Irish National NeTEx Profile
for exchanging Irish Stop & Timetable data

Part 2 – Data Mappings
Version 1.0

Document Control Log

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1 Introduction

This document describes the mappings of existing Irish public transport data sets to the Irish NeTEx profile (EIRE_NP). It accompanies the main profile specification document describing the Irish NeTEx profile elements.

The Irish NeTEx profile specifies how to encode Irish stop and timetable data using NeTEx XML, the common European format for the exchange of public transport data. See the main profile specification document *Irish National NeTEx Profile – Part1 Specification f*or further details.

The document is accompanied by examples of Irish public transport data for different modes of transport encoded as NeTEx XML.

1.1 Related document

This document is in effect an appendix to the main *Irish National NeTEx Profile – Part1 Specification,* providing specific detail on the mapping of data elements from specific formats. The Part1 document should be read first. It provides a description of the profile elements as well as uses cases, terminology, validation rules, etc.

1.2 Normative references

The profile is based on a number of CEN standards as given in the normative references below, this document also references a number of legacy data formats from which the data is mapped – for a summary of these see the bibliography at the end.

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

NTA

- EIRE_NP, *Irish National NeTEx Profile – Part1 Specification.*

CEN

- EN 12896, Road transport and traffic telematics - *Public transport - Reference data model* (*Transmodel*) Parts 1 to 9.
- CEN/TS 16614-*1 Network and Timetable Exchange (NeTEx) - Network description.*
- CEN/TS 16614-2 *Network and Timetable Exchange (NeTEx) - Timing information.*
- CEN/TS 16614-*3 Network and Timetable Exchange (NeTEx) - Fare description.*
- CEN/TS 16614:PI *Network and Timetable Exchange (NeTEx)— Passenger Information European Profile*
- EN 15531-1, *Public transport - Service interface for real-time information relating to public transport operations - Part 1: Context and framework.*
- EN 15531-2, *Public transport - Service interface for real-time information relating to public transport operations - Part 2: Communications infrastructure.*
- EN 15531-3, *Public transport - Service interface for real-time information relating to public transport operations - Part 3: Functional service interfaces.*

- CEN/TS 15531-4, *Public transport - Service interface for real-time information relating to public transport operations - Part 4: Functional service interfaces: Facility Monitoring.*
- CEN/TS 15531-5, *Public transport - Service interface for real-time information relating to public transport operations - Part 5: Functional service interfaces - Situation Exchange.*

UK Department of Transport (DfT)

- *NPTG & NaPTAN Schema Guide v2.5 2014*

The NeTEx XML schema can be downloaded from http://netex-cen.eu, along with available guidance on its use, example XML files, and case studies of national and local deployments.

See also bibliography at end.

1.2.1 Presentation Conventions in the text

NeTEx follows certain conventions for presentation of technical terms within text; in particular this helps to distinguish the use of the same concept at different levels of abstraction (informal use, conceptual model, physical model, XML schema, etc). These conventions are given in detail in the Profile Part1 specification document but two key points are repeated here:

- Transmodel conceptual model elements are shown in UPPER CASE, for example “LINE”, “SCHEDULED STOP POINT”, “TYPE OF TARIFF”. If required to be in the plural, a lower case is used; for example, “SCHEDULED STOP POINTs”, “TYPEs OF TARIFF”.
- Concrete XML elements from the NeTEx schema are shown in bold italic, *for* example, ***Line, TypeOfTariff***. Compound names are camel cased without a space and are never pluralised, e.g. “***ScheduledStopPoint***”. The NeTEx element names correspond word for word with their corresponding Transmodel entities.

1.3 The structure of this document

Separate sections describe the mappings from each of the different legacy formats for different types of data.

1. **Operators** (NOC)
2. **Localities** (NPTG)
3. **Stops** (NaPTAN(
4. **Timetables**
   - GTFS.
   - VDV452
   - HRDF data
5. **Accessibility** (PTIMS-UD Rating)

2 Overview of the Mapping of existing Irish data sets to NeTEx

This introductory summary is repeated from the part1 specification

2.1 Use of the profile with Irish public transport data

The Irish NeTEx profile is intended to facilitate the creation of an Irish National Access Point (NAP), providing a central definitive source of transport data for national and international use.

A specific purpose of the Irish profile is thus to show how existing Irish stop and timetable data can be exchanged in a NeTEx XML document that is conformant with the common European Passenger Information profile.

The data comes from a variety of different legacy Irish data sets:

- **Operator data** comes from the Irish NOC data set. It is also possible to export operator data from the current NTA database. Operator data of individual operators is also given in specific individual timetables.
- **Place data:** comes from the Irish NPTG data set provides a gazetteer of place (e.g. cities, towns and villages) s in Ireland served by public transport. This includes names in both English and Gaelic.
- **Stop data for** comes from NaPTAN. Note that bus and tram data is held as on street NaPTAN StopPoints. Rail, and Coach stations are indicated by a NaPTAN ***StopArea.***
- **Stop data for rail** also comes from Irish rail – using UIC codes for stops
- **Timetable data** comes in several different formats.
    - **Bus & Ferry:** Data: primarily VDV452 from the NTA database
    - **Tram**: available in GTFS format.
    - **Rail:** in HaFas format (The proprietary format for Hacon Gmbh – with similar content to VDV462) from Irish Rail.
- Accessibility attributes from the Inspire Transport Networks theme can also be integrated.

2.2 General differences between Irish PT Data schemas and NeTEx

There are a number of general differences between NeTEx and the various legacy Irish data formats such as NPTG, NaPTAN.

- NeTEx uses a single schema, with different types of specific version frames (***ServiceFrame***, ***TimetableFrame***, etc.), rather than having different schemas for each data set as have NPTG, NaPTAN, or separate files for each record type, as do GTFS and HaFas.
- Most NeTEx data attributes are optional, including a number that are mandatory in NPTG and NaPTAN.
- As well as having fixed enumerations to classify stops and other elements, NeTEx allows for open-ended code enumerations to classify many entities. These can be used to retain the legacy Irish classifications in a NeTEx data set to facilitate “round-trip” exchange.
- NeTEx uses uniform mechanisms for assigning responsibility for data elements that are more general than the Administrative Areas of the NPTG.

3 Mapping Irish Operator data to NeTEx

NeTEx can be used to exchange data about operators, authorities and other stakeholders.

There are two main use cases for the exchange of operator data.

- The exchange of information about all Irish Public Transport operators as a reference data set for validation and other purposes.
- The exchange of timetables including information about the individual operators providing each timetable.

3.1 Use of Operator data

Operator data is used with passenger information to indicate the providers and operators of services and to give contact details for answering queries and complaints.

The EIRE_NP profile includes basic data about operators, taken from the existing Irish *National Operator Code* (NOC) database.

- The NeTEx profile also be used to exchange the entire operator data set as a single NeTEx XML document (using an EI_PI_NETWORK OFFER document.
- NeTEx Timetable documents conformant to the profile must contain OPERATOR data for the operator providing the service.

In practice, datasets for timetables and fares are usually provided by and specific to a given operator, so the use of unique operator identifiers is convenient for establishing unique codespaces for such data.

3.2 Mapping NOC Operator data to NeTEx

Details about the OPERATOR or AUTHORITY providing a service or operating a station (NeTEx STOP PLACE) can be specified using the NeTEx ***Operator*** Element

The mapping of an OPERATOR to NeTEx is straightforward:

- A NOC ***Operator*** is equivalent to a NeTEx ***Operator,*** which has similar attributes for name, address, contact details etc.

NB☞ In the EIRE_NP, the NOC identifier should be used to identify the OPERATOR in timetables etc.

3.2.1 Example of Mapping NOC Operator data to NeTEx OPERATOR

NeTEx XML EXAMPLE of an OPERATOR

The following shows am Irish NOC operator coded in NeTEx

```
<Operator version="any" id="868" changed="2018-08-20T10:23:00">
    <Name>Kealy's Coach Hire</Name>
    <ShortName>Kealy's</ShortName>
    <LegalName>Kealy's Coaches Ltd</LegalName>
    <TradingName>Kealy's Coaches Ltd</TradingName>
    <typesOfOrganisation>
        <TypeOfOrganisationRef version="any" ref="70-PTSR"/>
    </typesOfOrganisation>
    <Address version="any" id="868">
        <AddressLine1>Lislehane</AddressLine1>
        <Town>Mallow</Town>
        <Suburb>Cullen</Suburb>
        <Province>Co.Cork</Province>
```

```
    </Address>
    <PrimaryMode>coach</PrimaryMode>
        </Operator>
```

3.3 Mapping NOC Operator responsibilities to NeTEx

Transmodel and NeTEx provide a general-purpose mechanism for indicating the roles and responsibilities of operators in providing and managing data and services – the RESPONSIBILITY SET. A RESPONSIBILITY SET is made up of one or more RESPONSIBILITY ROLE ASSIGNMENTs, each describing a specific role for an OPERATOR or other ORGANISATION.

This can be used to provide an equivalent to the NPTG ***AdminArea*** concept to indicate who is responsible for specific items of data (and also be used more widely for other types of data and additional responsibilities)z

The mapping of an OPERATOR to a NeTEx i RESPONSIBILITY SET is straightforward:

- For each NOC ***Operator***, a RESPONSIBILITY SET is created. The RESPONSIBILITY SET can be indicated on a VERSION FRAME or individual element within a frame.

3.3.1 Example of Mapping NOC Operator data to NeTEx RESPONSIBILITY SET

An operator definition is placed in a ***ResourceFrame***. The following example shows also the of a ***ResponsibilitySet*** for the OPERATOR in NeTEx. This may be referenced in other frames or elements as illustrated after below.

NeTEx XML EXAMPLE of a RESPONSIBILITY SET for an OPERATOR

```
<ResourceFrame version="1.6" id="epd:EI:PHBS:ResourceFrame_IE_PI_COMMON:Phoebus:phb”>
    <Name>Operator specific common resources</Name>
    <TypeOfFrameRef ref="eix:EI:NTA:TypeOfFrame:EI_PI_COMMON:EIRE_NP"
versionRef="eix:v1.0"/>
    <codespaces>
        <Codespace id="phb_data">
            <Xmlns>mb</Xmlns>
            <XmlnsUrl>http://www.phoebus.ei/</XmlnsUrl>
            <Description>Phoebus data</Description>
        </Codespace>
    </codespaces>
    <dataSources>
        <DataSource id="phb:phoebus" version="1.0">
            <Email>feedback@phoebus.ei</Email>
        </DataSource>
    </dataSources>
    <!-- ========Responsibility Sets========== -->
    <responsibilitySets>
        <ResponsibilitySet version="1.0" id="phb:tariffs">
            <Name>Operator Tariffs</Name>
            <roles>
                <ResponsibilityRoleAssignment version="1.0"
id="phb:tariff_data@creates">
                    <DataRoleType>creates</DataRoleType>
                    <StakeholderRoleType>FareManagement</StakeholderRoleType>
                    <ResponsibleOrganisationRef ref="noc:PHBS"
                        version="1.0">Phoebus</ResponsibleOrganisationRef>
```

```
                </ResponsibilityRoleAssignment>
            </roles>
        </ResponsibilitySet>
        <ResponsibilitySet version="1.0" id="phb:timetable_data">
            <Name>Operator data</Name>
            <roles>
                <ResponsibilityRoleAssignment version="1.0" id="phb:timetable@creates">
                    <DataRoleType>creates</DataRoleType>
                    <StakeholderRoleType>Planning</StakeholderRoleType>
                    <ResponsibleOrganisationRef ref="noc:PHBS"
                        version="1.0">Phoebus</ResponsibleOrganisationRef>
                </ResponsibilityRoleAssignment>
            </roles>
        </ResponsibilitySet>
    </responsibilitySets>
    <!--==== CODE VALUES ==== -->
    <typesOfValue>
        <ValueSet version="1.0" id="phb:Branding" classOfValues="Branding">
            <Name>Operator Branding</Name>
            <values>
                <Branding version="1.0" id="phb:Phoebus@brand">
                    <Name>Phoebus</Name>

    <Url>https://www.phoebus.ei/static/images/colorways/phoebus/logo.png</Url>
                </Branding>
            </values>
        </ValueSet>
    </typesOfValue>
    <organisations>
        <!-- ==== ORGANISATIONS ==== -->
        <Operator version="1.0" id="noc:PHBS">
            <PublicCode>PHBS</PublicCode>
            <Name>Phoebus</Name>
            <ShortName>Phoebus</ShortName>
            <TradingName>Phoebus Ltd</TradingName>
            <ContactDetails>
                <Phone>01293 449191</Phone>
            </ContactDetails>
            <OrganisationType>operator</OrganisationType>
            <Address>
                <Street>Wheatstone Close</Street>
                <Town>Crawley</Town>
                <PostCode>RH10 9UA</PostCode>
                <PostalRegion>West Sussex</PostalRegion>
            </Address>
            <PrimaryMode>bus</PrimaryMode>
        </Operator>
    </organisations>
</ResourceFrame>
```

NeTEx XML EXAMPLE of reference to a RESPONSIBILITY SET for an OPERATOR

```
    <TimetableFrame id="epd:EI:PHBS:SiteFrame_IE_PI_LINE_OFFER:Line3:phb"
            version="napt:data_1.0" responsibilitySetRef=" phb:timetable_data">
        <Name>Stop and Stop Area data - Area 822</Name>
        <TypeOfFrameRef ref="eix:EI:NTA:TypeOfFrame:EI_PI_LINE_OFFER:EIRE_NP"
                versionRef="eix:v1.0"/>
```

```
        <FrameDefaults>
            <DefaultCodespaceRef ref=" phb_data "/>
            <DefaultResponsibilitySetRef ref=" phb:timetable_data 2" version="any"/>
        </FrameDefaults>
:::::Frame contents
```

3.1 Mapping of Operator attributes

The following table summarise the mapping of elements from the existing Operator spreadsheet to NeTEx.

Table 1 Irish Noc Data mapping to NeTEx

NOC column	NeTEx element	
Identifier	#id	
NO Code	<TradingName>	
Name	<Name>	
Display (passenger information)	<ShortName>	
AVM number	NOT USED	
Company	<LegalName>	
Operating branch	Reference to a TYPE OF ORGANISATION	
Branch offices	<ContactPerson>, <Address>	
VAT ID exists	NOT USED	
Data supplier	<ownResponsibilitySets><ResponsibilitySetRef>	
Last modified	#changed (attribute)	
NO Code (GD)	NOT USED	
Name (GD)	NOT USED	Not used
Display (passenger information) (GD)	NOT USED	Not used

In the current spreadsheet the Operating Branch is used to indicate a classification. In NeTEx this is TYPE OF ORGANISATION ?

Table 2 Irish Noc Operating Branch codes Mapping to NeTEx

NOC column	NeTEx element
Operating branch code	#id
Value	
Name	<Name>

4 Mapping Irish NPTG locality Data to the profile

The Irish National Public Transport Gazetteer (NPTG) provides details about places served by Public Transport in Ireland. In particular it provides canonical place names in English and Gaelic, and spatial coordinates. These can be used by journey planners to find services for an area and to provide definitive names for stops and places. The NPTG also provides a data set of Administrative areas for the distributed management of NaPTAN stop data.

This section discusses the mapping of NPTG data to the basic profile.

4.1 Use of NPTG data

There are two main use cases for the exchange of NPTG data.

- The exchange of all Irish NPTG data as a reference data set for validation and other purposes
- The exchange of references to localities as part of NaPTAN stop data.

The EIRE_NP profile shows how the existing Irish National data sets for places (NPTG) can be exchanged as XML documents conforming to the profile.

It also shows how references to NPTG localities can be encoded with NeTEx stop data.

4.2 Summary of Irish NPTG Data Mapping

The following is a summary of mapping of Irish NaPTAN Stop data to NeTEx:

- An NPTG ***NptgLocality*** is mapped to a NeTEx TOPOGRAPHIC PLACE.
- An NPTG ***AdministrativeArea*** is mapped to a TRANSPORT ADMINISTRATIVE ZONE, together with a RESPONSIBILITY SET that indicates the ORGANISATION responsible for managing data for the area and one or more CODESPACE ASSIGNMENTs to indicate the code prefix to use for stops in the zone.

4.2.1 Codespaces for NPTG data

The following codespaces should be used for NaPTAN data (in addition to the NPTG codespaces) in order to indicate the coding system for identifiers and the scope of their uniqueness.

Table 1 — Codespaces for NaPTAN data

Prefix	Codespace	URL	NPTG elements	NeTEx
nptgLocality	naptStop_data	*nptg.org.uk/locality*	*(***NptgLocality***)*	***StopPlace*** ***ScheduledStopPoint***
nptgAdminArea	naptAdmin_data	*nptg.org.uk/admin*	NPTG registrar data (***Country, Region, District, AdministrativeArea***)	*TransportAdministrativeZone,* *ResponsibilitySet* *Organisation, OrganisationalUnit*
nptg:	nptg_metadata	*nptg.org.uk/nptg*	***NptgLocality***	TypeOfPlace
			BusStopType	TypeOfPlace

4.1 Overall organisation of NPTG data in NeTEx

A NeTEx RESOURCE FRAME is used to group the definitions of ORGANISATIONs and their TRANSPORT ADMINISTRATIVE ZONEs.

TOPOGRAPHIC PLACEs are exchanged in a NeTEx SITE FRAME.

A single document containing a RESOURCE FRAME and a SITE FRAME within a NeTEx COMPOSITE FRAME can be used to exchange the entire NPTG Data set.

4.1.1 Example of Mapping NPTG data in Frames

NeTEx XML EXAMPLE of a RESPONSIBILITY SET for an OPERATOR

The following example show an outline organisation of frames for NPTG stop data.

```
    <CompositeFrame version="1" id="epd:EI:NPTG:CompositeFrame_IE_PI_ NETWORK
_OFFER:ALl:nptg"
                responsibilitySetRef="napt:stop_data" dataSourceRef="napt:NTA">
        <Name>Sample extract of NPTG data encoded a in NeTEx</Name>
    <TypeOfFrameRef ref="eix:EI:NTA:TypeOfFrame:EI_PI_NETWORK_OFFER:EIRE_NP"
versionRef="eix:v1.0"/>

 :::::
        <frames>
            <!--- ONE FRAME PER ADMIN AREAS -->
            <SiteFrame id="epd:EI: NPTG:SiteFrame_IE_PI_NETWORK:all:nptg"
                    version="nptg:data_1.0" responsibilitySetRef="nptgAdminArea:NPTG"
                    dataSourceRef=" nptg:NTA">
                <Name>Stop and Stop Area data - Area 822</Name>
                <TypeOfFrameRef ref="eix:EI:NTA:TypeOfFrame_IE_PI_STOP:EIRE_NP"
                    version="eix:v1.0"/>
                <FrameDefaults>
                    <DefaultCodespaceRef ref="nptgLocation_data"/>
                    <DefaultDataSourceRef ref="nptg:NTA" version="nptg:v2.4"/>
                    <DefaultResponsibilitySetRef ref="nptgAdminArea:NPTG"
version="nptg:v2.4"/>
                </FrameDefaults>
                <topographicPlaces>
            ::::::::: etc etc
                </topographicPlaces >
                </SiteFrame>
            <           <ResourceFrame version="nptg:NPTG_data_1.0"
id="nptg:AdminAreas" responsibilitySetRef="nptg:NPTG_data" dataSourceRef="nptg:NTA">

            ::::::::: etc., etc.

            <ResourceFrame version="nptg:NPTG_data_1.0" id="nptg:AdminAreas"
responsibilitySetRef="nptg:NPTG_data" dataSourceRef="nptg:NTA">
                    <!--
========================================================================= -->
                    <Name>Admin areas for NPTG data</Name>
                    <TypeOfFrameRef ref="nptg:NPTG_profile@admin_context"
versionRef="nptg:v2.1"/>
                    <codespaces>
                        <Codespace id="nptgAdministrativeArea">
                            <Xmlns>nptgAdministrativeArea</Xmlns>
                            <XmlnsUrl>http://www.nptg.org.uk/adminAreas</XmlnsUrl>
                            <Description>EIRE National Public Transport gazetteer.
Codes of administrative areas, are unique within the EIRE.</Description>
                        </Codespace>
                        <Codespace id="nptgRegion_data">
                            <Xmlns>nptgRegion</Xmlns>
                            <XmlnsUrl>http://www.nptg.org.uk/regions</XmlnsUrl>
                            <Description>EIRE National Public Transport gazetteer.
Codes of regions unique within the EIRE.</Description>
                        </Codespace>
                    </codespaces>
                    <FrameDefaults>
                        <DefaultCodespaceRef ref="nptgAdministrativeArea"/>
                        <DefaultDataSourceRef ref="nptg:NTA" versionRef="nptg:v2.1"/>
                        <DefaultResponsibilitySetRef ref="nptg:NPTG_metadata"
versionRef="nptg:v2.1"/>
                    </FrameDefaults>
                    <versions>
```

```
                        <Version id="nptg:NPTG_data_1.0" version="any">
                            <Description>NPTG data version </Description>
                        </Version>
                    </versions>
                    <!-- === ADMIN AREAs===== -->
                    <organisations>
                        <!--- EIRE REGIONs -->
                        <GeneralOrganisation id="nptg:NPTG" version="nptg:v2.1">
                            <Name>Overall Management of Nptg codes</Name>
                            <parts>
                                <OrganisationPart created="2011-01-18T11:54:31"
changed="2011-01-18T11:54:31" version="0" id="nptgRegion:CON">
                                    <Name lang="EN">Connaught</Name>
                                    <administrativeZones>
                                        <TransportAdministrativeZone created="2011-01-
18T11:54:31" changed="2011-01-18T11:54:31" version="0" id="nptgRegion:CON">
                                            <Name lang="EN">Connaught</Name>
                                            <subzones>
:::::::::
                                            </subzones>
                                        </TransportAdministrativeZone>
                                    </administrativeZones>
                                </OrganisationPart>

            <ResourceFrame
            </frames>
    <CompositeFrame>
```

4.2 Mapping of NPTG Data elements to NeTEx

4.2.1 NPTG: NptgLocality / NeTEx TopographicPlace Attribute mapping

Table 3 Mapping of attributes from NPTG Locality element

NPTG Element	NPTG Attribute	NeTEx element	NeTEx attribute	Type
NptgLocality	***CreationDateTime***	***TopographicPlace***	***created***	*xsd:dateTime*
	ModificationDateTime		***changed***	*xsd:dateTime*
	RevisionNumber		***version***	*revision*
	Modification		***modified***	enum
	NptgLocalityCode		***id***	*ObjectIdType*
NptgLocality. Descriptor	***LocalityName***	***TopographicPlace***	***Name***	*xsd:normString*
	LocalityName.lang		***Name.lang***	*xml:language*
	LocalityName	***TopographicPlace .Descriptor***	***Qualify.Name***	*xsd:normString*
	LocalityName.lang		***Qualify.Name.lang***	*xml:language*
	ShortName		***Qualify.ShortName***	*placeName*
	ShortNameLang		***Qualify.ShortName.lang***	*xml:language*
	QualifierName		***Qualify.Name***	*xsd:normString*
	QualifierName.lang		***Qualify.Name.lang***	*xml:language*
	QualifierLocalityRef		***Qualify .TopographicPlaceRef***	*ObjectIdType*
	QualifierDistrictRef		***Qualify .TopographicPlaceRef***	*ObjectIdType*

NPTG Element	NPTG Attribute	NeTEx element	NeTEx attribute	Type
NptgLocality	*alternativeDescriptors* ➔*Descriptor*	*TopographicPlace .alternativeDesciptor**	➔*.alternativeDesciptor* TopographicPlace-Descriptor*	*ObjectIdType*
	ParentNptgLocalityRef	*TopographicPlace*	*ParentTopographic-PlaceRef*	*ObjectIdType*
	AdministrativeAreaRef		*responsibilitySetRef*	*ObjectIdType*
	NptgDistrictRef		*TopographicPlaceRef*	*ObjectIdType*
	AdjacentLocalities .NptgLocalityRef		*adjacentPlaces* TopographicPlaceRef*	*ObjectIdType*
	SourceLocalityType		*.placeTypes* TypeOfPlaceRef*	*nptg:value*
	LocalityClassification		*TopographicPlaceType*	*enum*
NptgLocality. Location	*GridType*	*TopographicPlace*	*Centroid.pos.srsName*	*gridType*
	Easting		*Centroid.pos*	*easting*
	Northing		*Centroid.pos*	*northing*
	Longitude		*Centroid.Longitude*	*Longitude*
	Latitude		*Centroid.Latitude*	*Latitude*
NptgLocality	*PlusbusZones ➔*PlusBusZone*	*TopographicPlace .tariffZones**	➔*TariffZoneRef*	*ObjectId*

4.2.2 Example of Mapping of NPTG Location data to NeTEx TOPOGRAPHIC PLACE

A minimal representation of NPTG data as NeTEx defines the TRANSPORT ADMINISTRATIVE ZONEs corresponding to each NPTG ***AdminArea***.

The following XML excerpt shows the NPTG definition of part of the Connaught region with four of its zones Galway City, Galway County, Leitrim and Mayo. An ORGANISATIONAL unit CONNAUGHT is defined with the a NeTEx GENERAL ORGANISATION.

NPTG XML EXAMPLE

```
<NationalPublicTransportGazetteer CreationDateTime="2011-01-04T08:03:19"
ModificationDateTime="2011-01-04T08:03:19" Modification="revise" RevisionNumber="314"
FileName="NPTG.xml" SchemaVersion="2.5" LocationSystem="Grid">
    <Regions>
        <Region CreationDateTime="2011-01-18T11:54:31" ModificationDateTime="2011-01-
18T11:54:31" RevisionNumber="0">
            <RegionCode>CON</RegionCode>
            <Name xml:lang="EN">Connaught</Name>
            <Country>Eire</Country>
            <AdministrativeAreas>
                <AdministrativeArea CreationDateTime="2011-01-18T11:54:31"
ModificationDateTime="2011-01-18T11:54:31" RevisionNumber="0">
                    <AdministrativeAreaCode>846</AdministrativeAreaCode>
    <NptgLocality CreationDateTime="2011-03-14T10:00:00" ModificationDateTime="2011-03-
14T10:00:00" Modification="new">
        <NptgLocalityCode>E0846003</NptgLocalityCode>
        <Descriptor>
            <LocalityName xml:lang="EN">Dangan</LocalityName>
        </Descriptor>
```

```
        <AlternativeDescriptors>
            <Descriptor>
                <LocalityName xml:lang="ga">An Daingean</LocalityName>
            </Descriptor>
        </AlternativeDescriptors>
        <AdministrativeAreaRef>846</AdministrativeAreaRef>
        <SourceLocalityType>Lo</SourceLocalityType>
        <Location>
            <Translation>
                <GridType>ITM</GridType>
                <Easting>528149</Easting>
                <Northing>727189</Northing>
                <Longitude>-9.077645</Longitude>
                <Latitude>53.290138</Latitude>
            </Translation>
        </Location>
    </NptgLocality>
```

NeTEx XML EXAMPLE of an TOPOGRAPHIC PLACE for a NPTG Locality

```
    <TopographicPlace created="2011-03-14T10:00:00" changed="2011-03-14T10:00:00"
modification="new" id="E0846003" version="any" responsibilitySetRef="846">
        <Centroid>
            <Location>
                <Longitude>-9.077645</Longitude>
                <Latitude>53.290138</Latitude>
                <gml:pos srsName="ITM">528149 727189</gml:pos>
            </Location>
        </Centroid>
        <Descriptor>
            <Name lang="EN">Dangan</Name>
        </Descriptor>
        <alternativeDescriptors>
            <TopographicPlaceDescriptor>
                <Name lang="ga">An Daingean</Name>
            </TopographicPlaceDescriptor>
        </alternativeDescriptors>
        <TopographicPlaceType>area</TopographicPlaceType>
    </TopographicPlace>
```

4.2.3 NPTG: AdminArea / NeTEx TRANSPORT ADMINISTRATIVE ZONE mapping

NPTG Element	NPTG Attribute	NeTEx element	NeTEx attribute	Type
AdminArea	***CreationDateTime***	***Transport-AdministrativeZone***	***created***	*xsd:dateTime*
	ModificationDateTime		***changed***	*xsd:dateTime*
	RevisionNumber		***version***	*revision*
	Modification		***modified***	enum
	NptgLocalityCode		***id***	*Tarnsport-Administrative-ZoneIdType*
	Name		***Name***	*xsd:normString*
	AtcoCOde		***PublicCode***	*xsd:normString*

4.2.4 Example of Mapping NPTG AdminArea data to NeTEx ADMINSTRATIVE ZONE

A minimal representation of NPTG data as NeTEx creates a TRANSPORT ADMINISTRATIVE ZONEs corresponding to each ***AdminArea.***

NPTG XML EXAMPLE

The following XML excerpt shows the NPTG XML definition for part of the Connaught ***Region*** with four of its ***AdminArea*** instances: *Galway City, Galway County, Leitrim* and *Mayo*. An ORGANISATIONAL unit CONNAUGHT is defined with the a NeTEx GENERAL ORGANISATION

```
<NationalPublicTransportGazetteer CreationDateTime="2011-01-04T08:03:19"
ModificationDateTime="2011-01-04T08:03:19" Modification="revise" RevisionNumber="314"
FileName="NPTG.xml" SchemaVersion="2.5" LocationSystem="Grid">
    <Regions>
        <Region CreationDateTime="2011-01-18T11:54:31" ModificationDateTime="2011-01-
18T11:54:31" RevisionNumber="0">
            <RegionCode>CON</RegionCode>
            <Name xml:lang="EN">Connaught</Name>
            <Country>Eire</Country>
            <AdministrativeAreas>
                <AdministrativeArea CreationDateTime="2011-01-18T11:54:31"
ModificationDateTime="2011-01-18T11:54:31" RevisionNumber="0">
                    <AdministrativeAreaCode>846</AdministrativeAreaCode>
                    <AtcoAreaCode>846</AtcoAreaCode>
                    <Name>Galway City</Name>
                    <National>false</National>
                </AdministrativeArea>
                <AdministrativeArea CreationDateTime="2011-01-18T11:54:31"
ModificationDateTime="2011-01-18T11:54:31" RevisionNumber="0">
                    <AdministrativeAreaCode>847</AdministrativeAreaCode>
                    <AtcoAreaCode>847</AtcoAreaCode>
                    <Name>Galway County</Name>
                    <National>false</National>
                </AdministrativeArea>
                <AdministrativeArea CreationDateTime="2011-01-18T11:54:31"
ModificationDateTime="2011-01-18T11:54:31" RevisionNumber="0">
                    <AdministrativeAreaCode>848</AdministrativeAreaCode>
                    <AtcoAreaCode>848</AtcoAreaCode>
                    <Name>Leitrim</Name>
                    <National>false</National>
                </AdministrativeArea>
                <AdministrativeArea CreationDateTime="2011-01-18T11:54:31"
ModificationDateTime="2011-01-18T11:54:31" RevisionNumber="0">
                    <AdministrativeAreaCode>849</AdministrativeAreaCode>
                    <AtcoAreaCode>849</AtcoAreaCode>
                    <Name>Mayo</Name>
                    <National>false</National>
                </AdministrativeArea>
:::::etc
            </AdministrativeAreas>
        </Region>
```

NeTEx XML EXAMPLE of an TRANSPORT ADMINISTRATIVE ZONEs for a NPTG Region

The following example shows the above NPTG ***AdminArea*** data encoded as NeTEx TRANSPORT ADMINISTRATIVE ZONEs.

```
    <GeneralOrganisation id="nptg:NPTG" version="nptg:v2.1">
        <Name>Overall Management of Nptg codes</Name>
        <parts>
            <OrganisationPart created="2011-01-18T11:54:31" changed="2011-01-
18T11:54:31" version="0" id="nptgRegion:CON">
                <Name lang="EN">Connaught</Name>
                <administrativeZones>
                    <TransportAdministrativeZone created="2011-01-18T11:54:31"
changed="2011-01-18T11:54:31" version="0" id="nptgRegion:CON">
                        <Name lang="EN">Connaught</Name>
                        <subzones>
                            <TransportAdministrativeZone created="2011-01-18T11:54:31"
changed="2011-01-18T11:54:31" version="0" id="nptgAdministrativeArea:846">
                                <Name>Galway City</Name>
                            </TransportAdministrativeZone>
                            <TransportAdministrativeZone created="2011-01-18T11:54:31"
changed="2011-01-18T11:54:31" version="0" id="nptgAdministrativeArea:847">
                                <Name>Galway County</Name>
                            </TransportAdministrativeZone>
                            <TransportAdministrativeZone created="2011-01-18T11:54:31"
changed="2011-01-18T11:54:31" version="0" id="nptgAdministrativeArea:848">
                                <Name>Leitrim</Name>
                            </TransportAdministrativeZone>
                            <TransportAdministrativeZone created="2011-01-18T11:54:31"
changed="2011-01-18T11:54:31" version="0" id="nptgAdministrativeArea:849">
                                <Name>Mayo</Name>
                            </TransportAdministrativeZone>
:::::::etc
                    </TransportAdministrativeZone>
                </administrativeZones>
            </OrganisationPart>
Wtc, etc
    <GeneralOrganisation>
```

4.2.5 NPTG: AdminArea / NeTEx RESPONSIBILITY SET Attribute mapping

Table 4 Mapping of attributes from NPTG AdminArea element

NPTG Element	NPTG Attribute	NeTEx element	NeTEx attribute	Type
AdminArea	***CreationDateTime***	***ResponsibilitySet***	***created***	*xsd:dateTime*
	ModificationDateTime		***changed***	*xsd:dateTime*
	RevisionNumber		***version***	*revision*
	Modification		***modified***	enum
	NptgLocalityCode		***id***	*ResponsibilitySetIdType*
	Name		***Name***	*MultilingualSTring*
	Region		***RegionRef***	*xsd:normString*

4.2.6 Example of Mapping of NPTG AdminArea data to NeTEx RESPONSIBILITY SET

Since for Irish NPTG data there is a one to one correspondence between TRANSPORT ADMINISTRATIVE ZONE, RESPONSIBILITY SET and CODE PREFIX, the latter two can be inferred from just the TRANSPORT ADMINISTRATIVE ZONEs.

In a fuller mapping, for each NPTG Admin area a NeTEx RESPONSIBILITY SET may be created to specify its responsibilities, and a CODESPACE ASSIGNMENT map be specified to formally state the prefix for the zone.

NeTEx XML EXAMPLE of a RESPONSIBILITY SET for a TRANSPORT ADMINISTRATIVE ZONE

```
<ResponsibilitySet id="nptgAdministrativeArea:847" version="0">
    <roles>
        <ResponsibilityRoleAssignment id="nptgAdministrativeArea:847" version="0">
            <DataRoleType>all</DataRoleType>
            <ResponsiblePartRef ref="nptgRegion:CON" version="0"/>
            <ResponsibleAreaRef ref="nptgAdministrativeArea:847" version="0"/>
        </ResponsibilityRoleAssignment>
    </roles>
</ResponsibilitySet>
```

NeTEx XML EXAMPLE of an CODESPACE ASSIGNMENT for a TRANSPORT ADMINISTRATIVE ZONE

```
<TransportAdministrativeZone created="2011-01-18T11:54:31" changed="2011-01-
18T11:54:31" version="0" id="nptgAdministrativeArea:847">
        <Name>Galway County</Name>
        <types>
            <TypeOfZoneRef version="nptg:v2.1"
ref="nptg:AdministrativeArea@Local"/>
        </types>
            <PublicCode>847</PublicCode>
            <codespaceAssignments>
                <CodespaceAssignment version="0" id="nptgAdminArea847@atco@847">
                    <CodespaceRef ref="naptan_prefix_data"/>
                <CodePrefix>847</CodePrefix>
                <TypeOfCodespaceAssignmentRef version="nptg:v2.1"
ref="nptg:naptan_prefix"/>
            </CodespaceAssignment>
        </codespaceAssignments>
</TransportAdministrativeZone>
```

5 Mapping Irish NaPTAN Stop Data to the profile

This section discusses the mapping of NaPTAN data to the basic profile.

5.1 Use of NaPTAN data

The EIRE_NP profile shows how the existing Irish National data set for stops (NaPTAN) can be exchanged as XML documents conforming to the profile.

5.1 Summary of Irish NaPTAN Stop Mapping

The following is a summary of mapping of Irish NaPTAN Stop data to NeTEx:

- When using stops in timetables
  - For Rail, bus and coach stations, a NaPTAN ***StopArea*** is mapped to a NeTEx STOP AREA.
  - For on street bus and tram stops, a NaPTAN ***StopPoint*** is mapped to a NeTEx SCHEDULED STOP POINT.
- For encoding physical stop data to provide information about stops.
  - For Rail, bus and coach stations, a NaPTAN ***StopArea*** is mapped to a NeTEx STOP PLACE, and STOP PLACE ENTRANCE.
  - For on-street stops, a NaPTAN ***StopArea*** is mapped to a NeTEx STOP PLACE.
  - For on-street stops, a NaPTAN ***StopPoint*** is mapped to a NeTEx QUAY, within the NeTEx STOP PLACE corresponding to NaPTAN ***StopArea.***
  - If there is no NaPTAN ***StopArea*** for a NaPTAN ***StopPoint***, (or pair of points) one is created with the same name as one of the stops. The opportunity should thus be taken to create STOP PLACEs to pair stops that are close together and have the same name.

- A STOP PLACE ASSIGNMENT can be used to associate a given SCHEDULED STOP POINT with a given STOP PLACE and QUAY

NB☞ It should be noted that the current Irish NaPTAN data set does not fully populate all the possible NaPTAN attributes and element types (For example rail stations, rail platforms and station entrances are not given as NaPTAN ***StopPoint*** instances, instead just a ***StopArea*** is given). This significantly reduces the work involved in an actual data conversion.

5.1.1 EIRE_NP Support for round trip use of NPTG and NaPTAN data

The Irish national stop (NaPTAN) and locality (NPTG) data sets classify various aspects of their data using a fixed set of standard NaPTAN classifications (for example, an on-street bus stop has type ‘BCS’, etc), implemented in the NaPTAN and NPTG schemas as enumerated values.

These values have equivalents in the fixed values offered by the NeTEx schema. For example, ‘*railStation’*, ‘*onstreetBus’*, etc.

In order to make it easier for applications that wish to import EIRE_NP data back into NaPTAN systems (so called “round-trip” processing, the original NaPTAN classifications may also be included in an EIRE_NP document.

The EIRE_NP uses a feature of the NeTEx schema that allow the definition of arbitrary code sets to be associated with entities. This makes it easier for systems based on NaPTAN and to import NaPTAN data back into computer systems in a ‘lossless’ manner.

For example, the encoding of a NaPTAN ***StopPoint*** of with a ***StopClassification*** of on street 'BCT', as a NeTEx ***StopPlace*** classified as '*onstreetBus'* could be further annotated as having a legacy NeTEx ***TypeOfPlace*** classification of '*napt*:*StopClassification@BCT*'.

5.2 Overall organisation of stop data in NeTEx

Each XML document in NaPTAN format exchanges the stop data for one or more 'administrative area' (as defined in the NPTG), as ***StopPoint*** and ***StopArea*** elements, grouped within a ***NaPTAN*** element. In current practice, a separate document is used to exchange the stop data for each separate NPTG administrative area, both national (700, 920, 930, etc.) and regional (001-500, 490, etc., etc.)

In NeTEx, the equivalent data is grouped in a ***SiteFrame***. A ***CompositeFrame*** is used to group the these as a coherent set with the same validity conditions;

- A ***NaPTAN*** element is equivalent to a NeTEx ***SiteFrame (***usually wrapped within a ***CompositeFrame***)
- In the EIRE_NP, data for each administrative area should be placed in a separate ***SiteFrame*** and the ***TypeOfFrame*** should be EI_PI_STOP. The ***CompositeFrame*** should have a TypeOfFrame of EI_PI_STOP OFFER
- A ***ResponsibilitySet*** corresponding to the NPTG ***Administrative*** Area should be declared on each frame.

Note that a NPTG document also includes data defining the regions, districts and administrative areas used to organize the management of the NPTG and NaPTAN. Such data can be encoded in NeTEx (as TRANSPORT ADMINISTRATIVE AREAs RESPONSIBILITY SETs etc).

NeTEx XML EXAMPLE

The following example show an outline organisation of a ***SiteFrame*** for NaPTAN stop data.

```
    <CompositeFrame version="1"
id="epd:EI:NAPTAN:CompositeFrame_IE_PI_STOP_OFFER:822+084:napt"
                responsibilitySetRef="napt:stop_data" dataSourceRef="napt:NTA">
        <Name>Sample extract of NaPTAN data encoded a in NeTEx</Name>
        <TypeOfFrameRef ref="eix:EI:NTA:TypeOfFrame_IE_PI_STOP_OFFER:EIRE_NP"
version="eix:v1.0"/>
 :::::
        <frames>
            <!-- ONE FRAME PER ADMIN AREAs -->
            <SiteFrame id="epd:EI:NAPTAN:SiteFrame_IE_PI_STOP:822:napt"
                    version="napt:data_1.0" responsibilitySetRef="nptgAdminArea:822"
                    dataSourceRef="napt:NTA">
                <Name>Stop and Stop Area data - Area 822</Name>
                <TypeOfFrameRef ref="eix:EI:NTA:TypeOfFrame_IE_PI_STOP:EIRE_NP"
                    version="eix:v1.0"/>
                <FrameDefaults>
                    <DefaultCodespaceRef ref="naptStop_data"/>
                    <DefaultDataSourceRef ref="napt:NTA" version="napt:v2.4"/>
                    <DefaultResponsibilitySetRef ref="nptgAdminArea: 822"
version="napt:v2.4"/>
```

```
            </FrameDefaults>
            <!-- ======= NaPTAN Stop Data ====== -->
            <stopPlaces>
        ::::::::: etc etc
            </stopPlaces>
            </SiteFrame>
        <SiteFrame id="epd:EI:NAPTAN:SiteFrame_IE_PI_STOP:844:napt"
        ::::::::: etc., etc.

        </frames>
    <CompositeFrame>
```

5.2.1 Codespaces for NaPTAN data

The following codespaces should be used for NaPTAN data (in addition to the NPTG codespaces) in order to indicate the coding system for identifiers and the scope of their uniqueness.

Table 2 — Codespaces for NaPTAN data

Prefix	Codespace	URL	NaPTAN elements	NeTEx
naptStop	naptStop_data	http:naptan.org.uk/stop_data	***StopPoint***	***StopPlace*** ***ScheduledStopPoint***
			StopArea	***StopArea***
napt:	napt_metadata	http:naptan.org.uk/metadata	***StopClassification***	TypeOfPlace
			BusStopType	TypeOfPlace

5.3 Mapping NaPTAN stop data to NeTEx

A NaPTAN ***StopPoint*** combines two concepts that are represented separately in NeTEx and Transmodel v6.0; the *physical stop* and the *stop point for use in the schedule* (in the original v1.0 of Transmodel on which NaPTAN was based, there were no QUAYs or ENTRANCEs so the concepts were also combined). This means that the mapping for NaPTAN, for the physical stop is different from the mapping for timetables (as say for GTFS format stops) which is concerned with the scheduled "logical stop" or NeTEx SCHEDULED STOP POINT. The two can be connected explicitly with a STOP ASSIGNMENT (or implicitly, by dint of their common identifier).

5.3.1 NaPTAN "scheduled" stop point Mapping

NaPTAN stop points are used in timetables to indicate the logical stop point in the timetable. This use maps primarily to a NeTEx SCHEDULED STOP POINT.

- The timetable use of a NaPTAN ***StopPoint*** is equivalent to a NeTEx SCHEDULED STOP POINT.
    1) For modes such as Bus, where a timetable Stop Point indicates a QUAY, the timetable use of a NaPTAN ***StopPoint*** is equivalent to a NeTEx SCHEDULED STOP POINT + PASSENGER STOP ASSIGNMENT + STOP PLACE + QUAY. The STOP PLACE elements do not necessarily need to be declared.
    2) For modes such as Rail where a timetable Stop Point indicates a station, the timetable use of a NaPTAN ***StopPoint*** is equivalent to a NeTEx SCHEDULED STOP POINT + PASSENGER STOP ASSIGNMENT + STOP PLACE. The STOP PLACE elements do not necessarily need to be declared.

- The NaPTAN 'BCQ' stop type (an unassigned bay in a bus or coach station) is a special case: it is in effect a SCHEDULED STOP POINT without an assignment to any particular QUAY. (A DYNAMIC STOP ASSIGNMENT can be used for it).

  NB☞ These are not used in Irish NaPTAN data

- NaPTAN also holds alternative identifiers for specific modes e.g. The ***AnnotatedRailRef***, ***AnnotatedMetroRef*** etc. These can be represented as additional STOP POINT ASSIGNMENTs to assign the SCHEDULED STOP POINTs of specific modes. The alternative codes have different namespaces e.g. ATOC TIPLOCs.

  NB☞ These are not used in Irish NaPTAN data.

:

5.3.2 NaPTAN "physical "stop point Mapping

NaPTAN stop points are also used to describe physical attributes of a stop. This use maps primarily to a NeTEx STOP PLACE.

- Depending on its NaPTAN ***StopType***, a NaPTAN ***StopPoint*** is equivalent to either a STOP PLACE, QUAY, or ENTRANCE in NeTEx (see table below).
- If a ***StopPoint*** corresponds to a QUAY or ENTRANCE, it must be placed within a STOP PLACE. The appropriate STOP PLACE may be inferred either
  1) From by a related NaPTAN StopArea (Of NaPTAN ***StopArea*** type '*GCLS', 'GRLS'*, etc).
     - NB☞ These are generally present in Irish NaPTAN data, but not for all stops
  2) Or From any related a NaPTAN "AccessArea" stop point (i.e. one of type '*RLY', 'MET', 'AIR'*, etc), and/or or by a NaPTAN main entrance ('*RSE', 'TMU',* etc
     - NB☞ These are not used in Irish NaPTAN data.
- NaPTAN flexible stops of NaPTAN ***BusStopType*** "Hail and ride" ('*HAR'*) or "Flexible Zone" ('*FLX*') are equivalent to a FLEXIBLE STOP PLACE, with a HAIL AND RIDE AREA or a FLEXIBLE AREA.
     - NB☞ These are not used in Irish NaPTAN data.

A NaPTAN ***StopArea*** groups stops as potential transfer points when journey planning – these are used in particular to group pairs of stops for travel in opposite directions on the street (GPBS) and around coach (GBCS) and rail stations (GRLS).

- A NaPTAN ***StopArea*** is equivalent to a NeTEx: STOP PLACE. NaPTAN allows for an unlimited nesting of stop places, but the usage is similar: most Stop areas are "Monomodal": they may be nested to make larger interchanges combining different modes.
-

For a detailed mapping of attributes for a NaPTAN ***StopPoint*** to a NeTEx STOP PLACE, see Annex E.

5.3.3 NaPTAN: StopPoint / NeTEx StopPlace Attribute mapping

Table 5 Mapping of attributes from NaPTAN StopPoint element

NaPTAN	NaPTAN Attribute	NeTEx	NeTEx Attribute	Type
StopPoint	***CreationDateTime***	***StopPlace***	***created***	*xsd:dateTime*
	ModificationDateTime	***StopPlace***	***changed***	*xsd:dateTime*

NaPTAN	NaPTAN Attribute	NeTEx	NeTEx Attribute	Type
	RevisionNumber	***StopPlace***	***version***	*revision*
	Modification	***StopPlace***	***modified***	enum
	Status	***StopPlace***	***status***	enum
	AtcoCode	***StopPlace***	***id***	idType
	NaptanCode	***StopPlace***	***PublicCode***	*xsd:nmtoken*
	PlateCode	***StopPlace.Quay***	***PlateCode***	*xsd:nmtoken*
	PrivateCode	***StopPlace.Quay***	***PrivateCode***	*xsd:nmtoken*
	CleardownCode	***StopPlace.Quay***	***ShortCode***	*xsd:nmtoken*
	FormerStopPointRef	***StopPlace***	***derivedFromObjectRef***	idType
StopPoint.Descriptor	***CommonName***	***StopPlace***	***Name***	*xsd:normString*
	CommonName.lang	***StopPlace***	***Name.lang***	*xml:language*
	ShortCommonName	***StopPlace***	***ShortName***	*xsd:normString*
	ShortCommonName.lang	***StopPlace***	***ShortName.lang***	*xml:language*
	Landmark	***StopPlace.Quay***	***Landmark***	*xsd:normString*
	Landmark.lang+	***StopPlace.Quay***	***Landmark.lang***	*xml:language*
	Street	***StopPlace.RoadAddress***	***Name***	*xsd:normString*
	StreetLang+	***StopPlace.RoadAddress***	***Name.lang***	*xml:language*
	Crossing	***StopPlace***	***CrossRoad***	*xsd:normString*
	Crossing.lang+	***StopPlace***	***CrossRoad.lang***	*xml:language*
	Indicator	***StopPlace***	***NameSuffix***	*xsd:normString*
	Indicator.lang+	***StopPlace***	***NameSuffix.lang***	*xml:language*
	AlternativDescriptor	***StopPlace .alternativeNames***	***AlternativeName***	*AlternativeName*
StopPoint .Place	***NptgLocalityCode***	***StopPlace***	***TopographicPlaceRef***	**FK**
	LocalityName	***StopPlace. TopographicPlaceView.***	***Name***	*xsd:normString*
	AlternativeNptgLocalities .NptgLocalityRef	***StopPlace***	***servedTopographicPlaces .TopographicPlaceRef***	*ObjectIdType*
	MainNptgLocalities .NptgLocalityRef	***StopPlace***	***mainTerminusForPlaces .TopographicPlaceRef***	*ObjectIdType*
	ParentLocalityName	***StopPlace***	***additionalTopographicPlaces .TopographicPlaceRef***	*xsd:normString*
	GrandParentLocalityName	***StopPlace***	***additionalTopographicPlaces .TopographicPlaceRef***	*xsd:normString*
	Town	***StopPlace***	***PostalAddress.Town***	*xsd:normString*
	TownLang	***StopPlace***	***PostalAddress.Town.lang***	*xml:language*
	Suburb	***StopPlace***	***PostalAddress.Suburb***	*xsd:normString*
	SuburbLang	***StopPlace***	***PostalAddress.Suburb.lang***	*xml:language*
	Country	***StopPlace***	***CountryRef***	*enum*

NaPTAN	NaPTAN Attribute	NeTEx	NeTEx Attribute	Type
	LocalityCentre	***StopPlace***	***AtCentre***	*xsd:boolean*
StopPoint.Place .Location	***GridType***	***StopPlace.Location***	***Centroid.pos.srsName***	*gridType*
	Easting	***StopPlace.Location***	***Centroid.pos***	*easting*
	Northing	***StopPlace.Location***	***Centroid.pos***	*northing*
	Longitude	***StopPlace.Location***	***Centroid.Longitude***	*Longitude*
	Latitude	***StopPlace.Location***	***Centroid.Latitude***	*Latitude*
StopPoint .StopClassif-ication	***StopType***	***StopPlace***	***Quay.StopPlaceType***	*enum*
		StopPlace.placeTypes*	***TypeOfPlaceRef***	*napt:value*
StopPoint .StopClassif-ication . OnStreet.	***BusStopType***	***StopPlace.***	***Quay.QuayType***	*enum*
	Bus.TimingStatus	***ScheduledStopPoint***	***TimingPointStatus***	*enum*
	Bus.MarkedPoint.	***StopPlace***	***Quay.TypeOfPlaceRef***	*napt:value*
	Bus.MarkedPoint. DefaultWaitTime			
	Bus.MarkedPoint.Bearing	***StopPlace***	***RoadAddress.BearingCompass***	*enum*
	Bus.UnmarkedPoint	***StopPlace.placeTypes****	***TypeOfPlaceRef***	*napt:value*
	Bus.UnmarkedPoint.Bearing	***StopPlace.RoadAddress***	***BearingCompass***	*enum*
	Bus.HailAndRideSection	***FlexibleStopPlace .placeTypes****	***TypeOfPlaceRef***	*napt:value*
	Bus.HailAndRideSection .StartPoint	***FlexibleStopPlace.areas****	***HailAndRideArea.StartPoint***	*Location*
	Bus.HailAndRideSection .EndPoint	***FlexibleStopPlace.areas****	***HailAndRideArea.EndPoint***	*Location*
	Bus.HailAndRideSection .Bearing	***FlexibleStopPlace.areas****	***HailAndRideArea .BearingCompass***	*enum*
	Bus.FlexibleZone	***FlexibleStopPlace.areas****	***FlexibleQuay .TypeOfPlaceRef***	*napt:value*
	Bus.FlexibleZone.Location	***FlexibleStopPlace.areas****	***FlexibleQuay.Centroid***	*Centroid*
	Bus.AnnotatedCoachRef	***StopPlace***	***PrivateCode***	*xsd:nmtoken*
	Taxi.TaxiRank	***StopPlace.placeTypes***	***TypeOfPlaceRef***	*napt:value*
	Taxi.SharedTaxiRank	***StopPlace.placeTypes***	***TypeOfPlaceRef***	*napt:value*
	SetDownPickUpARea	***StopPlace.placeTypes***	***TypeOfPlaceRef***	*napt:value*
StopPoint .StopClassif-ication .OffStreet.	***Air.Entrance***	***StopPlace.quays****	***Quay.TypeOfPlaceRef***	*napt:value*
	Air.AccessArea	***StopPlace.quays****	***Quay.TypeOfPlaceRef***	*napt:value*
	Air.AnnotatedAIrRef	***StopPlace***	***PrivateCode***	*xsd:nmtoken*
	Air.Location	***StopPlace.quays****	***Quay.Location***	*Location*
	Ferry.Entrance	***StopPlace.quays****	***Quay.TypeOfPlaceRef***	*napt:value*
	Ferry.Berth	***StopPlace.quays****	***Quay.TypeOfPlaceRef***	*napt:value*
	Ferry.AccessArea	***StopPlace.quays****	***Quay.TypeOfPlaceRef***	*napt:value*
	Ferry.AnnotatedFerryRef	***StopPlace***	***PrivateCode***	*xsd:nmtoken*
	Rail.Entrance	***StopPlace.quays****	***Quay.TypeOfPlaceRef***	*napt:value*

NaPTAN	NaPTAN Attribute	NeTEx	NeTEx Attribute	Type
	Rail.AccessArea	***StopPlace.quays****	***Quay.TypeOfPlaceRef***	*napt:value*
	Rail.Platfrom	***StopPlace.quays****	***Quay.TypeOfPlaceRef***	*napt:value*
	Rail.AnnotatedRailRef	***StopPlace.quays****	***Quay.TypeOfPlaceRef***	*napt:value*
	Metro.Entrance	***StopPlace.quays****	***Quay.TypeOfPlaceRef***	*napt:value*
	Metro.AccessArea	***StopPlace.quays****	***Quay.TypeOfPlaceRef***	*napt:value*
	Metro.Platform	***StopPlace.quays****	***Quay.TypeOfPlaceRef***	*napt:value*
	Metro.AnnotatedMetroRef	***StopPlace***	***PrivateCode***	*xsd:nmtoken*
	BusAndCoach.Entrance	***StopPlace.quays.Quay***	***TypeOfPlaceRef***	*napt:value*
	BusAndCoach.AccessArea	***StopPlace***	***TypeOfPlaceRef***	*napt:value*
	BusAndCoach.Bay	***StopPlace.quays.Quay***	***TypeOfPlaceRef***	*napt:value*
	BusAndCoach.Bay .TimingStatus	***ScheduledStopPoint***	***TimingPointSTatus***	*enum*
	BusAndCoach.VariableBay	***StopPlace.quays.Quay***	***TypeOfPlaceRef***	*napt:value*
	BusAndCoach.VariableBay .TimingStatus	***ScheduledStopPoint***	***TimingPointSTatus***	*enum*
	BusAndCoach .AnnotatedCoachRef	***StopPlace***	***PrivateCode***	*xsd:nmtoken*
	Telecabine.Entrance	***StopPlace.quays.Quay***	***TypeOfPlaceRef***	*napt:value*
	Telecabine.AccessArea	***StopPlace.quays.Quay***	***TypeOfPlaceRef***	*napt:value*
	Telecabine.Platform	***StopPlace.quays.Quay***	***TypeOfPlaceRef***	*napt:value*
	Telecabine .AnnotatedTelecabineRef	***StopPlace***	***PrivateCode***	*xsd:nmtoken*
StopPoint	***StopAreas.StopAreaRef***	***StopPlace.stopAreas***	***StopAreaRef***	*ObjectIdType*
	AdministrativeAreaRef	***StopPlace***	***ResponsibilitySetRef***	*ObjectIdType*
	PlusBusZones .PlusBusZoneRef*	***StopPlace.tariffZones***	***TariffZoneRef***	*ObjectIdType*
	TariffZones.TariffZoneRef*	***StopPlace.tariffZones***	***TariffZoneRef***	*ObjectIdType*
	Notes	***StopPlace***	***Description***	*xsd:normString*
	Notes.lang	***StopPlace***	***Description.Lang***	*xml:language*
	Public	***StopPlace***	***LimitedUse***	*xsd:boolean*
	➔StopValidity	***StopPlace***	***ValidityCondition***	➔
	➔StopAccesibility	***StopPlace***	***AccessibilityAsement***	➔

5.3.4 Correspondence between NaPTAN and NeTEx Stop type classifications

The following table shows the existing NaPTAN stop types, with the NeTEx equivalents in the bottom row.

Note that the current NaPTAN data set is only partially populated. For example, for buses there is not always a NaPTAN ***StopArea*** for Rail stations, and often only a single point (the main entrance 'RSE' and an access area 'RLY') is encoded.

Table 3 — NaPTAN StopPoint and StopArea classifications

NaPTAN Stop Point Type							Stop Area
Group	**Mode**	**Description**	***Entrance***	***Access Area***	**Bay / Pole**	**Sub Type**	**Primary Area**
Off Street	***Air***	Airport		***AIR***	*GAT*	--	*GAIR*
	Ferry	Ferry / Port	*FTD*	*FER*	*FBT*	--	*GFTD*
	Rail	Rail Station	*RSE*	***RLY***	*RPL*	--	***GRLS***
	Metro & Tram	Metro Station	*TMU*	***MET***	*PLT*	--	*GTMU*
	Bus & Coach	Bus or Coach Station	*BCE*	*BST*	*BCQ **	*MKD*	***GBCS***
			-	-	***BCS***	*MKD*	
	Telecabine	Lift or Cable Car station	*LSE*	*LCB*	*LPL*		*GLCB*
On Street	***Bus***	Bus Coach on Street	-	--	***BCT***	*MKD*	*GBPS, GCLS, GCCH*
					BCT	*CUS*	
					BCT	*HAR*	
					BCT	*FLX*	
	Taxi	Taxi Rank			*TXR*	--	--
	Car	Pick up and set down area			*SDA*	--	--
		TRANSMODEL:	STOP PLACE ENTRANCE	STOP PLACE	QUAY	FLEXIBLE STOP	STOP AREA
		NeTEx	***StopPlace-Entrance***	***StopPlace***	***Quay***	***QuayType***	***StopPlace***

A 'BCQ' stop is an unassigned SCHEDULED STOP POINT in a bus station.

5.3.5 Mapping of Stop classifications from NaPTAN to NeTEx

The NaPTAN ***StopPoint*** and ***StopArea*** classifications can be used to assign a NeTEx ***StopPlaceType***, or ***QuayType*** to the corresponding NeTEx entities, as follows.

Table 4 — Mapping of NaPTAN stop classifications to NeTEx

Group		**NaPTAN**			**NeTEx**		
	Mode	***Stop-Classif-ication***	***StopArea Type***	***BusStop-Type***	**NeTEx *Element***	***StopPlace .StopPlaceType* or *Quay.QuayType***	***StopPlace.TypeOfPlace***

NaPTAN Access Area →NeTEx STOP PLACE	***air***	*AIR*	*GAIR*		***StopPlace***	*airport*	*napt StopAreaType@GAIR; napt:StopClassification@AIR*
	water	*FER*	*GFTD*		***StopPlace***	*ferryPort*	*napt StopAreaType@GFTD; napt:StopClassification@FER*
	rail	*RLY*	***GRLS***		***StopPlace***	*railStation*	*napt StopAreaType@GRLS; napt:StopClassification@RLY*
	metro	*MET*	*GTMU*		***StopPlace***	*metroStation*	*napt StopAreaType@GTMU; napt:StopClassification@MET*
	coach	*BST*	*GBCS, GCCH*		***StopPlace***	*coachStation*	*napt StopAreaType@GBCS; napt:StopClassification@BST*
	bus	*BST*	*GBCS*		***StopPlace***	*busStation*	*napt StopAreaType@GBCS; napt:StopClassification@BST*
	onStreetBus	*BST*	*GBPS*		***StopPlace***	*busStation*	*napt StopAreaType@GPBS; napt:StopClassification@BST*
	lift	*LCB*	*GLCB*		***StopPlace***	*liftStation*	*napt StopAreaType@GLCB; napt:StopClassification@LCB*
NaPTAN Access point / →NeTEx QUAY	***Air***	*GAT*	*GAIR*			*airlineGate*	*napt:StopClassification@GAT*
	water	*FBT*	*GFTD*		***Quay***	*boatQuay*	*napt:StopClassification@FBT*
	rail	*RPL*	***GRLS***		***Quay***	*railPlatform*	*napt:StopClassification@RPL*
	metro	*PLT*	*GTMU*		***Quay***	*metroPlatform*	*napt:StopClassification@PLT*
	coach	*BCS*	*GBCS, GCCH*	*MKD*	***Quay***	*coachStop*	*napt:StopClassification@BCS; napt:StopType@MKD*
	tram	*BCT*	*GBCS*	*MKD*	***Quay***	*tramStop*	*napt:StopClassification@BCT; napt:StopType@MKD*
	bus	*BST*	*GBPS*	*MKD*	***Quay***	*busStop*	*napt:StopClassification@BST; napt:StopType@MKD*
	bus	*BCQ*	*GBPS*	*MKD*	***Quay***	*busBay*	*napt:StopClassification@BCQ; napt:StopType@MKD*
	bus	*BCT*	*GLCB*	*MKD*	***Quay***	*onStreetBus*	*napt:StopClassification@BCT`; napt:StopType@MKD*
	bus	*BCT*		*CUS*	***Quay***	*onStreetBus*	*napt:StopClassification@BCT; napt:StopType@CUS*
	bus	*BCT*		*HAR*	***Flexible-Quay***		*napt:StopClassification@BCT; napt:StopType@HAR*
	bus	*BCT*		*FLX*	***Flexible-Quay***		*napt:StopClassification@BCT; napt:StopType@FLX*
	lift	*LPL*			***Quay***	*liftPlatform*	*napt:StopClassification@LPL*
	taxi	*TXR*			***Quay***	*taxiRank*	*napt:StopClassification@TXR*
	privateCar	*SDA*			***Quay***	*setDownPoint*	*napt:StopClassification@SDA*
NaPTAN Entrance/ →NeTEx STOP PLACE ENTRANCE	***water***	*FTD*	*GFTD*		***StopPlace Entrance***		*napt:StopClassification@FTD*
	rail	*RSE*	***GRLS***		***StopPlace Entrance***		*napt:StopClassification@RSE*
	metro	*TMU*	*GTMU*		***StopPlace Entrance***		*napt:StopClassification@TMU*

	coach	*BCE*	*GBCS*		***StopPlace Entrance***		*napt:StopClassification@BCE*
	bus	*LSE*	*GBPS*		***StopPlace Entrance***		*napt:StopClassification@LSE*

5.3.6 Example: Irish NAPTAN XML representation of a Railway Station

The following example shows the XML code for a Railway station as currently encoded in NaPTAN. Note that only a single point for the station is currently populated (though the specification allows for the platforms to be populated too).

NaPTAN XML EXAMPLE

```
        <StopArea CreationDateTime="1970-01-01T00:00:00" Modification="new"
ModificationDateTime="2016-03-16T16:04:53" RevisionNumber="8" Status="active">
            <StopAreaCode>821G000014</StopAreaCode>
            <Name xml:lang="en">Carlow Train Station</Name>
            <AdministrativeAreaRef>821</AdministrativeAreaRef>
            <StopAreaType>GPBS</StopAreaType>
            <Location>
                <Translation>
                    <GridType>ITM</GridType>
                    <Easting>672559</Easting>
                    <Northing>677188</Northing>
                    <Longitude>-6.92299054219178</Longitude>
                    <Latitude>52.8407397228482</Lati1tude>
                </Translation>
            </Location>
        </StopArea>
```

5.3.7 Example: NeTEx XML representation of a Railway Station

The equivalent NeTEx representation for the same station is given below:

(1) A NeTEx ***StopPlace*** is created to represent the overall station.
(2) A ***Quay*** could be created to represent each of the physical platforms. (However, information about individual platforms is not available in Irish NaPTAN)
(3) The NeTEx ***StopType*** '*railStation*' is derived from the NaPTANs ***StopClassification*** 'GRLS'. Bus and coach stations can eb derived from NaPTAN Type GBCS
(4) The original NaPTAN stop area type can also be indicated by a NeTEx ***TypeOfPlaceRef.***
(5) A ***PassengerStopAssignment*** can be used to associate the corresponding instances of a ***StopPlace*** and a ***ScheduledStopPoint*** together **-** they are all given the same identifier***.***

Note that in the following examples;

- For an equivalent to NaPTAN use of a stop for its physical location and properties data, only the ***StopPlace*** element is needed.
- For a timetable use of a stop, only the ***ScheduledStopPoint*** is needed.

In NaPTAN, a ***StopArea*** is used (i) to provide (the grouping of physical stops for a station (i.e. as indicated by a NeTEx ***StopPlace);*** and (ii) to indicate the stops of any mode between which it is reasonable to interchange when journey planning. In most cases (rail and bus station, ferry port, a pair of bus stops on the street, etc) these are the same, so it is sufficient just to use a NeTEx ***StopPlace*** to represent a NaPTAN ***StopArea***. Sometimes however it is useful to indicate additional connectivity for journey planning between ***ScheduledStopPoint*** instances

of different modes or different StopPlace instances (e.g. several stations that are close together). A NeTEx ***StopArea*** can be used to indicate that stops from in different ***StopPlaces*** are near enough together to be used for a transfer; a hierarchy of StopAreas for different modes can be used.

NeTEx XML EXAMPLE – SCHEDULED STOP POINT

```
    <ScheduledStopPoint responsibilitySetRef="nptgAdminArea:821"
            created="1970-01-01T00:00:00Z" modification="new" changed="2016-03-
16T16:04:53"
                    version="11" status="active" id="naptStop:821G000014">
        <Name lang="en”>Carlow Rail Station</Name>
            <Location>
                <Longitude>-6.92299054219178</Longitude>
                <Latitude>52.840739722848</Latitude>
                <gml:pos srsName="ITM">672559 677188</gml:pos>
            </Location>
        <stopAreas>
            <StopAreaRef version="11" ref="naptStopArea:7000B6310001"/>
        </stopAreas>
        <ShortName lang="en">Carlow</ShortName>
        <StopType>railStation</StopType>
    </ScheduledStopPoint>
```

NeTEx XML EXAMPLE – STOP AREA

```
    <StopArea responsibilitySetRef="nptgAdminArea:821"
            created="1970-01-01T00:00:00Z" modification="new" changed="2016-03-
16T16:04:53"
                    version="11" status="active" id="naptStop: 821G000014">
        <Name lang="en”>Carlow Rail Station</Name>
        <ShortName lang="en">Carlow</ShortName>
            <Centroid>
                <Location>
                    <Longitude>-6.92299054219178</Longitude>
                    <Latitude>52.840739722848</Latitude>
                    <gml:pos srsName="ITM">672559 677188</gml:pos>
                </Location>
            </Centroid>
    </StopArea>
```

NeTEx XML EXAMPLE – STOP PLACE

```
    <StopPlace id="naptStop:821G000014" responsibilitySetRef="nptgAdminArea:821"
created="1970-01-01T00:00:00Z" modification="new" changed="2016-03-16T16:04:53"
version="11" status="active">
    <Name lang="en">Carlow Train Station</Name>
    <ShortName lang="en">Carlow</ShortName>
    <types>
        <TypeOfZoneRef version="napt:v2.1" ref="napt:StopAreaType@GRLS"/>
    </types>
    <entrances>
        <StopPlaceEntrance id="naptStop:821G000014@entrance" version="11">
            <Name lang="en">Carlow</Name>
            <Centroid>
                <Location>
                    <Longitude>-6.92299054219178</Longitude>
                    <Latitude>52.840739722848</Latitude>
```

```
                    <gml:pos srsName="ITM">672559 677188</gml:pos>
                </Location>
            </Centroid>
            <TransportMode>rail</TransportMode>
        </StopPlaceEntrance>
    </entrances>
    <StopPlaceType>onstreetBus</StopPlaceType>
</StopPlace>
```

NeTEx XML EXAMPLE –STOP POINT ASSIGNMENT

```
<PassengerStopAssignment responsibilitySetRef="nptgAdminArea:821" version="1"
            id="naptStop:821G000014" order="1">
    <ScheduledStopPointRef version="11" ref="naptStop:821G000014"/>
    <StopPlaceRef version="11" ref="naptStop:821G000014”/>
</PassengerStopAssignment>
```

5.3.8 Example: Irish NAPTAN XML representation of a pair of On Street Bus Stops

Here we show a pair of on street bus stops mapped from NaPTAN to NeTEx

NaPTAN XML EXAMPLE – On street Stop Point

```
        <StopPoint CreationDateTime="1970-01-01T00:00:00" Modification="new"
ModificationDateTime="2016-09-09T15:20:57" RevisionNumber="20" Status="active">
            <AtcoCode>8220DB007608</AtcoCode>
            <PlateCode>7608</PlateCode>
            <Descriptor>
                <CommonName xml:lang="en">Sean MacDermott Street</CommonName>
            </Descriptor>
            <Place>
                <NptgLocalityRef>E0822013</NptgLocalityRef>
                <LocalityCentre>false</LocalityCentre>
                <Location>
                    <Translation>
                        <GridType>ITM</GridType>
                        <Easting>716023</Easting>
                        <Northing>735039</Northing>
                        <Longitude>-6.25722507190553</Longitude>
                        <Latitude>53.3528237326837</Latitude>
                    </Translation>
                </Location>
            </Place>
            <StopClassification>
                <StopType>BCT</StopType>
                <OnStreet>
                    <Bus>
                        <BusStopType>MKD</BusStopType>
                        <TimingStatus>OTH</TimingStatus>
                    </Bus>
                </OnStreet>
            </StopClassification>
            <StopAreas>
                <StopAreaRef CreationDateTime="2019-12-20T12:50:17.2665809+01:00"
Modification="new" ModificationDateTime="2019-12-20T12:50:17.2665809+01:00"
Status="active">822G000045</StopAreaRef>
            </StopAreas>
            <AdministrativeAreaRef>822</AdministrativeAreaRef>
        </StopPoint>
```

NaPTAN XML EXAMPLE – On street Stop Point

```
        <StopPoint CreationDateTime="1970-01-01T00:00:00" Modification="new"
ModificationDateTime="2017-01-19T09:38:38" RevisionNumber="16" Status="active">
            <AtcoCode>8220DB007590</AtcoCode>
            <PlateCode>7590</PlateCode>
```

```
            <Descriptor>
                <CommonName xml:lang="en">Marlborough Street</CommonName>
                <ShortCommonName xml:lang="en">Marlborough Street</ShortCommonName>
            </Descriptor>
            <AlternativeDescriptors>
                <Descriptor CreationDateTime="2019-12-20T12:50:17.2665809+01:00"
ModificationDateTime="2019-12-20T12:50:17.2665809+01:00">
                    <ShortCommonName xml:lang="ga">Sráid Mhaoilbhríde</ShortCommonName>
                </Descriptor>
            </AlternativeDescriptors>
            <Place>
                <NptgLocalityRef>E0822013</NptgLocalityRef>
                <LocalityCentre>false</LocalityCentre>
                <Location>
                    <Translation>
                        <GridType>ITM</GridType>
                        <Easting>715986</Easting>
                        <Northing>735014</Northing>
                        <Longitude>-6.25778972475227</Longitude>
                        <Latitude>53.3526072760509</Latitude>
                    </Translation>
                </Location>
            </Place>
            <StopClassification>
                <StopType>BCT</StopType>
                <OnStreet>
                    <Bus>
                        <BusStopType>MKD</BusStopType>
                        <TimingStatus>OTH</TimingStatus>
                    </Bus>
                </OnStreet>
            </StopClassification>
            <StopAreas>
                <StopAreaRef CreationDateTime="2019-12-20T12:50:17.2977809+01:00"
Modification="new" ModificationDateTime="2019-12-20T12:50:17.2977809+01:00"
Status="active">822G000045</StopAreaRef>
            </StopAreas>
            <AdministrativeAreaRef>822</AdministrativeAreaRef>
        </StopPoint>
```

NaPTAN XML EXAMPLE – Stop area for On -street bus stop pair

```
        <StopArea CreationDateTime="1970-01-01T00:00:00" Modification="new"
ModificationDateTime="2018-03-06T18:36:23" RevisionNumber="44" Status="active">
            <StopAreaCode>822G000045</StopAreaCode>
            <Name xml:lang="en">Sean McDermott Street</Name>
            <AdministrativeAreaRef>822</AdministrativeAreaRef>
            <StopAreaType>GPBS</StopAreaType>
            <Location>
                <Translation>
                    <GridType>ITM</GridType>
                    <Easting>716024</Easting>
                    <Northing>735037</Northing>
                    <Longitude>-6.2572107915977</Longitude>
                    <Latitude>53.3528055478833</Latitude>
                </Translation>
            </Location>
        </StopArea>
```

5.3.9 Example: NaPTAN On street Bus stop as NeTEx STOP PLACE

The following code example shows the same pair of on street bus stops as shown above in NaPTAN, encoded in NeTEx.

NeTEx XML EXAMPLE – as SCHEDULED STOP POINTs

```
<ScheduledStopPoint id="naptStop:8220DB007608" responsibilitySetRef="nptgAdminArea:822"
created="2006-02-07T00:00:00" modification="new" changed="2016-01-14T18:03:22"
version="20" status="active">
    <Name lang="en">Sean MacDermott Street</Name>
    <Location>
```

```
        <Longitude>-6.257225072</Longitude>
        <Latitude>53.35282374</Latitude>
        <gml:pos srsName="ITM"> 715986 735014</gml:pos>
    </Location>

    <stopAreas>
        <StopAreaRef version="44" ref="naptStopArea:822G000045"/>
    </stopAreas>
    <ShortName lang="en">Sean MacDermott Street</ShortName>
    <PublicCode>7608</PublicCode>
    <StopType>onstreetBus</StopType>
    <TopographicPlaceRef ref="nptgLocality:E0822013"/>
</ScheduledStopPoint>

<ScheduledStopPoint id="naptStop:8220DB007590" responsibilitySetRef="nptgAdminArea:822"
created="2006-02-07T00:00:00" modification="new" changed="2016-01-14T18:03:22"
version="16" status="active">
    <alternativeTexts>
        <AlternativeText attributeName="Name" version="11" id="naptStop:8220DB007590">
            <Text lang="ga">Sráid Mhaoilbhríde</Text>
        </AlternativeText>
    </alternativeTexts>
    <Name lang="en">Marlborough Street</Name>
    <Location>
        <Longitude>-6.257789724</Longitude>
        <Latitude>53.35260728</Latitude>
        <gml:pos srsName="ITM">715986 735014</gml:pos>
    </Location>
    <stopAreas>
        <StopAreaRef version="44" ref="naptStopArea:822G000045"/>
    </stopAreas>
    <ShortName lang="en">Marlborough Street</ShortName>
    <PublicCode>7590</PublicCode>
    <StopType>onstreetBus</StopType>
    <TopographicPlaceRef ref="nptgLocality:E0822013"/>
</ScheduledStopPoint>
```

NeTEx XML EXAMPLE – as STOP AREA

```
<StopArea id="naptStopArea:822G000045" responsibilitySetRef="nptgAdminArea:822"
created="2006-02-07T00:00:00" modification="new" changed="2016-01-14T18:03:22"
version="44" status="active">
    <Name lang="en">Sean McDermott Street</Name>
    <Centroid>
        <Location>
            <Longitude>-6.257016351</Longitude>
            <Latitude>53.35278473</Latitude>
            <gml:pos srsName="ITM">716037 735035</gml:pos>
        </Location>
    </Centroid>
</StopArea>
```

NeTEx XML EXAMPLE - as STOP PLACE

```
    <StopPlace responsibilitySetRef="nptgAdminArea: 822" version="44"
id="naptStopArea:822G000045">
            <Name lang="en"> Sean McDermott Street </Name>
            <TopographicPlaceRef ref="nptgLocality:E0822013"/>
            <AtCentre>false</AtCentre> <!-- NAPT_<LocalityCentre>0 -->
            <TransportMode>bus</TransportMode>
            <StopPlaceType>onstreetBus</StopPlaceType>
            <quays>
                <Quay id="naptStop:8220DB007608" version="20">
                    <Name lang="en">Sean MacDermott Street</Name>
                    <Centroid>
                        <Location>
                            <Longitude>-6.257225072</Longitude>
                            <Latitude>53.35282374</Latitude>
                            <gml:pos srsName="ITM"> 715986 735014</gml:pos>
                        </Location>
```

```
                    </Centroid>
                    <placeTypes>
                        <TypeOfPlaceRef version="napt:v2.1"
                                ref="napt:StopClassification@BCT"/>
                        <TypeOfPlaceRef version="napt:v2.1" ref="napt:StopType@MKD"/>
                    </placeTypes>
                    <TransportMode>bus</TransportMode>
                    <QuayType>busStop</QuayType>
                </Quay>
                <Quay id="naptStop:8220DB007590" version="16">
                    <Name lang="en">Marlborough Street</Name>
                    <Centroid>
                        <Location>
                            <Longitude>-6.257789724</Longitude>
                            <Latitude>53.35260728</Latitude>
                            <gml:pos srsName="ITM">715986 735014</gml:pos>
                        </Location>
                    </Centroid>
                    <placeTypes>
                        <TypeOfPlaceRef version="napt:v2.1"
                                ref="napt:StopClassification@BCT"/>
                        <TypeOfPlaceRef version="napt:v2.1" ref="napt:StopType@MKD"/>
                    </placeTypes>
                    <TransportMode>bus</TransportMode>
                    <QuayType>busStop</QuayType>
                </Quay>

            </quays>
        </quays>
    </StopPlace>
```

NeTEx XML EXAMPLE - STOP ASSIGNMENT to associate SCHEDULED STOP POINT with STOP PLACE

```
<PassengerStopAssignment version="any"    id="naptStop:8220DB007608" order="1">
    <ScheduledStopPointRef version="20" ref="naptStop:8220DB007608"/>
    <StopPlaceRef version="44" ref="naptStopArea:822G000045”/>
</PassengerStopAssignment>
<PassengerStopAssignment version="any"    id=aptStop:8220DB007590" order="1">
    <ScheduledStopPointRef version="16" ref=" aptStop:8220DB007590"/>
    <StopPlaceRef version="44" ref="naptStopArea:822G000045”/>
    <QuayRef version="16" ref="="naptStop:8220DB007590"/>
</PassengerStopAssignment>
```

If desired, the two can be inlined within the stop assignment, thus stop assignment can be used to group logical and physical stop data togetehr

```
<PassengerStopAssignment version="any"    id="naptStop:8220DB007608" order="1">
    <ScheduledStopPoint: version="1" id ="nptgAdminArea:847">
….etc
    </ ScheduledStopPoint>

    <StopPlace version="1" id=" naptStopArea:822G000045">
….etc
    </StopPlace>

</PassengerStopAssignment>
```

6 Mapping Irish Timetable data to NeTEx

This section introduces the mapping of Timetable data to the EIRE_NP basic profile.

As noted in the introduction to this document, the Irish Timetable data comes in several different legacy formats.

- **Bus & Ferry:** Data: primarily VDV452 from the NTA database
- **Tram**: available in GTFS format.
- **Rail:** in HaFas format (The proprietary format for Hacon Gmbh – with similar content to VDV462) from Irish Rail.

The GTFS and HRDF mappings are discussed in detail below.

The VDV452 mapping is given in the German NeTEx profile.

6.1 Representing journeys in the EIRE Profile

The EIRE_NP, like the EU EPIP, uses only a minimal representation of a SERVICE JOURNEY, thus it:

1) Uses only a sequence-of-points representation of JOURNEY PATTERNs. (The full NeTEx schema supports both a sequence-of-points and sequence-of-links representations; the latter allows a timing pattern to be held separately).
2) Doesn't hold timing data, only the resolved PASSING TIMEs.
3) Represents each stop visit as a separate pair of POINT IN JOURNEY PATTERN and PASSING TIME elements (i.e. is very normalised and does not use CALLs).
4) Does not include operational data elements such as BLOCK and DUTY CREW references, or ROUTE INSTRUCTION data for drivers, or DEAD RUNs, GARAGEs, and LAYOVER POINTs.
5) Uses DAY TYPEs to separate calendar dates from the timetable.
6) Distinguishes between SERVICE JOURNEYs with individual timings and TEMPLATE SERVICE JOURNEYs with a FREQUENCY GROUP representing a group of journeys with a HEADWAY INTERVAL.
7) Does not include FLEXIBLE STOP PLACEs with HAIL AND RIDE AREAs and FLEXIBLE QUAYs.

The GTFS and HaFas formats use a passing times representation similar to the EIRE_NP. VDV452 can also exchange timing data.

The GTFS and HaFas mappings are covered in the following sections.

6.2 Overall organisation of NPTG data in NeTEx

Data for a given timetable is placed in a single NETEX document within a NeTEx COMPOSITE FRAME. This contains other frames with specific types of data.

- A NeTEx SERVICE FRAME is used to group the definitions of SCHEDULED STOP POINTs.

- A NeTEx TIMETABLE FRAME is used to group the definitions of SERVICE JOURNEYs and their TRANSPORT ADMINISTRATIVE ZONEs.
- A SERVICE CALENDAR is used to group the DAY TYPEs.
- A RESOURCE FRAME is used to define the OPERATOR and RESPONSIBILITY SETs.

7 Mapping of GTFS Data to NeTEx

7.1.1 Timetables in GTFS format

Timetable data for some other services, in particular for the LUAS trams, is available in the General Transit Feed Specification (GTFS) format.

Developed by Google, GTFS is a simple CSV encoding of timetables using a representation that combines a POINT IN PATTERN with a resolved PASSING TIME FOR each stop. This can be considered an optimised view of the full timing data – equivalent to a CALL in NeTEx).

Unlike VDV452 or NeTEx, GTFS does not handle the more complex aspects of timetable data such as trains that join or split, default transfer times, separate physical stops, etc. A mapping from GTFS is indicated in section 7 of this document.

The relevant GTFS elements for mapping to the profile are summarised in Table 6.

Table 6 – GTFS / NeTEx main mappings

GTFS file	Scope		NeTEx element	NeTEx Frame
agency.txt	Operators and Authorities	➔	***<Operator>***	***<ResourceFrame>***
stops.txt	Stops in timetable	➔	***<ScheduledStopPoint>***	***<ServiceFrame>***
	Physical stops (Stations, stops, platforms, levels, entrances)	➔	***<StopPlace> <Quay> <Entrance>***	***<SiteFrame>***
transfer.txt	Interchange times	➔	***<Connection> <ServiceJourneyInterchange>, <InterchangeRule>***	***<ServiceFrame>***
routes.txt	Line name and facilities	➔	***<Line>***	***<ServiceFrame>***
trips.txt	Journeys	➔	***<ServiceJourney> + DestinationDisplay***>	***<ServiceFrame>***
stop_times.txt	Journey times at stops	➔	***<StopPointInPattern>*** + ***<PassingTimes***> + <***DestinationDisplay***> &/ or ***<Call>***	***<TimetableFrame>***
frequency.txt	Frequency based journey timings	➔	***<HeadwayJourneyGroup>,*** or ***<RythmicalJourneyGroup>*** with ***<TemplateServiceJourney>***	***<ServiceFrame>***
calendar.txt	Days of operation	➔	<***DayType***>, <OperatingPeriod> ***<DayTypeAssignment>*** (in ***<ServiceCalendar>)***	<***ServiceCalendarFrame***>
calendar_dates.txt	Exception to days s of operation	➔	***<DayTypeAssignment>*** and <***OperatingDay***> (in <***ServiceCalendar>)***	<***ServiceCalendarFrame***>
shapes.txt	Route plot	➔	***<RouteLink> <LinkProjection> <LineString>***	*(parent)*
translations	Translations	➔	***<AlternativeText>, <AlternativeName>***	*(parent)*
feedinfo.txt	Validity and data source	➔	***<DataSource>ValidityCondition>, <ResponsibilitySet> <Branding>***	***<CompositeFrame>***

attributions.txt	Data credits		***<ResponsibilitySet> + <ResponsibilityRole> + Organisation***	
fare_attributes	prices		***<FarePrice>***	***<SiteFrame>***
fare_rules	Fare products		***<FareProduct>, <SalesOfferPackage>, <UsageParameter> etc***	
levels.txt	Station levels		***<Level>***	
pathways.txt	Path h between stops		***<PathLink>***	

A more detailed mapping is given in Section 7.<

7.1.1.1 High Level comparisons of GTFS and NeTEx

The GTFS format is optimised for brevity and gives an efficient format for the specific purpose of exchanging finalised timetable data. The NeTEx model is more extensive - and more verbose - than the GTFS representation for three fundamental reasons:

(a) It provides significant additional function, including the planning, scheduling and operational aspects of timetables and has a much richer fare model; it is intended not just for distribution of final timetables to third parties, but also for many other use cases, including the exchange of the planning and operational timetables, the exchange of data for operations, etc.

(b) It separates different concerns into separate abstractions in the model, so as to achieve a high level of reuse of components and allow flexibility for future evolution of the model.

(c) It uses a self-describing XML schema, allowing the automatic validation of data types and referential integrity checks using off-the-shelf XML validators (GTFS requires a custom validator program to do the same).

In addition, NeTEx is intended to support the distributed peer-to-peer exchange and integration of data. It has mechanisms to allow different coding systems to be used alongside each other.

7.1.1.2 Comparison of GTFS and NeTEx representations of a timetable

As a simple visualisation of the difference of scope of GTFS and Transmodel/ NeTEx timetable representations, the following two diagrams are offered:

1. The first shows the Transmodel representation of a route and its timetable as a set of informational layers, each concerned with different aspects of the problem domain (physical route, timing information, service pattern, etc), the elements of each layer can be separately defined and repeatedly reused. So, for example, a given journey can be fully defined simply by a starting time and references to other existing elements. Timing information is held separately so that reusable sets of precise operational times can be exchanged (including wait times) independently of specific journeys, and also allowing different timings to be used at different times of day for the same service patterns.

2. The second shows the GTFS representation, which holds only the full resolved timings for each journey. Data (apart from stop details) must be repeated on each journey.

Figure 1 Transmodel representation of a timetabled journey

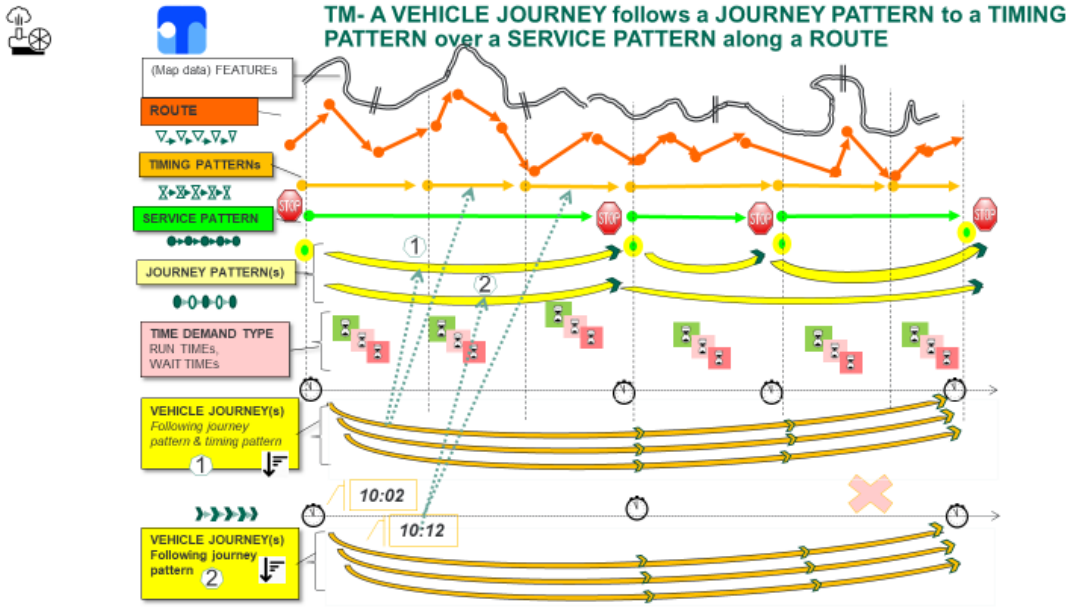
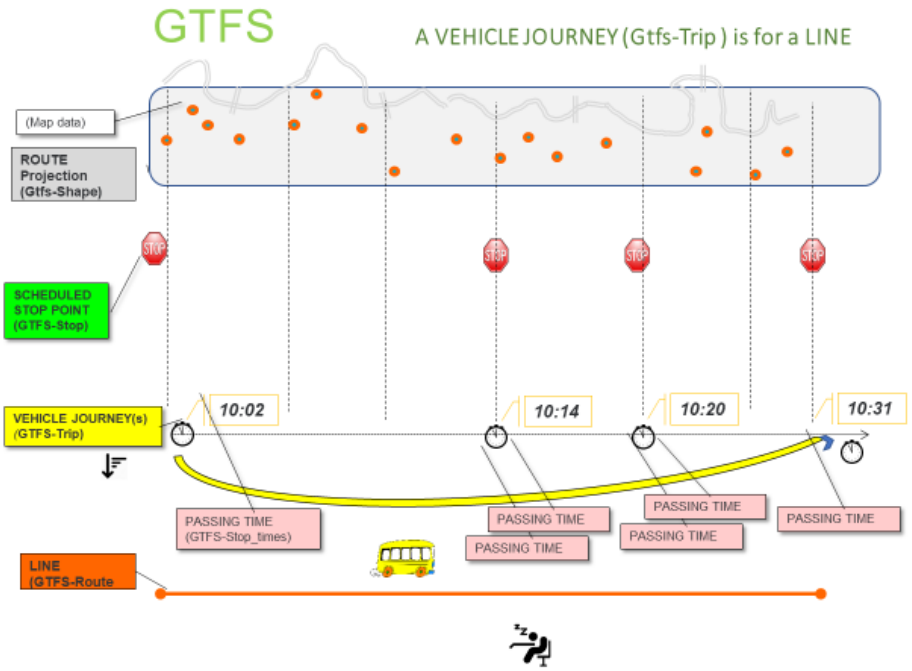


Figure 2 GTFS representation of a timetabled journey



7.2 Overview of mapping of GTFS to Transmodel/ NeTEx

GTFS does not have a formal model *per se*, but a UML model can be reverse engineered from the GTFS specification, albeit with some anomalies because certain of the GTFS elements are overloaded to have different meanings in different contexts, or are not explicitly modelled but only implied by enumeration values or reference.

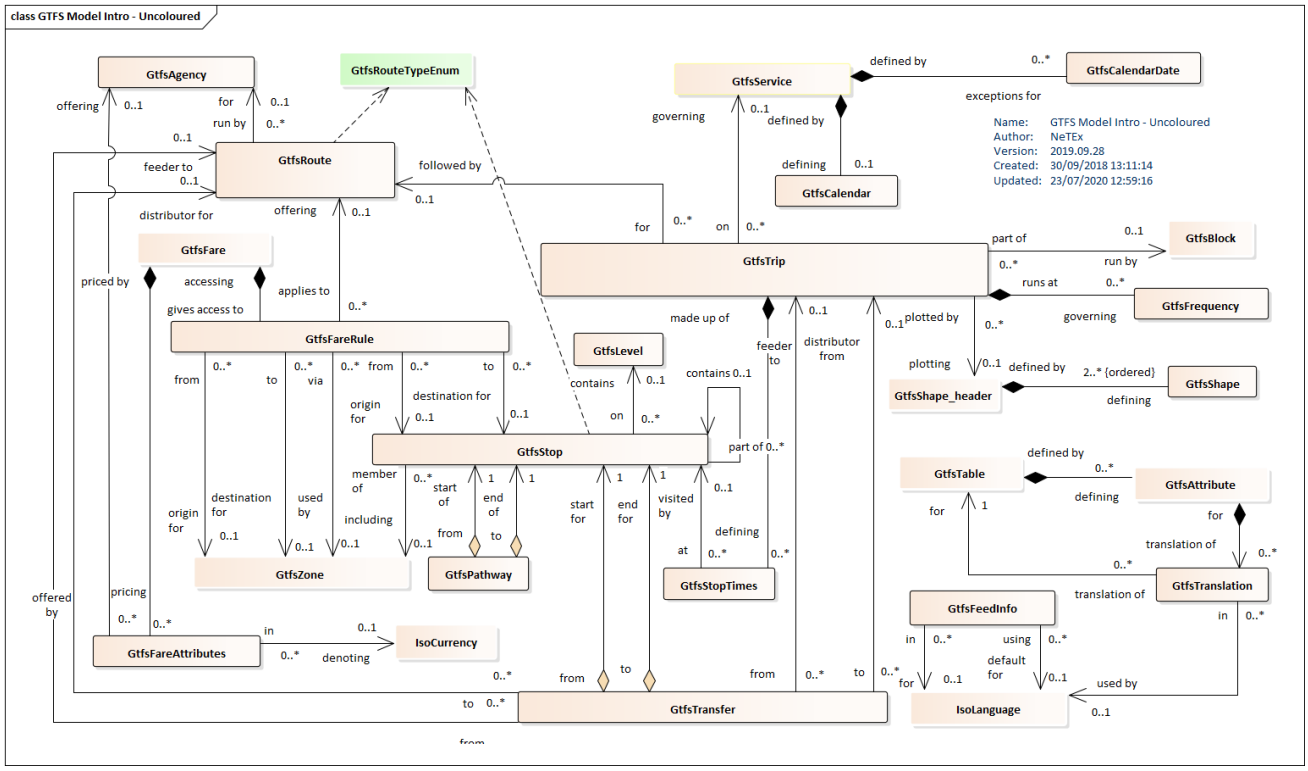
7.2.1 The GTFS Intro

This section gives an overview of the GTFS model, inferring relationships between the records from the foreign keys of records in order to be able to make a model level comparison with Transmodel/NeTEx.

7.2.1.1 GTFS Model overview

The following diagram shows the GTFS model drawn as UML classes

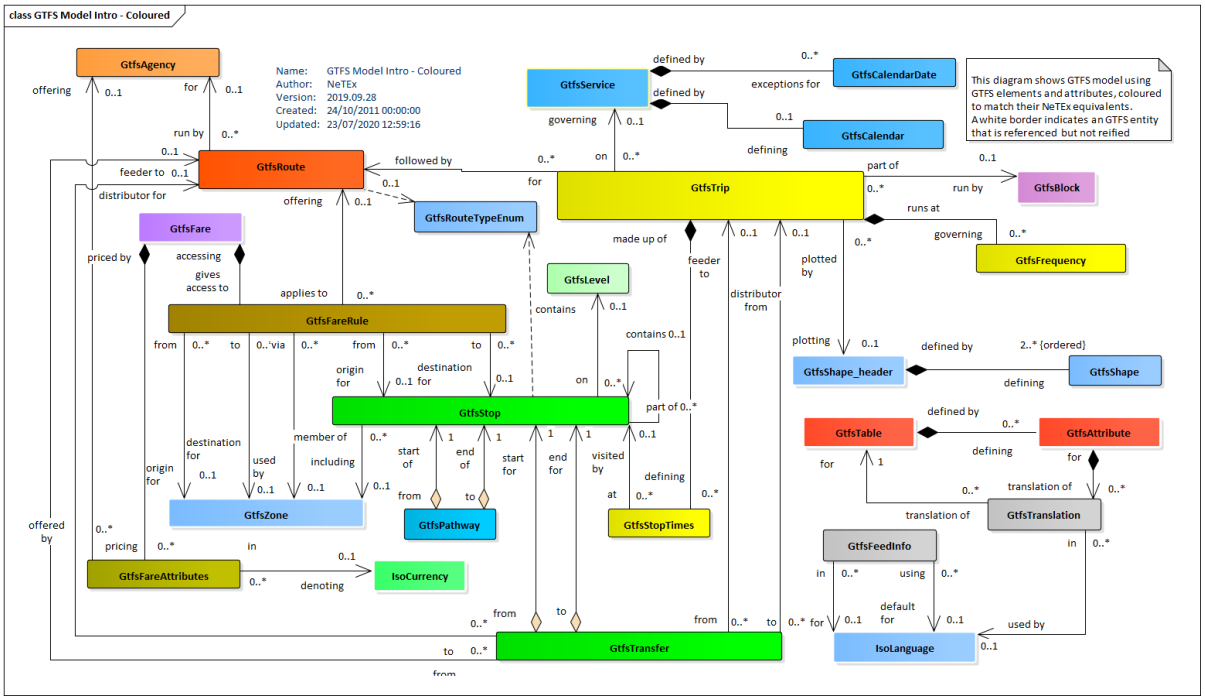
Figure 3 GTFS Model Intro – Uncoloured



7.2.1.2 GTFS Model functional areas

The following diagram shows the same basic GTFS model as above, now coloured with the same colours used in Transmodel for equivalent functional areas. Thus, for example, Journey related elements (GTFS **trip** and **stop_times**) are coloured yellow. This presentation convention helps in making a high-level comparison and in achieving a gestalt grasp of the overall models.

Figure 4 GTFS Model Intro – Coloured



7.2.2 The GTFS Model details

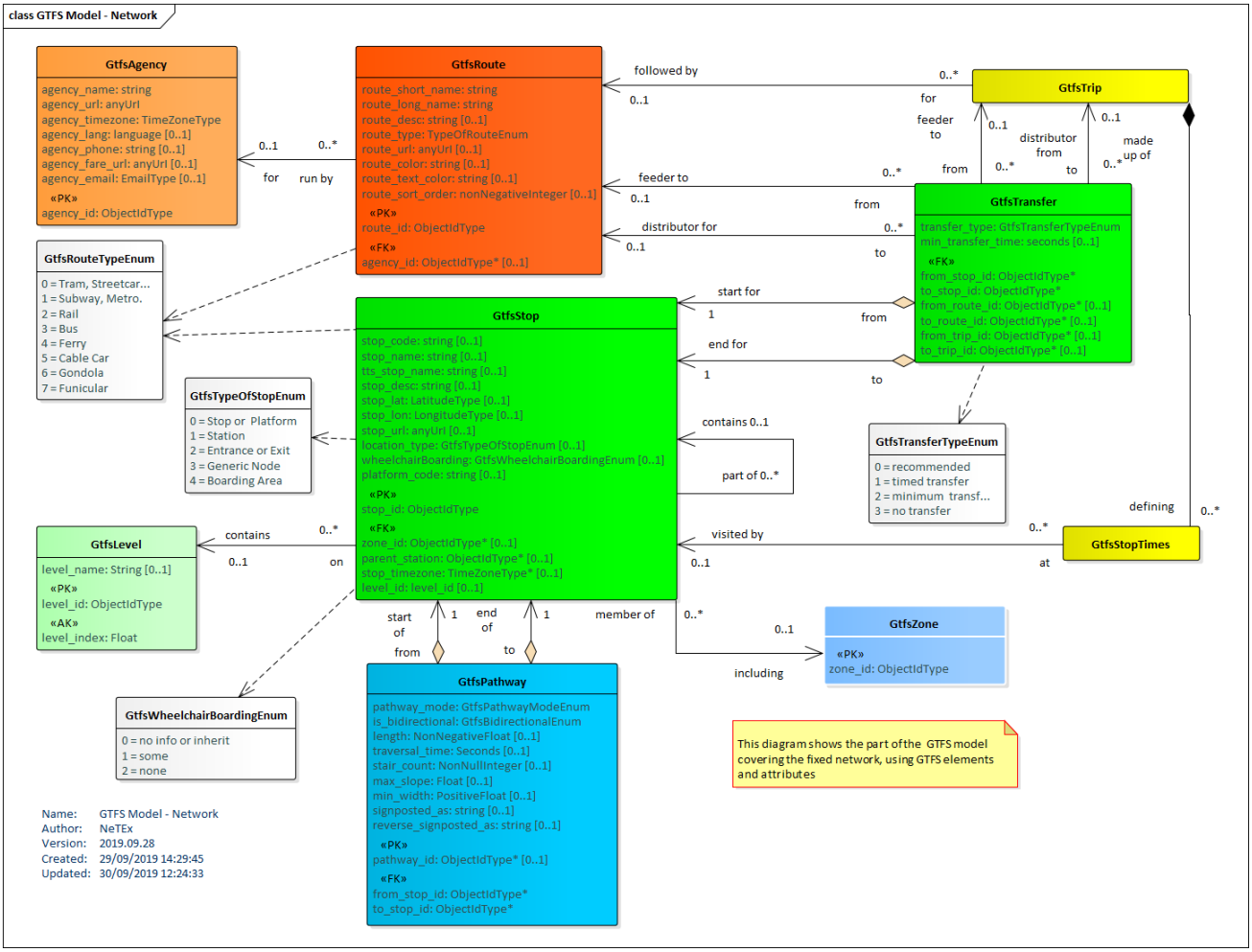
The GTFS model includes detailed attributes for specific elements, as shown below. The diagrams depict the June 2020 version of GTFS – new attributes and tables are added from time to time.

The GTFS Fare Model elements are omitted as out of scope for current Irish data

7.2.2.1 GTFS Model details - Network

GTFS has records to exchange data for the fixed network. GTFS **agency**, **routes**, **stops, transfers** and **levels,**

Figure 5 GTFS Model detailed attributes - Network

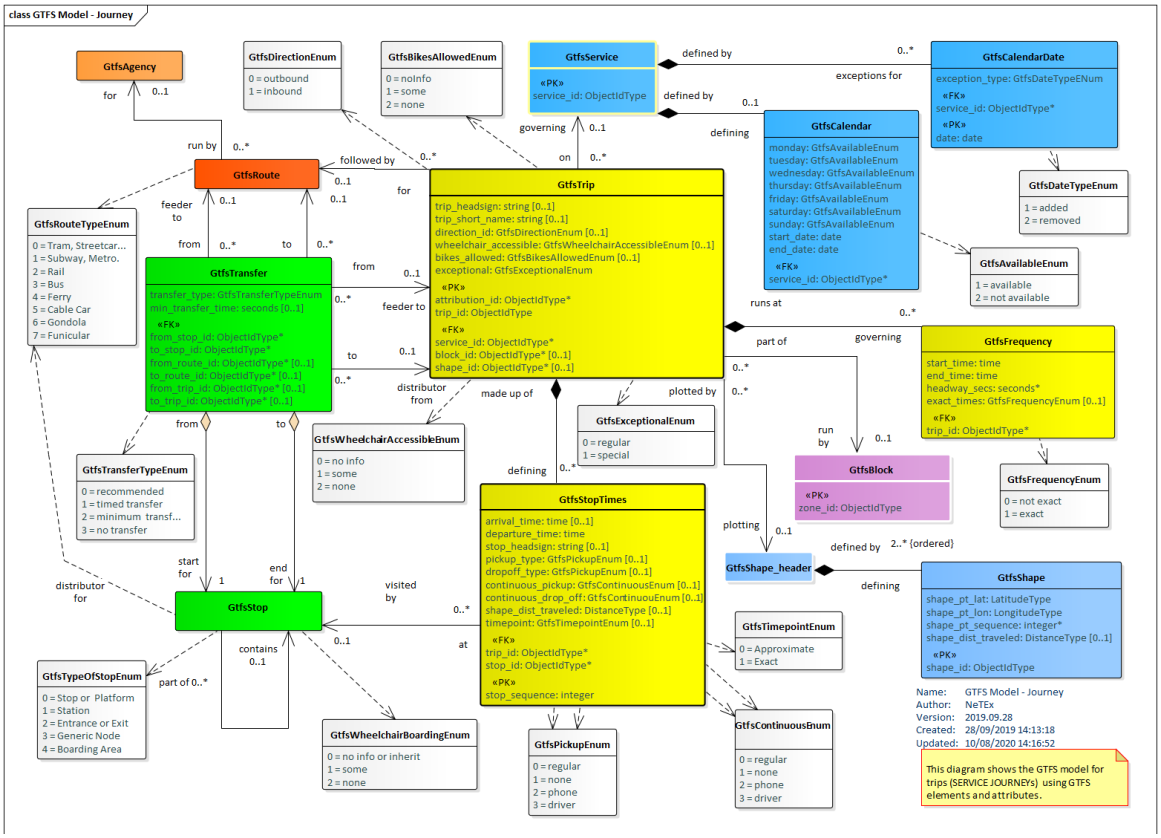


7.2.2.2 GTFS Model details - Journeys

GTFS has records to exchange data about journeys made over the network, in particular GTFS **trips**, **stop_times,** and **frequency**. GTFS **transfer** may also contain journey specific data (i.e. timetable rather than network specific data).

The days on which journeys run are described by the GTFS **calendar** and **calendar_dates** elements.

Figure 6 GTFS Model detailed attributes - Journeys

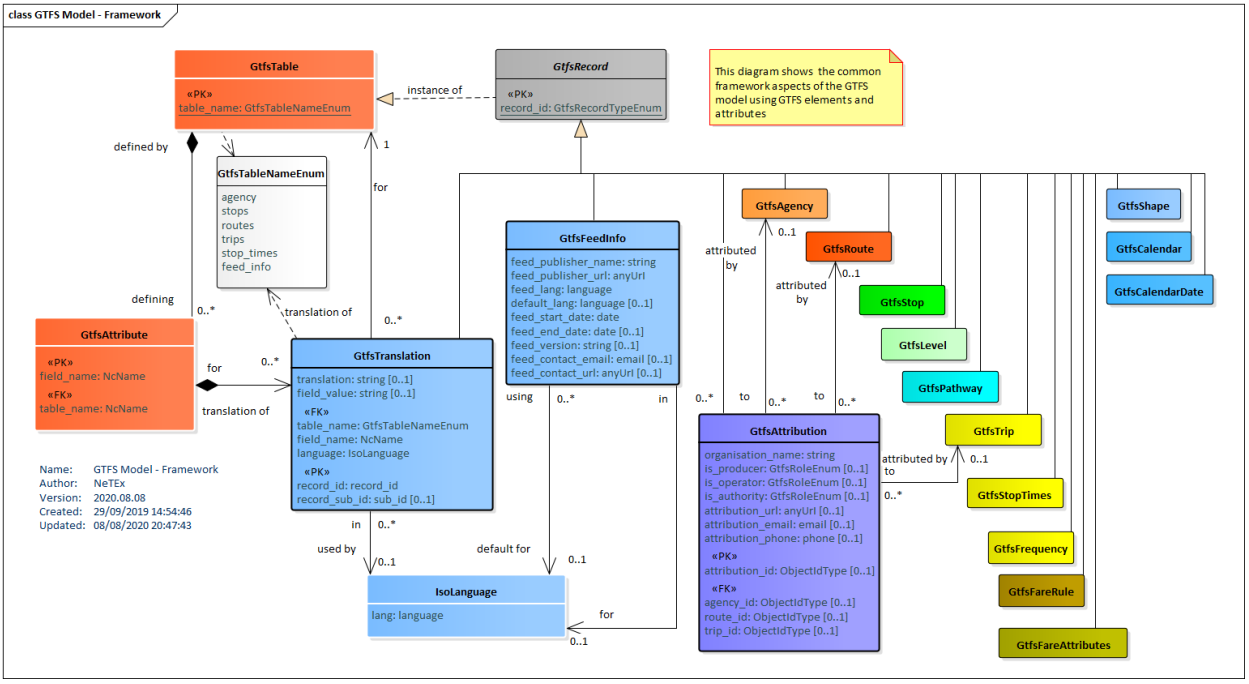


7.2.2.3 GTFS Model details - Framework

GTFS has records to exchange certain common properties of the feed, GTFS **feed_info, attributions and translations.**

The GTFS translations element makes references to attribute names (i.e. metamodel properties of records).

Figure 7 GTFS Model detailed attributes - Framework



7.2.4 Transmodel/NeTEx elements equivalent to GTFS - Overview

The following diagrams summarises the core Transmodel/NeTEx elements needed to represent the GTFS model. Most primary correspondences are one-to-one, in other cases, the Transmodel representation is normalised into distinct elements, or spread over a supertype and a subtype (so that common properties can be reused in different subdomains), such that that several separate Transmodel/NeTEx elements are used together to represent a given GTFS element.

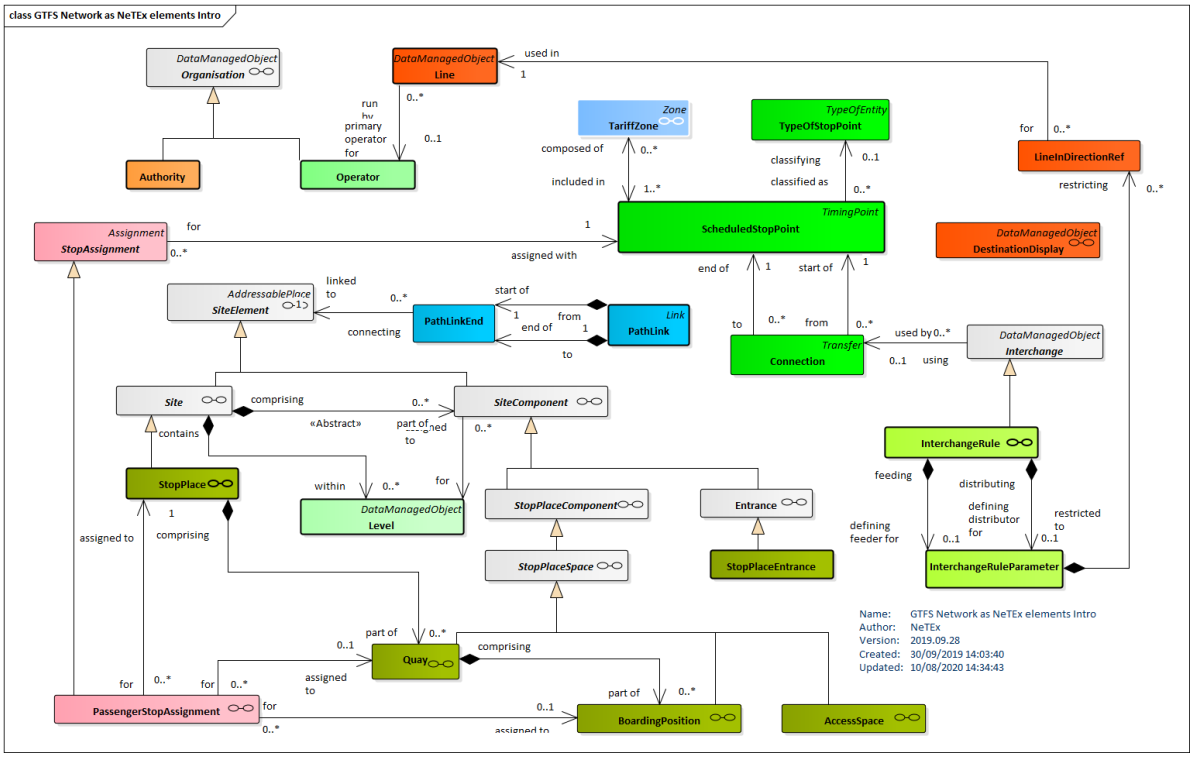
A few particular points of difference should be noted:

- Transmodel / NeTEx distinguished between physical and timetabled stop reference. GTFS overloads multiple concepts onto a single GTFS **stops** element.
- Transmodel /NeTEx separates the spatial concerns of journeys from the temporal concerns, with separate STOP POINT in PATTERN and PASSING TIMEs elements. GTFS combines these in a GTFS **stop_times** record.
- Transmodel / NeTEx allows reusable head signs (with variants for different media) represented by DESTINATION DISPLAY element. GTFS has separate head signs on each GTFS **trip** and **stop_times** record.

7.2.4.1 Transmodel/NeTEx elements equivalent to GTFS – Network

The following figure shows the NeTEx elements equivalent to the GTFS network model.

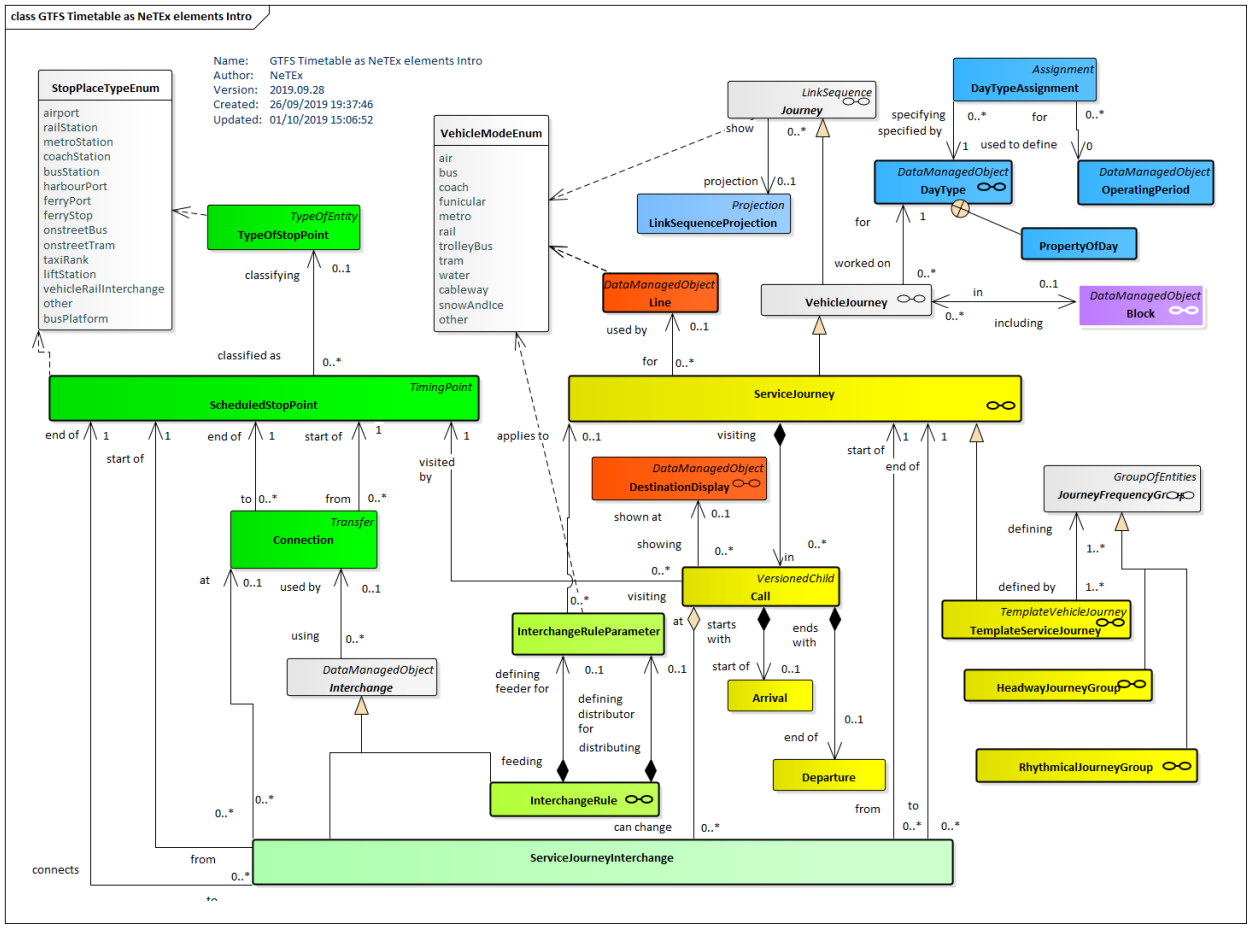
Figure 8 NeTEx elements equivalent to GTFS Network elements



7.2.4.2 Transmodel/NeTEx elements equivalent to GTFS – Timetable

The following figure shows the NeTEx elements equivalent to the GTFS timetable model.

Figure 9 GTFS Timetable as NeTEx



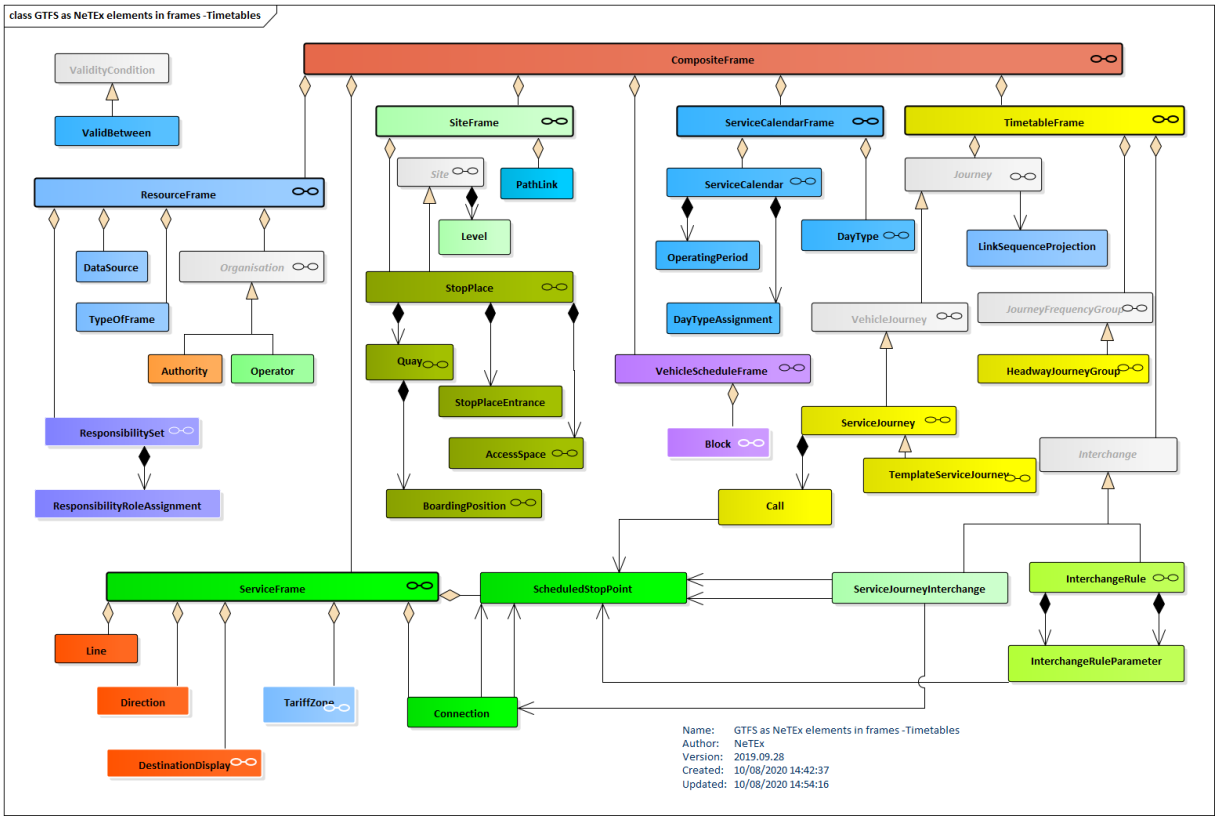
7.3 General Considerations for mapping

7.3.1 Packaging of elements

GTFS records are grouped by packaging them together in a zip file as a coherent set of data. The same data can be held in a single XML document using NeTEx VERSION FRAMEs.

The elements used to represent a timetable In NeTEx will be grouped within specific frames; RESOURCE FRAMEs SITE FRAMEs, TIMETABLE FRAME, SERVICE FRAMEs, and SERVICE CALENDAR FRAMEs. The following figure shows the frames and elements covering equivalent function to the GTFS network and timetable modes.

Figure 10 GTFS Timetable grouped as NeTEx Version frames



7.3.2 Codespaces for GTFS data

The providers' own CODESPACEs should be declared and used for the journeys of the timetable.

- For IRISH bus and coach data NPTG and NaPTAN CODESPACEs should be used for the SCHEDULED STOP POINTs.
- For rail timetables, the rail stop CODESPACE should be used.
- The NOC CODESPACE should be used for OPERATOR codes.
- The suppliers own CODESPACE should be used for all other codes – it can be set as default on the COMPOSITE FRAME so it does not need stating

The following CODESPACEs should be used for timetable data elements (in addition to the NPTG and NaPTAN CODESPACEs).

Table 5 — Codespaces for GTFS data

Prefix	URL / CODESPACE path	NeTEx
naptStop:	http://naptan.org.uk/stop_data	***StopPlace*** ***StopArea*** ***ScheduledStopPoint***
uic	http://irishrail.ie	***ScheduledStopPoint***
op:	Operators code space	***ServiceJourney etc***
noc:	http://nta.ie/noc	***Operator***

7.4 Element by element detailed mapping of GTFS to Transmodel/NeTEx

The following diagrams take each GTFS element in turn and show its mapping to one or more equivalent NeTEx elements and attributes.

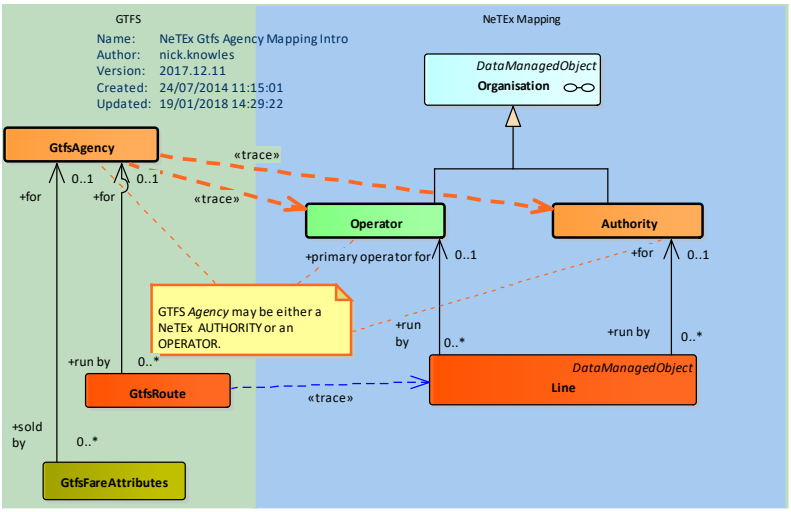
- For each GTFS element, two diagrams are provided: (i) a high-level view of the mapping showing just the elements (i.e. without XML attributes) and (ii) a separate, detailed view with attributes.
- NeTEx attributes that are not needed are generally suppressed in the diagrams (in effect, this is the large majority of NeTEx attributes), as are additional NeTEx elements that are not supported in GTFS.
- In each diagram the GTFS elements are shown on the left and the corresponding NeTEx elements on the right.
- UML Trace relationships (dotted lines, labelled <<Trace>>) are used to indicate the mapping of entities between GTFS and NeTEx. These are coloured orange for the mapping of the main subject of the diagram, blue for correspondeces between related ancillary elements.

7.4.1 GTFS agency / NeTEx OPERATOR Mapping

7.4.1.1 GTFS agency / NeTEx OPERATOR Mapping Intro

A GTFS ***Agency*** record corresponds to a NeTEx transport organisation – either an AUTHORITY or OPERATOR.

Figure 11 GTFS Agency to NeTEx OPERATOR Mapping - Intro

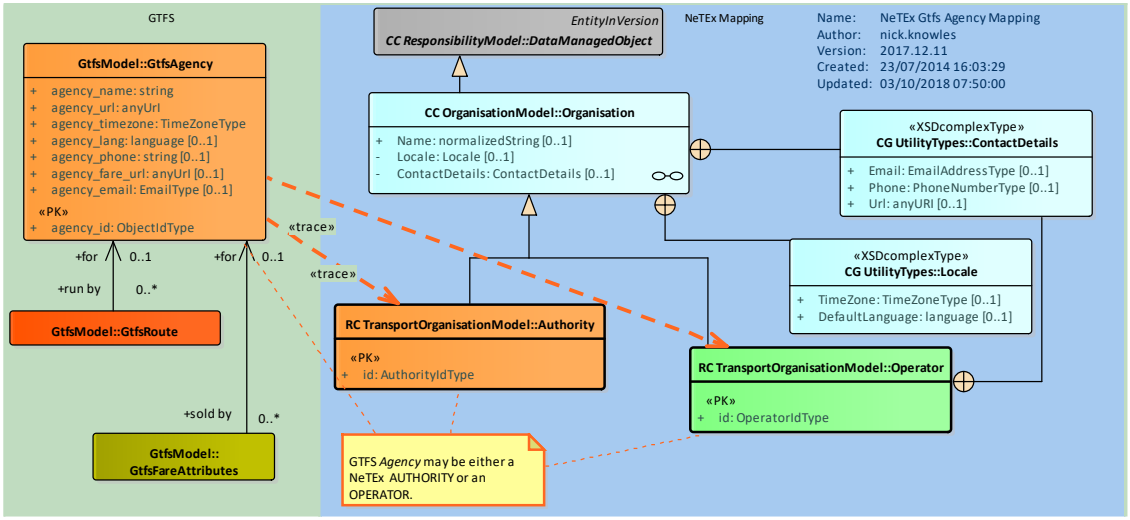


7.4.1.2 GTFS agency / NeTEx OPERATOR Mapping details

Equivalents to the detailed attributes of a GTFS ***Agency*** are found on NeTEx AUTHORITY and OPERATOR.

Note that the Transmodel representation also has a responsibility model (not shown) that allows the relevant responsibilities of different organisations to be characterised precisely (for example who originates and owns, data or operates services). GTFS assumes certain fixed responsibilities. See the GTFS attribution model

Figure 12 GTFS Agency to NeTEx OPERATOR Mapping - Details



7.4.1.3 GTFS agency / NeTEx OPERATOR Attribute mapping

A GTFS **agency** record is equivalent to a NeTEx OPERATOR.

There is only one instance of an agency record in a GTFS agency file.

Table 7 Mapping of attributes from GTFS agency record

GTFS record	GTFS Attribute	NeTEx element	NeTEx attribute	Type	Alt Text	
agency	***agency_id***	***Operator***	***id***	*OperatorIdType*		
	agency_name		*Name*	*MultilingualString*	*Y*	
	TimeZone		*Timezone*	*xsd:string*		
	agency_language		*DefaultLanguage*	*xsd:lang*		
	agency_phone		***ContactDetails.Phone***	PhoneNumber	Y	
	email		***ContactDetails. Email***	*Email*	*Y*	
	agency_url		***ContactDetails. Url***	*xsd:anyURI*	*Y*	
	agency_fare_url		***Keylist.gtfs_fare_url***	*xsd:string*		

Notes

An equivalent to the GTFS fares_url is not currently present in the NeTEx schema but can be implemented using a KeyList

7.4.1.4 Example Mapping GTFS agency as NeTEx OPERATOR

The following shows a mapping of GTS agency values to NeTEx

GTFS Example:: agency

```
agency_id,agency_name,agency_url,agency_timezone,agency_lang,agency_phone,agency_fare_ur
l
10000,Transport For Ireland,http://transportforireland.ie,Irish Standard Time,en,1-800-
300-604,http://transportforireland.ie/fares
```

Example GTFS agency as NeTEx OPERATOR

```
<Operator version="any" id="10000">
    <keyList>
        <KeyValue typeOfKey="gtfs">
            <Key>gtfs_agency_fare_url</Key>
            <Value>http:// transportforireland.ie/fares</Value>
        </KeyValue>
    </keyList>
    <Name>Demo Transit Authority</Name>
    <Locale>
        <TimeZone>Irish Standard Time</TimeZone>
        <DefaultLanguage>en</DefaultLanguage>
    </Locale>
    <ContactDetails>
        <Phone> 1800 300 604</Phone>
        <Url>http://www.transportforireland.ie</Url>
    </ContactDetails>
</Operator>
```

7.4.2 GTFS stops / NeTEx SCHEDULED STOP POINT Mapping

7.4.2.1 GTFS stops / NeTEx SCHEDULED STOP POINT Mapping Intro

A GTFS s***top***s record includes both physical and timetabled stop concepts, corresponding variously to a Transmodel/NeTEx SCHEDULED STOP POINT (for the stop in the schedule) and to a STOP PLACE and or QUAY and ENTRANCE for a physical stop\.

A QUAY represents a physical point of access, such as a Platform or bus stop, which will exist within a Physical STOP PLACE.

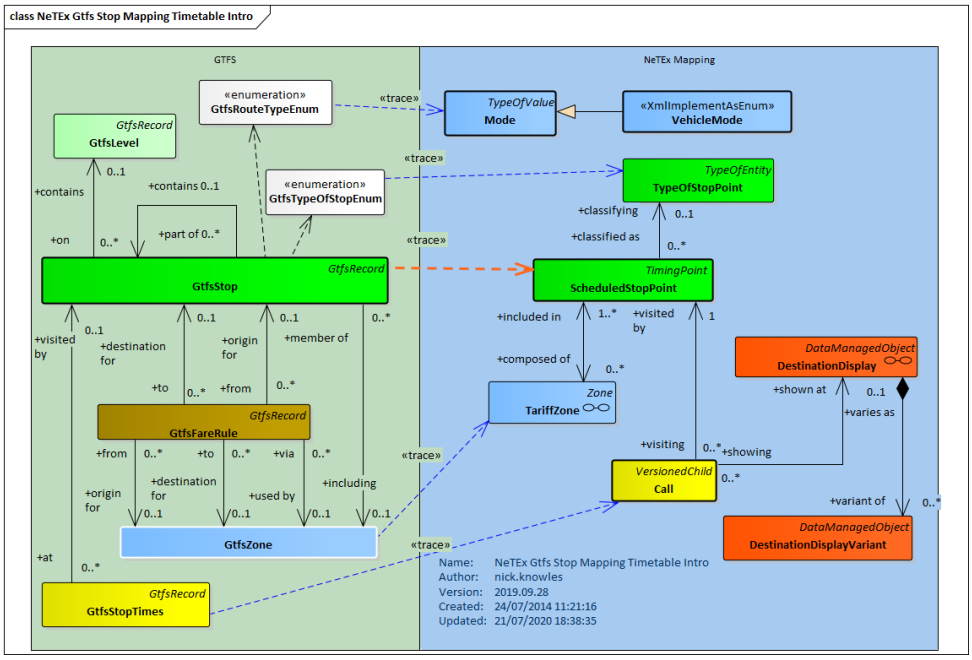
A SCHEDULED STOP POINT represents the use of a stop in a timetable – this will correspond to a given STOP PLACE, but the correspondence may be changed (as when a platform is changed or a stop moved) without affecting the sequence of points in a timetable. Furthermore, in a multi-operator environment it is possible for different identifier systems to be used for the physical and timetabled stops.

In Transmodel, the precise relationship between physical and timetabled stops can be described with a STOP ASSIGNMENT, furthermore a more detailed representation of the physical stop (BOARDING POINT, accessibility, etc,) can be given (not shown, because not in GTFS.)

GTFS overloads the same ***Stop*** element to represent both a whole station and an individual platform or quay by means of the GTFS location_type value.

GTFS has recently added an attribute to hold the Text-to-speech content for a stop name. In NeTEx alternative media presentations are held on a DESTINATION DISPLAY VARIANT – a DESTINATION DISPLAY would be defined for the stop name and the alternative presentation be placed on the variant.

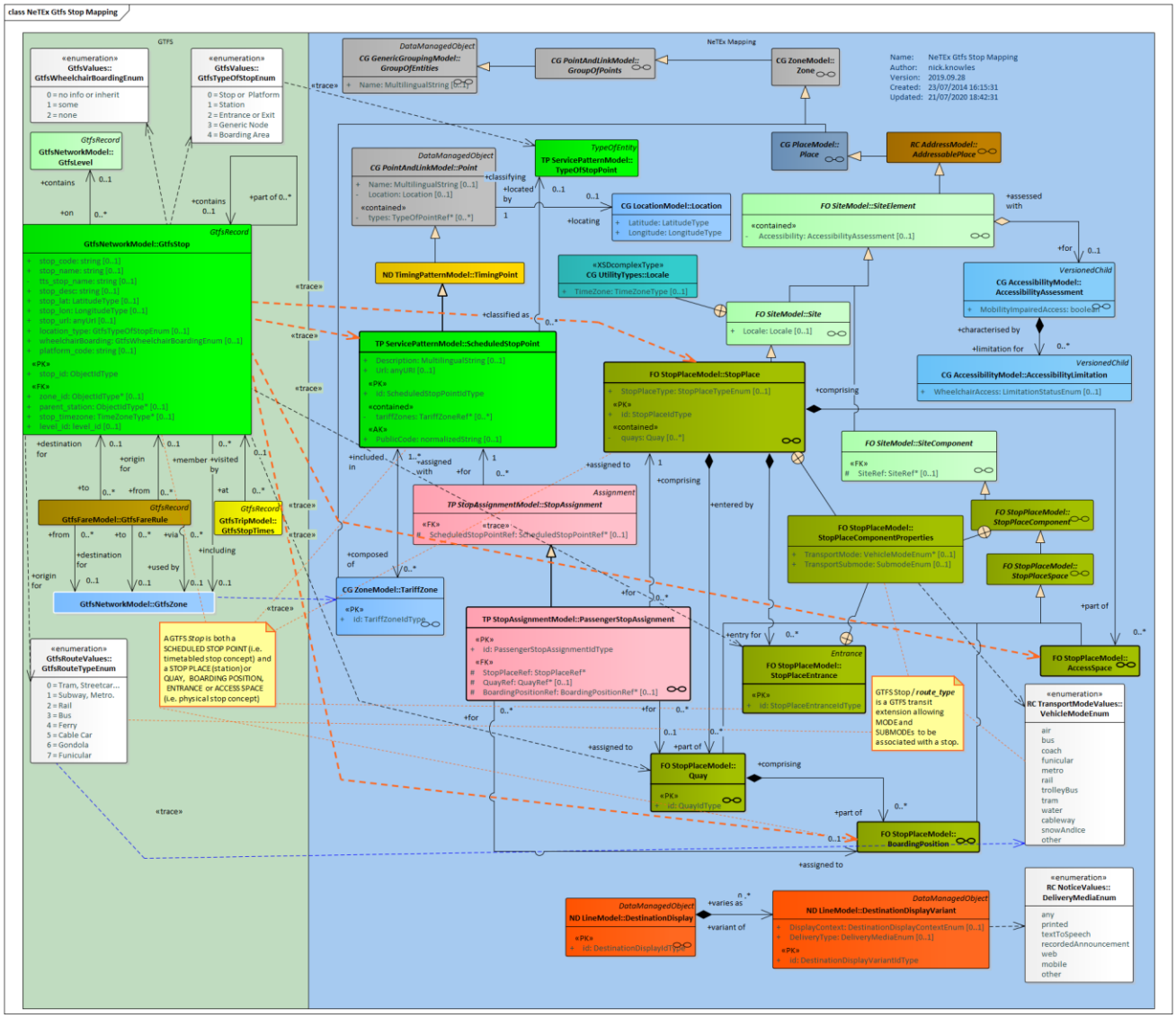
Figure 13 GTFS Stop to NeTEx SCHEDULED STOP POINT Mapping - Intro



7.4.2.2 GTFS stops / NeTEx SCHEDULED STOP POINT Mapping details

The detailed GTFS ***Stop*** attributes are mapped variously to SCHEDULED STOP POINT and STOP PLACE elements.

Figure 14 GTFS Stop to NeTEx SCHEDULED STOP POINT Mapping - Details



7.4.2.3 GTFS stops / NeTEx SCHEDULED STOP POINT Attribute mapping

As noted earlier, the GTFS **stops** record incorporates two separate concepts – the stop in the physical timetable (NeTEx SCHEDULE D STOP POINT) and the physical stop (NETEX STOP PLACE QUAY, etc). For the exchange of timetables, a SCHEDULED STOP POINT representation is generally sufficient.

Table 8 Mapping of attributes from GTFS stops record – to NeTEx SCHEDULED STOP POINT

GTFS record	GTFS Attribute	NeTEx element	NeTEx attribute	Type	Alt Text
stops	***stop_id***	***Scheduled-StopPoint***	***id***	*ScheduledStopPoint-IdIdType*	
	stop_code		*PublicCode*	*xsd:string*	
	stop_name		*Name*	*MultilingualString*	*Y*
	stop_desc		***Description***	*xsd:string*	*Y*
	stop_long		***Location. Longitude***	*Longitude*	
	stop_lat		***Location. Latitude***	*Latitude*	
	zone_id		***tariffZones. TariffZoneRef***	*TariffZoneRef*	
	stop_url		***Url***	*xsd:anyURI*	*Y*
	location_type		***StopPlaceType***	*Enum*	
	parent_station		***StopAreaRef***	*StopAreaRef*	

Notes

Some GTFS stop record attributes are only present on the NeTEx physical model elements (e.g. Time Zone).

GTFS Tariff zones are not actually defined other than by refernce.

7.4.2.4 Example Mapping GTFS stops to NeTEx SCHEDULED STOP POINT

The logical stop point in a timetable aspect of a GTFS stops record are represented in NeTEx by a SCHEDULED STOP POINT; this is distinct from the Physical stop, but is sufficient for most cases. In order to produce a timetable, only basic details – a stop code and stop labelling components – need to be present

GTFS Example: stops

For example, the following is a typical GTFS representation of a stop

```
stop_id,stop_name,stop_lat,stop_lon
"822GA00366","Drimnagh","53.3353461945075","-6.31827231820978"
```

NeTEx Example: GTFS stops as NeTEx SCHEDULED STOP POINT

The NeTEx SCHEDULED STOP POINT equivalent (with the stop type being inferred from VEHICLE MODE of the accompanying GTFS routes file) is:

```
<ScheduledStopPoint version="1" id="naptStop:822GA00366">
    <Name>Drimnagh</Name>
    <Location>
        <Longitude>-6.31827231820978</Longitude>
        <Latitude>53.3353461945075</Latitude>
    </Location>
    <StopType>onstreetTram</StopType>
```

```
</ScheduledStopPoint>
```

7.4.2.5 GTFS stops / NeTEx STOP PLACE mapping

GTFS stops can also include record types for physical stop data, such as entrances and boarding positions. The GTFS ***location_type*** attribute indicates which type of physical element should be derived from the GTFS stop record, corresponding variously to a NeTEx STOP PLACE, QUAY, ENTRANCE or ACCESS SPACE. A NeTEx STOP ASSIGNMENT can be provided to link the two.

Table 9 Mapping of attributes from GTFS stops record – to NeTEx STOP PLACE

GTFS record	GTFS Attribute	NeTEx element	NeTEx attribute	Type	Alt Text
Stops (Location_type ='1') ***Stop***	***stop_id***	***StopPlace***	***id***	*StopPlaceIdType*	
	stop_code		***PublicCode***	*xsd:string*	
	stop_name		*Name*	*MultilingualString*	*Y*
	stop_desc		***Description***	*xsd:string*	*Y*
	stop_long		***Centroid.Location. Longitude***	*Longitude*	
	stop_lat		***Centroid.Location. Latitude***	*Latitude*	
	stop_url		***Url***	*xsd:anyURI*	*Y*
	(Use routes file to determine)		***StopPlaceType***	*StopPlaceType enum*	
	zone_id		***tariffZones.TariffZoneRef***	*TariffZoneRef*	
	stop_timezone		***Locale.TimeZone***	*TimeZoneString*	
	stop_level		***LevelRef***	***LevelRef***	
	wheelchair_boarding		***AccessibilityAssessment. mobilityImpairedAccess:*** ***wheelchairAccess:***	*accessibilityEnum*	
Stops (Location_type ='0') ***Station***	***stop_id***	***Quay***	***id***	*QuayIdType*	
	stop_code		***PublicCode***	*xsd:string*	
	stop_name		*Name*	*MultilingualString*	*Y*
	stop_desc		***Description***	*xsd:string*	*Y*
	stop_long		***Centroid.Location. Longitude***	*Longitude*	
	stop_lat		***Centroid.Location. Latitude***	*Latitude*	
	stop_url		***Url***	*xsd:anyURI*	*Y*
	platform_code		***Label***	*xsd:string*	
	(Use routes file to determine)		***QuayType***	*QuayType enum*	
	zone_id		***tariffZones.TariffZoneRef***	*TariffZoneRef*	
	stop_level		***LevelRef***	***LevelRef***	
	wheelchair_boarding		***AccessibilityAssessment. mobilityImpairedAccess:*** ***wheelchairAccess:***	*accessibility Enum*	

GTFS record	GTFS Attribute	NeTEx element	NeTEx attribute	Type	Alt Text
Stops (Location_type = '2') Entrance	***stop_id***	***Entrance***	***id***	*EntranceIdType*	
	stop_code		***PublicCode***	*xsd:string*	
	stop_name		*Name*	*MultilingualString*	*Y*
	stop_desc		***Description***	*xsd:string*	*Y*
	stop_long		***Centroid.Location. Longitude***	*Longitude*	
	stop_lat		***Centroid.Location. Latitude***	*Latitude*	
	stop_url		***Url***	*xsd:anyURI*	*Y*
	(Use routes file to determine)		***EntranceType***	*EntranceType enum*	
	zone_id		***tariffZones.TariffZoneRef***	*TariffZoneRef*	
	stop_level		***LevelRef***	***LevelRef***	
	wheelchair_boarding		***AccessibilityAssessment. mobilityImpairedAccess: wheelchairAccess:***	*accessibility Enum*	
Stops (Location_type = '3') Generic Node	***stop_id***	***AccessSpace***	***id***	*EntranceIdType*	
	stop_code		***PublicCode***	*xsd:string*	
	stop_name		*Name*	*MultilingualString*	*Y*
	stop_desc		***Description***	*xsd:string*	*Y*
	stop_long		***Centroid.Location. Longitude***	*Longitude*	
	stop_lat		***Centroid.Location. Latitude***	*Latitude*	
	(Use routes file to determine)		***AccessSpaceType***	*AccessSpaceType enum*	
	zone_id		***tariffZones.TariffZoneRef***	*TariffZoneRef*	
	stop_level		***LevelRef***	***LevelRef***	
	wheelchair_boarding		***AccessibilityAssessment. mobilityImpairedAccess: wheelchairAccess:***	*accessibility Enum*	
Stops (Location_type = '4') Boarding Area	***stop_id***	***BoardingPosition***	***id***	*EntranceIdType*	
	stop_code		***PublicCode***	*xsd:string*	
	stop_name		*Name*	*MultilingualString*	*Y*
	stop_desc		***Description***	*xsd:string*	*Y*
	stop_long		***Centroid.Location. Longitude***	*Longitude*	
	stop_lat		***Centroid.Location. Latitude***	*Latitude*	
	wheelchair_boarding		***AccessibilityAssessment. mobilityImpairedAccess: wheelchairAccess:***	*accessibility Enum*	

Notes

Some attributes are only present on the NeTEx physical model elements (e.g. Time Zone).

Table 10 Gtfs wheelchair_boarding enum to NeTEx accessibility enum mapping

GTFS Element	GTFS value	NeTEx Attribute	NeTEx value
wheelchair_boarding	***0***	***Mode***	***unknown***
	1		*partial*
	2z		*false*

7.4.2.6 Mapping of stop types from GTFS to NeTEx STOP PLACE

Common stop attributes, such as name and location can be specified on both a SCHEDULED STOP POINT and on a STOP PLACE.

The GTFS stop elements can include some further detailed attributes that are only represented in NeTEx as properties of physical stop elements (for example TimeZone). If these elements are needed then then a STOP PLACE should also be created to hold them in NeTEx.

To represent the physical stop elements of GTFS (location_type 2,3,4) a NeTEx STOP PLACE must be created.

The GTFS ***location_type*** classifications can be used to decide whether a GTFS element additionally corresponds to a NeTEx ***StopPlaceType***, or ***QuayType*** Or Entrance.

Table 6 — Mapping of GTFS Location types to NeTEx

GTFS Location Type use	GTFS Usage	NeTEx	NeTEx *SiteElement*
0	Stop or Platform	***ScheduledStopPoint***	***Quay***
1	Station	***ScheduledStopPoint***	***StopPlace***
2	Entrance/Exit.		***StopPlaceEntrance***
3	Generic Node		***AccessSpace***
4	Boarding Area		***BoardingPosition***

7.4.2.7 Example Mapping GTFS stops to NeTEx STOP PLACE

The NeTEx STOP PLACE equivalent for the example given above (with the stop type being inferred from VEHICLE MODE of the accompanying GTFS routes file) is:

NeTEx Example on street stop as STOP PLACE

The NeTEx STOP PLACE equivalent is as below.

```
<StopPlace version="any" id="822GA00366-SP">
    <Name>Drimnagh</Name>
    <Centroid>
        <Location>
            <Longitude>-6.31827231820978</Longitude>
            <Latitude>53.3353461945075</Latitude>
```

```
            </Location>
        </Centroid>
        <StopPlaceType>onstreetTram</StopPlaceType>
        <quays>
            <Quay version="any" id="naptanStop:822GA00366">
                <Name>Added Quay for Drimnagh</Name>
                <QuayType>onstreetTram</QuayType>
            </Quay>
        </quays>
    </StopPlace>
```

NeTEx Example of STOP ASSIGNMENT to associate SCHEDULED TOP POINT with STOP PLACE

A STOP PLACE ASSIGNMENT can be used to indicate the correspondence between a SCHEDULED STOP POINT and a STOP PLACE.

```
<PassengerStopAssignment version="any" id="822GA00367-SP@822GA00367" order="1">
    <Name>Assignment for Drimnagh</Name>
    <ScheduledStopPointRef version="any" ref="naptanStop:822GA00367"/>
    <StopPlaceRef version="any" ref="822GA00367-SP"/>
    <QuayRef version="any" ref="naptanStop:822GA00367"/>
</PassengerStopAssignment
```

Note that there is a difference between stop types as to the assignment

- If it is an on-street stop (bus or tram, etc), the QUAY corresponds to the SCHEDULED STOP POINT. Usually there will be a pair of QUAYs, one in each direction and a STOP PLACE is created as a parent to associate them two. If there is a an existing NaPTAN STOP AREA, this can be used to create an explicit stop place with a known code.
- In the case of a rail or metro station, the STOP PLACE corresponds to the SCHEDULED STOP POINT.

7.4.3 GTFS levels / NeTEx LEVEL Mapping

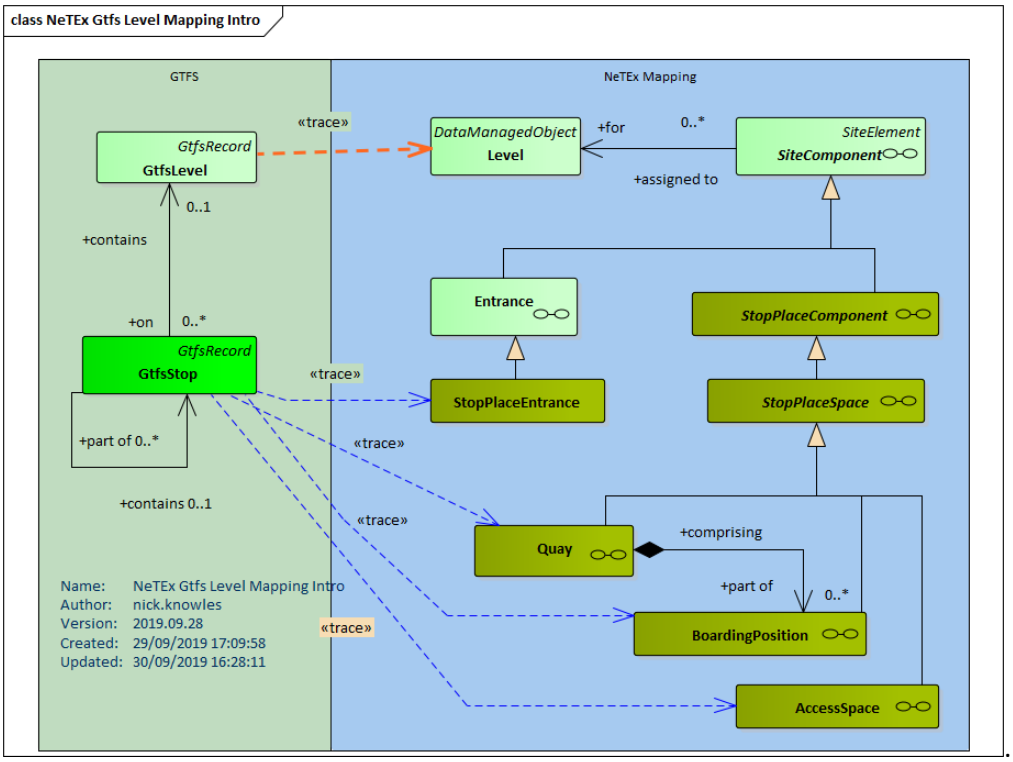
NB☞ The GTFS *levels* record is not currently populated in Irish Data examples and can be ignored.

7.4.3.1 GTFS levels / NeTEx LEVEL Mapping Intro

A GTFS ***levels*** record describes a physical property of a stop – which level it is on within the STOP PLACE. The equivalent element in NeTEx is a LEVEL. A LEVEL can be associated with any SITE COMPONENT, e.g. QUAY, ENTRANCE or ACCESS SPACE.

NB☞ In NETEX a LEVEL is specific to a SITE. In GTFS Levels may be shared between SITEs

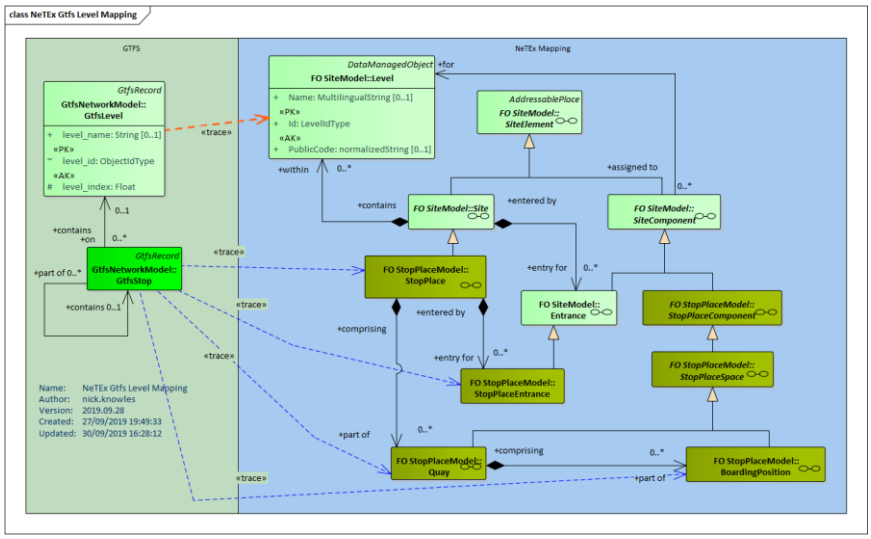
Figure 15 GTFS *levels* to NeTEx LEVEL Mapping – Intro#



7.4.3.2 GTFS levels / NeTEx LEVEL Mapping details

A GTFS ***levels*** record only carries limited attributes describing. Similar attributes can be specified on the NeTEx LEVEL.

Figure 16 GTFS *levels* to NeTEx LEVEL Mapping - Details



7.4.3.3 GTFS levels / NeTEx LEVEL Attribute mapping

GTFS **levels** record is equivalent to a NeTEx LEVEL.

It should be noted that the scope of a level in GTFS is global, whereas in NeTEx levels are specific to a stop place.

Table 11 Mapping of attributes from GTFS levels record

GTFS record	GTFS Attribute	NeTEx element	NeTEx attribute	Type	Alt Text
levels	***level_id***	***Level***	***id***	*LevelIdType*	
	level_name		*Name*	*MultilingualString*	*Y*
	level_index		*PublicCode*	*xsd:string*	
	elevation		***Keylist.gtfs_elevation***	*xsd:string*	

Notes

An equivalent to the GTFS ***elevation*** is not currently present in the NeTEx schema but can be implement using a KeyList

7.4.4 GTFS transfers / NeTEx CONNECTION Mapping

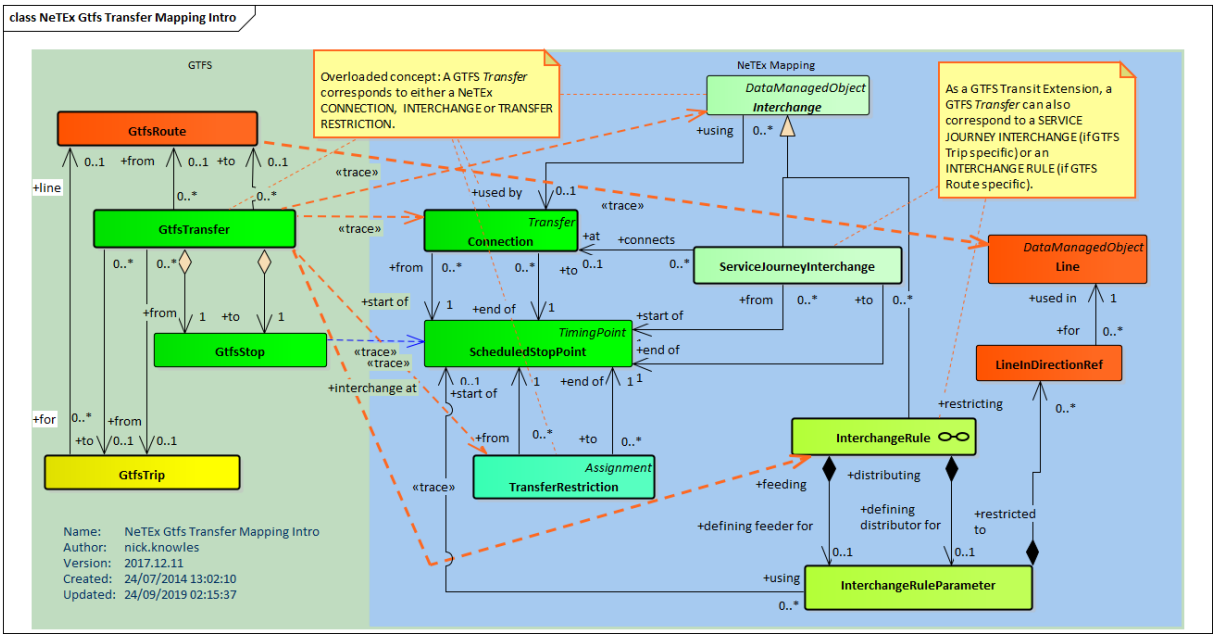
7.4.4.1 GTFS transfers / NeTEx CONNECTION Mapping Intro

A GTFS t***ransfers*** record includes both physical and timetabled connection concepts, and both timing and routing parameters, corresponding variously to NeTEx CONNECTION, INTERCHANGE and TRANSFER RESTRICTION entities. The GTFS Transit extensions allow a further limiting of the applicability of the ***Transfer*** to specific GTFS ***Routes*** (i.e. Transmodel LINEs) or pair of GTFS ***Trips*** (i.e. Transmodel SERVICE JOURNEYs).

Transmodel uses different elements to represent the possibility of a connection between any two stops in the schedule (a CONNECTION), as opposed to an interchange just between two specific journeys that service the two stops in close succession (a SERVICE JOURNEY INTERCHANGE) – thus, different connection times, etc may be specified for specific journeys. Rules that apply more generally to specific LINEs or routings may be described by an INTERCHANGE RULE. Rules that limit passengers use of certain connections are represented by a TRANSFER RESTRICTION.

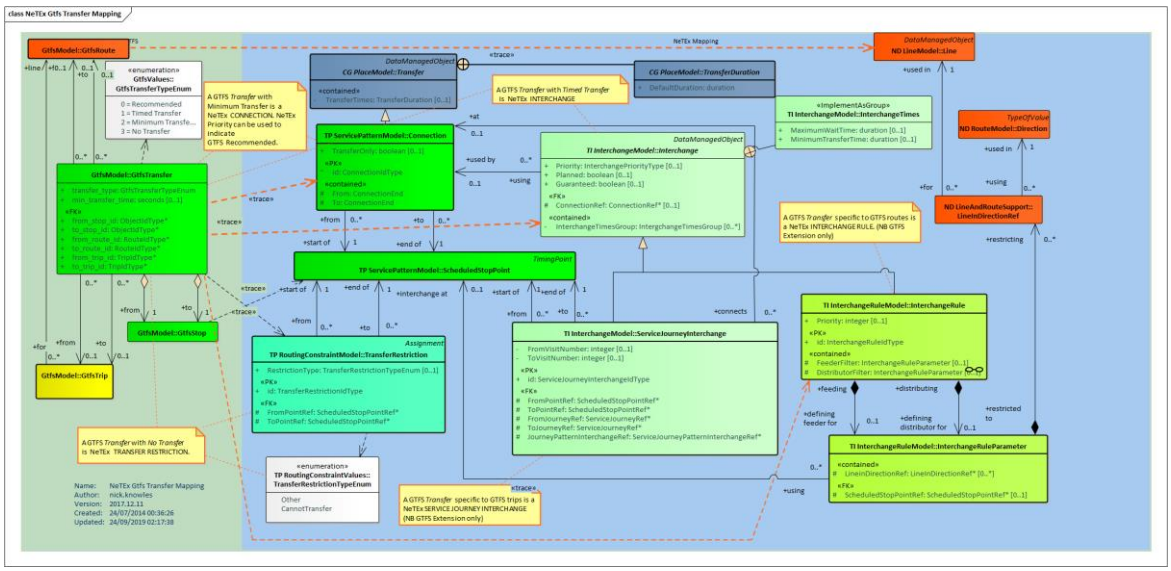
Transmodel also allows generic defaults for mode, operator, station, etc, to be set (not shown in diagram as not supported in GTFS) that can be used by trip planners when no specific timings are given (as is often the case).

Figure 17 GTFS Transfer to NeTEx CONNECTION Mapping - Intro



7.4.4.2 GTFS transfers / NeTEx CONNECTION Mapping details

Figure 18 GTFS Transfer to NeTEx CONNECTION Mapping - Details



7.4.4.3 GTFS transfers / NeTEx CONNECTION Attribute mapping

GTFS **transfers** record is equivalent to a NeTEx CONNECTION, which indicates the possibility of transfer. However, a specific restriction on transfer is further indicated by an INTERCHANGE RULE.

There is a proposed GTFS extension that would allow a route_id to be specified as well on a transfer – this would be mapped to a NeTEx SERVICE JOURNEY INTERCHANGE instead.

Table 12 Mapping of attributes from GTFS transfers record

GTFS record	GTFS Attribute	NeTEx element	NeTEx attribute	Type	Alt Text
transfers	from_stop_id	***Connection***	***From.ConnectionEnd. ScheduledStopPoint***	*ScheduledStopPointRef*	
	to_stop_id		***To.ConnectionEnd. ScheduledStopPoint***	*ScheduledStopPointRef*	
	transfer_type		[mapped as different elements]	*enum*	
	min_transfer_time		***TransferDuration.minimum TransferTime***	*Xsd:duration*	

Notes

The GTFS transfer_type can be used to determine the nature of the mapping.

Table 13 Gtfs transfer_type to NeTEx mapping

GTFS Element	GTFS value	GTFS	NeTEx Element	NeTEx value
transfer_type	***0***	Recommended transfer point	***Connection***	
	1	Timed transfer point between two routes.	***Connection,*** *transferTime*	***xsd:duration***

GTFS Element	GTFS value	GTFS	NeTEx Element	NeTEx value
	2	Transfer requires a minimum amount of time	***Interchange.*** *minimumTransferTime*	***xsd:duration***
	3	Transfers are not possible	***InterchangeRule.Exclude***	*xsd.boolean*

7.4.4.4 Example Mapping GTFS transfers as NeTEx CONNECTION

The logical stop point in a timetable aspects of a GTFS stops record are s represented in NeTEx by a SCHEDULED STOP POINT; this is distinct from the Physical stop, but is sufficient for most cases: In order to produce a timetable, only basic details – a stop code and stop labelling components – need to be present

GTFS Example transfers

For example, the following is a typical GTFS representation of a transfer

```
from_stop_id,to_stop_id,transfer_type,min_transfer_time,
822GA00367, 822GA00367,1,180
```

NeTEx Example of CONNECTION

The following is the NeTEx equivalent:

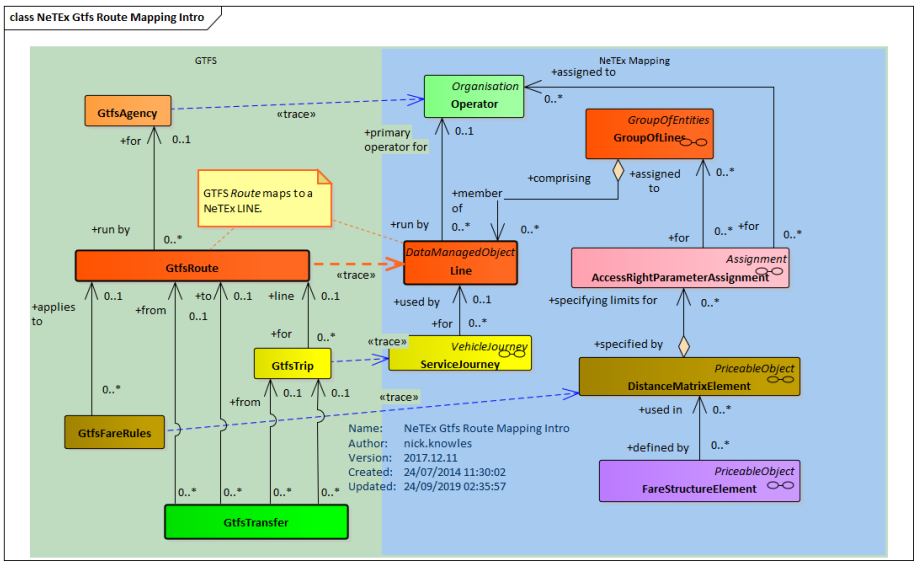
```
<Connection version="any" id="op:822GA00367+822GA00367">
    <TypeOfTransferRef version="gtfs:1.5" ref="gtfs:1"/>
    <TransferDuration>
        <DefaultDuration>PT3M</DefaultDuration>
    </TransferDuration>
    <From>
        <ScheduledStopPointRef ref="naptanStop:822GA00367"/>
    </From>
    <To>
        <ScheduledStopPointRef ref="naptanStop:822GA00368"/>
    </To>
</Connection>
```

7.4.5 GTFS routes / NeTEx LINE Mapping

7.4.5.1 GTFS routes / NeTEx LINE Mapping Intro

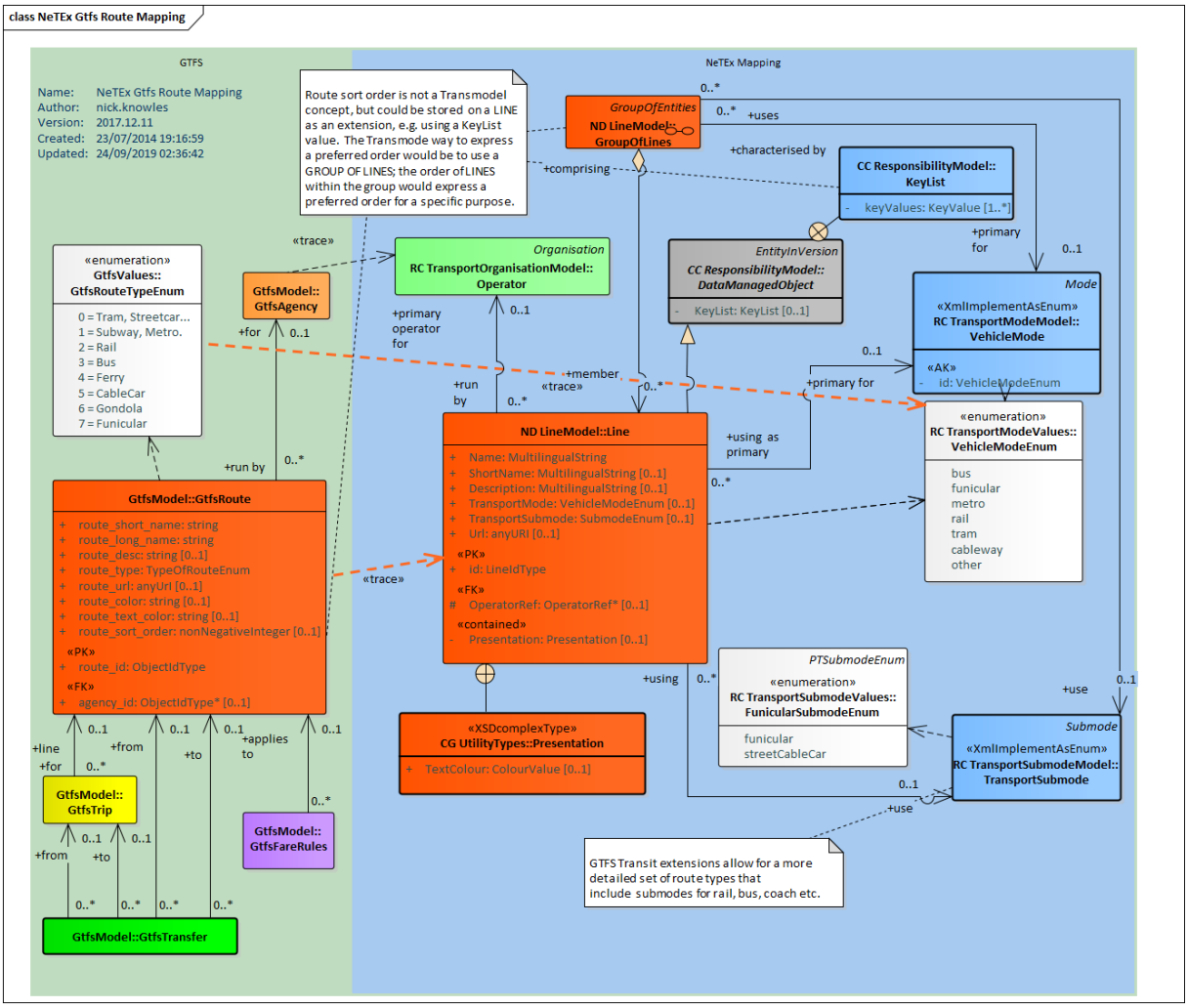
A GTFS r***outes*** record corresponds to a Transmodel/NeTEx LINE.

Figure 19 GTFS Route to NeTEx LINE Mapping- Intro



7.4.5.2 GTFS routes / NeTEx LINE Mapping details

Figure 20 GTFS Route to NeTEx LINE Mapping- Details



7.4.5.3 GTFS routes / NeTEx LINE Attribute mapping

A GTFS **route**s record is equivalent to a NeTEx LINE.

Table 14 Mapping of attributes from GTFS routes record

GTFS record	GTFS Attribute	NeTEx element	NeTEx attribute	Type	Alt Text
routes	***route_id***	***Line***	***id***	*LineIdType*	
	route_long_name		*Name*	*MultilingualString*	*Y*
	route_short_name		*PublicCode*	*xsd:string*	*Y*
	route_desc		***Description***	*xsd:string*	*Y*
	route_type		***Mode***	*ModeEnum*	
	route_url		***Url***	*xsd:anyURI*	*Y*
	route_colour		***Presentation.Colour***	*xsd:string*	
	route_text_colour		***Presentation. TextColour***	*xsd:string*	
	route_sort_order		***Keylist. route_sort_order***	*Xsd:string*	

Notes

An equivalent to the GTFS ***route_sort_order*** is not currently present in the NeTEx schema but can be implement using a KeyList.

The Gtfs route_type attribute is mapped as follows:

Table 15 Gtfs route_type to NeTEx MODE mapping

GTFS Element	GTFS value	NeTEx Attribute	NeTEx value
Route_type	***1***	***Mode***	***metro***
	2		*rail*
	3		*tram*
	4		***water***
	5		***tram***
	6		***telecabine***
	7		***funicular***
	11		***trolleybus***
	12		***monorail***

7.4.5.4 Example Mapping GTFS routes as NeTEx LINE

The mapping of a LINE from a GTFS Change document is straightforward:

- A GTFS Route is equivalent to a NeTEx ***Line,*** which has similar attributes for name, codes, presentation etc. (NeTEx also has a number of additional attributes, for example to specify the allowed means of payment)

GTFS Example Routes

For example, the following is a typical GTFS representation of a route

```
route_id,agency_id,route_short_name,route_long_name,route_type,route_url,route_color,route_text_color
93-GRN-y11-3,1000,10,Green,Green Line,3,http://www.demoagency.org/ab,00FFFF,00FFFF
```

NeTEx Example of mapping GTFS routes to NeTEx LINE

The following is the NeTEx equivalent:

```
<Line version="any1" id="93-GRN-y11-3">
    <Name>Green Line</Name>
    <PublicCode>Green</PublicCode>
    <OperatorRef version="2" ref="noc:1000"/>
    <TransportMode>tram</TransportMode
    <Presentation>
        <Colour>00FFFF</Colour>
        <TextColour>00FFFF</TextColour>
    </Presentation>
</Line>
```

Each LINE must have a unique identifier within the operator's codespace. As well as a unique identifier, LINEs usually have a public identifier which is not necessarily unique; for example, it

is not unusual for an operator to have a several lines with the same public identifier operating in different areas (for example a "*Line 1 in Cambridge*" and a "*Line 1 in Ipswich*", or even for different operators to use the same Line public identifier in the same area.

NeTEx XML EXAMPLE

Two separate "line 86"' instances, each with a different internal identifier but the same PublicCode.

```
<Line version="any" id="frst:985654">
    <Name>86</Name>
    <Description>Cork Line 86</ Description >
    <PublicCode>86</PublicCode>
</Line>
<Line version="any" id="frst:67534">
    <Name>86</Name>
    <Description>Dublin Line 86</ Description >
    <PublicCode>86</PublicCode>
</Line>
```

7.4.6 GTFS trips / NeTEx SERVICE JOURNEY Mapping

The primary component of a GTFS timetable is a ***Trip.*** The Transmodel equivalent is a VEHICLE JOURNEY

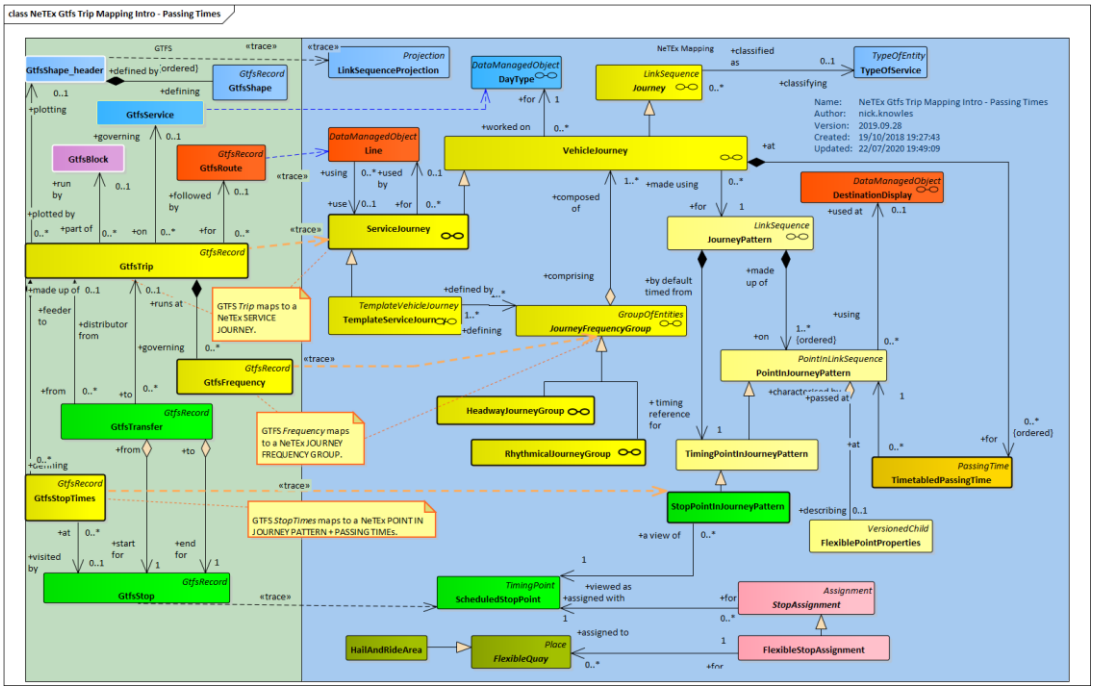
7.4.6.1 GTFS trips / NeTEx SERVICE JOURNEY Mapping Intro – PASSING TIMEs

A GTFS ***trips*** record corresponds to a Transmodel/NeTEx VEHICLE JOURNEY; a GTFS Trip record may either correspond to a SERVICE JOURNEY or to a TEMPLATE SERVICE JOURNEY (if it has an associated GTFS ***frequencies*** record) ; the latter in effect defining a number of different SERVICE JOURNEYS running at a specified frequency.

The Transmodel representation also separates the SERVICE PATTERN of STOP POINTS in PATTERN from the PASSING TIMEs so that the same pattern can be used with different journeys.

GTFS has recently added a continuous pickup feature for areas where the bus will stop at any point. This can be represented in NeTEx as a flexible stop using the FLEXIBLE POINT PROPERTIES. The extend of the hail and ride zone may be indicated with a HAIL AND RIDE AREA associated with the SCHEDULED STOP POINT by a FLEXIBLE STOP ASSIGNMENT.

Figure 21 GTFS Trip to NeTEx SERVICE JOURNEY Mapping – Intro

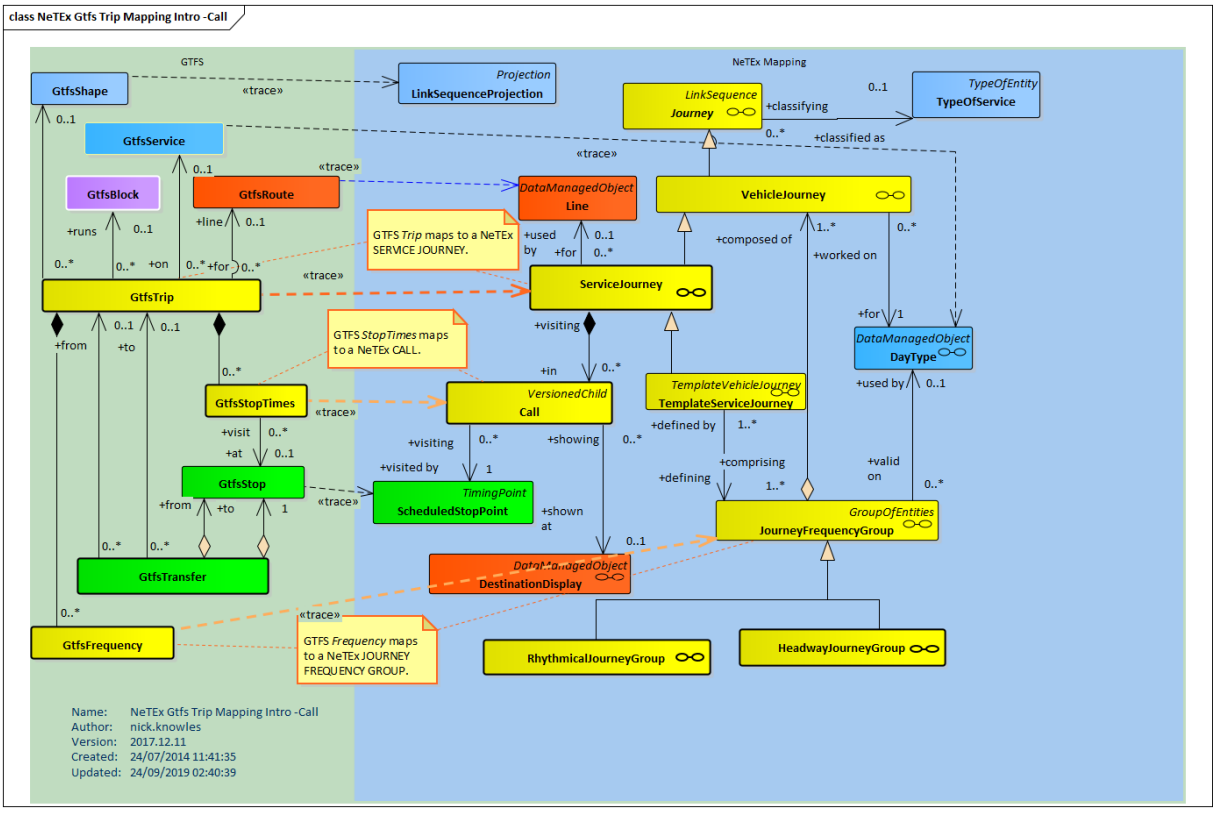


7.4.6.2 GTFS trips / NeTEx SERVICE JOURNEY Mapping Intro – using a CALL

As a simplification for the implementation of timetable formats, NeTEx also supports the use of a CALL – a view element that assembles POINT IN JOURNEY PATTERN, PASSING TIMEs and other attributes in a single element that can be included in sequence in the description of a SERVICE JOURNEY instead of (or even as well as) separate POINT IN JOURNEY PATTERN, PASSING TIMEs, etc. A CALL gives a mapping very close to that of GTFS, since a CALL is largely equivalent to GTFS ***Stop Times*** element**.**

Furthermore use of a CALL makes it easy to transform the absolute passing times from GTFS into true timing values (.i.e. WAIT TIME at stop and RUN TIME between stops), since an onward SERVICE LINK can be associated with each CALL to hold the RUN TIME, and a WAIT time can be associated with the CALL.

Figure 22 GTFS Trip to NeTEx SERVICE JOURNEY Mapping - With Calls



7.4.6.3 GTFS trips / NeTEx SERVICE JOURNEY Mapping details

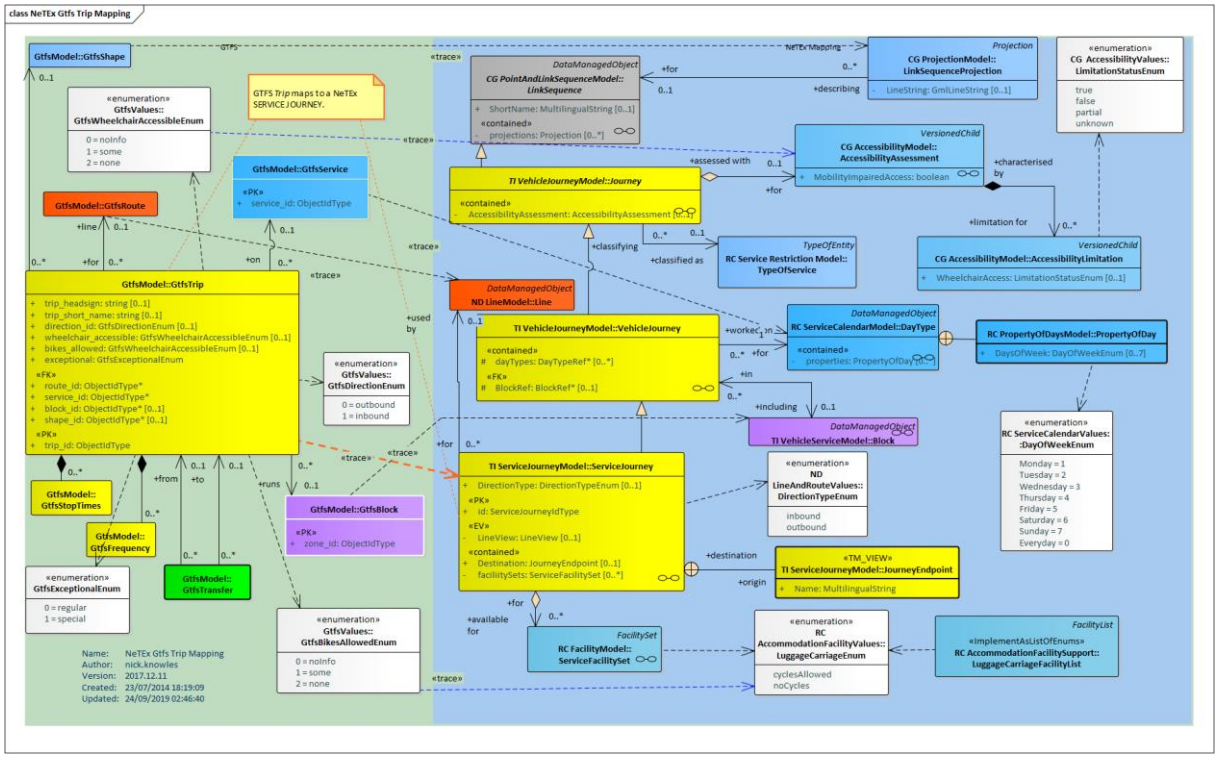
Unlike GTFS, Transmodel covers not just the passenger timetable, but also the planning and operational representations of the journey, so the mapping a GTFS ***Trip*** has to a Transmodel /NeTEx Service Journey, has several differences

(a) Transmodel describes planned journeys in the timetable as running on specific DAY TYPEs (for example “Monday to Friday”, “Weekends”, “Public Holidays”, etc) rather than any specific dates. To arrive at an operational calendar, a specific calendar date is assigned to each day type and “dated” journeys additional defined with crews, vehicles etc. The GTFS Service element (see later below) combine day type and calendar concepts.

(b) In a Transmodel, a SERVICE JOURNEY is just one type of VEHICLE JOURNEY – There are others, not shown in the diagram below, for example DEAD RUNs to position vehicles in place for service, that are part of the operational timetable as well and can be described by Transmodel/NeTEx. GTFS covers only passenger information, so corresponds to a SERVICE JOURNEY,

(c) A frequency-based journey that is described to the passenger in a timetable simply as a single journey at a given interval, say “every five to then minute”, is in fact operationally, multiple journeys carried out by different vehicles and crews. This is reconciled in the Transmodel/NeTEx model by describing such journeys in the timetable as TEMPLATE VEHICLE JOURNEYs, which act as placeholders for the actual vehicle journeys. See later below.

Figure 23 GTFS Trip to NeTEx SERVICE JOURNEY Mapping - Details



7.4.6.4 GTFS trips / NeTEx SERVICE JOURNEY Attribute mapping

A GTFS **trips** record is equivalent to a NeTEx SERVICE JOURNEY.

Table 16 Mapping of attributes from GTFS trips record

TFS record	GTFS Attribute	NeTEx element	NeTEx attribute	Type	Alt Text
trips	***route_id***	***ServiceJourney***	***LineRef***	*LineRef*	
	service_id		*DayTypeRef*	*DayTypeRef*	
	trip_id		***id***	*ServiceJourneyIdType*	
	trip_headsign		***Destination.name***	*MultilingualString*	*Y*
	trip_short_name		***ShortName***	*MultilingualString*	Y
	direction_id		***DirectionType***	*Direction enum*	*Y*
	block_id		***BlockRef***	*xsd:anyURI BlockRef*	
	shape_id		***LinkSequenceProjection***	***LinkSequenceProjection***	
	wheelchair_accessible		***AccessibilityAssessment.WheelchairAccess***	*Enum*	
	bikes_allowed		***ServiceFacilitySet.LuggageAllowance***	*enum*	

Notes

A DESTINATION DISPLAY may also be used to hold the content for the GTFS trip_headsign attribute so that it is shareable between journeys.

Gtfs direction is mapped as follows

Table 17 Gtfs direction to NeTEx DirectionType mapping

GTFS Element	GTFS value	NeTEx Attribute	NeTEx value
Direction_id	***0***	***DirectionType***	***outbound***
	1		*inbound*

Table 18 Gtfs bikes_allowed to NeTEx Facility mapping

GTFS Element	GTFS value	NeTEx Attribute	NeTEx value
Bikes_allowed	***1***	***DirectionType***	*cyclesAllowed*
	2		*noCycles*
	0	***unspecified***	

7.4.6.5 Example Mapping GTFS trips data to NeTEx SERVICE JOURNEY

GTFS Example trips

For example, the following is a typical GTFS representation of a trip

```
route_id,service_id,trip_id,shape_id,trip_headsign,direction_id
"93-RED-y11-4","Fri","178.Mon.93-RED-y11-4.45.I ","93-RED-y11-4.76.I","","1"
```

NeTEx Example of SERVICE JOURNEY

The following is the NeTEx equivalent:

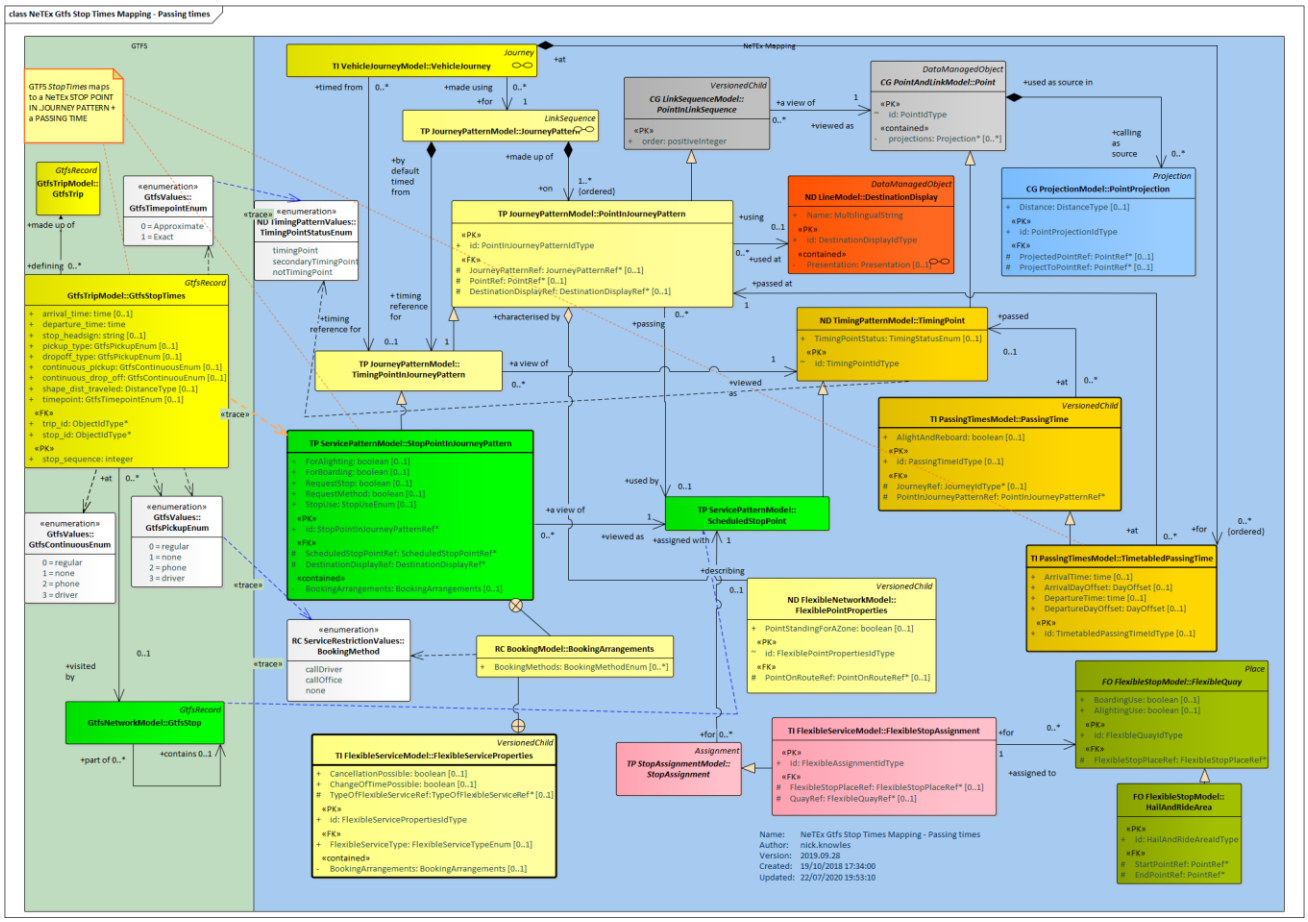
```
<ServiceJourney version="any" id="178.Mon.93-RED-y11-4.45.I">
    <dayTypes>
        <DayTypeRef version="any" ref="Fri"/>
    <dayTypes>
    <LineRef version="any" ref="93-RED-y11-4"/>
    <DirectionType>outbound</DirectionType>
    <Destination>
        <Name>93-RED-y11-4.76.I</Name>
        <DestinationDisplayRef version="any" ref="253450203"/>
    </Destination>
</ServiceJourney>
```

7.4.8 GTFS stop_times Trips / NeTEx PASSING TIMEs Mapping

7.4.8.1 GTFS stop_times Trips / NeTEx PASSING TIMEs details

The GTFS ***Stop Times*** element provides information about an individual visit to a stop in the course of a GTFS ***Trip***, i.e. NeTEx journey. A GTFS ***Stop Time*** can be mapped to separate Transmodel POINT IN JOURNEY PATTERN and PASSING TIME elements.

Figure 24 GTFS Stop Times to NeTEx PassingTimes Mapping - Intro



7.4.8.2 GTFS: stop_times / NeTEx POINT IN PATTERN Attribute mapping

A GTFS **stop_times** record is equivalent to a NeTEx POINT IN PATTERN

An alternative representation as a CALL is also possible.

Table 19 Mapping of attributes from GTFS stop_times record toa NeTEx STOP POINT IN PATTERN

GTFS record	GTFS Attribute	NeTEx element	NeTEx attribute	Type	Alt Text
Stop_times	trip_id	***StopPointInJourneyPattern***	***JourneyRef***	*JourneyRef*	
	arrival_time		***TimetablePassingTime. ArrivalTime***	*Xsd:time*	
			TimetablePassingTime ArrivalDayOffset	*Xsd:integer*	

GTFS record	GTFS Attribute	NeTEx element	NeTEx attribute	Type	Alt Text
	departure_time		***TimetablePassingTime. DepartureTime***	*Xsd:time*	
			TimetablePassingTime. DepartureDayOffset	*Xsd:integer*	
	stop_id		***ScheduledStopPointRef***	*ScheduledStopPointRef*	
	stop_sequence		***order***	*integer*	
	stop_headsign		***DestinationDisplayRef***	***DestinationDisplayRef***	*(Y)*
	pickup_type		***BookingArrangements. BookingMethod***	*Enum*	
			ForBoarding	*xsd:boolean*	
	drop_off_type		***BookingArrangements. BookingMethod***	*Enum*	
			ForAlighting	*xsd:boolean*	
	continuous_pickup		***BookingArrangements. BookingMethod***	*enum*	
			→FlexiblePointProperties.PointStandingForAZone	*xsd:boolean*	
	continuous_drop_off		***BookingArrangements. BookingMethod***	*enum*	
			→FlexiblePointProperties.PointSTaningForAZone	*xsd:boolean*	
	shape_dist_traveled		***(ServiceLink.Distance)***	*distance*	
	timepoint		***TimingPointStatus***	*enum*	

Notes

A DESTINATION DISPLAY may also be used for the content of the GTFS stop_headsign attribute so that it is shareable between journeys.

In NeTEx times are relative to the operating day – a ***DayOffset*** may be used to indicate times that are in the next or successive days

The extent of a continuous GTFS Pickup Zone is defined with a NeTEx HAIL AND RIDE AREA; this is a type of NeTEx FLEXIBLE QUAY that may be associated with a STOP POINT using a FLEXIBLE STOP ASSIGNMENT.

The availability of continuous pick up can be indicated by a NeTEx FLEXIBLE POINT PROPERTIES associated with the POINT IN PATTERN.

The GTFS shape_dist_traveled attribute can be computed by adding up the distances for the NeTEx SERVICE LINKs in the rout up to the point in pattern. To associate a precomputed cumulative value, a LINK PROJECTION can be associated with the point.

Table 20 Gtfs drop_off_type& continuous_drop_off _ mapping e to NeTEx

GTFS Element	GTFS value	NeTEx Attribute	NeTEx value
Drop_off_type	***0***	***ForAlighting***	*true*

GTFS Element	GTFS value	NeTEx Attribute	NeTEx value
	1		***false***
	3	***BookingMethod***	***callDriver***
	2		***callOffice***

Table 21 Gtfs pickup_type & continuous_pick_up_type to NeTEx mapping

GTFS Element	GTFS value	NeTEx Attribute	NeTEx value
Pickup_type	***0***	***ForBoarding***	*true*
	1		***false***
	3	***BookingMethod***	***callDriver***
	2		***callOffice***

7.4.8.3 Example Mapping GTFS Stop Times data to NeTEx PASSING TIMEs

GTFS Example trips

For example, the following is a typical GTFS representation of a stop_times as an ordered sequence of times at individual stops.

```
trip_id,arrival_time,departure_time,stop_id,stop_sequence,stop_headsign,pickup_type,drop
_off_type,shape_dist_traveled
"178.Sat.93-RED-y11-1.45.I","24:08:00","24:08:00","823GA00345","1","Foo","0","0","0"
"178.Sat.93-RED-y11-
1.45.I","24:09:08","24:09:10","823GA00342","2","Bar","2","2","406.474786416385"
"178.Sat.93-RED-y11-
1.45.I","24:11:01","24:11:01","823GA00339","3","","0","0","966.293835932707"
```

NeTEx Example of point in pattern as PASSING TIMEs

The following is the NeTEx equivalent as a SERVICE PATTERN made up of an ordered sequence POINTS in JOURNEY PATTERN and PASSING TIMEs that reference the points.

```
    <ServicePattern version="any" id="178.Sat.93-RED-y11-1.45.I@1">
        <pointsInSequence>
            <StopPointInJourneyPattern version="any" id="178.Sat.93-RED-y11-1.45.I@1"
order="1">
                <ScheduledStopPointRef version="any" ref="823GA00345"/>
                <OnwardServiceLinkRef version="any" ref="823GA00345+823GA00342"/>
                <DestinationDisplayRef version="any" ref="9606568"/>
            </StopPointInJourneyPattern>
            <StopPointInJourneyPattern version="any" id="178.Sat.93-RED-y11-1.45.I@1"
order="2">
                <ScheduledStopPointRef version="any" ref="823GA00342"/>
                <OnwardServiceLinkRef version="any" ref="823GA00342+823GA00339"/>
                <DestinationDisplayRef version="any" ref="245730365"/>
            </StopPointInJourneyPattern>
            <StopPointInJourneyPattern version="any" id="178.Sat.93-RED-y11-1.45.I@1"
order="3">
                <ScheduledStopPointRef version="any" ref="823GA00339"/>
            </StopPointInJourneyPattern>
        </pointsInSequence>
    </ServicePattern>
```

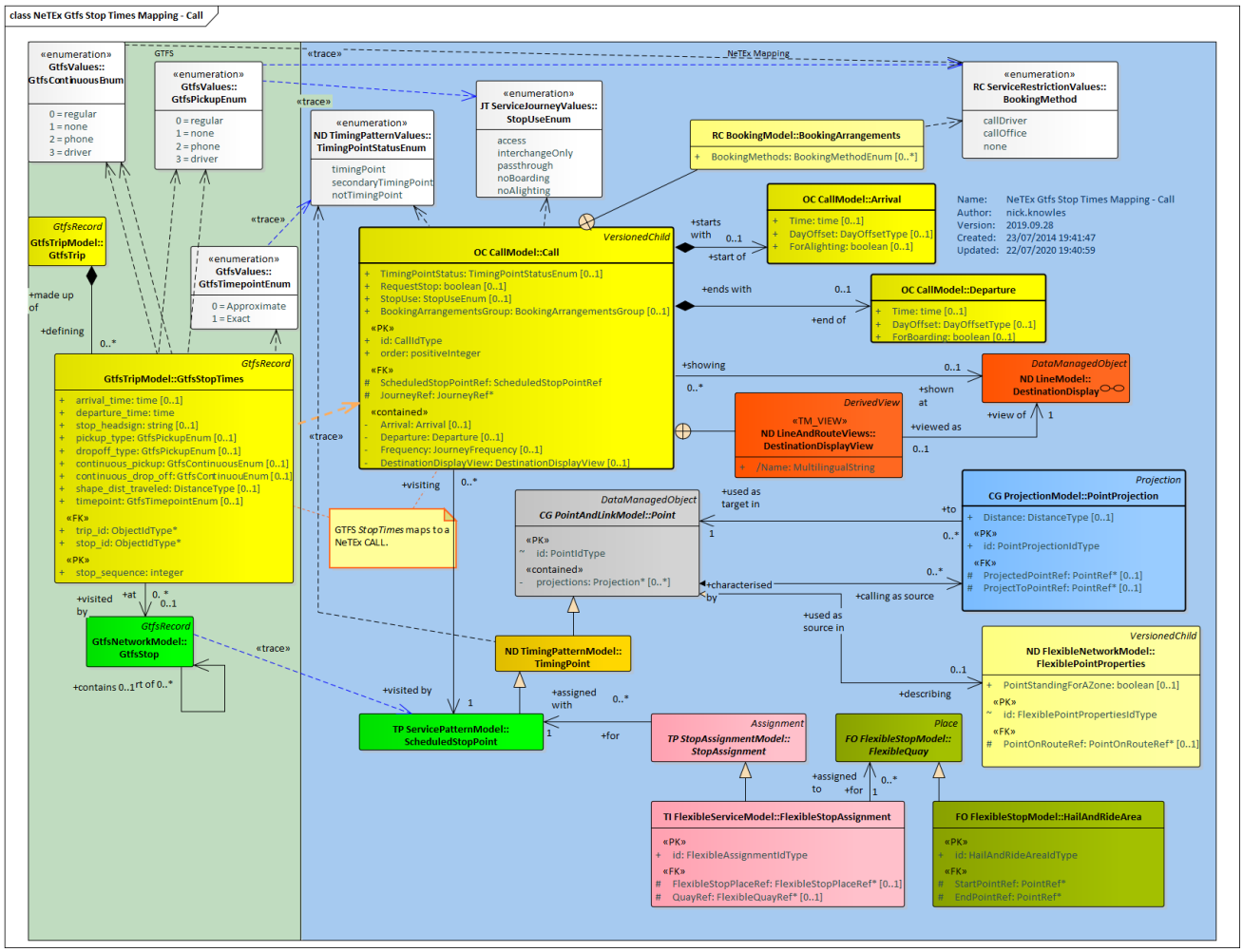
```
<ServiceJourney version="any" id="178.Sat.93-RED-y11-1.45.I ">
    <ServiceJourneyPatternRef: version="any" ref="178.Sat.93-RED-y11-1.45.I@1"/>
    <LineRef version="any" ref="93-RED-y11-1"/>
    <DirectionType>outbound</DirectionType>

……
    <passingTimes>
        <TimetabledPassingTime version="any" id=178.Sat.93-RED-y11-1.45.I@1”>
            <PointInJourneyPatternRef version="any" ref=178.Sat.93-RED-y11-1.45.I@1 "
order="1"/>
            <DepartureTime>00:08:00</DepartureTime>
        </TimetabledPassingTime>
        <TimetabledPassingTime version="any" id=178.Sat.93-RED-y11-1.45.I@2>
            <PointInJourneyPatternRef version="any" ref=178.Sat.93-RED-y11-1.45.I@1
order="2"/>
            <ArrivalTime>00:09:08</ArrivalTime>
            <DepartureTime>00:09:10</DepartureTime>
        </TimetabledPassingTime>
        <TimetabledPassingTime version="any" id="178.Sat.93-RED-y11-1.45.I@3" >
            <PointInJourneyPatternRef version="any" ref=178.Sat.93-RED-y11-1.45.I@1
order="3"/>
            <ArrivalTime>00:11:01</ArrivalTime>
        </TimetabledPassingTime>
    </passingTimes>
</ServiceJourney
```

7.4.8.4 GTFS stop_times Trips / NeTEx PASSING TIMEs Mapping – CALL details

An alternative simpler mapping of a GTFS ***Stop Times*** is to use a NeTEx CALL element.

Figure 25 GTFS Stop Times to NeTEx PassingTimes Mapping - With Call - details



7.4.8.5 GTFS: stop_times / NeTEx CALL Attribute mapping

A GTFS **stop_times** record may be represented additionally as a NeTEx CALL

Table 22 Mapping of attributes from GTFS stop_times record to a NeTEx CALL

GTFS record	GTFS Attribute	NeTEx element	NeTEx attribute	Type	Alt Text
Stop_times	trip_id	***Call***	***JourneyRef***	*JourneyRef*	
	arrival_time		***Arrival.Time***	*Xsd:time*	
			Arrival.DayOffset	*Xsd:integer*	
	departure_time		***Departure.Time***	*Xsd:time*	
			Departure.DayOffset	*Xsd:integer*	
	stop_id		***ScheduledStopPointRef***	*ScheduledStopPointRef*	

GTFS record	GTFS Attribute	NeTEx element	NeTEx attribute	Type	Alt Text
	stop_sequence		***order***	*integer*	
	stop_headsign		***DestinationDisplayRef***	***DestinationDisplayRef***	*(Y)*
	pickup_type		***BookingArrangements.BookingMethod***	*Enum*	
			DepartureForBoarding	*xsd:boolean*	
	drop_off_type		***BookingArrangements.BookingMethod***	*Enum*	
			Arrival.ForAlighting	*xsd:boolean*	
	continuous_pickup		***BookingArrangements.BookingMethod***	*enum*	
	continuous_drop_off		***BookingArrangements.BookingMethod***	*enum*	
	shape_dist_traveled		***(ServiceLink.Distance)***	*distance*	
	timepoint		***TimingPointStatus***	*enum*	

Notes

A DESTINATION DISPLAY may also be used for the content of the GTFS stop_headsign so that it is shareable between journeys.

In NeTEx times are relative to the operating day – a ***DayOffset*** may be used to indicate times that are in the next or successive days

The extent of a continuous Pickup Zone is defined with a HAIL AND RIDE AREA; this is a type of FLEXIBLE QUAY that may be associated with a STOP POINT using a FLEXIBLE STOP ASSIGNMENT.

The availability of continuous pick up can be indicated by a FLEXIBLE POINT PROPERTIES associated with the POINT IN PATTERN.

The shape_dist_traveled can be computed by adding up the distances for the SERVICE LINKs in the rout up to the point in pattern. To associate a precomputed cumulative value, a LINK PROJECTION can be associated with the po/int

7.4.8.6 Example Mapping GTFS Stop times data to NeTEx CALL

GTFS Example stop times

For example, the following is a typical GTFS representation of a stop_times

```
trip_id,arrival_time,departure_time,stop_id,stop_sequence,stop_headsign,pickup_type,drop_off_type,shape_dist_traveled
"10.MF-BH.93-RED-y11-1.104.I","06:30:00","06:30:00","823GA00354","1","","0","0","0"
"10.MF-BH.93-RED-y11-1.104.I","06:35:28","06:35:28","822GA00357","2","","0","0","2160.30410146446"
"10.MF-BH.93-RED-y11-1.104.I","06:37:23","06:37:23","822GA00361","3","","0","0","2888.3851156893"
:::::intervening stops omitted
"10.MF-BH.93-RED-y11-1.104.I","07:06:20","07:06:20","822GA00434","20","","0","0","11094.5606944589"
"10.MF-BH.93-RED-y11-1.104.I","07:09:00","07:09:00","822GA00437","21","","0","0","11626.0679850957"
```

NeTEx Example of GTFS stop_times as CALLs

The following is the NeTEx equivalent of the GTFS stop times as CALLs within a SERVICE JOURNEY.:

```
<
    <ServiceJourney version="any" id="10.MF-BH.93-RED-y11-1.104.I">
        <LineRef version="any" ref="93-RED-y11-1"/>
        <DirectionType>outbound</DirectionType>
        <Destination>
            <Name>93-RED-y11-1.104.I</Name>
            <DestinationDisplayRef version="any" ref="59168868"/>
        </Destination>
        <calls>
            <Call version="any" id="10.MF-BH.93-RED-y11-1.104.I" order="1">
                <ScheduledStopPointRef version="any" ref="823GA00354"/>
                <Departure>
                    <Time>06:30:00</Time>
                </Departure>
            </Call>
            <Call version="any" id="10.MF-BH.93-RED-y11-1.104.I" order="2">
:::::intervening stops omitted
            <Call version="any" id="10.MF-BH.93-RED-y11-1.104.I" order="21">
                <ScheduledStopPointRef version="any" ref="822GA00437"/>
                <Arrival>
                    <Time>07:09:00</Time>
                </Arrival>
            </Call>
        </calls>
```

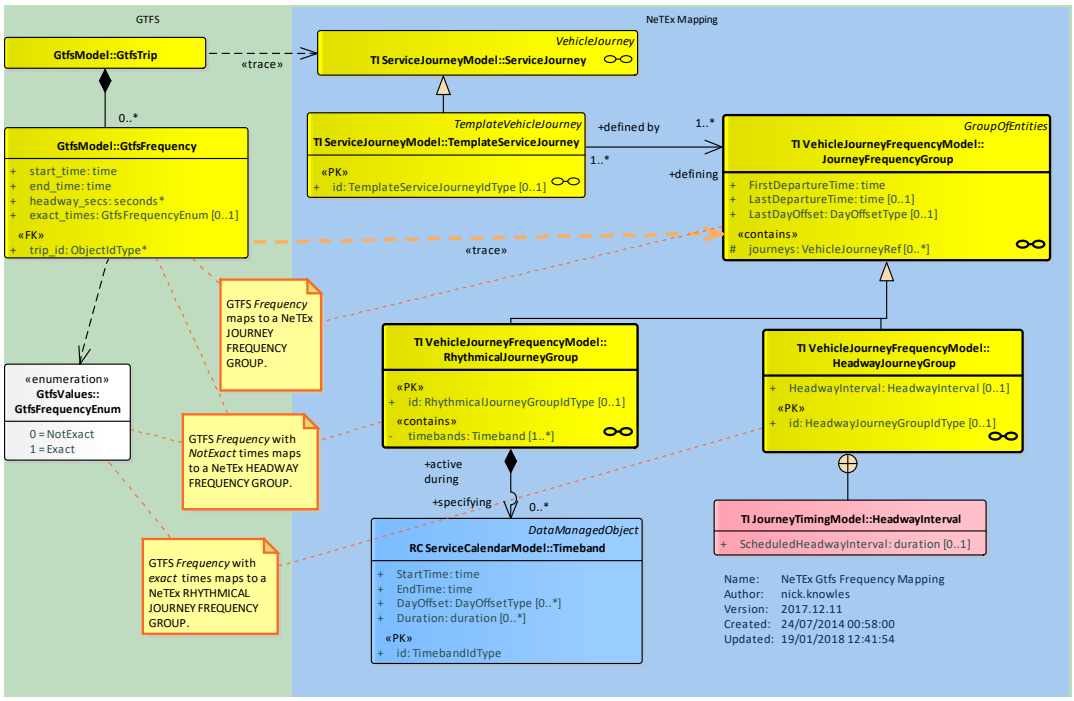
7.4.10 GTFS frequency / NeTEx HEADWAY JOURNEY GROUP Mapping

A GTFS f***requency*** provides interval times for frequency- based services. The data corresponds to that held by a Transmodel/NeTEx JOURNEY FREQUENCY GROUP. If the GTFS frequency is given as “headway_secs”, then a Transmodel HEADWAY JOURNEY GROUP is used. If it is given as “exact times”, then a Transmodel RHYTHMICAL JOURNEY GROUP is used.

Note that Transmodel/NeTEx distinguishes between an individual SERVICE JOURNEY and a TEMPLATE SERVICE JOURNEY, representing multiple SERVICE JOURNEYs running at a specified frequency.

7.4.10.1 GTFS frequency / NeTEx HEADWAY JOURNEY GROUP Mapping details

Figure 26 GTFS Frequency to NeTEx HEADWAY JOURNEY GROUP Mapping - Details



7.4.10.2 GTFS frequencies / NeTEx HEADWAY JOURNEY GROUP Attribute mapping

A GTFS **frequencies** record may be represented as a NeTEx HEADWAY JOURNEY GROUP that specifies the frequency. Note that if the journey is a frequency-based journey, then a TEMPLATE SERVICE JOURNEY should be used.

Table 23 Mapping of attributes from GTFS frequencies record

GTFS record	GTFS Attribute	NeTEx element	NeTEx attribute	Type	Alt Text
frequencies	trip_id	ServiceJourney	TemplateServiceJourneyRef	TemplateServiceJourneyRef	
	start_time		FirstDepartureTime	xsd:time	
	end_time		LastDepartureTime	xsd:time	
	headway_secs		ScheduledHeadwayInterval	Xsd:duration	
	exact_times		MaximumHeadwayInterval	Xsd:duration	

Notes

Gtfs distinguishes between a service running to exact intervals and an approximate one. This is represented in NeTEx by a whether the interval is exact or a band, as specified by a minimum and maximum interval

Table 24 Gtfs transfer_type to NeTEx mapping

GTFS Element	GTFS value	GTFS	NeTEx Element	NeTEx value
transfer_type	***0***	Frequency based		
	1	Schedule based with constant headway	***Minimum and Maxim headway values are the same***	

7.4.10.3 Example Mapping GTFS frequencies data to NeTEx HEADWAY JOURNEY GROUP

The following example shows a GTFS ***frequencies*** record as NeTEx XML.

GTFS Example frequencies

For example, the following is a typical GTFS representation of frequencies

```
trip_id,start_time,end_time,headway_secs,exact_times
STBA,6:00:00,22:00:00,1800,1
CITY1,6:00:00,7:59:59,1800,0
CITY1,8:00:00,9:59:59,600,0
CITY1,10:00:00,15:59:59,1800,0
CITY1,16:00:00,18:59:59,600,0
CITY1,19:00:00,22:00:00,1800,0
```

NeTEx Example of frequencies as HEADWAY JOURNEY GROUP

The following is the NeTEx equivalent as two TEMPLATE SERVICE JOURNEYS with HEADWAY JOURNEY GROUPs that specify the intervals.

```
<TemplateServiceJourney version="any" id="mygtfsxm:STBA">
    <Description>STBA,6:00:00,22:00:00,1800</Description>
    <DepartureTime>06:00:00</DepartureTime>
    <frequencyGroups>
        <HeadwayJourneyGroup version="any" id="mygtfsxm:STBA-06:00:00">
            <FirstDepartureTime>06:00:00</FirstDepartureTime>
            <LastDepartureTime>22:00:00</LastDepartureTime>
            <ScheduledHeadwayInterval>PT30M</ScheduledHeadwayInterval>
            <MaximumHeadwayInterval>PT30M</MaximumHeadwayInterval>
        </HeadwayJourneyGroup>
    </frequencyGroups>
</TemplateServiceJourney>

<TemplateServiceJourney version="any" id="mygtfsxm:CITY1">
    <DepartureTime>06:00:00</DepartureTime>
    <frequencyGroups>
        <HeadwayJourneyGroup version="any" id="mygtfsxm:CITY1-06:00:00">
            <FirstDepartureTime>06:00:00</FirstDepartureTime>
            <LastDepartureTime>07:59:59</LastDepartureTime>
```

```
            <ScheduledHeadwayInterval>PT30M</ScheduledHeadwayInterval>
        </HeadwayJourneyGroup>
        <HeadwayJourneyGroup version="any" id="mygtfsxm:CITY1-08:00:00">
            <FirstDepartureTime>08:00:00</FirstDepartureTime>
            <LastDepartureTime>09:59:59</LastDepartureTime>
            <ScheduledHeadwayInterval>PT10M</ScheduledHeadwayInterval>
        </HeadwayJourneyGroup>
        <HeadwayJourneyGroup version="any" id="mygtfsxm:CITY1-10:00:00">
            <FirstDepartureTime>10:00:00</FirstDepartureTime>
            <LastDepartureTime>15:59:59</LastDepartureTime>
            <ScheduledHeadwayInterval>PT30M</ScheduledHeadwayInterval>
        </HeadwayJourneyGroup>
        <HeadwayJourneyGroup version="any" id="mygtfsxm:CITY1-16:00:00">
            <FirstDepartureTime>16:00:00</FirstDepartureTime>
            <LastDepartureTime>18:59:59</LastDepartureTime>
            <ScheduledHeadwayInterval>PT10M</ScheduledHeadwayInterval>
        </HeadwayJourneyGroup>
        <HeadwayJourneyGroup version="any" id="mygtfsxm:CITY1-19:00:00">
            <FirstDepartureTime>19:00:00</FirstDepartureTime>
            <LastDepartureTime>22:00:00</LastDepartureTime>
            <ScheduledHeadwayInterval>PT30M</ScheduledHeadwayInterval>
        </HeadwayJourneyGroup>
    </frequencyGroups>
</TemplateServiceJourney>
```

7.4.11 Adding timing information

GTFS exchanges absolute passing times for each separate journey. In NeTEx it is possible also (or instead) to exchange the timings for each link and stop so that scheduling and real-time applications can be supported.

The full NeTEx model allows different sets of timing values (RUN TIME, WAIT TIME) to be specified for different TIME DEMAND TYPEs (peak, off-peak, etc,) so that the computation of passing times can take into account different traffic conditions. Each JOURNEY WAIT TIME is a separate element associated with a TIME DEMAND TYPE and a TIMING POINT. Each JOURNEY RUN TIME is a separate element associated with a TIME DEMAND TYPE and a TIMING LINK.

In order to associate RUN TIMEs and WAIT TIMEs with a journey, a SERVICE LINKs must be specified.

A default set of timings is specified on the SERVICE PATTERN that may be shared by any SERVICE JOURNEY that follows the PATTERN. Override values may be specified for a specific VEHICLE JOURNEY.

It is possible to “Reverse engineer” the SERVICE LINKs for SERVICE PATTERN from the sequence of stops in a GTFS stop_times file.

It is also possible to infer the RUN TIMEs from the passing time at stops. Unless separate arrival times and departure times are given, it is not possible to infer the WAIT TIMEs. Thus, the resultant RUN TIMEs also may also wrongly include any WAIT TIMEs; they may contain slight inaccuracies due to rounding errors;

NeTEx XML Example of Timing information

The following example shows a simple journey between three stops.

i) SCHEDULED STOP POINTs and service LINKs are defined and used in sequence in a SERVICE PATTERN.

ii) WAIT TIMEs and RUN TIMEs are specified for the stops and links.

iii) SERVICE JOURNEY is defined that follows the links.

iv) PASSING TIMES computed from the stat time of the journey and the timings are shown.

```
<ServiceFrame version="any" id="gtfs:100">
    <scheduledStopPoints>
        <ScheduledStopPoint version="any" id="823GA00345">
            <Name>Stop 1</Name>
        </ScheduledStopPoint>
        <ScheduledStopPoint version="any" id="823GA00342">
            <Name>Stop 2</Name>
        </ScheduledStopPoint>
        <ScheduledStopPoint version="any" id="823GA00339">
            <Name>Stop 3</Name>A SERVICE PATTERN
        </ScheduledStopPoint>
    </scheduledStopPoints>

    <serviceLinks>
        <ServiceLink version="any" id="823GA00345+823GA00342">
            <Name>Stop 1+Stop 2</Name>
            <FromScheduledStopPointRef version="any" ref="823GA00345"/>
            <ToScheduledStopPointRef version="any" ref="823GA00342"/>
            </ServiceLink>
        <ServiceLink version="any" id="823GA00342+823GA00339">
            <Name>Stop 2+Stop 3</Name>
            <FromScheduledStopPointRef version="any" ref="823GA00342"/>
            <ToScheduledStopPointRef version="any" ref="823GA00339"/>
        </ServiceLink>
    </serviceLinks>

    <journeyPatterns>
        <ServicePattern version="any" id="178.Sat.93-RED-y11-1.45.I@1">
            <Name>Stop 1+Stop 3</Name>
            <waitTimes>
                <WaitTime version="any" id="178.Sat.93-RED-y11-1.45.I@1" order="1">
                    <TimingPointRef version="any" ref="823GA00342"/>
                    <WaitTime>PT2S</WaitTime>
                </WaitTime>
            </waitTimes>
            <runTimes>
                <RunTime version="any" id="178.Sat.93-RED-y11-1.45.I@1" order="1">
                    <TimingLinkRef version="any" ref="823GA00345+823GA00342"/>
                    <RunTime>PT1M8S</RunTime>
                </RunTime>
                <RunTime version="any" id="178.Sat.93-RED-y11-1.45.I@1" order="2">
                    <TimingLinkRef version="any" ref="823GA00342+823GA00339"/>
                    <RunTime>PT1M51S</RunTime>
                </RunTime>
            </runTimes>
            <pointsInSequence>
                <StopPointInJourneyPattern version="any" id="178.Sat.93-RED-y11-
1.45.I@1" order="1">
```

```
                    <ScheduledStopPointRef version="any" ref="823GA00345"/>
                    <OnwardServiceLinkRef version="any" ref="823GA00345+823GA00342"/>
                </StopPointInJourneyPattern>
                <StopPointInJourneyPattern version="any" id="178.Sat.93-RED-y11-
1.45.I@1" order="2">
                    <ScheduledStopPointRef version="any" ref="823GA00342"/>
                    <OnwardServiceLinkRef version="any" ref="823GA00342+823GA00339"/>
                </StopPointInJourneyPattern>
                <StopPointInJourneyPattern version="any" id="178.Sat.93-RED-y11-
1.45.I@1" order="3">
                    <ScheduledStopPointRef version="any" ref="823GA00339"/>
                </StopPointInJourneyPattern>
            </pointsInSequence>
            <linksInSequence>
                <ServiceLinkInJourneyPattern version="any" id="178.Sat.93-RED-y11-
1.45.I@1" order="1">
                    <ServiceLinkRef version="any" ref="823GA00345+823GA00342"/>
                </ServiceLinkInJourneyPattern>
                <ServiceLinkInJourneyPattern version="any" id="178.Sat.93-RED-y11-
1.45.I@1" order="2">
                    <ServiceLinkRef version="any" ref="823GA00342+823GA00339"/>
                </ServiceLinkInJourneyPattern>
            </linksInSequence>
        </ServicePattern>
    </journeyPatterns>
</ServiceFrame>

<TimetableFrame version="any" id="gtfs:1000">
    <vehicleJourneys>
        <ServiceJourney version="any" id="178.Sat.93-RED-y11-1.45.I">
            <DepartureTime>00:08:00</DepartureTime>
            <JourneyPatternRef version="any" ref="178.Sat.93-RED-y11-1.45.I@1"/>
            <LineRef/>

            <waitTimes>
                <VehicleJourneyWaitTime version="any" id="178.Sat.93-RED-y11-1.45.I"
order="1">
                    <TimingPointRef version="any" ref="823GA00342"/>
                    <WaitTime>PT2S</WaitTime>
                </VehicleJourneyWaitTime>
            </waitTimes>

            <runTimes>
                <VehicleJourneyRunTime version="any" id="178.Sat.93-RED-y11-1.45.I"
order="1">
                    <TimingLinkRef version="any" ref="823GA00345+823GA00342"/>
                    <RunTime>PT1M8S</RunTime>
                </VehicleJourneyRunTime>
            <VehicleJourneyRunTime version="any" id="178.Sat.93-RED-y11-1.45.I"
order="2">
                <TimingLinkRef version="any" ref="823GA00342+823GA00339"/>
                <RunTime>PT1M51S</RunTime>
            </VehicleJourneyRunTime>
            </runTimes>

            <passingTimes>
                <TimetabledPassingTimes version="any" id="178.Sat.93-RED-y11-1.45.I"
order="1">
                    <PointInJourneyPatternRef version="any" ref="178.Sat.93-RED-y11-
1.45.I@1"/>
```

```
                    <DepartureTime>00:08:00</DepartureTime>
                </TimetabledPassingTimes>
                <TimetabledPassingTimes version="any" id="178.Sat.93-RED-y11-1.45.I"
order="2">
                <PointInJourneyPatternRef version="any" ref="178.Sat.93-RED-y11-
1.45.I@1"/>
                    <ArrivalTime>00:09:08</ArrivalTime>
                    <DepartureTime>00:09:10</DepartureTime>
                </TimetabledPassingTimes>
                <TimetabledPassingTimes version="any" id="178.Sat.93-RED-y11-1.45.I"
order="3">
                    <PointInJourneyPatternRef version="any" ref="178.Sat.93-RED-y11-
1.45.I@1"/>
                    <ArrivalTime>00:11:01</ArrivalTime>
                </TimetabledPassingTimes>
            </passingTimes>
        </ServiceJourney>
    </vehicleJourneys>
</TimetableFrame>
```

7.4.12 Groups of services

When presenting journeys in a tabular format for printing or display, it is normal to group journeys into separate tables according to their characteristics of direction and day type, for example "*Monday to Friday, outbound*", "*Saturday, inbound*", "*Weekdays Express*" etc. This grouping is complex to perform in an optimal way.

In NeTEx, any grouping must be stated explicitly using a NeTEx ***GroupOfServices*** element.

- There should be separate ***GroupOfServices*** instances for each of the two directions, e.g. '*inbound*' and '*outbound, or 'clockwise' and 'anticlockwise*)**.**

NB☞ For the EIRE_NP, one or more GROUPs OF SERVICEs must be included to group journeys. By default, each journey should be placed into one of the following groups according to ***DayType*** and ***Direction***.

Other groupings are also possible, and it is also permitted to combine the journeys for two-day types that have the same journey timings (e.g. If Sunday and Public Holidays have the same schedule).

Table 7 — GroupOfServices – Timetables

Group of Services	DirectionType
Outbound, Monday-to-Friday	outbound
Outbound, Saturday	
Outbound, Sunday	
Outbound, public holidays	
Inbound, Monday-to-Friday	inbound
Inbound, Saturday	
Inbound, Sunday	
Inbound, public holidays	

NeTEx XML EXAMPLE

```
<GroupOfServices version="1" id="stg:Service@R86@out@monday+friday">
    <Name>Outbound</Name>
    <Description>Outbound services from Connolly Street to Golfclub Monday To
Friday</Description>

    <dayTypes>
        <DayTypeRef ref="phb:Monday+friday" version="phb:v2.1"/>
    </dayTypes>
    <DirectionType>outbound</DirectionType>
    <Origin>
        <Name>Connolly</Name>
    </Origin>
    <Destination>
        <Name>Golfclub</Name>
    </Destination>

</GroupOfServices>
```

7.4.13 GTFS calendar and calendar_dates / NeTEx DAY TYPE Mapping

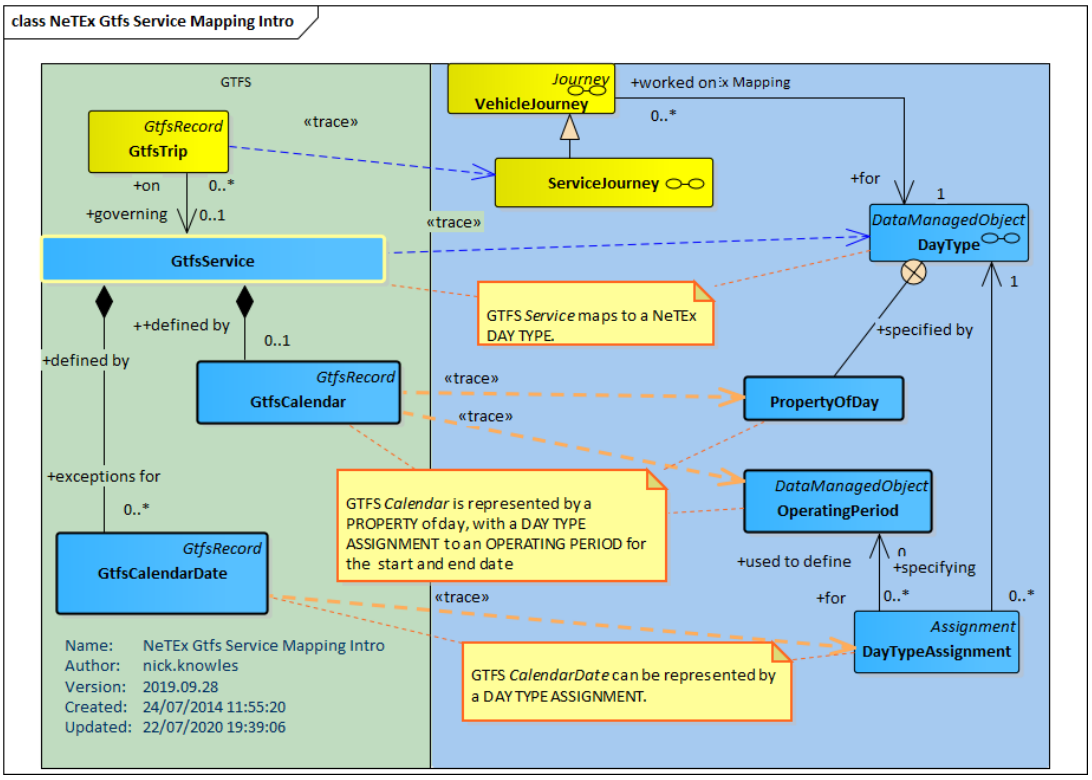
7.4.13.1 GTFS calendar and calendar_dates / NeTEx DAY TYPE Mapping Intro

A GTFS **calendar** record specifies when a service runs (E.g. Weekdays). This is specified in NeTEx by a DAY TYPE. A DAY TYPE ASSIGNMENT Can be used to indicate the period within which the DAY TYPE applies.

In GTFS, exceptions to the normal calendar are specified with a GTFS c**alendar_dates** record

NB☞ The GTFS **calendar** and **calendar_dates** record can reference a service_id, though the separate service entity (i.e. DAY TYPE) is not actually materialised in GTFS

Figure 27 GTFS Service to NeTEx DAY TYPE Mapping - Intro

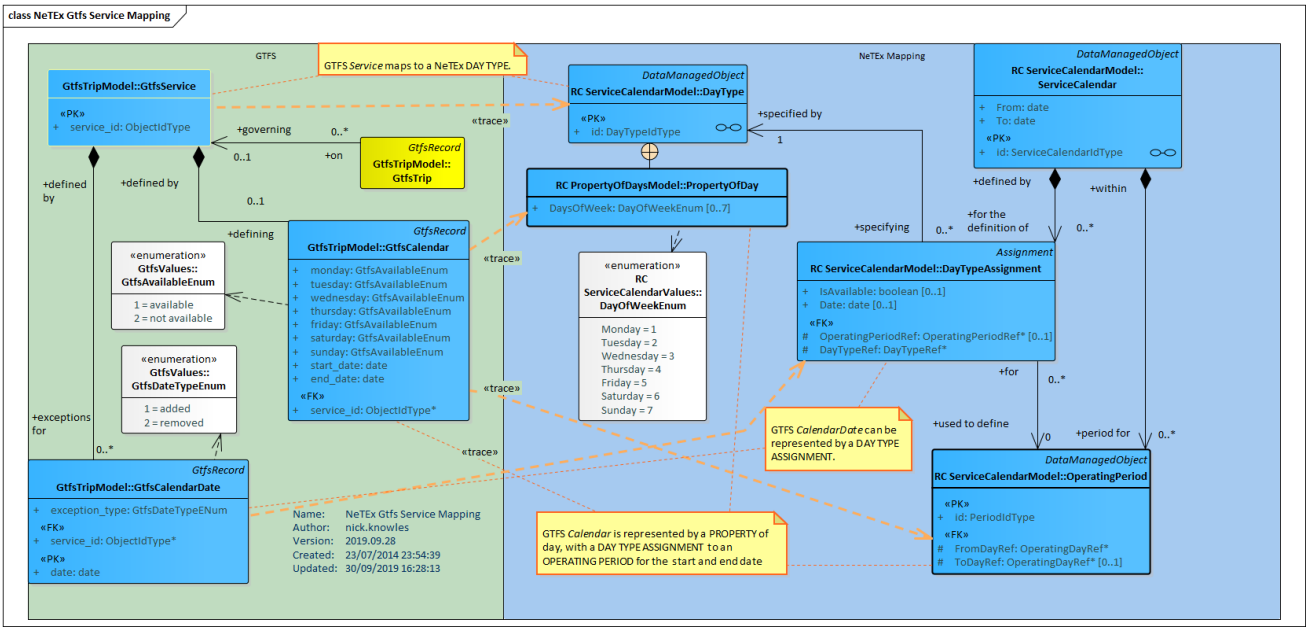


7.4.13.2 GTFS calendar and calendar_dates / NeTEx DAY TYPE Mapping details

GTFS Service aspects that are independent of calendar date (i.e. day of week) map to DAY TYPE and PROPERTY of DAY. Calendar dates map to a DAY TYPE assignment.

Note that NeTEx support additional characterisations of PROPERTY OF DAY (“market day”, ”match day”, etc.) that are not given in GTFS (Not shown in diagram).

Figure 28 GTFS Service to NeTEx DAY TYPE Mapping - Details



7.4.13.3 GTFS service / NeTEx DAY TYPE Attribute mapping

A GTFS **calendar** record may be represented as a NeTEx DAY TYPE

Table 25 Mapping of attributes from GTFS calendar record

GTFS record	GTFS Attribute	NeTEx element	NeTEx attribute	Type	Alt Text
calendar	service_id	***DayType***	***id***	*DayTypeIdType*	
	monday		***Properties.PropertyOfDay. DaysOfWeek. Monday***	*xsd:boolean*	
	tuesday		***Properties.PropertyOfDay. DaysOfWeek. Tuesday***	*xsd:boolean*	
	wednesday		***Properties.PropertyOfDay. DaysOfWeek. Wednesday***	*xsd:boolean*	
	thursday		***Properties.PropertyOfDay. DaysOfWeek. Thursday***	*xsd:boolean*	
	friday		***Properties.PropertyOfDay. DaysOfWeek. Friday***	*xsd:boolean*	
	saturday		***Properties.PropertyOfDay. DaysOfWeek. Saturday***	*xsd:boolean*	
	sunday		***Properties.PropertyOfDay. DaysOfWeek. Sunnday***	*xsd:boolean*	
	drop_off_type		***Properties.PropertyOfDay. DaysOfWeek. Monday***	*xsd:boolean*	
	start_date	***Operating-Period***	***StartDate***	*xsd:dateTime*	
	end_date		***EndDate***	*xsd:dateTime*	
		DayType-Assignment	***DayTypeRef***	*DayTypeRef*	
			OperatingPeriodRef	*OperatingPeriodRef*	

7.4.13.4 Example Mapping GTFS calendar data to NeTEx DAY TYPE

GTFS Example service

For example, the following calendar records are a typical GTFS representation of a service, both with the same service interval

```
service_id,monday,tuesday,wednesday,thursday,friday,saturday,sunday,start_date,end_date
FULLW,1,0,1,0,1,1,1,20070101,20101231
WE,0,0,0,0,0,1,1,20070101,20101231
```

NeTEx Example of GTFS calendar as NeTEx **DAY TYPEs**

The following is the NeTEx equivalent as two DAY TYPEs. An OPERATING PERIOD is created for the service interval and a DAY TYPE ASSIGNMENT used to combine the two. They are grouped within a calendar.

```
<ServiceCalendar version="any" id="1000">
    <dayTypes>
        <DayType version="any" id="FULLW">
            <properties>
                <PropertyOfDay>
                    <DaysOfWeek>Monday Tuesday Friday</DaysOfWeek>
```

```
                </PropertyOfDay>
            </properties>
        </DayType>
        <DayType version="any" id="WE">
            <properties>
                <PropertyOfDay>
                    <DaysOfWeek>none</DaysOfWeek>
                </PropertyOfDay>
            </properties>
        </DayType>
    </dayTypes>
    <operatingPeriods>
        <OperatingPeriod version="any" id="2006-12-31+2010-12-3">
            <FromDate>2006-12-31T23:00:00+00:00</FromDate>
            <ToDate>2010-12-30T23:00:00+00:00</ToDate>
        </OperatingPeriod>
    </operatingPeriods>
    <dayTypeAssignments>
        <DayTypeAssignment version="any" id="FULLW" order="1">
            <OperatingPeriodRef version="any" ref="2006-12-31+2010-12-3”/>
            <DayTypeRef version="any" ref="FULLW">Default day type for
FULLW</DayTypeRef>
        </DayTypeAssignment>
        <DayTypeAssignment version="any" id="WE" order="2">
            <OperatingPeriodRef version="any" ref="2006-12-31+2010-12-3"/>
            <DayTypeRef version="any" ref="WE">Default day type for WE</DayTypeRef>
        </DayTypeAssignment>
    </dayTypeAssignments>
</ServiceCalendar>
```

7.4.13.5 GTFS calendar dates / NeTEx DAY TYPE ASSIGNMENT Attribute mapping

A GTFS **calendar_dates** record may be represented as a NeTEx DAY TYPE ASSIGNMENT that either includes or excludes a date.

Table 26 Mapping of attributes from GTFS calendar_dates record

GTFS record	GTFS Attribute	NeTEx element	NeTEx attribute	Type	Alt Text
Calendar_dates	service_id	***DayType-Assignment***	***DayTypeRef***	*DayTypeRef*	
	date		***Date***	*xsd:date*	
	exception_type		***isAvailable***	*xsd:boolean*	

Notes

A day type may be included or excluded for a calendar date

Table 27 Gtfs exception_type to NeTEx DAY TYPE ASSIGNMENT mapping

GTFS Element	GTFS value		NeTEx Attribute	NeTEx value
exception ***_type***	***1***	Include for date	***DayTypeAssignment***	***isAvailable: true***
	2	Exclude for date		***isAvailable: false***

7.4.13.6 Example Mapping GTFS calendar_dates data to NeTEx DayTypeAssignment

GTFS Example calendar dates

For example, the following is a GTFS representation of two GTFS calendar_dates records, one to exclude and one to include a day

```
service_id,date,exception_typeF
FULLW,20078224,2
FULLW,20078228,1
```

NeTEx Example of DAY TYPEs and DAY TYPE ASSIGNMENTs

The following is the NeTEx equivalent as two DAY TYPE ASSIGNMENTS. TYPEs. An OPERATING PERIOD is created for the service interval and a DAY TYPE ASSIGNMENT used to combine the two. They are grouped within a calendar.

```
<ServiceCalendar version="any" id="FULLW">
    <dayTypes>
        <DayType version="any" id="FULLW@active">
            <Name>FULLW@active</Name>
            <properties>
                <PropertyOfDay>
                    <DaysOfWeek>Everyday</DaysOfWeek>
                </PropertyOfDay>
            </properties>
        </DayType>
    </dayTypes>
    <dayTypeAssignments>
        <DayTypeAssignment version="any" id="FULLW" order="1">
            <Date>2007-06-04</Date>
            <DayTypeRef version="any" ref="FULLW@active”/>
            <isAvailable>false</isAvailable>
        </DayTypeAssignment>
        <DayTypeAssignment version="any" id="FULLW" order="2">
            <Date>2007-06-08</Date>
            <DayTypeRef version="any" ref="FULLW@active”/>
            <isAvailable>true</isAvailable>
        </DayTypeAssignment>
    </dayTypeAssignments>
</ServiceCalendar>
```

7.4.14 GTFS shapes / NeTEx POINT ON LINK Mapping

7.4.14.1 GTFS shapes / NeTEx POINT ON LINK Mapping Intro

A GTFS ***shapes*** record represents a point on a route – a set of such records for each trip describes the spatial plot of a trip as a list of coordinates. A GTFS shape distance can be associated with each GTFS ***stop_times*** record, representing the *cumulative* distance along the plot to that point.

In NeTEx, each POINT has coordinates and each LINK can have its own distance and a plot, allowing the reuse of LINK plots in different use cases.

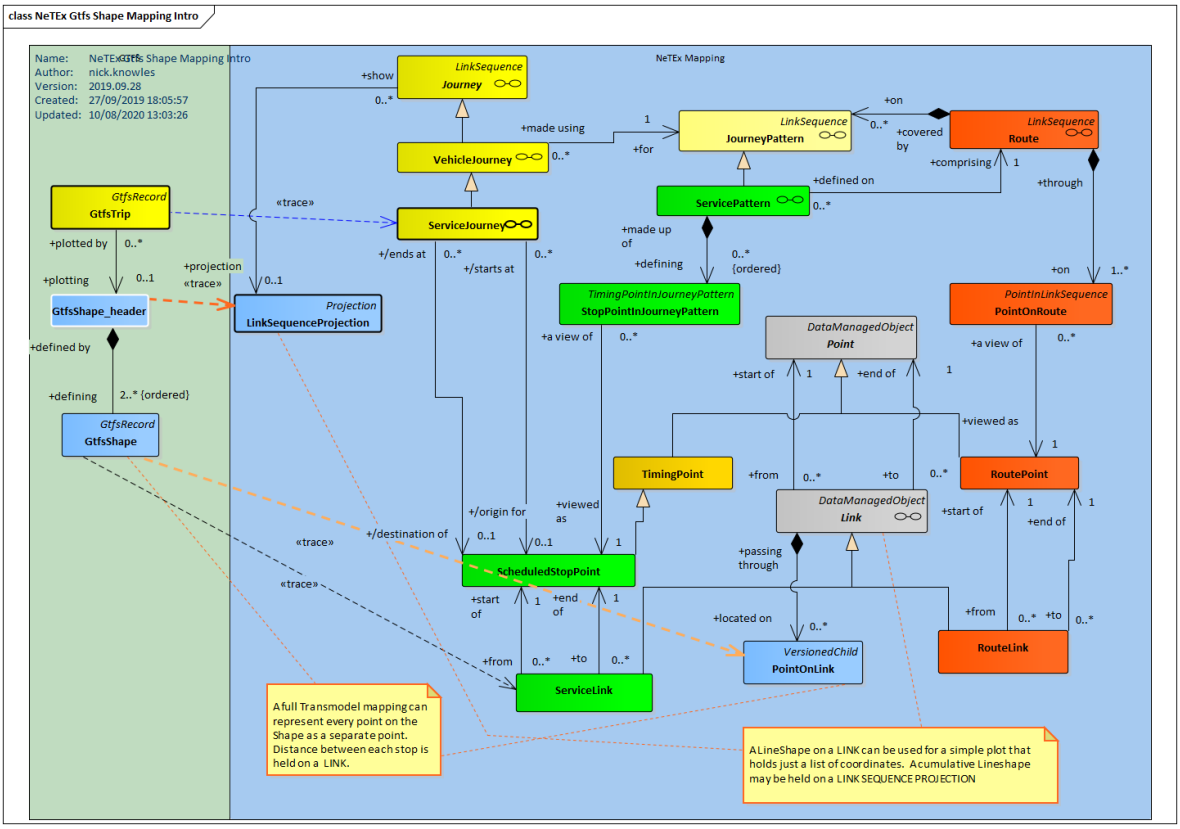
NeTEx provides two mechanisms for representing the spatial plot of a LINK

- As a simple ***LineString*** attribute – a sequence of GML format coordinates associated with a given LINK.
- As a LINK PROJECTION, with a sequence of POINTs ON LINK giving the coordinates and distance along the link.

There are two different mappings possible of the GTFS shapes

1. **As Stop to stop links:** *The* most versatile and compact representation of the GTFS ***shapes*** records is to place an incremental distance from the GTFS ***stop_times*** record on a separate SERVICE LINK for each of the journey and then to provide a plot for each separate SERVICE LINK, either as a ***LineString*** or a LINK PROJECTION. This in effect cuts up the sequence of GTFS **shapes** records into smaller link size segments which can be reused. The incremental distance is computed by subtracting the GTFS cumulative distance to the previous stop from the cumulative distance to the current stop. Given that a SERVICE PATTERN is already associated with a SERVICE JOURNEY (i.e. GTFS trip) the sequence of links inherently provides a plot.
2. **As a single link:** An alternative representation that retains the statically precomputed GTFS cumulative distances is to create a single ROUTE LINK for the entire journey with a POINT ON LINK subelement for each GTFS ***shapes*** record, giving the coordinates and cumulative distance for that point. A LINK PROJECTION can be used to project this link onto the entire SERVICE PATTERN for the route.

Figure 29 GTFS *shapes* to NeTEx SHAPE Mapping – Intro#

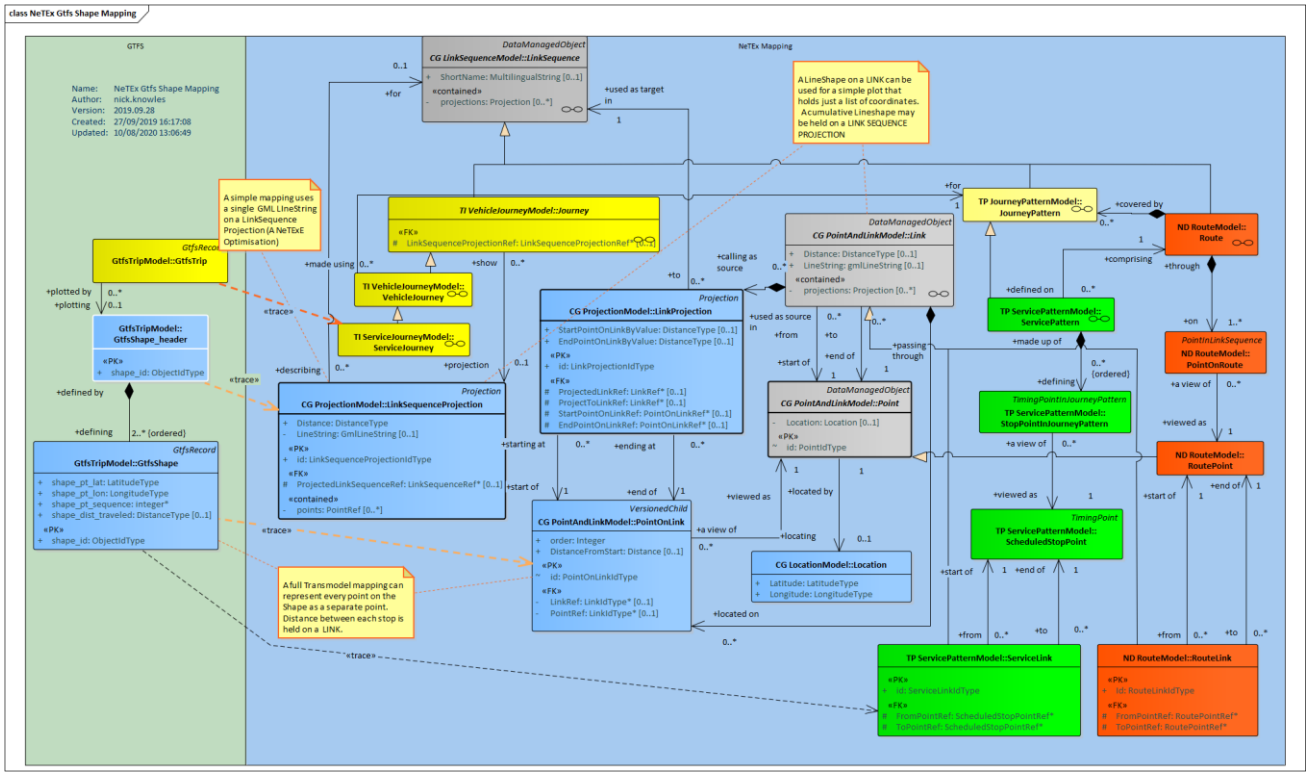


.

7.4.14.2 GTFS shapes / NeTEx POINT ON LINK Mapping details

A GTFS ***shapes*** record only carries limited attributes describing. Similar attributes can be specified on the NeTEx SHAPE.

Figure 30 GTFS *shapes* to NeTEx SHAPE Mapping - Details



7.4.14.3 GTFS shapes / NeTEx POINT ON LINK Attribute mapping

GTFS **shapes** record is equivalent to a NeTEx SHAPE.

It should be noted that the scope of a shape in GTFS is global, whereas in NeTEx shapes are specific to a stop place.

Table 28 Mapping of attributes from GTFS shapes **record**

GTFS record	GTFS Attribute	NeTEx element	NeTEx attribute	Type	Alt Text
shapes	***shape_id***	***PointOnLink***	***id***	*PointOnLink IdType*	
	shape_pt_lat		***Location. Latitude***	*Latitude*	
	shape_pt_lon		***Location. Longitude***	*Longitude*	
	shape_pt_seq		***order***	*xsd:integer*	
	shape_dist_travelled		***DistanceFromStart***	*Distance*	

Notes

An equivalent to the GTFS

7.4.14.4 Example Mapping GTFS shapes data to NeTEx POINTs ON LINK

GTFS Example trips

For example, the following is a typical GTFS representation of a trip

```
shape_id,shape_pt_lat,shape_pt_lon,shape_pt_sequence,shape_dist_traveled
```

```
93-RED-y11-1.104.I","53.3167288179034","-6.36984124363596","1","0"
"93-RED-y11-1.104.I","53.3171171513218","-6.36997653776914","2","44.1474801092882"
"93-RED-y11-1.104.I","53.3175677529054","-6.37006443249403","3","94.6351023547456"
"93-RED-y11-1.104.I","53.3176937245352","-6.37007464154037","4","108.670771202364"
"93-RED-y11-1.104.I","53.3178997261243","-6.37002176180577","5","131.86559821185"
:::etc, etc.
```

NeTEx Example of Gtfs shapes as POINTs ON LINK for single ROUTE LINK

```
    <routeLinks>
        <RouteLink version="any" id="10.MF-BH.93-RED-y11-1.104.I">
            <Name>Shape for Link</Name>
            <projections>
                <LinkSequenceProjection version="any" id="10.MF-BH.93-RED-y11-1.104.I">
                    <ProjectedLinkSequenceRef xsi:type="ServicePatternRefStructure"
version="any"
                                              ref="10.MF-BH.93-RED-y11-1.104.I"/>
                </LinkSequenceProjection>
            </projections>
            <passingThrough>
                <PointOnLink version="any" id="93-RED-y11-1.104.I@1" order="1">
                    <DistanceFromStart>0</DistanceFromStart>
                    <Point version="any" id="93-RED-y11-1.104.I@1">
                        <Location>
                            <Longitude>-6.369841244</Longitude>
                            <Latitude>53.31672882</Latitude>
                        </Location>
                    </Point>
                </PointOnLink>
                <PointOnLink version="any" id="93-RED-y11-1.104.I@2" order="2">
                    <DistanceFromStart>44.14748011</DistanceFromStart>
                    <Point version="any" id="93-RED-y11-1.104.I@2">
                        <Location>
                            <Longitude>-6.369976538</Longitude>
                            <Latitude>53.31711715</Latitude>
                        </Location>
                    </Point>
                </PointOnLink>
                <PointOnLink version="any" id="93-RED-y11-1.104.I@3" order="3">
                    <DistanceFromStart>94.63510235</DistanceFromStart>
                    <Point version="any" id="93-RED-y11-1.104.I@3">
                        <Location>
                            <Longitude>-6.370064432</Longitude>
                            <Latitude>53.31756775</Latitude>
                        </Location>
                    </Point>
                </PointOnLink>
:::etc, etc.

            </passingThrough>
        <RouteLink>
    < routeLinks >
```

7.4.15 GTFS pathway / NeTEx PATH LINK Mapping

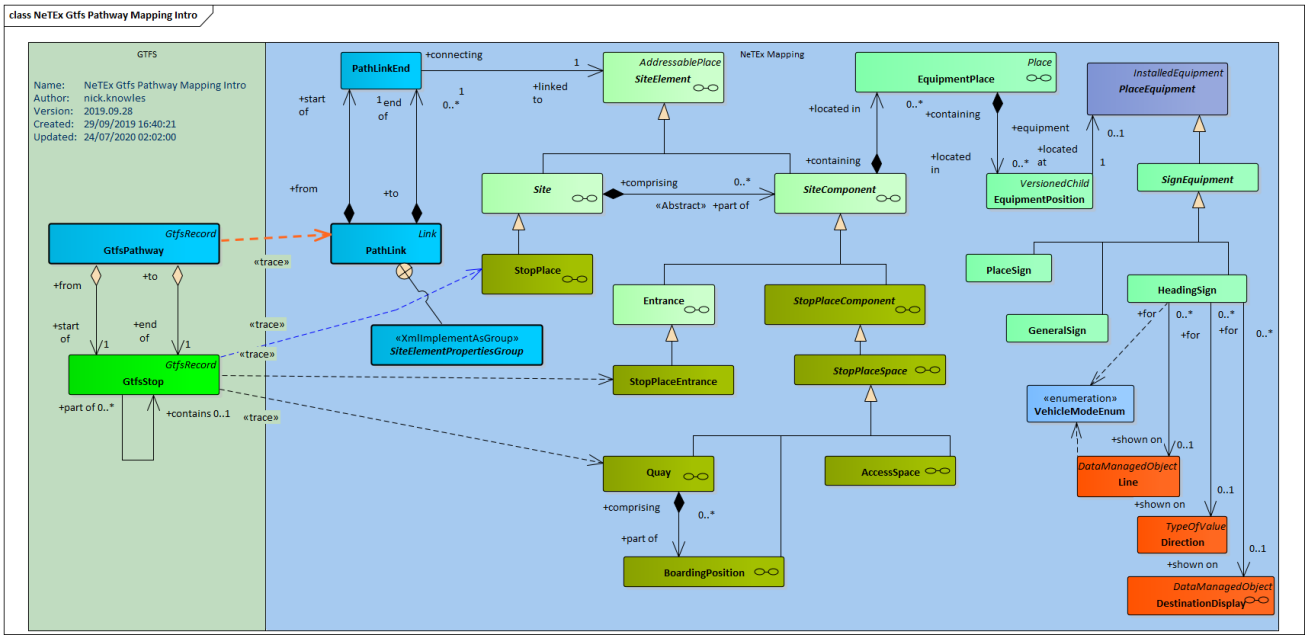
NB☞ The GTFS pathway record is not currently populated in Irish Data examples and can be ignored.

7.4.15.1 GTFS pathway / NeTEx PATH LINK Mapping Intro

A GTFS ***pathway*** record ***p***rovides information on accessibility between two nodes in an interchange**.** The nodes will all be SITE ELEMENTs, that's is components of a STOP PLACE

equivalent to the GTFS nodes. Any sign content associated with the PATH LINK is represented by SIGN EQUIPMENT.

Figure 31 GTFS Pathway to NeTEx PATH LINK Mapping – Intro#

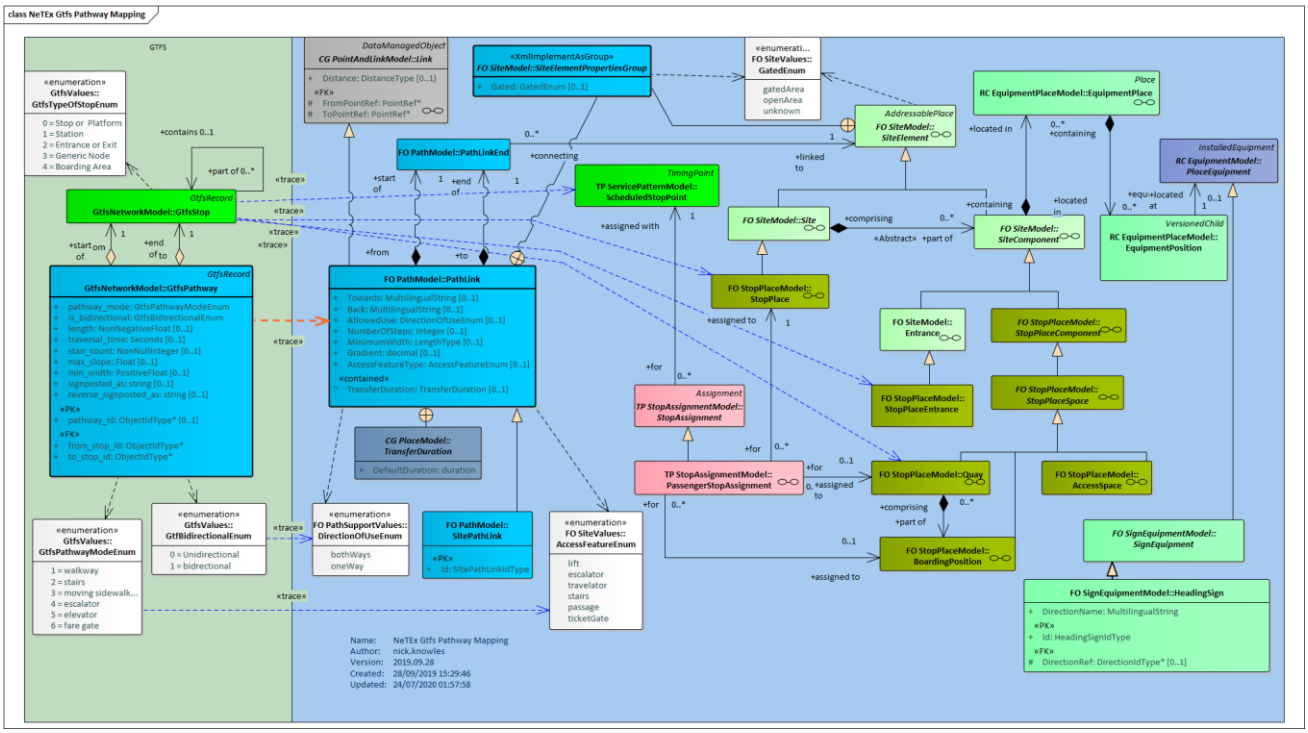


.

7.4.15.2 GTFS pathway / NeTEx PATH LINK Mapping details

A GTFS ***pathway*** record can carry attributes describing its accessibility features. Similar attributes can be specified on the NeTEx PATH LINK.

Figure 32 GTFS Pathway to NeTEx PATH LINK Mapping - Details



7.4.15.3 GTFS pathway / NeTEx PATH LINK Attribute mapping

GTFS **pathway** record is equivalent to a NeTEx PATH LINK, which indicates the accessibility characteristics of a link between two nodes.

Table 29 Mapping of attributes from GTFS pathway record

GTFS record	GTFS Attribute	NeTEx element	NeTEx attribute	Type	Alt Text
pathways	pathway_id	***PathLink***	***id***	*PathLinkIdType*	
	from_stop_id		***FromPointRef***	*PointRef*	
	to_stop_id		***ToPointRef***	*PointRef*	
	pathway_mode		***AccessFeatureType***	*enum*	
	is_bidirectional		***DIrectionOfUse***	*enum*	
	length		***Distance***	*Length*	
	traversal_time		***TransferDuration. DefaultDuration***	*Xsd:duration*	
	stair_count		***NumberOfSteps***	*xsd:integer*	
	max_slope		***Gradient:***	*xsd:decimal*	
	min_width		***MinimumWIdth***	*Length*	
	signposted_as	***HeadingSign***	***DirectionName***	*MultilingualString*	*Y*
	reversed_signposted_as	***HeadingSign***	***DirectionName***	*MultilingualString*	*Y*

Notes

A DIRECTION element can be used to set which SIGN is forward or reverse.
The distinction as to whether a link is inside or outside of a gated area is given by the NeTEx gated attribute, on the SITE ELEMENT not by the barrier type. A specific door way can be marked as an exit.
Separate HEADING SIGN equipment items are needed for each direction.

Table 30 Gtfs pathway_mode to NeTEx AccessFeatureType mapping

GTFS Element	GTFS value	GTFS	NeTEx Element	NeTEx value
pathway_mode	***1***	walkway	***A***ccessFeatureType	***p****assage*
	2	stairs		***s****tairs*
	3	Moving sidewalk		***t****ravelator*
	44	escalator		***e****scalator*
	5	elevator		***l****ift*
	6	Fare gate		***t****icketGate*
	7	Exit gate	***Gated***	***t****icketGate*

31 Gtfs pathway_mode to NeTEx AllowedUse mapping

GTFS Element	GTFS value	GTFS	NeTEx Element	NeTEx value
Is_bidirectional	***0***	Unidirectional	***A***llowedUse	***oneWay***
	1	Bidirectional		***b***othWays

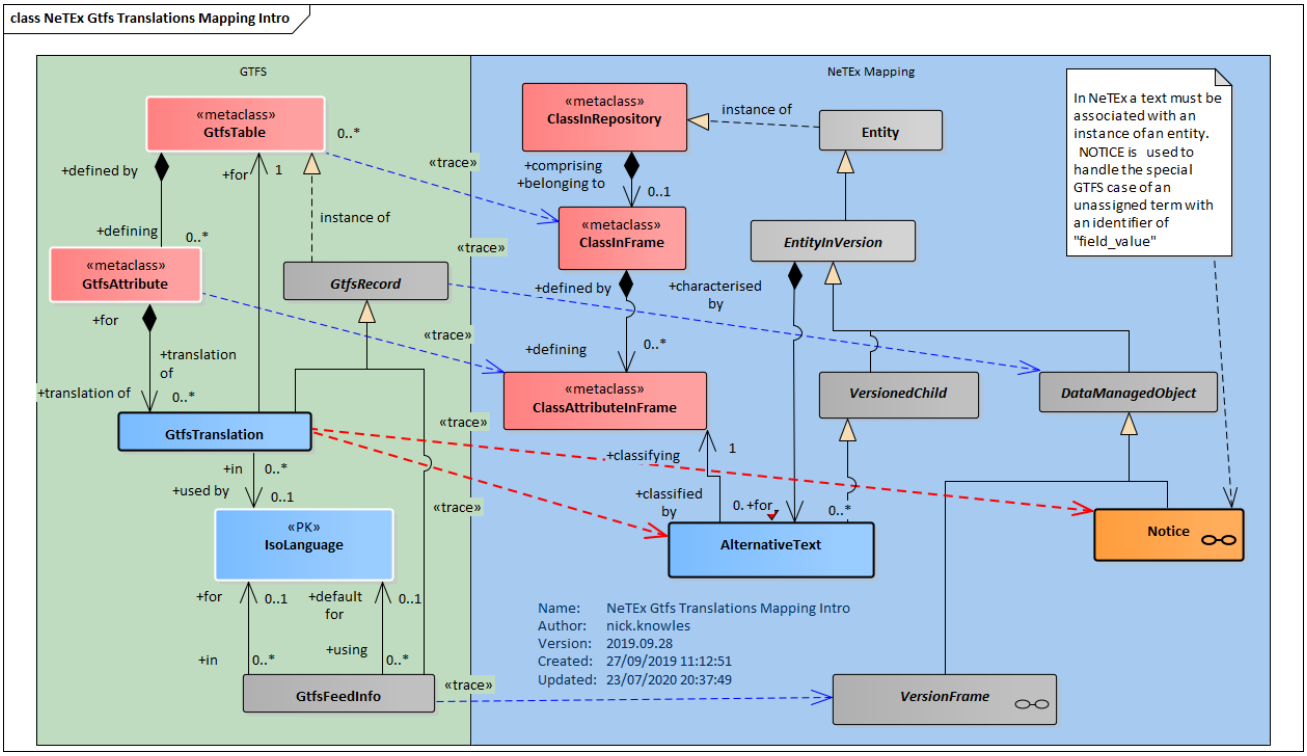
7.4.16 GTFS translations / NeTEx ALTERNATIVE TEXT Mapping

7.4.16.1 GTFS translations / NeTEx ALTERNATIVE TEXT Mapping Intro

A GTFS **translations** record corresponds to a NeTEx ALTERNATIVE TEXT.

Note that for certain elements for which the title name is important, for example TOPOGRAPHICAL PLACEs, NETEX provides an ALTERNATIVE NAME element with which to create an alternative title.

Figure 33 GTFS Service to NeTEx ALTERNATIVE TEXT Mapping - Intro

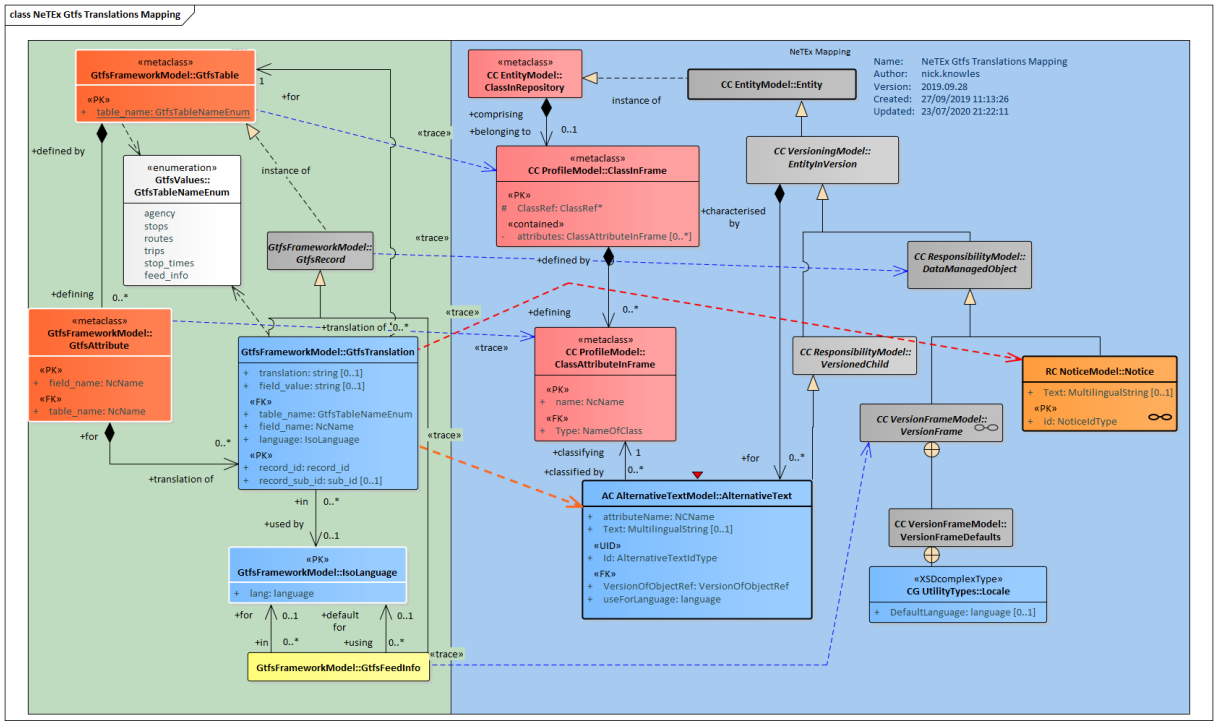


7.4.16.2 GTFS translations / NeTEx ALTERNATIVE TEXT Mapping details

Equivalents to the detailed attributes of a GTFS **Translations** record are found on the NeTEx ALTERNATIVE TEXT element.

A NeTEx NOTICE element can be used to provide the equivalent to the GTFS field_value record type, which hold arbitrary terms and pieces of text that are not associated with any particular object.

Figure 34 GTFS Translations to NeTEx AlternativeText - Details



7.4.16.3 GTFS translations / NeTEx ALTERNATIVE TEXT Attribute mapping

A GTFS **translations** record may be represented as a NeTEx ALTERNATIVE TEXT in a specified language.

Table 32 Mapping of attributes from GTFS translations **record**

GTFS record	GTFS Attribute	NeTEx element	NeTEx attribute	Type	Alt Text
translations	table_name	***AlternativeText***	***DataManagedObjectRef***	*DataManagedObjectIdType*	
	field_name		***<attributeName>***	*xsd:NAME*	
	language		***Text.lang***	*xsd:language*	
	translation		***Text***	*MultilingualString*	
	record_id		***EntityClass***	*className*	
	record_sub_id	***[Used to resolve id of subelement]***	***PassingTime. Order***	*xsd:integer*	
			Call. order	*xsd:integer*	
			FrequencyGroup. StartTime	*xsd:date*	
			Connection.to	*PointRef*	
	field_value		***Notice. Text***		

Notes

NeTEx ALTERNATIVE TEXT elements are located within the instance to which they apply.

The use of a translation of term independent of any element (GTFS field_value) can be implement as in NeTEx with an arbitrary NOTICE element for the field_value and an ALTERNATIVE TEXT for the translation, as normal.

7.4.16.4 Example Mapping GTFS Translations data to NeTEx ALTERNATIVE TEXT

GTFS Example: translations for a stop

For example, the following is a typical GTFS representation of the alternative names for a stop:

```
table_name,field_name,language,translation,record_id,record_sub_id
stops,stop_name,de,Hochbahnhof Tokyo,stopid000001,,
stops,stop_name,fr,Gare de Tokyo,stopid000001,,
```

NeTEx Example of GTFS translations mapped to NeTEx ALTERNATIVE TEXT

The following is the NeTEx equivalent as ALTERNATIVE TEXTs.

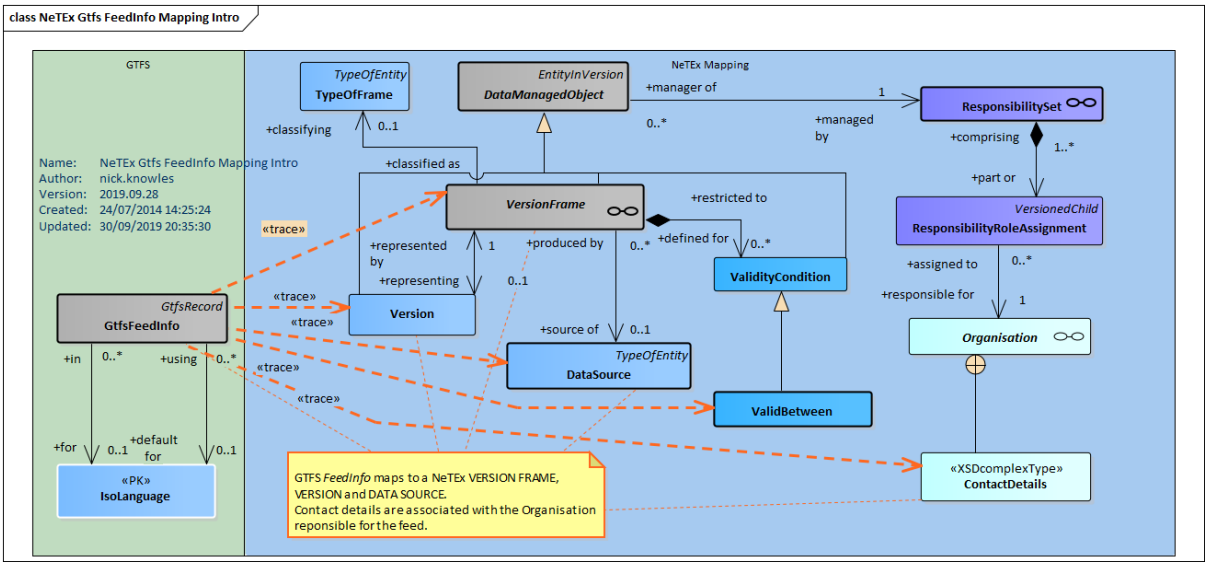
```
        <ScheduledStopPoint version="any" id="stopid000001">
            <alternativeTexts>
                <AlternativeText attributeName="Name" version="any" id="stopid000001"
order="1">
                    <Text lang="de">Hochbahnhof Tokyo</Text>
                </AlternativeText>
                <AlternativeText attributeName="Name" version="any" id="stopid000001"
order="2">
                    <Text lang="fr">Gare de Tokyo</Text>
                </AlternativeText>
            </alternativeTexts>
            <Text lang="en">Tokyo Station</Text>
        </ScheduledStopPoint>
```

7.4.17 GTFS feed_info / NeTEx DATA SOURCE Mapping

7.4.17.1 GTFS / feed_info / NeTEx DATA SOURCE Mapping Intro

A GTFS **feed_info** record provides some metadata about the data set. It includes information that is separated into different concerns in NeTEx; in NeTEx the supplier of the data is indicated by a DATA SOURCE, the ownership and other roles are indicated by a RESPONSIBILITY SET; the version is represented by a VERSION. The validity period for the data set is et a s a VALID BETWEEN validity condition on the COMPOSITE FRAME holding all the other frames.

Figure 35 GTFS Feed_info to NeTEx DataSource and ResponsibilitySet - Intro

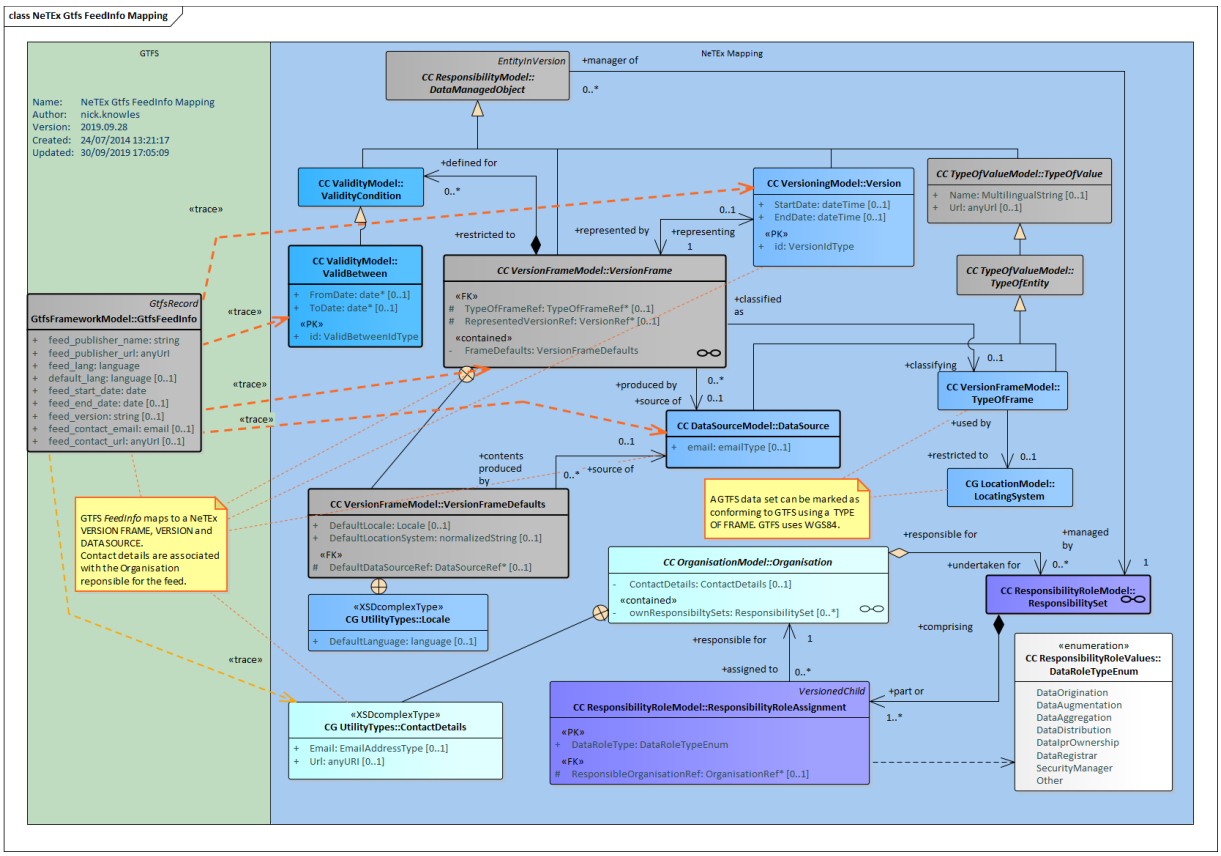


7.4.17.2 GTFS feed_info / NeTEx DATA SOURCE Mapping details

Equivalents to the detailed attributes of a GTFS Feed_info record are found on NeTEx DATA SOURCE, RESPONSIBILITY SET and a VALID BETWEEN condition. They can be referenced on a VERSION FRAME (or any individual element) to show

Note that the Transmodel representation also has a responsibility model (not shown) that allows the relevant responsibilities of different organisations to be characterised precisely (for example who originates and owns, data or operates services). GTFS assumes certain fixed responsibilities.

Figure 36 GTFS Feed Info to NeTEx DATA SOURCE, etc - Details



7.4.17.3 GTFS feed_info / NeTEx DATA SOURCE, etc Attribute mapping

A GTFS **feed_info** record contains data that is mapped to several different elements. A NeTEx DATA SOURCE indicates the data publisher, a RESPONSIBILITY SET provides a RESPONSIBILITY SET ASSIGNMENT to the ORGANISATION that publishes the feed. The overall validity dates can be stated as a VALIDITY CONDITION on a COMPOSITE FRAME holding the other frames, as can, as can the version number and RESPONSIBILITY SET

Table 33 Mapping of attributes from GTFS feed_info record

GTFS record	GTFS Attribute	NeTEx element	NeTEx attribute	Type	Alt Text
feed_info	feed_publisher_name	***ResponsibilitySet***	***Name***	*MultilingualString*	
	feed_publisher_url	***Operator***	***Url***	*xsd:NAME*	

GTFS record	GTFS Attribute	NeTEx element	NeTEx attribute	Type	Alt Text
	feed_lang	***DataSource***	***Text.lang***	*xsd:language*	
	default_lang	***Operator***	***Operator.Locale.DefaultLanguage***	*xsd:language*	
	feed_start_date	***CompositeFrame***	***ValidBetween.StartDate***	*xsd:dateTime*	
	feed_end_date		***ValidBetween.EndDate***	*xsd:dateTime*	
	feed_version		***version***	*Xsd:string*	
	feed_contact_email	***DataSource***	***email***	*EmailType*	
	feed_contact_url		***url***	*xsd:anyUri*	

Notes

NeTEx ALTERNATIVE TEXT elements are located within the instance to which they apply.

The use of a translation of term independent of any element (GTFS field_value) can be implement as in NeTEx with an arbitrary NOTICE element for the field_value and an ALTERNATIVE TEXT for the translation, as normal.

7.4.17.4 Example mapping GTFS Feed_info as NeTEx DATA SOURCE, etc

The following shows a mapping of GTS feed_info values to NeTEx

GTFS Example: feed_info

```
feed_publisher_name,feed_publisher_url,feed_lang,default_lang,feed_start_date,feed_end_date,feed_version,feed_contact_email,feed_contact_url'
Transport For Ireland
Feeder,http://transportforireland.ie,en,en,20078224,20071004,1.0,fixme@transportforireland.cie, http://transportforireland.ie/fares/datax
```

NeTEx XML Example mapping of GTFS feed_info to a NeTEx DATA SOURCE etc

```
<CompositeFrame version="1.0" id=" TypeOfFrame_EI_PI_LINE_OFFER:op" responsibilitySetRef=" gtfs:FeedPublisher" dataSourceRef="gtfs:FeedSource">
    <validityConditions>
        <ValidBetween>
            <FromDate>2007-06-04</FromDate>
            <ToDate>2007-10-04</ToDate>
        </ValidBetween>
    </validityConditions>
    <TypeOfFrameRef ref="eix:EI:NTA:TypeOfFrame:EI_PI_COMMON:EIRE_NP" versionRef="eix:v1.0"/>
    <FrameDefaults>
        <DefaultDataSourceRef ref="gtfs:FeedSource"/>
        <DefaultResponsibilitySetRef ref="gtfs:FeedPublisher">
    </FrameDefaults>
    <frames>
        <ResourceFrame version="1.0" id=" GTFS: FeedInfo">
            <dataSources>
                <DataSource version="1.0" id=" gtfs:FeedSource">
                    <Name>Source</Name>
                    <Url>http://google.com/fix</Url>
                    <Email>fixme@google.con</Email>
                </DataSource>
```

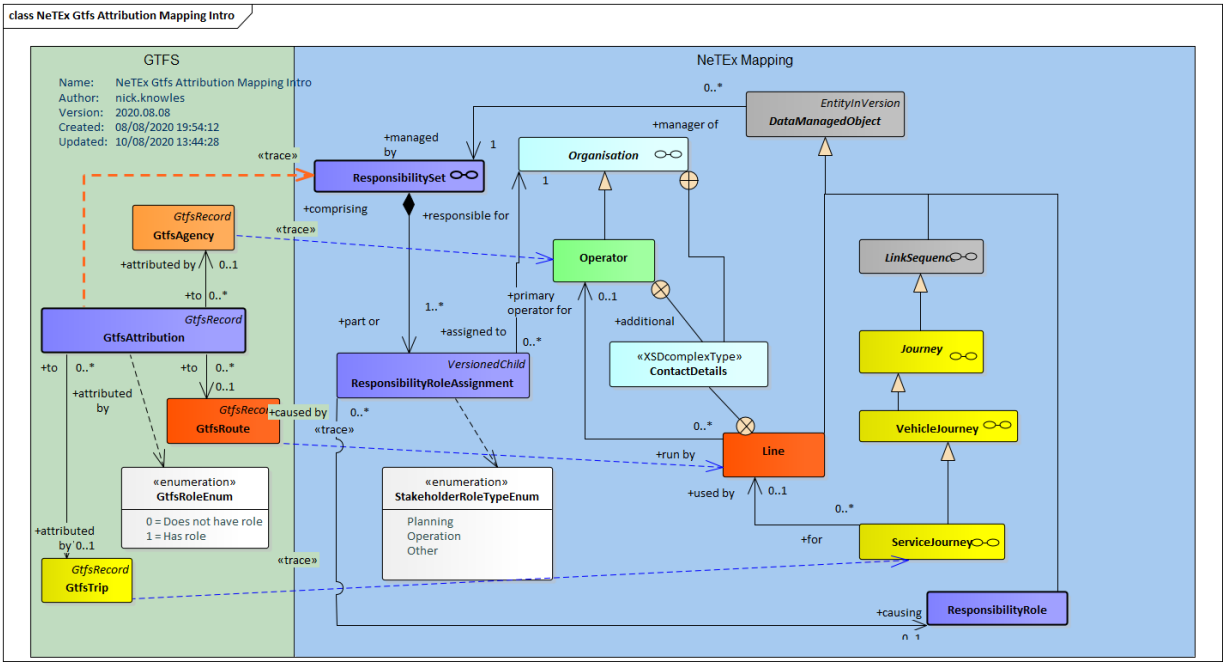
```
            </dataSources>
            <responsibilitySets>
                <ResponsibilitySet version="1.0" id="gtfs:FeedPublisher">
                    <Name>Demo Transit Authority Feeder</Name>
                    <roles>
                        <ResponsibilityRoleAssignment version="1.0"
id="gtfs:FeedPublisher" order="1">
                            <Name>Publisher</Name>
                            <DataRoleType>distributes</DataRoleType>
                            <ResponsibleOrganisationRef version="any"
ref="noc:10000"/>
                        </ResponsibilityRoleAssignment>
                    </roles>
                </ResponsibilitySet>
            </responsibilitySets>
        </ResourceFrame>
    </frames>
</CompositeFrame>
```

7.4.18 GTFS attributions / NeTEx RESPONSIBILITY SET Mapping

7.4.18.1 GTFS attributions / NeTEx RESPONSIBILITY SET Mapping Intro

A GTFS **attributions** record corresponds to a NeTEx RESPONSIBILITY SET with one or more a RESPONSIBILITY ROLE ASSIGNMENTs. NeTEx provides number of predefined Stakeholder roles as an enumeration. It is also possible to add arbitrary new RESPONSIBILITY ROLEs.

Figure 37 GTFS attributions to NeTEx RESPONSIBILITY SET Mapping - Intro

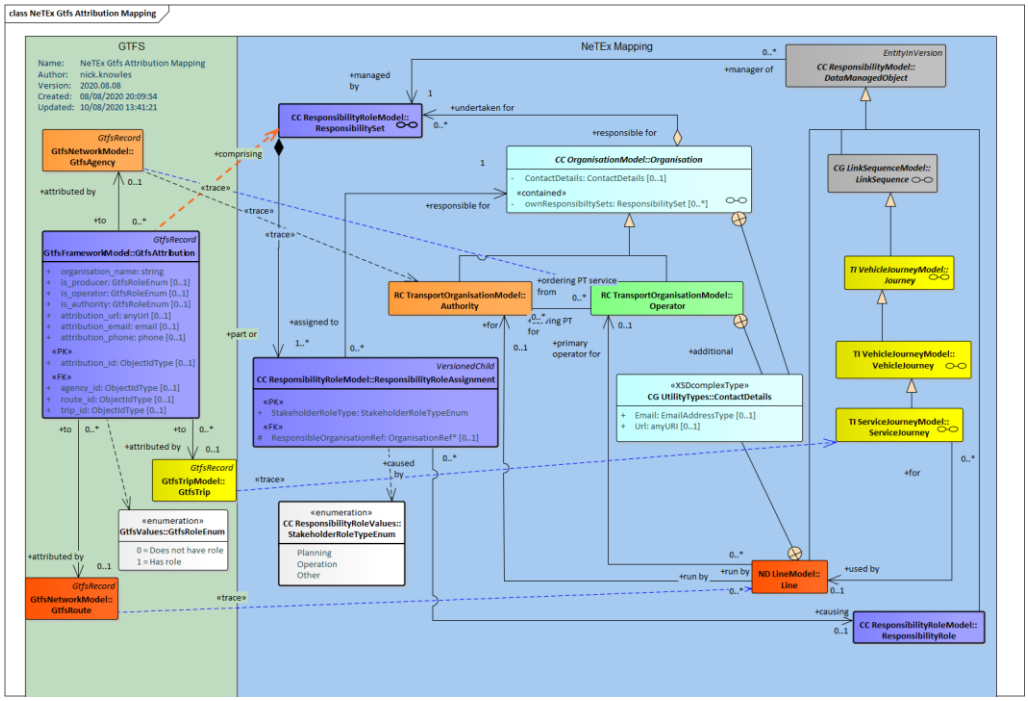


7.4.18.2 GTFS attributions / NeTEx RESPONSIBILITY SET Mapping details

Equivalents to the detailed attributes of a GTFS **Translations** record are found on the NeTEx ALTERNATIVE TEXT element.

A NeTEx NOTICE element can be used to provide the equivalent to the GTFS field_value record type, which hold arbitrary terms and pieces of text that are not associated with any particular object.

Figure 38 GTFS attributions to NeTEx ResponsibilitySet - Details



7.4.18.3 GTFS attributions / NeTEx RESPONSIBILITY SET Attribute mapping

A GTFS **attributions** record may be represented as a NeTEx RESPONSIBILITY SET.

Table 34 Mapping of attributes from GTFS attributions record

GTFS record	GTFS Attribute	NeTEx element	NeTEx attribute	Type	Alt Text
attributions	attribution_id	***Responsibility Set***	***id***	*DataManagedObject IdType*	
			DataManagedObjectRef	*DataManagedObject Ref*	
	agency_id		***DataManagedObjectRef***	*OperatorRef*	
	route_id		***DataManagedObjectRef***	*LineRef*	
	trip_id		***DataManagedObjectRef***	*JourneyRef*	
	organization_name		***Name***	*MultilingualString*	*Y*
	is_producer	***Responsibility Rolet-Assignment***	***PassingTime. Order***	*enum*	
	is_operator		***StakeholderRole***	*enum*	
	is_authority		***StakeholderRole***	*enum*	
	attribution_url	***Organisation***	***Url***	*Xsd:anyURI*	*Y*
	attribution_email		***ContactDetails. Email***	*Email*	*Y*
	attribution_phone		***ContactDetails. Phone***	*PhoneNumber*	*Y*

Notes

A RESPONSIBILITY SET may be attached to a frame to apply to the whole feed.

7.4.18.4 Example Mapping GTFS attributions data to NeTEx RESPONSIBILITY SET

GTFS Example: attributions

For example, the following is a typical GTFS representation of a service, both with the same service interval

```
attribution_id,is_producer,is_operator,organization_name,agency_id
attribution001,1,0,Transport For Ireland,10000
attribution002,0,1,Transdev,12345
```

NeTEx Example of GTFS attributions mapped to NeTEx RESPONSIBILITY SET

The following is the NeTEx equivalent as RESPONSIBILITY SETs.

```
<ResponsibilitySet version="any" id="attribution001">
    <Name>Transport For Ireland</Name>
    <roles>
        <ResponsibilityRoleAssignment version="any" id="attribution001">
            <StakeholderRoleType>Planning</StakeholderRoleType>
            <ResponsibleOrganisationRef version="any" ref="noc:10000"/>
        </ResponsibilityRoleAssignment>
    </roles>
</ResponsibilitySet>
<ResponsibilitySet version="any" id="attribution002">
    <Name>Transdev</Name>
    <roles>
        <ResponsibilityRoleAssignment version="any" id="attribution002">
            <StakeholderRoleType>Operation</StakeholderRoleType>
            <ResponsibleOrganisationRef version="any" ref="noc:12345"/>
        </ResponsibilityRoleAssignment>
    </roles>
</ResponsibilitySet>
```

8 Mapping VDV452 data to NeTEx

See the canonical mapping from VDV452 to NeTEx is set out in the VDV publication *Recommendation 462- NeTEx VDV Application Handbook: Standardised exchange of line network and timetable data with the European standard CEN-TS 16441,* which provides detailed element by element equivalences

8.1.1 Timetables in VDV452 format

Timetable data for most bus lines is available in VDV452 format from the NTA database (currently an MDV DIVA database). VDV 452 is a German transport data standard for the exchange of timetables.

A canonical mapping from VDV452 to NeTEx is set out in the VDV publication *Recommendation 462- NeTEx VDV Application Handbook: Standardised exchange of line network and timetable data with the European standard CEN-TS 16441,* which provides detailed element by element equivalences. Note that The VDV 452 profile also includes a number of elements that are not present in the Irish bus data and may be omitted.

A high-level mapping from VDV 452 to NeTEx is summarised in the following table. A detailed mapping is given in the VDV462 publication. For the most part, there is a one-to-one correspondence between VDV and NeTEx concepts, and terminology is similar (since they are based on Transmodel).

Note however that VDV format, (like the UK TransXChange format), is intended to cover planning and scheduling use cases and not just the provision of Passenger information; it

therefore separates timing data from service data. Thus, RUN TIMEs for a given SERVICE LINK, and WAIT TIMEs at a given stop, are represented separately from the SERVICE PATTERN itself. A JOURNEY itself states only an initial departure time, from which the passing times at stops can be computed using the SERVICE PATTERN and the timing information.

In consequence, these timings must be resolved into simple NeTEx PASSING TIMEs in order to generate an EPIP conformant timetable.

The underlying service and timing pattern information is of use for certain uses cases, so the EIRE-NP allows this to be included as an optional profile augmentation if desired. This is an augmentation of the EPIP.

The Irish codespaces should be used on data elements, e.g. NaPTAN for stops.

Examples of the use of VDV452 timetable data are given to show the use of Irish codespaces, etc.

Table 35 VDV452 to NeTEx high level mapping

VDV #	VDV 452 Class / Parent Element		NeTEx Containing Frame name	NeTEx Parent Element
993	**BASE_VERSION_VALID**	→	***CompositeFrame***	***<CompositeFrame>***
485	**BASE_VERSION**	→	***CompositeFrame***	***<CompositeFrame>***
992	**TRANSPORT_COMPANY**	→	***ResourceFrame***	***<Operator>***
333	**OPERATING_DEPARTMENT**	→	***ResourceFrame***	***<OperationalContext>***
443	**VEHICLE**	→	***ResourceFrame***	***<Vehicle>***
293	**VEHICLE_TYPE**	→	***ResourceFrame***	***<VehicleType>***
290	**DAY_TYPE**	→	***ServiceCalendarFrame***	***<DayType>***
291	**OPERATING_DAY**	→	***ServiceCalendarFrame***	***<OperatingDay>***
348	**PERIOD**	→	***ServiceCalendarFrame***	***<ServiceCalendar>***
292	**DAY_TYPE_ASSIGNMENT**	→	***ServiceCalendarFrame***	***<DayTypeAssignment>***
295	**ACTIVATION POINT**	→	***InfrastructureFrame***	***<ActivationPoint>***
997	**STOP_TYPE**	→	***SiteFrame***	***<TypeOfPlace>***
998	**POINT_TYPE**	→	***ServiceFrame***	***<TypeOfPoint>***
246	**ROUTE_SEQUENCE**	→	***ServiceFrame***	***<ServicePattern>***
226	**LINE**	→	***ServiceFrame***	***<Route>***
226	**LINE**	→	***ServiceFrame***	***<JourneyPattern>***
994	**DESTINATION**	→	***ServiceFrame***	***<DestinationDisplay>***
229	**STOP_POINT**	→	***ServiceFrame***	***<ScheduledStopPoint>***
253	**STOP**	→	***ServiceFrame***	***<PassengerStopAssignment>***
299	**LINK**	→	***ServiceFrame***	***<ServiceLink>***
995	**POINT_ON_LINK**	→	***ServiceFrame***	***<PointOnLink>***
282	**TRAVEL_TIME**	→	***ServiceFrame***	***<JourneyPatternRunTime>***

999	WAIT_TIME	→	*ServiceFrame*	*<JourneyPatternWaitTime>*
996	ANNOUNCEMENT	→	*ServiceFrame*	*<Notice>*
332	JOURNEY_TYPE	→	*TimetableFrame*	*<TypeOfService>*
715	JOURNEY	→	*TimetableFrame*	*<VehicleJourney>*
222	TIMING_GROUP	→	*TimetableFrame*	*<TimeDemandType>*
308	JOURNEY_WAIT_TIME	→	*TimetableFrame*	*<VehicleJourneyWaitTime>*
432	SERVICE JOURNEY INTERCHANGE	→	*TimetableFrame*	*<InterchangeRule>*
232	SERVICE JOURNEY INTERCHANGE TIME	→	*TimetableFrame*	*<InterchangeRule>*
225	DEAD_RUN	→	*TimetableFrame*	*<DeadRun>*
247	DEAD_RUN_TIME	→	*TimetableFrame*	*<DeadRun>*
310	BLOCK	→	*VehicleScheduleFrame*	*<Block>*

9 Mapping HaFas HRDF data to NeTEx

Irish Rail data is available in HaFas format, a proprietary format. There is an established mapping for HaFas data to GTFS, see Swiss Railways (SBB) documentation in the Bibliography. A possible conversion route is thus to go via GTFS. However, the HaFas model is a richer model than GTFS and in effect includes reusable concepts equivalent to many of those found in Transmodel NeTEx (such as NeTEx DAY TYPEs, JOURNEY PATTERNs and STOP ASSIGNMENTs), so mapping direct to NeTEx would be both simpler and less “lossy”.

9.1.1 Timetables in Hacon HaFas (HRDF)format

The following table shows the files for the proprietary HaFas HRDF (Rohdatenformat or Raw Data format)

The full HRDF specification includes additional files – the ones listed here are just the ones used in the Irish data sample.

Table 36 Summary of Equivalences between HaFas HRDF and NeTEx

HRDF record	Scope	Description	NeTEx equivalent
eckdaten	Data valitiy	Validity period of data	***CompositeFrame /Validity Condition***
betrieb	Undertaking	Transport Operator	***Operator***
bahnhof	Stations	Station codes and names	***ScheduledStopPoint, StopPlace***
koord	Spatial coordinates	Spatial coordinates of stations	***Location***
maincoor	Spatial cordinates for	Spatial coordinates of other points	***Location***
bhfattr	Station Accessibility	Accessibility attributes for a station and other properties	***StopPlace/ AccessibilityAssessment, SiteFacilitySet***
umsteig	Connections	Connections and transfer times between modes	***Connection/ServiceInterchange***
bhfrt	Permitted station routings	Routings	
kminfo	Ranking	Relative rankings for transfers	***Connection***
fplan	Journeys	Service journey with annotations	***ServiceJourney*** or ***DatedServiceJourney,*** ***JourneyPart,***
fplan FPlan Laufwegzeilen	Run times	Passing times at stop	***PointinJourneyPattern, PassingTimes,***
fplan – G	product	Type of service (express, local etc)	***TypeOfProductCategory***
fplan – A	attributes	Journey Facilities	***ServiceFacilitySet***
fplan – I	Infolinks	Journey footnotes	***NoticeAssignment,***

bitfield	Operational days	stores validity days for a specific ID in the form of a bitmap.	***DayTypeAssignment***
gleise	Platforms for	Platform assignments	***PassengerStopAssignment, ValidityCOnditions***
infotext	Notice	Text notices associated with journeys etc	***Notice***
attribut	Facilities	Site & Onboard facilities	***Facility***
metabhf	Station groups	Group of nearby stations	***StopArea***
sortkeys	Sort table for stations		***n/a***
attribue	Transport mode	Mode codes	***TransportMode***
zugart	Train type	"Means of transport"	***Submode, TypeOfService***
vardim	System parameters		***n/a***

9.2 HRDF General record structure

The HRDF format uses plain text files with fixed column positions for some elements; but also some variable length fields - for variable length fields, the character '$' is used as a delimiter.

- Within certain files there may be multiple record types, indicated at the beginning of the record by a letter.
- Data may be divided between different files, for example, stop names and stop coordinates are in different files.
- Many records include text annotations on the right.
- Comment lines are prefixed with '%'.

9.3 Codespaces for HRDF data

HRDF uses UIC station identifiers. A UIC CODESPACE can be used to indicate this.

An Irish Rail CODESPACE can be used for other data.

9.1 Element by element detailed mapping of HRDF to Transmodel/NeTEx

9.1.1 HRDF eckdaten (Validity) – NeTEx VALIDITY CONDITION

A HRDF **eckdaten** record contains data about the validity of the data set as a whole. In NETEX the overall validity dates can be stated as a VALIDITY CONDITION on a COMPOSITE FRAME.

Table 37 Mapping of attributes from HRDF eckdaten record

HRDF record	HRDF Row	HRDF Column	HRDF description	NeTEx element	NeTEx attribute	Type
Eckdaten	1	1:10	Start date	***CompositeFrame***	***ValidBetween.StartDate***	*xsd:dateTime*
	2	1:10	End date		***ValidBetween.EndDate***	*xsd:dateTime*
	3	1ff	Timetable name	***TimetableFrame***	***Name***	*xsd:normalizedString*
	3		Designation		***Description***	*xsd:normalizedString*
	3		Export timestamp	***PublicationDelivery***	***PublicationTimestamp***	*xsd:dateTime*
	3		HRDF version	***CompositeFrame***	***version***	*xsd:normalizedString*
	3		Producer	***CompositeFrame***	***DefaultDataSourceRef***	*DataSourceIdType*

9.1.1.1 Example: Irish HaFas eckdaten

Here we show a pair of on street bus stops mapped from NaPTAN to NeTEx

HRDF Example: eckdaten

```
16.08.2019
07.03.2020
Protim


16.08.2019
07.03.2020
Fahrplan 2011$15.09.2010 13:34:12$5.20.39$
```

NeTEx XML Example mapping of HRDF eckdaten to a NeTEx DATA SOURCE etc

```
<CompositeFrame version="1.0" id="FeedInfo" responsibilitySetRef=" hrdf:FeedPublisher"
dataSourceRef="gtfs:FeedSource">
    <validityConditions>
        <ValidBetween>
            <FromDate>2019-08-16</FromDate>
            <ToDate>2020-03-07</ToDate>
        </ValidBetween>
    </validityConditions>
    <TypeOfFrameRef ref="eix:EI:NTA:TypeOfFrame:EI_PI_LINE_OFFER:EIRE_NP"
versionRef="eix:v1.0"/>
    <FrameDefaults>
        <DefaultDataSourceRef ref="hrdf:FeedSource"/>
        <DefaultResponsibilitySetRef ref="hrdf:FeedPublisher">
    </FrameDefaults>
    <frames>
        <ResourceFrame version="1.0" id=" HRDF: FeedInfo">
            <dataSources>
                <DataSource version="1.0" id=" HRDF:FeedSource">
                </DataSource>
            </dataSources>
```

….

9.1.2 HRDF betrieb (undertaking) – NeTEx OPERATOR

The HaFas b***etrieb*** ("undertaking") records provides information on the service provider, the first record identifies the OPERATOR. The second record can give a list of subsidiaries (these can be represented on NeTEx with ORGANISATIONAL UNITs.

Note that the identifiers of operators used by rail are usually taken from the UIC code list. They should be translated to the official Irish operator code. The UIC codes can be can be retained as a cross-reference.

Table 38 Mapping of attributes from HRDF betrieb record

HRDF record	HRDF Row	HRDF Column	HRDF description	NeTEx element	NeTEx attribute	Type
betrieb	1*	1:5%	Operator	***Operator***	***id***	*OperatorIdType*
	1	7ff	***K Short name***		***PublicCode***	*xsd:normalizedString*
			L long name		***PrivateCode***	*xsd:normalizedString*
			V Full name		***Name***	*MultilingualString*
	2	7:7	***':'***	***OrganisationalUnit***		
	2	9:ff	Subsidiary		***OrganisationalUnitRef***	***OrganisationalUnitRef***

9.1.2.1 Example: Irish HaFas betrieb

The following shows a mapping of HRDF betrieb record values to NeTEx

HRDF EXAMPLE

```
00013 K "IR" L "AAIRR" V "Irish Rail"
00013 : 000812
```

NeTEx XML EXAMPLE

```
<Operator version="any" id="noc:000013">
    <PublicCode>IR</PublicCode>
    <PrivateCode>AAIR</PrivateCode>
    <ExternalOperatorRef>uic:0013</ExternalOperatorRef>
    <Name>Irish Rail</Name>
    <parts>
        <OrganisationalUnit version="any" id="00081"/>
    </parts>
</Operator>
```

9.1.3 HRDF bahnhof (stations) – NeTEx SCHEDULED STOP POINT

A HaFas **Bahnhof** record corresponds to a NeTEx SCHEDULED STOP POINT. HaFas uses UIC station ids, also holds the alphanumeric TIPLOC code e.g. 'BBRDG' for Broombridge. It can contain up to four naming elements in any order, indicated by <1> >2> <3> <4>

A STOP ASSIGNMENT can be used to map them to the corresponding NeTEx STOP PLACE identified with a NaPTAN codes.

Table 39 Mapping of attributes from HRDF bahnhof record

HRDF record	HRDF Row	HRDF Column	HRDF description	NeTEx element	NeTEx attribute	Type
Bahnhf	*	1:7	Stop number	***ScheduledStopPoint***	***id***	*ScheduledStopPointIdType*
	*	13:62 <1>	Long Name		***Name***	*MultilingualString*
	*	<2>	Name		***PublicCode***	*Xsd:normalizedString*
	*	<3>	Abbreviation		***ShortCode***	*Xsd:normalizedString*
	*	<4>	Synonym		***AlternativeName***	*MultilingualString*

9.1.3.1 Example: Irish HaFas bahnhof

HRDF Example: bahnhof

```
6100101 ABYJC$ABYJC$<1>
6100007 ADAMF$ADAMF$<1>
6100089 ADAMS$ADAMS$<1>
6010062 Adamstown$ADMTN$<1>
6100091 ALXRD$ALXRD$<1>
6000093 Ardrahan$ARHAN$<1>
6000001 Arklow$ARKLW$<1>
6010059 Ashtown$ASHTN$<1>
6100822 ATHMD$ATHMD$<1>
6000002 Athenry$ATHRY$<1>
6000004 Athy$ATHY$<1>
6000003 Athlone$ATLNE$<1>
6000005 Attymon$ATMON$<1>
6100054 BAHLE$BAHLE$<1>
6000007 Ballina$BALNA$<1>
6010001 Broombridge$BBRDG$<1>
::::: etc
"822GA00366","Drimnagh","53.3353461945075","-6.31827231820978"
```

NeTEx XML Example: HRDF bahnhof as NeTEx SCHEDULED STOP POINT

The NeTEx SCHEDULED STOP POINT equivalent is:

```
<ScheduledStopPoint version="1" id="uic:6010001">
    <Name>Broombridge /Name>
    <PublicCode>BBRDG</PublicCode>
    <StopType>railStation</StopType>
</ScheduledStopPoint>
```

A NeTEx STOP POINT ASSIGNMENT can be used to related the SCHEDULED STOP POINT equivalent to a NeTEx STOP PLACE as defined from NaPTAN.:

NeTEx XML EXAMPLE –STOP POINT ASSIGNMENT

```
<PassengerStopAssignment version="any" id=" uic:6010001" order="1">
    <ScheduledStopPointRef version="11" ref="uic:6010001"/>
    <StopPlaceRef version="11" ref="naptStop:822GIR0026”/>
</PassengerStopAssignment>
```

9.1.4 HRDF koord (station locations) – NeTEx SCHEDULED STOP POINT / LOCATION

The HRDF **koord** record provides spatial coordinates for stations including a Z coordinate in meters above sea level. The Station name is present as documentation

Table 40 Mapping of attributes from HRDF koord record

HRDF record	HRDF Row	HRDF Column	HRDF description	NeTEx element	NeTEx attribute	Type
koord	*	1:7	Stop number	***ScheduledStopPoint***	***id***	*ScheduledStopPointIdType*
	*	9-18	X coordinate		***Latitude***	*Latitude*
	*	20-29	Y coordinate		***Latitude***	*Latitude*
	*	31-36	Z coordinate		***Altitude***	*DistanceType*

9.1.4.1 Example: Irish HaFas koord

HRDF Example

```
6100007 -6.466484 53.335950 ADAMF
6100089 -6.469870 53.316538 ADAMS
6010062 -6.469110 53.336295 Adamstown
6000093 -8.814752 53.157044 Ardrahan
6000001 -6.159583 52.793921 Arklow
6100054 -7.180191 52.497934 BAHLE
6000007 -9.160596 54.109063 Ballina
6010001 -6.298690 53.372506 Broombridge
6000006 -6.182205 53.611807 Balbriggan
6000009 -7.603346 52.899963 Ballybrophy
```

9.1.5 HRDF mainkoord (other locations) – NeTEx / LOCATION

The HRDF **mainkoord** record provides spatial coordinates for additional non-station elements in the same format as for the HRDF koord record.

9.1.5.1 Example: Irish HaFas mainkoord

HRDF Example

```
6010046 -6.1436440 53.5207820 % Rush and Lusk$Lusk and Rush$Rus
6000011 -8.7587160 53.7617720 % Ballyhaunis
6100057 -6.4713170 52.3451420 % WXLOP
6000046 -9.1364330 53.9829390 % Foxford
6100034 -8.0177930 52.5719550 % TS463
6010011 -6.3915240 53.3775822 % Coolmine
6100033 -8.0765480 52.5517400 % LJ461
6100044 -9.5064590 52.0708430 % KILCK
6100068 -6.2528160 53.3600620 % NEWCJ
```

9.1.6 HRDF bhfatr (station properties) – NeTEx ACCCESSIBILITY ASSESSMENT

The HRDF **mainkoord** record provides additional features for a station, in particular it is used for accessibility

HRDF Example

```
WA 0 10 wheelchair accessibility
```

9.1.7 HRDF metabhf (stop groups) – NeTEx STOP AREA

There are several types of record the HRDF metabhf record. The **Haltestellengruppen** Stop group use of metabhf groups several stations as an interchange. This is similar to the NeTEx STOP AREA

Table 41 Mapping of attributes from HRDF metabhf record – STOP AREA

HRDF record	HRDF Row	HRDF Column	HRDF description	NeTEx element	NeTEx attribute	Type
Metabhf Haltestellen-gruppen	*	1:7	Group identifier	***StopArea***	***id***	*StopAreaIdType*
	*	8:80	':'			
	*	10:10	Type of equivalence S, B, F, V, H or blank			
	*	11:17	Stop number		*ScheduledStopPointRef*	*ScheduledStopPointRef*
	*	19:19	Type of equivalence S, B, F, V, H or blank			
	*	20:26	Stop number		*ScheduledStopPointRef*	*ScheduledStopPointRef*
		etc	Repeated pairs			

9.1.7.1 Example: Irish HaFas metabhf Haltestellen-gruppen

HRDF Example

```
% Dublin : Dublin Connolly$Connolly$Dublin Connolly, Dublin Heuston$Heuston$Dublin
Heuston
9909002 : 6000036 6000037
```

NeTEx XML EXAMPLE – CONNECTION

```
<StopArea version="any" id=ir:9909002 >
    <members>
        <ScheduledStopPointRef version="any" ref="uic:6000036"/>
        <ScheduledStopPointRef version="any" ref="uic:6000037"/>

    </members>
</StopArea>
```

9.1.8 HRDF metabhf (transfers) – NeTEx CONNECTION

The HRDF METABHF record can also ndicates the possibility of a station to station transfer and can provides minimal transition time to use in journey planning. There are several types of record

Table 42 Mapping of attributes from HRDF metabhf record - CONNECTION

HRDF record	HRDF Row	HRDF Column	HRDF description	NeTEx element	NeTEx attribute	Type
metabhf	*	1:7	From stop	***Connection***	***From. ScheduledStopPointRef***	*ScheduledStopPointRef*
	*	09:15	To Stop		***To. ScheduledStopPointRef***	*ScheduledStopPointRef*
	*	17:19	Transfer duration in minutes		***TransferDuration. DefaultDuration***	*xsd:duration*
	*	20:20	'S'			*xsd:duration*
	*	21:22	Transfer duration additional seconds		***TransferDuration. DefaultDuration***	*xsd:duration*

9.1.8.1 Example: Irish HaFas metabhf

HRDF Example

```
6000036 6000037 010
```

NeTEx XML EXAMPLE – CONNECTION

```
<Connection version="any" id=" uic:6000036+6000037">
    <TransferDuration>
        <DefaultDuration>PT10M</DefaultDuration>
    </TransferDuration>
    <BothWays>true</BothWays>
    <From>
        <TransportMode>rail</TransportMode>
        <ScheduledStopPointRef version="any" ref="uic:6000036"/>
    </From>
    <To>
        <TransportMode>rail</TransportMode>
        <ScheduledStopPointRef version="any" ref=" uic:6000037"/>
    </To>
</Connection>
```

9.1.9 HRDF umsteig (transfer) – NeTEx SITE CONNECTION

The HRDF **umsteig** record provides minimal transition times for transfers within a station.

The first record can be used to set a system wide default – represented as a NeTEx DEFAULT CONNECTION.

Different times may be specified for connecting between local and high-speed services. Note that the full HRDF specification has several different types of umsteig record covering different levels of specificity, including concepts equivalent to NeTEx SERVICE INTERCHANGEs.

Table 43 Mapping of attributes from HRDF umsteig record

HRDF record	HRDF Row	HRDF Column	HRDF description	NeTEx element	NeTEx attribute	Type
umsteig	*	1:7	Stop number	***SiteConnection***	***id***	*ScheduledStopPointIdType*

HRDF record	HRDF Row	HRDF Column	HRDF description	NeTEx element	NeTEx attribute	Type
	*	9:10	High speed transfer		***TransferDuration. DefaultDuration***	*xsd:duration*
	*	12:13	Other node tarnsfer			
	*	15ff	Stop name or name			

9.1.9.1 Example: Irish HaFas umsteig

HRDF Example

```
9999999 5 5 Standard
6100101 0 0 ABYJC
6100007 0 0 ADAMF
6100089 0 0 ADAMS
6010059 2 2 Ashtown
6100822 0 0 ATHMD
6000002 5 5 Athenry
6000004 5 5 Athy
6000003 2 2 Athlone
6100054 0 0 BAHLE
6010001 2 2 Broombridge
6000006 3 3 Balbriggan
6000009 3 3 Ballybrophy
9990840 5 5 Belfast
```

NeTEx XML EXAMPLE – CONNECTION

```
<SiteConnection version="any" id=" uic:6010001">
    <Name>Broombridge</Name>
    <TransferDuration>
        <DefaultDuration>PT2M</DefaultDuration>
        <OccasionalTravellerDuration>PT2M</OccasionalTravellerDuration>
    </TransferDuration>
    <BothWays>true</BothWays>
    <From>
        <TransportMode>rail</TransportMode>
    </From>
    <To>
        <TransportMode>rail</TransportMode>
    </To>
</ SiteConnection >
```

9.1.10 HRDF bhfrt (routings) – NeTEx SERVICE PATTERN

The HRDF **bhfrt** record defines a routing restriction on a stop. This is a fare concept and is out of scope

Table 44 Mapping of attributes from HRDF bhfrt record

HRDF record	HRDF Row	HRDF Column	HRDF description	NeTEx element	NeTEx attribute	Type
bhfrt	*	1:7	Stop number	***ValidityCondition***	***ScheduledSTopPointRef***	*ScheduledStopPointIdType*
	*	9:9	B			

HRDF record	HRDF Row	HRDF Column	HRDF description	NeTEx element	NeTEx attribute	Type
	*	11:12	Stop restriction (0-7)		*[*	
	*	14:15	Routing Restriction(0-7)			
		16ff	Stop Name		***ScheduledStopPoint. name)***	

9.1.10.1 Example: Irish HaFas bhfrt

HRDF Example

```
6100101 I TL 0001967
6100101 I sn 0001967
6100101 B 7 7
6100007 I TL 0001968
6100007 I sn 0001968
6100089 I TL 0001969
6100089 I sn 0001969
6100089 B 7 7
6010062 I TL 0001970
6010062 I sn 0001970
6010062 I UR 0001971
6010062 I CZ 0001972
6010062 A WA
6100091 I TL 0001973
6100091 I sn 0001973
6100091 B 7 7
6000093 I TL 0001974
6000093 I sn 0001974
6000093 I UR 0001975
6000093 I CZ 0001976
6000093 A WA
6000001 I TL 0001977
6000001 I sn 0001977
6000001 I UR 0001978
6000001 I CZ 0001979
6000001 A WA
6010059 I TL 0001980
6010059 I sn 0001980
6010059 I UR 0001981
6010059 I CZ 0001982
6010059 A WA
6100822 I TL 0001983
6100822 I sn 0001983
6100822 B 7 7
6000002 I TL 0001984
6000002 I sn 0001984
6000002 I UR 0001985
6000002 I CZ 0001986
```

9.1.11 HRDF kminfo (rankings) – NeTEx INTERCHANGE RULE

The HRDF **kminfo** record defines the ranking that a station is given as a transfer point. If the priority is 0, this station should not be used as a transfer point. This can be expressed in NeTEx as an INTERCHANGE RULE.

Table 45 Mapping of attributes from HRDF kminfo record

HRDF record	HRDF Row	HRDF Column	HRDF description	NeTEx element	NeTEx attribute	Type
kminfo	*	1:7	Stop number	***InterchangeRule***	***FromScheduledStopPointRef***	*ScheduledStopPointIdType*
	*	9:13	Ranking		***Ranking***	*xsd:duration*
	*	15ff	Stop Name			

9.1.11.1 Example: Irish HaFas kminfo

HRDF Example

```
6000002 272 Athenry
6000009 185 Ballybrophy
6000023 40 Castlebar
6000026 74 Charleville
6000034 134 Drogheda (MacBride)
6000038 85 Dublin Pearse
6000040 99 Dundalk (Clarke)
6000050 219 Kildare
6000053 285 Limerick (Colbert)
6000054 185 Limerick Junction
6000055 155 Longford
6000067 253 Portarlington
6000068 227 Portlaoise
6000082 173 Tullamore
6010001 17 Broombridge
6010003 12 Blackrock
6010013 14 Clontarf Road
6010026 22 Howth Junction and Donaghmede
6010036 17 Lansdowne Road
6010051 15 Sydney Parade
```

NeTEx XML EXAMPLE – CONNECTION

```
<InterchangeRule version="any" id="6010001 ">
        <ConnectionRef ref="uic:6010001"/>
        <Priority>17</Priority>
        <FeederFilter>
            <CScheduleddStopPointRef ref="uic:6010001"/>
        <FeederFilter>
</InterchangeRule>

<TransferRestriction order="1" version="any" id=" uic:6000036"/">
        <Name>No Transfer</Name>
        <RestrictionType>cannotTransfer</RestrictionType>
</TransferRestriction>
```

9.1.12 HRDF fplan (journeys) – NeTEx SERVICE JOURNEY / POINTs IN PATTERN

The HRDF **fplan** file contain journey definitions; it is made up of a number of different record types and is the central (and most complex) part of the HaFas format.

The initial ‘ Z’ record identifies the journey. The primary subrecords (fplan Laufwegzeilen) are untagged and start with a stop number; they give the POINTs IN PATTERN and the PASSING TIMEsat stops.

The other tagged record types (A, G, L, I) state ancillary properties of the trip (corresponding variously to NeTEx TRAIN NUMBERs, TYPEs of SERVICEs, FACILITY SETs, and NOTICE ASSIGNMENTs). For several of the record types it is possible to state that they apply for a section of the journey between two stops (modelled in NeTEx with a JOURNEY PART). The trip itself and various properties may be conditional, specified using the ‘bitfeld’ day validity mechanism (corresponding to NeTEx VALIDITY CONDITIONs based on DAY TYPES)

Table 46 Mapping of attributes from HRDF fplan record

HRDF record	HRDF Row	HRDF Column	HRDF description	NeTEx element	NeTEx attribute	Type
Fplan - Z	*Z	4:8	Journey number	*ServiceJourney*	***id***	*ServiceJourneyIdType*
	*Z	10:15	Operator id		*OperatorRef*	*OperatorRef*
	*Z	19:21	Operator variant			
	*Z	23:25	Frequency number		***HeadWayJourneyGroup Ref***	***HeadWayJourneyGroup*** *yIdType*
	*Z	27:29	Frequency in minutes		***HeadWayJourneyGroup. Scheduled FrequencyInterval***	*xsd:duration*
Fplan-R *(Richtung : ie direction)*	*R-Z	4:4	Direction id	*ServiceJourney*	***DirectionRef***	*Ref*
	*R-Z	6:12	Heading id		***DestinationDisplayRef***	
	*R-Z	14:20	Start stop id		***FromPointRef***	*StopPointInPatternRef*
	*R-Z	22:28	End stop id		***ToPointRef***	*StopPointInPatternRef*
	*R-Z	30:35	Arrival Time		***ArrivalTime***	*xsd:time*
	*R-Z	37-42	Departure time		***DepartureTime***	*xsd:time*
Fplan-G (means of transport)	*G	4:6	Mode	***JourneyPart + TypeOfService***	***Name***	*MultilingualString*
	*G	8:14	Start stop id		***FromPointRef***	*StopPointInPatternRef*
See Zugart	*G	16:22	End stop id		***ToPointRef***	*StopPointInPatternRef*

HRDF record	HRDF Row	HRDF Column	HRDF description	NeTEx element	NeTEx attribute	Type
	*G	24:29	Arrival Time		***ArrivalTime***	*xsd:time*
	*G	31:36	Departure time		***DepartureTime***	*xsd:time*
Fplan-L *(line number)*	*L	4:11	Line id	***JourneyPart + TrainNumber***	***PublicCode***	*Xsd:normalizedString*
	*L	13:19	Start stop id		***FromPointRef***	*StopPointInPatternRef*
	*L	21:27	End stop id		***ToPointRef***	*StopPointInPatternRef*
	*L	29:34	Departure time		***ArrivalTime***	*xsd:time*
	*L	36:41	Arrival Time		***DepartureTime***	*xsd:time*
Fplan-A-VE *(Day types)* ***See bitfld***	*A VEI	7:13	Start stop id	*ServiceJourney (or DatedServiceJourney)*	***FromPointRef***	*StopPointInPatternRef*
	*I	15:21	End stop id		***ToPointRef***	*StopPointInPatternRef*
	*A VEI	23:28	Day Type id		***DayTypeRef***	*DayTypeID*
	*A VEI	30:35	Arrival Time		***ArrivalTime***	*xsd:time*
	*A VEI	37:42	Departure time		***DepartureTime***	*xsd:time*
Fplan-I *(Info text)*	*I	4:5	Infotext code	***NoticeAssignment*** *I	***Notice.PublicCode***	*Xsd:normalisedString*
	*I	7:13	Start stop id		***FromPointRef***	*StopPointInPatternRef*
	*I	15:21	End stop id		***ToPointRef***	*STopPointInPatternRef*
	*I	23:28	Day Bit id		ValidityCondition. DayType+ UicOperatingPeriod	*UicOperatingPeriodIdType*
	*I	30:36	info text id		***NoticeRef***	*NoticeRef*
	*I	38:43	Arrival Time		***ArrivalTime***	*xsd:time*
	*I	45:50	Departure time		***DepartureTime***	*xsd:time*
Fplan-A *(Attribute i.e. facilities)* ***See attribut***	*A	4:5	Attribute code	***FaciliilitySet***	***FacilitySet/FacilitySetRef***	***FacilitySetRef***
	*A	7:13	Start stop id	***JourneyPart***	***FromPointRef***	*StopPointInPatternRef*
	*A	15:21	End stop id		***ToPointRef***	*StopPointInPatternRef*
	*A	23:28	Day Type id		***ValidityCondition DayTypeRef***	*DayTypeID*

HRDF record	HRDF Row	HRDF Column	HRDF description	NeTEx element	NeTEx attribute	Type
	*A	30:356	Arrival Time		***ArrivalTime***	*xsd:time*
	*A	45:50	Departure time		***DepartureTime***	*xsd:time*
FPlan Laufwegzeilen		1:7	stop id	***StopPointInPattern***	***ScheduledStopPointRef***	
		9-29	Stop name		***ScheduledStopPoint.Name***	*MultilingualString*
		30:35	Arrival Time	***PassingTimes***	***ArrivalTime***	*xsd:time*
		37:42	Departure time		***DepartureTime***	*xsd:time*
		44:48	Train number from stop	***JourneyPart***	***TrainNumberRef***	***TrainNumberRef***
		50:55	Operator id from stop	***JourneyPart/Operator***	***Operator***	
		57:57	X include in display			
		59ff	Note		***Deascription***	

9.1.12.1 Example: Irish HaFas fplan

HRDF Example

```
*Z 00121 IR____ % A121 1752FF
*G A 9990840 6000036 %
*A VE 9990840 6000036 000374 %
*I TH 0000001 %
*A 1F 9990840 6000036 %
*A BF 9990840 6000036 %
*A RS 9990840 6000036 %
9990840 Belfast 00645 %
7003280 Lisburn -00656 -00656 %
6010039 Lurgan -00715 -00715 %
7003310 Portadown 00721 00721 %
6100000 PPASS -00733 -00733 %
7003300 Newry 00742 00742 %
6000040 Dundalk (Clarke) 00800 00800 %
6000034 Drogheda (MacBride) 00822 00822 %
6000061 Mosney -00830 -00830 %
6000006 Balbriggan -00833 -00833 %
6010053 Skerries -00836 -00836 %
6000057 Malahide -00844 -00844 %
6010043 Portmarnock -00846 -00846 %
6010026 Howth Junction and -00849 -00849 %
```

```
6010028 Kilbarrack -00850 -00850 %
6010044 Raheny -00851 -00851 %
6010025 Harmonstown -00852 -00852 %
6010034 Killester -00854 -00854 %
6010013 Clontarf Road -00856 -00856 %
6000036 Dublin Connolly$Con 00900 %
*Z 00122 IR____ % A122 175300
*G A 6000036 9990840 %
*A VE 6000036 9990840 000374 %
*I TH 0000002 %
*A 1F 6000036 9990840 %
*A BF 6000036 9990840 %
*A RS 6000036 9990840 %
6000036 Dublin Connolly$Con 00735 %
6010013 Clontarf Road -00737 -00737 %
6010034 Killester -00739 -00739 %
6010025 Harmonstown -00740 -00740 %
6010044 Raheny -00743 -00743 %
6010028 Kilbarrack -00745 -00745 %
6010026 Howth Junction and -00746 -00746 %
6010043 Portmarnock -00747 -00747 %
6000057 Malahide -00750 -00750 %
6010053 Skerries -00757 -00757 %
6000006 Balbriggan -00800 -00800 %
6000061 Mosney -00803 -00803 %
6000034 Drogheda (MacBride) 00809 00810 %
6000040 Dundalk (Clarke) 00831 00831 %
7003300 Newry 00848 00849 %
6100000 PPASS -00858 -00858 %
7003310 Portadown 00909 00909 %
6010039 Lurgan -00917 -00917 %
7003280 Lisburn -00931 -00931 %
9990840 Belfast 00945 %
```

```
    <ServicePattern version="any" id="ir:00122">
        <pointsInSequence>
            <StopPointInJourneyPattern version="any" id=" r:00122" order="1">
                <ScheduledStopPointRef version="any" ref="uic:6000036”>Dublin
Connolly</ScheduledStopPointRef>
            </StopPointInJourneyPattern>
            <StopPointInJourneyPattern version="any" id="ir:00122" order="2">
                <ScheduledStopPointRef version="any" ref="uic:6010013">Clontarf
Road</ScheduledStopPointRef>
            </StopPointInJourneyPattern>
            <StopPointInJourneyPattern version="any" id=" ir:00122" order="3">
                <ScheduledStopPointRef version="any" ref="uic:6010025"> Killester
</ScheduledStopPointRef>
            </StopPointInJourneyPattern>

:::::
            <StopPointInJourneyPattern version="any" id=" ir:00122" order="20">
                <ScheduledStopPointRef version="any" ref="uic:9990840">Belfast
</ScheduledStopPointRef>
            </StopPointInJourneyPattern>

        </pointsInSequence>
    </ServicePattern>
```

```
*Z 00122 IR____ % A122 175300
*G A 6000036 9990840 %
*A VE 6000036 9990840 000374 %
*I TH 0000002 %
*A 1F 6000036 6000036 %
*A BF 6000036 9990840 %
*A RS 6000036 9990840 %
```

```
<ServiceJourney version="any" id="ir:00122">
    <DepartureTime>07:35:00Z</DepartureTime>
    <dayTypes>
        <DayTypeRef version="any" ref=" ir:000374"/>
    </dayTypes>
    <ServiceJourneyPatternRef version="any" ref="ir:00122"/>
    <OperatorRef version="any" ref="uicShortOperator:IR"/>
    <TransportMode>rail</TransportMode>
    <ServicePatternRef version="any" ref=" ir:00122@JP"/>
    <DirectionType>outbound</DirectionType>


    <passingTimes>
        <TimetabledPassingTime version="any" id="ir:00122" order="1">
            <PointInJourneyPatternRef version="any" ref="ir:00122" order="1"/>
            <DepartureTime>07:35:00Z</DepartureTime>
        </TimetabledPassingTime>
        <TimetabledPassingTime version="any" id="ir:00122" order="2">
            <PointInJourneyPatternRef version="any" ref="ir:00122" order="2"/>
            <ArrivalTime>07:37:00Z</ArrivalTime>
            <DepartureTime>00:09:10</DepartureTime>
        </TimetabledPassingTime>
        <TimetabledPassingTime version="any" id="ir:00122" order="3">
            <PointInJourneyPatternRef version="any" ref="ir:00122" order="3">/>
            <ArrivalTime>07:39:00Z</ArrivalTime>
            <DepartureTime>07:39:00Z</DepartureTime>
        </TimetabledPassingTime>
….ETC ETC
        <TimetabledPassingTime version="any" id="ir:00122" order="203">
            <PointInJourneyPatternRef version="any" ref="ir:00122" order="20"/>
            <ArrivalTime>09:45:01Z</ArrivalTime>
        </TimetabledPassingTime>

    </passingTimes>


    <parts>
        <JourneyPart version="any" id="ir:00122@6000036+6000036 ">
            <MainPartRef version="any" ref="ir:00122"/>
            <FromStopPointRef version="any" ref="uic:6000036 "/>
            <ToStopPointRef version="any" ref="uic: 6000036 "/>
            <StartTime>07:35:00Z</StartTime>
            <EndTime>07:35:00Z </EndTime>
            <PurposeOfJourneyPartitionRef ref="ir:onboardAmenities"/>
            <facilities>
                <ServiceFacilitySet version="any" id=”ir:00122@6000036+6000036">
                    <FareClasses>firstClass</FareClasses>
                </ServiceFacilitySet>
            </facilities>
        </JourneyPart>

        <JourneyPart version="any" id="ir:00122@6000036+9990840">
            <MainPartRef version="any" ref="ir:00122"/>
```

```
            <TrainNumberRef version="any" ref="ir:A122"/>
            <FromStopPointRef version="any" ref="uic:6000036 "/>
            <ToStopPointRef version="any" ref="uic: 9990840"/>
            <StartTime>07:35:00Z</StartTime>
            <EndTime>09:45:01Z</EndTime>
            <PurposeOfJourneyPartitionRef ref="ir:onboardAmenities"/>
            <facilities>
                <ServiceFacilitySet version="any" id=”ir:00122@6000036+9990840">

    <TicketingServiceFacilityList>reservations</TicketingServiceFacilityList>
                    <MealFacilityList>breakfast</MealFacilityList>
                </ServiceFacilitySet>
            </facilities>
        </JourneyPart>
    </parts>
</ServiceJourney
```

9.1.13 HRDF bitfld (operational days) – NeTEx DAY TYPE ASSIGNMENT

The HRDF bitfld (“Bit field”) record species a sequence of valid days valid in the form of a bitmap., It is used to on which days one or more a Service Journeys run,

It should be noted that there is neither a 1: 1 nor an n: 1 relationship between a given journey in FPLAN and a bitfld validity day map. A journey in FPLAN can get several valid bitfld records for the entire trip, but also bitfld instances that are only valid for a certain section of the trip (e.g. station 2 to station 4, which are only served in the summer season). In addition, certain attributes of a trip can only refer to certain traffic days.

NeTEx has a special version of an OPERATING PERIOD allowing an efficient encoding of a period as a bit string. A DAY TYPE ASSIGNMENT is then used to assign the OPERATING period to the DAYTYPE of the SERVICE JOURNEYs to which it applies

Table 47 Mapping of attributes from HRDF bitfld record

HRDF record	HRDF Row	HRDF Column	HRDF description	NeTEx element	NeTEx attribute	Type
bitfld	*	1:6	Identifier	***UicOperatingPeriod***	***id***	*OperatingPeriodIdType*
	*	8:103	Day Bits		***ValidDayBits***	*Xsd:normalizedString*

9.1.13.1 Example: Irish HaFas bitfld

HRDF Example - Day Bit

```
000001
FFFFFFFFFFFFFFFE000000000000000000000000000000000018000000000000000000000000000000000000000000000000
000002
FE7FFFFFFFFFFFFE000000000000000000000000000000000018000000000000000000000000000000000000000000000000
000003
FFEFFFFFFFFFFFFE000000000000000000000000000000000018000000000000000000000000000000000000000000000000
```

NeTEx XML EXAMPLE – HRDF day bit as NeTEx OPERATING PERIOD

```
    <ServiceCalendarFrame version="any" id="000001">
        <operatingPeriods>
            <UicOperatingPeriod id="000001" version=" any ">
    <ValidDayBits>FFFFFFFFFFFFFFFFE000000000000000000000000000000000018000000000000000000000000000000000000000000000000</ValidDayBits>
            </UicOperatingPeriod>
    </operatingPeriods>>
```

9.1.14 HRDF infotext (train info) – NeTEx NOTICE

The HaFas **infotext** record provides a mechanism for associating further information of different types with a journey. A NeTEx NOTICE provides an equivalent mechanism. Arbitrary notices may be assigned using a NOTICE ASSIGNMENT.

NETEX NOTICEs may be assigned to entire, SERVICE JOURNEYs sections of journeys (JOURNEY PARTs) and individual POINTs IN JOURNEY PART

Table 48 Mapping of attributes from HRDF infotext record

HRDF record	HRDF Row	HRDF Column	HRDF description	NeTEx element	NeTEx attribute	Type
infotext	*	1:7	Number	***Notice***	***id***	*OperatingPeriodIdType*
	*	9ff	Text		***ValidDayBits***	*Xsd:normalizedString*

9.1.14.1 Example: Irish HaFas infotext

HRDF Example

```
HRDF Example
0000002 A122
0000003 A123
0000004 A124
0000005 A125
```

NeTEx XML EXAMPLE HRDF infotext as STOP ASSIGNMENT

```
    <Notice version="any" id="ir:0000002 ">
        <Text lang="en">Next Stop is Bravo Road. Alight here for Chocolate
Museum</Text>
    </Notice>


        <StopPointInJourneyPattern id="ir:00121" version="1" order="9">
                <ScheduledStopPointRef ref="uic:6000061 " version="1"/>
                    <noticeAssignments>
                        <NoticeAssignmentView order="1" id="ir:00121@9">
                            <NoticeRef ref="ir:0000002"/>
                        </NoticeAssignmentView>
                    </noticeAssignments>
        <StopPointInJourneyPattern
```

9.1.15 HRDF gleise (platforms) – NeTEx QUAY, STOP PLACE ASSIGNMENT

The HaFas **gleise** record specifies the platforms to be used for a trip. This is similar to the NeTEx assignment of QUAYs with a DYNAMIC STOP ASSIGNMENT. Assignments may be conditional on DAY TYPE

Table 49 Mapping of attributes from HRDF gleise record

HRDF record	HRDF Row	HRDF Column	HRDF description	NeTEx element	NeTEx attribute	Type
gleise	*	1:7	Stop number.	***DynamicStop-Assignment***	***ScheduledStopPointRef***	***ScheduledStopPointRef***
	*	9:13	Journey id		***JourneyRef***	*JourneyIdType*
	*	15:20	Operator		***(Journey. OperatorRef)***	*OperatorRef*

HRDF record	HRDF Row	HRDF Column	HRDF description	NeTEx element	NeTEx attribute	Type
	*	22:29	Platform id		***QuayRef***	*QuayRef*
	*	31:34	Time		***(PassingTime)***	
	*	36:34	Day type id		***AvailabilityCondition. DayTypeRefe***	*DayTypeRef*

9.1.15.1 Example: Irish HaFas gleise

HRDF Example

```
6000036 00121 IR____ 2 0900 000374
6000036 00122 IR____ 2 0735 000374
6000036 00123 IR____ 2 1005 000374
6000036 00124 IR____ 2 0930 000374
6000036 00125 IR____ 2 1240 000374
6000036 00126 IR____ 2 1120 000374
7003280 00126 IR____ 2 1317 000374
6000036 00127 IR____ 2 1440 000374
6000036 00128 IR____ 2 1320 000374
6000036 00129 IR____ 2 1620 000375
6000036 00130 IR____ 2 1520 000374
9990840 00130 IR____ 2 1729 000374
6000036 00131 IR____ 2 1817 000378
```

9.1.16 HRDF attribut (facilities) – NeTEx SERVICE FACILITY

The HaFas **attribut** (“attribute”) record provides classification codes for the on-board amenities, represented in NeTEx by FACILITies and associated with a given SERVICE JOURNEY by a FACILITY SET. It is referenced in the FPLAN A* record. Ranking can be indicated by the order within the set.

Table 50 Mapping of attributes from HRDF attribut record

HRDF record	HRDF Row	HRDF Column	HRDF description	NeTEx element	NeTEx attribute	Type
attribut	*	1:2	Attribute code		***id***	*Enum*
	*	4:4	Stop affiliation both, 1 departure, 2 arrival		***VAlidtyCOndition***	
	*	6:8	Presentation ranking 0-999	***Facility***	***[***	
	*	10-11	Presentation sub ranking 0-99			
	*	13ff	Explanatory text		***Name***	*MultilingualString*

9.1.16.1 Example: Irish HaFas attribut

HRDF Example

```
1B 0 100 10 First and standard class#
1C 0 100 10 First and standard class#
1F 0 100 10 First class only#
1S 0 100 10 Standard class only#
B 0 100 10 Buffet Bar and Trolley#
```

```
BF 0 100 10 Breakfast (1st Class Only), Buffet bar & Trolley#
BI 0 100 10 Bistro Menu (1st Class Only), Buffet Bar & Trolley#
BP 0 100 10 Mini Bistro Menu (1st Class only), Buffet Bar Menu & Trolley#
BS 0 100 10 Breakfast service, catering trolley & buffet bar#
CT 0 100 10 Catering trolley followed by buffet bar#
N 0 100 10 No Catering Service#
RF 0 100 10 Restaurant service to 1st Plus only, trolley & buffet bar#
RS 0 100 10 Reservations available#
TS 0 100 10 Trolley Service#
```

NeTEx XML example - FPLAN Use of Facilities

```
<ServiceJourney version="any" id="ir:sj_40447">
    <DepartureTime>09:00:00Z</DepartureTime>

    ::::: Etc
    <facilities>
            <ServiceFacilitySet version="any" id="bbd:svcfc_60457">
                <CateringFacilityList>buffet</CateringFacilityList>
                <FareClasses>secondClass</FareClasses>
                </ServiceFacilitySet>        </facilities>
```

9.1 HRDF attribue (modes) – NeTEx TRANSPORT MODE

The HaFas **attribue** record provides classifications codes for the TRANSPORT MODE. It is referenced in the FPLAN A* record. NeTEx transport modes have fixed enumerations *rail, bus, tram,* etc

It has a similar record structure to the HRDF **attribute** record.

9.1.1.1 Example: Irish HaFas attribue

HRDF Example

```
RL 0 10 00 RailLink Bus 90
BU 0 10 00 Bus
TU 0 10 00 Tube
```

NeTEx XML example - FPLAN Use of Transport model

```
*Z 00121 IR____ % A121 1752FF
*A RL 9990840 6000036 000374 %
```

```
<ServiceJourney id="ir:00121 " version="any">
    <LineView>
        <PublicCode>9121</PublicCode>
        <TransportMode>rail</TransportMode>
    </LineView>
    <calls> e
```

9.1.2 HRDF zugart (train types) – NeTEx TYPE OF PRODUCT CATEGORY

The HaFas **zugart** (“train type”) record provides classification codes for a vehicle Journey: these can be represented in NeTEx by a TYPE OF PRODUCT CATEGORY and/or a TYPE OF SERVICE,.

Table 51 Mapping of attributes from HRDF zugart record

HRDF record	HRDF Row	HRDF Column	HRDF description	NeTEx element	NeTEx attribute	Type
zugart	*	1:3	***Short code***	***TypeOfService***	***id***	*TypeOfService IdType*
	*	5:6	***Product category***		***PrivateCode***	
	*	8:8	***Tariff group***			
	*	10:10	***0***			*MultilingualString*
	*	12:19	***Name***		***Name***	*MultilingualString*
	*	21:21	***0***			
	*	23:23	***N local transport B Ship***			
	*	25:28	***Generic name***			
	*	30:33	***Language code***		***Name lang***	*language*

9.1.2.1 Example: Irish HaFas zugart

HRDF Example

```
A 1 1 Train 0
B 1 1 Train 0
BUS 5 1 Bus 0
D 3 1 Train 0
E 4 1 DART 0
LUA 6 2 LUAS 0
P 3 1 Train 0
UUU 9 2 - 0
```

NeTEx XML example HaFas zugart - FPLAN Use of TYPE OF SERVICE

```
*Z 00121 IR____ % A121 1752FF
*A D 9990840 6000036 000374 %
```

```
<TypeOfProductCategory id="ir:A" version="any">
        <Name> Train</Name>

<ServiceJourney id="ir:00121 " version="any">
        < TypeOfProductCategory Ref ref="ir:A" version="any"/>
    <calls> e
```

9.1.3 HRDF vardim (system parameters) – Various

The HaFas **vardim** record sets various system wide parameters. A few of these may be of interest to journey planners, for example MAX_LAUFWEG. They are outside of the scope of this.

HRDF Example

```
MAX_ASSOC 11000000
MAX_ATTRIBUTE 900000
MAX_BFELDER 65530
MAX_BHF 700000
```

```
MAX_BUFFER 2000
MAX_GRENZHALTE 100000
MAX_HST 60
MAX_INFO 3000
MAX_KANTEN 2000000L
MAX_LAUFWEGE 300000
MAX_LAUFWEG_DUMMY 3600000
MAX_MLIST 9000
MAX_PFP_ANZ 11000
MAX_PFP_BFELD 10000
MAX_PFP_LAUF 3000
MAX_PROFILE 50
MAX_QUINTUPEL 1800000
MAX_RICHTUNG 65534
MAX_SONDERZUEGE 10000
MAX_SPERREN 5000000
MAX_VTAG 3500
MAX_VTAGE_INFO 40000
MAX_VVZUG 4000000
MAX_WKANTEN_PRO_BHF 5000
MAX_ZUEGE_PRO_KANTE 9000
MAX_ZUGID 5000000L
MAX_ZUGNO 110000
MAX_ZUGVW 5000000
MAX_ZUG_TEMP 5800000L
M_RAM 2000000L
PRO_MAX_BFELD 2000
PRO_MAX_HST 7000
PRO_MAX_LAUF 200
PRO_MAX_LINIEN 400
nah_station1_max 1999999
nah_station1_min 0
nah_station2_max 0
nah_station2_min 0
MAX_INFOLIST 400000
ignore_ioc_garant 1
compatibility_520 1
MAX_PRE_LISTE 4000000
```

10 Mapping UD Rating Accessibility data to NeTEx

10.1 Use of Accessibility Data

The NeTEx schema can encode detailed accessibility data about stops, stations and vehicles.

The NTA's classification system for accessibility at bus stops – see PTIMS- *Universal Design Rating* [6] – can be mapped to NeTEx.

The UD rating system assigns a rating to a stop, either by manual survey or as computed from features such as shelter, pole, seating kerb, etc.

10.1 Mapping of Accessibility Data

In NeTEx accessibility information is held on an ACCESSIBILITY ASSESSMENT element.

- The NeTEx ACCESSIBILITY ASSESSMENT element includes a summary attribute ***AllAreas-WheelchairAccessible*** which can take one of four values (*True, false, partial, unknown*). This maps broadly to the UD ratings (though no distinction is made between A & A+)
- The exact UD Rating may be placed on an ACCESSIBILITY ASSESSMENT as a NeTEx keylist value.

Table 52 Summary of UD rating characteristics

UD Rating	Characteristics	ACCESSIBILITY ASSESSMENT AllAreas-Wheelchair-Accessible
A+	As for A with additional facilities, e.g. real-time	true
A	• Marked with a pole/shelter and plate code. • Readily available and accurate information at stop. • Safe footpath to junctions nearby. • Cassle kerbing/kerbing of sufficient height. • Enough space for wheelchair users to wait and board. • Well lit.	true
B	• Marked with a pole/shelter. • Accessible by a footpath. • Having a kerbing which allows boarding onto a bus at the stop.	partial
C	• Not wheelchair accessible. • No stop markings. • Lack of infrastructure such as footpaths to junctions and kerbing.	false
Unknown	Not yet classified	unknown

NeTEx XML EXAMPLE – a NeTEx QUAY with a UD Rating

```
    <Quay id="naptStop:8220DB007590" created="2006-02-07T00:00:00" modification="new"
changed="2016-01-14T18:03:22" version="11" status="active">
        <keyList>
            <KeyValue typeOfKey="nta:PTIM-UD">
                <Key>UDRating</Key>
                    <Value>A+</Value>
            </KeyValue>
        z</keyList>
        <Name lang="en">Marlborough Street</Name>
                <Centroid>
                    <Location>
                        <Longitude>-6.257789724</Longitude>
                        <Latitude>53.35260728</Latitude>
                        <gml:pos srsName="ITM">715986 735014</gml:pos>
                    </Location>
```

```
                </Centroid>
                <AccessibilityAssessment id="naptStop:8220DB007590" version="11" >
                    <MobilityImpairedAccess>true</MobilityImpairedAccess>
                    <limitations>
                        <AccessibilityLimitation>
                            <WheelchairAccess>true</WheelchairAccess>
                        </AccessibilityLimitation>
                    </limitations>
                </AccessibilityAssessment>
                <TransportMode>bus</TransportMode>
                <PublicCode>7590</PublicCode>
                <QuayType>busStop</QuayType>
    </Quay>
```

10.2 Properties affecting the UD Rating

The UD rating can be computed from underlying characteristics according to an algorithm given in the UD Rating documentation. Although this is out of scope of the current profile, we note that most of the detailed properties used to assess the UD rating can also be represented in NeTEx, either as different types of EQUIPMENT and or SITE FACILITies. Thus, in principle it should be possible to make the underlying properties available as open data in future.

Table 53 Summary of UD rating features

UD feature	NeTEx Equipment	NeTEx Facility
Visible Plate code	SIGN EQUIPMENT	
Real time Passenger Information Present	PASSENGER INFORMATION EQUIPMENT:	***PassengerInformationFacilityList*** nextStopIndicator stopAnnouncements passengerInformationDisplay realTimeConnections
Valid Timetable	PASSENGER INFORMATION EQUIPMENT:	***AccessibilityInfoFacilityList*** audioInformation audioForHearingImpaired visualDisplays displaysForVisuallyImpaired largePrintTimetables other
Shelter Present	SHELTER EQUIPMENT	
Bench	SEATING EQUIPMENT	
Light	PASSENGER SAFETY EQUIPMENT LIGHTING EQUIPMENT	***SafetyFacilityList*** ccTv mobileCoverage sosPoints staffed
Standing Area	SHELTER EQUIPMENT	
Flag Present.	SHELTER EQUIPMENT	
Bin Present	RUBBISH DISPOSAL EQUIPMENT	
Bike Lane Front		

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