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Train Service and Path Identifiers

This document sets out requirements and guidance on how to uniquely identify train services and paths in telematic messages used on the Great Britain (GB) mainline railway. It provides guidance on train service and path identifiers used in GB and how train services and paths could be identified in the future, using the telematics framework.

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Synopsis

This document sets out requirements and guidance on how to uniquely identify train services and paths in telematic messages used on the Great Britain (GB) mainline railway. It provides guidance on train service and path identifiers used in GB and how train services and paths could be identified in the future, using the telematics framework.

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Superseded documents

This standard does not supersede any other Railway Group documents.

Supply

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Part 1 Purpose and introduction

1.1 Purpose

1.1.1 This document guides towards a harmonised methodology to uniquely identify and link train services and paths, using the framework set out in the telematic applications for freight and passenger services (TAF and TAP) National Technical Specification Notices (NTSNs). There is no proposal to change any current identifiers. This document provides:

a) Guidance on train planning processes, and train service and path identifiers used on the GB mainline railway (Part *2* and *3*);
b) Requirements and guidance on how train services and paths are identified and linked in telematics messages, including responsibilities for infrastructure managers and railway undertakings (Part *4* and *5*);
c) Challenges with existing train service and path identifiers (Appendix *A*); and
d) Opportunities to overcome train service and path identification challenges in the future (Appendix *B*).

1.1.2 Information Technology (IT) systems and staff have multiple ways of identifying a train service or path. Some systems create their own bespoke identifiers for their specific use case, with varying degrees of uniqueness. This has led to an increasing number of different identifiers being used in the rail industry to refer to the same timetabled service.

1.1.3 The most commonly used identifier is a four-character alphanumeric which has existed since the 1960s. However, this identifier is not unique to a specific train service each day and may repeat as many as 27 times across the GB mainline railway in a single day. The number of services run per day on the GB mainline railway is greater than the number of unique combinations possible within this convention.

1.1.4 Issues arise during communications, through either transfer or receipt of data as it may not be immediately apparent which train service or path is being referred to. Additional work, manual intervention or the use of other information may be required to establish the correct service, if it can be established at all. In some instances, systems track over a dozen different kinds of identifiers for a single train service.

1.1.5 This document has been created to negate the need for systems to create their own identifiers, harmonise data across operational systems and simplify system to system communications and data transfer.

1.1.6 The requirements in this document are targeted at IT systems and their interfaces, recognising that the industry change required to move away from a 4-character alphanumeric is substantial, particularly for operational and signalling staff.

1.1.7 Requirements and guidance in this document support transport operators in compliance with technical compatibility requirements set out in the Railway Interoperability Regulations (RIR) 2011. Schedule 2.7 of RIR places a duty on transport operators to take steps to ensure that 'data communication protocols are developed in a manner allowing maximum data interchange between different applications and operators'.

1.1.8 The data interchange framework, as set out in the TAF and TAP NTSNs (telematics framework), and the associated requirements for train service and path identification are designed to be:

a) System, application and supplier agnostic, usable across multiple organisations; and
b) Extensible, such that changes can be easily accommodated in future.

1.1.9 This document therefore derives requirements and guidance from this framework and offers direction on how technical compatibility on the GB mainline railway can be augmented in future.

1.1.10 This document can be adopted by railway undertakings (RUs), infrastructure managers (IMs) and other organisations under their respective safety or quality management systems, or when specifying products and services.

1.2 Application of this document

1.2.1 Compliance requirements and dates have not been specified because these are the subject of internal procedures or contract conditions.

1.2.2 If you plan to do something that does not comply with a requirement in this document, you can ask a standards committee to comment on your proposed alternative. To get their opinion, submit an application to RSSB. You can find advice and guidance on using alternative requirements on RSSB's website.

1.3 User's responsibilities

1.3.1 Industry experts representing railway industry stakeholders are involved in the process for setting the content of documents that are prepared in accordance with the procedures set out in the Railway Standards Code and Manual.

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1.4 Structure of this document

1.4.1 This document sets out a series of requirements that are sequentially numbered. This document also sets out the rationale for the requirement, explaining why the requirement is needed and its purpose and, where relevant, guidance to support the requirement. The rationale and the guidance are prefixed by the letter 'G'.

1.4.2 Some subjects do not have specific requirements but the subject is addressed through guidance only and, where this is the case, it is distinguished under a heading of 'Guidance' and is prefixed by the letter 'G'.

1.5 Approval and authorisation of this document

1.5.1 The content of this document will be approved by Data, Systems and Telematics Standards Committee on 17 June 2025 [proposed].

1.5.2 This document will be authorised by RSSB on 25 July 2025 [proposed].

Part 2 Introductory Guidance

2.1 Definitions for a train service and a path

Guidance

G 2.1.1 In the telematics framework, a distinction is made between the activities undertaken by the RU and those by the IM. This is to support the operation of an RU over multiple IMs, and multiple RUs on one or more IMs.

G 2.1.2 An RU finds demand for and plans train services. This includes developing the schedule for each train service, operating the planned train services and providing a service to passengers or freight customers. An RU may plan this service to cross one or multiple IM networks and may coordinate with other RUs to operate the service from the origin to the destination. In this document, the term train service refers to the perspective of the RU.

G 2.1.3 An IM allocates capacity on its network for train services to operate. This can involve the coordination of multiple RUs asking for the same capacity at the same time as well as managing interfaces with other IMs. In essence, the IM plans and allocates time slots for train services to run. In the telematics framework, this is referred to as a path. In this document, a path refers to the perspective of the IM.

2.2 Templates and specific instances of train services and paths

Guidance

G 2.2.1 Identifiers for train services and paths may be interpreted differently depending on the context in which it is being considered, managed or used.

G 2.2.2 In this document, a train service or path running on multiple days is denoted as a schedule template or entity. This could be, for example, across the entire timetable period or over multiple months or days. This is more likely to be referred to in a planning context.

G 2.2.3 For each operational day, there may be a specific instance of this train service or path. In an operational context, a specific train service or path on a particular day is typically referred to, rather than the service that is scheduled to run over a longer period. This includes situations where the train service or path is only planned to operate on a single day. In this document, this is denoted as an instance of a train service or path.

G 2.2.4 Figure *1* illustrates the differences between these terms.

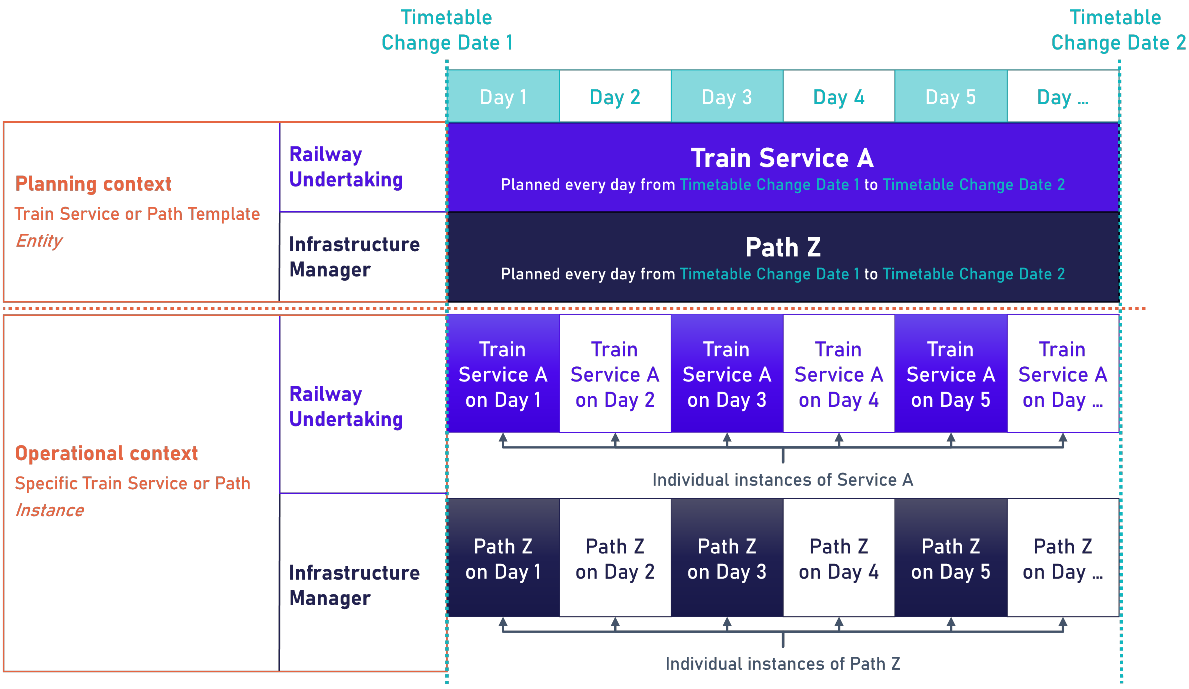

Figure 1: Comparison between a template and a specific instance of a train service or path.

G 2.2.5 The train service or path identifier, however, might be the same when referring to the template and the specific instance of the template running on a particular day. For example, stating 2A01 in a train planning context would be assumed to refer to 2A01 running over the planned timetable period, rather than on a specific day, unless a specific day is noted. In operational control, stating 2A01 would be assumed to be the opposite; the instance of 2A01 running today rather than across the timetable period unless otherwise stated. The identifier 2A01 may also not be unique within the RU and clarification may be sought.

G 2.2.6 Within the context of a single RU, a train service identifier may be unique; within processes and IT systems used, this identifier is sufficient for the RU's business needs. However, for an organisation interfacing with multiple RUs, such as an IM, this identifier may not be unique and, in the IM's context, may require another way of uniquely identifying a train service. In their responsibilities for allocating capacity on their network, the IM introduces a path identifier in addition to the RU's identifier. Therefore, an identifier used in one context may not be unique in another, which has led to the proliferation of identifiers for the same train service on the GB mainline railway.

G 2.2.7 This document aims to demystify current train service and path identifiers and present opportunities to align on a single framework to uniquely identify and link train services and paths.

2.3 Timetable planning processes

Guidance

G 2.3.1 On the GB mainline railway, there are multiple processes followed in the development of the timetable and the delivery of train services. A summary of some of these processes is provided in this section to contextualise why certain identifiers are used, when they are allocated, who allocates them, and how the uniqueness of an identifier changes depending on the situation.

G 2.3.2 Long-term planning (LTP) includes the activities required to develop the timetable up to 26 weeks before the day of operation.

G 2.3.3 Each RU develops the timetable it would like to run, deciding on for example service frequency, routing, and stopping patterns. The RU then 'bids' this timetable to the applicable IMs, requesting a 'path', or 'allocation of capacity', on the IM's network. This is referred to as the 'initial bid process' in this document. At this stage, the RU will have proposed an identifier for each train service to the IM, as detailed in Section *3.2*. However, these identifiers are subject to change. Appendix *A.7* details challenges around tracking train services during the long-term planning process.

G 2.3.4 The IM assesses the bid received from the RU against any capacity constraints and any bids for capacity made by other RUs. Where there are conflicts between two or more services requiring the same capacity at the same time, the IM will work with the relevant RUs to establish a compromise. This may involve retiming, rerouting or potentially refusing a train service bid by the RU(s).

G 2.3.5 The IM responds to the RU, known as the 'offer', detailing which train services have been accepted, altered or rejected from the initial bid from the RU. Train services that have been accepted or altered are given a path identifier by the IM, as detailed in Section *3.3*. If, in compiling the national timetable, the IM detects a clash with another operator's train service identifier in the same signalling location or area, they may alter the RU's proposed identifier.

G 2.3.6 The RU can accept the offered path or revise its bid to satisfy the IM. There may be several iterations of bids and offers depending on the scale of timetable change or alterations required. The working timetable (WTT) is finalised and published 26 weeks before the day of operation.

G 2.3.7 On the GB mainline railway, the longer-term timetable is updated twice a year. The 'principal' timetable period runs from December to May, with a 'subsidiary' timetable running from May to December. The LTP timetable can be changed at other times of the year, for example after major engineering or enhancement works, but this is uncommon.

G 2.3.8 Up to this point, train services and paths are generally referred to at a template or entity level – something that might operate at any point during the timetabled period. LTP construction can be considered as the development of the template train service or path from which specific instances are formed. Processes after this point are more likely to be referring to an instance of a train service or path; a version of the template operating on particular days in the plan.

G 2.3.9 Short-term planning (STP) encompasses changes to the long-term plan after it has been published, 26 weeks before, and up to the day before, the day of operation.

G 2.3.10 STP changes may be instigated by the RU or IM, for example, to add an additional train service or amend an existing train service. These are referred to as 'timetable variation' in the Network Code.

G 2.3.11 Methods similar to the LTP bid and offer processes are employed:

a) For RU-instigated variations, the RU bids the change to the IM which may be accepted, altered or rejected; and
b) For IM-instigated variations, the IM will inform the RU of the capacity change or restriction and may require the RU to rebid one or more train services. The resultant bid received from the RU may then be accepted, altered or rejected. Changes instigated by the IM less than 12 weeks before the day of operation are subject to different timescales and may have greater impact on customers as tickets typically go on sale around this time.

G 2.3.12 Once a variation is agreed by the RU and IM, the STP for each affected service is:

a) Made available to affected parties as soon as reasonably practicable; and
b) The LTP timetable is annotated to note where one or more instances of the template LTP train service is varied on a specific day. This is known as a service overlay.

G 2.3.13 The day of operation has an instance of the template train service being run. On the day of operation, train service identifiers can be extended to incorporate a date component to distinguish a service from, for example, the same service that ran the day before. Additional identifiers may also be introduced. Their degree of uniqueness and challenges with existing train service identifiers are detailed in Section *3.4* and Appendix *A* respectively.

G 2.3.14 Changes to the timetable on the day of operation, or the subsequent day of operation, are considered under very-short-term planning (VSTP) processes. As for STP, a similar bid and offer process to the LTP processes described above are used. To ensure uniqueness or to more clearly highlight changes to the LTP, new or altered train service identifiers may be used for the changed train service.

G 2.3.15 The timescales detailed in this section reflect the planning of services on the GB mainline railway. Timescales may be different for the planning of international services or with different IMs. Further information on the GB mainline railway timetable planning processes is detailed in Part D of the Network Code.

Part 3 Guidance on existing train service and path identifiers

3.1 Introduction

Guidance

G 3.1.1 The following sections detail identifiers (IDs) that are relevant to this standard and telematics framework. Examples of other IDs used on the GB mainline railway are included in Appendix *C*.

G 3.1.2 Section *3.2* gives guidance on IDs owned by the RU and Section *3.3* gives guidance on IDs owned by the IM.

3.2 Railway undertaking train service identifiers

Guidance on the four-character Train ID (TID)

G 3.2.1 Train services are most commonly identified by their four-character Train ID (TID), colloquially known as their headcode. This system of identification has been in use since the 1960s and is used to describe the characteristics of the train service, as well as give an indication of its destination, to signallers and operational staff.

G 3.2.2 It is comprised of four characters in the format of number-alpha-number-number (NANN).

G 3.2.3 The first character denotes the train service's classification, numbered 0 to 9. Table *6* sets out these classifications, applicable to the GB mainline railway. The responsibilities on RUs to assign a train service classification are set out in Section *5.2*.

G 3.2.4 Classifications can differ outside the GB mainline railway, for example, on High Speed 1. For freight services, the first character provides an indication to operational staff on how the train will perform and the maximum permitted speed based on the train's formation. This may alter signalling and train service regulation decisions.

G 3.2.5 The second character uses an alpha character to provide an indication of:

a) The route or destination of the train service; or
b) If the train service needs to be treated differently to others, by using specific, special characters, set out in *G 3.2.7*.

G 3.2.6 Current practice is to use the second character to identify a railway undertaking's service group or flow. Details of train service groups and their respective alpha character can be set out in the applicable region's Train Planning Rules (TPRs), although this is not the case for all train services.

G 3.2.7 Certain characters have a specific meaning:

a) Q, for track monitoring or measurement trains;
b) X, for out-of-gauge trains, train services with an exceptional load or where a train has not yet been route-proven; and
c) Z, a special, charter or short-term service.

G 3.2.8 The third and fourth characters are typically incrementing numbers, counting upwards from the first train service of the day, to help identify a specific train service with the train service group. Usually, one direction is given even numbers and the reverse direction given odd numbers. For example:

a) 2W00 is the first train service of the day between Ipswich and Cambridge;
b) 2W02 is the second train service of the day between Ipswich and Cambridge; and
c) 2W01 is the first train service of the day between Cambridge and Ipswich.

G 3.2.9 For some service groups, larger numbers may be used out of sequence to help indicate that the service is different from others in the service group or is a peak time extra. This may act as a reminder to a driver or signaller to check the routing or destination of the service. For instance, 1H05 (Littlehampton to London Victoria) is followed by 1H92 (Littlehampton to London Bridge), and then 1H07 (Littlehampton to London Victoria). Using the larger number '92' in this case makes it clearer to operational staff that this service is different; namely running to London Bridge rather than London Victoria.

G 3.2.10 There are multiple instances on the GB mainline railway where there are more than 99 train services within the train operator's service group and therefore a larger number does not always indicate that the service is different, as described above. For these service groups, train services are numbered sequentially from 00 to 99. When reaching 99, the sequence starts again from 00, repeating previous numbers, thereby meaning that there are multiple services on the same route and same RU with the same TID, across one day.

G 3.2.11 Train Planning Rules may also specify that certain services use a defined range of numbers for the final two characters. For example, train services between point A and B use 00 to 19, point C and D 20 to 39, E to F 40 and 59 and so on.

G 3.2.12 The TID is not necessarily unique across the GB mainline railway, within a geographic region or within an RU. The resultant challenges from this are detailed in Appendix *A.2* and *A.8*.

G 3.2.13 For On-Track Machines, the four-character TID stays with the machine and is generally not changed. In this case, the four-character TID has a one-to-one relationship with the ID of the machine. For example, 6U26 is associated with DR80206, a stoneblower machine. If this machine makes multiple planned movements per day, each of those journeys typically has the same four-character TID. On-Track Machines can use Train Service Classifications 3, 4, 6, 7 or 8, depending on the capabilities of the machine.

G 3.2.14 The IM may alter TIDs from different operators if they clash with another RU's TID in the same signalling location or area. Appendix *A.7* details challenges tracking of identifiers during Long-Term Planning (LTP) processes.

G 3.2.15 Where all numeric train service identifiers are used, for example on London Underground or the Channel Tunnel and international services on High Speed One, second character of the TID generally has a character that looks similar in numeric and alpha equivalents. For example, 9012 in an all-numeric format is shown as 9O12 in the alphanumeric TID format.

Guidance on the six-character Train ID (TID)

G 3.2.16 During timetable planning, a six-character Train ID with the format NANNAA is used. It incorporates the four-character alphanumeric TID and appends two alpha characters, AA to ZZ inclusive. The TID is proposed by the RU during the timetable bidding process.

G 3.2.17 The fifth character can represent the area of the GB mainline railway the train service is planned to terminate, and has been required by TPRs previously, although this is not the case in all regions in 2024. Table *1* sets out the list of characters and associated regions for the fifth character.

Fifth Character	Region in which the train service terminates
B	Kent and Sussex
C	Wessex
D	Wales and Western
E	Central & West Coast South and East Midlands
F	North West
G	London North East
H	Anglia
L	Scotland

Table 1: Fifth character of the 6-character Train ID.

G 3.2.18 The sixth character is chosen by the RU and helps identify different services within their operations with the same four-character TID.

G 3.2.19 The six-character TID is unique for each planned day of operation within a single RU. It refers to a service that may run across an entire timetable period or more, rather than a specific instance of that service running on a particular day. However, this TID may not be unique in the GB mainline railway and could be used by another RU. Where there are duplicate six-character TIDs, the IM may alter the sixth character to make it unique across the GB mainline railway. It is current GB practice to start from X and increment towards A until a unique combination is found.

G 3.2.20 Whilst used in timetable planning, the six-character TID is not published publicly, and it is not shown in national timetable files such as the Common Interface File (CIF), train service management systems or signalling systems. The relevance of this identifier to this document is detailed in Appendix *B.1*.

G 3.2.21 Table *2* sets out examples of the six-character TID.

TID	UID	Origin	Destination	Departure Time	Arrival Time	Days Run	Operator
2W01CA	L62358	Bournemouth	Weymouth	06:06	07:09	Mon to Fri	South Western Railway
2W01CB	L62360	Bournemouth	Weymouth	06:11	07:09	Sat	South Western Railway
2W01DA	G43982	Slough	Windsor & Eton Central	05:30	05:36	Mon to Fri	Great Western Railway
2W01FA	G31550	Manchester Victoria	Southport	06:07	07:25	Mon to Sat	Northern
2W01FN	C35757	West Kirby	West Kirby	06:21	07:27	Mon to Fri	Merseyrail
2W01FN	C36296	West Kirby	West Kirby	06:21	07:27	Sat	Merseyrail
2W01GE	G31551	Beverley	Hull	06:23	06:38	Mon to Sat	Northern
2W01GG	C78551	Wolverhampton	Birmingham New Street	05:56	06:14	Sat	West Midlands Trains
2W01GR	G47519	Alexandra Palace	Moorgate	05:34	05:56	Mon to Fri	Great Northern
2W01HJ	L71094	Bury St Edmunds	Ipswich	05:30	06:04	Mon to Fri	Greater Anglia
2W01JC	C60871	Nottingham	Worksop	05:16	06:25	Mon	East Midlands Railway
2W01JC	C60880	Nottingham	Worksop	05:16	06:25	Tues to Fri	East Midlands Railway
2W01JC	C61169	Nottingham	Worksop	05:17	06:24	Sat	East Midlands Railway
2W01LF	P82790	Glasgow Central	Wemyss Bay	05:47	06:46	Mon to Fri	Scotrail
2W01LF	P82791	Glasgow Central	Wemyss Bay	05:46	06:46	Sat	Scotrail
2W01ML	C78552	Wolverhampton	Birmingham New Street	06:00	06:20	Mon to Fri	West Midlands Trains

Table 2: Examples of six-character Train IDs for TID '2W01' taken from the June to December 2024 timetable.

3.3 Infrastructure manager path identifiers

Guidance on the Unique ID (UID)

G 3.3.1 The UID is assigned by the IM and has the format ANNNNN.

G 3.3.2 The UID is allocated during timetable development and is in response to an RU's bid for a timetabled service, once the service has been validated by national train planning functions. The UID is a path identifier unique on the planned day of operation and corresponds to a planned train service. The UID alone does not identify a train service running on a specific day unless date information is also stated. For example, P98609 (Dover Priory to London Charing Cross) is timetabled to run Monday to Friday between the June and December timetable changes – this identifier repeats each day, but it does not identify the specific instance of the service running on 14 November. When a UID is not planned to be used across an entire timetable period, it is possible that the UID is used by another, different path.

G 3.3.3 The first character of the UID previously represented the British Rail region which planned and validated the path. With the centralisation of train planning on the GB mainline railway, this convention is now used less often, and characters representing different regions can appear in different services across the country.

G 3.3.4 The remaining five characters are arbitrarily assigned as the timetable bid is processed, typically incrementing up by one as each new service is processed. For example, a Monday to Friday service with UID G00001 may have a Saturday equivalent numbered G00002, if bid and processed together in this order.

G 3.3.5 There is no method to directly convert between the UID and the TID (four- or six-character) as they are independent of each other. Lookup tables are typically used to track the relationship between the UID and TID.

G 3.3.6 From the perspective of the IM, the UID represents a unique path on the planned day of operation, related to the allocation of infrastructure capacity, as set out in the telematics NTSNs.

G 3.3.7 When a train service is altered but predominantly remains timed in its allocated path, this infrastructure capacity is still used and therefore the IM may not alter the UID, even if not all the path is used. This can include where a train service is terminated short of its planned destination. This can lead to challenges for RUs when diagramming and rostering traincrew and when allocating and managing rolling stock. Challenges with the UID are detailed in Appendices *A.3*, *A.4* and *A.5*. When a new path is requested, or a train service is radically altered, a new UID may be assigned, in accordance with the internal business rules set out by the IM.

Guidance on the TRUST ID

G 3.3.8 On the day of operation, when it is agreed that a train service will operate, it is assigned a TRUST ID. This process is known as 'train activation' and may be automatic for some train services up to two hours prior to departure, or it may be manually activated. The TRUST ID consists of 10 characters:

a) Characters one and two are numeric and are generated from the first two digits of the train service's origin location's Station Number (STANOX). The full list of timetable locations and their respective numeric STANOX can be found in published open data feeds;

b) Characters three to six repeat the train service's four-character TID, described above;

c) Character seven is an alpha representing the train service code, known as TSPEED. Permitted TSPEED values are set out in Table 3;

d) Character eight can be alpha or numeric and is derived from when the train service departs from its origin. It is also known as the 'call code'. The list of permitted values are set out in Table 4; and

e) Characters nine and ten are numeric and reflect the date in the month the train service operated.

Type of Train Service	TSPEED Value
Passenger or Parcels in Long-Term Plan (LTP)	M, N, O
Freight in LTP	C, D, E, F, G
Trips and agreed pathways	A, B, H-L, P-Z
Short-Term Plan (STP) and Very-Short-Term Plan (VSTP)	0-9

Table 3: List of ‘TSPEED’ values within a TRUST ID.

Departure time range (start)	Departure time range (end)	Call Code
00:00:00	00:59:59	0
01:00:00	01:59:59	1
02:00:00	02:59:59	2
03:00:00	03:59:59	3
04:00:00	04:59:59	4
05:00:00	05:59:59	5
06:00:00	06:59:59	6
07:00:00	07:29:59	A
07:30:00	07:59:59	B
08:00:00	08:29:59	C
08:30:00	08:59:59	D
09:00:00	09:29:30	E
09:30:00	09:59:59	F
10:00:00	10:29:59	G
10:30:00	10:59:59	H

Departure time range (start)	Departure time range (end)	Call Code
11:00:00	11:29:59	I
11:30:00	11:59:59	J
12:00:00	12:29:59	K
12:30:00	12:59:59	L
13:00:00	13:29:59	M
13:30:00	13:59:59	N
14:00:00	14:29:59	O
14:30:00	14:59:59	P
15:00:00	15:29:59	Q
15:30:00	15:59:59	R
16:00:00	16:29:59	S
16:30:00	16:59:59	T
17:00:00	17:29:59	U
17:30:00	17:59:59	V
18:00:00	18:29:59	W
18:30:00	18:59:59	X
19:00:00	19:59:59	Y
20:00:00	20:59:59	Z
21:00:00	21:59:59	7
22:00:00	22:59:59	8
23:00:00	23:59:59	9

Table 4: List of 'call codes' within a TRUST ID, representing when a train service departs from its origin.

G 3.3.9 An illustrative example of the composition of the TRUST ID is shown in Figure *2*.

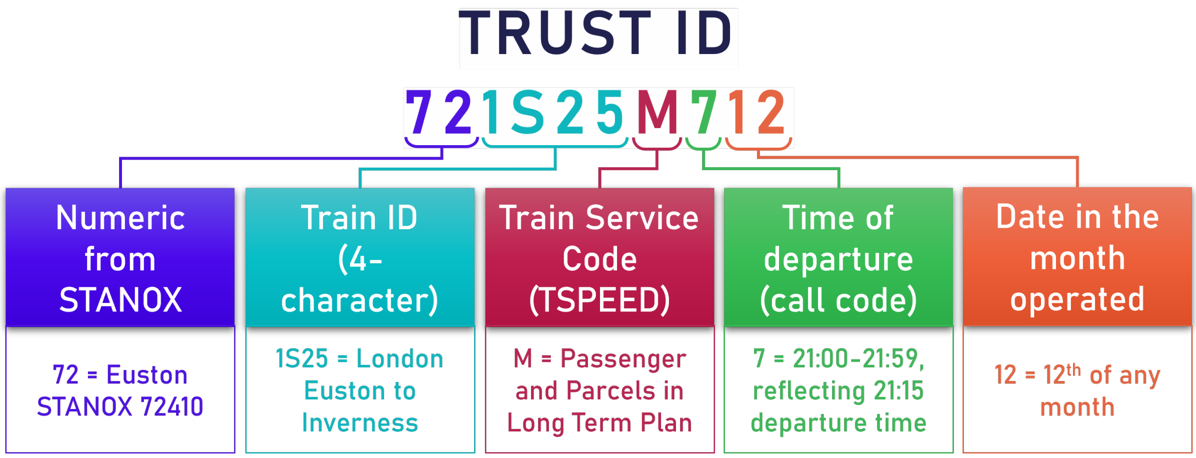

Figure 2: Composition of an example TRUST ID.

G 3.3.10 The TRUST ID is designed to be unique on the day of operation. As the TRUST ID incorporates the day of the month the train service operated, it can uniquely identify an instance of a train service within a rolling monthly window. When the same numeric date in a month reoccurs, the data is lost. For example, a TRUST ID for 21 January is replaced by information for the same train service on 21 February.

G 3.3.11 Potential challenges with the TRUST ID on the day of operation and during disruption are detailed further in Appendix *A.6*.

3.4 Comparison of identifier uniqueness

Guidance

G 3.4.1 Table *5* compares the uniqueness of the identifiers listed in Part *3*, including the contexts in which they are used, their uniqueness at a national level, and a brief commentary on their creation and challenges.

G 3.4.2 Note that none of the identifiers detailed in this section are unique nationally across a timetable period on its own. Combining an identifier with other information such as a specific date can uniquely identify a train service or path; however, there is no guarantee that any of the identifiers listed above will be the same on a preceding or subsequent day.

Identifier	Used in Planning Context?	Used in Operational Context?	Uniqueness at a national level	Comment / Description
Four-character TID	Yes	Yes	Not unique	Used in multitude of systems and operational staff and signalling systems. Can repeat multiple times within a RU, on the same line of route, in the same hour and in the same geographic area.
Six-character TID	Yes	No	Daily within an RU (not nationally)	Created by the RU in the timetable bidding process and is unique within their operation each day. Can be repeated by another RU, including an RU in the same area and at the same time.
UID	Yes	Yes	Daily	Created by the IM in the timetable bidding process and is unique within their area of operation each day. If not used on a particularly day, a UID could be reassigned to a different service.
TRUST ID	No	Yes	Monthly	Created by the IM on the day of operation. Inclusion of the date in the month in the identifier enables uniqueness each month. Other months repeat the same identifier. Can change depending on the origin of the train service or clashes with other identifiers.

Table 5: Comparison of the uniqueness of identifiers used on the GB mainline railway.

Part 4 Train service and path identifiers in telematics messages

4.1 Telematics data exchanges

Guidance

G 4.1.1 The TAF and TAP NTSNs define system and supplier agnostic data exchanges between organisations involved in the planning, preparation and live operation of paths and train services. This includes IMs, RUs, Station Managers and Wagon Keepers. Data in these exchanges can be used to enhance information provided to passengers and freight customers.

G 4.1.2 The telematics framework outlines:

a) When data needs to be exchanged;
b) What content is required in the data exchange;
c) Who the data needs to be sent to; and
d) How the data is formatted when sent.

G 4.1.3 The telematics framework is designed to accommodate strategic, long-term, short-term and very-short-term planning of train services as well as providing information about the live path occupancy and running of train services on the day of operation.

G 4.1.4 Implementation of the telematics framework on the GB mainline railway has predominantly focussed on the short-term planning of train services and live running information. This has supported the realisation of Traffic Management and Connected Driver Advisory systems (C-DAS). Data exchanges in the telematics framework could be extended to longer term planning in the future.

G 4.1.5 The data exchanges in the telematics framework, known as 'messages', use Extensible Markup Language (XML), a software and hardware agnostic language and file format designed for the storage and transport of data. XML has the advantage of being able to add new capabilities or functionalities into code without disrupting legacy systems or interfaces. The elements, attributes, structure and data types that appear in an XML file are defined in an XML Scheme Definition (XSD). An XSD contains the rules the XML file should comply with and can be used for the validation of files. A suite of harmonised messages is published as XSD files.

G 4.1.6 The telematics framework was created to support interoperability for cross-border and international freight and passenger services, particularly where multiple IMs and / or RUs are involved in the running of a train service. By harmonising business process and data exchanges, there are fewer barriers to international movement of freight and passengers. The framework can also be used in other settings, such as for domestic services, presenting opportunities to:

a) Align processes and data exchanges irrespective of the train service origin, destination, IM or RU. This has benefits for the IT system supply chain;
b) Increase data portability and system modularity; and
c) Adopt more modern and extensible file formats.

G 4.1.7 For international train services, there are obligations under the Uniform Technical Prescription (UTP) for telematic applications for passenger and freight services, published by the Intergovernmental Organisation for International Carriage by Rail

(OTIF). Whilst the implementation of the UTP is voluntary, in that there is no deadline for implementation, the application of the UTP is mandatory if 'new processes or technology is developed, or if equipment for telematics applications are purchased that fall within the scope'.

G 4.1.8 The data exchanges between RUs and IMs in the telematics framework are split into two types: planning and operational. Planning messages centre on the development of timetabled train services and the allocation of paths. They can be used for longer and shorter term train planning, typically up until the train service departs from its origin. Operational messages focus on the preparation and operation of the train service, including train composition and live running information.

G 4.1.9 Regulated planning messages include:

a) Path Request;
b) Path Details;
c) Path Confirmed;
d) Path Details Refused;
e) Path Cancelled;
f) Path Not Available; and
g) Receipt Confirmation.

G 4.1.10 Regulated operational messages include:

a) Train Ready;
b) Train Running Information;
c) Train Running Forecast;
d) Train Running Interruption;
e) Train Journey Modification;
f) Change of Track;
g) Train Delay Cause;
h) Train Composition; and
i) Passenger Train Composition.

G 4.1.11 *G 4.1.9* and *G 4.1.10* are not comprehensive. A list of harmonised TAF messages and their associated XSD for each TAF baseline can be found in the technical documents referenced by the TAF and TAP NTSNs. Note that new messages may be added in future versions or baselines. On the GB mainline railway specific messages and elements are currently managed by Network Rail.

G 4.1.12 Messages exchanged during both planning and operational phases need to clearly identify train services and paths, and whether a train service running over multiple days or an instance of a train service running on a particular day is being referred to.

4.2 Message structure for train service and path identifiers

4.2.1 Planning telematics messages shall include the PlannedCalendar element.

4.2.2 Operational telematics messages shall include the StartDate element.

Rationale

G 4.2.3 The data listed in this requirement is consistent with the structure set out in the TAF technical documents and data schemas.

Guidance on data structure

G 4.2.4 Data in telematics messages is structured in XML as shown below. Each line is termed an element; a term used throughout this section. The code extract has no data populated.

```
<Identifiers>
    <PlannedTransportIdentifiers>
        <ObjectType></ObjectType>
        <Company></Company>
        <Core></Core>
        <Variant></Variant>
        <TimetableYear></TimetableYear>
        <StartDate></StartDate><!--Not mandatory in all messages-->
    </PlannedTransportIdentifiers>
</Identifiers>
```

G 4.2.5 Structuring the XML elements in a telematics message in this order complies with the XML Scheme Definition (XSD). Not using this order of elements may result in unexpected behaviours or failure of the message to be published or understood by other organisations, even with different baselines.

G 4.2.6 A suite of XSDs containing each telematics message, and any new updates to the XSD, is published as a different baseline every six months. Baselines are intended to be backwards compatible, but new functionalities introduced in new baselines are not forward compatible.

G 4.2.7 The baseline of a telematics message is stated in the message header. By stating the schema baseline used, other organisations know what to expect, identify any gaps with any baseline they utilise and if there are any risks of information not being consumed or published.

G 4.2.8 As different organisations may use a different identifier for the same train service, multiple PlannedTransportIdentifiers may be included in the same message. This eases referencing in internal IT systems, such that translations from one identification system to another is not required. This also allows IM or RU identifiers to be changed independently if required – a change in one does not affect another. There is no limit on the number of PlannedTransportIdentifiers included in a message.

G 4.2.9 The following sections provide guidance on each of the elements in the data structure shown above as well as the PlannedCalendar element.

Guidance on the ObjectType element

G 4.2.10 The ObjectType element consists of two alpha characters. The following ObjectTypes are currently permitted in the TAF XSD:

a) TR - Train ID;
b) PA - Path ID, owned by the IM;

c) PR - Path Request;
d) CR - Case Reference;
e) CM - Capacity Model;
f) CN - Capacity Needs Announcements;
g) CP - Catalogue Path; or
h) RO - Route.

G 4.2.11 Only TR and PA are used on the GB mainline railway. Other values are shown for completeness, with further details available in Appendix *B.4* and the telematics technical documents and application guide.

G 4.2.12 ObjectTypes TR and PA can be used in both planning and operational messages, as defined in Section *4.1*.

G 4.2.13 To support the legal requirements for the separation of IMs and RUs in the Railways (Access, Management and Licensing of Railway Undertakings) Regulations 2019, different ObjectTypes may be assigned as multiple organisations are involved in delivering the train service and path.

G 4.2.14 The IM allocates and provides capacity on its network for the train service to operate; this is known as allocating a path in the telematics framework. Hence the inclusion of a PathID ObjectType.

G 4.2.15 The RU can plan a service from an origin point to a destination which may need to operate over multiple IM networks. From the RU's perspective, this train service has a single ID, contained in the TrainID ObjectType. However, multiple PathID ObjectTypes, to accommodate the IDs used by each IM, would be required for this train service.

G 4.2.16 Equally, multiple RUs may be involved in delivering the train service. In this case, multiple TrainID ObjectTypes may also be included, with one RU designated as the Lead RU. A train service being run by multiple RUs under the same train service identifier is very uncommon on the GB mainline railway. Whilst the telematics framework facilitates the inclusion of multiple RUs, it may not be extensively used.

G 4.2.17 The information included with each respective ObjectType is stated in *G 4.2.26*.

Guidance on the Company element

G 4.2.18 The Company element consists of four numeric characters. The RU/IM Telematics Sector Handbook states that from 1 January 2026, alphanumeric characters will be permitted.

G 4.2.19 To support the implementation of telematic messages across Europe, each organisation involved in transportation by rail is expected to have an identifier that is unique worldwide. For train service identifiers, this enables the clear identification of which organisation created and owns the stated identifier.

G 4.2.20 The assignment and management of Company identifiers is undertaken by the International Union of Railways (UIC). The ownership of the database is currently being debated and is likely to change in future.

G 4.2.21 Organisations operating on the GB mainline railway that interface with adjacent networks may already have a Company identifier assigned by the UIC. A list of these organisations is available on the UIC website. Most GB passenger RUs and some freight RUs do not have a UIC identifier assigned.

G 4.2.22 For organisations that do not have a UIC identifier assigned, GB practice is to use 'Train Operator Sector Codes' assigned as part of agreements between the IM and RU. These two-character numeric codes are prefixed with '99' to make the identifier four characters. For example, the Sector Code for Transport for Wales is '71', which in telematic messages, is converted to '9971'. Continued use of these GB-specific identifiers is not guaranteed.

G 4.2.23 A list of Company identifiers, correct as of May 2023, is shown in Appendix *D.1*. An up-to-date list of Sector Codes for the GB mainline railway can be obtained through open data sources such as the Rail Data Marketplace, in the published Codes for Operations, Retail & Planning – a Unified Solution (CORPUS) data.

Guidance on the Core element

G 4.2.24 The Core element contains the identifier for the stated ObjectType.

G 4.2.25 Up to 12 alphanumeric characters may be stated in this element and organisations have the freedom to use whatever identifier they decide upon. Identifiers that use fewer than 12 characters need to be padded such that the element is 12 characters in length. The characters permitted for padding are detailed in the TAF XSDs.

G 4.2.26 On the GB mainline railway, telematics messages referencing a train service contain a PathID ObjectType, owned by the IM. The IM's company code is stated and the Core element contains the UID (see Section *3.3*). To support legacy systems, in operational telematics messages, the IM also publishes a TrainID ObjectType with the IM's company code and the Core element stating the TRUST ID (see Section *3.3*). No TrainID ObjectTypes with RU company codes are published.

G 4.2.27 Appendix *B.2* details opportunities to start including RU-owned train service identifiers to address challenges with existing train service identifiers, detailed in Appendix *A*.

G 4.2.28 The code below provides an illustrative example of what is provided in GB mainline railway telematics messages.

```
<Identifiers>
    <PlannedTransportIdentifiers>
        <ObjectType>PA</ObjectType>
        <Company>0070</Company>
        <Core>--1B32G36797</Core>
        <Variant>01</Variant>
        <TimetableYear>2023</TimetableYear>
        <StartDate>2023-04-25</StartDate>
    </PlannedTransportIdentifiers>
    <PlannedTransportIdentifiers>
        <ObjectType>TR</ObjectType>
        <Company>0070</Company>
        <Core>--731B32MY25</Core>
        <Variant>01</Variant>
        <TimetableYear>2023</TimetableYear>
        <StartDate>2023-04-25</StartDate>
    </PlannedTransportIdentifiers>
</Identifiers>
```

Guidance on the Variant element

G 4.2.29 On the GB mainline railway, the Variant element is declared as the numeric '01'. Business processes do not currently support the full capabilities of the Variant element. An explanation of the Variant element is provided below for context only.

G 4.2.30 The Variant element is used to denote different versions of the train service or path.

G 4.2.31 In the telematics framework, the Core element remains the same and the Variant element is used to indicate that the service is a variation to this originally planned train service or path. Therefore, when train services or paths are altered, a new Core identifier is not required, and a clear link is kept to the original service or path planned. The persistent Core element can be analogised to a 'family name' with the Variant used to identify different individuals within that family, as shown in Figure *3* (part A). Without the Variant, a new Core identifier would be needed for each train service or path alteration, with no clear link to the original train service or path identifier and its associated information. This is a suboptimal outcome.

G 4.2.32 The Variant element consists of two alphanumeric characters with all combinations from 00 to ZZ permissible.

G 4.2.33 The originally planned train service, analogised as 'family name' above, is signified by declaring the numeric '00'. This may only be used for the TrainID (TR) ObjectType. A TR ObjectType with Variant 00 is referred to as the Reference Train ID. This could be, for example, the train service in the LTP, with alterations to this service documented as different Variants of this Reference Train ID. This is shown in Figure *3* parts B, C and D.

G 4.2.34 Appendix *B.3* describes potential opportunity to utilise the Variant element in future to resolve challenges with existing train service and path identifiers, such as:

a) The reuse of identifiers despite the train service, path and service associations being different, as detailed in Appendix *A.3*;
b) Duplicate train services being run on different days being given different identifiers, as detailed in Appendix *A.4*; and
c) Changes to identifiers during disruption, detailed in Appendix *A.6*.

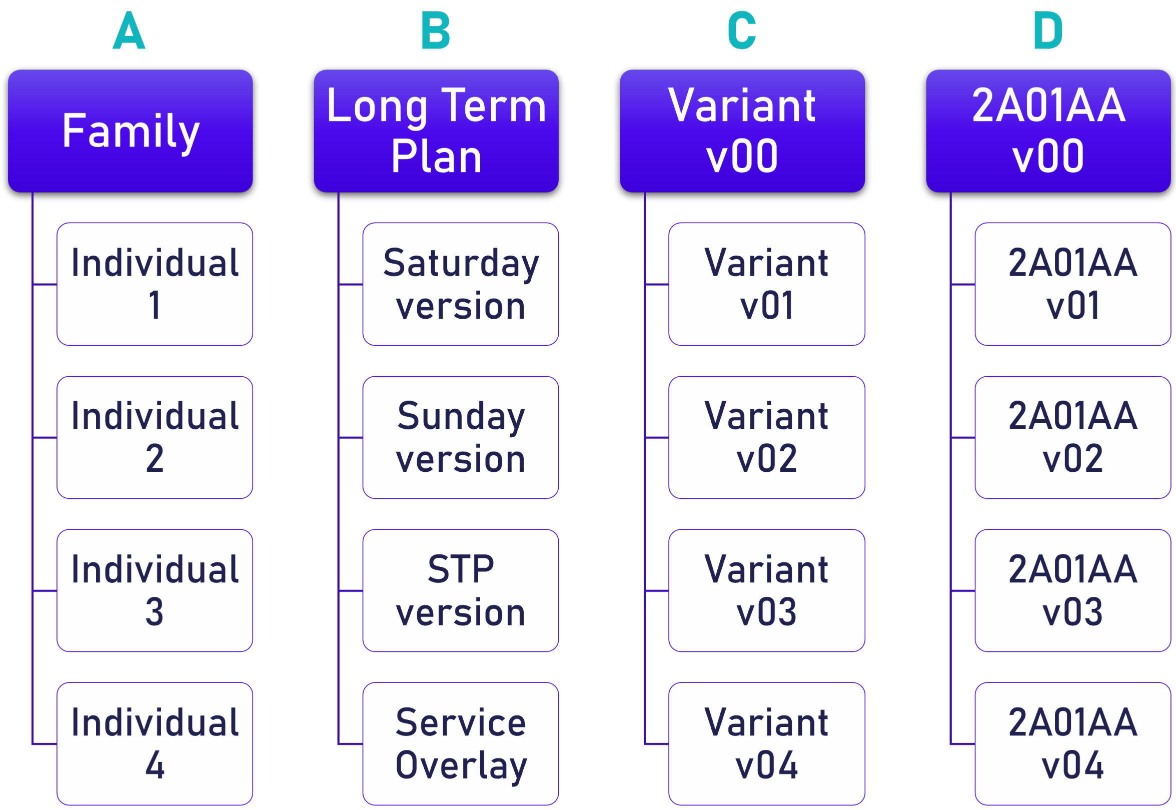

Figure 3: Illustrative examples of the use of the Variant element.

Guidance on the TimetableYear element

G 4.2.35 The TimetableYear element states the four-character numeric year in the Gregorian calendar; YYYY. Expressing year values as four digits avoids ambiguity over which century is being referred to, known colloquially as the Y2K problem or millennium bug.

G 4.2.36 This element refers to the year in which the timetabled service is due to run. In order to allow the core element to be reused for different timetable periods, the year is included to indicate which year it applies to.

Guidance on the StartDate element

G 4.2.37 The StartDate element contains the date of planned departure from the origin location of the relevant object.

G 4.2.38 The inclusion of this element makes it clear that a specific instance of a train service is being referenced rather than a schedule template that may run on multiple days. The StartDate element is optional for planning messages and mandatory for any message used in an operational context, and for both ObjectTypes TR and PA.

G 4.2.39 The StartDate element states the date formatted as YYYY-MM-DD, with Y representing the year, M the month, and D the day in the month. This format aligns with existing international practices such as those set out in International Organization for Standardization (ISO) standards and Internet Engineering Task Force Request for Comments (RFCs). Expressing the date with a hyphen is termed the 'extended format' in BS ISO 8601-1:2019. Further information on the formatting and presentation of date and time values is set out in RIS-6702-DST.

G 4.2.40 For train services running over midnight, there are additional considerations:

a) Where there are multiple IMs or RUs involved in the running of the service, there will be multiple TR and PA ObjectTypes in the same message. For example, if a train service with one RU travels over midnight and changes to another IM network after midnight, the StartDate stated by the second IM will be the day after the StartDate stated by the RU and first IM. This is because the second IM's Path element begins on the second date – the StartDate reflects the date the element is planned to start; and
b) Where a train service starts short of its planned origin point and the new (operational) origin of the train service is now after midnight, and therefore starting on a different date to that planned. On the GB mainline railway, the planned date of departure from the planned origin point is used, irrespective of whether the actual departure is the next day.

G 4.2.41 Note that the StartDate element is used differently when declaring the associated Variant as 00, instead becoming the 'Reference Day'. As Variant 00 is not used in GB, this clause has been added for completeness only.

Guidance on the PlannedCalendar element

G 4.2.42 A train service or path may be planned to operate on just a single day or over a number of days. The PlannedCalendar element details this information through a series of sub-elements such as the ValidityPeriod and BitmapDays. These elements indicate which days the object is valid and provide message recipients with information about the operational status of the object at different stages of the planning process.

G 4.2.43 The ValidityPeriod element is defined by a StartDateTime and EndDateTime. These elements are stated in Coordinated Universal Time (UTC) and in the extended format, as defined by BS ISO 8601-1:2019. This is also aligned with the requirements and guidance set out in RIS-6702-DST.

G 4.2.44 The BitmapDays element contains binary characters, with the length of the value in the element defined by the number of days of operation stated in the ValidityPeriod. The first value in the bitmap corresponds to the start date of the ValidityPeriod, while the last value corresponds to the end date of the ValidityPeriod.

G 4.2.45 The value of 1 represents a day the object is valid, and a value of 0 is when the object would not be valid. For a train service or path operating on a single day, a single '1' character is included in the BitmapDays, as shown in the code below.

```
<PlannedCalendar>
    <BitmapDays>1</BitmapDays>
    <ValidityPeriod>
        <StartDateTime>2023-04-25T18:48:00</StartDateTime>
        <EndDateTime>2023-04-25T20:01:30</EndDateTime>
    </ValidityPeriod>
</PlannedCalendar>
```

G 4.2.46 The code below shows an example of a PlannedCalendar for a train service running on multiple days.

```
<PlannedCalendar>
    <BitmapDays>11111111111111111111111111111111111111111111
    11111111111111111111111111111111111111111111111111111111
    11111111111111111111111111111111111111111111111111111111
    11111111111111111111111111111111111111111111111111101111
    11011111101111111111111111111111111111111111111111111111
    11111111111111111111111111111111111111111111111111111111
    1101111110111111011111101111111111111111</BitmapDays>
    <ValidityPeriod>
        <StartDateTime>2015-12-13T00:00:00</StartDateTime>
        <EndDateTime>2016-12-10T00:00:00</EndDateTime>
    </ValidityPeriod>
</PlannedCalendar>
```

G 4.2.47 In telematics messages, the PlannedCalendar element appears in a different part of the message to the <Identifiers> elements shown above. The PlannedCalendar element can appear within <PathInformation>, <TrainInformation> and <AffectedSection> elements in the current XSD. These are used in Planning telematics messages. Further information can be found in the telematics technical documents.

Part 5 Responsibilities for train service and path identifiers

5.1 Infrastructure manager responsibilities for path identifiers

5.1.1 When allocating capacity on its network, the IM shall assign an identifier that is unique within its organisation to each path assigned.

5.1.2 When an IM publishes a planning or operational telematics message regarding a path, the IM shall include its:

a) Path identifier in the Core element, with the ObjectType declared as 'PA'; and
b) Assigned company code in the Company element.

Rationale

G 5.1.3 Assigning an identifier to each path assigned supports organisations in clearly and uniquely identifying what capacity has been used on an IM's network and to which organisation it has been allocated to.

G 5.1.4 The use of the Company element in telematics messages means that the identifier only needs to be unique within the respective organisation.

G 5.1.5 The data listed in this requirement is consistent with the structure set out in the TAF technical documents and data schemas.

Guidance

G 5.1.6 On the GB mainline railway, the identifier for each path assigned is the UID.

G 5.1.7 The assigned company codes for organisations, including IMs, are listed in Appendix *D.1*. Further guidance on the Company element is given in Section *4.2*.

G 5.1.8 An IM may choose to publish other ObjectTypes in telematics messages, including TrainID (TR) ObjectTypes used in an operational context. On the day of operation, it is current practice on the GB mainline railway for the IM to publish the TRUST ID, declared as TR ObjectType, and the IM's company code in the Company element.

G 5.1.9 When a train service is planned to operate over multiple IM networks, each respective IM will assign its own identifier, declared with its own company code in the Company element. In this situation, one of the IMs is nominated to be the lead IM. There are currently no GB rules on how this is established.

G 5.1.10 When a train service is planned to operate with multiple RUs, each respective RU will assign its own identifier, declared with its own company code in the Company element. One of the RUs may inform the IM that it has been nominated as the lead IM. There are currently no GB rules on how this is established. The IM may use the same path identifier for the full train service, even if operated by a different RU.

5.2 Railway undertaking responsibilities for train service identifiers

5.2.1 For each planned train service, the RU shall assign a train service classification, in accordance with table *6*.

Train Service Classification	Description
1	Express passenger train Nominated postal or parcels train Breakdown or overhead line equipment train going to clear the line, traction unit going to assist a failed train or snow plough going to clear the line (1Z99)
2	Ordinary passenger train Officers' special train (2Z01)
3	Freight train service, if specially authorised Parcels train service Autumn-railhead treatment train Empty Coaching Stock (ECS) if specially authorised
4	Freight train service which can run up to 75 mph (120 km/h)
5	ECS
6	Freight train service which can run up to 60 mph (95 km/h)
7	Freight train service which can run up to 45 mph (70 km/h)
8	Freight train service which can run up to 35 mph (55 km/h)
9	International train service Other passenger service, if specially authorised
0	Light locomotive or locomotives

Table 6: Train service classifications for Train IDs (TIDs).

5.2.2 When bidding for capacity on an IM's network, the RU shall allocate a train service identifier to each service that is bid.

5.2.3 When an RU publishes a planning or operational telematics message regarding a train service, the RU shall include its:

a) Train service identifier in the Core element, with the ObjectType declared as 'TR'; and
b) Assigned company ID in the Company element.

Rationale

G 5.2.4 Assigning a train service classification provides information to train planning and operational staff about the type, priority and capability of a train service. Table *6* reflects current practice on the GB mainline railway.

G 5.2.5 Assigning an identifier to each train service bid to the IM supports organisations in clearly identifying what train services are planned to operate.

G 5.2.6 Using the Company element in telematics messages means that there is no need for an identifier to be unique nationally, and no coordination is needed with other RUs.

G 5.2.7 The data listed in this requirement is consistent with the structure set out in the TAF technical documents and data schemas.

Guidance

G 5.2.8 Special authorisation to use a different train service classification may be obtained through agreement with the applicable IM train planning teams. Local variations and restrictions are detailed in the applicable region's TPRs.

G 5.2.9 The responsibilities for informing the signaller about changes to the train service classification are set out in GERT8000-TW1.

G 5.2.10 On the GB mainline railway, the identifier for each train service bid is the six-character TID.

G 5.2.11 The assigned company codes for organisations, including RUs, are listed in Appendix *D.1*. Further guidance on the Company element is in Section *4.2*.

G 5.2.12 When a train service is planned to operate over multiple IM networks, each respective IM will assign its own identifier, declared with its own company code in the Company element. One of the IMs may inform the RU that it has been nominated as the lead IM. There are currently no GB rules on how this is established. The RU may use the same identifier for the full train service, even if travelling over multiple IM networks.

G 5.2.13 When a train service is planned to operate with multiple RUs, each respective RU will assign its own identifier, declared with its own company code in the Company element. In this situation, one of the RUs is nominated to be the lead RU. There are currently no GB rules on how this is established.

5.3 Link with the Train Running Number (TRN)

Guidance

G 5.3.1 The Operation and Traffic Management (OPE) and Control Command and Signalling (CCS) NTSNs require a Train Running Number (TRN) for each train service. The OPE NTSN states that the TRN is 'given by the IM when allocating a path', and 'shall be unique per network'. The UID described in Section *3.3* meets these criteria.

G 5.3.2 The European Train Control System (ETCS), defined in the CCS NTSN, requires the entry of a TRN into the system through the Driver-Machine Interface (DMI), with a GB specific case to permit alphanumeric TRNs. This is linked to the registration of the train with the national radio system; the Global System for Mobile Communications-Railway (GSM-R). Requirements set out in RIS-0794-CCS, RIS-0799-CCS and GERT8402 use the four-character TID rather than the UID set by the IM.

G 5.3.3 On the GB mainline railway, the TRN generated to meet the requirements in the OPE NTSN and what is entered into the ETCS or GSM-R DMI may not necessarily be the same.

G 5.3.4 Whilst changes to the TRN during train operation are discouraged in NTSN guidance, current practice on the GB mainline railway does not always align to this. Appendix *A.6* details current practice and the resultant challenges with changing the four-character TID, or TRN, during disruption.

G 5.3.5 There are similar practices on European railways where the train service identifier may be changed to respect local rules. For example, a change in route, priority, direction, or inclusion or removal of hazardous goods.

G 5.3.6 These challenges were recognised during the development of the telematics framework. A specific element, known as the Operational Train Number (OTN) is included to accommodate local train numbering conventions, separate from the main identifiers described in Section *4.2*. This enables changes to the OTN or TRN during the journey, whether as a result of disruption or planned in advance. For traffic which crosses an international border, or is managed by multiple RUs, this facilitates the tracking of the respective OTNs or TRNs used by the respective countries or RUs.

G 5.3.7 The OTN is contained in the <PathInformation> element and is stated for each <PlannedJourneyLocation> on the path. On the GB mainline railway, the OTN element is populated with the four-character TID.

Appendices

Appendix A Challenges with existing identifiers

Note: The content of this appendix is provided for guidance only.

A.1 Introduction to challenges with existing train service and path identifiers

Guidance

G A.1.1 Train service and path identifiers currently used on the GB mainline railway can present a number of challenges to IT systems and operational processes. This includes identifying and tracking relationships between similar or identical train services. This appendix details six challenges:

a) Four-character TIDs can repeat multiple times nationally each day, detailed in Appendix *A.2*;
b) Identifiers can remain the same when the service is different, detailed in Appendix *A.3*;
c) Duplicate services can be given different, and arguably unnecessary, identifiers, detailed in Appendix *A.4*;
d) Planning practices can differ between the IM and RU, detailed in Appendix *A.5*;
e) Identifiers can vary in times of disruption, detailed in Appendix *A.6*; and
f) Identifiers used in the initial timetable bid can change, detailed in Appendix *A.7*.

G A.1.2 Adoption of additional parts of the telematics framework presents opportunities to resolve a number of these challenges in future. As they are not current GB practice, requirements have not been made for organisations to comply with any new processes. Instead, challenges with existing identifiers have been detailed in this appendix to build a case for change for the potential future opportunities described in Appendix *B*.

A.2 Four-character TIDs can repeat multiple times nationally each day

Guidance

G A.2.1 The four-character TID is not necessarily unique across the GB mainline railway, within a geographic region or within an RU. For example, in the June 2024 timetable, the TID '2I04' is used by 26 different train services in a single day. A TID is not always a reliable way to identify a train service. This is because the number of services per day run on the GB mainline railway far exceeds the number of unique combinations possible with the four character alpha-numeric convention. This is exacerbated by the fact that:

a) Greater than 90 % of the total planned train services each day are passenger services, including empty stock services, but only train service classifications 1, 2, 3 (when permitted), 5 and 9 can be used;
b) Greater than 45 % of the total planned train services each day have a '2' train service classification;

c) Less than 0.1 % of the total planned train services each day have an '8' train service classification; and

d) Operators running under different Infrastructure Managers have different numbering conventions. For example, the Tyne and Wear Metro identifies a train service by a diagram number which stays with the train throughout its service day. London Underground is similar, and also uses a 'trip number' within that diagram to identify the specific service.

G A.2.2 It has been widely acknowledged that using the four-character TID is a suboptimal method for identifying train services. As there are more services than can be accommodated within this convention, different and longer identifiers, at least within IT systems, will be needed in future. Any proposal for the use of other identifiers will need to acknowledge the risk of changing the first character from the four-character TID as this can be used for safety-critical purposes.

A.3 Identifiers can remain the same when the train service is different

Guidance

G A.3.1 In certain circumstances, such as Short-Term Planning (STP) and service overlays defined in *G 2.3.9*, the identifiers for both the IM path and RU train service remain the same, despite alterations to plan. Alterations to the train service, path, associations, or the need for additional services may therefore not be apparent or obvious. An example scenario where a train service has been altered due to engineering works is given in this section.

G A.3.2 In the Long-Term Plan timetable between June and December 2024, 2P01 was scheduled to run from Reading to London Paddington calling at Ealing Broadway. At London Paddington, this train was planned to Reading as 2R01 later in the morning. This is shown in Figure *4*.

G A.3.3 For one day during this timetable period, London Paddington was closed for early morning engineering works. As a result, 2P01 could not complete its journey into London Paddington. The RU varied the service for this day under STP rules; instead, 2P01 was timetabled to run from Reading to Ealing Broadway only. At Ealing Broadway, the train returned empty to Reading as a new service, 5R11, rather than forming 2R01 (London Paddington to Reading) as usual. 2R01 was instead formed from 1P09 which arrived the night before – associations between services were therefore different. This is shown in Figure *5*.

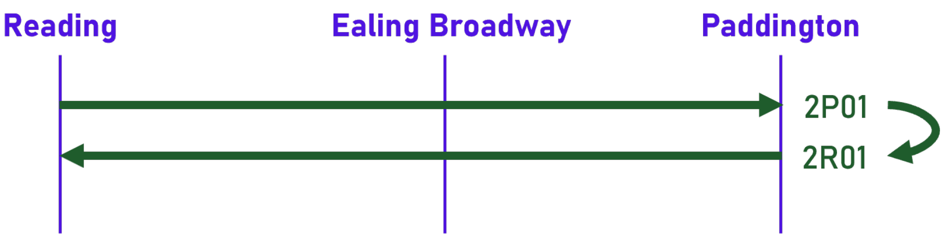

Figure 4: Long-Term Plan timetable between June and December for 2P01, including the association with 2R01.

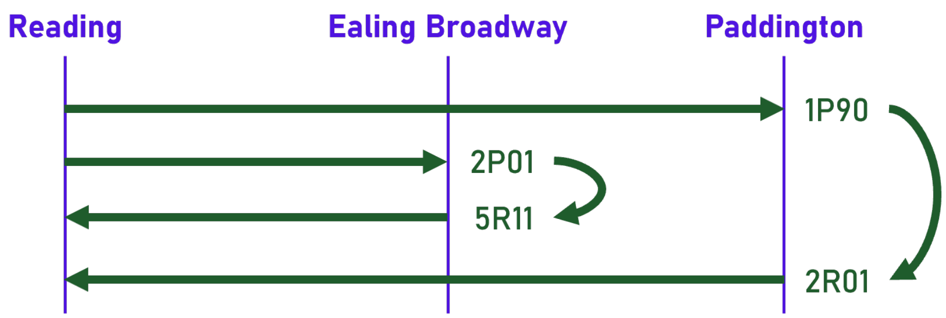

Figure 5: Short-Term Plan variation for Monday 19 August for 2P01, including the change of association for 2R01 and new service 5R11.

G A.3.4 Table 7 sets out the identifiers used for 2P01 in the Long-Term Plan and for the date of the engineering work. The table shows that there was no indication in any train identities that this train service was different from the LTP despite not completing the full route to London Paddington:

a) The path identifier from the IM (UID G43875) was the same; and
b) The Train IDs, both 4 and 6 character, were unchanged.

Data Element	Long-Term Plan	Short-Term Plan Variation
UID	G43875	G43875
Days Run	Mon to Fri	Mon only
TID (four-character)	2P01	2P01
TID (six-character)	2P01DB	2P01DB
Origin	Reading	Reading
Departure	02:24	02:24
Destination	London Paddington	Ealing Broadway
Arrival	03:11	03:01
Schedule Start Date	2024-06-03	2024-12-13
Schedule End Date	2024-08-19	2024-12-13

Table 7: Data for example service 2P01, including train service and path identifiers used by the RU and IM respectively.

G A.3.5 The variation to this train service and path may be recognised through observing the change in destination or that the service is marked as an STP variation. This can rely on the diligence of those planning and managing train services to spot this. However, when, for example, allocating rolling stock and traincrew to the service, it may not be obvious that this service and the service associations are different by looking at the identifiers. Not spotting this may lead to service disruption, cancellations or trains stranded with no onward train crew, for example.

A.4 Duplicate services can be given different, and arguably unnecessary, identifiers

Guidance

G A.4.1 On the GB mainline railway, how a train service is planned and how it is bid to the IM can change identifier, even if the train service and path remain the same. This can include which day of the week the train service is planned to run and whether the service is created through the STP or VSTP processes. Example scenarios are provided in this section for an identical train service and path running on different days.

Guidance: Different identifiers for different days of the week

G A.4.2 2D08 is timetabled to run between Orpington and London Victoria. The schedule is the same each day and there are no changes in the weekend timetable. However, due to how the services are bid to the IM, the LTP Monday to Friday, Saturday and Sunday schedules have different UIDs and six-character TIDs, although the service is the same each day, as set out in Table *8*.

Data Element	Monday to Friday Service	Saturday Service	Sunday Service
UID	P95923	P95922	P95925
TID (four-character)	2D08	2D08	2D08
TID (six-character)	2D08BJ	2D08BH	2D08BL
Origin	Orpington	Orpington	Orpington
Departure	16:20	16:20	16:20
Destination	London Victoria	London Victoria	London Victoria
Arrival	17:03	17:03	17:03
Schedule Start Date	2024-06-03	2024-06-08	2024-06-02
Schedule End Date	2024-12-13	2024-12-14	2024-12-08

Table 8: Example of 2D08 with different UID and Train IDs depending on the day of the week.

G A.4.3 In this case the IDs are not numbered sequentially, which can make the relationship between services harder to identify. As the schedules are identical in calling points and timings, they do not need to be identified differently. Consequently, this can make train service analysis and data management more challenging, for example.

Guidance: Different identifiers through different bidding processes

G A.4.4 The LTP schedule for 2D08 excluded a Bank Holiday Monday. For this day, the RU submitted an STP schedule that mirrored the daily service throughout.

G A.4.5 As the train service was bid through a different process, both the UID and six-character TID were different, despite the schedule being unchanged. This is set out in the far right hand column in Table *9*, and compared to the values in Table *8*.

Data Element	Monday to Friday Service	Saturday Service	Sunday Service	Bank Holiday STP
UID	P95923	P95922	P95925	J35106
TID (four-character)	2D08	2D08	2D08	2D08
TID (six-character)	2D08BJ	2D08BH	2D08BL	2D08UE
Origin	Orpington	Orpington	Orpington	Orpington
Departure	16:20	16:20	16:20	16:20
Destination	London Victoria	London Victoria	London Victoria	London Victoria
Arrival	17:03	17:03	17:03	17:03
Schedule Start Date	2024-06-03	2024-06-08	2024-06-02	2024-08-26
Schedule End Date	2024-12-13	2024-12-14	2024-12-08	2024-08-26

Table 9: Example of 2D08 with different UID and Train IDs depending on the day of the week and how the train service was bid.

G A.4.6 After the day of operation, it may not be obvious that this instance of 2D08 is linked to other instances, even with the duplicated schedule. Whilst the four-character TID remains constant, this cannot be used to uniquely identify the 16:20 departure from Orpington as it is not unique within the RU. 2D08 is also used:

a) In other areas of the RU's operation, such as a Dartford to London Charing Cross service and a Sheerness to Sittingbourne service. The former also operates at the same time as the 16:20 from Orpington; and
b) On the same route earlier in the day, namely the 05:18 Orpington to London Victoria service.

G A.4.7 Several data elements may need to be combined to pinpoint the train service in question which is suboptimal.

A.5 Planning practices can differ between the IM and RU

Guidance: Y-shaped Paths

G A.5.1 A train service can be timetabled to have different origins and/or destinations depending on the requirements and demands of the operator and their customer(s). For example, on different days, the same train service may start at a different origin but always deliver to the same destination. Generally, most of the train service, and therefore path, is the same; the variation is either at the start or end of the journey.

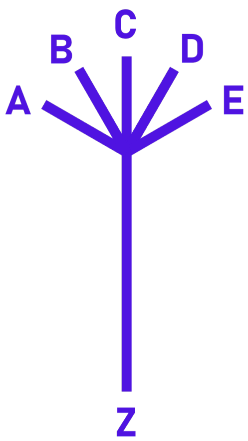

Figure 6: Example of a Y-shaped path where a train service timetabled to point Z could come from any of the points A to E.

G A.5.2 From the RU's perspective, these different train service combinations are planned together and may be given the same Train IDs. On the GB mainline railway, such services are flagged in timetable data with a Y character in its 'operational characteristics'. However, there is no formal grouping of these services, other than that part of their schedules overlap. Only one of the train services can be operated each day.

G A.5.3 Conversely, the IM plans each origin and destination combination separately and assigns them a different UID. There is a disparity in how IMs and RUs are identifying the same service. It may not always be clear which variation of the same service is being referred to.

A.6 Identifiers can vary in times of disruption

Guidance

G A.6.1 During disruption or due to an alteration of the train service or path, current GB practice can see the planned identifiers being used on the day of operation change. The example scenarios in this section include alterations to the four-character TID and the TRUST ID.

Guidance: Zulu TIDs

G A.6.2 To more clearly note, for example, that a train service or path has been altered from the planned timetable, the alpha character in the four-character TID (NANN) may be changed to a 'Z' or 'zulu' character (NZNN). For example, 1A01 could be changed to 1Z01. This can then impact multiple downstream systems and identifiers, including the TRUST ID.

G A.6.3 It may not always be apparent which service the zulu train service is created from as there is no reliable way of tracking the change. For instance, 1Z01 could be formed from 1A01, 1B01, 1C01, 1D01 and so on.

G A.6.4 A zulu character can also be used for additional or VSTP train services.

G A.6.5 When analysing train service data after the day of operation, it may not be apparent how the additional identifier links to other train services, or potentially a link is made to another train service where there was none. For example, 1Z05 might erroneously be associated with 1E05 if they ran at similar times, despite the fact the services were different.

G A.6.6 After the day of operation, it may not be easy to track these ID changes, and the original service may just be shown as cancelled.

Guidance: Change in Train Classification

G A.6.7 On the day of operation, a train service's Train Classification in the four-character TID may change. This could be due to, for example:

a) The train is running empty rather than in passenger service, changing the first character to a 5; or
b) The capabilities of the train service are different to that initially planned, potentially running at a slower or faster speed, changing the first character to either a 4, 6, 7 or 8.

G A.6.8 The challenges this presents are similar to those listed in *G A.6.3*, *G A.6.5* and *G A.6.6*.

Guidance: Changes to the TRUST ID

G A.6.9 The TRUST ID is created by adding a prefix based on the first two digits of the Station Number (STANOX) and a suffix that includes the four-character TID. Therefore, if the train service starts from a different location, or the four-character TID changes, the TRUST ID changes as well.

G A.6.10 In some cases, this changed TRUST ID can duplicate another, so the ID is changed again to ensure uniqueness each day. For example:

a) 2H36 (Charing Cross to Tunbridge Wells) usually has the TRUST ID '882H36MLDD' – the origin, Charing Cross, has the STANOX 88401;
b) If the service starts short from London Bridge (STANOX 87601), the TRUST ID for this service is changed to '872H36MLDD'; and
c) In this case, the updated TRUST ID also duplicates a Shepperton to London Waterloo service – as a result, details of the Tunbridge Wells service may not be captured by some systems.

G A.6.11 This example is shown in Figure *7*.

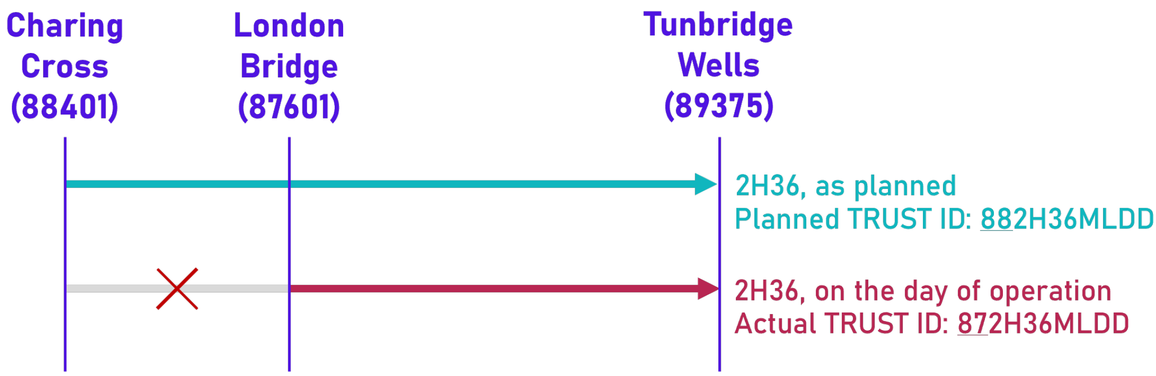

Figure 7: Example of a change to the TRUST ID during disruption, with a train service starting short of the planned origin, Charing Cross, at London Bridge. Locations are shown with their respective STANOX numbers.

G A.6.12 All changes to the four-character TID are reflected in the TRUST ID as well, including changes to the alpha character and changes to the Train Classification, as described earlier in this section.

G A.6.13 After the day of operation, it may not be easy to track these identifier changes. These examples show that current identifiers are not always reliable, predictable or consistent day-to-day or across a timetable period.

A.7 Identifiers used in the initial timetable bid can change

Guidance

G A.7.1 During initial timetable construction, the RU creates a four- and six-character TID for each train service. At this point, the UID has not been assigned, as this is assigned by the IM. The planned services are bid to the IM which may be submitted on paper or with a filename.

G A.7.2 The IM assesses the bid received from the RU against any capacity constraints and any bids for capacity made by other RUs. Where there are conflicts between two or more services requesting the same capacity at the same time, the IM will work with the relevant RUs to establish a compromise. If, in compiling the national timetable, the IM detects a clash with another operator's train service identifier in the same signalling location or area, it may alter the RU's proposed identifier.

G A.7.3 The IM responds to the RU, known as the 'offer', detailing which train services have been accepted, altered, or rejected the initial bid from the RU. Train services that have not been rejected are given a path identifier by the IM.

G A.7.4 For the RU to effectively assess what has been offered by the IM, the RU needs a 'primary key' to ensure that the train service bid is being compared with the same train service being offered.

G A.7.5 If the Train ID was changed from the initial bid, establishing the link between the bid and offered train service is non-trivial. The bid filename might be used to establish the link rather than using the train service's identifier, however this may require data processing; a suboptimal solution. Equally, the IM's UID is not in the initial bid and therefore cannot be used as the primary key.

G A.7.6 This can lead to mismatches between the RU and IM IT systems, with discrepancies between two organisations' data and what train services they believe will operate and when. This creates a performance risk. For example, if the RU does not accurately match the offered data through updates to its own systems and data, a change subsequently requested to the service using the original Train ID results in confusion as to which train service is being referred to.

G A.7.7 The rail industry's aspirations to move towards electronic exchange of data for the bid and offer of the timetable are undermined by this challenge. This current methodology is not compatible and does not enable more modern processes.

A.8 Impact of existing train service and path identifiers

Guidance

G A.8.1 Numerous workarounds are used to overcome these challenges and tend to be manual, so rely on human input and the associated employee costs, or the challenges are ignored or unseen. This leads to data inaccuracies.

G A.8.2 Whilst some more modern systems can track some of the ID changes, this requires unnecessary computer processing and data storage.

G A.8.3 Whilst workarounds can work for the majority of train services, the ones that are more likely to need assessment and tracking are the ones that have identifier or schedule changes; for example, those starting short of their planned origin or diverted away from their planned path. Data can be lost, and insights not gained, as there is no reliable way of knowing the impact of disruption, for example.

G A.8.4 Increasing numbers of digital systems need an unambiguous way of referencing, or searching for, a train service schedule – including an instance of that schedule. For example, a Driver Advisory System (DAS) needs to be able to find the correct train schedule to provide appropriate advice to the driver. Where there are duplicate identifiers, the driver must choose the correct service; a potential risk. Whilst existing identifiers can be used during normal operations, during disruption, a system may struggle to identify the correct schedule for the service, particularly if the identifier changes.

G A.8.5 The intricacies of existing identifiers are challenging to IT system suppliers outside the industry. In other areas such as data management, analysis, and digital solution development, and in other industries, unique identifiers are essential, and the foundation to data management. Enabling new suppliers can deliver accurate and lower cost solutions into the rail industry. Increasing the understanding of existing identifiers, and moving towards unique identifiers, also promotes the use of rail data for transport data solutions, particularly through open data distribution channels.

G A.8.6 Without recognising today's identifier challenges and proposing an agreed set of aspirations, future system development and delivering process change is hindered.

G A.8.7 The challenges highlighted in this appendix chiefly impact RUs and their system suppliers rather than the IM. The UID assigned by the IM is suitable for its designed purposes, and it is already widely published. There may be further challenges in future when there are multiple IMs coordinating the movement of a single train service.

A.9 Challenge, impact, need analysis

Guidance

G A.9.1 Table *10* sets out a summary of the challenges and the associated impact with existing identifiers. From these challenges and impacts, a series of 'need' statements for an identification framework have been developed. The opportunities to address these challenges, mitigate these impacts, and meet these needs are given in Appendix *B.1*.

Section	Challenge	Impact	Needs from an identification framework
A.2	TIDs can repeat multiple times nationally each day	Systems may struggle to identify the correct schedule for the service, particularly if the identifier changes. May require manual human input	Be unambiguous as to which instance of a train service is being referred to. Be unique per day, per RU, as a minimum
A.3	Identifiers can remain the same when the service is different	Hinders stock and crew planning and diagramming. Alterations, and the need for changes, may be missed, potentially leading to delays and cancellations	Identify where an instance of a train service is varied from the LTP. Clearly link the variation and the LTP schedule
A.4	Duplicate services can be given different, and arguably unnecessary, identifiers	After the day of operation, it may not be obvious which instances of a train service are linked to other instances, even with a duplicated schedule	Not change the ID for an identical service based on the day the train runs, or on how the service has been bid. Be unaffected by changes to the IM's identifier
A.5	Planning practices can differ between the IM and RU	It may not be clear which variation of the same service is being referred to	Support Y-shaped paths. Unaltered over timetable changes, unless specified
A.6	Identifiers can vary in times of disruption	IDs are not always reliable, predictable or consistent. Changes are not easy to track. Data may be lost in systems or analyses	Be unaffected by disruption or alteration
A.7	Identifiers used in the initial timetable bid can change	This may lead to train services being 'lost' and manual intervention being required; wasting time, money and resource, and leaving the base timetable prone to human errors	Be identical in planning, operational and performance systems. Support the tracking of initial bid identifier

Table 10: Challenge, Impact, Need analysis for train service and path identifiers

Appendix B Future train service and path identification

Note: The content of this appendix is provided for guidance only.

B.1 Opportunities to resolve challenges from existing train service and path identifiers

Guidance

G B.1.1 This appendix details three opportunities to address the challenges listed in Appendix *A*, setting out guidance on what could be implemented beyond the requirements set out in this issue of the document. This guidance sets out technical aspirations, akin to a Concept of Operations. This enables a direction to be set without the difficulties of making requirements that the industry cannot comply with yet. All opportunities utilise the telematics framework.

G B.1.2 The telematics framework was designed to address similar challenges at a European level, namely the amalgamation of different legacy and traditional identifiers, with the need to identify train services across a wide area with no duplicates. The framework, as currently defined, allows legacy identifiers to continue, with data structured in such a way that train services and paths can be uniquely identified.

G B.1.3 On the GB mainline railway, not all elements of the telematics framework have been implemented. Analysis of what the framework could offer has yielded three opportunities to resolve current challenges by adopting some additional components of the framework in future:

a) **Opportunity 1:** introducing an RU owned identifier in telematic messages, detailed in Appendix *B.2*;
b) **Opportunity 2:** implementing 'Variants' and utilising the Reference Train ID, detailed in Appendix *B.3*; and
c) **Opportunity 3:** using other ObjectTypes defined in the telematics framework such as 'Path Request' and 'Case Reference,' detailed in Appendix *B.4*.

G B.1.4 At present, there is no commitment to implement any of these solutions. These are technical possibilities only.

B.2 Introduction of an RU owned identifier

Guidance

G B.2.1 So that all organisations involved in the planning and delivery of train services or paths can easily track information, the telematics framework permits each organisation involved to append its identifiers in planning and operational telematics messages. This is particularly useful for a train service that might run in different countries with different IMs and RUs, for example. This method can be likened to sending a letter to another company, and including both your reference and theirs for clarity. Using the telematics framework allows each train service to be identified by the respective organisations.

G B.2.2 Current practice in telematics messages on the GB mainline railway includes the provision of:

a) A Path identifier published by the IM in planning and operational messages. For Network Rail infrastructure, this is the UID, detailed in Section *3.3*; and
b) A Train Service identifier published by the IM in operational messages. For Network Rail infrastructure, this is the TRUST ID, detailed in Section *3.3*.

G B.2.3 No train service identifiers are currently published in telematics messages with RU company codes.

G B.2.4 The introduction of an RU owned identifier in telematics messages can resolve the following challenges listed in Appendix *A*:

a) Train IDs can repeat multiple times;
b) Duplicate services are given different, and arguably unnecessary, identifiers;
c) Planning practices can differ between the IM and RU; and
d) Identifiers can vary in times of disruption.

G B.2.5 It also addresses the following needs listed in Appendix *A.9*:

a) Be unaffected by changes to the IM's identifier;
b) Support Y-shaped paths;
c) Unaltered over timetable changes (unless specified);
d) Be unaffected because of disruption or alteration;
e) Be unambiguous as to which instance of a train service is being referred to; and
f) Be unique per day, per train operator, as a minimum.

G B.2.6 The identifier for this element has been debated by the Data, Systems and Telematics Standards Committee (DST SC). A brand-new identifier could be developed, but this would take time to develop, agree and implement, potentially at significant cost.

G B.2.7 It is suggested that the six-character TID that is created during train planning, and detailed in Section *3.2*, is used as:

a) It is unique within an RU for each planned day of operation;
b) It is already in multiple RU and IM train planning systems;
c) No additional tasks are put on train planning teams. The task of assigning this identifier within the RU is already done and the information is already stored by the IM in train planning systems. It needs greater exposure outside of these planning systems and increased use in the operational context;
d) The cost of implementation is likely to be very low, with limited business change required;
e) Combining this identifier with the Company Code, would constitute a unique train service identifier in a planning context; and
f) Combining this identifier with the Company Code and the Start Date creates a unique train service identifier in an operational context.

G B.2.8 An illustrative example of a telematics message using the six-character TID is shown below.

```xml
<Identifiers>
    <PlannedTransportIdentifiers>
        <ObjectType>TR</ObjectType>
        <Company>9925</Company>
        <Core>------1B32DA</Core>
        <Variant>01</Variant>
        <TimetableYear>2023</TimetableYear>
        <StartDate>2023-04-25</StartDate>
    </PlannedTransportIdentifiers>
    <PlannedTransportIdentifiers>
        <ObjectType>PA</ObjectType>
        <Company>0070</Company>
        <Core>------G36797</Core>
        <Variant>01</Variant>
        <TimetableYear>2023</TimetableYear>
        <StartDate>2023-04-25</StartDate>
    </PlannedTransportIdentifiers>
    <PlannedTransportIdentifiers>
        <ObjectType>TR</ObjectType>
        <Company>0070</Company>
        <Core>--731B32MY25</Core>
        <Variant>01</Variant>
        <TimetableYear>2023</TimetableYear>
        <StartDate>2023-04-25</StartDate>
    </PlannedTransportIdentifiers>
</Identifiers>
```

G B.2.9 Publishing the six-character TID as an additional field in timetable outputs where it is not already included, and using it in telematics messages with the respective 'company code' for each RU would address current challenges and realise this opportunity.

G B.2.10 This approach represents a low-cost, quick win with limited business change, supporting unique train service identification and the implementation of the TAF and TAP NTSNs. It also lays the groundwork for resolving other challenges and enabling further opportunities.

B.3 Implementation of Variants and the Reference Train ID

Guidance

G B.3.1 Guidance on the Variant element is given in *G 4.2.29* to *G 4.2.34*.

G B.3.2 A train service or path can be planned to operate on a single day or across a whole timetable period. During this period, a train service or path may need to be slightly different on some days of the year compared to others, for example, retimed at a weekend, diverted for engineering works, extra stops on a Sunday, or summer and winter variations.

G B.3.3 In the telematics framework, it is intended that the Core element remains the same and the Variant element is used to indicate that the service is a variation to this originally planned train service or path. Therefore, when train services or paths are altered, a new identifier is not required, and a clear link is kept to the original service or path planned.

G B.3.4 Characters 01 to ZZ may be used in the Variant element for all ObjectTypes, and can be considered as an alteration to the original train service or path. There are currently no GB rules or guidance on how these Variant characters are assigned, managed or used.

G B.3.5 The numeric 00 in the Variant element may only be used for the TrainID (TR) ObjectType. A TR ObjectType with Variant 00 is referred to as the Reference Train ID.

G B.3.6 In a GB context, the Reference Train ID could be used for the LTP train service or path, with any subsequent alterations to this service documented as different Variants of this Reference Train ID. For standalone or additional services that may only operate on a single day, the Reference Train ID could be used for the identifiers assigned to each respective train service or path.

G B.3.7 For this opportunity to be more effective, it requires the implementation of opportunity 1; the introduction of an RU owned identifier. In this case, the Core element of the Reference Train ID would be the six-character TID. This is illustrated in Figure *3* part D.

G B.3.8 Implementation of Variants and the Reference Train ID in telematics messages can resolve the following challenges listed in Appendix *A*:

a) Identifiers can remain the same when the service is different;
b) Duplicate services are given different, and arguably unnecessary, identifiers;
c) Planning practices can differ between the IM and RU; and
d) Identifiers can vary in times of disruption.

G B.3.9 It also addresses the following needs listed in Appendix *A.9*, in addition to those already listed in *G B.2.5*:

a) Identify where an instance of a train service is varied from the LTP;
b) Clearly link the variation and the LTP schedule; and
c) Not change the identifier for an identical service based on the day the train runs, or on how the service has been bid.

G B.3.10 For example:

a) In the Appendix *A.3* challenge example, where it was not obvious that a service was different from the LTP, the use of the Variant element for both the train service and path identifiers would have made the alteration much more obvious; and
b) In the Appendix *A.4* challenge example, where duplicate services were given different identifiers, the use of Variants and the Reference Train ID would have made the relationship between services running on different days much clearer. It would have also prevented the generation of unnecessary identifiers which could have caused confusion or data loss.

G B.3.11 This way of working is different from current GB practices and requires more business change than Opportunity 1. Current systems and processes are not set up for this approach. Additional work is needed on, for example, industry rules on how to manage variants, which service is the reference train and rules on how different a train service is before the ID is changed. However, until a desired end state is defined, the industry is unlikely to move forward. The guidance in this document can inform this change.

B.4 Using other ObjectTypes defined in the telematics framework

Guidance

G B.4.1 The telematics framework sets out several ObjectTypes beyond the Path (PA) and Train (TR) ObjectTypes predominantly discussed in this document, namely:

a) PR - Path Request;
b) CR - Case Reference;
c) CM - Capacity Model;
d) CN - Capacity Needs Announcements;
e) CP - Catalogue Path; and
f) RO - Route.

G B.4.2 ObjectTypes PR and CR were designed to specifically address similar challenges to those described in Appendix *A.7*; tracking changes to identifiers during the LTP bid-offer processes between the IM and RU.

G B.4.3 The PR ObjectType, and the associated Core element, are defined by the RU for each service bid to the IM(s). In its offer to the RU's proposal, the IM repeats this PR element, even if they have changed to the operational train number to avoid duplicates with other services, as described in *G A.7.2*. Using the PR ObjectType provides an unambiguous link between what was bid by the RU and what was offered by the IM.

G B.4.4 The CR ObjectType, and the associated Core element, can be used by any RU or IM involved in the planning or operation of a train service or path. It is akin to a bid identifier, and may contain multiple train services or paths. In GB practice, this is an equivalent of the file names used in the bid and offer between the RU and IM.

G B.4.5 The principles of PR and CR ObjectTypes are already part of GB practices. For example, train services are generally bid with an identifier, potentially in a file name. However, telematics messages are not used for the bidding of long- or short-term bidding of train services at present, and therefore these specific ObjectTypes may not be implemented in the short-term. The principles may be used in future processes. However there is no commitment or specific timeframe for the GB adoption of telematics messages for these purposes.

G B.4.6 This guidance is provided to demonstrate how the challenge described in Appendix *A.7* could be mitigated as the other opportunities in this appendix do not address this.

B.5 Opportunity comparison

Guidance

G B.5.1 Table *11* compares the needs from an identification framework, introduced in Appendix *A.9*, with the opportunities set out in Appendix *B*. It is assumed that each opportunity is implemented sequentially.

Need	**Opportunity 1 (*B.2*): Use of an RU identifier**	**Opportunity 1+2 (*B.3*): Implementation of Variants**	**Opportunity 1+2+3 (*B.4*): Use of other ObjectTypes**
Be unambiguous as to which instance of a train service is being referred to	Addressed, if combined with Company Code	Addressed	Addressed
Be unique per day, per RU, as a minimum	Addressed	Addressed	Addressed
Identify where an instance of a train service is varied from the LTP		Addressed	Addressed
Clearly link the variation and the LTP schedule		Addressed	Addressed
Not change for an identical service based on the day the train runs, or on how the service has been bid		Addressed	Addressed
Be unaffected by changes to the IM's identifier	Addressed	Addressed	Addressed
Support Y-shaped paths	Addressed	Addressed	Addressed
Unaltered over timetable changes, unless specified	Addressed	Addressed	Addressed
Be unaffected by disruption or alteration		Addressed	Addressed
Be identical in planning, operational and performance systems		Addressed	Addressed
Support the tracking of initial bid identifier			Addressed

Table 11: Opportunities from the telematics framework compared with GB needs

Appendix C Other train service identifiers

Note: The content of this appendix is provided for guidance only.

C.1 Train Service Codes

Guidance

G C.1.1 Train Service Codes (TSCs) are eight-digit numbers used to group together similar train services within the timetable, sometimes called Service Groups. They are assigned to all train services, including empty train services. TSCs are published in multiple locations, including data released to implement the plan timetable.

G C.1.2 Each TSC represents a particular set of services within an RU that have common origins and destinations. Each TSC is unique and owned by a specific RU. A TSC may represent, or be used by, multiple train services. For example, TSC 21701001 represents all LNER services between London Kings Cross and Aberdeen and Inverness, and vice versa.

G C.1.3 Introduced for accounting purposes by British Rail, TSCs now form part of track access contracts between RUs and IMs on the GB mainline railway. TSCs are used in performance monitoring systems, revenue apportionment systems such as Operational Research Computerised Allocation of Tickets to Services (ORCATS) and ticketing purchase monitoring systems such as Latest Earnings Nationally Networked Over Night (LENNON).

G C.1.4 TSCs are not used within the telematics framework.

C.2 Service ID and Retail Service ID

Guidance

G C.2.1 The Service ID and Retail Service ID are used in retail and reservation systems.

G C.2.2 The Service ID is a 4-character numeric set by the RU. Each RU has control over how they number each service and not all RUs follow the same pattern. Examples include using the:

a) First character to represent the route of the service;
b) Second and third character as a sequential number, incrementing upwards throughout the day. The number could also mirror the final two characters of the four-character TID; and
c) Fourth character to represent the day of the week the service operates.

G C.2.3 Whilst RUs generally design the Service ID to be unique per day within their operations, this is not always the case.

G C.2.4 The Retail Service ID is a six-character alphanumeric. It mirrors the Service ID and prefixes this numeric with two alpha characters, representing the operators ATOC code. For example, the ATOC code for SouthEastern is SE. A list of ATOC codes for RUs is included in Appendix *D.1*.

G C.2.5 The Service ID and Retail Service ID are not used within the telematics framework.

C.3 GSM-R identity

Guidance

G C.3.1 An eight-character number is required to register a GSM-R cab radio with the radio network. This is derived from data entry by the driver to either the GSM-R cab radio or the ETCS driver-machine interface. GSM-R derives an all-numeric identifier from the four-character TID and three additional numeric characters; the identifier of a signal or a wild card.

G C.3.2 Requirements and guidance on the identifier used in GSM-R are set out in RIS-0794-CCS, including the algorithm to change from a four-character train ID to the all numeric train reporting number (TRN) and vice versa.

G C.3.3 In situations where there are conflicting four-character TIDs on the network, the GSM-R identifier can be altered three times, through the algorithm described in RIS-0794-CCS, until a unique combination is found. Inability to generate a unique combination may result in a registration failure. This alteration to the identifier may not be communicated outside of the GSM-R system. Whilst the four-character TID can always be retrieved, the specific train service being referred to may not be obvious. This can result in different information being stored in different systems, such as ETCS - see *G C.4.3*.

G C.3.4 The GSM-R identity is not used within the telematics framework.

C.4 ETCS identities

Guidance

G C.4.1 The CCS NTSN includes the GB specific case permitting the use of alphanumeric entry of the TRN via the ETCS driver-machine interface on the GB mainline railway. This is to permit the use of the four-character TID.

G C.4.2 The TRN is also made up of the four-character TID and three additional characters; the identifier of a signal or a wild card. The same algorithm referenced in Appendix *C.3* is used to convert the alphanumeric train running number to the all-numeric format required for the ETCS NID_OPERATIONAL parameter. RIS-0799-CCS and GERT8402 set out the requirements and guidance for implementing this specific case, including the management of NID_OPERATIONAL.

G C.4.3 An interface between the ETCS onboard subsystem and the GSM-R voice radio may be provided for the exchange of the NID_OPERATIONAL value for use by the GSM-R voice radio as the initial TRN for registration. This reduces the need for the driver to enter the same information into multiple different systems. This interface may be unidirectional, for example from the ETCS onboard to GSM-R voice radio only. This could result in a difference between the NID_OPERATIONAL parameter value and the GSM-R TRN value if, as part of GSM-R voice registration, a conflict with another train having the same four-character TID has to be resolved.

G C.4.4 Identifiers used in ETCS, including NID_OPERATIONAL, are not used within the telematics framework.

Appendix D Company codes

Note: The content of this appendix is provided for guidance only.

D.1 Company Codes

Company Name	Company Code	Sector Code	ATOC Code
Amey	9943	43	ZZ
Arriva Rail London	9930	30	LO
Avanti West Coast	9965	65	VT
Balfour Beatty Rail Plant	9940	40	ZZ
C2C Rail	9979	79	CC
Caledonian Sleeper	9935	35	CS
Carillion Rail CTRL Phase 1	9938	38	ZZ
Carillon Rail (Formerly GTRM)	9944	44	ZZ
Chiltern Railways	9974	74	CH
Colas Rail	9942	42	ZZ
CrossCountry Trains	9927	27	XC
DB Cargo	2170	05	ZZ
DB Cargo Charters	2170	04	ZZ
DB Cargo International	2170	08	ZZ
Devon and Cornwall Railways	9934	34	ZZ
Direct Rail Services (DRS)	9997	97	ZZ
East Midlands Railway	9928	28	EM
Elizabeth Line	9933	33	XR
Europorte Channel	3227	13	ZZ
Eurostar International	0019	06	ES
Ffestiniog Railway	9994	94	ZZ
Freight Europe	9912	12	ZZ
Freightliner	9909	09	ZZ
GB Railfreight (GBRf)	3357	54	ZZ
GCNW	9914	14	LN
Govia Thameslink Railway	9988	88	TL

Company Name	**Company Code**	**Sector Code**	**ATOC Code**
Grand Central	9922	22	GC
Great Western Railway	9925	25	GW
Greater Anglia	9921	21	LE
Hanson & Hall Rail Services	9917	17	YG
Harsco	9939	39	ZZ
Heathrow Express	9986	86	HX
Hull Trains	9955	55	HT
Island Lines	9985	85	IL
JSD Research & Development Ltd	9902	02	ZZ
Legge Infrastructure Services	9999	72	ZZ
Locomotive Services	9989	89	LS
London North Eastern Railway (LNER)	9961	61	GR
LORAM	9999	16	ZZ
London Underground (LUL) Bakerloo	9991	91	LT
LUL District (Richmond)	9993	93	LT
LUL District (Wimbledon)	9990	90	LT
Lumo	9945	45	LD
Merseyrail Electrics	9964	64	ME
Network Rail On-Track Machine (OTM)	0070	15	ZZ
Network Rail Virtual Freight Company	0070	31	ZZ
North Yorkshire Moors Railway	9951	51	NY
Northern Trains Limited	9923	23	NT
NR Reserved Pathings (Non QJ)	0070	92	ZZ
On Route Logistics (UK)	9959	59	ZZ
Pre Metro Operations	9952	52	PM
Rail Operations Group (ROG)	9907	07	ZZ
Scotrail	9960	60	SR
Seco Rail	9937	37	ZZ
Serco Railtest	9910	10	ZZ
SLC Operations Limited	9911	11	SO

Company Name	Company Code	Sector Code	ATOC Code
SNCF Freight Services	2187	53	ZZ
South Western Railway	9984	84	SW
South Yorkshire Supertram	9919	19	SY
Southeastern	9980	80	SE
Swanage Railway	9918	18	SG
Swietelsky Babcock (SB) Rail	9946	46	ZZ
Transpennine Express	9920	20	TP
Transport for Wales	9971	71	AW
Tyne and Wear Metro	9956	56	TW
Varamis Rail	9995	95	MV
Victa Rail	9903	03	ZZ
Vintage Trains	9999	36	TY
VolkerRail	9949	49	ZZ
West Coast Railway Company	9950	50	WR
West Midlands Trains	9929	29	LM

Table 12: Company codes used on the GB mainline railway, correct as of June 2024.

Definitions

Common Interface File (CIF)	Contains timetable data published by Network Rail which is transferred electronically from central train service database to other computer systems that require such information.
Driver Advisory System (DAS)	Provides information for a train driver to optimise the train's speed over a given route, with the capability for more efficient energy usage, improved punctuality and increased network capacity.
ERTMS/ETCS DMI	The full interface between the driver and the ERTMS/ETCS onboard equipment containing all inputs and outputs (for example, visual, audible, keys, and buttons).
European Train Control System (ETCS)	The signalling, control and train protection part of the European Rail Traffic Management System designed to provide interoperability and standardisation across European railways.
GB mainline railway	'Mainline railway' has the meaning given to it in the Railways and Other Guided Transport Systems (Safety) Regulations 2006 (as amended) and the associated exclusions. 'GB mainline railway' is the mainline railway network excluding any railway in Northern Ireland, the Channel Tunnel, the dedicated high-speed railway between London St Pancras International Station and the Channel Tunnel, and any other exclusions determined by the Secretary of State.
Global System for Mobile Communications – Railway (GSM-R)	The European Standard specific to railway applications for the transmission by radio of voice and data between train and trackside installations.
infrastructure capacity	The potential to schedule train paths requested for an element of infrastructure for a certain period
infrastructure manager (IM)	Has the meaning given to it in the Railways and Other Guided Transport Systems (Safety) Regulations 2006 (as amended), but is limited to those infrastructure managers who hold a safety authorisation issued in respect of the mainline railway. Source: *ROGS*
Layered Interface Exchange (LINX)	The data integration platform being developed as part of the Network Rail Traffic Management system.
National Technical Specification Notice (NTSN)	Document published by the Secretary of State pursuant to regulation 3B of the Railways (Interoperability) Regulations 2011 (as amended) which sets out the standards, technical specifications and technical rules in use in the United Kingdom as amended or varied from time to time. These may be standards to be complied with in relation to the design, construction, placing in service, upgrading, renewal, operation and maintenance of the parts of the rail system. For the purposes of these Regulations, the essential requirements for a project subsystem conforms with applicable

	National Technical Specification Notices and National Technical Rules. Source: *RIR*
network	The entire railway infrastructure managed by an infrastructure manager.
operational context	The operational features of the external environment that influence compatibility, including train operations, station operations and infrastructure operations.
railway undertaking (RU)	Has the meaning given to the term 'transport undertaking' in the Railways and Other Guided Transport Systems (Safety) Regulations 2006 as amended, but is limited to any private or public undertaking the principal business of which is to provide rail transport services for goods and/or passengers, with a requirement that the undertaking must ensure traction. Source*: ROGS*
route	The geographical way to be taken from a starting point to a point of destination.
STANOX	Station Number Code.
train path	The infrastructure capacity needed to run a train service between two places over a given time-period.
Train Running Number (TRN)	The identity of the train service. GB Rail currently uses a 4-character headcode, but may be expected to migrate to an identifier which is unique across the network, and not repeated within a 24-hour period.
train service	The operation of a train between specified origins and destinations on the rail infrastructure for the transport of goods or passengers (or both).
transport undertaking	Any person who operates a vehicle in relation to any infrastructure but shall not include a person who operates a vehicle solely within an engineering possession. Source: *ROGS*
Working Timetable (WTT)	The data defining all planned train and rolling-stock movements which will take place on the relevant infrastructure during the period for which it is in force.
XML	Extensible Markup Language (XML), a software and hardware agnostic language and file format designed for the storage and transport of data, and to be both human- and machine-readable.
XSD	Extensible Markup Language Schema Definition (XSD), a language for describing the structure and constraining the contents of XML documents.
Y-shaped path	Path incorporated in the Working Timetable which (a) departs from one or more Origins to the same Destination: and/or (b) arrives at one of more Destinations from the same Origin, that is identified as such by the incorporation of the letter "Y" in the operating characteristics part of the Train Slot's heading.

References

The Standards catalogue gives the current issue number and status of documents published by RSSB: http://www.rssb.co.uk/standards-catalogue.

RGSC 01	Railway Group Standards Code
RGSC 02	Standards Manual

Documents referenced in the text

Railway Group Standards

GERT8000-TW1	Preparation and movement of trains
GERT8402	ERTMS/ETCS DMI National requirements

RSSB documents

RIS-0794-CCS	GSM-R Train Voice Radio Systems
RIS-0799-CCS	ERTMS/ETCS Baseline 3 Onboard Subsystem Requirements
RIS-6702-DST	Time and Date in Railway Systems

Other references

BS ISO 8601-1:2019 + A1:2022	Date and time. Representations for information interchange - Basic rules
CCS NTSN	Command Control and Signalling National Technical Specification Notice (CCS NTSN). Published by the Secretary of State on 1 January 2021 pursuant to regulation 3B of the Railways (Interoperability) Regulations 2011. This Notice replaces and substantially reproduces the provisions of Commission Regulation (EU) 2016/919 of 27 May 2016 (the CCS TSI) and includes relevant amendments made by Commission Implementing Regulation (EU) 2019/776 which came into force in June 2019
Network Code	The Network Code, Network Rail, August 2024
OPE NTSN	Operation and Traffic Management National Technical Specification Notice (OPE NTSN). Published by the Secretary of State on 1 January 2021 pursuant to regulation 3B of the Railways (Interoperability) Regulations 2011. This NTSN replaces and substantially reproduces the provisions of Commission Decision 2012/757/EU of 14 November 2012 (the OPE TSI), and includes relevant amendments made by Commission Regulation (EU) 2015/995 of 8 June 2015 and Commission Implementing Regulation (EU) 2019/773 which came into force in June 2019
RU/IM Telematics Sector Handbook	Sector Handbook for the Communication between Railway Undertakings and Infrastructure Managers (RU/IM Telematics

	Sector Handbook). Published by the RU/IM Telematics Joint Sector Group (JSG) on 17 April 2024
SI 2011/3066	The Railways (Interoperability) Regulations 2011
SI 2019/518	The Railways (Access, Management and Licensing of Railway Undertakings) Regulations 2019
TAF NTSN	Telematic Applications for Freight National Technical Specification Notice (TAF NTSN). Published by the Secretary of State on 1 January 2021 pursuant to regulation 3B of the Railways (Interoperability) Regulations 2011. This Notice replaces and substantially reproduces the provisions of Commission Regulation (EU) 1305/2014 of 11 December 2014 (the TAF TSI), and repeals the Regulation (EC) 62/2006 of 23 December 2005 and includes relevant amendments made by Commission Implementing Regulation (EU) 2019/778 which came into force in June 2019
TAP NTSN	Telematic Application for Passenger Services National Technical Specification Notice (TAP NTSN). Published by the Secretary of State on 1 January 2021 pursuant to regulation 3B of the Railways (Interoperability) Regulations 2011. This NTSN replaces and substantially reproduces the provisions of Regulation (EU) 454/2011 of 5 May 2011 (the TAP TSI), and includes relevant amendments made by Commission Regulation (EU) 665/2012 of 20 July 2012, Commission Regulation (EU) 1273/2013 of 6 December 2013, Commission Regulation (EU) 2016/527 of 4 April 2016 and Commission Implementing Regulation (EU) 2019/775 which came into force in June 2019
TPR	Timetable Planning Rules (National), 2024
UIC/OSJD 920-1	Standard Numerical Coding for Railway Undertakings, Infrastructure Managers and other companies involved in rail-transport chains
UTP TAF	Uniform Technical Prescription applicable to the subsystem: "Telematics applications for passenger and freight services – Telematics applications for freight services" (UTP TAF), Appendix F to COTIF 1999, Intergovernmental Organisation for International Carriage by Rail (OTIF)