Rail Delivery Group

National Rail

National Routeing Guide
Data Feed Specification

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Version Information

Version	Comments
02-02	Updates include: • Clarify 4.12.3 London Data Record entry type T and X • Clarify what time of day start date and end dates relate to • Minor updates in 4.12.3 to the London Data Record ENTRY TYPE

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Terms and Definitions

Term	Definition
ASCII	American Standard Code for Information Interchange
CRS	Computerised Reservation System (the predecessor to current reservation service)
CSV	Comma-Separated Values
DTD	Data Transformation and Distribution Service
FTP	File Transfer Protocol
NLC	National Location Code
NRG	National Routeing Guide
RDG	Rail Delivery Group
RSP	Rail Settlement Plan
SFTP	Secure File Transfer Protocol
TOC	Train Operating Company
UID	Unique Identifier
XML	Extensible Mark-up Language

1. Introduction

1.1 Overview

1.1.1 This document describes the Data Feed for the extraction of National Routeing Guide (NRG) data from the Data Transformation and Distribution (DTD) Service. The DTD is a service owned by RDG.

1.1.2 The Routeing Guide can be found online at http://data.atoc.org/routeing-guide.

1.2 Purpose

1.2.1 This document describes the Data Feed for Routeing Guide Data extracted from the DTD Service.

1.2.2 The DTD Service is responsible for managing and distributing other Data Feeds and the following documents describe the interfaces for these Data Feeds:

- RSPS5045: Fares and Associated Data Feed Interface Specification.
- RSPS5046: Timetable Information Data Feed Interface Specification.

1.3 Scope

1.3.1 The scope of this document is the interface specification of Routeing Guide Data Feeds provided by the DTD service.

1.3.2 This document describes the file structure of all the Routeing Guide files of the Routeing Guide Feed and provides technical details of how these files are made available to registered recipients of the data.

2. Structure

2.1 Structure Details

2.1.1 Data Feeds will be delivered in fixed format flat text files containing a number of records. Some files contain several record types.

2.1.2 The following export file types are defined for the NRG export (where nnnn is a sequence number defined by the file's exporter):

File type	Contents	Typical size	Generic filename
Station file	Lists all stations in the NRG.	80 Kb	RJRGnnnn.RGS
Station-Group file	Lists all station groups and the preferred station of each.	3 Kb	RJRGnnnn.RGG
Routeing point file	Lists all routeing points.	4 Kb	RJRGnnnn.RGP
Node file	Lists all nodes (routeing points & interchanges).	4 Kb	RJRGnnnn.RGN
Map file	Lists all maps in section D of the NRG (plus the LO map).	5 Kb	RJRGnnnn.RGM
Link file	Lists all links (between nodes) appearing on any map.	180 Kb	RJRGnnnn.RGL
Permitted routes file	Lists all routes (between routeing points) permitted by section C of the NRG.	3 Mb	RJRGnnnn.RGR
Station-Link file	Lists physical distance between every pair of adjacent stations.	80 Kb	RJRGnnnn.RGD
Easement Text	Text information regarding an Easement.	25 Kb	RJRGnnnn.RGE
Easement Definition	Details of the type of easement and the affected TOCs, locations, etc.	60 Kb	RJRGnnnn.RGF
Easement TOC	TOC that publishes the easement.	3 Kb	RJRGnnnn.RGH
Routes	Route Details and Route Data.	15 Kb	RJRGnnnn.RGK
London Stations	Details of stations which are included in Cross London processing.	< 1k	RJRGnnnn.RGC
New Stations	New Stations file.	1 Kb	RJRGnnnn.RGX
Locations	Locations cross ref. File (CRS/NLC codes).	250 Kb	RJRGnnnn.RGY
Zonal routes	Lists zonal routes and the zones covered by those routes.	< 1k	RJRGnnnn.RGV
Zonal fare locations	Lists zonal fare locations and the zones covered by those locations.	< 1k	RJRGnnnn.RGB
Zonal system locations	Lists locations which are included in a zonal system, and the zones in which the location exists.	3.5 Kb	RJRGnnnn.RGA
Download Index	List of files in the download.	< 1k	RJRGnnnn.RGI

2.1.3 Each file will contain all appropriate records from the DTD NRG database. The files for the National Routeing Guide Data Feed are available as full files only (i.e. changes cannot be downloaded and imported into existing files).

2.1.4 The format of the files for the National Routeing Guide Data Feed is defined in the next section. These have taken into account all the necessary standards.

3. Key technical details

3.1.1 Output from the NRG Data Feed will comprise a number of separate CSV files containing data records. Each file will comprise an informational header, followed by an ordered sequence of records, followed by a terminator.

3.1.2 All records will be produced in ASCII.

3.1.3 Every line of every file will be either a comment (introduced by a leading '/' character) or a record. Each record will comprise of a sequence of fields separated by commas or in fixed character positions. For comma separated files where there is no data present in a field then the commas will be adjacent (i.e. not space filled).

3.1.4 Every file will commence with the following sequence of comments:

```
/!! Start of file
/!! Content type:  type
/!! Sequence:      nnnn        (incl. preceding zeroes)
/!! Generated:     dd/mm/yyyy
/!! Exporter:      DTD_module version
```

where type is one of:

- stations
- station-groups
- routeing points
- nodes
- maps
- links
- permitted routes
- station-links
- easement text
- easement definition
- easement TOC
- routes
- London station list
- new stations
- locations
- index
- zonal routes
- zonal system locations
- zonal fare locations

3.2 The sequence number listed in the header will match that in the filename (see above); the number of records reported will not include comment lines.

3.3 The records in each export file will be sorted in increasing order (according to the standard ASCII collating sequence) on all fields, in the order in which they appear in records.

3.4 Every file will terminate with a comment line of the form:

```
/!! End of file (nnnnnnn records) (dd/mm/yyyy)
```

thus providing some protection against inadvertent file truncation.

3.5 Start and end dates shall be converted into timestamps using the format below:

Field	Date	Timestamp equivalent
Start date	23-11-2020	23-11-2020 00:00:00
End date	31-12-2020	31-12-2020 23:59:59

4. File types

4.1 General

4.1.1 The following record layouts define the full file layouts. Note that file layouts may change in later versions of this document. In each of the output files the fields are comma separated, with empty fields having zero length. The 'Length' column in the tables shows the maximum length of the fields.

4.2 File: STATION

4.2.1 Description

4.2.1.1 All stations relevant to the National Routeing Guide are included in this file.

4.2.1.2 Stations that are routeing points, or members of station groups which are routeing points, will have no related routeing points. Other stations will have between 1 and 4 related routeing points as given in section B of the NRG.

4.2.1.3 Station-group identifier data is required for those stations in the station-groups defined in section A of the NRG.

4.2.2 Station record

Key	Field	Field Name	Length	Description
Y	1	STATION IDENTIFIER	3	Station Identifier (CRS code).
	2	ROUTEING_POINT_1	3	First related routeing point, either a station CRS code or a Routeing Guide Group code. No value will be specified in this field if the station is a routeing point.
	3	ROUTEING_POINT_2	3	Second related routeing point, if applicable, either a station CRS code or a Routeing Guide Group code.
	4	ROUTEING_POINT_3	3	Third related routeing point, if applicable, either a station CRS code or a Routeing Guide Group code.
	5	ROUTEING_POINT_4	3	Fourth related routeing point, if applicable, either a station CRS code or a Routeing Guide Group code.
	6	STATION_GROUP_ID	3	Identifies the Routeing Guide group in which the station resides, if applicable.

Example Records for Abbey Wood, Aberdeen (a routeing point), Aston (part of Birmingham group) and Stevenage (has 3 routeing points and is in Stevenage group).

```
ABW,DFD,G17,G01,,
ABD,,,,,
AST,,,,,G02
SVG,CBG,FPK,PBO,,G28
```

4.3 File: STATION GROUP

4.3.1 Description

4.3.1.1 This file does not include the list of stations which comprise the station group, as this data is present in the station records themselves.

4.3.2 Station Group record

Key	Field	Field Name	Length	Description
Y	1	STATION_GROUP_ID	3	3-character code, with format Gnn, where nn is 2 numeric characters.
	2	MAIN_STATION	3	The CRS code of the main station in the routeing point group.

Example station-group records:

```
G02,BHM                 / Birmingham Group
G09,DBY                 / Derby Group
```

4.4 File: ROUTEING POINTS

4.4.1 Description

4.4.2 This file contains a list of the routeing points and does not associate any other data with them.

4.4.3 Routeing Points record

Key	Field	Field Name	Length	Description
Y	1	ROUTEING POINT	3	This field contains either a CRS code, or a Station Group identifier.

Example routeing point records, for Aberdeen and Birmingham Group:

```
ABD
G02
```

4.5 File: NODE

4.5.1 Description

4.5.2 This file consists of a list of nodes (i.e. the routeing points and interchanges) and does not associate any other data with them.

4.5.3 Node record

Key	Field	Field Name	Length	Description
Y	1	NODE	3	This field contains either a CRS code, or a Station Group identifier.

Example node records, for Loughborough and Stevenage Group:

```
LBO
G28
```

4.6 File: MAP

4.6.1 Description

4.6.1.1 This file consists of a list of map codes, and does not associate any other data with them. An entry exists in this file for the map LO, which is used when validating journeys via Thameslink.

4.6.2 Map record

Key	Field	Field Name	Length	Description
Y	1	MAP_IDENTIFIER	2	A Routeing Guide map code, as defined in Section D of the NRG.

Example map records:

```
AS
BD
```

4.7 File: LINK

4.7.1 Description

4.7.1.1 The records in this file apply to routeing points and interchange points and define the links between the nodes which are represented on the maps in section D of the NRG.

4.7.1.2 Each link is directional, therefore each link record has a corresponding record with the start and end nodes reversed, which will also be explicitly included in the link file.

4.7.1.3 If a link appears on more than one map then a separate link record is required for each map which contains the link.

4.7.2 Link record

Key	Field	Field Name	Length	Description
Y	1	START_NODE	3	Either a CRS code or Station Group identifier which identifies a routeing point or interchange point.
Y	2	END_NODE	3	Either a CRS code or Station Group identifier which identifies a routeing point or interchange point.
Y	3	MAP_CODE	2	A map code, as identified in the MAP file.

Example link data, for Norwich to Peterborough, and Nuneaton to Birmingham:

```
G02,NUN,CN
G02,NUN,CS
NRW,PBO,CN
NUN,G02,CN
NUN,G02,CS
PBO,NRW,CN
```

4.8 File: PERMITTED ROUTES

4.8.1 Description

4.8.1.1 These records define the permitted routes between all pairs of routeing points which are defined in section C of the NRG.

4.8.1.2 The map sequence consists of an ordered list of map identifiers. The maps will appear in the correct geographical sequence so that the sequence defines a continuous route from the start routeing point on the first map to the end routeing point on the last map.

4.8.1.3 Permitted routes shown in the NRG as “LONDON” are represented by a map sequence consisting of the single map “LO”.

4.8.1.4 Each permitted route is directional so each permitted route has a corresponding record with the start and end routeing points and the map sequence reversed.

4.8.2 Permitted Routes record

Key	Field	Field Name	Length	Description
Y	1	START_ROUTEING_POINT	3	Either a CRS code or Station Group identifier which identifies a routeing point or interchange point.
Y	2	END_ROUTEING_POINT	3	Either a CRS code or Station Group identifier which identifies a routeing point or interchange point.
Y	3	MAP_CODE	2*n	One or more map codes which define a map sequence between the start and end routeing points. Where more than one map code exists, they are comma separated.

Example permitted routes data:

```
/ Bedford to Aberdeen
BDM,ABD,LO
BDM,ABD,MM,LM
BDM,ABD,MM,ER
BDM,ABD,LM
BDM,ABD,MM,PS,LM
BDM,ADB,MM,CN,LM
/ Ashford International to Bristol Group
ASI,G05,LO
ASI,G05,CS,WR
ASI,G05,CS,WE,CE
ASI,G05,CW,BD
```

4.9 File: STATION LINKS

4.9.1 Description

4.9.1.1 These records define the distances between the stations as represented on the Great Britain Passenger Railway Timetable map.

4.9.1.2 The distance format is of the form NN.NN where leading and/or trailing zeroes are not mandatory but the decimal place is.

4.9.1.3 Each station-link record is directional so each station-link record has a corresponding record with the start and end stations reversed.

4.9.2 Station Links record

Key	Field	Field Name	Length	Description
Y	1	START_STATION	3	CRS code of station.
Y	2	END_STATION	3	CRS code of station.
Y	3	DISTANCE	4 or 5	Mileage between start station and end station to the nearest hundredth of a mile.

Example station-link data for Kidsgrove to Alsager and Kidsgrove to Congleton:

```
KDG,ASG,2.34
KDG,CNG,5.63
```

4.10 File: EASEMENT DEFINITION

4.10.1 Description

4.10.1.1 This file contains details of the easements described in the Easement Text file. There are several record types in this file, each of which is identified by the RECORD_TYPE field.

4.10.2 Easement record

Key	Field	Field Name	Length	Description
Y	1	RECORD_TYPE	1	Value = 'E' (Easement).
Y	2	EASEMENT_REF	6	A unique identifier for this easement.
	3	START_DATE	8	The date from which this easement applies in the format ddmmyyyy.
	4	END_DATE	8	The date to which this easement applies in the format ddmmyyyy. A high date value 31122999 indicates that the easement applies until further notice.
	5	TEXT_REF	6	This identifies the textual description of this easement. Several easements may refer to the same textual description.
	6	EASEMENT_TYPE	1	Indicates the type of easement. Values are as follows: '1' = Sleeper. '2' = Disabled Passenger. '3' = Normal. '4' = Service Variation.
	7	EASEMENT_CLASS	1	Indicates whether the easement is a positive easement, or a negative easement. Values are as follows: '1' = Positive. '2' = Negative.
	8	CATEGORY	1	Indicates the category of the easement. Values are as follows: '1' = Local easement. '2' = Map easement. '3' = Routeing point easement. '4' = Doubleback easement. '5' = Fare route easement. '6' = Manual easement. '7' = Circuitous Route easement.
	9	VALID_DAYS	7	A flag for each day to indicate whether the easement applies on that day. The first flag represents Monday. Each flag has a value 'Y' or 'N'.
	10	START_TIME	4	The time of day from which the easement applies, in the format hhmm. There will be no value in this field if the easement applies at all times. Both START_TIME and END_TIME will be specified if relevant.
	11	END_TIME	4	The time of day to which the easement applies, in the format hhmm. There will be no value in this field if the easement applies at all times.

Example Easement record

```
E,000509,01012000,31122999,000001,3,1,1,YYYYYYY,,
```

4.10.3 Easement Location record

Key	Field	Field Name	Length	Description
Y	1	RECORD_TYPE	1	Value = 'L' (Easement Location).
Y	2	EASEMENT_REF	6	A unique identifier for this easement.
Y	3	LOCATION_CODE	3	CRS code identifying a location associated with the easement.
	4	LOCATION_MODIFIER	1	Indicates the type of location, as follows: '1' = Applicable location. The easement applies to journeys containing this location. '2' = Origin. The easement applies to journeys from this origin. '3' = Destination. The easement applies to journeys to this destination. '4' = Via. The easement applies to journeys via this location. '5' = Exclude. The easement applies to journeys which exclude this location. '6' = Doubleback Point. This location is the station to which a doubleback is allowed for doubleback easements. NOTE: There will also be an easement location record with LOCATION_MODIFIER set to 4 (Via) for the same location (for backwards compatibility).

Example Easement records

```
L,000509,NRW,1
L,000509,BUC,3
L,000509,CNY,3
L,000509,LGD,2
L,000509,GYM,2
```

4.10.4 Easement Details record

Key	Field	Field Name	Length	Description
Y	1	RECORD_TYPE	1	Value = 'D' (Easement Details).
Y	2	EASEMENT_REF	6	A unique identifier for this easement.
Y	3	DETAIL_REF	1	Indicates the type of detail for this easement, as follows. The type of code in the DETAIL_CODE field depends on the setting of this field. '1' = The easement applies when trains with this UID code are included in the journey. '2' = The easement applies to journeys using this TOC. '3' = The easement applies to tickets with this route. '4' = The easement applies to tickets with this ticket code.
Y	4	DETAIL_CODE	8	The value in this field depends on the value of the previous field. It may include a TOC code, Route code, Ticket code or Train UID.

Example Easement Detail records

```
D,000509,2,VT
D,000509,4,FOR
D,000509,4,FOS
```

4.10.5 Easement Exception record

Key	Field	Field Name	Length	Description
Y	1	RECORD_TYPE	1	Value = 'X' (Easement Exception).
Y	2	EASEMENT_REF	6	A unique identifier for this easement.
Y	3		1	Indicates the type of exception for this easement, as follows. The type of code in the DETAIL_CODE field dictates the setting of this field. '1' = The easement does not apply when trains with this UID code are included in the journey. '2' = The easement does not apply to journeys using this TOC.
Y	4		8	The value in this field depends on the value of the previous field. It may include a TOC code or Train UID.

Example Easement Detail record

```
X,000509,2,SR
```

4.11 File: EASEMENT TOC

4.11.1 Description

4.11.1.1 This file contains all the easement texts with details of the TOC publishing the easement text.

4.11.2 Easement TOC record

Key	Field	Field Name	Length	Description
Y	1	TEXT_REF	6	A unique identifier for this easement.
Y	2	TOC	2	The TOC code of the TOC which has raised the easement. May be set to spaces if this information has not been recorded.

Example record

```
000027,WW
```

4.12 File: ROUTES

4.12.1 Description

4.12.1.1 This file contains two record types.

4.12.1.2 The first indicates whether a particular route refers to London (either excludes or includes London). This information is required for cross-London processing to be handled correctly. There will always be a London Route record for routes which have route data records. There are no London Route records for those routes which do not have any Route Data (e.g. ANY PERMITTED).

4.12.1.3 The second record type contains details of the TOCs, modes of transport and locations included in the route descriptor. There is no Route Data record for those routes which do not include particular locations, TOCs or transport modes, e.g. DIRECT.

4.12.2 London Route record

Key	Field	Field Name	Length	Description
Y	1	ROUTE_CODE	5	A 5-digit route code which uniquely identifies this route.
Y	2	RECORD_TYPE	1	Value = ‘L’ (London Route).
	3	LONDON_MARKER	1	Indicates whether London is included in or excluded from the route. Values are: ‘0’ = the route excludes London. ‘1’ = the route MUST include London. ‘2’ = the route MAY include London (i.e. the route descriptor contains two locations, e.g. STRATFORD/LONDON, indicating that the journey must pass through Stratford OR London to be valid). ‘3’ = the route does not mention London (e.g. ROMFORD).

Example London Route record

```
/ Route 00202 (WATFORD NOT LOND)
/ Route excludes London
00202,L,0
```

4.12.3 London Data record

Key	Field	Field Name	Length	Description
Y	1	ROUTE_CODE	5	A 5-digit route code which uniquely identifies this route.
Y	2	RECORD_TYPE	1	Value = 'D' (Route Data).
Y	3	ENTRY_TYPE	1	One of the following values: 'A' = used with CRS code to indicate that the route description contains a list of locations ALL of which must be included in the journey for any fare with this route code to be valid. 'I' = used with CRS code to indicate that the route description contains a list of locations ANY of which must be included in the journey for any fare with this route code to be valid. 'E' = used with CRS code to indicate that the route description contains a list of locations ALL of which must not be included in the journey for any fare with this route to be valid. 'T' = used with TOC ID to indicate that the route description contains a list of TOC codes, which indicate which TOCs' trains must be used for at least one leg of a journey for any fare with this route to be valid. The inclusion of a TOC T value should not be deemed to exclude all TOC codes that are not listed. See 'X'. 'X' = used with TOC ID to indicate that the route description contains a list of TOC codes, which indicate which TOCs' trains must NOT be used on any leg of the journey for any fare with this route to be valid. 'L' = Used with Mode Code to indicate that the route description contains a transport mode which must be used by one of the legs on the journey. 'N' = Used with Mode Code to indicate that the route description contains a transport mode which must NOT be used by any of the legs of the journey.
Y	4	CRS_CODE	3	A value will be specified for entry types 'A', 'I' and 'E'.
Y	5	GROUP_MKR	1	'Y' or 'N' to indicate whether the CRS code represents an individual location (Value='N'), or one station in a routeing guide group (Value= 'Y'). If 'Y', then the whole of the group is included in the route (i.e. the route must include one of the locations in the group (for 'A' or 'I' type entries) or must exclude all the locations in the group (for 'E' type entries)).
	6	MODE_CODE	3	One of the valid mode codes, i.e. '000' = train. '001' = walk. '002' = bus. '003' = ferry. '004' = London Underground. '005' = transfer. '006' = metro. '007' = tram '100' = hovercraft. '101' = jetfoil.

				The Mode Code must be specified where Entry Type is 'L' or 'N'.
	7	TOC_ID		A value will be specified for Entry Types 'T' and 'X'.

Example Route Data

```
/ Route 00461 (AP BHAM RUGBY)
/ Route includes Birmingham and Rugby.  Birmingham is a routeing
guide group.
00461,D,A,BHM,Y,,
00461,D,A,RUG,N,,
```

4.13 File: LONDON STATIONS

4.13.1 Description

4.13.1.1 This file contains a list of the London stations required for Cross London processing. Each station has markers to indicate whether it is a London terminal, and whether cross-London transfer is permissible from or to this station.

4.13.2 London Station record

Key	Field	Field Name	Length	Description
Y	1	CRS_CODE	3	Station CRS code.
	2	LT_MARKER	1	'Y' or 'N' to indicate whether the station is a London Terminal.
	3	XLONDON_MARKER	1	'Y' or 'N' to indicate whether cross-London transfer is permissible from or to this station.

Example London Station record

```
/ London Blackfriars is a London terminal and also a location
from/to which cross London
/ transfer is permitted.
BFR,Y,Y
```

4.14 File: NEW STATIONS

4.14.1 Description

4.14.1.1 This file is used to hold new stations that have been created since NFM64 and shows the NFM station code that should be used when obtaining fares for Routeing Guide Fare checking.

4.14.2 New Station record

Key	Field	Field Name	Length	Description
Y	1	NFM64_STATION_CODE	3	The CRS code of the station for which fares exist in NFM64.
Y	2	NEW_STATION_CODE	3	The CRS code of the station for which fares did not exist in NFM64.

	3	START_DATE	8	The date from which this translation is effective, in the form ddmmyyyy.
	4	END_DATE	8	The date until which this translation is effective, in the form ddmmyyyy. If this field is set to a high date, 31122999, then this indicates that the record is effective until further notice.

Example New Stations data

```
/ new station code LTN is equivalent to LUT (when checking fares)
from 31st Dec 99 until further notice.
LUT,LTN,31121999,31122999
```

4.15 File: LOCATIONS

4.15.1 Description

4.15.1.1 This file is used to hold cross reference details between CRS and NLC codes.

4.15.2 New Station record

Key	Field	Field Name	Length	Description
Y	1	UIC_CODE	3	Admin Area Code for the location.
Y	2	NLC_CODE	4	NLC code for location. Fares in NFM64 are specified using the NLC code of the fare origin and destination.
	3	GROUP_CODE	4	Fares group code, which may be the same as the NLC code.
	4	CRS_CODE	3	The CRS code of the location.
	5	COUNTY_CODE	2	County code of the location.
	6	ZONE_CODE	4	Zone code of the location.
	7	START_DATE	8	The date from which this record is effective, in the form ddmmyyyy.
	8	END_DATE	8	The date until which this record is effective, in the form ddmmyyyy. If this field is set to a high date, 31122999, then this indicates that the record is effective until further notice.

Example Locations data

```
/ Melton Mowbray is not in a fares group and has no zone code.
70 ,1851,1851,MMO,20,,01011999,31122999
```

4.16 File: EASEMENT TEXT

4.16.1 Description

4.16.1.1 This file contains all the easement descriptions. It is linked with the Easement Details File, which contains all other data required for the application of the easement to a journey.

4.16.2 Easement Text record

Key	Field	Field Name	Length	Description
Y	1	TEXT_REF	6	A reference number which uniquely identifies the easement.
	2	EASEMENT_TEXT	2000	This is free format text with a maximum length of 2,000 characters. Any commas embedded in this text are part of the text; they are not to be considered record separators.

Example Easement data

```
/ An example easement.
000001, Customers travelling from the Great Yarmouth to Norwich line
(via ACLE) to the Lowestoft line may change at Norwich
```

4.17 File: ZONAL ROUTES

4.17.1 This file is no longer used and contains a header only.

4.18 File: ZONAL FARE LOCATIONS

4.18.1 This file is no longer used and contains a header only.

4.19 File: ZONAL SYSTEM LOCATIONS

4.19.1 This file is no longer used and contains a header only.

4.20 File: NRG Rules

4.20.1 This file described the rules that are utilised in the National Routeing Guide.

4.20.2 The NRG Rules are now found in Section 6 of this document.

4.21 File: NFM64

4.21.1 This is a single file of fares data that makes up the National Fares Manual Issue 64. These Fares are used as a Baseline by the Routeing Guide process for the fare checking rules. This is not a complete fare set; only records with TICKET_CODE 'SOS', 'SDS', 'SVS' and 'CDS' are included, as these are the only relevant fares to be checked by a Routeing Guide application.

4.21.2 The file name is nfm64, and it is compressed. Its file size is around 230mb.

4.21.3 Note that the header and footer records contained in the Data Feed files described in Section 2.1 are not included in this file.

4.21.4 As this is a large and static file it will not form part of the normal Data Feed but only be provided as a one-off load to new customers or by special request to existing customers via the DTD.

4.21.5 Each record in the NFM files has been simplified to contain only the data necessary for Routeing Guide use. The fares contained in this file are used by the routeing guide to determine the appropriate routeing point(s).

NFM64 Fare Records:

Key	Field Name	Length	Description
Y	FROM_NLC_CODE	4	The NLC code of the fare origin.
Y	TO_NLC_CODE	4	The NLC code of the fare destination.
Y	ROUTE_CODE	5	The route code pertaining to the flow.
Y	TICKET_CODE	3	The ticket code of the fare.
	FARE_PRICE	6	Fare price in pence.

5. Data feed service

5.1 Feed distribution

5.1.1 Data Recipients will receive ad hoc Routeing Guide Data Feeds, on days when the Routeing Guide service publishes a new version of the Routeing Guide Data.

5.1.2 New Recipients that begin the service will be provided with a one off full NFM64 file.

5.1.3 Fares data feeds are distributed to registered data recipients by the Data Transformation and Distribution Service (DTD). The DTD is a service owned by RDG.

5.1.4 The DTD provides the following delivery methods for Registered Data Feed Users to receive their feeds:

- SFTP Pull over the Internet from a publicly addressable and accessible SFTP server with the domain https://dtdportal.atocrsp.org.
- SFTP Push over the Internet from the DTD's SFTP Client to the Data Recipient's SFTP Server
- FTP Push over the internet from the DTD's FTP Client to the Data Recipients FTP Server

5.2 Feed file

5.2.1 The NRG feed is provided as a compressed zip file in version 2.0 of the zip file format and is readable using common zip applications such as WINZIP and UNZIP.

5.2.2 The following sizes of Feed Files can be used as a guide for Data Recipients to plan their connectivity resources:

File Type	Typical Size	Maximum Size
NRG File	1 – 2 MB	60 MB

5.2.3 The NRG Data Feed file (RJRG0nnn.Zip) is a manifest file for the feed and the Data Recipient should ensure that all files in the manifest file are present in the zip. The order of the files in the manifest file and in the zip file has no meaning and it is the Data Recipients responsibility to process the files according to their requirements.

5.3 Scheduling

5.3.1 The DTD receives NRG data from the Routeing Guide at around 7pm on an ad hoc basis and processes this data within one hour depending on the volume of NRG data received. On completion of the transformation process from XML to CSV, the DTD pushes the feed to Data Recipients or makes the data available for Data Recipients to pull.

5.4 Distribution configuration

5.4.1 Data Recipients can manage their FTP Server configuration details using the DTD Web Portal at https://dtdportal.atocrsp.org.

5.4.2 Data Recipients that require a resilient service can set up two SFTP or FTP servers and the DTD will distribute Fares Data to both servers.

5.4.3 The DTD SFTP service is a resilient service. If the infrastructure on which the service fails, the DTD will automatically start up another SFTP server instance on an alternative server at the same domain and IP address.

6. National Routeing Guide Rules

6.1 Definition of Terms

6.1.1 Stations

6.1.1.1 A station is a place at which a passenger rail journey can start or end, or at which a change of trains can be made. Each station has an associated 3-character CRS code.

6.1.2 Station-Groups

6.1.2.1 A station-group is a set of stations which are geographically close. Most stations are not in a station-group. No station is in more than one station-group. Each station-group will have an associated station-group code.

6.1.3 Routeing Points and Interchanges

6.1.3.1 Routeing points represent places on the railway network where different lines join and changes of train can readily be made. A routeing point may be either a station-group or else a station which is not in a station-group.

6.1.3.2 Any station which is not a routeing point, and not a member of a station group which is a routeing point has a set of related routeing points.

6.1.3.3 Interchanges represent other places on the railway network where different lines join, and changes of train can readily be made. Where stations are used in the fares system to determine routeing. For example, Evesham EVE, is an interchange used to identify routes for tickets priced on Route 00799 LONDON EVESHAM.

6.1.3.4 Routeing points and Interchanges are collectively known as nodes.

6.1.4 Map Links

6.1.4.1 A link is a section of a rail route between adjacent nodes.

6.1.4.2 Each link may be present on one or more maps. A link is directional, with a start node and an end node, therefore will occur in both directions on the relevant maps.

6.1.5 Maps

6.1.5.1 A map consists of a number of links. Each map has a 2 character map code.

6.1.6 Station-Links

6.1.6.1 A station-link is a section of line between two adjacent stations over which there is a passenger service. Each station-link has an associated distance, in miles to two decimal points. The distance data is used to calculate the shortest routes by rail between any two National Rail stations.

6.1.6.2 Currently there are no station links representing Elizabeth Line stations between London Paddington and London Liverpool Street or to Abbey Wood.

6.1.7 Journey

6.1.7.1 A journey is defined by an origin station, a list of intermediate stations (which may be empty) and a destination station.

6.1.7.2 At each station the following information is given:

- whether the train stops at the station or not.
- whether a change of train takes place at this station.

6.1.7.3 For each journey leg, the following information is also relevant

- the transport mode of the leg, (e.g. train or other means such as walk, bus)
- whether the train is a sleeper train
- whether the train is a London Underground train

6.1.7.4 A journey includes all intermediate stations where a stop is made, and must also include all intermediate stations at which a pass is made if the station is a routeing point or interchange point. Where the routeing point or interchange point is a station group, then the journey must include at least one of the stations in the group.

6.1.7.5 A journey-leg is a subset of the journey which is undertaken with no change of train, which may be:

- from the origin station to an intermediate station at which a change is made.
- between intermediate stations at which changes are made.
- from an intermediate station at which a change is made to the destination station.

6.1.7.6 Non-rail legs

6.1.7.6.1 Journeys may include legs by bus, ferry or walk as an alternative to a rail leg between adjacent stations, or between stations in the same station group.

6.1.7.6.2 Several situations need to be taken into consideration when handling non-rail legs:

- Distances between two stations on a non-rail leg will not be included in the station links distance data, which deals exclusively with distances between stations via rail. This means that if there is no station link information between the two locations, and that the length of a journey cannot be calculated accurately.
- No distance data is available for timetabled journeys by bus, ferry or other non-rail transport mode. In most cases Non rail legs are in the timetable data with times allocated to undertake the non-rail as part of an integrated journey enquiry.
- The stations at either end of the non-rail leg may not have the same associated routeing points in NRG. This may lead to journeys which do not pass through a valid ORP or DRP.
- The introduction of a non-rail leg in a journey may cause a problem with the interpretation of the NRG route maps, where the non-rail leg origin and destination do not appear on the same map, and the interchange between two maps cannot be determined.

6.1.7.7 Any non-rail legs can be stripped off from the start and end of the journey without checking that the locations on those legs are valid.

6.1.7.8 When calculating the actual length of a journey the length of any bus/ferry/walk leg can be considered to be zero. This will ensure that journeys including such legs are not considered longer than the shortest calculated route, unless of course the journey includes rail legs which themselves constitute a longer journey.

6.1.7.9 The shortest calculated route (including distance data for fixed legs, if present) should always be permitted. Any journeys which include a non-rail leg may be shorter than the shortest rail route and they should also be permitted if the non-rail leg is part of the permitted route.

6.1.8 NFM64 Fares (September 1996 fares)

6.1.8.1 To determine whether a routeing point found in a journey is valid, the fares between the routeing point and the journey origin/destination are compared with the fares for the overall journey. NFM64 Fares are always used in these comparisons.

7. General Rules

7.1 Classification of Journey Type

7.1.1 If there is no change of train at any intermediate location on the journey, then the journey is on a through train and is permitted. No further checks are required.

7.1.2 The journey is permitted if it is the shortest distance between the origin and destination, or is within a specified margin of the length of the shortest route, if an allowed margin has been specified. No further checks are required.

7.1.3 Currently the allowed margin is 3 miles.

7.1.4 If the journey origin is a station which is a routeing point, or is in a station-group which is a routeing point, then that routeing point is the only routeing point related to the origin. Otherwise the related routeing points are found from the NRG data model.

7.1.5 If the journey destination is a station which is a routeing point, or is in a station-group which is a routeing point, then that routeing point is the only routeing point related to the destination. Otherwise the related routeing points are found from the NRG data model.

7.1.6 If one or more of the routeing points related to the origin are also related to the destination, then the journey has common routeing points and its validity is checked according to the "Local Journey" rules defined in section 4.2.

7.1.7 The Origin Routeing Point (ORP) and Destination Routeing Point (DRP) applying to the journey are found. The ORP is the first station on the journey which is a routeing point related to the origin, or is in a station-group which is a routeing point related to the origin. .The DRP is the last station on the journey which is a routeing point related to the destination, or is in a station-group which is a routeing point related to the destination. If the journey has no ORP and no DRP, and the origin and destination have common routeing points, then the journey is a fully local journey. Otherwise, if the journey has no ORP, or no DRP, or the DRP precedes the ORP, then the journey is not permitted.

7.1.8 If there are no common routeing points, then the journey is then split into three part-journeys which are checked as follows:

- the part-journey from the origin to the ORP is checked according to the "Local Journey" rules defined in section 4.2. This part-journey does not occur if the journey origin is the ORP.
- the part-journey from the ORP to the DRP is checked according to the "Map Journey" rules defined in section 4.3.
- the part journey from the DRP to the destination is checked according to the "Local Journey" rules defined in section 4.2. This part-journey does not occur if the journey origin is the DRP.

7.1.9 The journey is permitted if all of the part-journeys are permitted.

7.2 Local Journey Rules

7.2.1 These are the rules which apply to a journey between origin and destination with common routeing points, or to a part-journey to or from a routeing point related to a station. Within this section the term Local Journey is used to refer to that journey or part-journey.

7.2.2 The Local Journey is permitted if one of the following conditions is satisfied:

- the Local Journey is on a through train
- the Local Journey is on a through train from the journey origin to a common routeing point and then on another through train from that common routeing point to the journey destination. Where several common routeing points exist, then the valid routeing point is the one which would result in the shortest journey, i.e. the permitted route is via the routeing point which would give the shortest distance journey via any of the routeing points.
- the Local Journey is via the shortest route.
- the Local Journey is via the shortest route except for deviations via stations which are in the same station-group as a station on the shortest route.
- the length of the Local Journey is within a specified margin of the length of the shortest route, if an allowed margin has been specified.
- the Local Journey is via the shortest route except for one valid doubleback through the journey origin and/or one valid doubleback through the journey destination.

7.2.3 For a small number of journeys there may be 2 or more possible “shortest routes” of equal length. In this case the journey is permitted if any of the above conditions are satisfied by any of these “shortest routes”.

7.2.4 Shortest Route

7.2.4.1 The shortest route between two stations is determined using the station-link data described in section 3.6.

7.2.4.2 If the Local Journey includes the same location twice, the shortest route condition will not be satisfied.

7.2.5 Deviations within a station-group

7.2.5.1 Deviations within a station-group are allowed except when the journey origin station or destination station is part of that station-group.

7.2.5.2 If the Local Journey includes a station which is in the same station-group as any station on the shortest journey (excluding any station-groups containing the origin and destination stations) then this is considered a permitted deviation from the shortest route.

7.2.5.3 This includes both deviations to stations not on the shortest journey, and double-backs between stations which are on the shortest journey.

7.2.6 Journey within allowed margin of shortest route

7.2.6.1 The Local Journey is permitted if the distance of the actual journey is within a specified margin of the distance of the shortest route, if an allowed margin has been specified.

7.2.6.2 Any deviations or double-backs within that station-group should not be included in the distance calculation. However, journeys involving a short doubleback will continue to be invalid, even if the doubleback distance is within the permitted margin.

7.2.7 Through Train

7.2.7.1 The Local Journey is considered as being on a through train if there is no change of train at any intermediate station on the Local Journey.

7.2.8 Deviations via valid doublebacks

7.2.8.1 In certain circumstances, a doubleback is permitted via the journey origin and/or destination.

7.2.8.2 If there is a doubleback through the journey origin, then it is valid provided that:

- The fare from the origin to the first change station is not more than the fare from the overall journey origin to the destination.
- The fare from the first change station to the destination is not more than the fare from the overall journey origin to the destination.
- The part of the journey from the first change station to the end of the Local Journey is itself a valid Local Journey, except that another doubleback through the journey origin is not permitted.
- Where the journey origin is in a station group, there is no doubleback through the origin station

7.2.8.3 If there is a doubleback through the journey destination, then it is valid provided that:

- The fare from the origin to the last change station is not more than the fare from the overall journey origin to the destination.
- The fare from the last change station to the destination is not more than the fare from the overall journey origin to the destination.
- The part of the journey from the start of the Local Journey to the last change station is itself a valid Local Journey journey, except that another doubleback is not permitted.
- Where the journey destination is in a station group, there is no doubleback through the destination station

7.2.8.4 When the Local Journey rules apply, it is not valid to pass through either the origin or destination more than twice.

7.2.9 Through trains to and from routeing point

7.2.9.1 The following rules apply to journeys which start and end at stations which are not routeing points, and pass through a routeing point station which is common to both the journey origin and journey destination. The routeing point station is either a routeing point or a member of a station-group which is a routeing point. The Local Journey is permitted if all of the following conditions are satisfied:

- The Local Journey does not include a change of trains
- the first change station is either a routeing point or a member of a station-group which is a routeing point.
- this routeing point is a related routeing point for the journey origin/journey destination.
- the Local Journey does not include any station twice, except for other stations in the same station-group as the change station.

7.2.9.2 The Local Journey is also permitted if all of the following conditions are satisfied:

- there are several changes of train on the Local Journey.
- all of the change stations are members of the same station-group which is a routeing point.
- this routeing point is a related routeing point for the journey origin/journey destination.
- the Local Journey does not include any station twice, except for other stations in the same station-group as the change stations.

7.2.9.3 When the journey origin and journey destination have two, three or four common routeing points then the journey is only permitted if the journey via the change station is shorter than the journey via any other common routeing point.

7.3 Map Journey Rules

7.3.1 These are the rules which apply to the part-journey from the ORP to the DRP. Within this section the term Map Journey is used to refer to that part-journey.

7.3.2 The Map Journey is permitted if all of the following conditions are satisfied:

- the ORP and DRP are appropriate for the journey.
- the Map Journey does not pass through any station twice.
- the Map Journey follows a permitted sequence of rail route maps.

7.3.3 ORP and DRP appropriate for the journey

7.3.3.1 The condition for the ORP and DRP to be appropriate for the journey depends on fares checks.

7.3.3.2 The ORP is appropriate if either the ORP is the same as the origin station, or if the fare from the ORP to the journey destination is not more than the fare from the journey origin to the journey destination.

7.3.3.3 The DRP is appropriate if either the DRP is the same as the destination station, or if the fare from the journey origin to the DRP is not more than the fare from the journey origin to the journey destination.

7.3.3.4 If either the ORP or the DRP is not appropriate then the journey is not permitted.

7.3.4 Journey does not pass through a station twice

7.3.4.1 The Map Journey is not permitted if it passes through any station more than once. However, if the Map Journey passes through a station which is in a station-group, other than station-groups containing the origin or destination, then it may pass through any sequence of stations in the same station-group, including repetitions, before reaching any other station which is not in that station-group.

7.3.4.2 Any journey which passes through the ORP or DRP more than once, is invalid.

7.3.5 Journey follows a permitted sequence of maps

7.3.5.1 This condition involves consideration of the nodes in the Map Journey.

7.3.5.2 The nodes in the Map Journey are identified as follows:

- any station in the Map Journey which is a node.
- any station in the Map Journey journey which is in a station-group which is a node.

7.3.5.3 The Map Journey links are identified as the links between each pair of consecutive nodes.

7.3.5.4 The Map Journey is valid if the Map Journey links follow any of the permitted routes between the ORP and the DRP.

7.3.5.5 Permitted routes are defined in terms of sequences of rail route maps. A sequence of maps may contain one or more maps. The Map Journey links follow the permitted route if the links can be allocated to the maps in the sequence in such a way that order is maintained (i.e. when a link is allocated to a map no link later in the journey is allocated to a map earlier in the sequence.) and that each map has at least one allocated link.

7.3.5.6 There may be one or more map sequence permitted between any pair of routeing points.

7.3.5.7 In some cases a permitted route will be defined as the special “via LONDON” map LO. In these cases the Map Journey is considered in two parts. The journey between the ORP and the first instance of the “London Group” node is compared with the permitted routes between the ORP and London Group, and the journey between the first instance of “London Group” and the DRP is compared with the permitted routes between the London Group and the DRP. The complete Map Journey follows the “via LONDON” permitted route if both parts of the journey follow a permitted route. If the nodes in a Map Journey do not include “London Group” then the journey does not follow the “via LONDON” permitted route.

8. Specific Rules

8.1 Elizabeth Line

8.1.1 Data for the Elizabeth Line between London Paddington and London Liverpool Street, and Abbey Wood is not included in the Routeing Guide data. Currently there are no station link distance data for Abbey Wood Crossrail ABX; Bond Street BDS; Canary Wharf CWX; Custom House CUS; Farringdon Crossrail FDX; London Liverpool street Crossrail LSX; Paddington Crossrail PDX; Tottenham Court Road TCR; Whitechapel Crossrail WCA; Woolwich WWC.

8.1.2 Timetable data timings are used to calculate journey plans. The services are treated by Journey planners as a fixed link “TUBE” service as defined in RSPS5046 Timetable data specification.

8.2 Journeys including sleeper services

8.2.1 A Map Journey link on a sleeper service is permitted on any map relevant to the Map Journey.

8.3 Journeys via Thameslink

8.3.1 When one of the journey legs is via a Thameslink service, between London St Pancras and London Blackfriars the following modifications to the general rules apply.

8.3.2 When the journey origin and destination have no common routeing point, and the permitted route from the ORP to the DRP is “via LONDON”, then a cross-London journey via a Thameslink service is permitted.

8.3.3 Valid Thameslink journeys are allocated to map LO. Any journey crossing London on a Thameslink service will include at least one station in the London Group.

8.4 Journeys via London Underground

8.4.1 Some modifications and additions to the general checks apply when one of the journey legs is via a London Underground service.

8.4.2 No common routeing points

8.4.2.1 Where the origin and destination station have no common routeing points, and the permitted route from the ORP to the DRP is “via LONDON”, then travel by London Underground is permitted from any station on the permitted route from the ORP to London, to any station on the permitted route from London to the DRP, provided the customer’s fare includes a cross London transfer.

9. Additional Rules

9.1 Route checking

9.1.1 Each current fare for a journey should be checked to ensure that it is valid for the journey, according to the above rules. However, the route descriptor associated with the fare may contain locations through which the journey must pass, or through which the journey may not pass for the fare to be valid.

- If the route description associated with the fare has **must include** or **must not include** locations, then the journey **must include** or **must not include** travel through those locations. In general these locations will be either routeing points or interchanges (see 3.3) to guarantee timings (including passing times) in timetables.
- If the route description associated with the fare has **must** include or **must not include** TOCs, then the journey **must** include those TOCs (one of the timetable legs of the journey must be provided by the listed TOCs) or **must not include** those TOCs (none of the timetable legs of the journey must be provided by the listed TOCs).

9.2 Journey Splitting

9.2.1 Application of the routeing guide to routed fares

9.2.1.1 If a routed fare is found to be invalid, then the journey can be split at the via locations contained in the route descriptor. Each part of the journey must follow a permitted route. If all part journeys are permitted, then the routed fare is valid, and the journey is deemed to be “split for routeing”.

9.2.2 Application of the routeing guide to zonal fares

9.2.2.1 When a zonal fare applies to a journey, then the routeing guide only applies to that part of the journey which is not within the zones included in the fare. That part of the journey which is not subject to ENRG checking should be disregarded, and only that part of the journey which requires to be validated is subject to the above rules. For example, on a journey from Walsall to Stratford the zonal fare “WALSALL to ZONE U345* LONDN” may apply. The fare is zonal because the fare destination is a zonal destination.

9.2.2.2 A fare will be deemed to be a zonal fare if specific zonal data exists for that fare. The zonal data will indicate to which zonal system the fare location or route relates, and which zones within that zonal system are included in the fare location/route. Any stations which exist within a zone must have zonal data so that the zones to which the stations belong can be recognised. If the zonal data does not exist, then the fare should be validated as if it is a non-zonal fare.

9.2.2.3 If a zonal fare applies to a journey, then the part of the journey which is within the zones is not subject to the standard routeing guide checking.

9.2.2.4 Journeys wholly within a zonal system

9.2.2.4.1 If the journey is wholly within the permitted zones for a fare, i.e. both origin and destination are within the same zonal system and included in the permitted zones, then the journey is valid if all the pass/stop events on the journey are covered by the permitted zones. The permitted zones are those associated with the fare origin location or the fare destination location or the fare route.

9.2.2.4.2 If all the pass/stop events on the journey are not covered by the permitted zones, then the journey is invalid.

9.2.2.5 Journeys where the origin is outside the zonal system

9.2.2.5.1 For journeys which commence outside the zonal system, where the fare destination is zonal, the Rail part of the journey should be validated, up to the first relevant station inside the zonal system. The first station pass/stop event which is in one of the zones covered by the zonal fare is the relevant station. The part of the journey from the journey origin to this station should be validated using NRG rules. All other pass/stop events in the journey must be included in the zones covered by the zonal fare destination.

9.2.2.6 Journeys where the destination is outside the zonal system

9.2.2.6.1 For journeys which terminate outside the zonal system, where the fare origin is zonal, the Rail part of the journey is validated, from the last relevant station inside the zonal system to the destination. The last station pass/stop event which is in one of the zones covered by the zonal fare is the relevant station. The part of the journey from this station to the journey destination should be validated using NRG rules. All other pass/stop events in the journey must be included in the zones covered by the zonal fare origin.

9.2.2.7 Journeys where a ticket route is via the zonal system

9.2.2.7.1 Some fares have zonal routes such as ZONE R1256 LONDN. For journeys where there is a fare with a route of this type the following validation is required.

9.2.2.7.2 The part of the journey from the origin to the first pass/stop event station inside the zonal system must be validated.

9.2.2.7.3 The part of the journey from the last pass/stop event station inside the zonal system must be validated.

9.2.2.7.4 Each of these journeys must be validated separately using the ticket type which is relevant for the overall journey. If both parts of the journey are valid, then the total journey is valid. No validation is required on the part of the journey which is within the zonal system, except to check that all pass/stop events are within the zones covered by the route description.

9.3 Related fares

9.3.1 Each current fare for a journey must be validated separately, because the appropriate routeing points for the journey may differ depending on the NFM64 fare prices for that ticket.

9.3.2 However, when a fare is validated, it may be possible to infer from the result of that validation that other fares are either valid or invalid, as shown below. This process does not apply to TOC Specific fares, whose prices may not be compared with non-TOC Specific fares.

- If the journey follows a permitted route, and no fare checks are required to determine the appropriate routeing points, then all the other fares for the journey are also valid, provided they include any via locations included in the route descriptor.
- If the journey does not follow a permitted route, and no fare checks are required to determine the appropriate routeing points, then all the unrouted fares are invalid (i.e. those which do not have explicit via locations in their route descriptor).
- If a routed fare is valid, then all unrouted fares with the same ticket code, which are equal to or dearer than this fare, are also valid.
- If the fare is a routed fare and the journey is permitted, but only after it has been “split for routeing”, then all unrouted fares, with the same ticket code, which are cheaper than this fare are not valid.

9.4 Cross London journeys

9.4.1 The fare for a journey may have a cross-London marker, which indicates that the fare includes cross-London transfer, if applicable. If the route descriptor associated with a fare includes LONDON, then the journey must include a London station. Where the journey does include a cross London transfer, the journey may cross London only between a given set of stations.

9.4.2 A journey across London includes a transfer using London Underground or Thameslink services between two of these London stations, i.e.

- London Underground journey legs are not permitted between stations which are not on the London list.
- Train journeys across London on Thameslink /St Pancras rail routes cross London if the pass/stop events for the journey include Farringdon ZFD and London Blackfriars BFR.

9.4.3 If the route descriptor associated with a fare excludes LONDON, then the journey may not pass through or stop at a London terminal, but may pass through or stop at any other station in the London Stations list which is not a London terminal.

9.4.4 In all cases, the journey is not valid unless it also follows a permitted route (or is valid when split, as described above).

9.5 Fare Checking

9.5.1 As part of the checking that valid origin and destination routeing points have been found, NFM64 Fares are used to determine whether the supplied journey contains a valid routeing point.

9.5.2 The ORP is permitted if the SOS, SDS, CDS or SVS fare from the origin routeing point to the destination is the same or lower than the fare of that type from the origin to the destination.

9.5.3 When the ORP is a station group, then the fares from all stations in the group must be found and the lowest fare price used for comparison.

9.5.4 The DRP is permitted if the SOS, SDS, CDS or SVS fare from the origin to the proposed destination routeing point is the same or lower than the fare of that type from the origin to the destination.

9.5.5 When the DRP is a station group, then the fares to all stations in the group must be found and the lowest fare price used for comparison.

9.5.6 Selection of fares for comparison

9.5.6.1 If the supplied origin and destination did not exist in NFM64, then a different CRS code for the station should be substituted All stations opened since NFM64 are mapped to a station that existed in NFM64 for fares checking purposes. For example Soham SOJ is NFM64 mapped to Kennett KNE.

9.5.6.2 When fares are compared, fares with the same ticket type must be compared with each other, except in the case of SOS/SDS ticket types. An SOS fare can be compared with an SDS fare.

9.5.6.3 The table below shows an example; the route of the supplied fare is 99999. Route 00000 is route “ANY PERMITTED”.

Routes between origin and destination	Routes between routeing point and origin/ destination	Comparison rules

(Set 1)	(Set 2)	
99999 00000	99999 00000	Compare fares on the supplied route.
99999 00000	00000 55555	Compare fares for route 00000
99999	55555	Compare route 99999 on Set 1 with route 55555 on Set 2.
99999 22222	55555 66666	Determine which route in each fare set gives the CHEAPEST fare for the required ticket. Compare those fares.

9.5.6.4 If a routeing point is a station group, then it is necessary to check the fares to or from each station in that group.

10. The application of easements to journeys

10.1 Easements are defined as either positive easements or negative easements.

10.2 Positive easements can be applied to a journey which has failed the ENRG rules, in order to change its validity. Where a journey contains several “errors”, an easement is required for each in order to make the journey valid.

10.3 Negative easements include details of locations which may NOT be included in a journey.

10.4 Easements may be defined which apply to Sleeper journeys only, disabled passengers only, service disruptions, or they may be normal easements, as published in the NRG. All easements have effective start and end dates, between which the easement is to be applied.

10.5 Optional Easement data includes the following:

- The TOCs to which the easement applies
- The days of the week on which the easement applies
- The times of day between which the easement applies
- Any routes codes, ticket types or train UIDS to which the easement applies
- Any TOCs or trains to which the easement does not apply

10.6 All easements have at least one associated location. The locations associated with an easement are categorised as follows:

10.7 **Applicable location.** The easement must have at least one applicable location. At least one of these locations must be included in the journey for the easement to apply.

10.8 **Origin location.** The easement may have several origin locations. If origin locations are specified, then one of these locations must be the journey origin for the easement to apply.

10.9 **Destination location.** The easement may have several destination locations. If destination locations are specified, then one of these locations must be the journey destination for the easement to apply.

10.10 **Via location.** The easement may have several via locations. If via locations are specified, then all of these via locations must be included in the journey for the easement to apply.

10.11 **Exclude location.** The easement may have several exclude locations. If exclude locations are specified, then the easement does not apply if any of these locations is included in the journey.

10.12 Positive easements

10.12.1 The following table shows the validation errors which may be corrected by the application of an appropriate positive easement.

10.12.2 Where the conditions for the application of the easement are satisfied, then the easement can be applied to the journey.

Validation Error	Easement Type	Conditions for application of easement
Fare check error when checking doubleback through origin station	LOCAL	The doubleback point is included in the easement as the applicable location for the easement.
Fare check error when checking doubleback through destination station	LOCAL	The doubleback point is included in the easement as the applicable location for the easement.
Repeated station found in the journey, including doublebacks in the origin or destination group.	DOUBLEBACK	The repeated station is included in the easement as the applicable location for the easement.
Map Journey does not follow given map sequences	MAP	The point at which the journey departs from the map routes is included in the easement as the applicable location for the easement.
Local Journey does not follow a permitted route	LOCAL	Either the ORP station or the DRP station is included in the easement as the applicable location for the easement.
Fare check error when checking that the origin routeing point is the correct ORP for the journey	ROUTEING POINT	The ORP station is included in the easement as the applicable location for the easement
Fare check error when checking that the destination routeing point is the correct DRP for the journey	ROUTEING POINT	The DRP station is included in the easement as the applicable location for the easement
A journey with a common routeing point is not via the point which would give the shortest journey.	LOCAL	The common routeing point station is included in the easement as the applicable location for the easement.
Fare did not pass the route check	FARE ROUTE	The journey follows a permitted route after any other positive easements have been applied. The location through which the journey is permitted to pass (instead of the location named on the route descriptor) is included in the easement as the applicable location for the easement.
Journey did not contain an origin routeing point	LOCAL	The origin station is included in the easement as the applicable location for the easement.
Journey did not contain a destination routeing point	LOCAL	The destination station is included in the easement as the applicable location for the easement.

10.13 Negative easements

10.13.1 If a negative easement applies to a journey, then the journey is not valid. The application of negative easements allows TOCs to:

- disallow “valid” doublebacks through the origin and destination as defined in Section 4 above.
- disallow routes which are permitted according to Map Journey processing rules, when the journey would follow a circuitous route on a permitted map.
- disallow routeing points which are permitted because the fares are equal to or lower than the overall journey.

Validation	Easement Type	Conditions for application of easement
Fare check was successful when checking doubleback through origin station	LOCAL	The doubleback point is included in the easement as the applicable location for the easement.
Fare check was successful when checking doubleback through destination station	LOCAL	The doubleback point is included in the easement as the applicable location for the easement.
Journey validation is successful.	CIRCUITOUS ROUTE	The point which should NOT be permitted in the journey is included in the easement as the applicable location for the easement.
Fare check was successful when checking that the origin routeing point is the correct ORP for the journey	ROUTEING POINT	The ORP station is included in the easement as the applicable location for the easement
Fare check was successful when checking that the destination routeing point is the correct DRP for the journey	ROUTEING POINT	The DRP station is included in the easement as the applicable location for the easement

End.