6.3.5 Method – Add Fulfilment Location

- 6.3.5.1 This method will provide the functionality by which a “TIS” rail node can request an additional fulfilment location for a product that fulfilment or a void has been requested for.

Parameters	[Add Fulfilment Location]
Return Value	[Fulfilment Service Positive Acknowledgement]
Exceptions	[Fulfilment Service Negative Acknowledgement]
Default Behaviour	Generates an action to make the product available for fulfilment or void (depending on the fulfilment state) at the additional fulfilment locations detailed in this request. This method is an append action and thus previously requested fulfilment locations will remain.

6.3.6 TIS ITSO Fulfilment Web Service – Methods

- 6.3.6.1 The TIS Owner ITSO Fulfilment Web Service shall be called using the following path:

6.3.6.2 /itsofulfilment-v3-tis/

E.g. an example URL:

tickets.firstscotrail.co.uk/itsofulfilment-v3-tis/

webtis.londonmidland.co.uk/itsofulfilment-v3-tis/

- 6.3.6.3 The remaining subsections in this section 6.3.6 detail the methods available to the TIS Owner ITSO Fulfilment Web Service. Support for these methods is mandatory unless specified otherwise in the method descriptions.

6.3.7 Method - Fulfilment Update

- 6.3.7.1 This method will be called by a “Flow” rail node wishing to update the fulfilment status of a request.

Parameters	[Fulfilment Update]
Return Value	None

Exceptions	[Fulfilment Service Negative Acknowledgement]
Default Behaviour	Generates a Fulfilment Update event at the "TIS" rail node.

6.3.8 Method - Void Initiation Request

6.3.8.1 This method will be called by a "Flow" rail node wishing to request the initiation of a void (or cancellation) process with the "TIS" rail node that originally created the fulfilment request.

Parameters	[Void Initiation Request]
Return Value	[Fulfilment Service Positive Acknowledgement]
Exceptions	[Fulfilment Service Negative Acknowledgement]
Default Behaviour	Requests the originating "TIS" rail node initiates a Void request (or cancellation depending on state) for the referenced fulfilment. Once validated the TIS would send a void request for the original fulfilment referenced.

6.3.9 Method - Replacement Initiation Request

6.3.9.1 This method will be called by a "Flow" rail node wishing to request the initiation of a replacement of an already fulfilled product with the "TIS" rail node that originally created the fulfilment request.

Parameters	[Replacement Initiation Request]
Return Value	[Fulfilment Service Positive Acknowledgement]
Exceptions	[Fulfilment Service Negative Acknowledgement]
Default Behaviour	Requests the originating "TIS" rail node initiates the creation of a replacement product for the referenced fulfilment. Once validated the TIS would then initiate a fulfilment request for the replacement product.

6.3.10 Method – Add Fulfilment Location Initiation Request

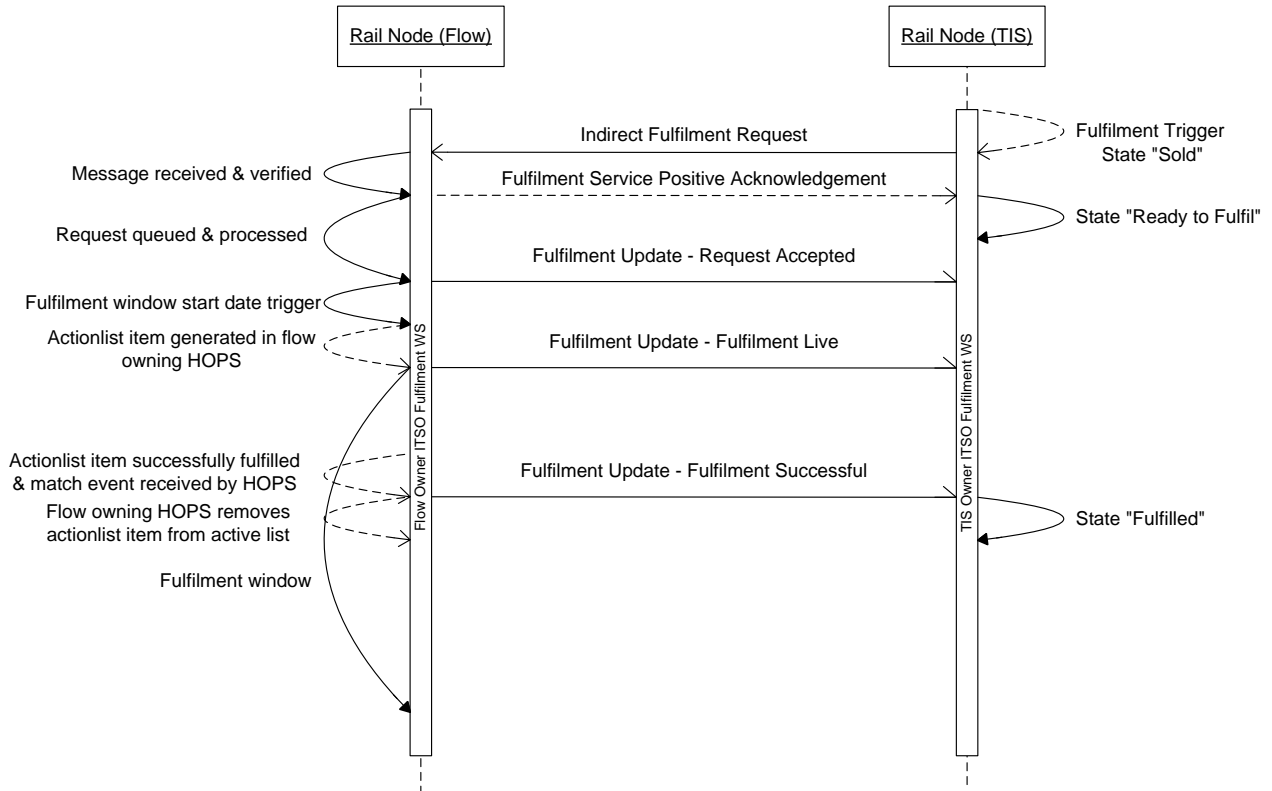
6.3.10.1 This method will be called by a “Flow” rail node wishing to request the addition of one or more fulfilment locations to a product currently pending fulfilment or void request with the “TIS” rail node that originally created the fulfilment request. Implementation of this method is optional at the “Flow” rail node however support is mandatory at the “TIS” rail node.

Parameters	[Add Fulfilment Location Initiation Request]
Return Value	[Fulfilment Service Positive Acknowledgement]
Exceptions	[Fulfilment Service Negative Acknowledgement]
Default Behaviour	Requests the originating “TIS” rail node initiates the addition of fulfilment locations for the referenced fulfilment or void request. Once validated the TIS would then send an update to the existing fulfilment requesting the addition of the new location.

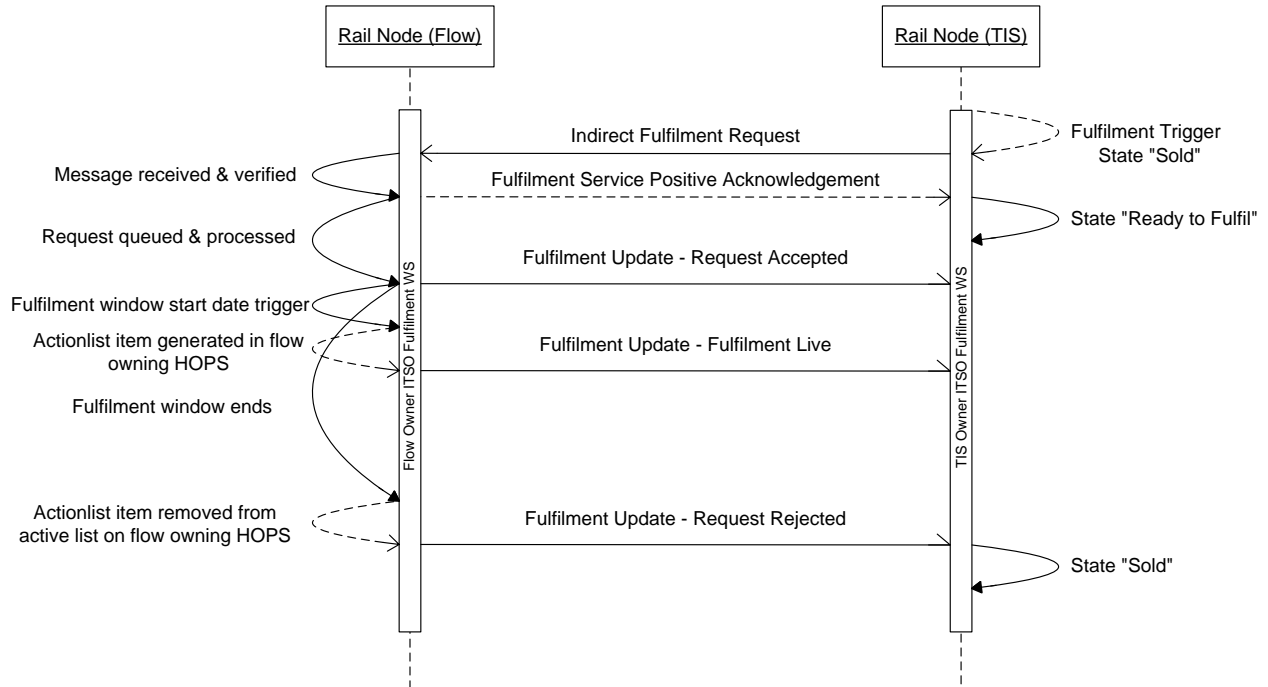
6.3.11 Messaging Scenarios – Sequence Diagrams

6.3.11.1 Note that these scenarios contain all optional methods and updates.

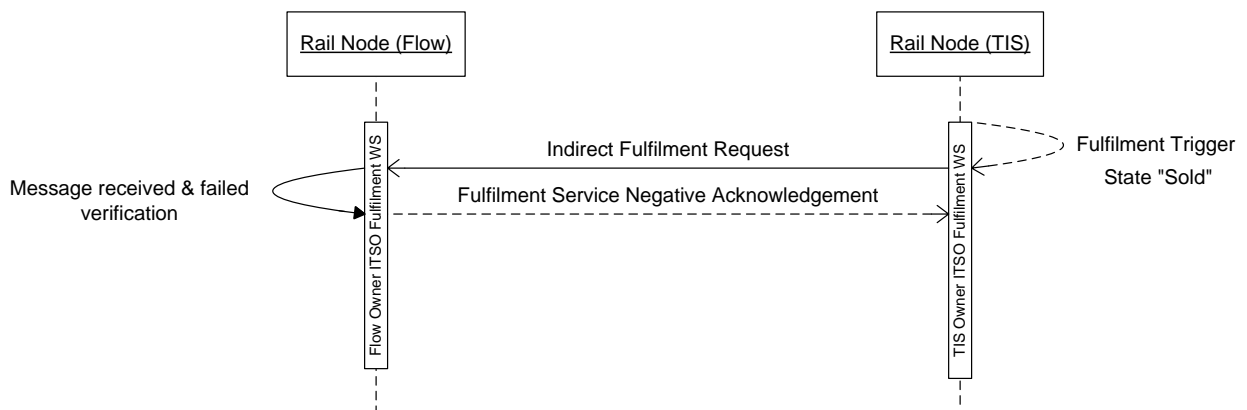
6.3.11.2 Fulfilment Request and Successful Fulfilment



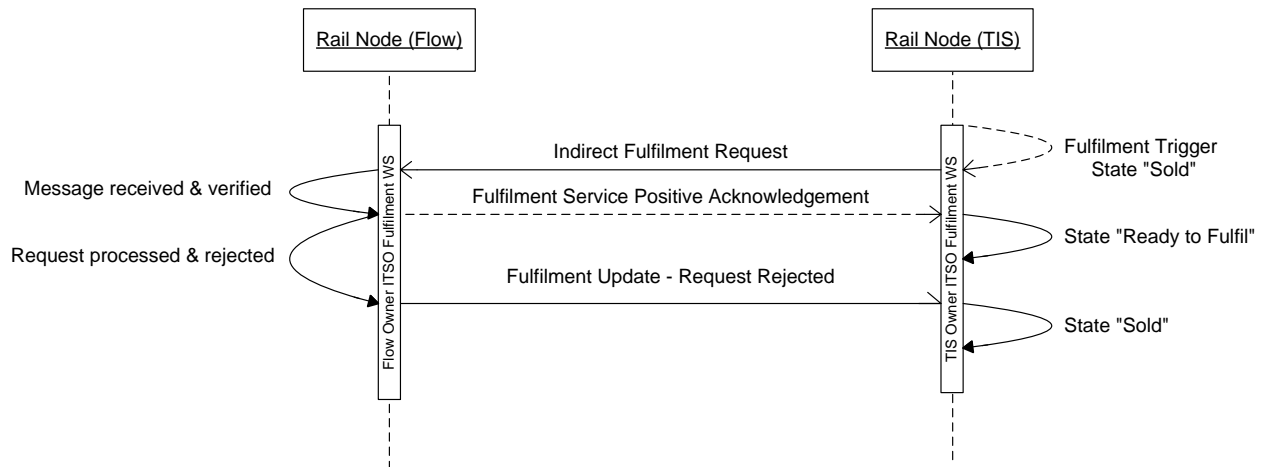
6.3.11.3 Fulfilment Request Timeout



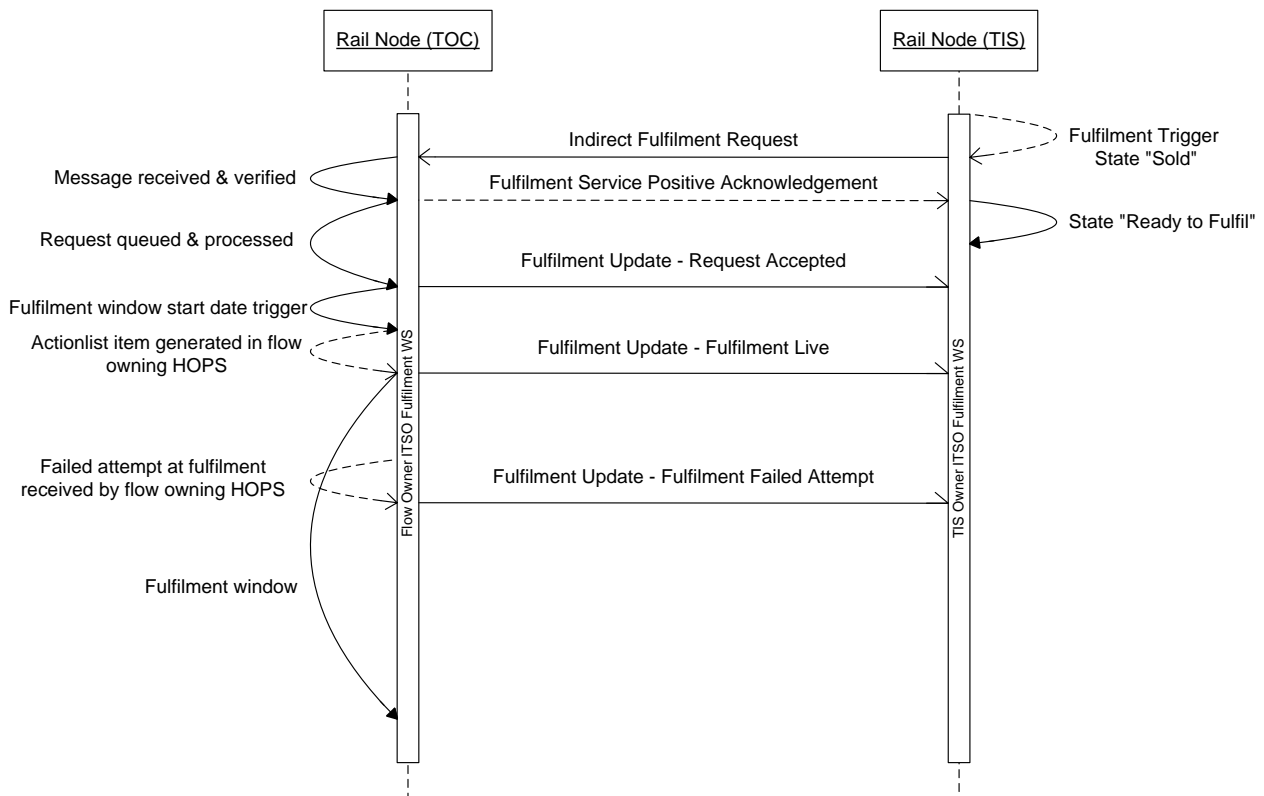
6.3.11.4 Fulfilment Request – Negative acknowledgement



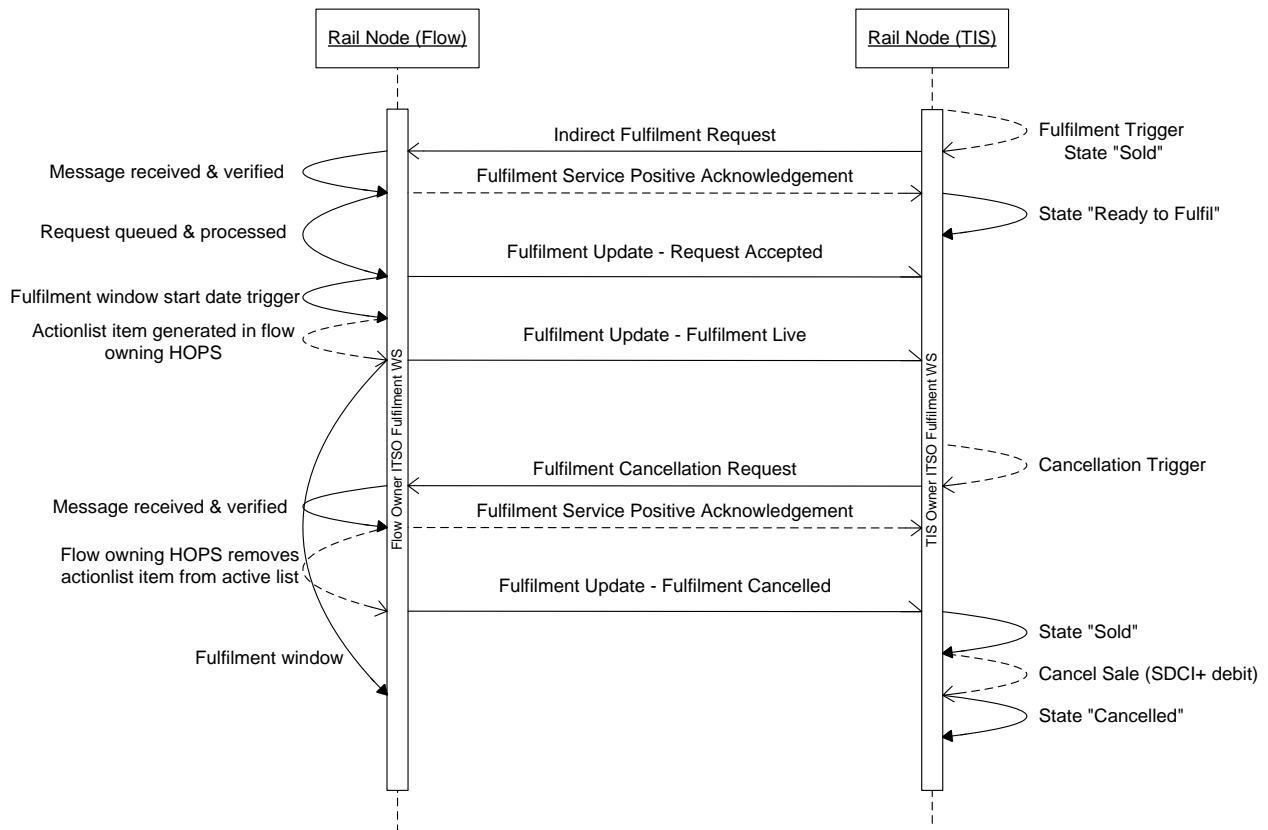
6.3.11.5 Fulfilment Request and Rejected for Fulfilment



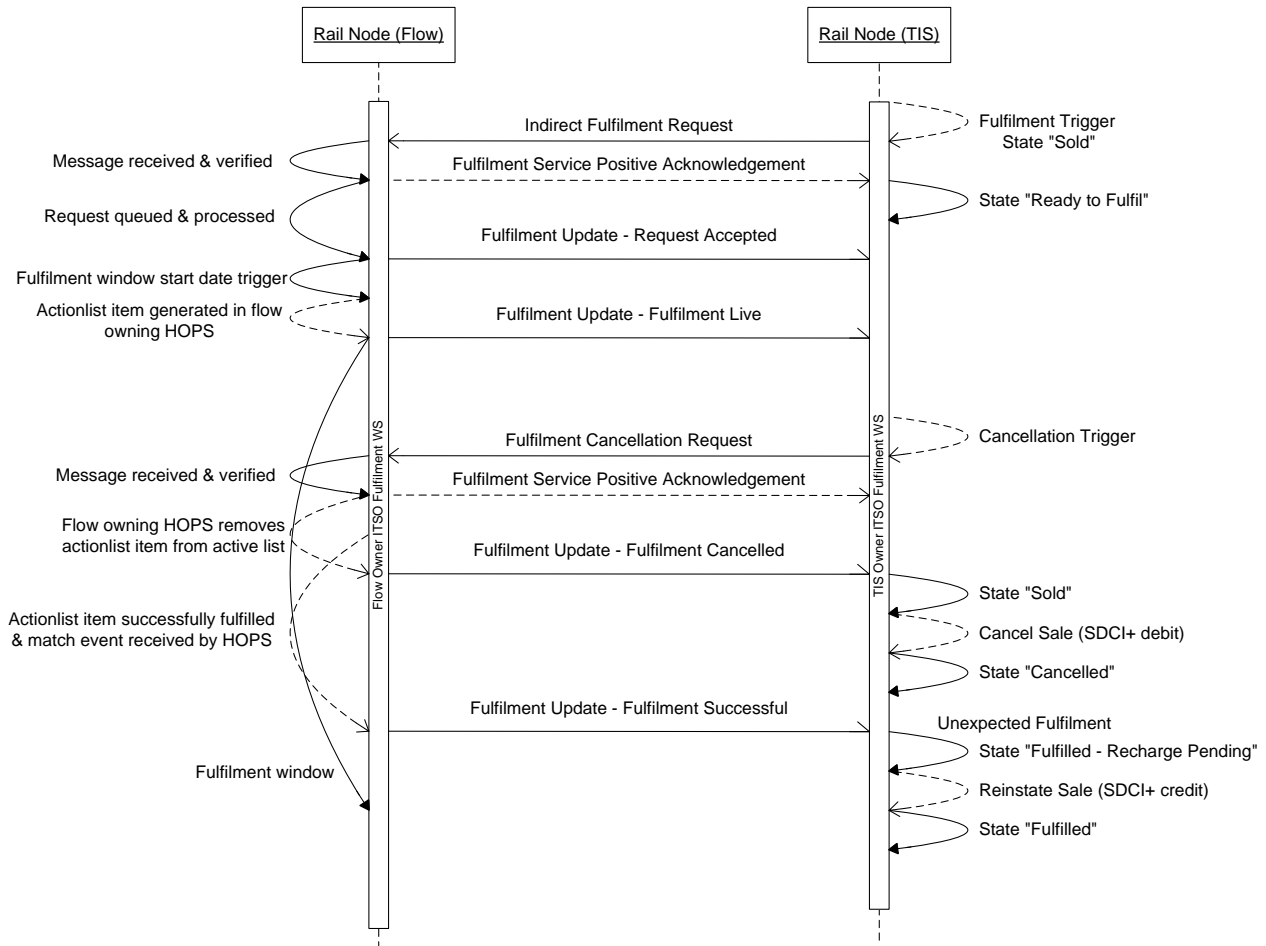
6.3.11.6 Fulfilment Request and Failed Fulfilment



6.3.11.7 Fulfilment Request and Cancellation

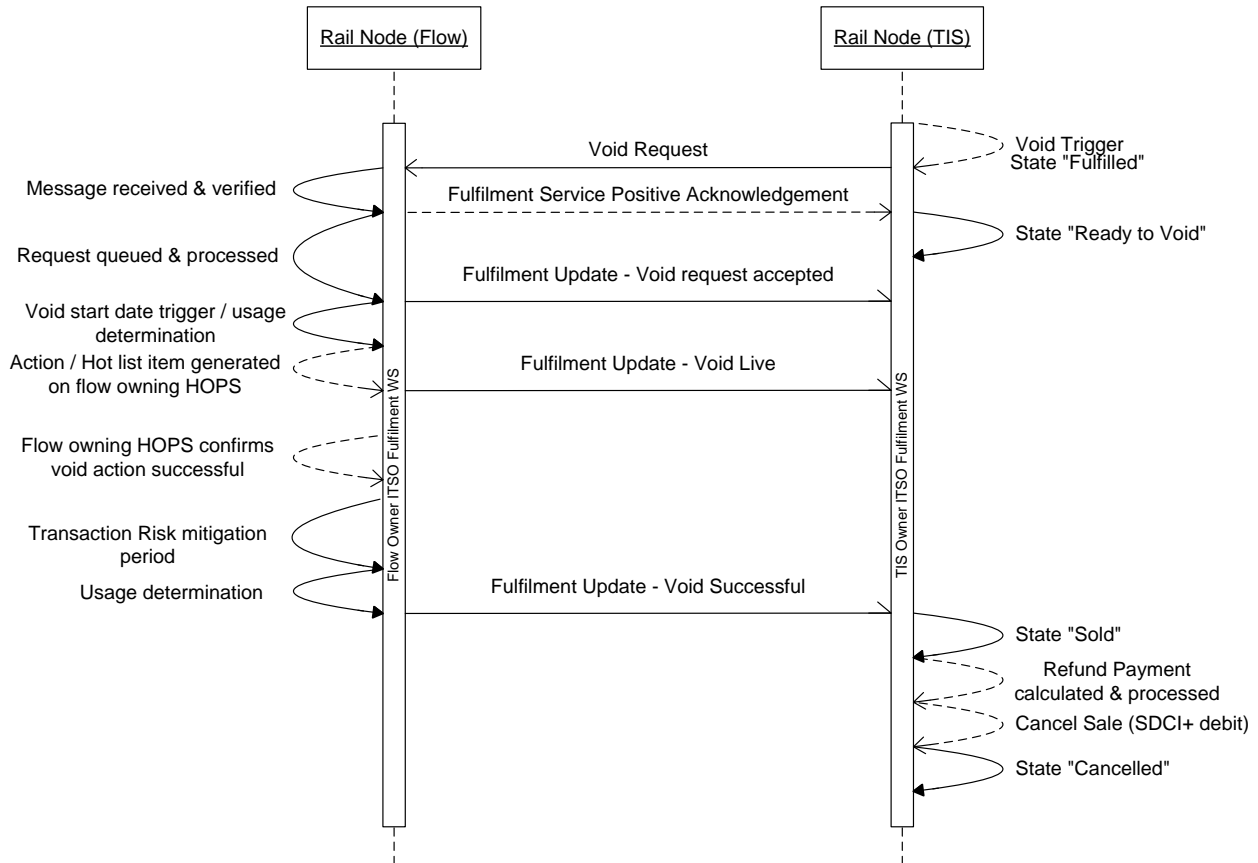


6.3.11.8 Fulfilment Request, Cancellation and Unexpected Fulfilment

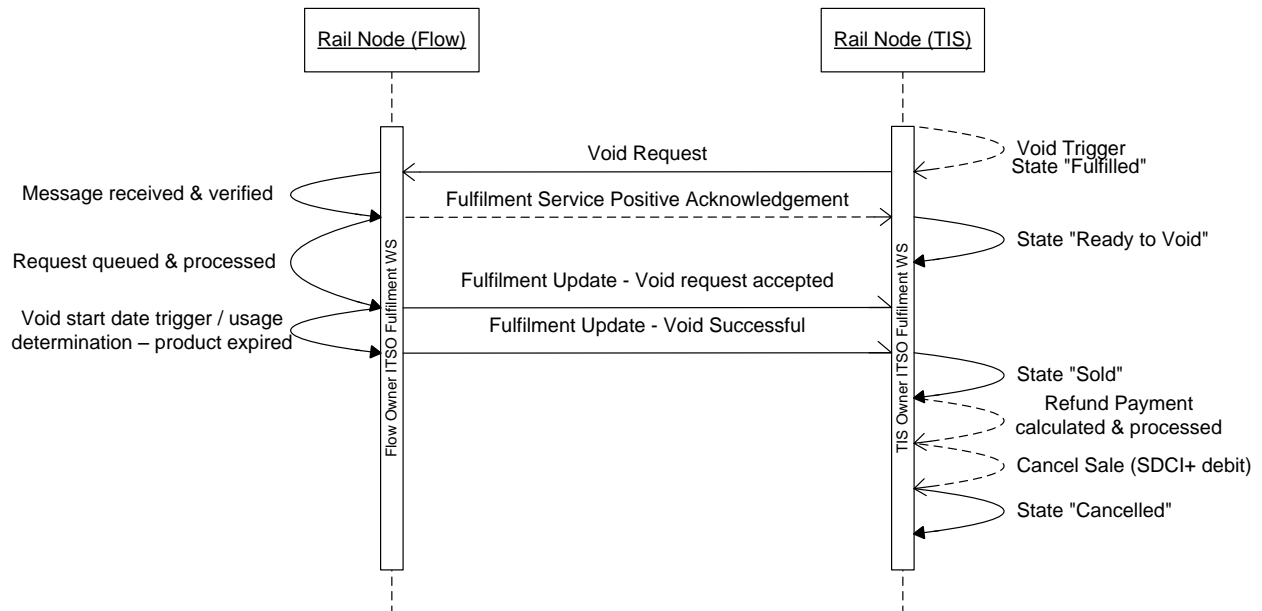


6.3.11.9 Void Request and Successful Void

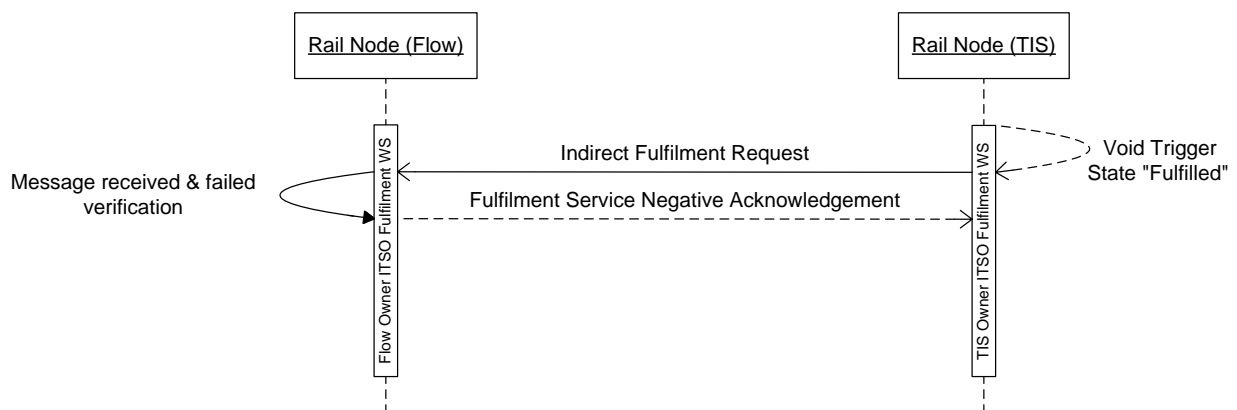
Note the "Void Trigger" may be a request generated by a "TIS" rail node or as a result of the "TIS" rail node receiving a "Void Initiation Request" from a "Flow" rail node.



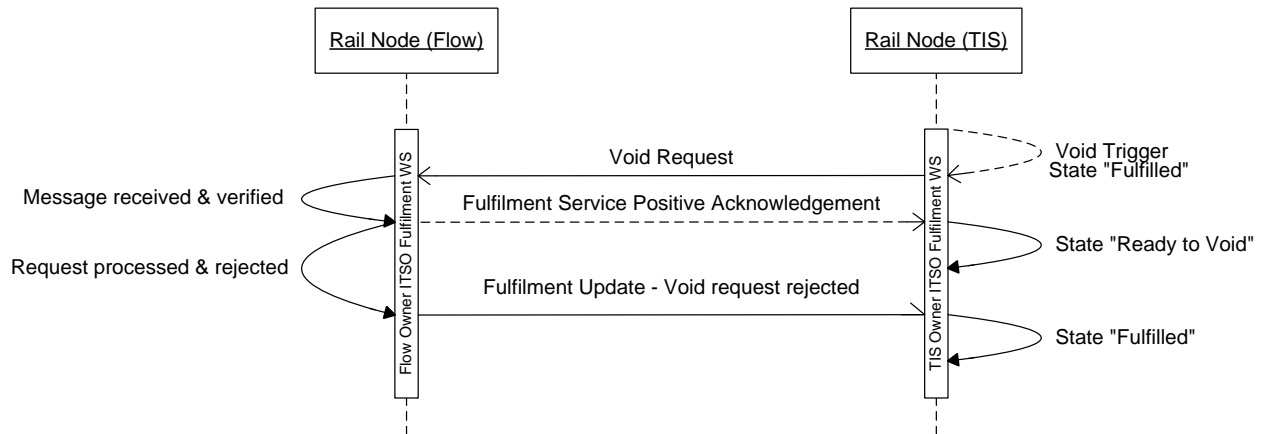
6.3.11.10 Void Request and Expired Product



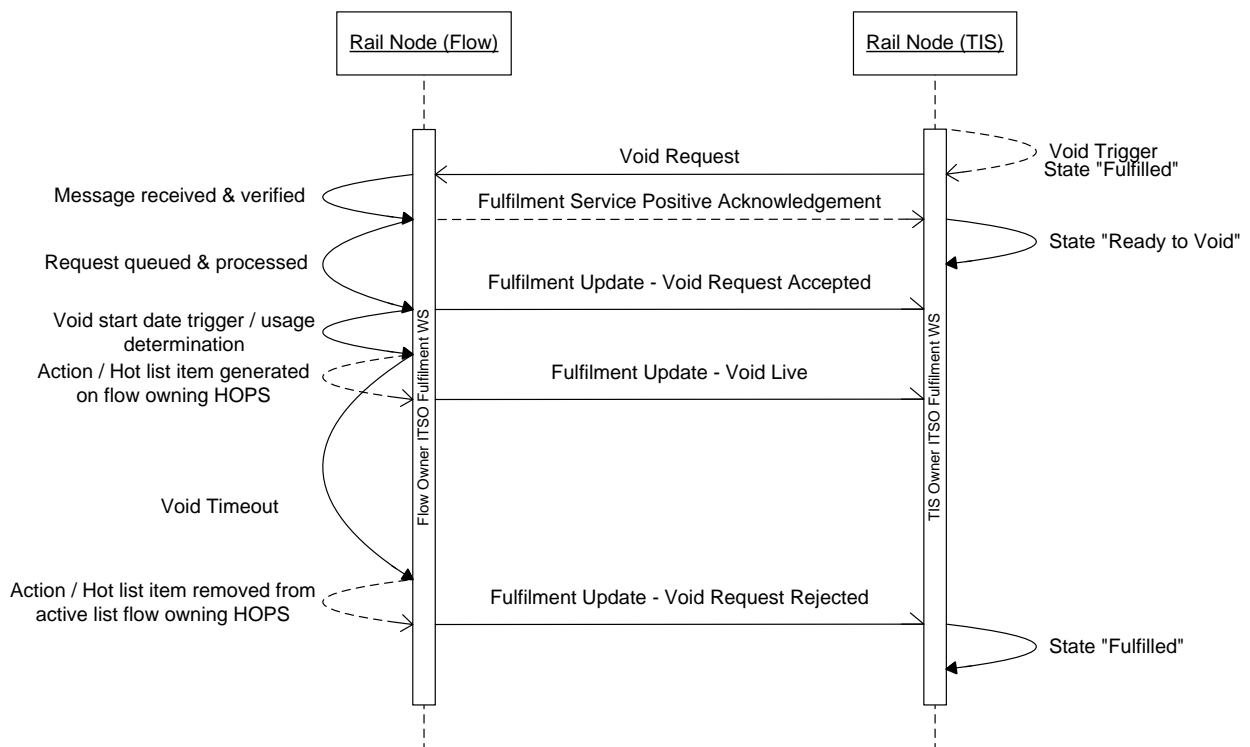
6.3.11.11 Void Request – Negative Acknowledgement



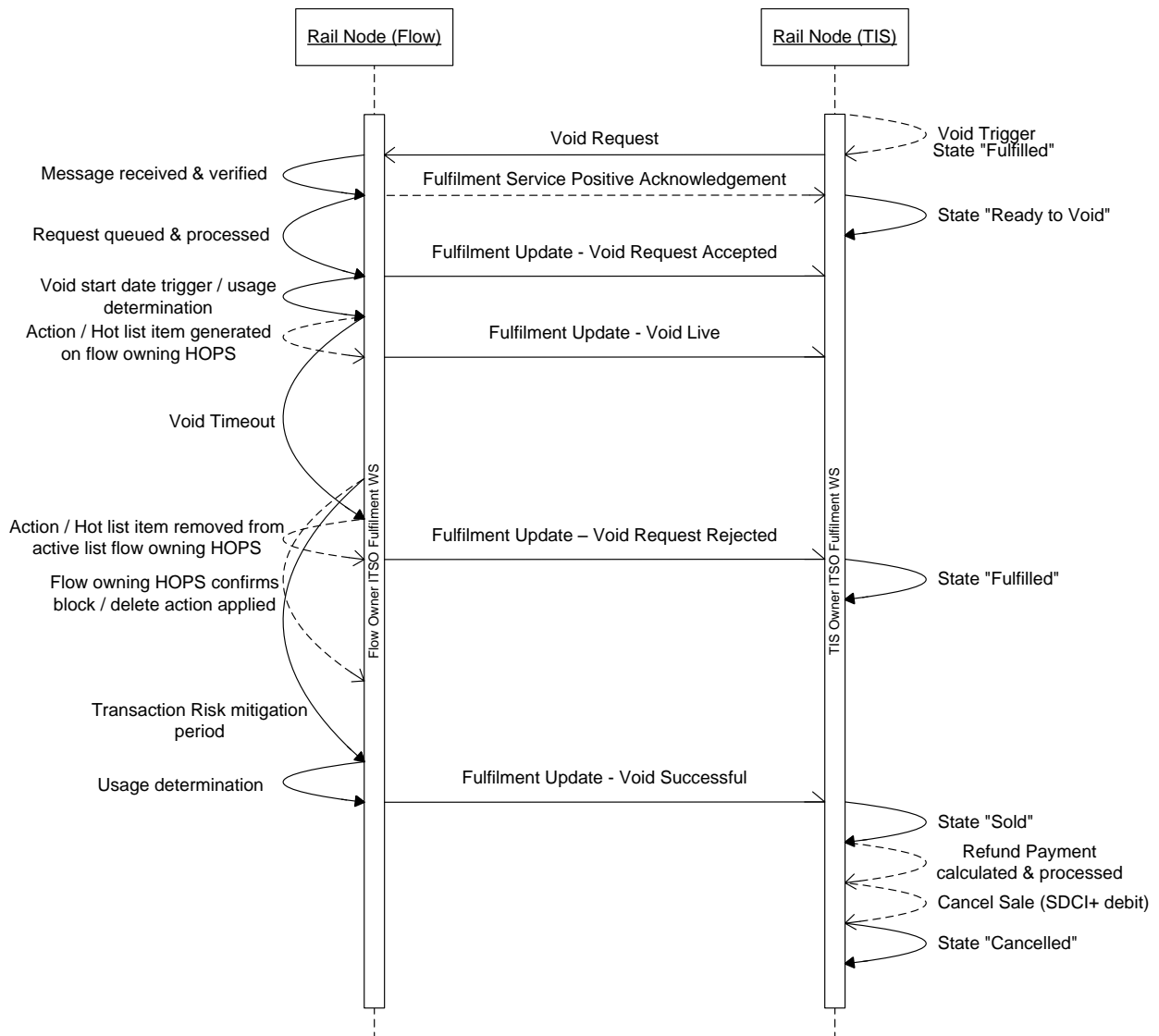
6.3.11.12 Void Request Rejected



6.3.11.13 Void Request Timeout

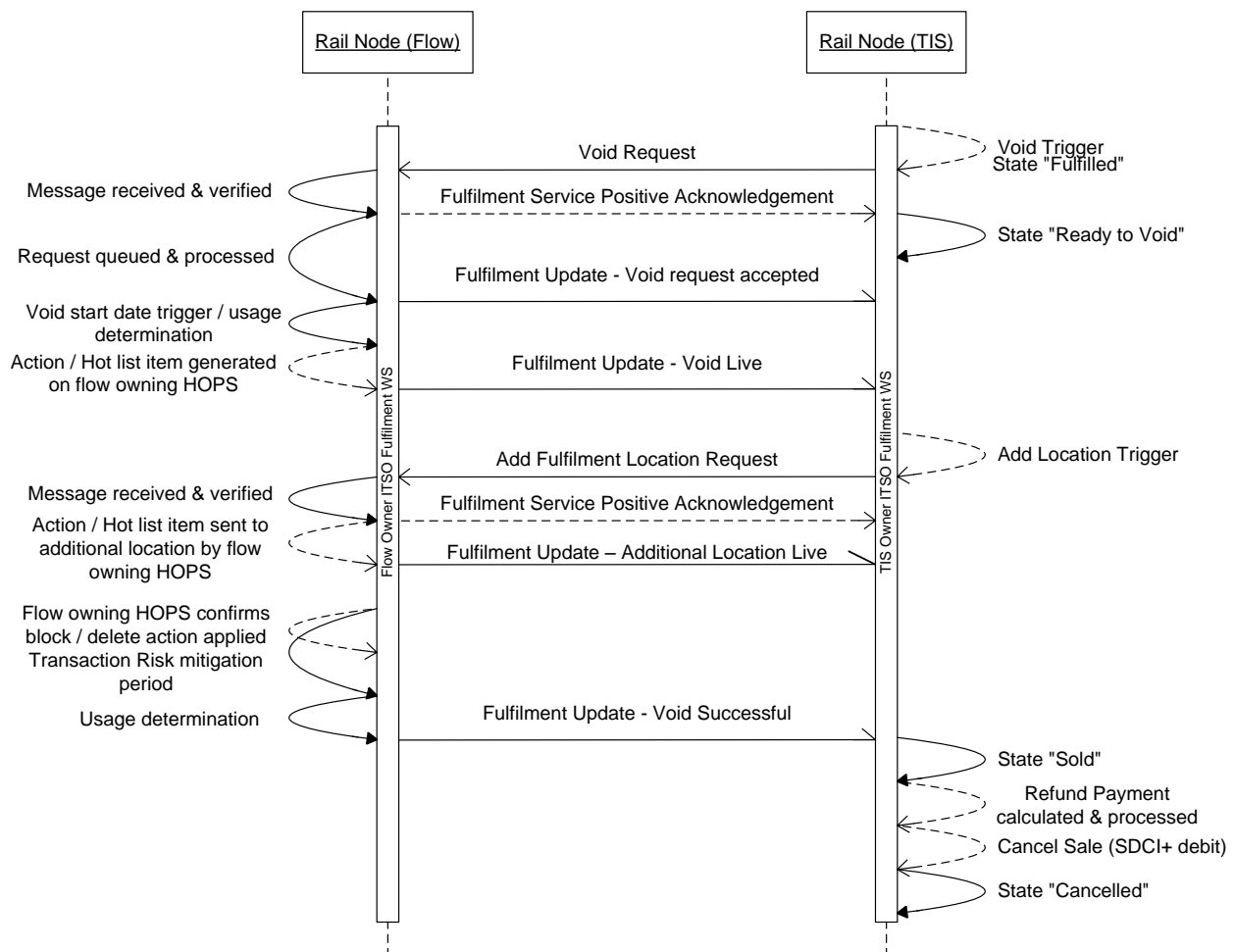


6.3.11.14 Void Request, Timeout and unexpected Successful Void

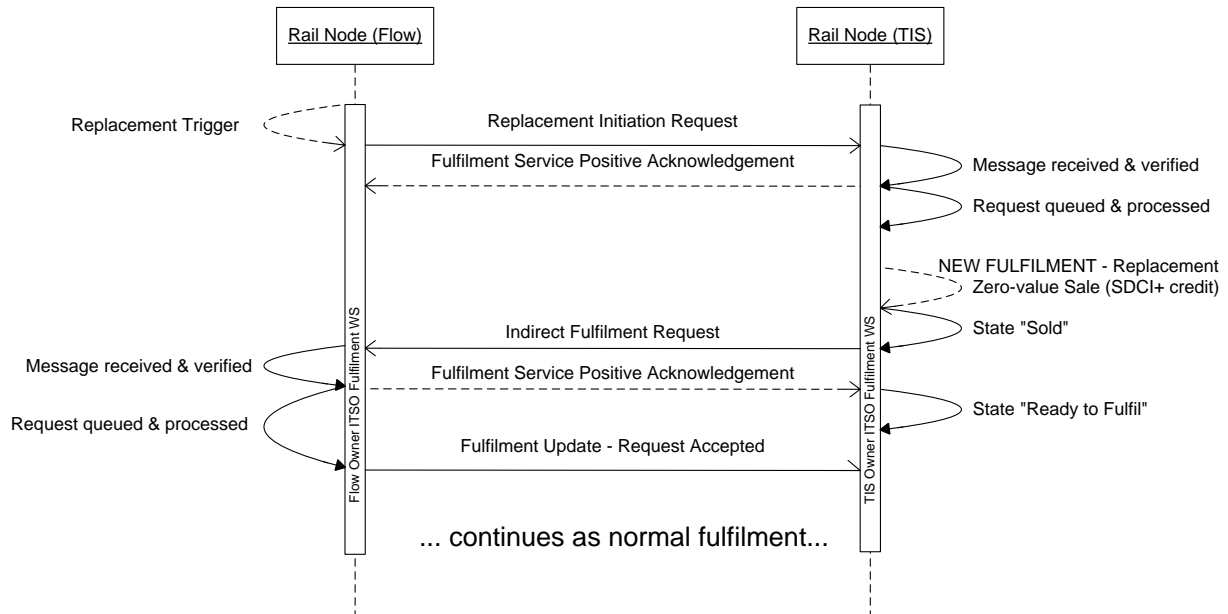


6.3.11.16 Add Fulfilment Location – Successful Void Request example

Note the “Add Location Trigger” may be a request generated by a “TIS” rail node directly or as a result of the “TIS” rail node receiving an “Add Fulfilment Location Initiation” request from a “Flow” rail node.



6.3.11.17 Replacement Initiation



6.3.12 Data Structures

6.3.12.1 Indirect Fulfilment Request

This data structure will be included in the Indirect Fulfilment Request method.

Description	Type	Values
[Fulfilment Header]	Data Structure	See 6.3.12.9
[Fulfilment Request Details]	Data Structure	See 6.3.12.12

6.3.12.2 Fulfilment Cancellation Request

This data structure will be included in the Fulfilment Cancellation Request method.

Description	Type	Values
[Fulfilment Header]	Data Structure	See 6.3.12.9

6.3.12.3 Void Request

This data structure will be included in the Void Request method.

Description	Type	Values
[Fulfilment Header]	Data Structure	See 6.3.12.9
[Void Request Details]	Data Structure	See 6.3.12.38

6.3.12.4 Add Fulfilment Location

This data structure will be included in the Add Fulfilment Location method.

Description	Type	Values
[Fulfilment Header]	Data Structure	See 6.3.12.9
[Fulfilment Location Details]	Data Structure	See 6.3.12.166.3.12.17

6.3.12.5 Fulfilment Update

This data structure will be included in the Fulfilment Update method.

Description	Type	Values
[Fulfilment Header]	Data Structure	See 6.3.12.9
[Fulfilment Update Details]	Data Structure	See 6.3.12.39

6.3.12.6 Void Initiation Request

This data structure will be included in the Void Initiation Request method.

Description	Type	Values
[Fulfilment Header]	Data Structure	See 6.3.12.9
[Void Request Details]	Data Structure	See 6.3.12.38

6.3.12.7 Replacement Initiation Request

This data structure will be included in the Replacement Initiation Request method.

Description	Type	Values
[Fulfilment Header]	Data Structure	See 6.3.12.9
[Replacement Details]	Data Structure	See 6.3.12.55

6.3.12.8 Add Fulfilment Location Initiation Request

This data structure will be included in the Add Fulfilment Location Initiation Request method.

Description	Type	Values
[Fulfilment Header]	Data Structure	See 6.3.12.9
[Fulfilment Location Details]	Data Structure	See 6.3.12.16

6.3.12.9 Fulfilment Header

This data structure will be included in all Web Service methods.

Description	Type	Values
[Originating TIS ID]	Data Structure	See 6.3.12.10
[Flow Owner TOC ITSO ID]	Data Structure	See 6.3.12.11
Fulfilment Request Reference	String	Unique ID of fulfilment request generated by requesting TIS. This must be unique for the TIS and may be constructed of a string of alphanumeric characters as required by the TIS.

6.3.12.10 Originating TIS ID

This data structure describes how the originating TIS ID is formed. Please know Vendor ID is same as Originating TIS ID. The fulfilment data elements must either be sourced from or match the equivalent listed SDCI+ data attribute.

Description	Type	Values	SDCI+ record type	SDCI+ record type data attribute
Machine Type	String	Originating TIS machine Type	DB	Machine Type
TIS Machine ID	String	Originating TIS machine ID.	DB	Machine Number E.g. 12345
TIS Window ID	String	Originating TIS window ID.	DB	Window Number E.g. 1234
TIS NLC ID	String	Originating TIS NLC ID	DB	DB – Shift Location CF – Selling Office Location Code E.g. 1212

6.3.12.11 Flow Owner TOC ITSO ID

This data structure describes how the Flow Owner TOC ITSO ID is formed. These fulfilment data attributes will be sourced from the Retail Control Service.

Description	Type	Values
Flow Owner IIN	String	IIN – 6 digits (decimal)
Flow Owner OID	String	OID – 4 digits (decimal)

6.3.12.12 Fulfilment Request Details

This data structure will provide a summary of the sales information. Where appropriate the fulfilment data elements must either be sourced from or match the equivalent listed SDCl+ data attribute. If data elements are not within SDCl+ then the elements must be taken from the Retail Control Service or be set by the TIS.

Where products are to be linked for fulfilment use the ITSO Fulfilment Item Index and ITSO Fulfilment Item Count to show the number and order of linked requests.

Description	Type	Values	SDCI+ record type	SDCI+ record type data attribute
Sales Transaction Reference	String	Sale reference	CF	Transaction Header Number
Sales Ticket Number	String	Ticket number	BE, BM	Transaction Number
Replacement Flag	Boolean	FFF = No not replacement TTT = Yes replacement		Set as required by TIS Replacement to utilise ATT=15 and delete old product while adding replacement
Test Transaction Flag	Boolean	FFF = Live transaction TTT = Test transaction	DB	Refer to Operating Mode where: 0 (Revenue) – Live 1 (Non revenue) – Test Transaction.
ITSO Fulfilment Item Index	Integer	Identifier within sale		No SDCI+ equivalent Set by TIS
ITSO Fulfilment Item Count	Integer	Count of requests within sale (same range as Sales Transaction Reference)		No SDCI+ equivalent, Set by TIS
Sales Transaction Date Time Stamp	String	12 characters “YYYYMMDDHHMM” in UTC	DB	DB Date (Shift Start) & Time (Issue) This will be the Time (issue) field from the TIS BE/BM record
Sale Value	Integer	Sale value in pence	BE, BM	Fare
Fulfilment Window Start Date	String	8 characters “YYYYMMDD”		No SDCI+ equivalent Set by TIS Set to date of request

Fulfilment Window Period	Integer	Number of days (whole) that fulfilment will be available for.		No SDCI+ equivalent Set by TIS Set to number of days to last date of expiry of the product set.
[Fulfilment Location Details]	Data Structure	See 6.3.12.16		
[Fulfilment Target Details]	Data Structure	See 6.3.12.19		
[IPE]	Data Structure	See 6.3.12.13		
[IPE Must Be Present] Up to 4 (optional)	Data Structure	Up to 4 [IPEReferenceID] See 6.3.12.16		
[IPE Must Not Be Present] Up to 4 (optional)	Data Structure	Up to 4 [IPEReferenceID] See 6.3.12.16		

6.3.12.13 IPEDetails

Product IIN	Integer	IIN in decimal		No SDCI+ equivalent Set by TIS from RCS
Product OID	Integer	OID in decimal (OID16)		No SDCI+ equivalent Set by TIS from RCS
Product TYP	Integer	TYP decimal		No SDCI+ equivalent Set by TIS from RCS
Product PTYP	Integer	PTYP decimal		No SDCI+ equivalent Set by TIS from RCS
IPE Format Revision	Integer	Format decimal		No SDCI+ equivalent Set by Vendor TIS from RCS when available. Default to values in standard product definitions in this document.
Expiry Date	String	8 characters "YYYYMMDD"	BM	Expiry Date
Fulfilment Data Fields – up to 4 of the following: [TYP 14 Create] [TYP 16 Create] [TYP 22 Season – Create Data Fields] [TYP 23 Simple Tickets – Create Data Fields] [TYP 24 Simple Tickets – Create Data Fields] [TYP 22 Season – Amend Data Fields] [TYP 23 Simple Tickets – Amend Data Fields] [TYP 24 Simple Tickets – Amend Data Fields] [TYP 22 Period Carnet – Create Data Fields] [TYP 22 Period Carnet – Amend Data Fields] [IPE to be Deleted]	Data Structure	See 6.3.12.20 onwards The total number of Added and Deleted products must not exceed 4.		
FulfilmentRequestIPEReference	String	Unique reference supplied by the TIS		

6.3.12.14 IPE to be Deleted

[IPE to be deleted]	Data Structure	[IPEInstance]		
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6.3.12.15 IPEInstance

Fulfilment IPE Instance INP	String	INP# of the product instance		
Fulfilment IPE Instance ISAMID	String	ISAMID of the ISAM (or proxy) that created the product instance (including IIN).		
Fulfilment IPE Instance Sequence Number	Integer	The Sequence number of the ISAM that created the product instance.		

6.3.12.16 IPEReferenceID

Product IIN	Integer	IIN in decimal		No SDCI+ equivalent Set by TIS from RCS
Product OID	Integer	OID in decimal (OID16)		No SDCI+ equivalent Set by TIS from RCS
Product TYP	Integer	TYP decimal		No SDCI+ equivalent Set by TIS from RCS
Product PTYP	Integer	PTYP decimal		No SDCI+ equivalent Set by TIS from RCS
IPE Format Revision	Integer	Format decimal		No SDCI+ equivalent Set by Vendor TIS from RCS when available. Default to values in standard product definitions in this document.
Expiry Date	String	8 characters "YYYYMMDD"	BM	Expiry Date
IPE Instance_ID	Data Structure	[IPEInstanceID]		Fulfilment IPE Instance INP#, Fulfilment IPE Instance ISAMID and Fulfilment IPE Instance Sequence Number from the Fulfilment Successful Response

6.3.12.17 Fulfilment Location Details

This data structure will provide a collection of fulfilment locations.

Description	Type	Values
[Fulfilment Location]	Data Structure collection	Collection of fulfilment location structures.

6.3.12.18 Fulfilment Location

This data structure identifies a specific fulfilment location. These fulfilment data attributes will be sourced from the TIS based on the data contained in the Retail Control Service.

Description	Type	Values
Location Type	String	Initially this will be limited to the data provided in the RCS feed. Hence the type will be: "RCS"
Location Reference	String	<p>The RCS type's location reference is a Rail Short NLC Code.</p> <p>A "RCS" fulfilment location data structure may contain a number of "location reference" elements but will always contain at least one.</p> <p>Note the Location Reference may be "0" where Location Address (ITSO POST Set IDs) are used.</p>
Location Address	String	<p>The RCS type's location address is a ITSO POST Set ID defined in Appendix D Defined Terms</p> <p>A "RCS" fulfilment location data structure may contain a number of "location address" elements but will always contain at least one.</p> <p>Note in the initial non interoperable deployments the ITSO POST Set ID may be "0". In this case the "Flow" Rail node must be capable of determining the ITSO POST Set ID of the limited locations the scheme supports.</p> <p>Any interoperable fulfilment must be implemented using the POST Set ID provided in the RCS feed.</p>

6.3.12.19 Fulfilment Target Details

This data structure identifies a specific fulfilment target (i.e. product or shell). These fulfilment data attributes will be sourced from the TIS.

Description	Type	Values
Fulfilment Target Type	String	"P" – IPE "S" – Shell "R" – Request
Fulfilment Target Reference	String	Target Type "P" then reference is IPE Instance ID which is defined in Appendix D Defined Terms Target Type "S" then reference is the ISRN. Target Type "R" leave blank. Target directed at the original fulfilment Request rather than ITSO Shell or Product

6.3.12.20 Typ 14 Create

Description	Type	Values	SDCI+ record type	SDCI+ record type data attribute
RemoveDays	Integer	0 to 255		
CPICC	String	4 Hex Chars (0-F)		
IDFlags	String	4 Binary Chars (0/1)		
RoundingFlagsEnable	String	Optional Field. Use POST value if omitted		
PassbackTime	Integer	Optional Field. Use POST value if omitted		
IDCardNumber	String	Encoding the Photocard ID in the format "AAA9999"		
RoundingFlags	String	Optional Field. Use POST value if omitted		
RoundingValueFlag	String	Optional Field. Use POST value if omitted		
EntitlementExpiry	String	YYYYMMDD		

Description	Type	Values	SDCI+ record type	SDCI+ record type data attribute
CurrencyCode	Integer	0 (GBP) or 1(Euro)	BM	Derived from Currency Marker
Method of Payment	String	"U" = Unspecified "M" = Cash "Q" = Cheque "W" = Warrant "X" = Payment Card "S" = STR	BM	Method of Payment
DepositVATSalesTAX	Integer	Optional Field. Use POST value if omitted		
Amount	Integer	Fare value in pence / cents	BM	Fare
EntitlementCode	Integer			TIS should use status code from fares data feed to map with Entitlement Code/Concessionary Class combination.
ConcessionaryClass	Integer			TIS should use status code from fares data feed to map with Entitlement Code/Concessionary Class combination.
IDCardNumber2	String	Optional Field. Use POST value if omitted		
HalfDayOfWeek	String	Optional Field. Use POST value if omitted		
Origin	String	Rail NLC code	BM	Origin NLC
Destination	String	Rail NLC code	BM	Destination NLC

6.3.12.21 Typ 16 Create

Description	Type	Values	SDCI+ record type	SDCI+ record type data attribute
RemoveDays	Integer	0 to 255		
CPICC	String	4 Hex Chars (0-F)		

Description	Type	Values	SDCI+ record type	SDCI+ record type data attribute
IDFlags	String	4 Binary Chars (0/1)		
RoundingFlagsEnable	String	Optional Field. Use POST value if omitted		
PassbackTime	Integer	Optional Field. Use POST value if omitted		
DateOfBirth	String	YYYYMMDD		
Language	Integer	Optional Field. Use POST value if omitted		
IDCardNumber	String	Encoding the Photocard ID in the format "AAA9999"		
RoundingFlags	String	Optional Field. Use POST value if omitted		
RoundingValueFlag	String	Optional Field. Use POST value if omitted		
EntitlementExpiry	String	YYYYMMDD		
Method of Payment	String	"U" = Unspecified "M" = Cash "Q" = Cheque "W" = Warrant "X" = Payment Card "S" = STR	BM	Method of Payment
DepositVATSalesTAX	Integer	Optional Field. Use POST value if omitted		
Shell Method of Payment	String	"U" = Unspecified "M" = Cash "Q" = Cheque "W" = Warrant "X" = Payment Card "S" = STR	BM	Method of Payment
Shell Deposit VAT Sales TAX	Integer	Optional Field. Use POST value if omitted		
CurrencyCode	Integer	0 (GBP) or 1(Euro)	BM	Derived from Currency Marker

Description	Type	Values	SDCI+ record type	SDCI+ record type data attribute
ShellCurrencyCode	Integer	0 (GBP) or 1(Euro)	BM	Derived from Currency Marker
Amount	Integer	Fare value in pence / cents	BM	Fare
ShellAmount	Integer	Fare value in pence / cents	BM	Fare
EntitlementCode	Integer			TIS should use status code from fares data feed to map with Entitlement Code/Concessionary Class combination.
ConcessionaryClass	Integer			TIS should use status code from fares data feed to map with Entitlement Code/Concessionary Class combination.
IDCardNumber2	String	Optional Field. Use POST value if omitted		
Forename	String	Optional Field. Use POST value if omitted		
Surname	String	Optional Field. Use POST value if omitted		
HalfDayOfWeek	String	Optional Field. Use POST value if omitted		
Origin	String	Rail NLC code	BM	Origin NLC
Destination	String	Rail NLC code	BM	Destination NLC

6.3.12.22 TYP 22 Season – Create Data Fields

This data structure identifies the fields for the creation of a period based ticket using a ITSO IPE TYP 22. Where appropriate the fulfilment data elements must either be sourced from or match the equivalent listed SDCI+ data attribute, or derived from the Fares data held by the Vendor TIS.

Description	Type	Values	SDCI+ record type	SDCI+ record type data attribute
RemoveDays	Integer	0 to 255		
Type22Flags	Integer	0 to 65535		
PassbackTime	Integer	0 to 63		
ExpiryTime	Integer	0 to 2048		
AutoRenewValue	Integer			
Class	Integer	0 = Undefined (equivalent to Class Indicator="9") 1 = First 2 = Standard	BM	Class
Validity Code	Integer	Integer value of validity code as defined in 3.6.6	From RCS Data	Validity Code of Product – 16 (10000)= Test NoGradation 17 (10001)= Live NoGradation 18 (10010)=Test HighPeak 19 (10011)= Live HighPeak 20 (10100)= Test MidPeak21 (10101)= Live MidPeak22 (10110)=Test ShoulderPeak 23 (10111)= Live ShoulderPeak 24 (11000) = Test ShoulderOffPeak25 (11001) = Live ShoulderOffPeak 26 (11010) = Test MidOffPeak27 (11011) = Live MidOffPeak 28 (11100) = Test LowOffPeak29 (11101) = Live LowOffPeak
Start of Validity Date	String	8 characters "YYYYMMDD"	BM	Start of Validity
PromotionCode	String	2* Hex		
ValidDays	String	8 * Binary Chars (0/1)		
Passenger Type	Integer	0 = Adult 1 = Child 2 = Concession	BM	Derived from Status

Description	Type	Values	SDCI+ record type	SDCI+ record type data attribute
Currency Code	Integer	0 (GBP) or 1(Euro)	BM	Derived from Currency Marker
Fare	Integer	Fare value in pence / cents	BM	Fare
Method of Payment	String	"U" = Unspecified "M" = Cash "Q" = Cheque "W" = Warrant "X" = Payment Card "S" = STR	BM	Method of Payment
CPICC	String	4*Hex		
PassDuration	Integer			
Route Code	String	Rail route code 5 numeric characters with leading zeros	BM	Route Code
Origin	String	Rail NLC code	BM	Origin NLC
Destination	String	Rail NLC code	BM	Destination NLC

6.3.12.23 TYP 23 Simple Tickets – Create Data Fields

This data structure identifies the fields for the creation of a simple ticket (single, return or carnet) using a ITSO TYP 23 IPE. Where appropriate the fulfilment data elements must either be sourced from or match the equivalent listed SDCI+ data attribute, or derived from the Fares data held by the Vendor TIS.

Description	Type	Values	SDCI+ record type	SDCI+ record type data attribute
RemoveDays	Integer	0 to 255		
Typ23Flags	String	16 x Binary Chars		
Validity Code	Integer	1 digit integer of validity code as defined in 3.7.6	From RCS Data	Validity Code of Product – 16 (10000)= Test NoGradation 17 (10001)= Live NoGradation 18 (10010)=Test HighPeak 19 (10011)= Live HighPeak 20 (10100)= Test MidPeak 21 (10101)= Live MidPeak 22 (10110)=Test ShoulderPeak 23 (10111)= Live ShoulderPeak 24 (11000) = Test ShoulderOffPeak 25 (11001) = Live ShoulderOffPeak 26 (11010) = Test MidOffPeak# 27 (11011) = Live MidOffPeak 28 (11100) = Test LowOffPeak 29 (11101) = Live LowOffPeak
Start of Validity Date Time	String	12 characters "YYYYMMDDHHMM" " in UTC		Set as required by TIS
Class	Integer	1 = First 2 = Standard	BE	Class
Passenger Type	Integer	0 = Adult 1 = Child 2 = Concession	BE	Derived from Status
Currency Code	Integer	0 (GBP) or 1(Euro)	BE	Derived from Currency Marker
Fare	Integer	Fare value in pence / cents	BE	Fare
Method of Payment	String	"U" = Unspecified "M" = Cash "Q" = Cheque "W" = Warrant "X" = Payment Card "S" = STR	BE	Method of Payment

ID Card Number	String	Last 4 characters of associated card		No SDCl+ equivalent Set by Vendor TIS
Promotion Code	String			
CPICC	String			
Mode	Integer			
Max Transfers	Integer			
Transfer Time Limit	Integer			
Value of Ride Journey	Integer			
Value of Ride Journey Currency Code	Integer			
Route Code	String	Rail route code 5 numeric characters with leading zeros	BE	Route Code
Origin	String	Rail NLC code	BE	Origin NLC
Destination	String	Rail NLC code	BE	Destination NLC
Number of Journeys	Integer	1 – single 12 – return Other – Carnet		No SDCl+ equivalent Set by Vendor TIS.
Number Of Transfers	Integer			
Type23ValueFlags	String			

6.3.12.24 TYP 24 Simple Tickets – Create Data Fields

This data structure identifies the fields for the creation of a simple ticket (single, return or carnet) using a ITSO TYP 24 IPE.

Description	Type	Values	SDCI+ record type	SDCI+ record type data attribute
RemoveDays	Integer			
Typ24flags	String	Refer to ITSO TS 1000-5		
ProductTypeEncoding	Int	0 = Single 1 = Return 2 = Carnet either direction		
Ticket Number	String	5 bytes numeric with leading zeros	BE	Transaction Number
Number of Associate IPEs	Integer			Optional field
Number of Discounts	Integer			Optional field
Number of Supplements	Integer			Optional field
Number of Transfer Types	Integer			Optional field
Number of Interchanges	Integer			Optional field
Number of Restriction Time Bands	Integer			Optional Field
Number of Vehicle Specific Restrictions	Integer			Optional Field
Number of Routing Points	Integer			Optional Field
ClassType	Integer	0 = Unknown 1 = First 2 = Standard	BE	Class (Note TIS will need to change SDCI+ class of 9 to 0)
AutorenewTime AfterExpiry	Integer			Optional Field

Number of Journeys	Integer	1= Single 2= Return Other = carnet		No SDCl+ equivalent Set by Vendor TIS.
Number of Journeys Sold	Integer			Optional Field
Out Journey Validity	Integer	3 bytes Number of days		Set as required by TIS
Return Journey Validity	Integer	3 bytes Number of days		Set as required by TIS
Operator	String	2 alphanumeric characters		Set as required by TIS
Fares Ticket Type	String	3 alphanumeric characters		Set as required by TIS
Passenger Type	Integer	0 = Adult 1 = Child 2 = Concession	BE	Derived from Status
ID Card Number	String	Last 4 characters of associated card		No SDCl+ equivalent Set by Vendor TIS
Origin	String	Rail NLC code	BE	Origin NLC
Destination	String	Rail NLC code	BE	Destination NLC
Alternative Origin	String	Rail NLC code		Optional Field
Alternative Destination	String	Rail NLC code		Optional Field
Route Code	String	Rail route code 5 numeric characters with leading zeros	BE	Route Code
Out Valid From	String	8 characters "YYYYMMDD"	BE	Set as required by TIS or Date of Travel from SDCl+ record
Return Valid From	String	8 characters "YYYYMMDD"		Set as required by TIS
Restriction Code	String	2 alphanumeric characters		Set as required by TIS
Days Travel Permitted	String			Optional Field

Days Restriction Applies	String			Optional Field
Currency Code	Integer	0 (GBP) or 1(Euro)	BE	Derived from Currency Marker
Method of Payment	String	"U" = Unspecified "M" = Cash "Q" = Cheque "W" = Warrant "X" = Payment Card "S" = STR	BE	Method of Payment
Fare	Integer	Fare value in pence / cents	BE	Fare
Vendor	String	Rail NLC code	DB	NLC (Shift)
AssociatedIPEInstanceID	Integer			Optional Field
[Discount Details]	Data Collection Structure	[Typ24DiscountDetails]		A collection of Discount Details data structures.
[Supplement Details]	Data Collection Structure	[Typ24SupplementDetails]		A collection of Supplement Details data structures.
Name	String			Optional Field
Gender	Integer	Value 0 to 3		Optional Field
Booking Reference	String	8 alphanumeric characters		Set as required by TIS based on information returned by NRS
Number of reservation	Integer	0 = no reservations 1 to 6 = reservation detail legs		Set as required by TIS based on information returned by NRS
Reservations Mandatory	Boolean	No= FFF Yes = TTT		Set as required by TIS based on information returned by NRS
[TYP 24 Reservation Details]	Data Collection Structure			A collection of reservation detail data structures.

Break of Journey Permitted	Boolean	No= FFF Yes= TTT		Set as required by TIS
Number of interchanges	Integer	0 = no interchanges 1 – 7 = number of interchanges		Set as required by TIS
[Interchange Details]	Data Collection Structure			A collection of interchange detail data structures.
[Transfer Details]	Data Collection Structure			A collection of Transfer Details data structures.

6.3.12.25 TYP 22 Season – Amend Data Fields

This data structure identifies the fields for the amendment of a TYP 22 Season ticket.

Description	Type	Values	SDCI+ record type	SDCI+ record type data attribute
Remove Days	Integer			
Type22Flags	String	0 to 65535		
PassbackTime	Integer	0 to 63		
ExpiryTime	Integer	0 to 2048		
AutoRenew Value	Integer			
Class	Integer	1 = First 2 = Standard	BM	Class
ValidityCode	Integer	1 digit integer of validity code as defined in 3.6.6	From RCS Data	Validity Code of Product – 16 (10000)= Test NoGradation 17 (10001)= Live NoGradation 18 (10010)=Test HighPeak 19 (10011)= Live HighPeak 20 (10100)= Test MidPeak 21 (10101)= Live MidPeak 22 (10110)=Test ShoulderPeak 23 (10111)= Live ShoulderPeak 24 (11000) = Test ShoulderOffPeak 25 (11001) = Live ShoulderOffPeak 26 (11010) = Test MidOffPeak# 27 (11011) = Live MidOffPeak

Description	Type	Values	SDCI+ record type	SDCI+ record type data attribute
				28 (11100) = Test LowOffPeak 29 (11101) = Live LowOffPeak
Start of Validity Date	String	8 characters "YYYYMMDD"	BM	Start of Validity
Promotion Code	String			
Valid Days	String			
Passenger Type	Integer	0 = Adult 1 = Child 2 = Concession	BM	Derived from Status
Currency Code	Integer	0 (GBP) or 1(Euro)	BM	Currency Marker
Fare	Integer	Fare value in pence / cents	BM	Fare
Method of Payment	String	"U" = Unspecified "M" = Cash "Q" = Cheque "W" = Warrant "X" = Payment Card "S" = STR	BM	Method of Payment
CPICC	String			
Pass Duration	Integer			
Route Code	String	Rail route code 5 numeric characters with leading zeros	BM	Route Code
Origin	String	Rail NLC code	BM	Origin NLC
Destination	String	Rail NLC code	BM	Destination NLC

6.3.12.26 TYP 23 Simple Tickets – Amend Data Fields

This data structure identifies the fields for the amendment of a TYP 23 Simple tickets.

Description	Type	Values	SDCI+ record type	SDCI+ record type data attribute
Remove Days	Integer			
Typ23Flags	String			
Validity Code	Integer	1 digit integer of validity code as defined in 3.7.6	From RCS Data	Validity Code of Product – 16 (10000)= Test NoGradation 17 (10001)= Live NoGradation 18 (10010)=Test HighPeak 19 (10011)= Live HighPeak 20 (10100)= Test MidPeak 21 (10101)= Live MidPeak 22 (10110)=Test ShoulderPeak 23 (10111)= Live ShoulderPeak 24 (11000) = Test ShoulderOffPeak 25 (11001) = Live ShoulderOffPeak 26 (11010) = Test MidOffPeak# 27 (11011) = Live MidOffPeak 28 (11100) = Test LowOffPeak 29 (11101) = Live LowOffPeak
Start of Validity Date Time	String	12 characters "YYYYMMDDHHMM" " in UTC		Set as required by TIS
Class	Integer	1 = First 2 = Standard	BE	Class
Passenger Type	Integer	0 = Adult 1 = Child 2 = Concession	BE	Derived from Status
Currency Code	Integer	0 (GBP) or 1(Euro)	BE	Currency Marker
Fare	Integer	Fare value in pence / cents	BE	Fare
Method of Payment	String	"U" = Unspecified "M" = Cash "Q" = Cheque "W" = Warrant "X" = Payment Card "S" = STR	BE	Method of Payment

Description	Type	Values	SDCI+ record type	SDCI+ record type data attribute
ID Card Number	String	Last 4 characters of associated card		No SDCI+ equivalent Set by Vendor TIS
Promotion Code	String			
CPICC	String			
Mode	Integer			
Max Transfers	Integer			
Transfer Time Limit	Integer			
Value of Ride Journey	Integer			Optional Field
Value of Ride Journey Currency Code	Integer			Optional field
Route Code	String	Rail route code 5 numeric characters with leading zeros	BE	Route Code
Origin	String	Rail NLC code	BE	Origin NLC
Destination	String	Rail NLC code	BE	Destination NLC
Number of Journeys	Integer	1 – single 2 – return Other – Carnet		No SDCI+ equivalent Set by Vendor TIS.
Number of Transfers	Integer			
Type23ValueFlags	String			

6.3.12.27 TYP 24 Simple Tickets – Amend Data Fields

This data structure identifies the fields for the creation of a TYP 24 simple ticket.

Description	Type	Values	SDCI+ record type	SDCI+ record type data attribute
Ticket Number	String	5 numeric characters with leading zeros	BE	Transaction Number
Class	Integer	0 = Unknown 1 = First 2 = Standard	BE	Class (Note TIS will need to change SDCI+ class of 9 to 0)
Number of Journeys	Integer	1 = Single 12 = Return Other = carnet		No SDCI+ equivalent Set by Vendor TIS.
Out Journey Validity	Integer	3 bytes Number of days		Set as required by TIS
Return Journey Validity	Integer	3 bytes Number of days		Set as required by TIS
Operator	String	2 alphanumeric characters		Set as required by TIS
Fares Ticket Type	String	3 alphanumeric characters		Set as required by TIS
Passenger Type	Integer	0 = Adult 1 = Child 2 = Concession	BE	Derived from Status
ID Card Number	String	Last 4 characters of associated card		No SDCI+ equivalent Set by Vendor TIS
Origin	String	Rail NLC code	BE	Origin NLC
Destination	String	Rail NLC code	BE	Destination NLC
Route Code	String	Rail route code 5 numeric characters with leading zeros	BE	Route Code
Out Valid From	String	8 characters "YYYYMMDD"	BE	Set as required by TIS or Date of Travel from SDCI+ record
Return Valid From	String	8 characters "YYYYMMDD"		Set as required by TIS
Restriction Code	String	2 alphanumeric characters		Set as required by TIS

Currency Code	Integer	0 (GBP) or 1(Euro)	BE	Currency Marker
Method of Payment	String	"M" = Cash "Q" = Cheque "W" = Warrant "X" = Payment Card "S" = STR	BE	Method of Payment
Fare	Integer	Fare value in pence / cents	BE	Fare
Vendor	String	Rail NLC code	DB	NLC (Shift)
[Discount Details]	Data Collection Structure			A collection of Discount Details data structures.
[Supplement Details]	Data Collection Structure			A collection of Supplement Details data structures.
Booking Reference	String	8 alphanumeric characters		Set as required by TIS based on information returned by NRS
Number of reservation	Integer	0 = no reservations 1 to 6 = reservation detail legs		Set as required by TIS based on information returned by NRS
Reservations Mandatory	Boolean	No = FFF yes = TTT		Set as required by TIS based on information returned by NRS
[TYP 24 Reservation Details]	Data Collection Structure			A collection of reservation detail data structures.
Break of Journey Permitted	Boolean	No = FFF Yes = TTT		Set as required by TIS
Number of interchanges	Integer	0 = no interchanges 1 – 7 = number of interchanges		Set as required by TIS
[Interchange Details]	Data Collection Structure			A collection of interchange detail data structures.

[Transfer Details]	Data Collection Structure			A collection of Transfer Details data structures.
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6.3.12.28 TYP 24 Supplement Details

This data structure will provide details of supplement codes when using a ITSO TYP 24 IPE.

Description	Type	Values
Supplement Code	String	12 bytes. Set as required by TIS

6.3.12.29 TYP 24 Reservation Details

This data structure details the reservations fields for when using a ITSO TYP 24 IPE.

Description	Type	Values	SDCI+ record type	SDCI+ record type data attribute
Departure Datetime	String	Date & time of the last usage of the product. 12 characters "YYYYMMDDHH MI" in UTC		Set as required by TIS based on information returned by NRS
Service Id	String	6 alphanumeric characters. Retail Service ID		Set as required by TIS based on information returned by NRS
Reservation Origin	String	Rail NLC code		Set as required by TIS based on information returned by NRS
Reservation Destination	String	Rail NLC code		Set as required by TIS based on information returned by NRS
Coach	String	2 alphanumeric characters padded left with spaces		Set as required by TIS based on information returned by NRS
Seat Number	String	3 alphanumeric characters padded left with spaces		Set as required by TIS based on information returned by NRS
Accommodation Type	String	4 alphanumeric characters		Set as required by TIS based on information returned by NRS
Seat Direction	Integer	1= Facing 2= Back 3= Airline 0 = no direction specified		Set as required by TIS based on information returned by NRS
Berth	Integer	1= Lower 2= Upper 3 = no type specified		Set as required by TIS based on information returned by NRS
Reservation Type	Integer	0 = Seat 1= Berth 2= Bike 3= No-place 4 = Wheelchair		Set as required by TIS based on information returned by NRS

Berth together	Integer	0 = not together 1 = together	Set as required by TIS based on information returned by NRS
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6.3.12.30 TYP 24 Interchange Details

This data structure will provide details of interchanges (OSI's) when using a ITSO TYP 24 IPE.

Description	Type	Values
Interchange Exit	String	NLC code of Interchange Exit location.
Interchange Entry	String	NLC code of Interchange Entry location.
Interchange Time	Integer	Time permitted for interchanges (in minutes).

6.3.12.31 TYP 24 Discount Details

This data structure will provide details of discounts when using a ITSO TYP 24 IPE.

Description	Type	Values
Discount Code	String	Discount code.
Discount Amount	Integer	Discount amount (in pence). Set to zero if Discount Percentage is populated.
Discount Percentage	Integer	Specified to 1 decimal place (e.g. 33.3% = 333). Set to zero if Discount Amount is populated.
Discount Code Type	String	Type of discount.
AssociatedSupplementCode	String	Set to the 3 character supplement code for the rail supplements priced (as defined within the RSP fares data).

6.3.12.32 TYP 24 Transfer Details

This data structure will provide details of transfers when using a ITSO TYP 24 IPE.

Description	Type	Values
Transfer Entitlement Type	Integer	Encoded transfer type.
Number of Transfers	Integer	Number of permitted transfers (maximum is 511).
Extended Validity Period	Integer	Period of time that the transfer is valid for after the end of the main product expiry (in hours).

6.3.12.33 TYP 22 Period Carnet – Create Data Fields

This data structure identifies the fields for the creation of a ticket where the allowed travel is based on the number of period passes associated with the IPE. It will use an ITSO IPE TYP 22 with associated value group. Where appropriate the fulfilment data elements must either be sourced from or match the equivalent listed SDCI+ data attribute, or derived from the Fares data held by the Vendor TIS.

Description	Type	Values	SDCI+ record type	SDCI+ record type data attribute
Remove Days	Integer			
Type22Flags	String			
Validity Code	Integer	1 digit integer of validity code as defined in 3.6.6	From RCS Data	Validity Code of Product – 16 (10000)= Test NoGradation 17 (10001)= Live NoGradation 18 (10010)=Test HighPeak 19 (10011)= Live HighPeak 20 (10100)= Test MidPeak 21 (10101)= Live MidPeak 22 (10110)=Test ShoulderPeak 23 (10111)= Live ShoulderPeak 24 (11000) = Test ShoulderOffPeak 25 (11001) = Live ShoulderOffPeak 26 (11010) = Test MidOffPeak 27 (11011) = Live MidOffPeak 28 (11100) = Test LowOffPeak 29 (11101) = Live LowOffPeak
Class	Integer	1 = First 2 = Standard	BE/BM	Class
Start of Validity Date Time	String	8 characters “YYYYMMDD” in UTC		Set as required by TIS
Passenger Type	Integer	0 = Adult 1 = Child 2 = Concession	BE/BM	Derived from Status
Currency Code	Integer	0 (GBP) or 1(Euro)	BE/BM	Currency Marker
Method of Payment	String	“M” = Cash “Q” = Cheque “W” = Warrant “X” = Payment Card “S” = STR	BE/BM	Method of Payment

Description	Type	Values	SDCI+ record type	SDCI+ record type data attribute
Fare	Integer	Fare value in pence / cents	BE/BM	Fare
Route Code	String	Rail route code 5 numeric characters with leading zeros	BE/BM	Route Code
Origin	String	Rail NLC code	BE/BM	Origin NLC
Destination	String	Rail NLC code	BE/BM	Destination NLC
Pass Duration	Integer	Number of days each pass is valid for; must be greater than 0		Set as required by TIS, default to 1 if unknown
Number of Stored Passes	Integer	1 to 63		Set as required by TIS.
Expiry Date of Stored Passes	String	8 characters "YYYYMMDD"		Set as required by TIS. Must be greater than the Start of Validity Date Time + (Number of Stored Passes * Pass Duration) and equal to or less than Expiry Date

6.3.12.34 TYP 22 Period Carnet – Amend Data Fields

This data structure identifies the fields for the amendment of a TYP 22 with stored passes.

Description	Type	Values	SDCI+ record type	SDCI+ record type data attribute
Class	Integer	1 = First 2 = Standard	BE/BM	Class
Remove Days	Integer			
Type22Flags	String			
Validity Code	Integer	1 digit integer of validity code as defined in 3.6.6	From RCS Data	Validity Code of Product – 16 (10000)= Test NoGradation 17 (10001)= Live NoGradation 18 (10010)=Test HighPeak 19 (10011)= Live HighPeak 20 (10100)= Test MidPeak

Description	Type	Values	SDCI+ record type	SDCI+ record type data attribute
				21 (10101)= Live MidPeak 22 (10110)=Test ShoulderPeak 23 (10111)= Live ShoulderPeak 24 (11000) = Test ShoulderOffPeak 25 (11001) = Live ShoulderOffPeak 26 (11010) = Test MidOffPeak# 27 (11011) = Live MidOffPeak 28 (11100) = Test LowOffPeak 29 (11101) = Live LowOffPeak
Start of Validity Date Time	String	8 characters "YYYYMMDD" in UTC		Set as required by TIS. Based upon the Expiry Date of Stored Passes for the existing product
Passenger Type	Integer	0 = Adult 1 = Child 2 = Concession	BE/BM	Derived from Status
Currency Code	Integer	0 (GBP) or 1(Euro)	BE/BM	Currency Marker
Method of Payment	String	"M" = Cash "Q" = Cheque "W" = Warrant "X" = Payment Card "S" = STR	BE/BM	Method of Payment
Fare	Integer	Fare value in pence / cents	BE/BM	Fare
Route Code	String	Rail route code 5 numeric characters with leading zeros	BE/BM	Route Code
Origin	String	Rail NLC code	BE/BM	Origin NLC
Destination	String	Rail NLC code	BE/BM	Destination NLC
Pass Duration	Integer	Number of days each pass is valid for; must be greater than 0		Set as required by TIS, default to 1 if unknown

Description	Type	Values	SDCI+ record type	SDCI+ record type data attribute
Number of Stored Passes	Integer	1 to 63		Set as required by TIS.
Expiry Date of Stored Passes	String	8 characters "YYYYMMDD"		Set as required by TIS. Must be greater than the Start of Validity Date Time + (Number of Stored Passes * Pass Duration) and equal to or less than Expiry Date

6.3.12.35 Fulfilment Service Positive Acknowledgement

This data structure is provided as the synchronous response to a Fulfilment Service Request message.

This will be sent, as a synchronous response, following the successful verification of a request being received by a Fulfilment web service Rail node. The minimum verification required is that a correctly formed message has been received from a valid Rail node.

Description	Type	Values
[Fulfilment Header]	Data Structure	See 6.3.12.9
[Flow Rail Node Details]	Data Structure	Note that this data structure is optional and is not required when the positive acknowledgement is being generated by the "TIS" Rail node.

6.3.12.36 Fulfilment Service Negative Acknowledgement

This data structure is provided as the synchronous response to a Fulfilment Service Request message.

Description	Type	Values
[Fulfilment Header]	Data Structure	See 6.3.12.9
NAK Code	Integer	Enumerated list as follows: 0 – Unspecified interface error (only to be used when no other NAK code appropriate) 1 – Invalid message format or bad data. 12 – Unrecognised rail node identifier.

Description	Type	Values
		<p>12 – Rail node temporarily unavailable (i.e. retry shortly)</p> <p>12 – Rail node critical error (i.e. contact rail node owner).</p> <p>5 – Incorrect fulfilment state for the requested action</p> <p>(Note it is anticipated that this list of NAK codes will be expanded upon as this interface is developed by suppliers)</p>
NAK Description	String	Description and further details of the NAK

6.3.12.37 Flow Rail Node Details

This data structure will provide of the details of the support for optional functions of the flow rail node implementation.

Description	Type	Values
Live Update Supported	Boolean	<p>This flag details if “Fulfilment Live” and “Fulfilment Additional Location Live” fulfilment updates are sent by this “Flow” rail node.</p> <p>No</p> <p>yes</p>
Full Void Confirmation	Boolean	<p>This flags details whether the “Flow” rail node waits for the ITSO block or delete action to be confirmed by an ITSO match event transaction message.</p> <p>No (“Flow” rail node does not wait for match event.)</p> <p>yes (“Flow” rail node does wait for match event.)</p>

6.3.12.38 Void Request Details

This data structure will provide of the void request information.

Description	Type	Values
Void Start Date Time	String	12 characters "YYYYMMDDHHMM" in UTC
Void Timeout	Integer	Number of days (whole) from void start date void should be active for before being automatically rejected.
[Fulfilment Location Details]	Data Structure	See 6.3.12.16
[Fulfilment Target Details]	Data Structure	See 6.3.12.19
Void Action	Integer	Enumerated list of void action types: 0 – Refund

6.3.12.39 Fulfilment Update Details

This data structure is provided as the asynchronous response to a Fulfilment Request, Cancellation Request and Void Request.

Description	Type	Values
Fulfilment Update – one of the following: [Fulfilment Request Accepted] [Fulfilment Request Rejected] [Fulfilment Live] [Fulfilment Additional Location Live] [Fulfilment Successful] [Fulfilment Failed Attempt] [Fulfilment Cancelled] [Fulfilment Cancellation Rejected] [Fulfilment Additional Location Rejected] [Void Request Accepted] [Void Request Rejected] [Void Request Live] [Void Successful] [Void Failed Attempt]	Data Structure	

6.3.12.40 Fulfilment Request Accepted

This data structure is provided as part of the asynchronous response to a Fulfilment Request message when the request is accepted.

Description	Type	Values
Accepted Comment	String	Any comments related to the fulfilment

6.3.12.41 Fulfilment Request Rejected

This data structure is provided as part of the asynchronous response to a Fulfilment Request message when the request is rejected.

Description	Type	Values
Rejection Code	Integer	Enumerated list of rejection codes: 0 – Unspecified fulfilment error (only to be used when no other Rejection code is appropriate) 1 - Fulfilment reference already used 2 – Unrecognised product / Product not owned by flow. 3 – Fulfilment request data content invalid. 4 – Fulfilment Timeout. (Note it is anticipated that this list of rejection codes will be expanded upon as this interface is developed by suppliers)
Rejection Comment	String	Any comments related to the fulfilment

6.3.12.42 Fulfilment Live

This data structure is provided as part of the asynchronous response to a Fulfilment Request message when the fulfilment request is made live (i.e actionlist items have been sent out by flow owing HOPS).

The Fulfilment Live update is intended to improve the customer service provided to the Smartcard customer and as such its implementation is optional and a “Flow” rail node may choose not to send this update. A “TIS” rail node must be able to receive such an update from a “Flow” node however the “TIS” node is not mandated to react to such an update.

Description	Type	Values
-------------	------	--------

Fulfilment Live Comment	String	Any comments related to the fulfilment being made live.
-------------------------	--------	---

6.3.12.43 Fulfilment Additional Location Live

This data structure is provided as part of the asynchronous response to a Add Fulfilment Location when the additional locations are made live (i.e actionlist items have been sent out by flow owing HOPS).

The Fulfilment Additional Location Live update is intended to improve the customer service provided to the Smartcard customer and as such its implementation is optional and a “Flow” rail node may choose not to send this update. A “TIS” rail node must be able to receive such an update from a “Flow” node however the “TIS” node is not mandated to react to such an update.

Description	Type	Values
Additional Location Live Comment	String	Any comments related to the additional locations being made live.

6.3.12.44 Fulfilment Successful

This data structure is provided as part of the asynchronous response to a Fulfilment Request message when the fulfilment has been successfully applied to the intended fulfilment target.

Description	Type	Values
Fulfilling POST ID	String	
Fulfilling ISAM ID	String	ISAMID of the ISAM that fulfilled the product (including IIN).
Fulfilment DateTimeStamp	String	Date & time the fulfilment took place. 12 characters "YYYYMMDDHHMI" in UTC
Fulfilment Location	String	NLC code of fulfilment location.
Fulfilment Shell ID	String	ISRN of the Shell product fulfilled to.
Fulfilment IPE Instance ID	Data Structure	
Fulfilment Request IPE Reference	String	Unique reference for the individual product in the original fulfilment request

6.3.12.45 Fulfilment Failed Attempt

This data structure is provided as part of the asynchronous response to a Fulfilment Request message when a fulfilment attempt is made but fails.

Description	Type	Values
Failure Date Time Stamp	String	Date & time the failed fulfilment took place. 12 characters "YYYYMMDDHHMI" in UTC
Failure Code	Integer	Enumerated list of failure codes: 0 – Unspecified failure error (only to be used when no

Description	Type	Values
		<p>other failure code is appropriate)</p> <p>1 – Failed fulfilment attempt – unspecified ITSO error.</p> <p>2 – Failed fulfilment attempt – Fulfilment POST could not write to customer media.</p> <p>3 – Failed fulfilment attempt – Fulfilment POST did not have necessary permissions.</p> <p>4 – Failed fulfilment attempt – Insufficient space on Customer media.</p> <p>5 – Failed fulfilment attempt – Customer media blocked.</p>
Failure Comment	String	Any comments related to the failed fulfilment attempt.

6.3.12.46 Fulfilment Cancelled

This data structure is provided as part of the asynchronous response to a Fulfilment Cancellation Request message when the cancellation request is successful

Description	Type	Values
Cancellation Comment	String	Any comments related to the fulfilment being cancelled.

6.3.12.47 Fulfilment Cancellation Rejected

This data structure is provided as part of the asynchronous response to a Cancellation Request message when the request is rejected.

Description	Type	Values
Rejection Code	Integer	<p>Enumerated list of rejection codes:</p> <p>0 – Unspecified cancellation error (only to be used when no other Rejection code is appropriate)</p> <p>1 – Invalid fulfilment reference</p> <p>2 – Fulfilment already successful</p> <p>3 – Cancellation request data content invalid.</p>

Description	Type	Values
		(Note it is anticipated that this list of rejection codes will be expanded upon as this interface is developed by suppliers)
Rejection Comment	String	Any comments related to the cancellation rejection.

6.3.12.48 Fulfilment Additional Location Rejected

This data structure is provided as part of the asynchronous response to an Add Location message when the request is rejected.

Description	Type	Values
Rejection Code	Integer	Enumerated list of rejection codes: 0 – Unspecified cancellation error (only to be used when no other Rejection code is appropriate) 1 – Invalid fulfilment reference 2 – Fulfilment already successful 3 – Cancellation request data content invalid. (Note it is anticipated that this list of rejection codes will be expanded upon as this interface is developed by suppliers)
Rejection Comment	String	Any comments related to the cancellation rejection.

6.3.12.49 Void Request Accepted

This data structure is provided as part of the asynchronous response to a Void Request message when the request is accepted.

Description	Type	Values
Accepted Comment	String	Any comments related to the void acceptance.

6.3.12.50 Void Request Rejected

This data structure is provided as part of the asynchronous response to a Void Request message when the request is rejected.

Description	Type	Values
Rejection Code	Integer	Enumerated list of rejection codes: 0 – Unspecified void error (only to be used when no other Rejection code is appropriate) 1 – Invalid fulfilment reference 2 – Void Timeout 3 – Void request data content invalid. (Note it is anticipated that this list of rejection codes will be expanded upon as this interface is developed by suppliers)
Rejection Comment	String	Any comments related to the void rejection.

6.3.12.51 Void Request Live

This data structure is provided as part of the asynchronous response to a Void Request message when the void request is made live (i.e actionlist / hotlist items have been sent out by flow owing HOPS).

The Void Live update is intended to improve the customer service provided to the Smartcard customer and as such its implementation is optional and a “Flow” rail node may choose not to send this update. A “TIS” rail node must be able to receive such an update from a “Flow” node however the “TIS” node is not mandated to react to such an update.

Description	Type	Values
Void Live Comment	String	Any comments related to the void being made live.
[Product Usage Information]		The usage state of the product at the time the void request went live. Note this is for informational purposes only (e.g. for estimating the refund should the product not be used any further) and the final refund usage state will be provided in the Void Successful response.

6.3.12.52 Void Successful

This data structure is provided as part of the asynchronous response to a Void Request message when the void action has been successfully applied. It is recommended that the void action is deemed successful when the product has been physically voided either by ITSO hot listing to block the product or through ITSO action listing to delete the product (i.e. the ITSO match event message has been received).

However the flow owning TOC may decide to deem the void action as being successfully when it has confidence that hot or action lists have been deployed such that any subsequent presentation of the product will result in the void action being physically applied. Note the mode of operation that the “Flow” rail node chooses to operate under is communicated to the “TIS” rail node in the Fulfilment Positive Acknowledgement.

Description	Type	Values
Voiding POST ID	String	
Void DateTimeStamp	String	Date & time the void took place. 12 characters “YYYYMMDDHHMM” in UTC

Description	Type	Values
Void Location	String	NLC code of void location.
[Product Usage Information]		The usage state of the product following successful blocking of the product and transactional risk mitigation period.

6.3.12.53 Void Failed Attempt

This data structure is provided as part of the asynchronous response to a Void Request message when a void attempt is made but fails.

Description	Type	Values
Failure Date Time Stamp	String	Date & time the failed void took place. 12 characters "YYYYMMDDHHMM" in UTC
Failure Code	Integer	Enumerated list of failure codes: 0 – Unspecified failure error (only to be used when no other failure code is appropriate) 1 – Failed void attempt – unspecified ITSO error. 2 – Failed void attempt – Fulfilment POST could not write to customer media. 3 – Failed void attempt – Customer media blocked.
Failure Comment	String	Any comments related to the failed void attempt.

6.3.12.54 Product Usage Information

This data structure is provided as part of a Void Successful or Void Request Live asynchronous response to a Void Request message to provide details of the usage state of the product voided or being voided.

Description	Type	Values
Last Usage Date Time Stamp	String	Date & time of the last usage of the product.

Description	Type	Values
		12 characters "YYYYMMDDHHMM" in UTC
Number of remaining journeys	Integer	Count of the remaining journeys. Note in the case of a season ticket this value may not be applicable

6.3.12.55 Replacement Details

This data structure allows a product to be updated as part of the replacement process to take into account any existing usage of the product.

Description	Type	Values
Replacement Start Date Time	String	12 characters "YYYYMMDDHHMM" in UTC
Replacement Timeout	Integer	Number of days (whole) from replacement start date replacement should be active for before being automatically rejected.
Replacement Action	String	Description of reason for replacement.
Number of remaining journeys	Integer	Count of the remaining journeys. Note in the case of a season ticket this value may not be applicable
[Fulfilment Location Details]	Data Structure	See 6.3.12.16
[Fulfilment Target Details]	Data Structure	6.3.12.19

Appendix A - ITSO Fulfilment Service – WSDL & XSD

ITSO Flow Node WSDL

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<wsdl:definitions xmlns:fofs="http://www.atoc.org/itsofulfilment-v3-flow/"
  xmlns:wSDL="http://schemas.xmlsoap.org/wsdl/" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap12/" xmlns:fst="http://www.atoc.org/ITSOFulfilmentService"
  name="itsofulfilment-v3-flow" targetNamespace="http://www.atoc.org/itsofulfilment-v3-flow/">
  <wsdl:types>
    <xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
      targetNamespace="http://www.atoc.org/itsofulfilment-v3-flow/">
      <xsd:import schemaLocation="ITSOFulfilmentTypesV3.xsd"
        namespace="http://www.atoc.org/ITSOFulfilmentService">
        </xsd:import>
        <xsd:element name="IndirectFulfilmentRequest" type="fst:IndirectFulfilmentRequest">
        </xsd:element>
        <xsd:element name="FulfilmentServicePositiveAcknowledgment"
          type="fst:FulfilmentServicePositiveAcknowledgment"/>
        <xsd:element name="FulfilmentServiceNegativeAcknowledgment"
          type="fst:FulfilmentServiceNegativeAcknowledgment"/>
        <xsd:element name="FulfilmentCancellationRequest"
          type="fst:FulfilmentCancellationRequest">
        </xsd:element>
        <xsd:element name="VoidRequest" type="fst:VoidRequest"/>
        <xsd:element name="AddFulfilmentLocation" type="fst:AddFulfilmentLocation">
        </xsd:element>
      </xsd:schema>
    </wsdl:types>
    <wsdl:message name="FulfilmentRequest">
      <wsdl:part name="request" element="fofs:IndirectFulfilmentRequest">
      </wsdl:part>
    </wsdl:message>
    <wsdl:message name="FulfilmentServicePositiveAcknowledgment">
      <wsdl:part name="response" element="fofs:FulfilmentServicePositiveAcknowledgment">
      </wsdl:part>
    </wsdl:message>
    <wsdl:message name="FulfilmentServiceNegativeAcknowledgment">
      <wsdl:part name="fault" element="fofs:FulfilmentServiceNegativeAcknowledgment">
      </wsdl:part>
    </wsdl:message>
    <wsdl:message name="FulfilmentCancellationRequestRequest">
      <wsdl:part name="request" element="fofs:FulfilmentCancellationRequest">
      </wsdl:part>
    </wsdl:message>
    <wsdl:message name="FulfilmentCancellationRequestResponse">
      <wsdl:part name="response" element="fofs:FulfilmentServicePositiveAcknowledgment">
      </wsdl:part>
    </wsdl:message>
    <wsdl:message name="VoidRequestRequest">
      <wsdl:part name="request" element="fofs:VoidRequest">
      </wsdl:part>
    </wsdl:message>
```

```

<wsdl:message name="VoidRequestResponse">
  <wsdl:part name="response" element="fofs:FulfilmentServicePositiveAcknowledgment">
  </wsdl:part>
</wsdl:message>
<wsdl:message name="AddFulfilmentLocationRequest">
  <wsdl:part name="request" element="fofs:AddFulfilmentLocation">
  </wsdl:part>
</wsdl:message>
<wsdl:message name="AddFulfilmentLocationResponse">
  <wsdl:part name="response" element="fofs:FulfilmentServicePositiveAcknowledgment">
  </wsdl:part>
</wsdl:message>
<wsdl:portType name="ITSOFulfilmentV3FlowPortType">
  <wsdl:operation name="IndirectFulfilmentRequest">
    <wsdl:input message="fofs:FulfilmentRequest"/>
    <wsdl:output message="fofs:FulfilmentServicePositiveAcknowledgment">
    </wsdl:output>
    <wsdl:fault name="fault" message="fofs:FulfilmentServiceNegativeAcknowledgment">
    </wsdl:fault>
  </wsdl:operation>
  <wsdl:operation name="FulfilmentCancellationRequest">
    <wsdl:input message="fofs:FulfilmentCancellationRequestRequest">
    </wsdl:input>
    <wsdl:output message="fofs:FulfilmentCancellationRequestResponse">
    </wsdl:output>
    <wsdl:fault name="fault" message="fofs:FulfilmentServiceNegativeAcknowledgment">
    </wsdl:fault>
  </wsdl:operation>
  <wsdl:operation name="VoidRequest">
    <wsdl:input message="fofs:VoidRequestRequest">
    </wsdl:input>
    <wsdl:output message="fofs:VoidRequestResponse">
    </wsdl:output>
    <wsdl:fault name="fault" message="fofs:FulfilmentServiceNegativeAcknowledgment">
    </wsdl:fault>
  </wsdl:operation>
  <wsdl:operation name="AddFulfilmentLocation">
    <wsdl:input message="fofs:AddFulfilmentLocationRequest">
    </wsdl:input>
    <wsdl:output message="fofs:AddFulfilmentLocationResponse">
    </wsdl:output>
    <wsdl:fault name="fault" message="fofs:FulfilmentServiceNegativeAcknowledgment">
    </wsdl:fault>
  </wsdl:operation>
</wsdl:portType>
<wsdl:binding name="ITSOFulfilmentV3FlowBinding" type="fofs:ITSOFulfilmentV3FlowPortType">
  <soap:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/>
  <wsdl:operation name="IndirectFulfilmentRequest">
    <soap:operation soapAction="http://www.atoc.org/itsofulfilment-v3-
flow/IndirectFulfilmentRequest"/>
    <wsdl:input>
      <soap:body use="literal"/>
    </wsdl:input>
    <wsdl:output>

```



```

        <soap:body use="literal"/>
    </wsdl:output>
    <wsdl:fault name="fault">
        <soap:fault name="fault" use="literal"/>
    </wsdl:fault>
</wsdl:operation>
<wsdl:operation name="FulfilmentCancellationRequest">
    <soap:operation soapAction="http://www.atoc.org/itsofulfilment-v3-
flow/FulfilmentCancellationRequest"/>
    <wsdl:input>
        <soap:body use="literal"/>
    </wsdl:input>
    <wsdl:output>
        <soap:body use="literal"/>
    </wsdl:output>
    <wsdl:fault name="fault">
        <soap:fault name="fault" use="literal"/>
    </wsdl:fault>
</wsdl:operation>
<wsdl:operation name="VoidRequest">
    <soap:operation soapAction="http://www.atoc.org/itsofulfilment-v3-flow/VoidRequest"/>
    <wsdl:input>
        <soap:body use="literal"/>
    </wsdl:input>
    <wsdl:output>
        <soap:body use="literal"/>
    </wsdl:output>
    <wsdl:fault name="fault">
        <soap:fault name="fault" use="literal"/>
    </wsdl:fault>
</wsdl:operation>
<wsdl:operation name="AddFulfilmentLocation">
    <soap:operation soapAction="http://www.atoc.org/itsofulfilment-v3-
flow/AddFulfilmentLocation"/>
    <wsdl:input>
        <soap:body use="literal"/>
    </wsdl:input>
    <wsdl:output>
        <soap:body use="literal"/>
    </wsdl:output>
    <wsdl:fault name="fault">
        <soap:fault name="fault" use="literal"/>
    </wsdl:fault>
</wsdl:operation>
</wsdl:binding>
<wsdl:service name="itsofulfilment-v3-flow">
    <wsdl:port name="ITSOFulfilmentV3FlowPort" binding="fofs:ITSOFulfilmentV3FlowBinding">
        <soap:address location="http://www.atoc.org/ITSOFulfilmentService"/>
    </wsdl:port>
</wsdl:service>
</wsdl:definitions>

```

TIS Node WSDL

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<!-- edited with XMLSpy v2014 rel. 2 sp1 (http://www.altova.com) by anjali gupta (ATOC) -->
<wsdl:definitions xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap12/"
xmlns:tnfs="http://www.atoc.org/itsofulfilment-v3-tis/" xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:fst="http://www.atoc.org/ITSOFulfilmentService"
name="itsofulfilment-v3-tis" targetNamespace="http://www.atoc.org/itsofulfilment-v3-tis">
  <wsdl:types>
    <xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
targetNamespace="http://www.atoc.org/itsofulfilment-v3-tis">
      <xsd:import schemaLocation="ITSOFulfilmentTypesV3.xsd"
namespace="http://www.atoc.org/ITSOFulfilmentService"/>
      <xsd:element name="VoidInitiationRequest" type="fst:VoidInitiationRequest"/>
      <xsd:element name="ReplacementInitiationRequest"
type="fst:ReplacementInitiationRequest"/>
      <xsd:element name="AddFulfilmentLocationInitiationRequest"
type="fst:AddFulfilmentLocationInitiationRequest"/>
      <xsd:element name="FulfilmentUpdate" type="fst:FulfilmentUpdate"/>
      <xsd:element name="FulfilmentTargetDetails" type="fst:FulfilmentTargetDetails"/>
      <xsd:element name="FulfilmentServicePositiveAcknowledgment"
type="fst:FulfilmentServicePositiveAcknowledgment"/>
      <xsd:element name="FulfilmentServiceNegativeAcknowledgment"
type="fst:FulfilmentServiceNegativeAcknowledgment"/>
    </xsd:schema>
  </wsdl:types>
  <wsdl:message name="VoidInitiationRequest">
    <wsdl:part name="request" element="tnfs:VoidInitiationRequest"/>
  </wsdl:message>
  <wsdl:message name="ReplacementInitiationRequest">
    <wsdl:part name="request" element="tnfs:ReplacementInitiationRequest"/>
  </wsdl:message>
  <wsdl:message name="AddFulfilmentLocationInitiationRequest">
    <wsdl:part name="request" element="tnfs:AddFulfilmentLocationInitiationRequest"/>
  </wsdl:message>
  <wsdl:message name="FulfilmentUpdateRequest">
    <wsdl:part name="updateRequest" element="tnfs:FulfilmentUpdate"/>
  </wsdl:message>
  <wsdl:message name="FulfilmentTargetDetailsRequest">
    <wsdl:part name="updateRequest" element="tnfs:FulfilmentTargetDetails"/>
  </wsdl:message>
  <wsdl:message name="FulfilmentServicePositiveAcknowledgment">
    <wsdl:part name="response" element="tnfs:FulfilmentServicePositiveAcknowledgment"/>
  </wsdl:message>
  <wsdl:message name="FulfilmentServiceNegativeAcknowledgment">
    <wsdl:part name="fault" element="tnfs:FulfilmentServiceNegativeAcknowledgment"/>
  </wsdl:message>
  <wsdl:message name="EmptyResponse">
  </wsdl:message>
  <wsdl:portType name="ITSOFulfilmentV3TISPortType">
    <wsdl:operation name="VoidInitiationRequest">
      <wsdl:input message="tnfs:VoidInitiationRequest"/>
      <wsdl:output message="tnfs:FulfilmentServicePositiveAcknowledgment"/>
    </wsdl:operation>
  </wsdl:portType>
</wsdl:definitions>
```

```

        <wsdl:fault name="fault" message="tnfs:FulfilmentServiceNegativeAcknowledgment"/>
    </wsdl:operation>
    <wsdl:operation name="ReplacementInitiationRequest">
        <wsdl:input message="tnfs:ReplacementInitiationRequest"/>
        <wsdl:output message="tnfs:FulfilmentServicePositiveAcknowledgment"/>
        <wsdl:fault name="fault" message="tnfs:FulfilmentServiceNegativeAcknowledgment"/>
    </wsdl:operation>
    <wsdl:operation name="AddFulfilmentLocationInitiationRequest">
        <wsdl:input message="tnfs:AddFulfilmentLocationInitiationRequest"/>
        <wsdl:output message="tnfs:FulfilmentServicePositiveAcknowledgment"/>
        <wsdl:fault name="fault" message="tnfs:FulfilmentServiceNegativeAcknowledgment"/>
    </wsdl:operation>
    <wsdl:operation name="FulfilmentUpdate">
        <wsdl:input message="tnfs:FulfilmentUpdateRequest"/>
        <wsdl:output message="tnfs:EmptyResponse"/>
        <wsdl:fault name="fault" message="tnfs:FulfilmentServiceNegativeAcknowledgment"/>
    </wsdl:operation>
    <wsdl:operation name="FulfilmentTargetDetails">
        <wsdl:input message="tnfs:FulfilmentTargetDetailsRequest"/>
        <wsdl:output message="tnfs:EmptyResponse"/>
        <wsdl:fault name="fault" message="tnfs:FulfilmentServiceNegativeAcknowledgment"/>
    </wsdl:operation>
</wsdl:portType>
<wsdl:binding name="ITSOFulfilmentV3TISBinding" type="tnfs:ITSOFulfilmentV3TISPortType">
    <soap:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/>
    <wsdl:operation name="VoidInitiationRequest">
        <soap:operation soapAction="urn:#VoidInitiationRequest"/>
        <wsdl:input>
            <soap:body use="literal"/>
        </wsdl:input>
        <wsdl:output>
            <soap:body use="literal"/>
        </wsdl:output>
        <wsdl:fault name="fault">
            <soap:fault name="fault" use="literal"/>
        </wsdl:fault>
    </wsdl:operation>
    <wsdl:operation name="ReplacementInitiationRequest">
        <soap:operation soapAction="urn:#ReplacementInitiationRequest"/>
        <wsdl:input>
            <soap:body use="literal"/>
        </wsdl:input>
        <wsdl:output>
            <soap:body use="literal"/>
        </wsdl:output>
        <wsdl:fault name="fault">
            <soap:fault name="fault" use="literal"/>
        </wsdl:fault>
    </wsdl:operation>
    <wsdl:operation name="AddFulfilmentLocationInitiationRequest">
        <soap:operation soapAction="urn:#AddFulfilmentLocationInitiationRequest"/>
        <wsdl:input>
            <soap:body use="literal"/>
        </wsdl:input>

```

```

        <wsdl:output>
            <soap:body use="literal"/>
        </wsdl:output>
        <wsdl:fault name="fault">
            <soap:fault name="fault" use="literal"/>
        </wsdl:fault>
    </wsdl:operation>
    <wsdl:operation name="FulfilmentUpdate">
        <soap:operation soapAction="urn:#FulfilmentUpdate"/>
        <wsdl:input>
            <soap:body use="literal"/>
        </wsdl:input>
        <wsdl:output>
            <soap:body use="literal"/>
        </wsdl:output>
        <wsdl:fault name="fault">
            <soap:fault name="fault" use="literal"/>
        </wsdl:fault>
    </wsdl:operation>
    <wsdl:operation name="FulfilmentTargetDetails">
        <soap:operation soapAction="urn:#FulfilmentTargetDetails"/>
        <wsdl:input>
            <soap:body use="literal"/>
        </wsdl:input>
        <wsdl:output>
            <soap:body use="literal"/>
        </wsdl:output>
        <wsdl:fault name="fault">
            <soap:fault name="fault" use="literal"/>
        </wsdl:fault>
    </wsdl:operation>
</wsdl:binding>
<wsdl:service name="itsofulfilment-v3-tis">
    <wsdl:port name="ITSOFulfilmentV3TISPort" binding="tnfs:ITSOFulfilmentV3TISBinding">
        <soap:address location="http://www.atoc.org/ITSOFulfilmentService"/>
    </wsdl:port>
</wsdl:service>
</wsdl:definitions>

```

ITSO Fulfilment Service XSD

```

<?xml version="1.0" encoding="UTF-8"?>
<!-- edited with XMLSpy v2014 rel. 2 sp1 (x64) (http://www.altova.com) by SEFT (Atoc Ltd) -->
<schema xmlns="http://www.w3.org/2001/XMLSchema"
  xmlns:fst="http://www.atoc.org/ITSOFulfilmentService"
  targetNamespace="http://www.atoc.org/ITSOFulfilmentService" elementFormDefault="qualified">
    <complexType name="IndirectFulfilmentRequest">
        <sequence>
            <element name="fulfilmentHeader" type="fst:FulfilmentHeader"/>
            <element name="fulfilmentRequestDetails" type="fst:FulfilmentRequestDetails"/>
        </sequence>
    </complexType>
    <complexType name="FulfilmentCancellationRequest">
        <sequence>

```

```

        <element name="fulfilmentHeader" type="fst:FulfilmentHeader"/>
    </sequence>
</complexType>
<complexType name="VoidRequest">
    <sequence>
        <element name="fulfilmentHeader" type="fst:FulfilmentHeader"/>
        <element name="voidRequestDetails" type="fst:VoidRequestDetails"/>
    </sequence>
</complexType>
<complexType name="AddFulfilmentLocation">
    <sequence>
        <element name="fulfilmentHeader" type="fst:FulfilmentHeader"/>
        <element name="fulfilmentLocationDetails" type="fst:FulfilmentLocationDetails"/>
    </sequence>
</complexType>
<complexType name="FulfilmentServiceNegativeAcknowledgment">
    <sequence>
        <element name="fulfilmentHeader" type="fst:FulfilmentHeader"/>
        <element name="nakCode" type="int"/>
        <element name="nakDescription" type="string"/>
    </sequence>
</complexType>
<complexType name="FulfilmentServicePositiveAcknowledgment">
    <sequence>
        <element name="fulfilmentHeader" type="fst:FulfilmentHeader"/>
        <element name="flowRailNodeDetails" type="fst:FlowRailNodeDetails"
minOccurs="0"/>
    </sequence>
</complexType>
<complexType name="FulfilmentHeader">
    <sequence>
        <element name="originatingTisId" type="fst:OriginatingTisId"/>
        <element name="flowOwnerToCtsId" type="fst:FlowOwnerToCtsId"/>
        <element name="fulfilmentRequestReference" type="string"/>
    </sequence>
</complexType>
<complexType name="FulfilmentRequestDetails">
    <sequence>
        <element name="salesTransactionReference" type="string"/>
        <element name="salesTicketNumber" type="string"/>
        <element name="replacementFlag" type="boolean"/>
        <element name="testTransactionFlag" type="boolean"/>
        <element name="itsoFulfilmentItemIndex" type="int"/>
        <element name="itsoFulfilmentItemCount" type="int"/>
        <element name="salesTransactionDateTimeStamp" type="fst:DateTime12"/>
        <element name="saleValue" type="int"/>
        <element name="fulfilmentWindowStartDate" type="fst:Date8"/>
        <element name="fulfilmentWindowPeriod" type="int"/>
        <element name="fulfilmentLocationsDetails" type="fst:FulfilmentLocationDetails"/>
        <element name="fulfilmentTargetDetails" type="fst:FulfilmentTargetDetails"
maxOccurs="unbounded"/>
        <element name="iPE" type="fst:IPEDetails" minOccurs="1" maxOccurs="4"/>
        <element name="iPE_Present" type="fst:iPEReferenceID" minOccurs="0"
maxOccurs="4"/>
        <element name="iPE_Not_Present" type="fst:iPEReferenceID" minOccurs="0"
maxOccurs="4"/>
    </sequence>

```

```

</complexType>
<complexType name="OriginatingTisId">
  <sequence>
    <element name="machineType" type="string"/>
    <element name="tisMachineId" type="string"/>
    <element name="tisWindowId" type="string"/>
    <element name="tisNlId" type="string"/>
  </sequence>
</complexType>
<complexType name="FlowOwnerTocItsId">
  <sequence>
    <element name="flowOwnerLin" type="fst:IINType"/>
    <element name="flowOwnerOid" type="fst:OIDType"/>
  </sequence>
</complexType>
<complexType name="FulfilmentLocationDetails">
  <sequence>
    <element name="fulfilmentLocation" type="fst:FulfilmentLocation"
maxOccurs="unbounded"/>
  </sequence>
</complexType>
<complexType name="FulfilmentTargetDetails">
  <sequence>
    <element name="fulfilmentTargetType" type="fst:FulfilmentTargetType"/>
    <element name="fulfilmentTargetReference" type="string"/>
  </sequence>
</complexType>
<complexType name="Typ22SeasonCreate">
  <sequence>
    <element name="removeDays" type="int" minOccurs="0"/>
    <element name="type22Flags" type="fst:FlagBitmap" minOccurs="0"/>
    <element name="passbackTime" type="integer" minOccurs="0"/>
    <element name="expiryTime" type="integer" minOccurs="0"/>
    <element name="autoRenewValue" type="int" minOccurs="0"/>
    <element name="classType" type="fst:ClassType"/>
    <element name="validityCode" type="int"/>
    <element name="startOfValidityDate" type="fst:DateTime8"/>
    <element name="promotionCode" type="string" minOccurs="0"/>
    <element name="validDays" type="string" minOccurs="0"/>
    <element name="passengerType" type="fst:PassengerType"/>
    <element name="currencyCode" type="fst:CurrencyCode"/>
    <element name="fare" type="int"/>
    <element name="methodOfPayment" type="fst:MethodOfPayment"/>
    <element name="cPICC" type="string" minOccurs="0"/>
    <element name="passDuration" type="int" minOccurs="0"/>
    <element name="routeCode" type="fst:RouteCode"/>
    <element name="origin" type="fst:NLCType"/>
    <element name="destination" type="fst:NLCType"/>
  </sequence>
</complexType>
<complexType name="Typ14Create">
  <sequence>
    <element name="removeDays" type="int" minOccurs="1" maxOccurs="1"/>
    <element name="cPICC" type="string" minOccurs="1" maxOccurs="1"/>
    <element name="iDFlags" type="string" minOccurs="1" maxOccurs="1"/>
    <element name="roundingFlagsEnable" type="string" minOccurs="0"
maxOccurs="1"/>

```



```

<element name="passbackTime" type="integer" minOccurs="0" maxOccurs="1"/>
<element name="idCardNumber" type="string" minOccurs="1" maxOccurs="1"/>
<element name="roundingFlags" type="string" minOccurs="0" maxOccurs="1"/>
<element name="roundingValueFlag" type="string" minOccurs="0"
maxOccurs="1"/>

<element name="entitlementExpiry" type="string" minOccurs="1" maxOccurs="1"/>
<element name="currencyCode" type="fst:CurrencyCode"/>
<element name="methodOfPayment" type="fst:MethodOfPayment"/>
<element name="depositVATSalesTax" type="int" minOccurs="0" maxOccurs="1"/>
<element name="amount" type="int" minOccurs="0" maxOccurs="1"/>
<element name="entitlementCode" type="int" minOccurs="1" maxOccurs="1"/>
<element name="concessionaryClass" type="int" minOccurs="1" maxOccurs="1"/>
<element name="idCardNumber2" type="string" minOccurs="0" maxOccurs="1"/>
<element name="halfDayOfWeek" type="string" minOccurs="0" maxOccurs="1"/>
<element name="origin" type="string"/>
<element name="destination" type="string"/>
</sequence>
</complexType>
<complexType name="Typ16Create">
<sequence>
<element name="removeDays" type="int" minOccurs="1" maxOccurs="1"/>
<element name="cPICC" type="string" minOccurs="1" maxOccurs="1"/>
<element name="iDFlags" type="string" minOccurs="1" maxOccurs="1"/>
<element name="roundingFlagsEnable" type="string" minOccurs="0"
maxOccurs="1"/>

<element name="passbackTime" type="integer" minOccurs="0" maxOccurs="1"/>
<element name="dateOfBirth" type="string" minOccurs="1" maxOccurs="1"/>
<element name="language" type="int" minOccurs="0" maxOccurs="1"/>
<element name="idCardNumber" type="string" minOccurs="1" maxOccurs="1"/>
<element name="roundingFlags" type="string" minOccurs="0" maxOccurs="1"/>
<element name="roundingValueFlag" type="string" minOccurs="0"
maxOccurs="1"/>

<element name="entitlementExpiry" type="string" minOccurs="1" maxOccurs="1"/>
<element name="methodOfPayment" type="fst:MethodOfPayment"/>
<element name="depositVATSalesTax" type="int" minOccurs="0" maxOccurs="1"/>
<element name="shellMethodOfPayment" type="fst:MethodOfPayment"/>
<element name="shellDepositVATSALESTax" type="int" minOccurs="1"
maxOccurs="1"/>

<element name="currencyCode" type="fst:CurrencyCode"/>
<element name="shellCurrencyCode" type="fst:CurrencyCode"/>
<element name="amount" type="int" minOccurs="0" maxOccurs="1"/>
<element name="shellAmount" type="int" minOccurs="0" maxOccurs="1"/>
<element name="entitlementCode" type="int" minOccurs="1" maxOccurs="1"/>
<element name="concessionaryClass" type="int" minOccurs="1" maxOccurs="1"/>
<element name="idCardNumber2" type="string" minOccurs="0" maxOccurs="1"/>
<element name="forename" type="string" minOccurs="0" maxOccurs="1"/>
<element name="surname" type="string" minOccurs="0" maxOccurs="1"/>
<element name="halfDayOfWeek" type="string" minOccurs="0" maxOccurs="1"/>
<element name="origin" type="string" minOccurs="0" maxOccurs="1"/>
<element name="destination" type="string" minOccurs="0" maxOccurs="1"/>
</sequence>
</complexType>
<complexType name="Typ23SimpleTicketsCreate">
<sequence>
<element name="removeDays" type="int" minOccurs="0" maxOccurs="1"/>
<element name="type23Flags" type="fst:FlagBitmap" minOccurs="0"
maxOccurs="1"/>

```

```

<element name="passbackTime" type="integer" minOccurs="0" maxOccurs="1"/>
<element name="startOfValidityDateTime" type="fst:DateTime12"/>
<element name="validityCode" type="int"/>
<element name="expiryTime" type="integer" minOccurs="0" maxOccurs="1"/>
<element name="classType" type="fst:ClassType"/>
<element name="passengerType" type="fst:PassengerType"/>
<element name="currencyCode" type="fst:CurrencyCode"/>
<element name="fare" type="int"/>
<element name="methodOfPayment" type="fst:MethodOfPayment"/>
<element name="idCardNumber" type="string"/>
<element name="promotionCode" type="string" minOccurs="0" maxOccurs="1"/>
<element name="cPICC" type="string" minOccurs="0" maxOccurs="1"/>
<element name="mode" type="int" minOccurs="0" maxOccurs="1"/>
<element name="maxTransfers" type="int" minOccurs="0" maxOccurs="1"/>
<element name="transferTimeLimit" type="int" minOccurs="0" maxOccurs="1"/>
<element name="valueOfRideJourney" type="int" minOccurs="0" maxOccurs="1"/>
<element name="valueOfRideJourneyCurrencyCode" type="int" minOccurs="0"
maxOccurs="1"/>

<element name="routeCode" type="fst:RouteCode"/>
<element name="origin" type="fst:NLCType"/>
<element name="destination" type="fst:NLCType"/>
<element name="numberOfJourneys" type="int"/>
<element name="numberOfTransfers" type="int" minOccurs="0" maxOccurs="1"/>
<element name="type23ValueFlags" type="string" minOccurs="0" maxOccurs="1"/>
</sequence>
</complexType>
<complexType name="Typ24SimpleTicketsCreate">
<sequence>
<element name="removeDays" type="int" minOccurs="0" maxOccurs="1"/>
<element name="type24Flags" type="fst:FlagBitmap" minOccurs="0"
maxOccurs="1"/>

<element name="productTypeEncoding" type="fst:ProductType" minOccurs="0"
maxOccurs="1"/>

<element name="ticketNumber" type="string"/>
<element name="numberOfAssociatedIPEs" type="int" minOccurs="0"
maxOccurs="1"/>

<element name="numberOfDiscounts" type="int" minOccurs="0" maxOccurs="1"/>
<element name="numberOfSupplements" type="int" minOccurs="0"
maxOccurs="3"/>

<element name="numberOfTransferTypes" type="int" minOccurs="0"
maxOccurs="1"/>

<element name="numberOfInterchanges" type="fst:NumberOfInterchangesType"
minOccurs="0" maxOccurs="7"/>
<element name="numberOfRestrictionTimeBands" type="int" minOccurs="0"
maxOccurs="1"/>

<element name="numberOfVehicleSpecificRestriction" type="int" minOccurs="0"
maxOccurs="1"/>

<element name="numberOfRoutingPoints" type="int" minOccurs="0"
maxOccurs="1"/>

<element name="classType" type="fst:ClassType"/>
<element name="autorenewTimeAfterExpiry" type="int" minOccurs="0"
maxOccurs="1"/>

<element name="numberOfJourneys" type="int" minOccurs="0" maxOccurs="1"/>
<element name="numberOfJourneysSold" type="int"/>
<element name="outJourneyValidity" type="int"/>
<element name="returnJourneyValidity" type="int"/>
<element name="operator" type="string"/>

```



```

<element name="faresTicketType" type="string"/>
<element name="passengerType" type="fst:PassengerType"/>
<element name="idCardNumber" type="string"/>
<element name="origin" type="fst:NLCType"/>
<element name="destination" type="fst:NLCType"/>
<element name="alternativeOrigin" type="fst:NLCType" minOccurs="0"
maxOccurs="1"/>
<element name="alternativeDestination" type="fst:NLCType" minOccurs="0"
maxOccurs="1"/>
<element name="routeCode" type="fst:RouteCode"/>
<element name="outValidFrom" type="fst:DateTime8"/>
<element name="returnValidFrom" type="fst:DateTime8"/>
<element name="restrictionCode" type="string"/>
<element name="daysTravelPermitted" type="string" minOccurs="0"
maxOccurs="1"/>
<element name="daysRestrictionApplies" type="string" minOccurs="0"
maxOccurs="1"/>
<element name="currencyCode" type="fst:CurrencyCode"/>
<element name="methodOfPayment" type="fst:MethodOfPayment"/>
<element name="fare" type="int"/>
<element name="vendor" type="string"/>
<element name="associatedIPEInstanceID" type="int" minOccurs="0"
maxOccurs="3"/>
<element name="discountDetails" type="fst:Typ24DiscountDetails" minOccurs="0"
maxOccurs="3"/>
<element name="supplementDetails" type="fst:Typ24SupplementDetails"
minOccurs="0" maxOccurs="unbounded"/>
<element name="interchangeDetails" type="fst:Typ24InterchangeDetails"
minOccurs="0" maxOccurs="7"/>
<element name="transferDetails" type="fst:Typ24TransferDetails" minOccurs="0"
maxOccurs="3"/>
<element name="name" type="string" minOccurs="0" maxOccurs="1"/>
<element name="gender" type="fst:GenderType" minOccurs="0" maxOccurs="1"/>
<element name="bookingReference" type="string"/>
<element name="numberOfReservations" type="fst:NumberOfReservationsType"/>
<element name="reservationsMandatory" type="boolean"/>
<element name="reservationDetails" type="fst:Typ24ReservationDetails"
minOccurs="0" maxOccurs="6"/>
<element name="breakOfJourneyPermitted" type="boolean"/>
</sequence>
</complexType>
<complexType name="Typ22SeasonAmend">
<sequence>
<element name="removeDays" type="int" minOccurs="0" maxOccurs="1"/>
<element name="type22Flags" type="fst:FlagBitmap" minOccurs="0"
maxOccurs="1"/>
<element name="passbackTime" type="integer" minOccurs="0" maxOccurs="1"/>
<element name="expiryTime" type="integer" minOccurs="0" maxOccurs="1"/>
<element name="autoRenewValue" type="int" minOccurs="0" maxOccurs="1"/>
<element name="classType" type="fst:ClassType"/>
<element name="validityCode" type="int"/>
<element name="startOfValidityDate" type="fst:DateTime8"/>
<element name="promotionCode" type="string" minOccurs="0" maxOccurs="1"/>
<element name="validDays" type="string" minOccurs="0" maxOccurs="1"/>
<element name="passengerType" type="fst:PassengerType"/>
<element name="currencyCode" type="fst:CurrencyCode"/>
<element name="fare" type="int"/>

```

```

        <element name="methodOfPayment" type="fst:MethodOfPayment"/>
        <element name="cPICC" type="string" minOccurs="0" maxOccurs="1"/>
        <element name="passDuration" type="int" minOccurs="0" maxOccurs="1"/>
        <element name="routeCode" type="fst:RouteCode"/>
        <element name="origin" type="fst:NLCType"/>
        <element name="destination" type="fst:NLCType"/>
    </sequence>
</complexType>
<complexType name="Typ23SimpleTicketsAmend">
    <sequence>
        <element name="removeDays" type="int" minOccurs="0" maxOccurs="1"/>
        <element name="type23Flags" type="fst:FlagBitmap" minOccurs="0"
maxOccurs="1"/>
        <element name="passbackTime" type="integer" minOccurs="0" maxOccurs="1"/>
        <element name="startOfValidityDateTime" type="fst:DateTime12"/>
        <element name="validityCode" type="int"/>
        <element name="expiryTime" type="integer" minOccurs="0" maxOccurs="1"/>
        <element name="classType" type="fst:ClassType"/>
        <element name="passengerType" type="fst:PassengerType"/>
        <element name="currencyCode" type="fst:CurrencyCode"/>
        <element name="fare" type="int"/>
        <element name="methodOfPayment" type="fst:MethodOfPayment"/>
        <element name="idCardNumber" type="string"/>
        <element name="promotionCode" type="string" minOccurs="0" maxOccurs="1"/>
        <element name="cPICC" type="string" minOccurs="0" maxOccurs="1"/>
        <element name="mode" type="int" minOccurs="0" maxOccurs="1"/>
        <element name="maxTransfers" type="int" minOccurs="0" maxOccurs="1"/>
        <element name="transferTimeLimit" type="int" minOccurs="0" maxOccurs="1"/>
        <element name="valueOfRideJourney" type="int" minOccurs="0" maxOccurs="1"/>
        <element name="valueOfRideJourneyCurrencyCode" type="int" minOccurs="0"
maxOccurs="1"/>
        <element name="routeCode" type="fst:RouteCode"/>
        <element name="origin" type="fst:NLCType"/>
        <element name="destination" type="fst:NLCType"/>
        <element name="numberOfJourneys" type="int"/>
        <element name="numberOfTransfers" type="int" minOccurs="0" maxOccurs="1"/>
        <element name="type23ValueFlags" type="string" minOccurs="0" maxOccurs="1"/>
    </sequence>
</complexType>
<complexType name="Typ24SimpleTicketsAmend">
    <sequence>
        <element name="expiry" type="fst:Date8"/>
        <element name="ticketNumber" type="string"/>
        <element name="classType" type="fst:ClassType"/>
        <element name="numberOfJourneys" type="int"/>
        <element name="outJourneyValidity" type="int"/>
        <element name="returnJourneyValidity" type="int"/>
        <element name="operator" type="string"/>
        <element name="faresTicketType" type="string"/>
        <element name="passengerType" type="fst:PassengerType"/>
        <element name="idCardNumber" type="string"/>
        <element name="origin" type="fst:NLCType"/>
        <element name="destination" type="fst:NLCType"/>
        <element name="routeCode" type="fst:RouteCode"/>
        <element name="outValidFrom" type="fst:DateTime8"/>
        <element name="returnValidFrom" type="fst:DateTime8"/>
        <element name="restrictionCode" type="string"/>
    </sequence>

```

```

        <element name="currencyCode" type="fst:CurrencyCode"/>
        <element name="methodOfPayment" type="fst:MethodOfPayment"/>
        <element name="fare" type="int"/>
        <element name="vendor" type="string"/>
        <element name="discountDetails" type="fst:Typ24DiscountDetails" minOccurs="0"
maxOccurs="3"/>
        <element name="supplementDetails" type="fst:Typ24SupplementDetails"
minOccurs="0" maxOccurs="unbounded"/>
        <element name="bookingReference" type="string" minOccurs="0"/>
        <element name="numberOfReservations" type="fst:NumberOfReservationsType"
minOccurs="0" maxOccurs="1"/>
        <element name="reservationsMandatory" type="boolean"/>
        <element name="reservationDetails" type="fst:Typ24ReservationDetails"
minOccurs="0" maxOccurs="6"/>
        <element name="breakOfJourneyPermitted" type="boolean"/>
        <element name="numberOfInterchanges" type="fst:NumberOfInterchangesType"/>
        <element name="interchangeDetails" type="fst:Typ24InterchangeDetails"
minOccurs="0" maxOccurs="7"/>
        <element name="transferDetails" type="fst:Typ24TransferDetails" minOccurs="0"
maxOccurs="3"/>
    </sequence>
</complexType>
<complexType name="Typ22PeriodCarnetCreate">
    <sequence>
        <element name="removeDays" type="int" minOccurs="0" maxOccurs="1"/>
        <element name="type22Flags" type="fst:FlagBitmap" minOccurs="0"
maxOccurs="1"/>
        <element name="passbackTime" type="integer" minOccurs="0" maxOccurs="1"/>
        <element name="expiryTime" type="integer" minOccurs="0" maxOccurs="1"/>
        <element name="autoRenewValue" type="int" minOccurs="0" maxOccurs="1"/>
        <element name="classType" type="fst:ClassType"/>
        <element name="validityCode" type="int"/>
        <element name="startOfValidityDate" type="fst:DateTime8"/>
        <element name="promotionCode" type="string" minOccurs="0" maxOccurs="1"/>
        <element name="validDays" type="string" minOccurs="0" maxOccurs="1"/>
        <element name="passengerType" type="fst:PassengerType"/>
        <element name="currencyCode" type="fst:CurrencyCode"/>
        <element name="fare" type="int"/>
        <element name="methodOfPayment" type="fst:MethodOfPayment"/>
        <element name="cPICC" type="string" minOccurs="0" maxOccurs="1"/>
        <element name="passDuration" type="int" minOccurs="0" maxOccurs="1"/>
        <element name="routeCode" type="fst:RouteCode"/>
        <element name="origin" type="fst:NLCType"/>
        <element name="destination" type="fst:NLCType"/>
        <element name="passDuration" type="int"/>
        <element name="numberOfStoredPasses"
type="fst:NumberOfStoredPassesType"/>
        <element name="type22ValueFlags" type="string" minOccurs="0" maxOccurs="1"/>
        <element name="expiryDateOfStoredPasses" type="fst:DateTime8"/>
        <element name="currentPassExpiry" type="string" minOccurs="0" maxOccurs="1"/>
    </sequence>
</complexType>
<complexType name="Typ22PeriodCarnetAmend">
    <sequence>
        <element name="removeDays" type="int" minOccurs="0" maxOccurs="1"/>
        <element name="type22Flags" type="fst:FlagBitmap" minOccurs="0"
maxOccurs="1"/>

```

```

<element name="passbackTime" type="integer" minOccurs="0" maxOccurs="1"/>
<element name="expiryTime" type="integer" minOccurs="0" maxOccurs="1"/>
<element name="autoRenewValue" type="int" minOccurs="0" maxOccurs="1"/>
<element name="classType" type="fst:ClassType"/>
<element name="validityCode" type="int"/>
<element name="startOfValidityDate" type="fst:DateTime8"/>
<element name="promotionCode" type="string" minOccurs="0" maxOccurs="1"/>
<element name="validDays" type="string" minOccurs="0" maxOccurs="1"/>
<element name="passengerType" type="fst:PassengerType"/>
<element name="currencyCode" type="fst:CurrencyCode"/>
<element name="fare" type="int"/>
<element name="methodOfPayment" type="fst:MethodOfPayment"/>
<element name="cPICC" type="string" minOccurs="0" maxOccurs="1"/>
<element name="passDuration" type="int" minOccurs="0" maxOccurs="1"/>
<element name="routeCode" type="fst:RouteCode"/>
<element name="origin" type="fst:NLCType"/>
<element name="destination" type="fst:NLCType"/>
<element name="passDuration" type="int"/>
<element name="numberOfStoredPasses"
type="fst:NumberOfStoredPassesType"/>
<element name="type22ValueFlags" type="string" minOccurs="0" maxOccurs="1"/>
<element name="expiryDateOfStoredPasses" type="fst:DateTime8"/>
<element name="currentPassExpiry" type="string" minOccurs="0" maxOccurs="1"/>
</sequence>
</complexType>
<complexType name="FulfilmentLocation">
<sequence>
<element name="locationType" type="string"/>
<element name="locationReference" type="string" minOccurs="0"
maxOccurs="unbounded"/>
<element name="locationAddress" type="string" minOccurs="0"
maxOccurs="unbounded"/>
</sequence>
</complexType>
<simpleType name="Date8">
<restriction base="string">
<pattern value="\d{8}"/>
</restriction>
</simpleType>
<simpleType name="ClassType">
<restriction base="int">
<enumeration value="0"/>
<enumeration value="1"/>
<enumeration value="2"/>
</restriction>
</simpleType>
<simpleType name="GenderType">
<restriction base="int">
<enumeration value="0"/>
<enumeration value="1"/>
<enumeration value="2"/>
<enumeration value="3"/>
</restriction>
</simpleType>
<simpleType name="PassengerType">
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        <enumeration value="W"/>
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        <enumeration value="S"/>
        <enumeration value="R"/>
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type="fst:FulfilmentRequestRejected"/>
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```

```

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        <element name="fulfilmentCancellationRejected"
type="fst:FulfilmentCancellationRejected"/>
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```

```

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```

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```

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    </simpleType>
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</schema>

```

Appendix B - Implementation of ITSO Zonal Ticketing on rail

B.1 Introduction

B.1.1 Purpose

This document defines how Zonal Ticketing will be used in the ITSO environment by Train Operating Companies (TOCs). Zonal Ticketing includes products such as the In-Boundary and Out-Boundary London Travelcard Products and also PTE promoted ticketing schemes, an example of which is the N Train multi-operator zonal rail product in the West Midlands.

This document provides the necessary detail for suppliers to understand specifically how the Products will be used and how their Point of Service Terminals (POSTs) should handle the Rail ITSO Zonal Ticketing Products.

B.1.2 Scope

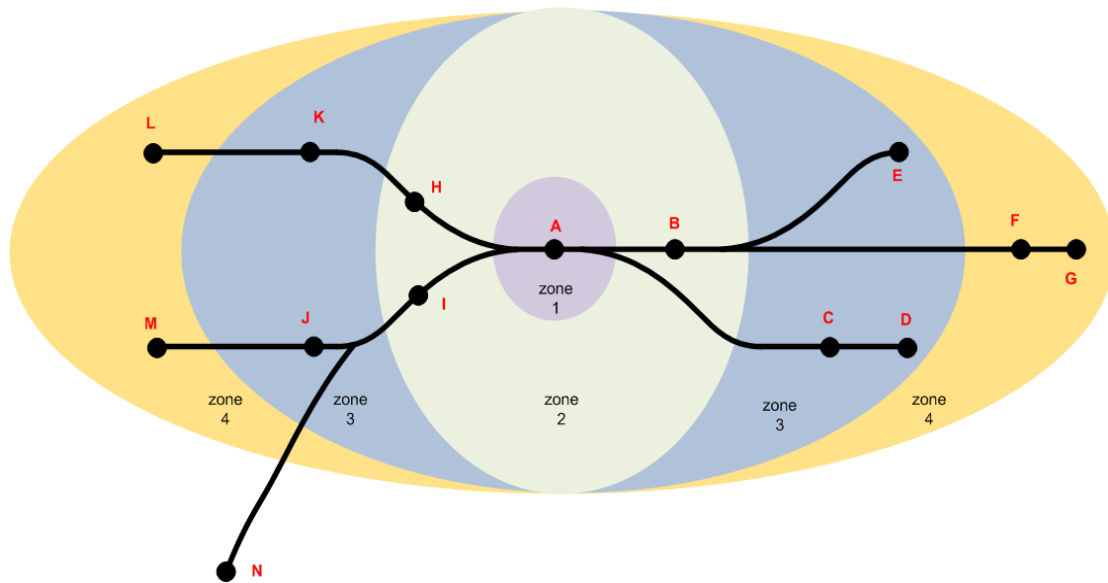
The product entities and functions listed in this specification are the current suite of functions that are to be implemented for Rail ITSO Zonal Ticketing initially. This does not preclude the expansion of these concepts in the future but sets out the baseline from which any future developments could be made.

B.2 Scheme Product Foundation Rules

B.2.1 Description

Zonal Tickets are those which allow a customer to travel on an unlimited basis within a specified zone. Unlike point to point tickets a customer does not need to nominate a fixed origin station and destination station for their ticket, but chooses a zone combination appropriate for their journey. The added flexibility this gives them is the ability to also make other journeys within the zone(s) other than from a fixed start and end point.

So in the case of the diagram below, a customer who needs to make a regular journey from station E to station A can purchase a Zone 1-3 product, which also would mean they could travel to stations C and D or to stations H, I, J or K as well; even though those stations are well away from their normal travel route:



There is also the concept in zonal ticketing of ‘In-boundary’ and ‘Out-boundary’ zonal products being available to customers. So, in the case of the same diagram, if a station N was to exist outside the zones, a customer travelling from this station could still benefit from the zonal product, in addition to the portion of their travel between station N and the boundary of the zonal travel area.

B.2.2 London specific conditions

The London Travelcard is an example of a zonal ticket.

In the case of the London Travelcard:

- only travel on ITSO enabled national rail services will be accepted for the non-zonal component.
- In-boundary zonal travel will be provided by TfL’s Prestige estate, through the ITSO on Prestige project. TfL will not issue this Product on ITSO media; it must be obtained from an ITSO enabled TOC, or other authorised retailer of this product which has ITSO retailing facilities.

Both the In-Boundary and Out-Boundary product variants allows the validity periods as specified below.

The rules around issuing London Travelcard must be in accordance with “The Manual”.

B.2.3 Background

Rail Zonal Tickets are products which are currently in existence for magnetic media. The ITSO Zonal Product shall be designed to emulate its functionality in addition to any new functionality required.

B.2.4 General Product Restrictions

Inter-TOC transfer is available for the Out-Boundary portion where other ITSO operators provide services available along appropriate line(s) of route(s).

There is no accompanied ticket policy; therefore each passenger travelling using this product must hold their own Smartcard.

Break of Journeys anywhere along the permitted routes are allowed for Zonal Tickets. The journey starting with the re-entry will be treated as a second journey completely divorced from the first journey.

B.2.5 Classes of Travel

Class of travel may be either one of:

1. First Class
2. Standard Class

The rules may vary from scheme to scheme (i.e. some may be Standard Class only).

B.2.6 Concessionary Travel

Concession Zonal Tickets are available for:

1. Child
2. Railcard holders (likely to be restricted to One Day products only)

The rules around the use and fare calculations of concessions will be in accordance with "The Manual".

At the time of writing they are (subject to change):

The fare calculation to derive the concession fares shall be the relevant calculation currently in use by TOCs at the time of the calculation.

Railcards must be held by the customer at the time of booking and inspection.

B.2.7 Product Variants

B.2.7.1 In-Boundary Zonal Tickets

In-boundary Zonal Tickets are valid for travel wholly within the appropriate zonal area. As such, travel can be purchased from a specified zone within the zonal area to another zone.

The minimum number of zones that can be purchased shall be defined by the scheme operator. If one or more zones are purchased in combination, these must be made up of the combination of adjacent / connected zones only (i.e. in a 6 zone scheme, a customer could not purchase a Zone 1 + Zone 6 ticket, as a gap would exist between these two areas).

Any number or combination of adjacent zones may be purchased if scheme rules permit this.

Break of Journey (BOJ) is permissible. The first journey, up to the BOJ, is treated as a complete journey in its own right. The resumed journey starting with the re-entry will be treated as a second journey completely divorced from the first. In-boundary Zonal Tickets will normally be issued from a station within the zonal area, but this is not always the case (remote issuance may also take place).

In the case of an In-Boundary Zonal Ticket, the origin NLC be set to reflect the issuing location but this field will not be required for validation purposes. The Destination NLC will

set to represent the zonal combination within the zones required and this field will always be the one that is validated.

B.2.7.1.1 Validity Periods

Peak and Off-Peak Products are available for selected Zonal Tickets. These are listed below.

Zonal Tickets can be purchased in the following validity periods:

1. One Day
2. Period (7 day or 1 to 12 Months. Also 4 weekly combinations in some areas)

One Day tickets will be available in Peak and Off-Peak format.

Period tickets will be available in Peak format to begin with. However devices should be able to support all 2.1.4 time bands as defined in Section 4.3, to enable more flexible Zonal tickets.

B.2.7.2 Out-Boundary Zonal Tickets

Out-boundary Zonal Tickets are valid for travel from outside the zonal area to a combination of zones within the zonal area. The destination zones must be located adjacent to the boundary point of the zonal area, and the origin station must be outside the zonal area.

Break of Journey is allowed for Zonal Tickets. The journey starting with the re-entry will be treated as a second journey completely divorced from the first journey.

Out-boundary Zonal Tickets will be issued from a station outside the zonal area. For example, a London Travelcard issued from Crawley to zones 1-6 will have the origin NLC set to represent the single station of Crawley and the Destination NLC set to represent the zonal combination of Travelcard Zones 1-6.

B.2.7.3 One Day Zonal Tickets

Peak One Day Zonal Tickets are valid all day on each day of travel and include validity on the day following expiry until 4:29am (although this may differ from scheme to scheme) for all selected zonal travel.

Off-Peak One Day Zonal Tickets are typically valid from 09:30am on the day of travel (although this may differ from scheme to scheme) and up to 4:29am (although this may differ from scheme to scheme) on the following day for all selected zonal travel.

B.2.7.4 Period Zonal Tickets (Season Pass)

Period Zonal Tickets have no Off-Peak Period to begin with. However devices should be able to support all 2.1.4 time bands as defined in Section 4.3, to enable more flexible Zonal tickets.

A Period Zonal Tickets is valid all day on the day for which travel is purchased through to 4:29am (although this may differ from scheme to scheme) on the day following expiry.

Period Zonal Tickets are available in a single increment of 7 days for registered and unregistered Products or increments of one month, not exceeding a total period of 12 months in any purchase and 13 months in total for registered Products.

B.2.8 Scope

For the zonal portion of travel, this Product is valid on all TOC stations within the selected zonal area. The Product may also be valid on other modes of transport, e.g, Buses, Underground, Metro, DLR and Trams etc... within the selected scheme as appropriate.

This Product does not include the use of PlusBus products, which are implemented as a separate product (see Appendix D).

The Point to Point travel portion is valid only on ITSO equipped TOC stations, from the specified origin to the specified destination.

B.2.9 Availability

The following availability rules apply:

1. Zonal Tickets are available for purchase in advance from TVM, online TIS or other retail outlets. Purchase via online TIS must be made at least 2 hours prior to collection.
2. For WebTIS purchases, a station must be nominated where the Product will be collected. The station must be an ITSO enabled TOC station.
3. Where a Period Zonal Ticket has not been collected it shall be withdrawn from the station after a period of time to be determined by the product owner. The product retailer must be contacted for the Product to be re-published.
4. Where a One Day Zonal Ticket has been purchased, the Product shall be activate, at the selected station, on the selected day. The Product is not valid for use until it has been collected from that station. The One Day Product shall be withdrawn from the station after a period of time to be determined by the product owner. The date of collection does not change or extend the Product expiry from the original date specified. There are no refunds for Products that have reached their publish date.
5. Same day purchases can be made from the TVM, online, online TIS or other retail outlets.
6. Photo identification may be required to obtain Out-Boundary Zonal Tickets. In certain circumstances this may be restricted for only products longer than 7 days validity (but this should be configurable on a scheme by scheme basis).

B.2.10 Refunds & Replacements

B.2.10.1 Refunds

Unused Zonal Tickets may be refunded in full as per the National Rail Conditions of Carriage and "The Manual".

The calculation for performing Period Zonal Ticket refunds is defined in "The Manual"

Refunds can be requested online, at the ticket office or from the Call Centre. If the card is registered, then this can be additionally requested at the TVM. An admin fee may be payable as per the National Rail Conditions of Carriage. This fee may be waived by the Customer service assistant.

B.2.10.2 Replacements

Specific rules on replacements of Zonal Tickets for when Smartcards are lost or stolen will be defined by individual TOCs.

B.2.11 Product Changeover

Only available on registered Smartcards and must be carried out in accordance with the rules in "The Manual".

Product Changeover must be requested through the Call Centre. This is a manual process and requires user intervention to complete the replacement.

B.2.12 Media

Certain Zonal Tickets may require a registered Smartcard. These would typically be:

- Products of longer than 7 days validity

Rules may be different from TOC to TOC.

Day Zonal Tickets do not usually require a name or photograph to be present on the Smartcard.

Photo identification may be required for products of 7 days validity or longer (but this should be configurable on a scheme by scheme basis).

B.2.13 Implementation

The Zonal Ticket will always be implemented as a single sale.

Where the Product includes a point to point travel portion (an Out-Boundary Zonal Ticket product):

- The Zonal Ticket shall be loaded onto the Smartcard either directly by a TVM; or via an actionlist. The origin station (Loc Def 203) where travel is required from outside the TfL estate will be encoded within the Valid At or From field of the IPE. The appropriate zonal identifier (Loc Def 203) will be encoded within the Valid To field of the IPE.

Where the passenger selects only zonal travel (an In-Boundary Zonal Tickets):

- The Zonal Ticket shall be loaded onto the Smartcard either directly by a TVM; or via an actionlist. The appropriate zonal identifier (Loc Def 203) will be encoded within the Valid To field of the IPE. The Valid At Or From field will be used to encode the issuing station location, but this will not be used for validation purposes.

B.3 Validation

B.3.1 Inside the zonal area ('In-Boundary')

All POST devices within the zonal area must always validate the Valid To field of the IPE, containing the Zonal Ticket zonal identifier, if travel is made In-Boundary.

The Zonal Ticket zonal identifier may be an alphanumeric NLC (e.g. H150) or numeric (e.g. 1234) depending on where the zonal ticketing scheme is located geographically.

The POST devices at in-boundary stations will need to be capable of holding more than one NLC in their base data to cope with: (1) being part of a zonal ticketing scheme, (2) being a station in its own right, and (3) potentially also being part of a group station NLC.

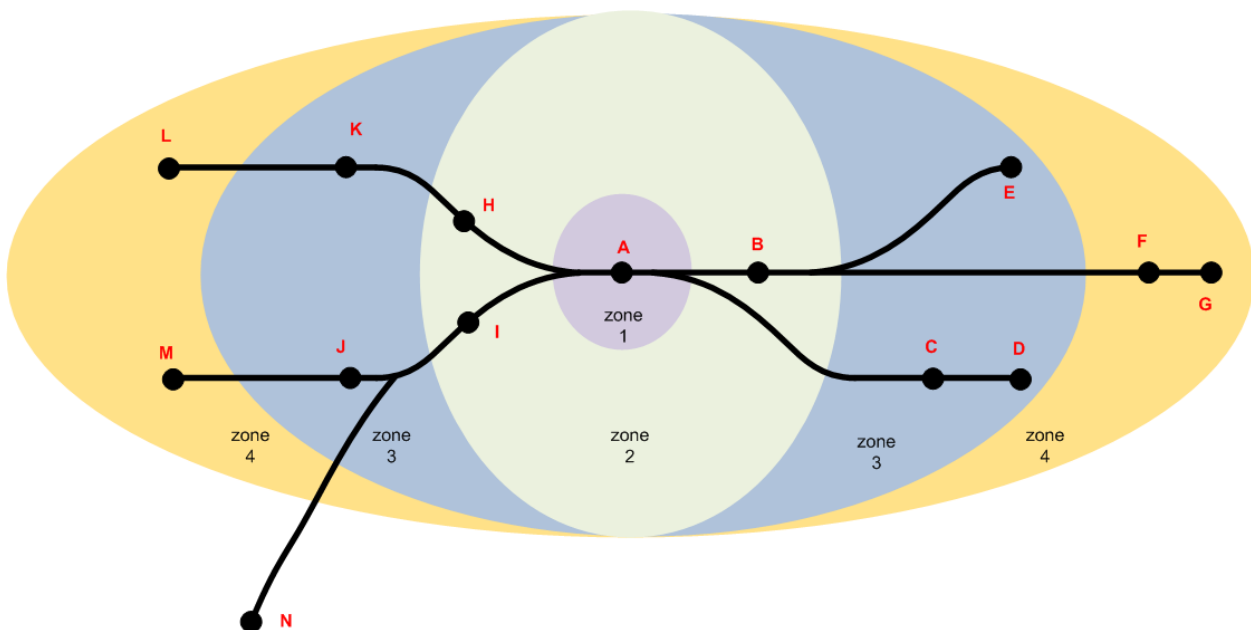
B.3.2 Outside the zonal area ('Out-Boundary')

All POST devices must always validate the Valid At or From field of the IPE, containing the station outside of the zonal area where travel is permitted from/to, if travel is made Out-Boundary.

The zonal identifier will always be a numeric NLC (e.g. 1234) in this scenario.

B.4 Example scenarios

The diagram below is used in each of the examples which follow



B.4.1 Customer travelling from station N to station A and holding an out-boundary zonal ticket for Zones 1-4

In this case the customer's ticket is encoded with:

- The NLC for Station N in the ValidAtOrFrom field of the IPE.
- The NLC for Zones 1-4 of the zonal ticketing scheme in the ValidTo field of the IPE.

If the customer validates at station N, the POST device will validate the product using the NLC encoded in the ValidAtOrFrom field of the IPE.

If the customer validates at any other station within the zonal ticketing scheme (e.g. stations A, but also B, C, D, E, F or G etc), the POST devices at those stations will validate the product using the zone NLC encoded in the ValidTo field of the IPE.

B.4.2 Customer travelling from station N to station I and holding an out-boundary zonal ticket for zone 2, 3 and 4

In this case the customer's ticket is encoded with:

- The NLC for Station N in the ValidAtOrFrom field of the IPE.
- The NLC for Zones 2-4 of the zonal ticketing scheme in the ValidTo field of the IPE.

If the customer validates at station N, the POST device will validate the product using the NLC encoded in the ValidAtOrFrom field of the IPE.

If the customer validates at a station within Zones 2, 3 and 4 of the zonal ticketing scheme (e.g. station I, but also stations J or M), the POST devices at those stations will validate the product using the NLC encoded in the ValidTo field of the IPE.

If the customer attempts to validate at station A, the POST will deny the customer travel as the ticket is not valid here. A seek assistance message will then be displayed.

B.4.3 Customer travelling from station K to station B and holding a zonal ticket for zones 1, 2 and 3

In this case the customer's ticket is encoded with:

- The issuing station NLC in the ValidAtOrFrom field of the IPE.
- The NLC for Zones 1, 2 and 3 of the zonal ticketing scheme in the ValidTo field of the IPE. Even though station K is in zone 3 and station B is in zone 2, to make this journey requires travel through zone 1, hence why a zone 1, 2 and 3 ticket is required.

If the customer validates at station K, the POST device will validate the product using the NLC encoded in the ValidTo field of the IPE.

If the customer validates at station B, the POST device will validate the product using the NLC encoded in the ValidTo field of the IPE.

B.4.4 Customer travelling from station G to station F and holding a point to point ticket for this journey

In this case the customer's ticket is encoded with:

- Station G's NLC in the ValidAtOrFrom field of the IPE.
- Station F's NLC in the ValidTo field of the IPE.

If the customer validates at station G, the POST device will validate the product using the NLC encoded in the ValidAtOrFrom field of the IPE.

If the customer validates at station F, the POST device will validate the product using the NLC encoded in the ValidTo field of the IPE.

Even though both Station G and Station F are part of zone 4 of the zonal ticketing scheme, they are also able to support point to point ticketing using their own unique station NLC identifiers.

Appendix C - Implementation of ITSO PlusBus ticketing on rail

C.1 Introduction

C.1.1 Purpose

This appendix provides functional details of the ITSO products that all TOCs wishing to retail PlusBus should use. The Appendix sets out a methodology for the sale of an ITSO PlusBus product in conjunction with an ITSO product for the associated rail journey(s); their collection and the method for acceptance on bus of the Rail PlusBus products by ITSO Smart enabled ETMs.

C.1.2 Scope

The product entities and functions listed in this Product Catalogue are the current suite of functions that are to be implemented for the PlusBus ITSO ticketing. This does not preclude the expansion of PlusBus concepts in the future but sets out the baseline from which any future developments could be made.

C.2 ITSO PlusBus Product Rules

C.2.1 Description

This section details the rules that apply to all ITSO versions of the PlusBus products.

These rules apply directly to the products or relate to the options for product availability or manipulation, in either case they apply to all interoperable PlusBus ITSO tickets to be retailed by participating TOCs and accepted by participating Bus Operators. The underlying assumption is that current PlusBus operating rules and concepts should be followed initially to ensure that passengers migrating from current CCST fulfilled PlusBus products will have the same or a better journey experience. The ITSO version of the product has been constructed to allow for expansion of capabilities in the future.

C.2.2 Product Load (Purchase)

All products will be loaded at time of purchase / fulfilment which may be at first issue if product purchase is associated with the first time issue of a Smart media. No limit will be applied to the overall number of products loaded; this will be determined at time of load from memory space available.

For products available for advance purchase from a website or Customer Service Centre, the product will be delivered for collection by the rail defined mechanisms to the station chosen by the customer within the timescales agreed between participating operators.

C.2.3 Product Refund

Refunds will be handled by the normal UK rail processes as defined in "The Manual"

C.2.4 Product Upgrade / Modification

No modifications or upgrades of PlusBus products will be allowed once sold, except for the ITSO usage modifications to the transient log.

C.2.5 Group Travel

No group travel will be possible with PlusBus products.

C.2.6 Zones

The geographical regions that form the ITSO Smart PlusBus zones will initially be unchanged from the currently defined PlusBus zones in each PlusBus location. These Zones could be extended or modified in future as agreed from time to time within the PlusBus scheme rules.

C.3 **ITSO Smart PlusBus Product Zone Encoding**

The only location information contained within the product will be rail NLCs, which the bus ETMs will need to read and map to the locally defined PlusBus zone. It is assumed that the current ETM mechanisms will be used for zonal definitions and that the NLC value for the required PlusBus location will be encoded into the product by the rail TIS . Where local PlusBus areas are divided into Zones, each zone will be allocated an NLC to facilitate sale by Rail TIS.

An example is given below for the TYP22 proposed for the ITSO PlusBus tickets:-

IPE Field Name	Description in ITSO Spec	Rail Uses	Data Format where not specified in ITSO Spec

Use for PlusBus

ValidAtOrFrom	Location code at which the Ticket is valid as the PlusBus Origin location code.	Populated with the NLC that defines PlusBus origin for that location – eg. Basingstoke; Linclon etc.. Bit 1 of the Bit Map must be set to 1 to indicate presence of this element.	LOC DEF 203
ValidTo	Destination location code - in this case the PlusBus destination.	Populated with the NLC of the PlusBus destination for that location –eg. Basingstoke PlusBus , Lincoln PlusBus etc.. Bit 1 of the Bit Map must be set to 1 to indicate presence of this element.	LOC DEF 203

C.4 Product Summary ITSO PlusBus

C.4.1 Product Construction

The PlusBus product shall be a TYP 22 area validity ticket. It is proposed that initially the ITSO PlusBus tickets shall be encoded as a single day or season area pass without Stored Pass functionality enabled. However, it is proposed that the Stored Pass functionality should be enabled at some time in the future to allow open hanging return PlusBus tickets to be used if required.

The product will be constructed using Section 3 of this specification supplemented by the following information:-

OID – shall be the OID of the TOC owning the Plus Bus Flow or allocated the PlusBus flow by RSP.

PTYP – shall be set to 29 (note ITSO has reserved this PTYP for use on National Rail for PlusBus)

Validity :-

- For season tickets shall be set to the expiry of the associated rail season ticket
- For single tickets shall be set to one day
- Initially for return tickets with a known return date a second PlusBus ticket will be encoded with the one day validity set to the known return day.

(In the future it is proposed that return tickets could have a validity of one day for the outward trip plus a stored pass of one day (hanging start) valid for one calendar month for the return trip. This would remove the necessity for placing two PlusBus products onto the media for a return trip, however there are potential business and operational issues which would need to be solved before this type of product could be used.)

C.4.2 Product Description

Note – the table below sets out what is designed to be technically possible and allowable for the PlusBus ticketing scheme. Individual participating operators may choose to deploy only some of the facilities listed here and this is recognised as being a purely commercial decision.

	PlusBus Rail Ticket
Overview	Unlimited travel within specified PlusBus zone for the period of validity of the ticket.
ITSO MediaType	Any full ITSO CMD
Product TYP	22
Product PTYP	29
Maximum Number of IPE Instances	Limited only by the available media memory space
Restriction on number of stored passes / Trips	For first implementations Stored Passes would not be enabled but in the future a maximum of 1 stored pass.
Available concessions	All rail allowable concessions for PlusBus
Restrictions	Travel only in the specified area on the participating Operators' services.
Recurring Payment	As per associated rail products
Validity Periods	1 day (and 1 day for stored pass in the future)
Online Purchase	As per TOC rail products
Product Collection	As per TOC rail products
Call Centre Purchase	As per TOC rail products
ETM on-bus purchase	No – not an accredited rail TIS
ETM on-bus acceptance	Yes
TVM Purchase	As per TOC rail products
Refunds	As per TOC rail products
Replacements	As per Seller's terms and conditions
Expiry	Set to match associated rail product

C.4.3 Product Fulfilment

The ITSO PlusBus product can be fulfilled directly at point of sale during initial production of an ITSO Smart media or at a Ticket Vending Machine (TVM). It can also be fulfilled by

action listing to a collection location Automatic Ticket Gate, Platform Validator or TVM. In all instances this would be a Rail station or similar location.

It is not currently envisaged that any action listing of PlusBus products sold by any rail TIS would be sent to any Bus HOPS for collection of products at ETMs

Appendix D Defined Terms

The following descriptions provide examples of some important terms defined within the ITSO specification, which remains the primary source for the definition.

D.1 ISAM IDs

The ISAMID is formed by concatenating the Base OID with an ISAM Serial No. Within the Fulfilment Interface an ISAM ID should always be specified as the IIN “633597” followed by 8 Hexadecimal characters comprising the base OID and ISAM Serial No. An example TfL ISAM ID would be “633597004E04D2”. An example SEFT ISAM ID would be “633597047004D2”.

D.2 SHELL ISRN

The Shell ISRN is referenced in:

- ‘Fulfilment Target Reference’ of the ‘Fulfilment Target Details’ structure (6.3.12.19)
- ‘Fulfilment Shell ID’ of the ‘Fulfilment Successful’ response structure (6.3.12.44)

The Shell ISRN (ITSO Shell Reference Number) is stored in the ITSO Shell Environment data Group (ITSO Part 2 Clause 4.1) and is made up of the following:

- IIN – currently 633597 stored as BCD in 24 bits.
- OID – Shell owner Operator ID stored as 4 numeric digits as BCD in 16 bits.
- ISSN – ITSO Shell Serial Number stored as 7 numeric digits as BCD in 28 bits.
- CHD – Check Digit stored as 1 numeric digit in 4 bits.

The Shell OID is stored in 2 bytes in BCD, effectively limiting the Shell OID to 9999. However this is further limited by ITSO to a value between 0001 and 8000.

The format for use within the Fulfilment Request is the concatenation of all the Shell ISRN elements using numeric characters, for example “633597024700123459” shows a C2C live Shell ISRN.

D.3 SET Addresses

SET addresses are specified in the “[FulfilmentLocation]Location Address” and will comprise:

IIN	6 x Decimal characters
OID16	4 x Hexadecimal characters in OID16 format
SETID	4 x Hexadecimal characters in the range 0x0000 to 0x3FFF

The address used within a Fulfilment Request should be the same as that published by the Service Operator.

Within National Rail, the SET ID is typically the NLC converted into Hex so NLC 5246 becomes 0x1532. This applies to individual station NLCs as well as Station Groups. So for London Terminal (1072) the SETID would be 0x0430. Additional SETIDs above 9999 may also be used to represent multiple NLCs which do not have a group NLC.

Where multiple OIDs are used in devices within a location then more than a separate POST SET address for each OID should be located in each Fulfilment Request.

Multiple SETs are detailed in the fulfilment interface using multiple locationaddress elements.

An example single POST SET to TfL devices only at station 5399 (Balham) would be "63359760091517".

An example of multiple POST SETs to TfL & Southern devices at station 5399 (Balham) would be "63359760091517" and "633597008F1517".

It will be the responsibility of the HOPS creating the Fulfilment Action to derive the Private SET IDs from the Published SET IDs. The assignment of Private SET IDs may vary between operators and will be in the range 0x4000 to 0x7FFF.

D.4 IPE InstanceID

An IPE InstanceID is used to uniquely identify a unique instance of a product and is stored at the end of the product data group. The actual Instance ID comprises:

KID	- Key Identifier (not used in fulfilment interface)
INP#	- Iteration number for the IPEData Group
ISAMID	- Unique ID of the ISAM that created the seal for the IPE Data Group
ISAMS#	- Sequence Number incremented by one for each InstanceID created

The Fulfilment Action current uses the above fields when identifying products to be deleted or confirming a product's presence or non presence. It is also used to identify a product to be amended.

KID is a hex value (0 to F) and may not be known by the HOPS creating the Fulfilment actions, depending on the POST being used for the Fulfilment Delivery. If the KID is not known by the HOPS creating the action, then the KID should be set to 0xF. The KID is actually redundant so is not required in the Fulfilment Interface

INP# is a numeric value (0 to 9) and is an iteration number which is incremented each time a product is unhotlisted. This prevents the product being blocked again when presented to another POST which still has the product on its hotlist.

ISAMID contains the identifier of the ISAM used to create the product. This may be a HOPS ISAM, a TVM POST ISAM, a Gate ISAM or a Remote POST ISAM depending on the method of delivery. Its format is as defined above.

The ISAMS# is a numeric value between 0 and 16777215.

Currently the RSP Fulfilment Interface does not provide for the explicit deletion of products or the checking of the product presence. However, as Fulfilment Actions cannot amend IPEs, then the InstanceID would be used to delete the prevailing product and create a new product with the amendments.

The format for the IPE Instance ID when being passed is:

ISAMID-ISAMS#-INP#
For example : "633597004E04D2-00001234-1"

End.